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REPORT

OF THE

COMMISSIONER OF EDUCATION

FOR

THE YEAR 1897-98.

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THE UNITED STATES
BUREAU OF EDUCATION,

Created as a Department March 2, 1867.

Made an Office of the Interior Department July 1, 1869.

COMMISSIONERS.

HENRY BARNARD, LL. D.,

March 14, 1867, to March 15, 1870.

JOHN EATON, PH. D., LL. D.,

March 16, 1870, to August 5, 1886.

NATHANIEL H. R. DAWSON, L. H. D.,

August 6, 1886, to September 3, 1889.

WILLIAM T. HARRIS, PH. D., LL. D.,

September 12, 1889, to date.

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Vol-I

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REPORT OF THE COMMISSIONER OF EDUCATION.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, D. C., October 1, 1898.

SIR: I have the honor to submit herewith the annual report of this office for the year ending June 30, 1898.

Total enrollment in schools and colleges.—There were enrolled in the schools and colleges, both public and private, during the year 1897–98 16,687,643 pupils, the same being an increase of 432,550 pupils over the previous year. This includes the enrollment in private and incorporated institutions of all grades (1,554,725) and 15,132,918 in public institutions. The increase in the public institutions was 390,841 (nearly 2.7 per cent), while the increase in private institutions was 41,709, or nearly 2.8 per cent over the previous year. I had occasion to note last year that the private school enrollment had slightly decreased in the year 1896–97 from the enrollment in 1895–96, and attributed it to the long-continued business depression which had caused parents, who feared reduced incomes, to remove their children from the private to the public schools.

These returns for 1897–98 show the effect of the beginning of business prosperity. The tide had turned in the previous year and its effects had begun to be felt.

The private school enrollment is a little more than 9 per cent of the whole at the present time. It should increase in the coming years of larger business incomes to its normal standard, which is about 15 per cent of the whole. During "hard times" there is a contraction in the business of manufacturing and this reacts disastrously on agriculture and commerce, for it returns to the farm large numbers of persons not needed there, and at the same time decreases the demand for farm products by taking away the farmer's best market, namely, the home market at the neighboring villages and cities. Then, again, it decreases the amount of commerce and causes depleted incomes to the population engaged in transportation and trade.

The lesson of school statistics for 1897–98 is therefore a cheerful one inasmuch as it manifests the return of prosperity and the removal of farm population to the villages and cities to engage again in manufacturing occupations.

Besides the sixteen and a half millions at school in public and private institutions of all grades there are pupils enrolled in various

special institutions not included in the above enrollment. These items are as follows:

Enrollment in other schools, 1897–98.

City evening schools	185,000
Business schools	70,950
Indian schools	23,000
Schools for defective classes	23,854
Reform schools	23,501
Benevolent institutions, chiefly orphan asylums	14,000
Schools in Alaska	1,250
Private kindergartens	93,737
Miscellaneous	50,000
Total	485,292

The miscellaneous in the above table includes such institutions as schools of music, oratory, elocution, cookery, and of various special arts.

This gives 17,172,935 as the grand total.

THE COMMON SCHOOLS.

The expression "common schools" is used in this office to include public schools of elementary grade—the first eight years of the course of study—and secondary grade—ninth to twelfth years of course of study—but no institutions for higher grade, although the State universities and State normal schools and professional schools might be included as institutions that draw support from public funds.

The statistics in the following table give a condensed summary of the common school statistics derived from data furnished this office by State superintendents in reply to circulars of inquiry. For convenience of comparison the items for the previous three decades are given. For a more detailed statement showing these returns by States, see tables 1 to 19 immediately following this introduction.

The average length of the school term has reached 143.1 days. Last year it reached 140.4 days, and for the years previous it had never reached 140 days. I have pointed out the fact that this increase in the length of school term keeps pace with the growth of large villages and cities. Urban populations have a school session of nine or ten months, while rural districts have three or four months, or at the highest six months.

This increase in the length of school term appears in the slight increase of school expenditure per inhabitant—namely, an increase from $2.62 in 1896–97 to $2.67 in 1897–98. There is an improvement from year to year in the qualifications of teachers, and this is indicated by increase in salaries. The cost per pupil for teachers' salaries was $11.83 for the year 1896–97 and $12.04 for the year 1897–98. The total expenditures for common-school purposes amounted to almost two hundred millions of dollars ($194,020,470).

TABLE I.—*Common-school statistics of the United States.*

	1870–71.	1879–80.	1889–90.	1897–98. *a*
I.—*General statistics.*				
Total population	39,500,500	50,155,783	62,622,250	72,737,100
Number of persons 5 to 18 years of age	12,305,600	15,065,767	18,543,201	21,458,294
Number of different pupils enrolled on the school registers	7,561,582	9,867,505	12,722,581	15,038,636
Per cent of total population enrolled	19.14	19.67	20.32	20.68
Per cent of persons 5 to 18 years of age enrolled	61.45	65.50	68.61	70.08
Average daily attendance	4,545,317	6,144,143	8,153,635	10,286,092
Ratio of same to enrollment	60.1	62.3	64.1	68.4
Average length of school term (days)	132.1	130.3	134.7	143.1
Aggregate number of days attended	600,432,802	800,719,970	1,098,232,725	1,471,435,367
Average number for each person 5 to 18 years of age	48.7	53.1	59.2	68.6
Average number for each pupil enrolled	79.4	81.1	86.3	97.8
Male teachers	90,293	122,795	125,525	131,750
Female teachers	129,932	163,798	238,397	277,443
Whole number of teachers	220,225	286,593	363,922	409,193
Per cent of male teachers	41.0	42.8	34.5	32.2
Average monthly wages of teachers:				
Males	.....	.....	.....	*b* $45.16
Females	.....	.....	.....	*b* $38.74
Number of schoolhouses	132,119	178,222	224,526	242,390
Value of school property	$143,818,703	$209,571,718	$342,531,791	$492,703,781
II.—*Financial statistics.*				
Receipts:				
Income from permanent funds	.....	.....	$7,744,765	$9,213,323
From State taxes	.....	.....	26,345,323	35,600,643
From local taxes	.....	.....	97,222,426	134,104,053
From all other sources	.....	.....	11,882,292	20,399,578
Total receipts	.....	.....	143,194,806	199,317,597
Per cent of total derived from—				
Permanent funds	.....	.....	5.4	4.6
State taxes	.....	.....	18.4	17.9
Local taxes	.....	.....	67.9	67.3
All other sources	.....	.....	8.3	10.2
Expenditures:				
For sites, buildings, furniture, libraries, and apparatus	.....	.....	$26,207,041	$32,814,532
For salaries of teachers and superintendents	$42,580,853	$55,942,972	91,836,484	123,809,412
For all other purposes	.....	.....	22,463,190	37,396,526
Total expenditures	69,107,612	78,094,687	140,506,715	194,020,470
Expenditure per capita of population	1.75	1.56	2.24	2.67
Expenditure per pupil (of average attendance):				
For sites, buildings, etc	.....	.....	$3.21	$3.19
For salaries	$9.37	$9.10	11.26	12.04
For all other purposes	.....	.....	2.75	3.63
Total expenditure per pupil	15.20	12.71	17.23	18.86
Per cent of total expenditure devoted to—				
Sites, buildings, etc	.....	.....	18.6	16.9
Salaries	61.6	71.6	65.4	63.8
All other purposes	.....	.....	16.0	19.3
Average expenditure per day for each pupil (in cents):				
For tuition	7.1	7.0	8.4	8.4
For all purposes	11.5	9.7	12.8	13.2

a The figures for 1897–98 are subject to correction. *b* In 44 States.

TABLE II.—*Total number of pupils and students of all grades in both public and private schools and colleges, 1897–98.*

NOTE.—The classification of States made use of in the following table is the same as that adopted by the United States census, and is as follows: *North Atlantic Division:* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. *South Atlantic Division:* Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. *South Central Division:* Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma. *North Central Division:* Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. *Western Division:* Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California.

Division.	Pupils receiving elementary instruction (primary and grammar grades).		Pupils receiving secondary instruction (high-school grade).*a*		Students receiving higher instruction.								
					In universities and colleges.*c*			In schools of medicine, law, and theology.*e*			In normal schools.*g*		
	Public.	Private (largely estimated).	Public.*b*	Private (in preparatory schools, academies, seminaries, etc.).	Public.*d*	Private.	Total.	Public.*f*	Private.	Total.	Public.	Private.	Total.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
The United States	14,589,036	1,249,665	459,813	166,302	29,728	71,330	101,058	8,096	46,135	54,231	46,245	21,293	*h*67,538
North Atlantic Division	3,472,716	510,286	143,977	50,635	5,072	26,667	31,739	254	17,366	17,620	19,470	1,724	21,194
South Atlantic Division	2,110,342	88,741	25,729	22,371	3,683	10,158	13,846	762	6,113	6,875	4,445	1,449	5,894
South Central Division	2,842,478	143,872	34,658	32,473	2,815	10,795	13,610	1,099	4,668	5,767	2,999	4,265	7,264
North Central Division	5,443,994	467,933	228,358	51,562	14,184	20,771	34,955	5,292	16,693	21,985	15,542	13,145	28,687
Western Division	719,506	38,833	27,091	9,261	3,969	2,939	6,908	689	1,295	1,984	3,789	710	4,499

a Including pupils in preparatory or academic departments of higher institutions, public and private, and excluding elementary pupils, who are classed in columns 2 and 3. A classification of public and of private secondary students, according to the character of the institutions in which they are found, is given in Chap. XLVI, vol. 2.

b This is made up from the returns of individual high schools to the Bureau, and is somewhat too small, as there are many secondary pupils outside the completely organized high schools whom there are no means of enumerating.

c Including colleges for women, agricultural and mechanical (land-grant) colleges, and scientific schools. Students in law, theological, and medical departments are excluded, being tabulated in columns 9–11. Students in academic and preparatory departments are also excluded, being tabulated in columns 4 and 5.

d Mainly State universities and agricultural and mechanical colleges.

e Including schools of dentistry, pharmacy, and veterinary medicine.

f Mainly in schools or departments of medicine and law attached to State universities.

g Nonprofessional pupils in normal schools are included in columns 4 and 5.

h There are, in addition to this number, 21,687 students taking normal courses in universities, colleges, and public and private high schools. (See Chap. XLV, vol. 2.)

TABLE II.—*Total number of pupils and students of all grades in both public and private schools, 1897–98*—Continued.

Division.	Summary of higher (including normal) instruction.		Summary of pupils by grade.			Summary according to control.		Grand total.
	Public.	Private.	Elementary.	Secondary.	Higher.	Public.	Private.	
1	15	16	17	18	19	20	21	22
The United States	84,069	138,758	15,838,701	626,115	222,827	15,132,918	1,554,725	16,687,643
North Atlantic Division	24,796	45,757	3,983,002	194,612	70,553	3,641,489	606,678	4,248,167
South Atlantic Division	8,895	17,720	2,199,083	48,100	26,615	2,144,966	128,832	2,273,798
South Central Division	6,913	19,728	2,986,350	67,131	26,641	2,884,049	196,073	3,080,122
North Central Division	35,018	50,609	5,911,927	279,920	85,627	5,707,370	570,104	6,277,474
Western Division	8,447	4,944	758,339	36,352	13,391	755,044	53,038	808,082

AVERAGE AMOUNT OF SCHOOLING PER INHABITANT.

How much schooling is each inhabitant receiving on an average on the basis of returns for 1897-98? Tables III and IV answer this question, the former table showing this item for all schools, public and private, of whatever grade, and the latter (Table IV) the amount of schooling furnished by the public schools alone in the various subdivisions of the United States.

The amount on an average has reached just five years for the entire nation.

TABLE III.—*Average number of years of schooling (of 200 days each) that would be given to each individual of the population under the conditions actually existing at the different dates specified in the table, and taking into account all public and private schooling of whatever grade.*

	1870.	1880.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	a1897.	a1898.
The United States	3.36	3.96	4.46	4.51	4.49	4.52	4.72	4.75	4.83	4.91	5.00
North Atlantic Division	5.06	5.69	6.05	6.15	6.18	6.10	6.35	6.47	6.52	6.64	6.75
South Atlantic Division	1.23	2.22	2.73	2.78	2.74	2.79	2.95	2.95	2.93	3.05	3.14
South Central Division	1.12	1.86	2.42	2.62	2.69	2.64	2.89	2.65	2.70	2.75	2.95
North Central Division	4.01	4.65	5.36	5.35	5.21	5.38	5.57	5.69	5.84	5.87	5.87
Western Division	3.56	4.17	4.57	4.71	5.07	4.93	5.01	5.43	5.46	5.55	5.77

TABLE IV.—*The same, taking into account only the schooling furnished by public elementary and secondary schools.*

	1870.	1880.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	a1897.	a1898.
The United States	2.91	3.45	3.85	3.93	3.97	3.99	4.17	4.23	4.28	4.37	4.46
North Atlantic Division	4.43	4.84	4.99	5.06	5.10	5.10	5.28	5.47	5.52	5.61	5.71
South Atlantic Division	.80	1.90	2.42	2.46	2.46	2.51	2.70	2.68	2.66	2.78	2.87
South Central Division	.80	1.57	2.20	2.31	2.41	2.38	2.59	2.39	2.44	2.49	2.68
North Central Division	3.71	4.19	4.67	4.74	4.75	4.84	5.00	5.15	5.21	5.28	5.25
Western Division	2.77	3.57	3.98	4.16	4.47	4.39	4.45	4.87	4.95	5.02	5.25

a Subject to correction.

NOTE.—The two preceding tables have been recomputed with revised data, and will be found to differ slightly from the figures previously published.

State school systems.—In an appendix hereto Mr. F. E. Upton, specialist in State school systems, has presented in tabular statements the several items of statistics relating to schools that are collected by the State superintendents of public instruction, showing items of attendance of pupils, number of teaching corps, schoolhouses, receipts and expenditures, etc. In Table 1 the population and estimated number of children between the ages of 5 and 18 years are given. These and other items are shown in per cents in Table 2 for better comparison. In Table 3 are brought together for the several States the items of legal school age, compulsory attendance, and the latest actual enumeration of children.

More than thirty States (32) have adopted compulsory laws, the majority making these laws apply during the period between 8 and 14 years, although the legal school age is from 6 to 21 in twenty-two States, 5 to 21 in eleven States. In Table 4 a historical survey is made of the total enrollment of pupils since 1870, and the percentage of the population of school age (5 to 18) given in each case. Table 5 gives items of sex of pupils, with percentages. Table 6 shows the percentage of enrollment as compared with total population of school age annually since 1870. Table 7 shows the average number of pupils attending school each day at three decennial periods, for comparison with the same items in 1897–98.

It must be understood that this item is reported from daily registers, in which are recorded the number of pupils actually in school for the day, excluding all pupils absent for sickness or other necessity, although they are considered as belonging to the school. The number enrolled includes all that have attended the school for any period during the year. It is obviously not fair to report the item of average attendance to show the extent of influence of the American school system. It is better to give the number enrolled and specify the average length of the school attendance. This is given in Table 8, the last column. Instead of saying that the schools of the United States had in 1896–97 an average attendance of 10,089,620 for the average school term of 140 days, it conveys a more adequate idea to say the entire number enrolled in 1896–97, namely, 14,652,492, attended an average of 96.7 days in the year. This gives the actual number of children that attended school in the course of the year and shows their actual amount of schooling, whereas the other gives about two thirds of the number who received schooling and credits them with a greater amount of schooling than they actually received, thus producing two erroneous impressions. The length of school year in actual days taught is given in Table 8, and Table 9 adds an historical survey of this item, showing a pretty steady increase in the number of days taught. The growth of cities and villages is sufficient to account for the increase, but the growing sentiment in favor of public schools in the South and Southwest is a considerable factor in the result.

Tables 10 and 11 show the proportion of males and females in the corps of teachers in each State and an historical survey from 1870 to the present time. The change from 41 per cent of male teachers to 32 per cent in twenty-eight years, considering the fact that in cities and villages the proportion of children 12 years of age and under amounts to about 83 per cent of the entire number at school, is not so wonderful, for it will be admitted that women are better fitted as a general thing than men for the instruction of children of that age. That the proportion of male teachers is likely to decrease still further with the growth of an urban population is clear from a comparison of the records of the

several divisions of the country. The South Central, for instance, had in 1870 a much larger proportion of men than of women teachers—in the ratio of 67.5 to 32.5. This has changed until in 1897–98 the proportion is 52 men to 48 women. But taking the division with most cities (the North Atlantic) for the same period, in 1870 the men were in ratio of 26.2 to 73.8 women, and in 1897–98 as 19 men to 81 women. This may go even a little further and reach the same ratio—17 to 83—that the pupils of 12 years and under bear to the pupils 13 years and over, but it is not probable that it will happen soon. The remarkable increase in secondary and higher education that accompanies prosperous business periods will quite likely delay the result by slightly increasing the average age of school pupils.

Table 12 gives interesting items regarding the average wages of teachers in the several States and divisions, together with other items as to the amount and value of school property, the last item in the aggregate being nearly half a billion of dollars. It is to be remembered in this connection that the property of higher institutions—colleges, universities, and professional schools—is not counted in this table.

Table 13 shows the actual returns for private schools from which the annual estimate is made. When States or parts of States do not report the statistics of private schools it becomes necessary to estimate for them on the basis of the returns of the adjoining States or parts of States, or sometimes on the basis of former returns from the States now failing to report. In this way a very close approximation can be obtained.

In Tables 14 and 15 the items of school revenue are given for the several States and analyzed so as to show clearly the source of the same, whether from general or local taxes or from permanent funds or rents. With the growth of cities local taxation becomes the main source of school revenues, as will be seen by a comparison of the North Atlantic Division with the South Central in this item.

Tables 16, 17, and 18 deal with school expenditures by States and divisions, and give a full analysis of the same, together with a historical retrospect by States and divisions.

A number of graphic exhibits have been prepared by Mr. Upton to show the trend of the several items of statistics from year to year.[1]

Historical sketch of German schools.—This interesting account of the rise and development of the school system of Germany by Dr. Nohle is translated from Rein's Encyclopædisches Handbuch by Dr. Klemm. It is noteworthy among histories of education for the fact that it does not lay the chief stress upon the criticisms and theories advanced by reformers, but sketches the actual conditions that existed from time to time, and touches upon the reformatory schemes only when they have had a perceptible influence in modifying the system.

Summer schools in Europe.—Chapter II gives an account of Sum-

[1] See pp. LXXXVIII-XCVII.

mer schools in certain European countries, by Prof. Herbert B. Adams. The work of these schools is akin to the university extension work and to that which characterizes the Chautauqua movement in this country.

The National Home Reading Union in England under the auspices of Oxford and Cambridge men has its summer assembly with excursions to historic points. At both Oxford and Cambridge are courses of lectures and study, of which a marked feature is the participation of workingmen.

A "Town and Gown Association" in Edinburgh endeavors to promote cooperation between citizens and students, and extended courses of lectures form a part of the summer work.

One of the chief objects of university extension as it appears at Oxford and Cambridge is to direct the reading of people who are educating themselves. The elementary schools of England are practically making readers of the entire population. But what it is wise to read is not obvious without some help from those who have made the voyage of discovery through higher education. At a summer school in Oxford or Cambridge new worlds are revealed to the farmer boy or mechanic who has learned how to read, but has not yet learned what to read.

The late Thomas Hill Green, of Oxford, devoted much of his strength to this work of making his university a power for the elevation and enlightenment of the town people. He was a pioneer in one of the best movements of the age.

In France the Alliance Française has labored to extend the knowledge of the French language and literature in French colonies and other countries. Under its auspices are summer courses, and diplomas are given for specified results.

Certain of the summer schools of Switzerland are conducted through the cooperation of English-speaking visitors, who endeavor in a systematic way to make the most of their opportunities while in the country. There are also summer schools for instruction in modern languages at Swiss universities.

It is noteworthy that the history of education in this epoch has for its chief feature the extension of all forms of education to the people. University extension has for its chief meaning the incitement of the people engaged in hard work and the direction of machinery to begin studies in science, history, and literature. The laborer shall have access to books and continue the meager school education into his after life, so that he may reenforce his mental strength by the instruction of his race, constant learning having become the habit of his life.

Education in Great Britain and Ireland.—Chapter III is introduced by a conspectus of the English system of elementary education, from which it appears that the public treasury bears an ever-increasing proportion of the cost of the elementary schools. In 1872, the year

after the school law of 1870 went into operation, 37 per cent of this expenditure was met from the Government grant; in 1897, 64 per cent.

The law of 1891 authorizing a special grant in lieu of fees remitted has gone far toward making elementary education free. Eighty-four per cent of the schools are free and 86 per cent of the pupils pay no fees; those from whom fees are still collected are, with few exceptions, in the advanced grades. Private schools, chiefly parochial, enroll 55 per cent of elementary pupils and draw 41 per cent of their support from other than public funds, i. e., from endowments and subscriptions. The board schools—that is, schools managed by elected boards—enroll 45 per cent of the pupils. They draw support from local taxes amounting in 1896 to upward of $10,600,000, or 40 per cent of the entire cost of maintenance for that year.

The early age at which children may be exempt from school attendance is accounted a serious obstacle to the efficiency of school training. In 1893 the law fixed 11 years as the upper limit of the age for exempting a child from the provisions of the compulsory law. The law just passed (August 1, 1899), as this matter goes to press, raises that limit to 12 years.

The statistics show clearly the effect of the regulations of 1890 enlarging the scope of the night schools. Since that date the attendance upon the night schools of England has increased by 127 per cent; in Scotland, where similar regulations were secured as early as 1883, the increase in the attendance upon night schools exceeds 300 per cent.

The public agitation over educational problems is scarcely less now than that just previous to the passage of the elementary school law of 1870, which has determined the character of the system for over twenty-five years. The main fact in the history of the system during that period is the irresistible expansion of the course of study beyond the meager elements originally prescribed by law, and the incidental organization of higher grades of work rivaling in many respects the endowed secondary schools of England. This growth of the elementary schools, combined with special efforts on the part of Government to provide ampler facilities for prolonging the education of the industrial classes, has revealed the disorganized condition of secondary education in England and the waste of time and resources actually existing. The need of a general administrative measure, thus made apparent, led to the education bill of 1896. The unexpected defeat of that measure prevented for the time renewed efforts in this direction. Meanwhile the demands of the parochial schools for further aid from public funds to offset the advantages accruing to the board schools from local taxes became imperative. The demand is, indeed, part of the deep-reaching struggle now going on in England with respect to the future destiny

of the established church. It was the sense of danger to the whole ecclesiastical system that caused the conservative leaders during the campaign of 1895 to make unqualified promise of support to the parochial school authorities. An attempt was made to satisfy these pledges by the law passed early in the session of 1897 providing a special grant for the "voluntary" schools; that is, elementary schools, chiefly parochial, under private management. This law is the first departure from the impartial policy of Government action with respect to the two classes of schools recognized by the law of 1870.

The provisions of the new law, with some consideration of its immediate effects, are given in Chapter III. The importance of the law lies in its political and social bearing rather than in the amount of relief afforded to the schools participating in the grant. The chapter also reviews the successive measures by which greater freedom and scope have been given to the elementary schools. These relate to the programmes and the teaching force. The decrease in the proportion of pupil teachers is very marked. In 1876 they formed 57 per cent of the entire number of teachers in England; in 1896 but 29 per cent. In Scotland a similar change has been effected, the proportion of pupil teachers falling between 1880 and 1896 from 40 to 21 per cent of the total force employed. The educational department has recently begun active efforts for the improvement of the pupil teachers as regards both their qualification and the conditions under which their apprenticeship is accomplished.

The report of a special committee appointed to investigate the pupil-teacher system is summarized in the chapter considered.

The discussions of school problems before the "church congress" of 1897, cited also in the chapter, show a high conception of the teacher's calling and of the standard which parochial schools must maintain under the pressure of modern conditions.

The failure of the education bill of 1896 caused a postponement of legislation with respect to secondary education. This continues to be the subject of public agitation, and a measure providing for some form of public supervision and assistance is confidently expected in the present session.[1]

Particulars are given in Chapter III respecting the existing provision for secondary education in England and the opinion of English authorities as to the course public action should take in respect to this interest.

The multiplication of university colleges, especially in the industrial centers of England, and their provision for scientific and technical

[1] As this matter goes to press an announcement is published of the passage of the board of education bill. This measure unites in one central authority functions at present exercised by several administrative bodies and provides for the inspection of such secondary schools as may apply for this service.

training is a feature emphasized in the brief survey of university work.

There has been organized recently a division of special inquiries and reports in the English education department. Its function is in some respects similar to that of our National Bureau of Education, and it has begun the issue of a series of annual reports of great value.

Education in Canada.—In Chapter IV is to be found an account of the educational systems of Canada which, as our nearest neighbor, and a people of similar origin and language to our own, is always of great interest to us. Its experiments at the solution of modern problems in education are all the more instructive to us from the fact that there is very much more attention paid to the central organization there, than is the case with us. It affords us a ready object lesson upon centralization, its many and great advantages, and its obvious defects, as compared with our own system. We are tending toward a stronger centralization, but so slowly as not to endanger the good of our local self-government in theory or practice. Our tradition leaves to individuals and small communities the initiative and nearly all the practical details.

The consequence of endowing individuals and local communities with such abundant powers is a constant education in political power and general self-direction, but it is the most expensive of all education so far as waste of time and misapplication of energy is concerned. Perceiving this, it is quite natural at first to suppose that it is all a mistake and that centralization pure and simple is the best and most rational, since it secures reasonable things at a minimum of expenditure of means. This is the view of statesmen in monarchies and likewise of such theorists as Thomas Carlyle, and men of great ability belonging to his school—Froude, Ruskin, and others. The trend of modern history is against them, and it seems to them to be a false tendency necessary to be retraced after manifold evils have developed. But the continued progress of natural science and the consequent application of its discoveries to mechanic inventions which save labor in the direction of mere drudgery, and turn it toward directive power and the acquirement of knowledge, is an underlying motive power which works irresistibly toward democracy. When the total product of industry in a community (as in Asia) is only 3 cents a day for each inhabitant, there is no reasonable demand for democracy; it is a political disease and must be suppressed. Nor has its time fully come even when the annual production of a people has reached only 10 or even 20 cents a day per inhabitant. Without steam and labor-saving machinery it can go no higher than 10 cents. But with a production of 20 to 50 cents a day on an average, there is an impulse manifested on the part of the masses to create for themselves by individual effort the means of self-culture and to enter the higher classes of occupations which have for their object: First, the means of luxury and creature comforts; secondly, the means of protection of life, property, and public institutions; thirdly, the collection

and diffusion of the instrumentalities of culture.[1] The printed page of book and periodical is diffused widely and more widely, and the consequence is a people at school through life. If the elementary school but teaches how to read, the what to read should be taught by the purveyors of higher education. To learn the technique of science and to follow its discoveries, to learn the higher vocabularies used by poets and the literary class, and to learn human nature as revealed in their productions is a sufficient employment for the span of life stretching on from the age of 21. There is constant progress in producing power among civilized nations and constant stimulation toward the culture that comes of the mastery of books. Hence, too, there is progress in self-directive power and a consequent impatience of direction in minute details from a master who requires blind obedience. Enlight-

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[1] LIST OF OCCUPATIONS.

I. THE LOWER ORDER—PRODUCTION OF NECESSITIES.

1. Procuring of raw materials.
   (*a*) Agriculture and grazing.
   (*b*) Hunting, fishing.
   (*c*) Mining (including petroleum wells, etc.).
2. Transportation.
   (*a*) Teaming.
   (*b*) Railroad.
   (*c*) Water transportation.
3. Transformation of products.
   (*a*) Textile fabrics, cloth, and clothing.
   (*b*) Wood and metal work.
   (*c*) Leather.
   (*d*) Miscellaneous.

II. THE HIGHER ORDER—PRODUCTION OF MEANS OF LUXURY, OF PROTECTION, AND OF CULTURE.

The vocations that provide:

1. Means of luxury and creature comfort, including manufactures that require a higher order of educated technical skill.
2. Means of protection, including—
   (*a*) Those who provide amusement and recreation.
   (*b*) Medical profession.
   (*c*) The legal profession.
   (*d*) Officials managing public works or public charities, also Government officials.
   (*e*) Insurance companies and the directive agents of companies formed for guarding the interests, general or special, of society as a whole, or of any particular part of it, charitable associations, trade unions, etc.
3. Instrumentalities of culture.
   (*a*) Moral and religious—churches, etc.
   (*b*) Intellectual and moral education—schools and libraries.
   (*c*) Esthetic, including all trades that produce ornaments on useful goods or that produce works of art in sculpture, painting, music, poetry and literary art, landscape gardening, etc.; also all influences that cultivate taste—the formation and care of art museums, etc.
   (*d*) The collection and diffusion of information, editing and printing of books newspapers, telegraph operators, etc.
   (*e*) Pursuit of science and the invention of devices useful in the arts.

enment spreads and is destined to spread with the growing opportunities created by the conquest over nature by science and invention. Self determination will increase and local self-government will become universal and remain so.

Meanwhile, in its crude elementary stages this form of government has evils which must be eliminated. These evils furnish the problems of our school management, and since our neighbors, the Canadians, are approaching them from a different point of view, the history of their school administration is of the greatest service to us.

Not only must there be local authority, but there must be central authority. The two should harmonize and be so adjusted that each one increases the other. A central power that continually enlightens the local powers and supplements them is the desideratum.

In this chapter (IV) are given the statistics of the elementary schools of each Province for 1896, with a brief historical survey of the several school systems.

The system of Quebec offers a decided contrast to those of the other Provinces, and bears much less resemblance to the systems of our own States. Separate schools are there maintained for Catholics and for Protestants, under distinct control and management.

This division, which is extremely interesting in the historic view, has been the cause of much friction, and attempts were made in the present year to secure legislation looking to the unification of the system. Though not successful, these efforts have, perhaps, reacted in such a way as to produce a more vigorous administration of the schools as now constituted.

Private seminaries and academies, and especially those maintained by the Catholic Church, have large enrollments, which explain the comparatively small attendance on the elementary schools of Quebec.

It is worthy of note that Ontario, under the enlightened administration of Minister Ross,[1] has made the kindergarten a feature of its public-school system; in Nova Scotia, also, public kindergartens are reported.

From a table showing the proportional parts of the school income derived from the Government grant or from local sources, it appears that the latter yield much the larger revenue (from three-fifths to nine-tenths) in all the Provinces excepting Prince Edward Island.

A tabular view is given of the higher educational institutions of Canada.

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[1] Minister Ross has also greatly stimulated the comparative and historical study of education by the publication of the results of special researches in these directions. To this policy the student of education is indebted for access to a "Documentary history of education in Upper Canada," drawn from original sources by Dr. J. George Hodgins, Deputy Minister of Education. The official service of Dr. Hodgins covers a period of more than fifty years. He was chief of staff from 1844 to 1890, the intimate friend and colaborer of Dr. Ryerson, and to his able direction was due in no small degree the success of the Ontario system of education from its inception.

Education in Australasia.—Chapter V presents a summarized account of education in Australia, New Zealand, and Tasmania, including the elementary-school systems and the agencies for secondary and for higher education.

The enrollment in elementary schools, ranging from 17 to 18 per cent of the population in the several colonies, is remarkably large, considering the social and industrial conditions. This result is due in great measure to special efforts for extending instruction to the children of isolated districts. Among the devices employed are house-to-house instruction and conveyance of children to central schools.

The compulsory laws, which have been enacted in all the colonies, are not easily enforced, by reason of natural obstacles; but the average attendance exceeds in every colony 64 per cent of the enrollment. In New Zealand it is higher, rising to 83 per cent. The percentage of attendance on total number enrolled in the United States as a whole is only 68 per cent. In cities and large villages it exceeds this.

The policy of centralized control adopted in the five divisions of Australia has been necessitated by the conditions of newly settled countries, enterprising, ambitious, and impatient of the slow development of local forces.

New Zealand has adhered more closely to the English precedents. Here the local authority predominates in school affairs, with results which commend the system. The working out of these opposite policies is shown by interesting detail in a report of personal observations on the school systems of Victoria, New South Wales, and South Australia by the rector of a New Zealand normal school. The report is reproduced in this chapter.

In addition to the public elementary schools, all the colonies maintain schools for afflicted children, the blind and deaf-mute, and for orphans. Special provision is also made for the training of incorrigible and vicious youths.

Secondary education in these colonies is provided by private agencies, but public scholarships are maintained, which enable promising children from the elementary schools to prolong their studies.

It will be seen from statistics given in this chapter that private schools form an important part of the school supply in New South Wales and Victoria, their enrollment being above one-fourth that of the public schools. The efforts made, especially in New Zealand and New South Wales, to promote technical training, like similar efforts in the mother country, increase the demand for public secondary schools. Already the elementary-school programmes of New South Wales have been extended to include high-school branches, as Latin, algebra, geometry, and French.

Higher education has been fostered in the colonies by Government grants for the support of universities and technical colleges. Sydney University, in New South Wales, receives annually from this source

$80,000, and Melbourne University, Victoria, $55,000. The University of New Zealand is an examining body, whose diplomas are recognized as of equal value with those granted by any university of the United Kingdom. This university has exercised a marked influence on the standards required for the elementary teachers of New Zealand. The classified list of teachers shows that 250, or one-tenth the regular corps (i. e., the pupil teachers being excluded), were university graduates.

Among the papers appended to Chapter V is a report on the school-attendance law of 1894 by Mr. J. Stormont Small, truant inspector, who has conducted the service with great efficiency, and also a paper by Mr. Mark Cohen, editor of the Dunedin Evening Star, on the industrial schools of the colony, which have been an indispensable auxiliary in the work of enforcing the compulsory law.

Education in Central Europe.—In Chapter VI Dr. Klemm discusses various points of interest concerning education in Central Europe. First, the object of polytechnic education is treated by Prof. A. Riedler, of the polytechnic institute of Berlin. This paper advocates a change in the course of study, and points to the results of polytechnic instruction in the United States. A statistical table, giving important items of information concerning technological, agricultural, forestry, mining, and veterinary schools in Europe, supplements the first paper. A statement of what is being done in Europe in fostering school gardens for the purpose of aiding nature study in school, and incidentally also agriculture, will be found helpful at present, inasmuch as this question has begun to be discussed in the press. The rates of salaries paid to teachers of elementary schools in Switzerland are shown in tabular form, similar to the statistics offered for Germany and Austria in the annual report preceding this. A governmental expression on the question of the higher education of women in Prussia, given by the minister of public education in the Prussian legislature, states the reasons why the Government of that State has hitherto hesitated to open the higher seats of learning to women. The customary table showing the percentage of illiteracy in Europe has been revised, and offers opportunity for instructive comparisons. Two articles follow, one on "Examinations" and the other on "Philosophy as a school study," by Prof. Friedrich Paulsen, of Berlin. In the former the learned author balances impartially the good and evil influences of school examinations, and shows their origin and present status in Germany. In the other paper he traces the gradual decline of philosophic study in the secondary schools of his country, and points out the danger for university students arising from it, claiming that the absence of this element from the curriculum of the preparatory schools prevents the student from acquiring a world view, wherein his particular science may be seen in its harmonious relations with other sciences and with the entirety of human knowledge.

The dissemination of hygienic knowledge.—Chapter VII is entitled

"Means for spreading hygienic knowledge among the people." It is the substance of an address delivered by Prof. Leo Burgerstein, of Vienna, at the International Medical Congress, held at Moscow, Russia. The address abounds with practical suggestions, some of which have since been adopted by European governments.

Technical education in Europe.—The first systematic effort to foster industry of a high order in the United States, such as the successive governments of France—whether monarchical, imperial, or republican—have fostered for more than two centuries by means of the porcelain establishment at Sèvres and of the tapestry establishment at Gobelins, has been comprehensively treated in special reports of this Bureau based upon the anticipations and results attending the introduction of industrial drawing, and the establishment of an art normal school by the State of Massachusetts, in 1870.[1] Since that important event in the history of education in this country the movement for industrial education of the people has in addition taken other forms, of which the latest, but by no means the least important, is the establishment of textile schools. In Chapter VIII an account of the European schools for weaving and dyeing is given by Mr. C. P. Brooks, director of the textile school at Lowell, Mass. (who represented this Bureau at the late International Congress on Technical Education, of which he speaks in Chapter IX).

Nowhere else as in Germany is there so widespread and accurate a comprehension and application of the aphorism that knowledge is power. It is a characteristic of the educated and directive classes of that country to systematize knowledge and to reduce it to a curriculum; to formulate it in a programme. The university seminar for training college teachers (Gymnasien, etc.), the normal (as we say) school for training elementary school teachers, the polytechnicum for training engineers, and the so called institutes attached to the university faculties for training expert chemists and physicans all originated in Germany, and thence, too, comes the present form of the textile school. Mr. Brooks notes this tendency. That the manufactures of the leading European nations, and notably the German manufacturing communities, have for several years seen in the trade school a very valuable auxiliary, if not a supreme necessity, to their business is noticed in his report. The number of textile schools in Europe, it seems, does not exceed 30, and 14 of them are in Germany. Mr. Brooks reviews the character of the financial organizations of these schools, bringing into relief the State character of the German textile school and the municipal character of the English school, and notes the prominent features of the textile schools of the several European countries, arranging the

[1] Notably on "Industrial and high art education in the United States: Part I: Drawing in the public schools, preceded by essays elucidative of the report proper, by Isaac Edwards Clarke, A. M., special agent, 1885." This was preceded several years by a preliminary special report.

descriptions of the schools by their nationality, his report being a summary of his observations intended to be suggestive rather than exhaustive.

The history of education in India.—In Chapter X Dr. W. E. De Riemer gives a brief commentary on some parts of education in India. While for this interesting subject there are no statistics or reports available prior to the period of British occupation, it is well known that India is a land where education of a high degree has prevailed for many centuries, and a history of indigenous education in India is identical with a history of its literature. The real intellectual life of the country radiates from the three great religious forces which have been from time to time uppermost there, for the Vedic, the Buddhistic, and the Mohammedan upheavals brought with them great educational awakenings. The character, extent, and influence of the native schools are traced with some detail, and the growth of female education in modern times is considered.

It is of note that the Mahabharata, the greater of the two epic poems mentioned (containing 200,000 lines and equal in length to 12 Homer's Iliads), is now translated into English prose and published complete in one hundred parts by Protab Chunder Roy (and his widow) in Calcutta, 1883–1897.

The epoch of reconstruction of the common schools in New England, 1830–1865.—In Chapter XI Dr. A. D. Mayo gives the important particulars of the formation of the present systems of common schools in New England and the Middle States. It is a very instructive chapter to the student seeking a clear outline of this epoch of new organization and recasting of educational theories.

Physical training.—Dr. E. M. Hartwell presents in Chapter XII a summary of the results of his study and experience in the field of physical training. It is claimed that the teachings of modern science and the lessons of experience demand that physical training should be provided for in the elementary and secondary education of both sexes, and the paper accordingly enters into an examination of the scientific basis of the demand as well as into the history and status of the general subject. The human body is a living machine, capable of transforming and utilizing energy. Regarded as a structure it is an aggregation of cells, so grouped and joined as to form the various organs and tissues.

The essential factor in physical training is neuro-muscular exercise. This results first in the increased health of the neuro-muscular machine, involving the attainment of a normal degree of size, strength, and working power in the structural parts; and, second, the acquisition of advantageous habits by the neural parts in regard to the transmission and regulation of stimuli. The development of the nervous mechanisms which control the bodily movements is the most important effect of neuro-muscular exercise. The main field of physical education is the

nervous system, and genuine success depends on the skill of the instructor in selecting such forms of neuro-muscular action as are adapted to the sex, age, and capacity of the pupil.

In the evolution of the individual the more general functions, such as the circulatory and alimentary organs, develop earlier than the special functions, as exemplified in the vocal organs and the hands and feet. Similarly the more massive parts of the nervous system develop before the minuter parts. Education, to be safe and natural, therefore, should defer the training of the accessory parts of the nervous system until the development of its fundamental portions has been secured.

During the first eight years of life strenuous drill is not advisable; simple games and elementary gymnastics yield valuable results. During the next eight years both gymnastic training and athletic pastimes should be given a prominent place in the curriculum, but violent exertion should not be permitted. The period between the seventeenth and twenty-fifth years is the period of established adolescence and development, and attempts at record breaking and trophy winning may be encouraged within reasonable limits.

The typical forms of physical training are five in number, and may be styled (1) the Grecian, (2) the mediæval or knightly, (3) the British, (4) the German, and (5) the Ling or Swedish. In tracing these typical systems to their original forms, it appears that they had their beginnings in childish plays or in games akin to such plays.

British sports are the most highly developed modern expression of the play instinct, and they reflect more fully than any other modern system of physical training the national spirit of their devotees. They are the inherited pastimes of a manly, self-sufficient folk and have never fully outgrown their primitive characteristics. They have been followed largely for their own sake and have been but slightly modified through the efforts of innovating educators and thinkers. In this they present a marked contrast to German turning and Swedish gymnastics, which have been developed chiefly for set purposes by their promoters.

In the breadth of its aims, in the magnitude of its proportions and completeness of development as a national institution, and in its abiding influence, the physical training of the Greeks has no parallel. Games formed a chief feature of the religious festivals of the Greeks, and this circumstance reacted both on sculpture and architecture, in supplying the former with models of ideal beauty and in setting the task to the latter of providing suitable places for the games to be celebrated.

The dominant note of the Middle Ages is one of warfare, and education was conceived and carried out almost wholly with a view to preparation for the life of a soldier. Though knighthood and its martial exercises have disappeared, the influence of chivalry remains in the favor still accorded to such bodily accomplishments as riding, hunting, fencing, and dancing.

German gymnastics embrace three well-marked departments, viz, "Volksturnen," or popular gymnastics; "Schulturnen," or school gymnastics; and "Militärturnen," or military gymnastics. The organization of the last two departments is maintained and controlled by the Government for strictly educational purposes; whereas the "Turnvereine," as the societies of the turners are called, are voluntary associations of a social and popular nature. The fondness of the German people for gymnastic exercises is as marked a national trait as the liking of the British for athletic sports. The three most eminent names in the list of men identified with the revival and upbuilding of German gymnastics are those of Guts Muths, Jahn, and Spiess. Each was a teacher and writer, but Jahn was an agitator and popular leader in addition. Guts Muths lived from 1759 to 1839, Jahn from 1778 to 1852, and Spiess from 1810 to 1858. Guts Muths by his work and writings prepared the way for Jahn, the "father of turning," and for Spiess, the "founder of German school gymnastics, and the creator of gymnastics for girls."

It appears that Ling, the founder of the Swedish system, derived his first ideas of gymnastics from German sources, but as the director of the Central Gymnastic Institute, founded in 1814, he evolved a system of gymnastics unlike any other. Ling divided gymnastics into (1) pedagogical gymnastics, (2) military gymnastics, (3) medical gymnastics, and (4) æsthetic gymnastics. He laid especial stress on exercises without apparatus. In Swedish school gymnastics great attention is given to precision and correctness in the execution of movements; and the system is further characterized by the effort employed in coordinating the exercises belonging to a single "day's order," not only to each other, but also with regard to the "day's orders" which have preceded and those that are to follow. The semimilitary character and labored rationalism of the Swedish gymnastics make them ill adapted to serve the purposes of popular gymnastics.

In the United States, interest in problems pertaining to physical training has never been so general, active, and intelligent as within the past ten years. Large sums of money have been spent for gymnasia and play grounds for colleges and secondary schools, and cities aggregating a school population of over a million have provided instruction of some sort in gymnastics for their elementary schools. One of the most striking signs of the times is the growing conviction that teachers of physical training must be thoroughly prepared for their work; the success attained by the few normal schools of gymnastics is a further hopeful indication. The best interests of rational physical training have suffered much from the disproportionate influence exercised by athletic ideals upon scholastic youth. Athletics constitute the most popular and most obtrusive branch of physical training. The mutiplication and growth of athletic clubs has been a notable feature in the history of physical training for the past fifteen years.

They constitute the consummate and peculiar product of the athletic movement. There is nothing just like them outside of America.

Appendix I to this chapter is a tentative effort on the part of Dr. Hartwell to arrange the leading topics relating to physical training in an orderly way, and to indicate certain of their relations. Appendix II is a translation by Dr. Charles E. Lowrey of Lucian's dialogue, entitled "Anacharsis and Solon," one of the best presentations extant of the views of the Greeks concerning gymnastics.

Foreign influence on education in the United States.—Prof. B. A. Hinsdale, of the University of Michigan, has incorporated the results of his studies on foreign influence upon education in the United States in Chapter XIII (pp. 591–629), from which it appears that the English colonists of the seventeenth and eighteenth centuries brought to New England educational ideals which they naturally strove to embody in universities and grammar schools similar to those of the mother country. These colonists were largely from the class of small landed proprietors, the yeomanry of England; many of them had been students of higher institutions, where Latin, Greek, Hebrew, mathematics, and (in a minor degree) the sciences were taught. The pursuit of commerce had brought them in touch with the French people; their desire for literary training had impressed the culture of Italy upon the English mind; Protestantism had familiarized them with the conception of elementary education, so that the English characteristics were quite fully impressed upon the New England colonies. Between 1630 and 1690 there were in those colonies "as many graduates of Cambridge and Oxford as could be found in any population of similar size in the mother country," and education was there developed along the lines of English tradition. New York and Pennsylvania felt the influence of Dutch and German immigration. The Huguenots, driven out of France, carried their ideas to South Carolina and other Southern States. The Catholic planters of Maryland sent their sons to France, and, with their return, there came in a French-Catholic influence which dominated many families of that section. With the breaking out of the Revolution many prominent Frenchmen reached these shores, either to aid the colonists or to report to their Government upon the conditions prevailing in the English colonies.

The early representatives of this country abroad—Franklin, Adams, and Jefferson—served as transmitters of continental ideas to their home people, and French influences made a perceptible impression in the United States. An attempt was made to found in Richmond an academy of arts and sciences upon the French model, which, if it had been placed upon a firm foundation, might have become a center of higher education for the South.

The attention of Thomas Jefferson, who had previously taken great interest in educational matters, during his stay abroad was given in liberal measure to the study of educational systems, organizations, insti-

tutions, and courses of study, with the object of giving the benefit of such investigations to home institutions. One of his ideas was that of an institution composed of "distinct schools of art and science," which has been carried out in the University of Virginia.

The first attempts to organize education in Michigan were made upon French models as adopted by Thomas Jefferson and still further modified by one of his disciples, Judge Woodward. By the time that State came into the Union (1837), German ideas were notably felt in that section, and they were permeating American schools and institutions generally. In the first half of this century the mind and culture of Germany became important factors in our intellectual and educational history. Its first impress upon England was for commercial purposes, then the literature came to be studied by the poets—Coleridge, Wordsworth, Southey, and Scott; Carlyle was especially instrumental in directing the attention of the English-speaking people to the treasures of German learning.

Benjamin Franklin in 1766 visited the University of Göttingen, and was present at a meeting of the Göttingen Academy of Sciences held in that year, at which time he was working on the plan for the establishment of an American university in Philadelphia; still it is questioned whether any German influence can be traced to that period in the history of that university. In 1814 Mr. George Ticknor became the pioneer in study at German universities, and his example has been followed by many well-known Americans (see list, pp. 610–613). It seemed even then to be felt that to be a scholar in the true sense of the word one must "resort to the larger libraries, to the abler teachers, and to the better universities of the old world." Rev. Fred. H. Hedge was thoroughly imbued with the German spirit, and his influence on the body of transcendentalists was noteworthy.

The difficulties attendant upon the teaching of German in the early years of this century at Harvard College are clearly portrayed by Dr. A. P. Peabody, who states that there were no German books in the bookstores; a German reader had to be compiled and furnished to the students sheet by sheet; it was printed in Roman type, as it was impossible to find German type. Between 1825 and 1831 the Cambridge University Library was augmented by a number of valuable works, and German books were published by the University Press.

Private libraries in the vicinity also obtained German books, which caused many people to enter into the sense and spirit of German thought.

The influence of George Bancroft's studies at Göttingen was felt in the Round Hill School, which he and Dr. Cogswell founded, but the effort of Mr. Ticknor to introduce portions of the German system of education by a direct division of preliminary and higher scientific studies in his alma mater, Harvard University, did not meet with a ready response. The Fellenberg system of education at Hofwyl, at first an agricultural school, then one for general training, interested

Dr. Cogswell greatly; its democratic ideals of society—high and low meeting together on equal ground—appealed to him. With Pestalozzi and his theories—"his hatred and envy of Fellenberg, bad order, no obedience in scholars"—he was not as favorably impressed. Prof. John Griscom's visit to literary and public institutions abroad is fully described by Dr. Hinsdale. Dr. Henry Barnard, speaking of Griscom's book, A Year in Europe, says that "No one volume in the first half of the nineteenth century had so wide an influence on the development of our educational, reformatory, and preventive measures, directly and indirectly, as this." In that work an account of a visit to Pestalozzi's school was given, which has been reproduced by Mr. Hinsdale on pages 619, 620. Prof. Alexander Dallas Bache was sent abroad to investigate and prepare a system of instruction for the Girard College for Orphans, to which he had been called as president; the trustees requested that his investigations be thorough and practical. His report deals, first, with the education of orphans; secondly, with systems of general instruction. He treats especially of the education of persons for particular vocations and of technical schools. His investigations abroad are said "to have done much to improve American methods of public instruction."

Victor Cousin's reports on education in Prussia and Holland were regarded by Sir William Hamilton as marking an epoch in the progress of national education, and as directly conducing to results important, not to France only, but to Europe.

At the University of Vermont President Marsh's interest in German literature was first developed through a study of Coleridge, and afterwards by a study of Kant's Critique of Pure Reason.

The influence of German studies upon American theology has been very marked. Among those who have exerted such influence are Professors Stuart and Smith. To the former belongs the credit of opening the rich storehouse of German biblical literature to Americans. To Professor Smith, as a master of the translator's art, America is indebted for the introduction of many gems of German religious thought. He also prepared elaborate articles on Hegel, Kant, and Schelling for the New American Cyclopedia.

Status of woman from an educational and industrial standpoint.—The educational status of woman in different countries was treated in the Report for 1894–95, the main effort in that presentation being to give comparative views of the laws and regulations governing the education of girls in all grades of instruction.

In Great Britain, France, Italy, the Netherlands, Switzerland, and the Scandinavian countries women, if suitably prepared, are allowed the privilege of university study and may take certain degrees—these vary in the different countries.

In Germany and Austria-Hungary the higher authorities are still discussing university study for women. Women who are desirous of attending university lectures must have the permission of the minister;

a ministerial decree of November 21, 1896, permitted women to study in the higher agricultural schools of Prussia; the minister of public instruction in Baden subordinates his decision to the views of the rectors of the universities. No general action has been taken in Germany as to the regular admission of women students in the universities of the Empire, yet greater privileges are being allowed from year to year. Higher courses, preparatory to university study, are being established and applications for permission to enter a university are increasing each year. Berlin University has for some years tolerated the presence of women "hearers."

Special stress is laid in this chapter upon woman's position in the industries; the woman bread-winner of the past is contrasted with the trained worker of to-day. Thirty years ago about one hundred occupations were open to women; to-day there are over four hundred.

An important consideration under this general subject is that of technical or industrial training schools for girls. Many such schools are found in central Europe, and their graduates are prepared to command a fair salary.

Professor Joynes, of South Carolina, gives an account of the industrial schools for girls in Germany and France. He describes the four departments in the German industrial schools: I, the review course; II, the commercial department; III, the professional department, including fine arts; IV, the domestic department.

"The importance of the commercial course," he says, "is justified by the presence of women in every branch of mercantile trade in Germany and France," and he notes further that the "industrial education of woman has taken strong hold of the public mind."

The public school and the public library.—Chapter XV is a symposium on the relations between the public school and the public library, in which educators and librarians give their views on the way these institutions may be made to supplement each other. The movement to secure this closer union began twenty years ago. The work done in Worcester and Springfield, Mass., St. Louis, Cleveland, Milwaukee, Detroit, Denver, and other cities, the methods of reaching school children with good books and the results are shown.

Education in France.—The system of State education in France, unlike the systems of English-speaking countries, comprises all grades of instruction, the dependence of the secondary and superior institutions upon Government aid and control being greater even than in the case of the elementary schools. The authority of the minister of education is so great and the bureaucratic organization so imposing that it is difficult to estimate fairly the degree of local independence in the matter.

In Chapter XVI, on French education, this feature is specially emphasized, and the events narrated which have tended to the increase of local directive power.

The most important of these events is the law of July 10, 1896, which completes the series of measures for transforming the former centralized system of higher education directed from Paris (the so-called faculties) into self-governing universities.

Fifteen universities have been created under the law, which will no longer look to the State for buildings, equipments, special courses, etc.; these must be provided from their own resources; local and individual efforts in behalf of higher education are being greatly stimulated by the change. A significant sign of the effect of the new law is the increased attendance upon the provincial universities. In 1885 Paris had more than half the total number of university students; in 1895 the majority were found in the provincial universities. This change was attributed by the minister of education to hopes inspired by the legislation then pending. The total number of university students in 1897 was 26,912 as against 15,976 in 1885. Medicine and law have by far the greater enrollment, comprising above 63 per cent of all the university students, but the increase of attendance is greatest in the faculties of science, 85 per cent from 1891 to 1896. The increase of students has been accompanied by decrease in expenditure per capita. This was $115 in 1877, it rose to $142 in 1887, and had fallen to $106 in 1895.

The State secondary schools (lycées) experience little change in programme or system of management, notwithstanding that one reform measure after another engages the attention of the educational and the legislative authorities. These institutions are hard pressed by the rival church schools and the statistics seem to show a constant though slight relative decrease in attendance, which excited alarm as early as 1892. In that year the public secondaries (lycées and communal colleges) enrolled 48⅓ per cent of secondary pupils, in 1897 the ratio had fallen to 46⅓ per cent.

The tendency here indicated is viewed with some concern by the Government and inquiries have been instituted with a view to ascertain its causes.[1]

The movement toward decentralization, whose effects in the departments of higher education have already been considered, is noticeable also in that of primary education. It is here particularly manifest in the development of high schools under local auspices. These schools give prominence to science and the modern languages, and omit entirely Latin and Greek.

Besides the high school for general literary and scientific instruction, the law recognizes a class of technical high schools. These have been the subject of much legislation and of various experiments, administrative and educational, which are of general interest. The history of their origin and progress is given with great fullness in a report to the

[1] The statistics presented on p. 703 are taken from the reports submitted to the chamber of deputies by M. Bouge, chairman of the Financial Commission (Commission du Budget Général, etc.): 1897, pp. 124, 125; 1898, pp. 32, 33.

English science and art department by Mr. Charles Copland Perry, of New College, Oxford. The report is republished in the chapter here considered.

The statistics of the primary schools of France tabulated in this chapter show a marked increase in attendance (17 per cent) from 1876–77 to 1886–87, and a slight decrease (1 per cent) in the five years following. The decline is really less than that in the child population (nearly 2 per cent for the half decade), and would excite little attention were it not limited to the public primary schools. In fact, during the five years specified the enrollment in private primary schools increased by nearly 17 per cent. It is further noticeable that this increase has taken place wholly in church schools. Other private schools seem to be rapidly giving place to public schools.

The latest report giving a detailed analysis of the attendance was for 1891–92, at which time the public primary schools enrolled 76.8 per cent of elementary pupils. Ten years before, 1881–82, their proportion was 81.6 per cent.

The church schools, which derive no support from Government, are now educating nearly 25 per cent of the children of school age.

The movement for the education of the adult masses, which has been fully noticed in previous reports, shows no abatement.

In 1896–97 there were reported 1,200 societies engaged in this work and 417,421 persons in attendance upon the evening or continuation classes, which employed above 33,000 teachers, most of them belonging to the State service.

France leads the world in the application of art or æsthetic taste to industry. French taste for what is graceful, realized in manufactures, commands the highest price in the world market. It is not a matter of caprice, but grounded in reason. The Greek set the standard of the beautiful for all time by making it the object of art to exhibit matter under perfect control of indwelling intelligence. Gracefulness is its principle and it expresses inward freedom. Much of oriental art, in fact its pervading spirit, is the portrayal of slavery or thraldom to matter. Egyptian art is ponderous and expresses limitation to freedom, although with a promise of emancipation. Individual immortality is to it a solution to the riddle of the Sphinx. There is a distinction to be drawn between the Greek ideal and that of the French. The former makes matter completely controlled by the indwelling will and hence shows freedom of action, while French art seems to strive to show all material attributes or qualities subdued in the presence of man, its master. No harsh contrasts in color or sound are allowed. The French artist looks after the frame of his picture—it must echo the general expression of the painting within it and not shock the senses by rough contrast or by drawing attention to itself and away from the picture. He goes further and looks after the objects in the room, the suggestions of each and all the surroundings. Each object in

a picture must heighten or reenforce the effect of all others. The subordinate must reflect the chief piece and not detract from it by setting up a different interest and creating a struggle for the attention of the spectator. In a world's fair the French exhibits show this æsthetic taste, while the exhibits of other nations show a conflict of interests, harsh contrasts, and even a contest between a picture and its frame or even its surroundings. In Greek art the material is vanquished and indifferent—it has no story of its own to tell in contrast to the revelation of the purpose of the living soul incarnated in it. In French art matter has its story, but it is one in harmony with the purpose of the soul; it reveals an effort on its part to repeat that purpose. The arrangement of colors, sounds, and forms distinctly suggests considerateness for the comfort and sensuous pleasure of man. Nothing shall be "loud" so as to shock the senses. The savage delights in gaudy colors, deep contrasts, harsh discords; they express his own inward and outward antagonisms. But to the Parisian, who has long since subdued nature and made it obedient to his will, who has accumulated wealth, there is necessary an art that shall reflect this conquest of nature by means of arts and industries at the disposal of capital. Parisian art meets the want and is certainly a worthy product, although it may be confidently claimed that Greek art is still on a higher plane. For the art of the best period does not betray its purpose of pleasing the senses, but appeals to the inward pride of the soul and its aspiration for freedom, even from sensuous pleasure. Hence the best Greek art is always serene and earnest and keeps far away from flattering sensual indulgences. Be this as it may, French instruction, both in art and in industry, deserves of all nations a far more thorough study than it has yet received.

The paper on M. Duruy, taken from an address by the Duc de Broglie, and an address by M. Ferdinand Buisson (well known and highly esteemed in America), reviewing the work of M. Henri Marion, are worthy of careful reading. M. Duruy was minister of education from 1863 to 1869, and the address of the Duc de Broglie is an admirable summary, not alone of the career of the eminent historian, but of the movement of education during that eventful period. M. Marion was the first incumbent of the chair of pedagogy at the Sorbonne, created in 1887, and from that position his influence extended to the entire teaching body of France.

Most interesting to many Americans who have desired to gain admission as students to the universities of France is the information on pages 749–759. The movement set on foot as early as 1893, and described in my reports for 1895–96 and 1896–97, has finally achieved its purpose by securing a decree opening French "faculties" to foreigners on liberal terms and an order on the part of the University of Paris which institutes a degree of doctor in the schools of letters, of sciences, and of medicine, open in 1899 to foreign students coming with the

degree of A. B. from their home institutions. This order is given in full (pp. 753–754) and further particulars as to fees for examinations (p. 755). Useful explanations will be found in the quotation from an address by Professor Bonet-Maury. It would seem that the number of foreign students (all told) at the University of Paris in 1891–92 was somewhat upward of a thousand and continued at that standard up to 1895–96, this being the attendance under the old arrangement. American students numbered 34 in 1892 and 64 in 1896. It is reported that under the new decree a large increase of foreign students has been noted.

Text-books in arithmetic.—In Chapter XVII Prof. J. M. Greenwood and Dr. Artemas Martin trace the development of arithmetical text-books in the United States. The chapter contains many valuable bibliographical and biographical details.

The teaching of astronomy.—A brief statement of the general principles which should govern the teaching of astronomy in the primary and secondary schools and in the university, by Dr. Edward S. Holden, formerly director of the Lick Observatory, is given in Chapter XVIII (pp. 869–892).

In the elementary grades the object of astronomical teaching, as viewed by Dr. Holden, is not so much to impart a knowledge of the elements of the science as to train the eyes and minds of the children to observation of natural phenomena, to accustom them to observe, note, and reflect. The outline which is given of the order in which it will be found useful to take up the different topics, of the apparatus and devices which may advantageously be employed, and of the methods to be pursued, will furnish many practical suggestions of value to the teachers of elementary classes.

In addition to its more purely educative functions, astronomy in the secondary schools is to be regarded and taught as an information study as well. For those high-school students who design to pursue astronomy in college a Latin scientific course, such as is given in the Report of the Committee of Ten on Secondary Studies, is strongly recommended, the student electing, preferably, sciences other than astronomy. On the other hand, those students whose future course is uncertain should by all means choose astronomy as one of the groups of secondary scientific studies. The grounds upon which Dr. Holden bases these conclusions are set forth on page 876, and are commended to the thoughtful consideration of both teachers and students.

Especial emphasis is laid upon the desirability of having better trained teachers, elementary and secondary. The teacher should thoroughly understand the subject. A broadening of sympathies and interests on the part of the teacher is needed quite as much as improvements in apparatus and appliances.

For the purpose of exhibiting the present state of higher astronomical instruction in the United States, the courses in this branch in a

number of representative colleges and universities are given in detail; also a discussion of the general considerations which should guide in forming such courses. Some of these considerations are analogous to those which the writer holds should govern the selection of studies in the secondary course. "The very best undergraduate preparation for graduate work in astronomy is not so much astronomy itself as a sound and sufficient training in the higher mathematics and thorough and long-continued work in the physical laboratory" (p. 890).

Systems of text-book supply.—An analysis of the principal features of the different State text-book laws is given in Chapter XIX. From this it will be seen that near a score of States prescribe State uniformity of text-books for terms of years varying from three to six. Local uniformity is secured in a considerable number of other States for similar periods. One State, California, publishes books for use in the common schools. Provision for use of books free of cost to pupils is made in more than a score of States, either by a general requirement or upon popular vote of a district or a town.

The advantages of State uniformity are: (1) Economy in purchasing, (2) avoidance of friction in local boards over text-books, and (3) the better facilities of State boards for examination of competing works. The gratuitous supply to pupils is advocated as cutting off the annoyance of delay in procuring books through parents and as costing less to the community as a whole, and also the increase in attendance on the part of the very poor, who shrink from incurring the expense of school books and likewise from the confession of poverty by accepting books "provided for indigent children." On the other hand, not all admit the economy of purchase of books exclusively adopted for a State, and some object to a prohibition of change within a fixed term as discouraging progress; while as to free text-books, it is urged that the families lose the benefit of ownership and that the transmission of books through a promiscuous succession of pupils is unsanitary. In the course of the discussion practice tends more toward broad uniformity in the thinly populated States and to providing free books for pupils.

Experimental study of children.—In Chapters XXI and XXV Mr. MacDonald has brought together the results of the movement known as child study and kindred branches of investigation. This movement is largely due to the labors of Dr. G. Stanley Hall, so far as this country is concerned, and it may be said that it is mainly confined to this country. If the result of so much labor seems small, it must be said in its behalf that in a new field of experimental research the first efforts are expended in the trial of new methods. These efforts are accordingly for the most part gropings until fruitful methods are happily discovered. And, in the case of the normal standards of growth in children, as Mr. MacDonald himself says, such normal standards are not yet fixed and must be generalized from a vast number of measurements under all conditions and with all manner of

children, rich and poor, urban and rural, white children, and other children of different nationalities and heredities. In the case of an application of the scientific method to the study of children neither purely physical methods nor purely psychological ones will suffice; for the child is a self-activity that organizes matter as its instrument of theory and practice. In these chapters we see the efforts, more or less unconscious, to combine the two methods, the physical methods, that deal with matter and explain its motions by external causes, and the spiritual ones, that deal with self-activity and explain its changes by purposes or intelligent motives and will.

Cuba, Porto Rico, and the Philippines.—With regard to the Spanish colonies and protectorates, a policy of liberal provision for education commends itself as the natural course. It is assumed that when the Government of the United States acquires additional territories, that it desires to assimilate their populations and make them capable of self-government with as much expedition as feasible. It has been said that the child of an American citizen, in a favorable locality, between the years of 1 and 20 passes through all the stages of culture between the savage and the highest civilization. However this may be, the school in the course of eight years of elementary studies and four years of secondary or higher study fits the youth for understanding and using the instruments of civilization and brings him into a proper sense of the ideals reverenced by his fellow-men.

A people is civilized when it has formed institutions for itself which enable each individual to profit by the industry of all his fellow-citizens; when it enables each individual to profit by the experience and wisdom, the observations, and the thoughts of his fellow-citizens; finally, when it encourages each individual to enter upon a rational self-activity by which he contributes, either through his industry or through his observation and his thoughts, to the benefit of the people with whom he lives.

This, too, will apply not only to the highest forms, but it will indicate the degree of advancement all along the line, from the lowest grade to the highest. If one nation allows one-half of its citizens to grow up illiterate and in consequence not able to profit, through means of books, by the experience of the race, nor enter into the thoughts of their fellow-citizens, that nation is surely inferior to another that gives these privileges to three-fourths of its people. So, too, a nation that can earn only 20 cents per day for each inhabitant is inferior by so much in its civilization to the nation that can earn 30, or 40, or 50 cents a day for each.

In the case of a population like that of Spanish America it is evident that special attention should be given in the public schools to the elements of industries. Not agriculture so much as the mechanic arts and the arts of transportation should be taught.

Civilization enables man to conquer nature and make it his servant;

to command the services of heat, light, electricity, and of all inorganic elements; to command the plant world of vegetation for his uses; to command also the animal kingdom for the same service; in short, to command the services of nature for food, clothing, and shelter. Besides this control over nature, civilization should give man access to the history of his race, access to its literature, access to its scientific discoveries, access to its various inventions, and, above all, access to its moral and religious ideals. Civilization, in short, should give man command of the earth and likewise command of the experience of the entire race. This shows the goal ahead of us and not merely our partial realizations.

A tribal civilization is low as compared with the civilization of Great Britain or France or Germany. There is no tribal civilization which could compare with these nations in its knowledge of the uses of minerals, chemical substances, and the natural forces, such as heat, light, electricity, gravitation. No tribe can possibly command the complete resources of the world as regards its vegetable and its animal life, the products of agriculture and the mines. The reason for this is that the tribe is too small, and the tribe, from the very nature of its constitution, can not cooperate with other tribes or receive their help. It stops at a view of nature which is a mere superstition. The tribe can climb only a little way up the ladder which leads to the control and command of all substances and forces of nature. Consequently the tribe can not participate, to any great degree, either in the productive industry of the whole world or in its intellectual investigations and discoveries.

Other forms of civilization above the tribe take rank as higher or lower according to the degree in which they realize this ideal of conquest over nature and complete intercommunication with the rest of the world. No nation that lacks a great commerce can be so high in civilization as Great Britain or France. No nation that lacks railroad communication can be so high in civilization as the United States. No nation that lacks steam engines to perform its drudgery can be so high as the nation which has these things.

There is another criterion by which to try a civilization, and it is a very important one. A nation may be very far advanced in its ability to control nature and to command access to the wisdom of the race. But it may do this only for some classes of its citizens, and not for all. Such a nation is not so highly advanced in its civilization as one that allows each of its citizens to participate in the product of the whole. The nation that gives schools to the humblest classes of its people as well as to its highest classes, and the nation that allows the humblest people to govern themselves under just laws, is a higher nation than one which separates the ruling class into a government apart from and above the mass of the people.

The highest ideal of a civilization is that of a civilization which is engaged constantly in elevating lower classes of people into participa-

tion in all that is good and reasonable, and perpetually increasing at the same time their self-activity.

If we can not come into contact with lower civilizations without bringing extermination to their people, we are still far from the goal. It must be our great object to improve our institutions until we can bring blessings to lower peoples and set them on a road to rapid progress. We must take in hand their education. We must emancipate them from tribal forms and usages and train them into productive industry and individual ownership of land. We must take them out of the form of civilization that rests on tradition and mere external authority and substitute for it a civilization of the printed page, which governs by public opinion and by insight rather than by mere authority. Such a civilization we have a right to enforce on this earth. We have a right to work for the enlightenment of all peoples and to give our aid to lift them into local self-government. But local self-government can not exist where there is no basis of productive industry and book-learning.

The States in the Union which have made themselves wealthy have given most attention to the schools of the people and have always devoted a large proportion of their revenues to their support. Quite as large a proportion of the revenue of the Spanish islands must be set apart for education. Attempts have often been made in the history of the Spanish colonies to set up educational systems that rivaled those of the United States and Germany, but they have always failed after a few months or years through financial mismanagement. With revenues in the hands of fiscal agents appointed by the United States it will be easy to collect and apply a sufficiency of school funds to make it possible to provide good buildings, efficient supervision, and an excellent corps of teachers. It is assumed that the management of these islands must be left for a number of years in the hands of military governors, assisted by a corps of local officers. All proper steps will be taken to interest substantial citizens—those who possess educated intelligence or who have been successful in the management of property—to come forward and assist in restoring social order and in reestablishing business in its proper channels. Such persons as these will be invited to assist in reestablishing schools, for the attempt must not be made to make new schools take the place of the old ones. The old ones must be revived and the persons who have been employed in them must be invited to take up their work again. Spanish teachers may be assisted by superintendents who are thoroughly acquainted with the most improved methods in operation in the United States. If Congress finds it desirable to aid education in these colonies by appropriations from the Federal Treasury, it should furnish supervisors in sufficient numbers to make possible weekly visits to each of the schools in operation. Further than this, it may provide a corps of Spanish-English teachers, teachers whose native tongue is English but who are familiar with the Spanish. These teachers may be itinerant, visiting each school once per week.

They must be numerous enough to form from 5 to 10 per cent of the entire corps of teachers.

It is all important that in the reorganization of the schools in Spanish countries we do not attempt too much in the way of introducing the English language. All of the daily lessons except one should be in Spanish. The one exception should be a lesson in reading elementary English. The lesson which is given once a week by the Spanish-English teacher should be left to the regular teacher of the school for repetition during the rest of the week. If it is required that other lessons, such as arithmetic, geography, or history, be taught in English, there will be just ground for suspicion on the part of the Spanish population that it is the purpose of the United States to enforce the use of the English language in these territories. There are a few examples in the history of nations of compulsory introduction of a new language in newly acquired territories, but these have been signally unsuccessful in effecting their purpose. Of course the policy will not be considered for a moment by the United States. It is reasonable, however, that the new colonists should be taught English as the most useful of foreign languages. Their children should of course know Spanish and have pride in all the good things that belong to the history of Spain. They will be all the stronger American citizens for it. But a suspicion among the Spanish citizens that an attempt will be made to dispossess them of their Spanish tongue will make all attempts at improving their schools worse than useless.

The revival of business in its old channels and the swift taking possession of new avenues of business which will open to these people through their connection with the United States; the education of their children in mechanic industries, and in a knowledge of science which makes the invention of labor-saving machines possible; the education of these children in Spanish and American literature, in geography, mathematics, and history, and above all the development of a habit of reading periodicals and especially the daily newspaper, will do what is desired in the way of assimilating these people to the national standard. The newspaper, more than any other instrumentality, aids in the formation of one public opinion north and south, east and west. In the daily newspaper each inhabitant sees what the rest of his nation, in fact, what the world, is thinking about, and he contributes his own quota of thought to the settlement of the great questions of the day, and forms his opinion also in the light of the aggregate verdict of his fellow-citizens. This government by public opinion is the perfection of free government.

Mr. Packard, in Chapter XX, treats of the history of education in Cuba, Porto Rico, and the Philippines.[1]

[1] The following is a table of contents to Mr. Packard's chapter, which will be useful in referring to the several topics which are treated in it.

Educational system of Cuba and Porto Rico. Three periods. Earliest period: tenth century to 1790, beginning of administration of Gen. Luis de las Casas. Sec-

Cuba.—According to the official report of the University of Cuba for 1888–89, there were 1,046 students enrolled. Later reports show substantially the same enrollment for following years.

1888–89	1,046	1890–91	1,059
1889–90	1,009	1891–92	1,083

The secondary instruction (such as is conducted in high schools and academies as preparatory schools for colleges in the Northern States of our Union) is organized since 1880 as an institute in each capital in the six provinces and has enrolled students and awarded degrees of bachelor of arts, as appears in the following table:

Year.	Havana students.	A. B. degree.	Matanzas.	A. B. degree.	Santa Clara.	A. B. degree.	Puerto Principe.	A. B. degree.	Pinar del Rio.	A. B. degree.	Santiago.	A. B. degree.
1863	633	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1864–65	764	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1865–66	541	.....	257	.....	.....	.....	.....	.....	.....	.....	.....	.....
1866–67	683	.....	238	.....	.....	.....	.....	.....	.....	.....	.....	.....
1867–68	.....	.....	308	.....	.....	.....	.....	.....	.....	.....	.....	.....
1886–87	1,804	186	.....	.....	334	56	113	17	.....	.....	.....	.....
1887–88	1,752	204	226	.....	390	34	121	14	.....	.....	.....	.....
1889–90	1,774	209	.....	.....	329	29	143	27	145	12	255	11
1890–91	1,956	243	367	51	326	26	144	19	.....	.....	.....	.....
1891–92	1,853	253	396	43	331	33	169	18	.....	.....	.....	.....
1892–93	.....	.....	371	40	331	36	.....	.....	.....	.....	.....	.....
1893–94	.....	.....	422	47	339	.....	.....	.....	.....	.....	.....	.....

Counting together the maximum attendance on these institutes we find 3,337 as the largest number of students, and 453 as the largest number of degrees for one year. The population at this epoch ranged from a million to a million and a half (1,675,771 in 1894). The number

ond period: 1790–1863, when a general reform was effected by the division of education into primary, secondary, and superior grades, and the assimilation of these to the corresponding grades of the mother country. Third period: 1863, superior institutions, Royal University, statistics of attendance and expenditure for 1888–89.

Humanities taught by monks, page 923; foundation and early history of university (1688 to eighteenth century); also efforts to establish additional higher institutions, pages 938–939; efforts in last part of eighteenth and in the nineteenth century to modernize the university studies, pages 939–945. Diplomas made valid in Spain and organization, programmes, etc., coordinated with those of Spain by decree of 1880, pages 948, 949; programmes reformed 1886, 1887, pages 949, 950; inaugural addresses, index of subjects, pages 952, 953; testimony of various authors (pages 953–957).

Special schools: Technical and art, page 910; theological, page 940; botanic gardens, page 942; scientific schools and societies, page 948, programmes, page 952.

Secondary schools: Institutes established, statistics, pages 910–912; Jesuit college, Porto Rico, page 919; low standard of secondary studies, page 937; clerical schools founded at Havana, page 938; studies regulated and modernized, page 942.

Activity of private colleges, page 947; decrees respecting public secondary schools, pages 949–952; testimony of various authors, references as above, pages 955–957.

Primary education: Early efforts made by Sociedad Económica, which received Government appropriation in 1833, page 912; action of Spanish Government with respect to primary education in Spain and the Antilles, page 953; recent statistics, pages 913–918; primary schools in Porto Rico; statistics, pages 919–922.

of pupils in the elementary schools may be seen, approximately, in the following table. (The term "elementary" with us in the States includes eight school years, from the age of 6 to 13, inclusive).

Place.	Population, 1893-94.	Elementary pupils, 1893-94.						
		Public schools.			Private schools.			Total.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.	
Havana	457,124	5,339	4,116	9,455	5,766	7,191	12,957	*a* 26,732
Matanzas	265,025	3,442	2,210	5,652	2,236	2,180	4,416	10,068
Santa Clara	383,790	4,694	3,395	8,089	2,279	2,329	4,608	12,697
Puerto Principe	69,061	986	801	1,787	281	507	788	2,575
Pinar del Rio *b*	271,010	.....	.....	3,565	.....	.....	732	4,297
Santiago *b*	229,761	.....	.....	6,031	.....	.....	1,837	7,868
Total	1,675,771	.....	.....	34,579	.....	.....	25,338	64,237

a Havana includes 4,320 domestic pupils in its total.
b Pinar del Rio and Santiago for the year 1888-89.

So far as reported, the girls at school in the several provinces number 21,729, while the boys number 25,023.

The province of Havana reports its colored pupils separately, giving for the public schools—

	Boys.	Girls.	Total.
Colored	1,003	1,080	2,083
White	4,336	3,036	7,372

and for the private schools—

	Boys.	Girls.	Total public and private schools.
Colored	1,152	1,401	2,553
White	4,614	5,790	10,404

The following table shows in four provinces the relative proportions of colored and white in the population at latest dates reported:

Province.	White.	Colored.
Havana	340,852	106,653
Matanzas	147,919	111,589
Santa Clara	244,344	109,778
Puerto Principe	54,231	13,558
Total	787,346	341,578

Porto Rico.—The latest statistics of the elementary schools for Porto Rico give for 1898, 27,936 as the number enrolled for the year. In the northern district there were 9,942 boys and 6,457 girls. In the southern district there were 9,132 boys and 4,207 girls. The same statistics report 125,695 children of school age (6 to 18 years, presumably).

The following historical table shows the increase of schools from 1864 to 1881:

Date.	Attendance.		
	Boys.	Girls.	Total.
1864	2,396	1,092	3,488
1867	7,543	1,929	9,472
1869	6,192	1,937	8,129
1878	7,523	3,474	11,097
1880	10,736	4,482	15,218
June, 1881	18,025	6,095	24,120
July, 1881	18,025	6,095	24,120

The population is reported in round numbers at 500,000 white, and 390,000 colored, making a total of 890,000 people. The illiteracy is reported as 87.4 per cent of the white population, and 86.8 per cent of the colored.

In January, Gen. John Eaton, formerly United States Commissioner of Education, received an appointment under the school authorities in the island of Porto Rico and undertook the work of reorganization. The problems incident on the adaptation of a former system of schools to the new conditions which arise upon a change of sovereignty are in a fair way to be settled by the experiment under his charge.

The Philippine Islands.—It seems that there are something like thirty languages and dialects spoken on the different islands composing the Philippine group. The Visaya dialect leads, with 2,024,409 natives who speak it. The Tagalo dialect is spoken by a little more than one-half as many natives, namely, 1,216,508. There are five other dialects which are spoken each by over 100,000 natives. These are the Cebuano, Ilocano, Vical (Bicol), Pangasinan, and Pampango.

Dialect.	Number who speak it.
Visaya	2,024,409
Tagalo	1,216,508
Cebuano	385,866
Ilocano	354,378
Vical (Bicol)	312,554
Pangasinan	253,000
Pampango	193,424
Total	4,750,139

In 1869 these seven peoples included nineteen-twentieths of the entire native population. The Tagales and Visayas are of the Malay race and were Christianized by Catholic missionaries in the sixteenth and seventeenth centuries. The number of Christians in these two peoples, together with the other Indians, amount to over 6,000,000. The total Spanish population aside from the army, including those born in Spain, and also those born of Spanish parents on the islands, amounts to less than 10,000 persons. The Catholic missionaries have organized a school system. The University of the Philippines reported

about a thousand students in 1858. The total number of graduates from it is reported as about 11,000.

The Argentine Republic, Uruguay, and Brazil.—Prof. F. F. Hilder contributes to this report, Chapter XXII, a survey of the educational institutions of the Argentine Republic, Uruguay, and Brazil. After a brief historical review of these countries, in which he names the chief promoters of education, he proceeds to describe the various classes and types of institutions, going into the details of statistics and curricula where special excellences justify it. The scope of elementary, secondary, and higher educational institutions is not as clearly defined as in Europe, nor, indeed, is it in this country. Greater political liberty seems to tend toward decentralization in school affairs; this is illustrated by the countries about which Mr. Hilder writes, as well as by Switzerland. It is very gratifying to notice the steady and healthy development of educational institutions in the countries of South America.

Dental education and the practice of dentistry.—Chapter XXIII gives an account of the early development and specialization of dentistry in the United States, together with regulations concerning the admission and graduation of students in dentistry. A synopsis of the dental laws of the various States is given, with the view especially of showing the requirements for a license to practice dentistry. It will be observed that all the States and Territories, with two or three exceptions, require the applicant for a license to undergo an examination before a board of dental examiners or to be a graduate of a dental school recognized by the board as a reputable institution. In several States it is required that an applicant shall both be a graduate of a reputable dental school and pass an examination before a State board of dental examiners.

Report of the Committee of Twelve of the Modern Language Association of America.—In Chapter XXVI is printed the report on modern languages as taught in secondary schools. It is a part of a larger report on college-entrance requirements to be presented to the National Educational Association at its meeting in Los Angeles in the summer of 1899. It is the fourth report provided for and issued by that association. The previous reports are as follows:

I. Report of Committee of Ten, on the Course of Study of Secondary Schools.

II. Report of the Committee of Fifteen on Elementary Schools.

III. Report of the Committee of Twelve on Rural Schools.

University types and ideals.—It is very profitable to see how our institutions look to distinguished thinkers abroad. Chapter XXVII gives four unusually valuable, although short, papers, all relating to universities: An address by Dr. E. Levasseur, so well known in this country and throughout the world for his labors in the field of statistics of sociology and education; an address by Dr. Henri Moissan; an address by Dr. Michael Foster; an article by M. Haguenin.

State supervision of degree-conferring institutions.—An examination of the State laws in regard to the chartering of degree-conferring institutions is given in Chapter XXVIII, with other information bearing upon this subject. It is shown that the States of New York and Pennsylvania are the only ones to provide by law for any supervision of such institutions by the State. The inadequacy of the general laws under which educational institutions are chartered is being generally recognized, and steps are being taken by various educational associations to secure the passage of laws that will prevent the granting of degree-conferring charters to other than bona fide institutions having a certain amount of endowment funds as well as material equipment, etc. Dr. Henry Wade Rogers, president of Northwestern University, Evanston, Ill., is one of the leaders in this movement.

On December 28, 1898, he delivered an address on "fraudulent diplomas and State supervision" before the Illinois State Teachers' Association, which body unanimously indorsed the recommendations of the North Central Association of Colleges and Preparatory Schools, which are printed in this chapter, and appointed a committee of eleven college men, including ten college presidents, who were directed to bring the matter to the attention of the Illinois legislature to the end that the recommendations referred to might be embodied in the statute law of the State. This commendable movement should be followed by similar action in other States.

School statistics.—Chapter XXIX contains a reprint of a report on statistics originally made to the department of superintendence of the National Educational Association. It was an attempt to single out significant items of statistics in regard to schools and classify them into three classes: First, those that are essential and fundamentally necessary to give a correct idea of the efficiency of a school system. There are seventeen of those items. Secondly, there are less essential but desirable items to give one an insight into the social conditions of the school. Of these there are eight principal topics, with forty-eight items in all. The third class includes items that are needed occasionally, and should be collected once in five years. The items have been investigated with much labor and painstaking by Mr. Upton (specialist of State systems) and tabulated so as to show for each State in the Union which of the items are reported. The same is shown with reference to foreign countries, and the technical terms used to indicate these items in Great Britain, Germany, France, Italy, and Spain are given.

The medical inspection of schools.—In Chapter XXX is described the work of medical inspectors of schools, and particularly the progress and results of medical inspection in the city of Boston, one of the pioneer cities in the introduction of this system. The views of a number of authorities are given as to the value of medical inspection, especially in warding off diphtheria, scarlet fever, and other contagious diseases.

Bible study in colleges—Bible reading in the public schools.—Chapters XXXI and XXXII are kindred in their general purpose, both treating of the use of the Bible in educational institutions. Chapter XXXI is a report furnished through the president of Chicago University of investigations as to Bible study in American colleges. Chapter XXXII consists of a report concerning Bible reading in the public schools of the United States, prepared by the president of the Chicago Woman's Educational Union; an extract from an address of Dr. A. P. Peabody upon the Bible in the public schools, and an article upon the English Bible and State universities by the field secretary of the Christian Woman's Board of Missions. The methods of procedure in preparation of the reports are explained and a large amount of detailed information is given.

Methods of instruction in agriculture.—Chapter XXXIII contains several leaflets issued by the States of New York and Indiana through the agricultural department of Cornell University and the Purdue University, of Indiana. I have caused these to be reproduced as being typical of the methods pursued and of the character of the matter of instruction offered by these institutions. Appended to these publications is a compilation showing the nature of the efforts to introduce agriculture as a subject of study into the public elementary schools of France.

Consular reports.—Chapter XXXIV contains consular reports relating to educational subjects, the same being obtained through the courtesy of the State Department. The following topics are discussed: (1) Schools for instruction in gardening in Russia; (2) Gardens attached to schools in Russia; (3) Korean schools; (4) Commercial University at Leipzig; (5) Commercial education in Germany; (6) Weaving schools in Germany; (7) Schools in Russia; (8) School for the merchant marine in Russia; (9) Education subsequent to the school in Saxony; (10) The study of malarious diseases in Germany; (11) Practice of professions in Japan.

Teachers' examinations and certificates—In the earlier history of our public schools the teacher was called upon simply to satisfy local authorities of his ability, and whatever license he thus secured had, in general, but a local and temporary value. With the extension of popular education and the establishment of schools expressly devoted to the professional training of teachers, the issue of a professional teacher's license corresponding in its scope and in its validity to that of a lawyer or a physician came to be regarded as desirable. A survey of the movements which have had their issue in the present systems of examining and licensing teachers is given in Chapter XXXV.

New York, Pennsylvania, and Illinois were among those States early granting some form of permanent license valid throughout the State. Pennsylvania has maintained the greatest stability in its regulations for such professional recognition. At present many States issue State

licenses to those found worthy by attainments and experience, and certain States recognize such licenses issued in other States.

The provisions for examination and the gradations of local and State licenses will be seen to vary even more than the conditions in the schools themselves in the respective States.

Current questions.—In Chapter XXXVI a survey is made of certain school questions that are ever recurring. This chapter is revised from year to year, and any noteworthy movement in any one of the subjects recorded. The principal topics are (1) Coeducation of the sexes, (2) Compulsory attendance laws, (3) Conveyance of children to school, (4) Corporal punishment, (5) Temperance instruction, (6) Sunday-school statistics, and a number of other special items which are not continued from year to year.

The Omaha exposition.—In Chapter XXXVIII Mr. Boykin, who had charge of the exhibits of this Bureau, first at Atlanta in 1896, second at Nashville in 1897, and latest at Omaha in 1898, reports interesting features of the last-named exposition.

Education in Alaska.—The extensive territory of Alaska consists of two regions, the southeast one accessible at all times of the year by weekly mails and ordinary modes of travel, and the other and vaster portion, including northwest Alaska, practically inaccessible for more than one mail a year, and one visit by sail or steam vessels. The United States Treasury sends a stout steamship bound for the Arctic in the late spring or early summer. It arrives at Unalaska at the east end of the Aleutian chain of islands and passes through the gateway into the Bering Sea, cautiously watching the ice floes which for many weeks prevent the near approach to any of the ports.

There are missionary stations and small settlements on both sides of the mouth of the Yukon, north and south, and many more in the interior on the banks of the Yukon, but they can not be reached until the ice moves out of that river late in June or early in July.

The Upper Yukon rising near southeast Alaska opens, perhaps, two or even three months earlier. Its waters swell with melted snows, lift the ice and break it up, piling it in great masses over the still solid ice down the river farther to the north. By the last of May the ice runs out of the upper river as far north as the great bend at Fort Yukon, on the Arctic Circle, where the river turns to the west. The ice at the mouth is the last to give way, and hence the river is not available for bringing freight from the States to the mining regions of the Upper Yukon until July. If there were a waterway through the Stikine River in southeast Alaska, or still better, through the Taku River to the upper waters of the Yukon (Lewes branch and the Teslin River and lake) there could be water communication through to the Klondike region for six or seven months of the year; and to the Fort Yukon for five months. But of course nearly all this part of the river is in Canada. The fact is that each nationality is at present in the way of the other's best approach to its possessions.

Inasmuch as the time of open-sea navigation in the Bering Sea has been (until 1897) too short to admit of two trips a year from Seattle, all business there is carried on from information received through agents who returned the previous fall, and brought out with them an account of the situation. In October it is known what needs existed at the ports north and south of Bering Strait and on the Lower Yukon, but nothing can be done until the next summer. Meanwhile the situation may have entirely changed. What is sent to the northwest may be useless when it arrives.

It is obvious that the first necessity is communication at all times of the year. For this purpose railroads and even telegraphs are impossible on account of the enormous distances to be overcome. From Sitka, by sea, it is 1,200 miles westward to Unalaska, the gateway to Bering Sea; thence northward to Bering Strait is 800 miles, in all 2,000 miles. Any practicable route through central Alaska, by the Yukon or otherwise, would measure more than 2,000 miles from southeastern Alaska to St. Michael, the port at the mouth of the Yukon. Even short stretches of railroad are almost impossible in Alaska on account of the enormous expense of building where the ground is frozen the year round, except a shallow layer at the surface in the summer, and where for three-fourths of the year the work must be conducted in the Arctic night. In some places in the Rocky Mountain region the railroads cost $200,000 a mile to build. In Alaska the expense would amount to a million of dollars a mile through the deep cuts of the river and over the watersheds at the head waters. Telegraphic communication will doubtless come to exist when there are permanent gold mines discovered and the requisite works erected; but for mere placer mining this will not be undertaken at once. It would seem at first, however, that a trunk line might be warranted along the Upper Yukon, connecting at Skagway, and extended after a year or two to the mouth of the Tanana or the Middle Yukon, and finally to St. Michael. But the protection and repair of a telegraph through many hundreds of miles of roadless country makes it so expensive that all the business done in those regions would not pay for the outlay. Only when there are permanent settlements, one in a hundred miles on an average, all the way from southeast Alaska, through central Alaska, to St. Michael at the mouth of the Yukon, may we expect even a telegraph connecting the extreme northwest with the southeast and the States. For a route from any of the ports on the coast from the Copper River, Prince Williams Sound, or Cooks Inlet, would have from 500 to 1,000 miles to reach the Middle Yukon at the mouth of the Tanana, and the mountainous character of the country would make a telegraph too expensive for the comparatively small volume of business of the northwest to support. Oxen and horses, even mules, can not make freight lines possible through these distances. Dog teams, much used already, have to freight their sledges with food for long journeys. Carrying 125 pounds

freight, and needing 1½ pounds of dried fish for a day's ration, a dog would eat up all his freight in traveling three weeks.

The natives of northern Siberia, as well as northern Sweden and Russia, have herds of reindeer, which furnish them food and clothing, and transportation. Oxen and horses need grass, but grass is not found in Alaska except for a few weeks in favored places. Reindeer moss grows on all places where trees do not grow, and in enormous quantities, so that there is a food supply for ten millions of reindeer in Alaska as a whole. The reindeer is the natural mediator between the arctic soil and the support of man.[1] With herds of reindeer a constant supply of food and clothing of the best sort and rapid transportation of passengers and freight will be in the possession of the dwellers in northern and western Alaska.

In my last report I discussed the mail routes that could be used:

1. The Yukon Valley, from its head waters near Dyea to St. Michael, near its mouth—all its settlements could be brought into postal communication throughout its entire length by reindeer express. The mail would be brought to Skagway to the steamers that run to Seattle.

2. A side route up the Tanana and down the Copper River to the ocean, or by the Sushitna to Cooks Inlet, would furnish a mail route entirely within the United States.

3. A coast line from Cape Prince of Wales to St. Michael, connecting the settlements at Cape Nome and along Norton Sound, with perhaps a northern route from Cape Prince of Wales to the settlements around Kotzebue Sound on the Arctic Ocean as far north as Point Barrow,

[1] *The supply of reindeer moss for food.*—Conceive all Alaska as one vast rock. The forces of nature—the sun, the rains, the frosts, the vital power of the seeds of the moss and of hardy trees—all these elements work on the rock to subdue it for vegetation. On the coast near the ocean, where the winds are laden with moisture, as well as in the river valleys, the first beginnings of vegetation appeared. The rock was eaten into by the moss plant. After the moss had flourished for untold ages it had created a humus or soil, in which the seeds of other plants could take root. The moss epoch, then, was followed by the tree epoch. When the trees grew in the river valleys and on the coast regions the moss could not any longer flourish. But by this time the moss had conquered the rock regions far up the mountain sides and over all the hills in Alaska, even up to the Arctic Ocean. This gives at one glance the actual view of the situation in Alaska. Around the southern coasts and in the river valleys trees flourish and moss is not found. Back on the hills and for a mile up the high mountains reindeer moss is to be found in immense quantities. A careful estimate finds sufficient food for ten millions of reindeer, basing the estimate on the present capacity of Finland and Lapland for the support of the reindeer.

But the routes for reindeer travel must not be laid out in river valleys nor along the coast of the ocean. The reindeer would starve on account of lack of moss. This was the actual experience in the journey made by Mr. Kjellmann in the winter of 1897 from Port Clarence south to Bristol Bay. He accomplished the other parts of his journey, even the scaling of high mountain passes, without difficulty, but in attempting to conduct a portion of his return journey through the forest between the Kuskokwim and Yukon rivers he could not find moss enough to subsist his reindeer except by cutting down trees and using an inferior quality of moss. As it was, a half dozen of his deer perished. These reindeer journeys can be accomplished only on trails leading over the hills above the river valleys.

would make possible communication with whaling fleets that winter in those regions as well as with the schools and missions.

4. At Nulato the Yukon bends south and runs some 350 miles to its mouth. An express line connecting the settlements on this part of the Yukon as well as those on Kuskokwim and Bristol Bay at the south would complete the mail routes necessary to connect all of inhabited Alaska with civilization in the States.

There would be substantial cabins with caches of food every 20 miles on a reindeer route, the food being for the men and not for the animals. The reindeer with his tough lips and shovel-shaped hoofs can find moss under the snow at any point in Alaska except the forest regions which line the rivers and southern coast.

I give in a note the location and other particulars of the missionary stations and schools in the regions mentioned above.[1]

[1] 1. On the Arctic are located the following:

Location.	Denomination.	Teachers.
1. Point Barrow	Presbyterian (Government school)	One missionary and one Government teacher.
2. Point Hope	Episcopal	Do.
3. Kotzebue Sound	Quaker	Three missionaries.

With herds of from 1,000 to 5,000 at each of these stations, there need never be any fear regarding the whalers who are caught in the ice before reaching Bering Strait on their way south. If they can not bring their vessels to the protected harbors near by the missionary stations they can at least escape over the ice and obtain sure subsistence until springtime. They can load their vessels, in fact, with supplies from one of these stations and on the breaking-up of the ice in the spring continue their whaling voyage.

2. The following missionary stations are located along the coast from Bering Strait to Unalaska, in the Bering Sea:

Location.	Denomination.	Teachers.
4. Cape Prince of Wales	Congregational	Two missionaries.
5. St. Lawrence Island	Presbyterian	One missionary.
6. St. Lawrence Island	Government school	One teacher.
6. Golovin Bay	Swedish Evangelical	Three missionaries.
7. Kangekosook	do	Two missionaries.
8. Unalaklik	do	Four missionaries.
9. St. Joseph	Roman Catholic	Seven missionaries.
10. Cape Vancouver	do	Two missionaries.
11. Bethel	Moravian	Five missionaries.
12. Carmel	do	Four missionaries.

3. The missionary stations on the Yukon are the following:

Location.	Denomination.	Teachers.
13. Ugavig	Moravian	Two missionaries.
14. Ihkamute	Roman Catholic	One missionary.
15. Koserefski	do	Eleven missionaries.
16. Sacred Heart	do	
17. Anvik	Episcopal	Three missionaries.
18. Nulato	Roman Catholic	Do.
19. Circle City	Episcopal	Two missionaries.

While the stations on the Arctic Sea are of vital importance for the safety of the whaling fleet, those on the Yukon are of vital importance for transportation in the

They furnish centers where the English language is taught and where, with the language, are taught English manners and customs, habits and occupations. At all these points the best qualified natives

winter time, and besides the missionary stations there will doubtless spring up many camps of miners from the middle Yukon on to its highest sources and also along all of the tributaries on which gold may be found. It is too much to expect that miners will raise herds of reindeer, or indeed that reindeer can possibly be raised in the immediate vicinity of a mining camp, but the missionary stations removed at a safe distance from these villages can produce hundreds and thousands of reindeer, together with skilled natives who have learned to speak the English language and have acquired the manners and customs of our people. These will become herdsmen and teamsters for the mines.

4. The Aleutian Islands. One of these, (20) Unalaska, has a missionary establishment, Methodist, with 3 missionaries and 1 Government teacher.

The Aleutian Islands are all said to be moss bearing, and they should all have herds of reindeer. If not tame, at least a few should be placed on each island to run wild and stock the pastures.

5. The missionary stations and Government schools along the northern Pacific coast between Sitka and Unalaska are:

Location.	Denomination.	Teachers.
21. Wood Island	Baptist	Four missionaries.
22. Yakutat	Swedish Evangelical	Three missionaries.
23. Kadiak (Government school)		One Government teacher.
24. Afognak (Government school)		Do.
25. Unga (Government school)		Do.

The voyage from Sitka to Unalaska, almost directly west, is 1,200 miles. Along this coast the above missionary stations and schools are established. Communication with the interior of Alaska from these stations will be made possible by the possession of reindeer herds.

6. The missionary stations and Government schools in the Sitka archipelago at the southeast are:

Location.	Denomination.	Teachers.
26. Haines	Presbyterian	Four missionaries.
Haines	Government school	One teacher.
27. Hoonah	Presbyterian	Four missionaries.
Hoonah	Government school	One teacher.
28. Juneau	Presbyterian	Three missionaries.
29. Juneau	Episcopal	One missionary.
30. Juneau	Roman Catholic	Three missionaries.
31. Juneau	Two Government schools	Three teachers.
Douglas	Quaker	Three missionaries.
Douglas	Two Government schools	Three teachers.
Sitka	Presbyterian	Twelve missionaries.
32. Sitka	Three Government schools	Eight teachers.
33. Sitka	Episcopal	One missionary.
34. Kake	Quaker	Two missionaries.
35. Fort Wrangell	Presbyterian	Do.
Fort Wrangell	Government school	One teacher.
36. Saxman	Presbyterian	Two missionaries.
Saxman	Government school	One teacher.
Jackson	Presbyterian	One missionary.
37. Jackson	Government school	One teacher.
38. Metlakahtla	Independent	One missionary and assistants.
39. Ketchikan	Episcopal	One missionary.

can be found for apprenticeship as herdsmen and teamsters for the reindeer service.

The reindeer team in Lapland and Finland, over a smooth, hard snow surface, often makes 100 miles a day. Mr. Kjellmann, the superintendent of our reindeer herd at Eaton Station, north of St. Michael and east of Unalaklik, made 85 miles in twelve hours on one occasion with a reindeer team. At the easy rate of 5 miles an hour, with a relay every 20 miles and with a change of teamsters every eight hours, a mail route of 500 miles could be traveled in five days, for where darkness holds for twenty-four hours the night hours are as good as day hours for travel. With the shelter cabins well built 20 miles apart on the route, and with relay stations every 50 miles, the journey from Dawson City to Bennet at the railroad terminus 40 miles from Skagway in the Klondike could be performed by a United States and Canada express company in six or seven days; from Dawson City to Circle City in three days; another three days to the mouth of the Tanana; three days more to Nulato, on the lower great bend of the Yukon, and two days more to St. Michael, or two weeks and a half from St. Michael to Skagway. Across the ice in winter Cape Prince of Wales is three days' distance from St. Michael (traveling by relays night and day) and Point Hope seven days, and Point Barrow twelve days via Cape Prince of Wales. Cape Prince of Wales, at Bering Strait, could be reached in three weeks from Bennet by reindeer express. But the first journeys, performed without relays and with imperfect knowledge of the best trails, will require daily intervals of rest, and it will take a week to do what will by and by be done in three days.

The reindeer imported from Siberia numbered 554 up to 1895. In the years 1896 and 1897 none were added from Siberia, but the 554 herd increased to 1,466 by June 30, 1897. In 1898 161 were obtained from Siberia, and although 180 had been used for food and 66 more had been lost in the expedition to Point Barrow for the relief of the sailors imprisoned in the ice, the total herd surviving October 1, 1898, numbered 1,918. This number is swelled to 2,062 by the addition of 144 deer turned over from the War Department as the survivors of the herd purchased in Lapland for the relief of the miners reported to be starving in the Klondike mines.

An account of this experiment of the War Department is given on pages 1787–1796. Pages 1779–1786 contain the record of the relief expedition to Point Barrow.

The conditions of northern, central, and western Alaska have been fully described above. The problem of southeast Alaska is a quite simple one in comparison. It is in constant communication with the Department of the Interior at Washington throughout the year. It lies entirely in the region covered by trees and no reindeer moss grows there, hence the reindeer question does not concern southeast Alaska; but there are gold mining, salmon fishing, and the fitting out of adventurers bound for the mines of central Alaska.

A white population is rapidly increasing in Skagway and Douglas, and there have been calls for more schools at these points. The business of southeast Alaska must ultimately tend along the lines of manufacturing as well as mining. The natives must be fitted to help civilization by laboring at such employments as are needed in the community. Those who can fit themselves at the Sitka Industrial School will find themselves in demand for carpenter and sawmill work, blacksmithing and tin work, these being necessary adjuncts to the industries of all border land settlements.

During the year there have been maintained in Alaska 19 public schools under the immediate supervision of this Bureau, with 22 teachers and an enrollment of 1,378 pupils. In addition to supporting the above public schools, this office pays the salaries of 5 teachers in the Sitka Industrial School, which has an enrollment of 153.

Although the entire number enrolled equals 1,378, this by no means indicates the actual average attendance. Even in rural schools in the several States the actual average number in attendance is generally not more than one-half the entire number enrolled. If the attendance equaled the entire number enrolled, the seating capacity of the school buildings in Alaska would be entirely insufficient to accommodate the pupils. On page 1760 there will be found a table showing the names of schools, the length of school term, and the number of pupils (total enrollment) for 1897–98 and previous years.

Appropriations for education in Alaska.—For the past five years the annual appropriation for the education of children in Alaska has been $30,000, increased yearly since 1895 by the sum of $5,000 from the Indian appropriation bill. By strict economy it has been possible with these amounts to support the present school system. Within the past three years thousands of white men have settled in Alaska, many of them taking their families with them. The population of the older settlements has largely increased and several new towns have sprung up which are clamoring for school facilities. If Congress regards it as the duty of the Secretary of the Interior to continue to provide schools for the white population of Alaska, I can not state too emphatically that it is absolutely necessary that the appropriation for education in Alaska be largely increased. In order to provide school facilities which shall approximate the present needs of the increasing population of Alaska, an annual appropriation of at least $60,000 is an imperative necessity. This is the amount which has been urgently recommended by the governor of Alaska. On page 1760 the amounts given in the past years are tabulated.

Local school committees.—Besides the schools for the natives (Eskimos and Indians) of Alaska there have been established in southeast Alaska five schools for white children exclusively. The influx of miners into the district has rendered it desirable to establish white schools at other places, and to enlarge, in the manner hereinafter described, two of the five schools already established.

In order to place the several school districts established for white children on the basis of local self-government as far as possible, and to interest the citizens there in the work of administration, I organized local committees as long ago as 1891 in Sitka, Juneau, Douglas, Fort Wrangell, Kadiak, and Unga and Unalaska. At Metlakahtla a most intelligent supervision of school matters has always been exercised by Mr. William Duncan, founder of the colony of Indians that occupies that island.

Of these committees some of the members have continued since their first appointment, in 1891, but a larger number have resigned or moved to other places and new members have been appointed in their stead. The following table shows the present membership and dates of appointment, brought down to October 1, 1899, the date that this goes to press:

Local school committees in Alaska.

Location.	Name.	Date of appointment.	Location.	Name.	Date of appointment.
Sitka	John G. Brady	Jan. 15, 1891	Skagway	Walter Church	Aug. 1, 1899
Do	Edward de Groff	Do.	Do	Frank A. Wise	Do.
Juneau	John G. Heid	Do.	Do	I. N. Wilcoxen	Do.
Douglas (1)	P. H. Fox	Do.	Do	D. E. L. Niskern	Do.
Do	Albert Anderson	Sept. 28, 1893	Do	F. R. Burnham	Sept. 26, 1899
Do	C. A. Hopp	Sept. 26, 1899	Kadiak	F. Sargent	July 22, 1893
Douglas (2)	R. J. Willis	July 25, 1899	Do	N. Kashevaroff	Jan. 15, 1891
Do	William Mackie	Do.	Unga	C. M. Dederick	Sept. 22, 1894
Fort Wrangell	Thomas Willson	Mar. 29, 1892	Do	Michael Dowd	July 22, 1893
Do	Finis Cagle	July 22, 1893	Do	George Levitt	Do.

The following list contains former members of local school committees in Alaska:

Sitka: James Sheakley, N. K. Peckinpaugh, Dr. C. D. Rodgers.
Juneau: Karl Koehler, Rev. Eugene S. Willard.
Douglas: G. E. Shotter, S. R. Moon.
Wrangell: W. G. Thomas, William Millmore, Allen Mackay, Rufus Sylvester.
Jackson: James W. Young, W. D. McLeod, G. Loomis Gould.
Metlakahtla: William Duncan, Dr. W. Bluett, D. J. Leask.
Unga: N. Guttridge, John Caton, Edward Cashel.
Unalaska: N. S. Reesoff, N. B. Anthony, L. R. Woodward.

The members of these committees have been of good service to my office both by correspondence and by acting as auditors, countersigning the bills sent in for various local expenses of these schools, inspecting repairs, and giving advice as to measures for the greater efficiency of the schools.

During the past year 67 letters have been received from 9 members of these committees and 78 vouchers countersigned by members (16 different names appearing).

For the southeastern section of Alaska the office of local superintendent was created as early as 1890, and has been filled ever since. The present local superintendent is W. A. Kelly, of the Sitka Industrial School. His duties are to visit the schools, report on their condition, and to examine candidates for the position of teacher.

New schools needed.—With the influx of miners into southern and western Alaska, and the formation of settlements by miners with their families, there arises a need for the opening of new schools.

Skagway.—Skagway is the terminal point of the newly constructed railroad which leads over White Pass to the head waters of the Yukon. A railroad brings with it permanent villages, and it is now clear that Skagway will become a populous village and will need a permanent school. A temporary one was taken charge of by the Government last November, but its number of pupils has increased so rapidly that a second teacher has been appointed and a third one is now needed. In new villages it happens that it is impossible to rent suitable buildings for schools. A three-room building is needed at a cost of $2,500.

Fort Wrangell.—The school at Fort Wrangell has been held for a number of years in an upper room of the Government building used for custom-house and post-office. The present room is occupied by natives (Indians) and whites together. The white people are desirous of having a separate school for their children in accordance with the custom that prevails generally in Alaska. One thousand two hundred dollars will build a schoolhouse with one room, but $2,000 will build one with two rooms and the entire school will be accommodated under one roof with two separate rooms and two separate school yards.

Dyea.—Dyea was for a long time the chief town at the head of the Lynn Canal, at the head of the road which enters Chilkoot Pass and arrives at Lake Bennett, leading into the Upper Yukon River. There is immediate need for the opening of a school in this town. A new building for a one-room school will cost $1,200.

Circle City.—At Circle City a rough log cabin was constructed for a school in 1896. With the rush of the mining population to the Klondike the village was nearly emptied and the school broken up, but a reaction has come since then and Circle City now needs another school building with one room, costing $1,000.

Unalaklik.—At Unalaklik, north of St. Michael, the Government formerly contributed a sum for the support of the school teacher, but the stipend was discontinued in 1894. There should be a Government schoolhouse of one room built, costing $1,500.

Yakutat.—At Yakutat, on the coast south of St. Elias, a small annual stipend was paid to assist in the support of the school-teacher at the Swedish mission, but as in the case above mentioned it was discontinued in 1894. There should be a new building of one room built at this point, costing $1,200.

St. Michael.—At St. Michael, which is the point of entry for the Yukon district and the chief port on the Bering Sea, a school building of two rooms should be constructed at a cost of $2,500.

Bethel.—At Bethel, on the Kuskokwim River, a building is needed for a school of one room. At the Moravian mission, situated at this place, the Government formerly assisted in paying the school-teacher, but discontinued it in 1894.

Carmel.—Carmel, on Bristol Bay, is an important point and up to 1894 a portion of the salary of the school-teacher at the mission at that point was paid. There should be a one-room schoolhouse built.

Golovin Bay.—Golovin Bay is situated to the north of Norton Sound. Up to 1894 a portion of the salary of the school-teacher at the Swedish mission here was paid by the Government. There should be a one-room schoolhouse built at this point.

Kotzebue Sound.—Kotzebue Sound, beyond Bering Strait, on the north side of Prince of Wales Peninsula, is a new mining district. There should be a school building of one room established near the mission supported by the Friends, to cost $1,500.

Weare.—At Weare, on the Middle Yukon, the North American Trading and Transportation Company has large storehouses, and will probably furnish a building in case the Government will pay for the teacher.

Rampart.—Rampart, at the mouth of the Tanana River, an important distributing station, needs a school building, but no estimate is here submitted.

Peavey.—Peavey, a mining town on the Koyukuk River, the great northern branch of the Yukon, needs a school building, but no estimate is here submitted.

Kosoreffsky.—At Kosoreffsky a Government teacher should be supported.

Higher education.—The usual statistics concerning higher education are given in Chapter XLII. These show that 101,058 students were enrolled in the undergraduate and graduate departments of universities and colleges, a decided increase over the number for the preceding year. The graduate students have increased from 4,919 in 1896–97 to 5,514 in 1897–98, an increase of nearly 600 students in one year. In this chapter is included a tabular statement giving the ratio of the various classes of students in higher education to the total population for each year from 1872 to 1897–98. This table shows that the number of students to each million persons increased as follows: Undergraduate, collegiate and technical students, from 573 to 1,193; graduate students, from 5 to 74; law students, from 49 to 163; medical students, from 142 to 328; theological students, from 83 to 117, and the total number from 852 to 1,875. The total amount of money invested in universities, colleges, and schools of technology is $311,842,428. Of this amount $133,576,967 consists of endowment funds invested at an average rate of 4.8 per cent per annum, the rate being the same as the preceding year. The benefactions to these institutions during the year amounted to $8,204,281.

Professional schools.—The statistics of professional schools, Chapter XLIII, show the whole number of theological students to be 8,371 in 155 institutions or departments of institutions. The number of law students continues to increase very rapidly, being now 11,615. Medical students number 23,433, excluding those in postgraduate schools.

Land-grant colleges.—In Chapter XLIV are the usual statistics furnished by the presidents of the several colleges and universities endowed by the acts of Congress of 1862 and 1890.

Normal schools.—The number of students pursuing courses designed for the professional training of teachers enrolled in 1,439 institutions was 89,225, as shown in Chapter XLV. Nearly 52 per cent of the whole number, or 46,245, were in the 167 public normal schools, 21,293 in the 178 private normal schools, 8,320 were in normal courses in 192 universities and colleges, 13,367 were in teachers' training departments of public and private high schools. Divided according to control, 55,878 students, or nearly 63 per cent, were in public institutions. The average number of students to each public normal school was 277, to each private normal school 120, to each of the 192 colleges 38, and to each secondary school having normal students 15. With two or three exceptions all the States make provision for the education of teachers in public normal schools. State appropriations for the support of these schools have increased steadily since 1892, with the exception of a single year, when there was a small decrease. For the year 1897–98 these public appropriations aggregated $2,566,132, an increase of $139,947 over the preceding year. The number of graduates from the normal courses of public normal schools in 1898 was 8,188. Of these graduates 6,645 were women and 1,543 were men. There were 3,067 graduates from the teachers' courses in private normal schools. The number of normal graduates from the public and private normal schools was about one-sixth of the number of normal students in these schools. If one-sixth of the normal students in other institutions completed their courses the total number of teachers graduated in 1898 must have approximated 14,871.

Secondary schools.—The increase in the enrollment of secondary students continues from year to year. During the year ending June, 1898, there were enrolled in the various classes of institutions reporting to this office 626,115 secondary students. This was a gain of 41,211 over the preceding year, or more than 7 per cent. As shown in Chapter XLVI, these students were distributed as follows: 449,600 in public high schools, 105,225 in private high schools and academies, 10,907 in secondary courses in normal schools, 53,474 in preparatory departments of colleges, 6,909 in manual-training schools. In the elementary schools of nearly all the States there are many students pursuing secondary studies where high schools are not accessible. These students and others not reported probably exceed in number 25,000, so that the aggregate number of secondary students in the United States may be estimated at not less than 650,000.

For the year 1897–98 there were 5,315 public high schools and 1,990 private high schools reporting to this Bureau. Chapter XLVI is devoted almost exclusively to the statistics of these 7,305 secondary schools. There was an increase of 206 in the number of public high schools and

an increase of 40,167 in the number of public secondary students, or nearly 10 per cent. The increase in the number of public high schools reporting to this office in the last seven years has been phenomenal. In 1889–90 there were 2,526 public high schools reporting 202,963 secondary students, while in 1897–98 the number had reached 5,315 schools with 449,600 students.

The 7,305 public and private secondary schools had 27,298 teachers and 554,825 secondary students—241,359 males and 313,466 females. About 14 per cent, or 77,559, of these secondary students were reported as preparing for college. The graduates of 1898 numbered 65,170, or nearly 12 per cent of the entire number enrolled. The number of graduates who had prepared for college was 19,940, or nearly 31 per cent of the whole number of graduates.

There has been a marked increase in the percentage of students pursuing certain studies in the last eight years. In 1889–90 the per cent of students in public and private high schools studying Latin was 33.62 of the total number of secondary students. In 1897–98 the percentage reached 49.44. There has been but little variation in the proportion of students in Greek, but a small increase in the percentage of students in French, while the percentage of those studying German increased from 11.48 in 1889–90 to 14.24 in 1897–98. In 1889–90 the per cent of students in algebra was 42.77, and in 1897–98 it had increased to 55.29.

Commercial education in the United States is the title of Chapter XLIX. A paper containing substantially the same information here published was prepared by this office in response to a request from the British ambassador at Washington and has been published by the British foreign office as Document No. 504, miscellaneous series, 1899.

All of which is respectfully submitted.

W. T. HARRIS, *Commissioner.*

Hon. E. A. HITCHCOCK,
Secretary of the Interior.

I.—STATISTICS OF STATE COMMON SCHOOL SYSTEMS.

II.—EXPENDITURE FOR WHITE AND COLORED SCHOOLS SINCE 1870.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS.

I.—STATISTICS OF STATE COMMON SCHOOL SYSTEMS.

TABLE 1.—*The total population, the school population, and the adult male population.*

State or Territory.	Estimated total population in 1898.	The school population.				Estimated number of male persons 21 years and over in 1898.
		Estimated number of children 5 to 18 years of age in 1898.			Percentage of boys.	
		Boys.	Girls.	Total.		
1	2	3	4	5	6	7
United States	72,737,100	10,831,573	10,626,721	21,458,294	50.48	19,788,210
North Atlantic Division	20,247,100	2,576,863	2,557,331	5,134,194	50.19	5,877,000
South Atlantic Division	9,868,500	1,691,360	1,663,390	3,354,750	50.42	2,249,380
South Central Division	12,868,600	2,261,730	2,202,250	4,463,980	50.66	2,968,700
North Central Division	25,737,600	3,869,580	3,725,650	7,595,230	50.56	7,149,230
Western Division	4,015,300	492,040	478,100	970,140	50.71	1,543,930
North Atlantic Division:						
Maine	655,400	81,470	79,730	161,200	50.53	199,500
New Hampshire (1897)	398,700	44,480	44,380	88,860	50.06	125,100
Vermont	334,100	42,470	39,900	82,370	51.55	102,200
Massachusetts	2,694,000	307,000	309,100	616,100	49.83	890,300
Rhode Island	417,000	50,600	51,050	101,650	49.77	120,700
Connecticut	863,900	102,200	101,100	203,300	50.24	259,400
New York (1897)	6,851,000	840,950	843,050	1,684,000	49.95	2,021,000
New Jersey	1,837,000	a 236,293	a 230,421	a 466,714	50.62	525,800
Pennsylvania	6,196,000	871,400	858,600	1,730,000	50.38	1,723,000
South Atlantic Division:						
Delaware (1892)	173,200	24,750	24,080	48,830	50.69	48,960
Maryland	1,200,000	176,300	175,100	351,400	50.18	311,700
District of Columbia	285,300	35,160	37,260	72,420	48.55	79,880
Virginia (1897)	1,704,600	293,400	288,700	582,100	50.41	389,800
West Virginia	806,000	147,200	144,000	291,200	50.56	205,900
North Carolina	1,754,000	313,300	306,700	620,000	50.54	371,400
South Carolina (1897)	1,274,000	238,900	234,300	473,200	50.48	260,800
Georgia	2,097,000	376,500	368,000	744,500	50.57	454,400
Florida	515,000	85,850	85,250	171,100	50.17	126,600
South Central Division:						
Kentucky (1897)	2,016,000	333,700	326,800	660,500	50.53	489,000
Tennessee (1896)	1,877,000	326,900	315,400	642,300	50.89	427,400
Alabama (1897)	1,741,000	315,000	306,600	621,600	50.68	373,700
Mississippi (1897)	1,448,000	269,800	261,500	531,300	50.78	304,400
Louisiana (1897)	1,347,000	230,300	228,300	458,600	50.22	301,700
Texas (1897)	2,821,000	501,000	488,900	989,900	50.61	676,200
Arkansas	1,295,000	234,500	227,600	462,100	50.75	296,600
Oklahoma	323,600	50,530	47,150	97,680	51.73	100,300
North Central Division:						
Ohio	3,917,000	562,000	549,000	1,111,000	50.57	1,084,000
Indiana	2,259,000	336,700	330,700	667,400	50.45	613,200
Illinois	5,017,000	713,800	704,200	1,418,000	50.34	1,406,000
Michigan	2,254,000	315,600	310,300	625,900	50.42	664,700
Wisconsin	2,107,000	317,100	312,400	629,500	50.37	576,600
Minnesota	1,766,000	257,900	252,900	510,800	50.48	510,000
Iowa	2,101,000	321,900	311,900	633,800	50.79	571,700
Missouri	3,062,000	480,500	472,000	952,500	50.45	806,500
North Dakota	352,300	49,700	46,480	96,180	51.67	107,900
South Dakota (1896)	406,300	60,880	58,120	119,000	51.16	119,600
Nebraska	1,167,000	179,500	171,900	351,400	51.08	332,200
Kansas	1,329,000	214,000	205,750	419,750	50.98	356,800
Western Division:						
Montana	245,900	22,440	21,980	44,420	50.52	121,700
Wyoming	112,300	12,400	11,550	23,950	51.78	50,020
Colorado	584,900	65,080	63,620	128,700	50.56	234,000
New Mexico	181,500	26,020	24,930	50,950	51.07	53,130
Arizona	87,020	11,170	10,950	22,120	50.52	34,590
Utah	264,900	43,490	42,480	85,970	50.59	69,410
Nevada	41,080	4,560	4,420	8,980	50.73	18,810
Idaho	157,200	21,880	20,670	42,550	51.43	58,670
Washington	472,100	54,850	52,250	107,100	51.20	198,500
Oregon	373,400	50,850	49,850	100,700	50.52	133,000
California	1,495,000	179,300	175,400	354,700	50.54	572,100

a State school census.

TABLE 2.—*Data from United States Census reports, of use in studying educational conditions.*

State or Territory.	Number of children 5 to 18 years of age to every 100 persons of the total population.			Number of adult males to every 100 children 5 to 18 years of age in 1890.	Percentage of white children 5 to 18 years of age that were of foreign birth or parentage in 1890.	Percentage of foreign of the total population in 1890.	Population to the square mile in 1890.	Percentage of the population in cities of 8,000 inhabitants and over in 1890.
	1870.	1880.	1890.					
1	2	3	4	5	6	7	8	9
United States	31.27	30.04	29.61	91.4	33.5	14.77	21	29.20
North Atlantic Division.	28.30	26.87	25.39	114.4	45.8	22.34	107	51.81
South Atlantic Division.	33.02	32.24	34.04	66.8	6.6	2.35	33	16.03
South Central Division..	33.92	33.13	34.76	65.9	8.6	2.93	19	10.45
North Central Division..	32.40	30.63	29.33	94.6	41.5	18.16	30	25.91
Western Division.....	25.57	25.13	24.33	156.7	44.7	25.46	3	29.99
North Atlantic Division:								
Maine	28.01	25.71	24.60	123.7	25.0	11.94	22	19.72
New Hampshire.....	24.75	22.80	22.29	140.8	38.4	19.21	42	27.37
Vermont.....	27.18	25.96	24.65	124.1	33.4	13.26	36	7.93
Massachusetts.....	25.51	23.98	22.87	129.9	60.5	29.35	278	69.90
Rhode Island.....	25.66	24.64	24.38	118.7	62.4	30.77	318	78.89
Connecticut.....	25.86	24.97	23.54	127.6	54.6	24.60	154	51.63
New York	28.09	26.32	24.57	120.1	54.8	26.19	126	60.02
New Jersey.....	29.01	27.98	26.04	109.9	48.3	22.77	194	54.04
Pennsylvania.....	30.55	29.43	27.92	99.6	32.3	16.08	117	40.93
South Atlantic Division:								
Delaware	31.84	29.11	28.19	100.1	17.3	7.81	86	36.46
Maryland.....	31.30	29.89	29.28	88.7	24.4	9.05	106	44.65
District of Columbia.	27.01	26.87	25.38	110.3	26.3	8.15	3,840	100.00
Virginia	32.39	32.43	34.16	67.0	2.8	1.11	41	13.40
West Virginia	34.13	33.37	33.62	70.7	5.9	2.48	31	6.95
North Carolina.....	33.60	32.30	35.35	59.9	.7	.23	33	3.87
South Carolina.....	33.15	33.21	37.14	55.1	2.3	.54	38	6.86
Georgia	34.42	33.17	35.50	61.0	2.1	.66	31	10.84
Florida.....	34.03	32.82	33.23	74.0	11.5	5.86	7	12.02
South Central Division:								
Kentucky	34.41	33.14	32.76	74.0	8.7	3.19	46	14.87
Tennessee	34.13	33.44	34.22	66.5	2.9	1.13	42	11.45
Alabama.....	34.40	33.37	35.70	60.1	3.2	.98	29	5.89
Mississippi	33.70	34.12	36.69	57.3	3.1	.62	28	2.64
Louisiana.....	31.11	31.93	34.04	65.8	17.8	4.45	25	23.65
Texas.....	34.80	32.60	35.10	68.3	16.9	6.84	9	10.08
Arkansas	34.16	33.15	35.68	64.0	3.5	1.26	21	4.89
Oklahoma.....	.....	.....	30.18	102.7	9.6	4.43	2	.....
North Central Division:								
Ohio	31.74	29.75	28.37	97.6	30.4	12.51	90	31.57
Indiana.....	33.75	31.37	29.54	91.9	17.8	6.67	61	18.27
Illinois	32.24	30.66	28.26	99.2	47.0	22.01	68	38.83
Michigan	30.28	28.37	27.77	106.2	56.1	25.97	36	26.08
Wisconsin	33.57	30.85	29.88	91.6	72.4	30.78	31	25.17
Minnesota	32.45	30.43	28.93	99.8	76.4	35.90	16	28.37
Iowa.....	33.06	31.40	30.17	90.2	42.6	16.95	34	14.08
Missouri.....	33.57	32.35	31.11	84.7	22.5	8.77	39	26.27
North Dakota.....	23.74	24.34	27.30	112.2	80.3	44.58	3	.....
South Dakota.....			29.29	100.5	61.2	27.69	4	3.10
Nebraska.....	28.07	29.88	30.12	94.5	42.1	19.13	14	24.46
Kansas.....	29.83	31.73	31.59	85.0	26.4	10.36	17	11.62
Western Division:								
Montana.....	10.20	17.10	18.06	274.0	49.4	32.61	1	18.58
Wyoming.....	9.39	18.06	21.33	208.8	47.2	24.57	1	19.26
Colorado.....	22.47	18.72	22.00	181.8	36.3	20.38	4	37.07
New Mexico.....	31.90	29.85	28.07	104.3	13.2	7.33	1	.....
Arizona.....	16.78	19.59	25.42	156.4	57.1	31.52	1	.....
Utah.....	35.05	33.39	32.45	80.7	66.6	25.52	3	28.73
Nevada.....	12.56	18.22	21.87	209.3	60.8	32.14	0⅓	18.60
Idaho.....	11.30	22.98	27.07	137.9	41.1	20.69	1	.....
Washington	26.96	27.19	22.69	185.3	39.3	25.76	5	28.27
Oregon.....	32.34	28.63	26.96	132.1	27.9	18.27	3	18.14
California.....	24.48	25.03	23.72	161.3	51.8	30.32	8	40.98

TABLE 3.—*School ages in the several States—State school censuses.*

State or Territory.	Age for free attendance at the public schools.	Age for compulsory attendance.	School census.				
			Date of latest school census reported.	Age of children enumerated.	Number of children enumerated.		
					Boys.	Girls.	Total.
1	2	3	4	5	6	7	8
North Atlantic Division:							
Maine	5-21	8-15	1898	4-21	.....	.....	209,713
New Hampshire	Over 6	8-14	1897	5-16	33,184	32,955	66,139
Vermont	5-21	8-15	1898	5-21	46,286	44,102	90,388
Massachusetts	No limit.	8-14	1897	5-15	.....	.....	441,352
Rhode Island	Over 5	7-15	1898	*a* 5-15	39,602	39,697	79,299
Connecticut	4-16	*b* 8-16	1897	4-16	.....	.....	184,336
New York	5-21	8-16	1898	5-18	763,238	755,570	1,518,808
New Jersey	5-20	7-15	1898	5-18	236,293	230,421	466,714
Pennsylvania	6-21	6-16	.....	6-16	.....	.....	1,126,166
South Atlantic Division:							
Delaware (1893)	6-21	(*c*)	1893	6-21	15,827	17,758	33,585
Maryland	5-20	(*c*)	(*d*)	.....	.....	.....	.....
District of Columbia	6-18	6-15	1897	6-18	.....	.....	60,306
Virginia	5-21	(*c*)	1895	5-21	339,475	326,058	665,533
West Virginia	6-21	8-14	1898	6-21	157,345	145,009	302,354
North Carolina	6-21	(*c*)	1898	6-21	*e* 306,471	*e* 307,331	*e* 613,802
South Carolina	6-21	(*c*)	(*d*)	.....	.....	.....	.....
Georgia	6-18	(*c*)	1898	6-18	333,039	327,831	660,870
Florida	6-21	(*c*)	1896	6-21	78,666	73,932	152,598
South Central Division:							
Kentucky	6-20	7-14	1896	6-20	375,259	360,846	736,105
Tennessee	.....	.....	.....	.....	.....	.....	.....
Alabama (1897)	7-21	(*c*)	1897	7-21	.....	.....	613,996
Mississippi	5-21	(*c*)	1896	5-21	279,789	281,678	552,467
Louisiana (1897)	6-18	(*c*)	1897	6-18	216,670	217,510	434,180
Texas	8-17	(*c*)	1897	8-17	397,157	379,710	776,867
Arkansas	6-21	(*c*)	1898	6-21	237,658	227,907	465,565
Oklahoma	6-21	(*c*)	1898	6-21	52,736	48,738	101,474
North Central Division:							
Ohio	6-21	8-14	1898	6-21	615,291	583,413	1,198,704
Indiana	6-21	8-14	1898	6-21	.....	.....	754,905
Illinois	6-21	7-14	1898	6-21	772,629	752,813	1,525,442
Michigan	5-20	*f* 8-16	1898	5-20	355,419	348,311	703,730
Wisconsin	4-20	7-13	1898	4-20	359,198	349,337	708,535
Minnesota	5-21	8-16	(*d*)	.....	.....	.....	.....
Iowa	5-21	(*c*)	1898	5-21	369,413	358,043	727,456
Missouri	6-20	(*c*)	1898	6-20	501,158	480,264	981,422
North Dakota	6-20	8-14	1897	6-20	39,111	37,540	76,651
South Dakota (1896)	6-20	8-14	1896	6-20	55,194	51,303	106,497
Nebraska	5-21	8-14	1898	5-21	186,916	179,153	366,069
Kansas	5-21	8-14	1898	5-21	251,562	244,387	495,949
Western Division:							
Montana	6-21	8-14	1898	6-21	25,190	24,308	49,498
Wyoming	6-21	7-16	(*d*)	.....	.....	.....	.....
Colorado	6-21	8-14	1898	6-21	68,260	66,747	135,007
New Mexico	5-20	8-16	1898	8-16	26,899	23,768	50,667
Arizona	6-18	(*c*)	1898	6-18	.....	.....	18,802
Utah	6-18	8-14	1898	6-18	41,687	41,509	83,196
Nevada	6-18	8-14	1898	6-18	4,535	4,461	8,996
Idaho	5-21	8-14	1898	5-21	23,703	24,257	47,960
Washington	6-21	8-15	1898	5-21	60,373	58,118	118,491
Oregon	4-20	8-14	1898	4-20	65,216	65,534	130,750
California	6-21	8-14	1898	5-17	175,670	171,954	347,624

a Inclusive.
b Children over 14, lawfully employed to labor, are exempt.
c No compulsory attendance law.
d No school census.
e Report incomplete.
f 7-16 in city.

TABLE 4.—*Number of pupils enrolled in the common schools at various periods, and the relation of the enrollment to the school population.*

State or Territory.	Number of different pupils enrolled during the school year (excluding duplicate enrollments).				Per cent of school population (i. e., of children 5 to 18 years of age) enrolled			
	1870–71.	1879–80.	1889–90.	1897–98.	1870–71.	1879–80.	1889–90.	1897–98.
1	2	3	4	5	6	7	8	9
United States	7,561,582	9,867,505	12,722,581	15,038,636	61.45	65.50	68.61	70.08
North Atlantic Division	2,743,344	2,930,345	3,112,622	3,614,463	77.95	75.17	70.45	70.38
South Atlantic Division	603,619	1,242,811	1,785,486	2,134,725	30.51	50.74	59.22	63.63
South Central Division	767,839	1,371,975	2,293,579	2,875,366	34.17	46.43	60.14	64.41
North Central Division	3,300,660	4,033,828	5,015,217	5,669,572	76.87	75.84	76.46	75.25
Western Division	146,120	288,546	515,677	744,510	54.77	64.96	70.01	76.73
North Atlantic Division:								
Maine	a 152,600	149,827	139,676	134,405	a 87.35	89.80	85.88	83.35
New Hampshire	71,957	64,341	59,813	b 64,207	91.31	81.32	71.28	b 72.25
Vermont	c 65,384	75,238	c 65,608	65,532	.....	87.21	.....	79.53
Massachusetts	273,661	306,777	371,492	456,141	72.34	71.76	72.56	74.03
Rhode Island	a 34,000	40,604	52,774	65,384	a 59.24	59.59	62.65	64.33
Connecticut	113,588	119,694	126,505	147,833	80.83	76.97	72.02	72.72
New York	1,028,110	1,031,593	1,042,160	b1,203,199	82.98	77.10	70.71	b 71.48
New Jersey	169,430	204,961	234,072	304,680	63.20	64.77	62.21	65.29
Pennsylvania	834,614	937,310	1,020,522	1,173,082	76.35	74.37	69.53	67.83
South Atlantic Division:								
Delaware	20,058	27,823	31,434	d 33,174	50.04	65.20	66.19	d 67.93
Maryland	115,683	162,431	184,251	236,003	46.70	58.13	60.37	67.16
District of Columbia	15,157	26,439	36,906	44,698	41.60	55.40	63.10	61.71
Virginia	131,088	220,736	342,269	b 367,817	32.34	45.00	60.51	b 63.19
West Virginia	76,999	142,850	193,064	236,188	49.47	69.21	75.27	81.10
North Carolina	a 115,000	252,612	322,533	399,375	a 31.23	55.87	56.39	64.41
South Carolina	66,056	134,072	201,260	b 258,183	27.28	40.56	47.08	b 54.55
Georgia	49,578	236,533	381,297	450,832	11.89	46.24	58.45	60.54
Florida	14,000	39,315	92,472	108,455	21.21	44.16	71.10	63.37
South Central Division:								
Kentucky	e 178,457	e 276,000	399,660	b 501,893	.....	.....	65.64	b 76.00
Tennessee	a 140,000	300,217	447,950	f 481,585	a 32.00	58.21	74.05	f 74.97
Alabama	141,312	179,490	301,615	b 348,899	40.36	42.60	55.83	b 56.13
Mississippi	117,000	236,654	334,158	b 367,579	40.60	61.29	70.62	b 69.17
Louisiana	57,639	77,642	120,253	182,341	24.78	25.87	31.58	39.76
Texas	63,504	a 220,000	466,872	b 612,140	21.00	a 42.40	59.50	b 61.84
Arkansas	69,927	81,972	223,071	303,808	40.29	30.81	55.41	65.75
Oklahoma	.....	.....	.....	77,121	.....	.....	.....	78.96
North Central Division:								
Ohio	719,372	729,499	797,439	810,285	84.04	76.69	76.54	72.92
Indiana	450,057	511,283	512,955	566,157	78.64	82.39	79.21	84.82
Illinois	672,787	704,041	778,319	939,163	81.01	74.61	71.97	66.25
Michigan	292,466	362,556	427,032	496,025	79.66	78.08	73.45	79.25
Wisconsin	265,285	299,457	351,723	435,914	73.92	73.78	69.77	69.25
Minnesota	113,983	180,248	280,960	384,063	75.92	75.87	74.59	75.18
Iowa	341,938	426,057	493,267	548,852	84.44	83.52	85.51	86.62
Missouri	330,070	482,986	620,314	688,583	56.03	68.85	74.43	72.30
North Dakota	a 1,660	13,718	35,543	67,375	a 39.26	41.68	71.26	70.05
South Dakota			78,043	f 89,001			81.04	f 74.78
Nebraska	23,265	92,549	240,300	273,914	58.79	68.48	75.35	77.97
Kansas	89,777	231,434	399,322	370,240	74.22	73.23	88.56	88.20
Western Division:								
Montana	1,657	4,270	16,980	35,070	70.24	63.77	71.14	78.94
Wyoming	a 450	2,907	7,052	13,042	a 45.34	77.44	54.46	54.46
Colorado	4,357	22,119	65,490	104,733	42.28	60.82	72.20	81.38
New Mexico	a 1,320	4,755	18,215	26,484	a 4.42	13.32	42.25	51.99
Arizona	0	4,212	7,989	14,613	.....	53.16	52.72	66.09
Utah	16,992	24,326	37,279	70,878	53.36	50.61	55.26	82.45
Nevada	3,106	9,045	7,387	7,348	53.97	79.73	73.80	81.78
Idaho	906	5,834	14,911	29,737	46.06	77.85	62.66	69.88
Washington	a 5,000	14,780	55,964	97,916	a 69.00	72.36	70.58	91.42
Oregon	21,000	37,533	63,254	85,230	67.73	75.02	74.78	84.64
California	91,332	158,765	221,756	259,459	63.63	73.37	77.38	73.17

a Approximately.
b In 1896–97.
c Pupils of legal school age only.
d In 1891–92.
e Highest number enrolled.
f In 1895–96.

TABLE 5.—*The school enrollment of 1897–98 classified by sex; per cent of the male and of the female school population enrolled; per cent of the total population enrolled.*

State or Territory.	Number of different pupils of all ages enrolled.			Per cent of the school population (5 to 18 years of age) enrolled.			Per cent of the total population enrolled.
	Male.	Female.	Total.	Male.	Female.	Male and female.	
1	2	3	4	5	6	7	8
United States	a 7,643,496	a 7,395,140	15,038,636	70.57	69.58	70.08	20.68
North Atlantic Division	a 1,824,420	a 1,790.043	3,614,463	70.82	70.02	70.38	17.85
South Atlantic Division	a 1,078,825	a 1,055,900	2,134,725	63.79	63.49	63.63	21.63
South Central Division	a 1,464,667	a 1,410,699	2,875,366	64.76	64.06	64.41	22.35
North Central Division	a 2,896,530	a 2,773,042	5,669,572	76.03	74.43	75.25	22.04
Western Division	a 379,054	a 365,456	744,510	77.03	76.43	76.73	18.55
North Atlantic Division:							
Maine			134,405			83.35	20.59
New Hampshire (1896–97)	32,488	31,719	64,207	73.05	71.47	72.25	16.10
Vermont	32,028	33,504	65,532	75.42	83.96	79.53	19.61
Massachusetts			456,141			74.03	16.93
Rhode Island	33,065	32,319	65,384	65.36	63.30	64.33	15.68
Connecticut			147,823			72.72	17.12
New York (1896–97)			1,203,199			71.48	17.56
New Jersey	153,310	151,370	304,680	64.88	65.69	65.29	16.58
Pennsylvania	593,494	579,588	b 1,173,082	68.11	67.50	67.83	18.93
South Atlantic Division:							
Delaware (1891–92)			33,174			67.93	19.16
Maryland			236,003			67.16	19.67
District of Columbia	21,140	23,558	44,698	60.11	63.24	61.71	15.67
Virginia (1896–97)	185,847	181,970	367,817	63.33	63.04	63.19	21.58
West Virginia	124,354	111,834	236,188	84.47	77.64	81.10	27.27
North Carolina	203,246	196,129	399,375	64.87	63.96	64.41	22.78
South Carolina (1896–97)	128,517	129,666	258,183	53.80	55.34	54.55	20.26
Georgia	224,948	225,884	450,832	59.74	61.39	60.54	21.50
Florida	54,748	53,707	108,455	63.77	63.03	63.37	21.06
South Central Division:							
Kentucky (1896–97)	256,520	245,373	501,893	76.86	75.10	76.00	24.89
Tennessee (1895–96)	247,635	233,950	481,585	75.75	74.17	74.97	25.66
Alabama (1896–97)			348,899			56.13	20.05
Mississippi (1896–97)	a 184,250	a 183,329	367,579	68.30	70.13	69.17	25.38
Louisiana	91,739	90,602	182,341	39.84	29.68	39.76	13.54
Texas (1896–97)	311,327	300,813	612,140	62.16	61.53	61.84	21.71
Arkansas	155,738	148,070	303,808	66.42	65.07	65.75	23.46
Oklahoma	39,741	37,380	77,121	78.65	79.30	78.96	23.83
North Central Division:							
Ohio	416,136	394,149	810,285	74.05	71.80	72.92	20.69
Indiana			566,157			84.82	25.06
Illinois	476,635	462,528	939,163	66.77	65.67	66.25	18.73
Michigan	250,414	245,611	496,025	79.34	79.14	79.25	22.00
Wisconsin	221,838	214,076	435,914	69.97	68.53	69.25	20.69
Minnesota			384,063			75.18	21.75
Iowa			548,852			86.62	26.13
Missouri	350,176	338,407	688,583	72.88	71.70	72.30	22.49
North Dakota	35,271	32,104	67,375	70.97	69.07	70.05	19.13
South Dakota (1895–96)	46,737	42,264	89,001	76.75	72.72	74.78	21.90
Nebraska	139,162	134,752	273,914	77.53	78.40	77.97	23.48
Kansas	194,352	175,888	370,240	90.80	85.48	88.20	27.87
Western Division:							
Montana			35,070			78.94	14.26
Wyoming	6,643	6,399	13,042	53.56	55.40	54.46	11.62
Colorado	52,603	52,130	104,733	80.82	81.94	81.38	17.90
New Mexico	15,068	11,416	26,484	57.90	45.79	51.99	14.59
Arizona	7,594	7,019	14,613	67.95	64.09	66.09	16.80
Utah	36,139	34,739	70,878	83.10	81.77	82.45	26.75
Nevada	3,886	3,462	7,348	85.26	78.32	81.78	17.89
Idaho	14,213	15,524	29,737	64.96	75.10	69.88	18.92
Washington	49,908	48,008	97,916	91.00	91.88	91.42	20.74
Oregon	43,135	42,095	85,230	84.82	84.45	84.64	22.82
California	132,008	127,451	259,459	73.63	72.68	73.17	17.36

a Approximately. *b* The enrollment of Philadelphia is estimated.

TABLE 6.—*Per cent of the school population (i. e., children 5 to 18 years of age) enrolled in the public schools, for a period of years.*

Year.	United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.
1870–71	61.45	77.95	30.51	34.17	76.87	54.77
1871–72	62.20	77.33	32.27	37.94	77.04	54.43
1872–73	62.36	76.79	35.86	38.67	75.97	57.52
1873–74	64.40	77.77	42.10	40.82	76.98	61.04
1874–75	65.54	78.59	44.61	42.47	77.54	64.39
1875–76	64.70	78.55	46.72	37.36	77.05	66.37
1876–77	63.92	76.83	47.02	38.51	75.60	66.12
1877–78	65.75	77.09	48.85	43.50	77.38	66.26
1878–79	64.64	76.18	46.72	44.71	75.28	65.63
1879–80	65.50	75.17	50.74	46.43	75.84	64.96
1880–81	65.03	74.28	51.49	47.03	74.59	64.82
1881–82	65.03	74.56	51.90	47.02	74.15	65.93
1882–83	66.39	74.15	54.30	50.68	75.13	67.05
1883–84	66.96	72.83	56.25	53.59	75.06	68.01
1884–85	67.96	73.23	57.17	56.57	75.46	68.53
1885–86	68.14	72.63	57.68	56.82	76.08	68.03
1886–87	67.98	72.23	58.98	56.21	75.77	67.97
1887–88	68.33	71.60	58.68	58.67	75.96	68.53
1888–89	68.20	70.60	58.40	58.28	76.63	69.39
1889–90	68.61	70.45	59.22	60.14	76.46	70.01
1890–91	69.03	69.85	59.80	62.51	76.00	73.28
1891–92	69.06	69.98	58.88	63.14	75.85	75.32
1892–93	68.72	68.64	60.93	62.39	75.52	73.51
1893–94	69.50	69.70	61.73	63.55	75.93	73.36
1894–95	69.68	71.02	61.07	61.97	76.52	76.70
1895–96	69.48	69.95	60.84	62.92	76.15	77.00
1896–97 *a*	69.50	69.98	62.56	61.14	76.48	76.56
1897–98 *a*	70.08	70.38	63.63	64.41	75.25	76.73

a Subject to correction.

TABLE 7.—*The average daily attendance at various periods, and its relation in 1897–98 to the enrollment.*

State or Territory.	Average number of pupils actually present at school each day.				Number in daily attendance for each 100 enrolled in 1897–98.
	1870–71.	1879–80.	1889–90.	1897–98.	
1	2	3	4	5	6
United States	4,545,317	6,144,143	8,153,635	*b* 10,286,092	68.39
North Atlantic Division	1,627,208	1,824,487	2,036,459	2,587,468	71.60
South Atlantic Division	368,111	776,798	1,126,683	1,314,622	61.59
South Central Division	535,632	902,767	1,467,649	1,870,510	65.06
North Central Division	1,911,720	2,451,167	3,188,732	3,996,895	70.50
Western Division	102,646	188,924	334,112	516,597	69.38
North Atlantic Division:					
Maine	100,392	103,115	98,364	97,616	72.63
New Hampshire	48,150	48,966	41,526	*a* 47,717	*a* 74.33
Vermont	*b* 44,100	48,606	45,887	48,060	73.33
Massachusetts	201,750	233,127	273,910	349,147	76.54
Rhode Island	22,485	27,217	33,905	47,370	72.45
Connecticut	62,683	73,546	83,656	105,002	71.02
New York	493,648	573,089	642,984	827,652	68.77
New Jersey	86,812	115,194	133,286	200,278	65.73
Pennsylvania	567,188	601,627	682,941	864,626	73.70
South Atlantic Division:					
Delaware	*b* 12,700	17,439	19,649	*c* 22,693	*c* 68.40
Maryland	56,435	85,778	102,351	134,539	57.00
District of Columbia	10,261	20,637	28,184	34,383	76.93
Virginia	77,402	128,404	198,290	213,421	58.03
West Virginia	51,336	91,604	121,700	159,768	67.66
North Carolina	*b* 73,000	170,100	203,100	214,540	53.72
South Carolina	*b* 44,700	*b* 90,600	147,799	*a* 182,559	*a* 70.71
Georgia	31,377	145,190	240,791	278,715	61.83
Florida	*b* 10,900	27,046	64,819	74,004	68.21

TABLE 7.—*The average daily attendance of various periods, and its relation in 1897–98 to the enrollment*—Continued.

State or Territory.	Average number of pupils actually present at school each day.				Number in daily attendance for each 100 enrolled in 1897–98.
	1870–71.	1879–80.	1889–90.	1897–98.	
1	2	3	4	5	6
South Central Division:					
Kentucky	120,866	178,000	225,739	*a* 308,697	*a* 61.51
Tennessee	*b* 89,000	208,528	323,548	*d* 338,176	*d* 70.23
Alabama	107,666	117,978	182,467	*ab* 222,690	*ab* 63.83
Mississippi	90,000	156,761	207,704	*a* 223,900	*a* 60.91
Louisiana	*b* 40,500	*b* 54,800	87,536	132,046	72.42
Texas	*b* 41,000	*b* 132,000	291,941	*a* 404,372	*a* 66.06
Arkansas	*b* 46,600	*b* 54,700	*b* 148,714	191,447	63.01
Oklahoma	.....	.....	.....	49,182	63.77
North Central Division:					
Ohio	432,452	476,279	549,269	618,667	76.37
Indiana	295,071	321,659	342,275	432,931	76.47
Illinois	341,686	431,638	538,310	729,227	77.62
Michigan	*b* 193,000	*b* 240,000	*b* 282,000	*b* 347,714	*b* 70.10
Wisconsin	*b* 132,000	*b* 156,000	200,457	*b* 287,000	*b* 65.84
Minnesota	50,694	*b* 78,400	127,025	*b* 243,200	*b* 63.33
Iowa	211,562	259,836	306,309	370,845	67.57
Missouri	187,024	*b* 281,000	384,627	440,692	63.99
North Dakota	*b* 1,040	8,530	20,694	41,155	61.09
South Dakota			48,327	*bd* 54,600	*bd* 61.34
Nebraska	*b* 14,300	60,156	146,139	173,930	63.49
Kansas	52,891	137,669	243,300	256,934	69.39
Western Division:					
Montana	*b* 1,100	*b* 3,000	10,596	*b* 23,400	*b* 66.73
Wyoming	*b* 250	1,920	*b* 4,700	*b* 8,700	*b* 66.70
Colorado	2,611	12,618	38,715	69,973	66.80
New Mexico	*b* 880	3,150	*b* 13,000	16,950	64.00
Arizona	.....	2,847	4,702	9,011	61.64
Utah	12,819	17,178	20,967	*e* 49,638	56.69
Nevada	1,800	4,501	5,064	4,982	67.80
Idaho	*b* 600	3,863	*b* 9,500	21,528	72.40
Washington	*b* 3,300	10,546	36,946	64,192	65.56
Oregon	*b* 15,000	27,435	43,333	62,799	73.70
California	64,286	100,966	146,589	185,424	71.45

a In 1896–97.
b Approximately.
c In 1891–92.
d In 1895–96.
e Salt Lake City estimated.

Method of ascertaining average attendance.—The average daily attendance during a year (which is the average number of pupils actually present each day the schools were in session) may be computed as follows:

First, for a single school: Add together the number of pupils present each school day during the year, and divide the sum (which is the "aggregate attendance in days") by the number of such school days.

Second, for a group of schools having the same number of school days in the year (as the schools of most cities have): (*a*) Divide the combined aggregate attendance in days of all the schools by the number of school days in the year; or (*b*) add together the average daily attendance for the year of the individual schools. The result is the same in either case.

Third, for a system of schools having different lengths of school year (as, for instance, those of a county): Add together the average attendance of the component schools and groups of the system, as ascertained by either of the foregoing rules. For larger systems, as those of a State or of the United States, the summing-up process is continued in the same way.

In a system of schools such as is specified under the heading "Third," the average number of days in the school year for the whole system is found by dividing the combined aggregate attendance in days of all the schools of the system by the average attendance as ascertained by the rule given. See observations on Table 8.

TABLE 8.—*(1) Average length of school term at various periods. (2) Aggregate number of days' schooling given to all pupils. (3) The same compared with the school population and the enrollment (columns 7 and 8).*

State or Territory.	Average number of days the schools were kept during the year. *a*				Aggregate number of days' schooling given in 1897–98.	Average number of days' schooling given for every child 5 to 18 years of age in 1897–98.	Average number of days attended by each pupil enrolled in 1897–98.
	1870–71.	1879–80.	1889–90.	1897–98.			
1	2	3	4	5	6	7	8
United States	132.1	130.3	134.7	143.1	1,471,435,367	68.6	97.8
North Atlantic Division	152.0	159.2	166.6	174.5	451,410,214	87.9	124.9
South Atlantic Division	97.4	92.4	99.9	112.7	148,098,404	44.2	69.4
South Central Division	91.6	79.2	83.2	98.6	184,373,722	41.3	64.1
North Central Division	133.9	139.8	148.0	152.4	609,143,615	80.8	107.4
Western Division	119.2	129.2	135.0	151.8	78,409,412	80.8	105.3
North Atlantic Division:							
Maine	98	109	112	137	13,373,392	82.9	99.5
New Hampshire	70	105.3	117.7	*b* 134.55	*b* 6,420,322	*b* 72.3	*b* 100.0
Vermont	115.6	125.5	136	154	7,401,240	89.8	113.0
Massachusetts	169	177	177	186	64,941,342	105.4	142.4
Rhode Island	170	184	188	191	9,213,700	90.6	140.9
Connecticut	172.4	179	182.5	188.82	19,826,478	97.5	134.1
New York	176	178.5	186.5	176	154,286,608	91.7	128.2
New Jersey	178	192	192	185	38,125,748	81.7	125.1
Pennsylvania	127.2	133.4	147.6	159.4	137,821,384	79.7	117.5
South Atlantic Division:							
Delaware	132	158	166	*cd* 160	*cd* 3,640,881	*cd* 74.6	*cd* 109.8
Maryland	183	187	184	*b* 182	*c* 24,486,098	*c* 69.5	*c* 103.5
District of Columbia	200	193	178	185	6,360,855	87.8	142.3
Virginia	93.2	112.8	118.2	*b* 120.2	*b* 25,653,204	*b* 44	*b* 69.7
West Virginia	76.8	90	97	111	17,772,190	61	75.3
North Carolina	*c* 50	50	59.25	68.8	14,750,082	23.8	36.9
South Carolina	*c* 100	70	69.6	*b* 83.2	*b* 15,188,909	*b* 32.1	*b* 58.8
Georgia	59	*c* 65	83.3	*b* 116.9	*c* 32,581,783	*c* 43.8	*c* 72.3
Florida	.....	.....	*c* 120	104	7,664,402	44.8	70.7
South Central Division:							
Kentucky	*c* 110	102	94	*bc* 115.4	*bc* 35,623,634	*bc* 53.9	*bc* 71.0
Tennessee	*c* 77	68	86	*c* 90.2	*c* 30,503,475	*c* 47.5	*c* 63.3
Alabama	66.5	81.3	73.5	*b* 80.1	*bc* 17,837,469	*bc* 28.7	*bc* 51.1
Mississippi	110	74.5	*c* 86	*b* 101.6	*b* 22,748,240	*b* 42.8	*b* 61.9
Louisiana	*c* 65	78.8	100.6	106.3	14,036,490	30.6	77.0
Texas	*c* 140	71.7	100	*b* 106	*b* 45,830,007	*b* 46.3	*b* 74.9
Arkansas	.....	.....	*c* 75	69	*c* 13,350,000	*c* 28.9	*c* 43.9
Oklahoma	.....	.....	.....	86.3	4,444,407	45.5	57.6
North Central Division:							
Ohio	165	152	166.5	162	100,225,674	90.2	123.7
Indiana	98.5	136	130	144	62,342,064	93.4	110.1
Illinois	146.7	150	155.4	158.7	115,728,315	81.6	123.2
Michigan	140	150	156	160.8	*c* 55,912,411	*c* 89.3	*c* 112.7
Wisconsin	155	165	158.6	*f* 160	*c* 45,920,000	*c* 73	*c* 105.4
Minnesota	*c* 83	94	128	156	37,939,200	74.3	98.8
Iowa	130	148	156	162	60,076,890	94.8	109.5
Missouri	90	*c* 104	129.4	141.7	62,422,055	65.5	90.7
North Dakota	*c* 75	*c* 96	113	122	6,295,751	65.5	93.4
South Dakota			145	*ce* 138.4	*ce* 7,559,529	*ce* 63.5	*ce* 84.9
Nebraska	72	82	140	131	22,784,830	64.8	83.2
Kansas	116	120	135	124.3	31,936,896	76.1	86.3
Western Division:							
Montana	*c* 89	96	142.7	*e* 149.2	*c* 3,510,000	*c* 79	*c* 100.1
Wyoming	*c* 200	119	*c* 120	*c* 110	*c* 957,000	*c* 40	*c* 73.4
Colorado	92	*c* 132	144.4	*e* 159.7	*c* 11,174,688	*c* 86.8	*c* 106.7
New Mexico	*c* 111	111	*c* 67	96.6	1,637,370	32.1	61.8
Arizona	0	109	126	130	1,171,430	53	80.2
Utah	152	128	133	157	7,793,166	73.4	89.0
Nevada	142	143	140	154	767,228	85.4	104.4
Idaho	*c* 45	94	*c* 69.8	100	2,152,800	50.6	72.4
Washington	*c* 80	*c* 91	97.2	148	9,497,836	88.7	97.0
Oregon	*c* 90	90	118.2	123.9	7,780,796	77.3	91.3
California	123	146.6	157.6	172.4	31,967,098	90.1	123.2

a Certain States report their school term in months; these months have been reduced to days by multiplying them by 20.
b In 1896–97.
c Approximately.
d In 1890–92.
e In 1895–96.
f In 1893–94.

Observations on ascertaining the average school term.—The "aggregate number of days' schooling given" to all pupils (see column 6), which is the same thing as the aggregate number of days attended by all the pupils, has been computed for those States which do not make an explicit report of this item by multiplying the average daily attendance of pupils by the average length of school term in days.

Conversely, the average length of school term (column 5) for the United States as a whole and for each of its geographical divisions has been obtained by dividing the aggregate number of days attended by the average daily attendance.

By this method the school term of each State, in computing the average term for a number of States, is in fact given a weight proportioned to the school attendance of the State, as should be done under a correct interpretation of the expression "Average length of school term." The result might more properly be called "Average length of attendance," which is essentially what it is desired to know.

A method which has been in use in some States for finding the average school term, of a county, for instance, is to weight the different school terms of the towns or districts the county is composed of by the number of schools in each. In other words, the total number of days (or months) all the schools of a county were kept is divided by the total number of schools to get the average time each one was kept. So, in finding the average term for the State, the school is taken as the unit instead of the pupil. When the schools differ much in size (number of pupils), as they do in all mixed urban and rural systems, varying from some half a dozen to 500 or more pupils each, the average term obtained by this method varies considerably from that obtained by the Bureau's method. The long terms of the large city schools not being given their proper weight, the resulting average is too small. The same objection applies still more forcibly to weighting the school terms of the different counties or towns by the number of school districts in each.

Another method is to divide the total number of months or days taught by the number of teachers. This is better than the preceding method, as it takes some account of the size of the schools; that is, an eight-grade school with eight teachers has eight times the weight, in determining the average term, that a district school with one teacher has. This is manifestly as it should be. If every teacher taught the same number of pupils, the result would be the same as by the Bureau's method. Care must be taken in working by this method to use the number of teachers' places (or number of teachers necessary to supply the schools) for the divisor; for if a teacher teaches a school or grade part of the term, and is replaced by another for the rest of the term, the two should obviously count as one teacher for the combined period of service. The liability to overlook this distinction in practice, as well as the inequality in the number of pupils to a teacher, makes this method generally objectionable.

Still another and most faulty method is to add together the school terms of the different counties or towns and divide by the number of such counties or towns; i. e., the simple arithmetical mean is taken. An example of this occurs in a school report, where it is stated that 14,193 pupils in one district attended 185 days, and 856 pupils in another district attended 160 days, while the average time the whole 15,049 pupils attended is computed at 172½ days, although nearly all (16 out of every 17) attended 185 days. This method, if it can be so called, gives altogether too short an average term, and nothing can be said in defense of it. It is as if, wishing to get the population per square mile of Minnesota and Dakota combined, we said, Minnesota, 9.86; Dakota, 0.92; average number of persons per square mile in the combined territory $(0.92+9.86)\div 2=5.39$, instead of dividing the total population of the two States by the combined area in square miles.

The "aggregate number of days' attendance" is a statistical item of the utmost simplicity and of great value, about the meaning of which there can be little or no difference of opinion. Every teacher's register that records the number of pupils present each day in school, as they all presumably do, contains the data for ascertaining it for that school for the school year by the simple process of addition or summing up.

There are a few States that make no pretense of ascertaining how long their schools were taught, and others that use methods so faulty that they also are totally in the dark in the matter. Yet this is one of the most necessary and fundamental items of information in determining their educational status. It is on this account that the subject has been somewhat enlarged on.

TABLE 9.—(*1*) *Length of school term.* (*2*) *The aggregate number of days' schooling given compared with the school population.*

Year.	Average length of school term, in days.						Average number of days' schooling given for every child 5 to 18 years of age.					
	The United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.	The United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.
1870–71	132.1	152.0	97.4	91.6	133.9	119.2	48.7	70.2	18.1	21.8	59.6	45.9
1871–72	133.4	151.9	103.4	97.7	136.1	121.8	49.5	68.9	20.3	25.8	59.8	46.0
1872–73	129.1	154.6	97.4	89.1	129.6	118.3	47.8	67.9	21.7	23.4	56.8	45.0
1873–74	128.8	154.8	95.6	81.1	132.6	119.0	49.6	70.4	24.5	21.9	59.8	46.1
1874–75	130.4	158.7	95.2	81.0	134.6	132.5	51.0	72.0	26.1	23.5	60.2	53.6
1875–76	133.1	158.0	95.6	82.5	139.1	130.3	51.4	73.7	26.8	20.1	62.2	54.4
1876–77	132.1	157.2	91.4	80.3	139.8	130.1	51.1	73.6	26.3	19.8	62.3	54.3
1877–78	132.0	157.6	89.7	86.7	140.1	129.9	53.2	75.6	26.8	24.3	64.3	54.5
1878–79	130.2	160.1	88.6	81.9	136.4	132.0	52.0	75.9	25.7	23.9	62.3	56.7
1879–80	130.3	159.2	92.4	79.2	139.8	129.2	53.1	74.5	29.3	24.2	64.4	54.9
1880–81	130.1	158.7	92.4	82.1	138.8	133.8	52.0	72.2	28.5	25.0	62.7	56.9
1881–82	131.2	160.6	95.9	82.5	137.1	136.2	52.9	73.3	30.6	25.6	63.2	58.0
1882–83	129.8	161.0	95.9	82.5	137.1	132.6	53.8	74.4	32.0	26.8	63.9	57.3
1883–84	129.1	156.0	95.6	85.9	138.6	133.8	55.5	72.5	32.7	30.0	67.7	61.6
1884–85	130.7	163.1	93.4	87.5	139.1	131.8	56.8	77.2	33.7	31.4	67.3	58.3
1885–86	130.4	161.6	93.4	86.9	140.4	130.8	57.3	76.7	33.7	32.0	68.7	59.6
1886–87	131.3	165.9	95.3	87.5	139.5	131.6	57.7	77.8	34.8	32.1	68.7	59.1
1887–88	132.3	164.4	95.7	87.6	144.0	130.7	58.7	76.8	35.5	33.6	71.3	57.3
1888–89	133.7	164.1	95.0	88.9	147.5	135.7	58.9	76.7	35.4	34.0	71.6	61.7
1889–90	134.7	166.6	99.9	88.2	148.0	135.0	59.2	76.8	37.3	33.9	71.9	61.2
1890–91	135.7	168.1	103.8	92.0	145.8	136.9	60.4	77.9	37.9	35.5	73.0	64.0
1891–92	136.9	169.1	105.3	94.1	146.8	139.1	61.1	78.5	37.8	37.1	73.1	68.7
1892–93	136.3	169.6	103.4	93.0	146.6	138.8	61.4	78.5	38.6	36.6	74.4	67.5
1893–94	139.5	172.3	108.3	97.5	150.2	137.1	64.2	81.3	41.5	39.8	76.9	68.5
1894–95	139.5	172.8	106.5	92.8	150.8	142.4	65.1	84.2	41.2	36.7	79.3	75.0
1895–96	140.5	175.5	107.8	92.2	151.9	142.0	65.9	84.9	41.0	37.5	80.2	76.1
1896–97*a*	140.4	172.9	111.2	92.8	151.2	141.5	67.2	86.3	42.8	38.3	81.3	77.3
1897–98*a*	143.1	174.5	112.7	98.6	152.4	151.8	68.6	87.9	44.2	41.3	80.8	80.8

a Subject to correction.

TABLE 10.—*Number and sex of teachers—Percentage of male teachers.*

State or Territory.	Whole number of different teachers employed.			Percentage of male teachers.			
	Male.	Female.	Total.	1870-71.	1879-80.	1889-90.	1897-98.
1	2	3	4	5	6	7	8
United States	131,750	277,443	409,193	41.0	42.8	34.5	32.2
North Atlantic Division	19,231	80,732	99,963	26.2	28.8	20.0	19.2
South Atlantic Division	20,199	26,605	46,804	63.8	62.5	49.1	43.2
South Central Division	31,317	29,167	60,484	67.5	67.2	57.5	51.8
North Central Division	54,911	124,442	179,353	43.2	41.7	32.4	30.6
Western Division	6,092	16,497	22,589	45.0	40.3	31.1	27.0
North Atlantic Division:							
Maine	*a* 1,257	*a* 5,470	6,727	*a* 24.4	*a* 27.2	*a* 16.0	*a* 18.7
New Hampshire	*b* 202	*b* 2,509	*b* 2,711	15.9	16.8	9.8	*b* 7.4
Vermont	389	2,397	2,786	16.5	16.8	12.0	14.0
Massachusetts	1,174	12,029	13,203	12.7	13.2	9.8	8.9
Rhode Island	193	1,659	1,852	*a* 20.4	20.2	12.6	10.4
Connecticut	373	3,570	3,943	*a* 22.1	*a* 22.8	*a* 13.4	9.5
New York	*b* 5,461	*b* 28,924	*b* 34,385	22.9	26.0	16.9	*b* 15.9
New Jersey	834	5,442	6,276	32.5	28.5	18.4	13.3
Pennsylvania	9,348	18,732	28,080	42.8	45.5	34.2	33.3
South Atlantic Division:							
Delaware	*c* 218	*c* 622	*c* 840	*a* 29.9	*a* 46.6	*a* 31.0	*c* 26.0
Maryland	1,144	3,843	4,987	45.0	42.6	27.8	22.9
District of Columbia	148	959	1,107	8.2	7.8	13.0	13.4
Virginia	*b* 3,013	*b* 5,562	*b* 8,575	64.5	61.8	41.5	*b* 35.1
West Virginia	4,096	2,712	6,808	79.0	75.2	63.4	60.2
North Carolina	3,695	3,522	7,217	*a* 73.2	*a* 71.3	59.1	51.2
South Carolina	*b* 2,245	*b* 2,728	*b* 4,973	62.4	59.5	49.6	*b* 45.1
Georgia	4,519	4,986	9,505	71.4	*a* 65.2	53.3	47.5
Florida	1,121	1,671	2,792	*a* 65.7	61.6	48.0	40.2
South Central Division:	*b* 4,909	*b* 5,051	*b* 9,960				*b* 49.3
Kentucky				*a* 66.0	64.6	49.8	
Tennessee	*d* 5,121	*d* 4,014	*d* 9,135	*a* 75.0	74.4	61.8	*d* 56.1
Alabama	*ab* 4,741	*ab* 2,778	*b* 7,519	66.8	63.8	62.9	*ab* 63.1
Mississippi	*b* 3,649	*b* 4,254	*b* 7,903	*a* 60.	61.2	49.6	*b* 46.2
Louisiana	1,362	2,472	3,834	50.	46.1	44.7	35.5
Texas	*b* 6,179	*b* 6,774	*b* 12,953	*a* 77.3	*a* 75.0	61.1	*b* 47.7
Arkansas	4,515	2,558	7,073	*a* 75.6	78.4	68.5	63.8
Oklahoma	841	1,266	2,107	.....	.....	.....	39.9
North Central Division:							
Ohio	10,358	14,898	25,256	43.2	47.8	43.1	41.0
Indiana	7,197	8,026	15,223	60.5	57.5	51.1	47.3
Illinois	6,718	18,549	25,267	43.5	39.7	32.5	26.6
Michigan	3,625	12,048	15,673	26.3	29.2	22.3	23.1
Wisconsin	2,654	9,811	12,465	*a* 28.8	28.9	19.8	21.3
Minnesota	2,304	8,939	11,243	33.7	35.9	23.9	20.5
Iowa	5,855	22,839	28,694	39.0	33.6	20.6	20.4
Missouri	5,951	9,315	15,266	65.3	58.1	44.4	39.0
North Dakota	1,115	2,522	3,637	} *a* 24.7	*a* 40.8	{ 28.3	30.7
South Dakota	*d* 1,321	*d* 3,187	*d* 4,508			29.0	*d* 29.3
Nebraska	2,433	7,175	9,608	51.9	40.7	27.1	25.3
Kansas	5,380	7,133	12,513	47.2	45.1	40.8	43.0
Western Division:							
Montana	201	885	1,086	*a* 60.3	38.5	22.9	18.5
Wyoming	102	434	536	*a* 28.6	44.3	22.4	19.0
Colorado	744	2,238	2,982	48.8	36.4	26.2	25.0
New Mexico	333	270	603	*a* 91.7	78.0	*a* 62.2	55.2
Arizona	156	279	435	.....	47.5	38.8	35.9
Utah	502	837	1,339	55.0	54.5	46.6	37.5
Nevada	40	274	314	32.4	46.7	16.3	12.7
Idaho	324	524	848	*a* 64 3	57.4	*a* 33.4	38.2
Washington	1,033	2,288	3,321	*a* 46.5	37.4	40.6	31.1
Oregon	1,250	2,443	3,693	*a* 51.7	48.3	43.3	33.8
California	1,407	6,025	7,432	40.0	33.6	21.4	18.9

a Approximately.
b In 1896-97.
c In 1891-92.
d In 1895-96.

TABLE 11.—*Showing, for a period of years, what per cent of the whole number of teachers were males.*

Year.	United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.
1870–71	41.0	26.2	63.8	67.5	43.2	45.0
1871–72	41.3	26.1	63.4	68.3	43.4	43.5
1872–73	41.2	26.1	63.3	68.9	42.8	43.0
1873–74	41.6	26.8	62.9	69.4	42.5	44.5
1874–75	42.2	26.7	63.3	69.1	42.5	44.1
1875–76	42.3	27.9	63.1	68.0	42.4	45.3
1876–77	42.8	28.2	62.7	67.8	43.0	44.4
1877–78	43.1	28.5	62.6	67.7	42.8	43.0
1878–79	43.3	29.1	62.8	67.8	42.7	42.3
1879–80	42.8	28.8	62.5	67.2	41.7	40.3
1880–81	41.7	27.4	61.4	67.0	39.9	37.3
1881–82	39.7	25.7	59.4	65.8	37.7	37.1
1882–83	38.2	23.9	57.3	63.5	35.9	35.9
1883–84	37.9	23.4	56.5	63.2	35.3	34.5
1884–85	37.4	22.5	55.6	62.9	34.8	34.6
1885–86	37.4	22.4	54.5	62.2	35.2	34.2
1886–87	37.4	22.6	53.4	63.5	34.8	34.5
1887–88	36.4	21.6	53.2	60.7	34.0	30.8
1888–89	34.9	20.2	51.7	58.8	32.3	31.2
1889–90	34.5	20.0	49.1	57.5	32.4	31.1
1890–91	33.5	19.4	47.0	56.4	31.4	30.4
1891–92	32.5	18.9	46.3	55.5	29.7	30.0
1892–93	32.0	19.1	45.2	55.7	28.7	29.3
1893–94	32.2	18.9	45.1	53.7	29.6	29.6
1894–95	32.6	18.8	45.0	53.1	30.6	29.6
1895–96	32.6	19.2	44.7	52.5	30.4	29.7
1896–97 *a*	32.6	19.1	43.9	52.9	30.6	28.9
1897–98 *a*	32.2	19.2	43.2	51.8	30.6	27.0

a Subject to correction.

TABLE 12.—*Teachers' salaries—Number of schoolhouses—Value of school property.*

State or Territory.	Average monthly salaries of teachers.		Number of buildings used as schoolhouses.	Estimated value of all school property.
	Males.	Females.		
1	2	3	4	5
United States	*a* $45.16	*a* $38.74	242,390	$492,703,781
North Atlantic Division	*a* 55.13	*a* 41.00	41,857	198,197,537
South Atlantic Division	*a* 31.21	*a* 31.45	35,771	22,266,065
South Central Division	*a* 40.21	*a* 34.74	48,896	21,760,411
North Central Division	46.53	38.14	103,231	211,848,908
Western Division	*a* 58.59	*a* 50.92	12,635	38,630,869
North Atlantic Division:				
Maine	40.61	26.32	4,113	4,225,401
New Hampshire (1896–97)	37.10	27.64	1,917	3,284,121
Vermont	41.40	26.04	1,891	1,800,000
Massachusetts	137.50	51.44	3,395	39,077,405
Rhode Island	104.63	51.00	525	4,579,334
Connecticut	88.49	43.03	1,617	9,879,922
New York			11,883	71,832,511
New Jersey	85.82	49.72	1,850	14,601,840
Pennsylvania	42.69	38.45	14,666	*b* 48,917,003
South Atlantic Division:				
Delaware	*c d* 36.60	*c d* 34.08	*e f* 497	*f* 904,426
Maryland	*c* 51.20	*c* 43.10	2,465	*c* 4,500,000
District of Columbia	94.48	64.31	117	3,750,000
Virginia (1896–97)	31.98	26.67	7,087	3,090,777
West Virginia			5,856	3,471,697
North Carolina	23.78	21.98	6,317	970,675
South Carolina	25.18	24.29	4,189	845,596
Georgia			6,622	3,977,070
Florida	35.04	32.40	2,121	755,824

a Average for those States reporting.
b In 1896–97.
c Estimated.
d In 1889–90.
e Number of schools.
f In 1891–92.

TABLE 12.—*Teachers' salaries—Number of schoolhouses—Value of school property*—Continued.

State or Territory.	Average monthly salaries of teachers.		Number of buildings used as schoolhouses.	Estimated value of all school property.
	Males.	Females.		
1	2	3	4	5
South Central Division:				
Kentucky	*a* $44.03	*a* $37.18	*b* 7,989	*b* $5,448,814
Tennessee	*c d* 31.88	*c d* 26.18	*a* 7,152	*a* 3,133,780
Alabama	.....	.....	*b c* 7,058	*b c* 1,500,000
Mississippi	*b* 32.18	*b* 26.69	*b* 6,510	*d* 1,636,055
Louisiana	34.26	29.60	3,055	*c* 1,066,000
Texas (1896-97)	51.81	44.87	10,234	6,081,356
Arkansas	38.50	36.75	4,936	2,294,397
Oklahoma	37.00	31.08	*e* 1,962	600,000
North Central Division:				
Ohio	*b* 41.75	*b* 39.80	13,114	41,428,289
Indiana	48.25	40.25	9,754	21,536,212
Illinois	60.87	51.84	12,740	43,705,943
Michigan	43.02	35.24	7,885	18,138,589
Wisconsin	41.00	29.50	6,940	*c* 14,800,000
Minnesota	61.90	36.72	7,000	14,559,564
Iowa	37.10	31.20	13,775	17,450,534
Missouri	49.40	42.40	10,116	16,718,410
North Dakota	39.92	35.51	2,304	2,132,738
South Dakota	*g* 49.00	*g* 37.00	*a* 3,739	*a* 2,929,744
Nebraska	42.61	36.04	6,676	8,943,924
Kansas	*a* 43.82	*a* 35.58	9,188	9,504,961
Western Division:				
Montana	69.28	48.61	656	1,857,964
Wyoming	60.40	42.86	338	441,460
Colorado	*d* 64.07	*d* 53.74	1,704	5,987,703
New Mexico	.....	.....	*e* 548	*c* 281,000
Arizona	73.23	63.17	*f* 244	472,108
Utah	61.75	41.66	675	2,652,595
Nevada	101.00	61.50	224	265,011
Idaho	56.11	47.47	648	597,718
Washington	42.13	34.53	1,941	4,977,679
Oregon	42.02	33.75	2,013	3,748,154
California	77.40	64.55	3,644	17,349,468

a In 1895-96.
b In 1896-97.
c Estimated.
d In 1894-95.
e Number of schools.
f Number of districts.
g In 1889-90.

Average salaries.—In computing (for Table 12) the average monthly wages of all the male (or female) teachers in a group of States, the average wages of each of the States in question is multiplied by the corresponding number of teachers. The sum of the resulting products is then divided by the sum of the teachers, and the quotient is the average wages of all. Each rate of wages thus receives its due weight.

To illustrate the principle: If 48 teachers receive an average of $72.20 per month, they all receive in a month $3,466; if 473 other teachers receive an average of $48.60 per month, these together receive in a month $22,988; all the 521 teachers combined therefore receive per month $26,454, or an average of $50.77.

Attention is called to this matter for the reason that the practice of taking the arithmetical mean of a number of rates of wages (the mean is $60.40 in the above case) in order to get the average of all is so common as to vitiate, to a considerable extent, the published statistics of average wages.

TABLE 13.—*Private schools (elementary and secondary).*

NOTE.—The reports of private schools are more or less incomplete, and the number of pupils as given below may be taken to represent the minimum number of private pupils in the States furnishing this item.

State or Territory.	Number of pupils enrolled in private schools.	Total public and private enrollment.	Per cent of pupils in private schools.
1	2	3	4
United States	*a* 1,354,890	*a* 16,393,526	8.26
North Atlantic Division	*a* 550,600	*a* 4,165,063	13.22
South Atlantic Division	*a* 105,650	*a* 2,240,375	4.72
South Central Division	*a* 164,970	*a* 3,040,336	5.43
North Central Division	*a* 489,600	*a* 6,159,172	7.95
Western Division	*a* 44,070	*a* 788,580	5.59
North Atlantic Division:			
Maine			
New Hampshire (1893–94)	7,425	69,862	10.63
Vermont	8,391	73,923	11.35
Massachusetts	73,470	529,611	13.87
Rhode Island	12,432	77,816	15.98
Connecticut	27,049	174,882	15.47
New York (1896–97)	173,369	1,376,568	12.59
New Jersey (1896–97)	47,535	342,415	13.88
Pennsylvania			
South Atlantic Division:			
Delaware			
Maryland			
District of Columbia (1895–96)	*b* 5,000	47,464	10.54
Virginia (1896–97)	*b* 25,000	392,817	6.36
West Virginia (1893–94)	1,894	220,709	0.86
North Carolina (1891–92)	26,198	361,556	7.25
South Carolina			
Georgia (1893–94)	14,151	450,833	3.14
Florida	2,487	110,942	2.24
South Central Division:	26,400	494,371	5.34
Kentucky (1894–95)	45,428	532,935	8.53
Tennessee (1891–92)			
Alabama	14,021	381,660	3.67
Mississippi (1896–97)			
Louisiana			
Texas	7,497	311,305	2.41
Arkansas			
Oklahoma			
North Central Division:			
Ohio			
Indiana			
Illinois	143,295	1,082,458	13.24
Michigan	45,465	541,490	8.40
Wisconsin	*c* 48,069	478,896	10.04
Minnesota (1894–95)	20,073	372,165	5.39
Iowa	30,751	579,603	5.31
Missouri (1896–97)	18,804	691,956	2.72
North Dakota (1893–94)	400	47,761	0.84
South Dakota (1893–94)	1,888	89,914	2.10
Nebraska			
Kansas			
Western Division:			
Montana	1,873	36,943	5.07
Wyoming (1894–95)	175	11,428	1.53
Colorado	2,984	107,717	2.77
New Mexico	3,600	36,084	11.96
Arizona			
Utah (1896–97)	2,457	71,685	3.43
Nevada	322	7,670	4.20
Idaho			
Washington	3,853	101,769	3.79
Oregon	5,705	90,935	6.27
California	20,620	280,079	7.36

a An estimate for all the States of the group, based upon the States reporting.
b Approximately.
c Number between 7 and 13 who attended twelve weeks or more.

TABLE 14.—*School moneys received.*

State or Territory.	Income of permanent school funds and rent of school lands.	From taxation.			From other sources, State and local.	Total revenue (excluding balances on hand and proceeds of bond sales.)
		From State taxes.	From local taxes.	Total from taxation.		
1	2	3	4	5	6	7
United States	$9,213,323	$35,600,643	$134,104,053	$169,704,696	$20,399,578	$199,317,597
North Atlantic Division	958,795	12,599,732	52,358,675	64,958,407	11,418,838	77,336,040
South Atlantic Division	494,196	4,445,868	6,492,677	10,938,545	1,020,565	12,453,306
South Central Division	1,920,022	6,530,317	4,380,672	10,910,989	679,413	13,510,424
North Central Division	5,088,975	7,289,537	62,450,015	69,739,552	5,868,475	80,697,002
Western Division	751,335	4,735,189	8,422,014	13,157,203	1,412,287	15,320,825
North Atlantic Division:						
Maine	30,696	513,066	1,076,160	1,589,226	0	1,619,922
N. Hampshire (1895–96)	12,961	58,831	857,388	916,219	63,360	992,540
Vermont	74,166	87,196	721,506	808,702	18,821	901,689
Massachusetts	193,816	0	13,367,878	13,367,878	91,955	13,653,649
Rhode Island	6,798	122,487	1,302,167	1,424,654	54,152	1,485,604
Connecticut	160,419	291,849	2,154,301	2,446,150	242,403	2,848,972
New York	279,939	a3,850,000	a17,107,893	a20,957,893	a7,300,000	28,537,832
New Jersey	200,000	2,194,895	3,265,485	5,460,380	97,299	5,757,679
Pennsylvania	0	5,481,408	12,505,897	17,987,305	3,550,848	21,538,153
South Atlantic Division:						
Delaware (1889–90) a	60,000	b6,000	209,000	215,000	0	275,000
Maryland	41,752	602,958	1,797,761	2,400,719	548,800	2,991,271
District of Columbia	0	0	c1,251,655	1,251,655	0	1,251,655
Virginia (1896–97)	46,058	937,512	840,241	1,777,753	39,893	1,863,704
West Virginia	42,753	342,680	1,439,758	1,782,438	108,527	1,933,718
North Carolina	56,849	760,460	21,522	781,982	147,683	986,514
S. Carolina (1896–97)	0	666,919	85,033	751,952	23,553	775,505
Georgia	212,046	992,810	415,607	1,408,417	124,743	1,745,206
Florida	34,738	136,529	432,100	568,629	27,366	630,733
South Central Division:						
Kentucky (1896–97)	121,899	1,326,230	1,108,395	2,434,625	197,140	2,753,664
Tennessee (1895–96)	135,445	1,330,219	(d)	1,330,219	205,134	1,671,798
Alabama (1895–96)	145,000	505,034	a150,000	655,034	239	800,273
Mississippi (1896–97)	103,860	630,225	e413,911	1,044,136	66,634	1,214,630
Louisiana	51,204	234,614	e670,002	904,016	31,826	987,046
Texas (1896–97)	1,361,614	2,051,724	806,690	2,858,414	129,806	4,349,834
Arkansas	0	331,487	e890,047	1,221,534	33,912	1,255,446
Oklahoma	0	121,384	341,627	463,011	14,722	477,733
North Central Division:						
Ohio	247,734	1,748,888	10,316,661	12,065,549	447,037	12,760,320
Indiana	615,786	1,558,276	4,806,354	6,364,630	461,130	7,441,546
Illinois	812,303	1,000,000	15,142,098	16,142,098	508,995	17,463,396
Michigan (1896–97)	344,762	673,647	4,903,854	5,577,501	530,308	6,452,571
Wisconsin	116,777	602,576	4,081,350	4,683,926	602,728	5,403,431
Minnesota	657,103	516,107	3,012,289	3,528,396	899,266	5,084,765
Iowa	a238,000	0	7,571,634	7,571,634	937,291	8,746,925
Missouri	734,327	680,050	4,791,982	5,472,032	283,117	6,489,476
North Dakota	184,225	f349,900	1,110,441	f1,460,341	51,802	1,696,368
South Dakota (1895–96)	91,500	0	1,181,037	1,181,037	52,928	1,325,465
Nebraska	646,893	160,093	2,053,054	2,213,147	969,115	3,829,155
Kansas	399,565	0	3,479,261	3,479,261	124,758	4,003,584
Western Division:						
Montana	22,248	575,332	159,094	734,426	58,667	815,341
Wyoming	12,618	0	203,370	203,370	1,407	217,395
Colorado	91,533	0	2,129,421	2,129,421	783,633	3,004,587
New Mexico	0	92,224	(d)	92,224	g110,995	203,219
Arizona	0	(h)	233,548	233,548	1,833	235,381
Utah	0	338,588	754,183	1,092,771	61,871	1,154,642
Nevada	111,320	8,149	87,266	95,415	86	206,821
Idaho	23,834	85,388	156,690	242,078	30,934	296,846
Washington	i126,220	k792,245	1,128,548	1,920,793	47,762	2,094,775
Oregon	133,562	0	885,478	885,478	219,128	1,238,168
California	a230,000	a2,843,263	2,684,416	5,527,679	95,971	5,853,650

a Approximately.
b State appropriation for colored schools.
c Includes money appropriated from the Federal treasury.
d Not reported.
e Includes poll tax.
f Includes some miscellaneous receipts.
g Includes all receipts in cities.
h Included in column 4.
i One-half the income of two years.
k Includes some local funds.

TABLE 15.—*The school revenue analyzed.*

State or Territory.	Average amount raised per taxpayer (i. e., per adult male).					Amount this will provide for each child 5 to 18 years of age.	Amount required from each adult male to provide $1 for each child 5 to 18 years of age.	Per cent of the whole revenue derived from—			
	From permanent funds and rents.	From State taxes.	From local taxes.	From all other sources.	Total amount raised per taxpayer.			Permanent funds and rents.	State taxes.	Local taxes.	Other sources.
1	2	3	4	5	6	7	8	9	10	11	12
United States..	$0.47	$1.80	$6.78	$1.02	$10.07	$9.29	$1.08	4.6	17.9	67.3	10.2
North Atlantic Div..	.16	2.14	8.91	1.95	13.16	15.06	.87	1.2	16.3	67.7	14.8
South Atlantic Div..	.22	1.98	2.89	.45	5.54	3.71	1.49	4.0	35.7	52.1	8.2
South Central Div...	.65	2.20	1.48	.22	4.55	3.03	1.50	14.2	48.3	32.4	5.1
North Central Div...	.71	1.02	8.74	.82	11.29	10.71	1.05	6.3	9.0	77.4	7.3
Western Division....	.49	3.07	5.46	.91	9.93	15.79	.63	4.9	30.9	55.0	9.2
North Atlantic Div.:											
Maine.....	.15	2.57	5.40	00	8.12	10.05	.81	1.9	31.7	66.4	0
N. H. (1895–96)....	.10	.47	6.86	.50	7.93	11.17	.71	1.3	5.9	86.4	6.4
Vermont.....	.73	.85	7.06	.18	8.82	10.95	.81	8.2	9.7	80.0	2.1
Massachusetts...	.24	00	16.70	.12	17.06	22.16	.77	1.4	0	97.9	.7
Rhode Island.....	.06	1.01	10.79	.45	12.31	14.62	.84	.5	8.2	87.7	3.6
Connecticut.....	.62	1.13	8.30	.93	10.98	14.01	.78	5.6	10.2	75.6	8.6
New York.....	.14	*a* 1.91	*a* 8.46	*a* 3.61	14.12	16.95	.83	1.0	*a* 13.5	*a* 60.0	*a* 25.5
New Jersey.....	.38	4.17	6.21	.19	10.95	12.34	.89	3.5	38.1	56.7	1.7
Pennsylvania....	00	3.18	7.26	2.06	12.50	12.45	1.00	0	25.5	58.1	16.4
South Atlantic Div.:											
Del. (1889–90) *a*...	1.26	*b* .13	4.39	00	5.78	5.79	1.00	21.8	*b* 2.2	76.0	0
Maryland.....	.13	1.93	5.77	1.77	9.60	8.51	1.13	1.4	20.2	60.1	18.3
Dist. of Columbia.	00	00	*c* 15.67	00	15.67	17.28	.91	0	0	*c* 100.0	0
Virginia (1896–97).	.12	2.41	2.16	.09	4.78	3.20	1.49	2.5	50.3	45.1	2.1
West Virginia ...	.21	1.66	6.99	.53	9.39	6.64	1.41	2.2	17.7	74.5	5.6
North Carolina...	.15	2.05	.06	.40	2.66	1.59	1.67	5.8	77.1	2.2	14.9
S. C. (1896–97)....	00	2.56	.33	.08	2.97	1.64	1.81	0	86.0	11.0	3.0
Georgia.....	.47	2.18	.91	.28	3.84	2.34	1.64	12.1	56.9	23.8	7.2
Florida.....	.27	1.08	3.41	.22	4.98	3.69	1.35	5.5	21.6	68.5	4.4
South Central Div.:											
Ky. (1896–97).....	.25	2.71	2.27	.40	5.63	4.17	1.35	4.4	48.2	40.3	7.1
Tenn. (1895–96)...	.32	3.11	(*d*)	.48	3.91	2.60	1.50	8.2	79.6	(*d*)	12.2
Alabama (1895–96)	.39	1.35	*a* .40	00	2.14	1.29	1.66	18.1	63.1	*a* 18.7	.1
Miss. (1896–97)....	.34	2.07	*e* 1.36	.22	3.99	2.29	1.75	8.5	51.9	*e* 34.1	5.5
Louisiana.....	.17	.78	*e* 2.22	.10	3.27	2.15	1.52	5.2	23.7	*e* 67.9	3.2
Texas (1896–97)..	2.01	3.03	1.19	.20	6.43	4.39	1.46	31.3	47.2	18.5	3.0
Arkansas.....	00	1.12	*e* 3.01	.11	4.24	2.72	1.56	0	26.4	*e* 70.9	2.7
Oklahoma.....	00	1.21	3.41	.14	4.76	4.89	.97	0	25.4	71.5	3.1
North Central Div.:											
Ohio.....	.23	1.61	9.52	.41	11.77	11.49	1.03	1.9	13.7	80.9	3.5
Indiana.....	1.00	2.54	7.84	.76	12.14	11.15	1.09	8.3	20.9	64.6	6.2
Illinois.....	.58	.71	10.77	.36	12.42	12.32	1.01	4.7	5.7	86.7	2.9
Mich. (1896–97)...	.52	1.01	7.38	.80	9.71	10.31	.94	5.3	10.4	76.0	8.3
Wisconsin.....	.20	1.05	7.08	1.04	9.37	8.58	1.09	2.2	11.1	75.5	11.2
Minnesota.....	1.29	1.01	5.91	1.76	9.97	9.95	1.00	12.9	10.1	59.2	17.8
Iowa.....	*a* .42	00	13.24	1.64	15.30	13.80	1.11	*a* 2.7	0	86.6	10.7
Missouri.....	.91	.84	5.94	.36	8.05	6.81	1.18	11.3	10.5	73.8	4.4
North Dakota....	1.71	*f* 3.24	10.29	.48	15.72	17.64	.89	10.9	*f* 20.6	65.5	3.0
S. Dak. (1895–96)..	.76	00	9.87	.45	11.08	11.14	1.00	6.9	0	89.1	4.0
Nebraska.....	1.95	.48	6.18	2.92	11.53	10.90	1.06	16.9	4.2	53.6	25.3
Kansas.....	1.12	00	9.75	.35	11.22	9.54	1.18	10.0	0	86.9	3.1
Western Division:											
Montana.....	.13	4.72	1.31	.49	6.70	18.36	.36	2.7	70.5	19.5	7.3
Wyoming.....	.25	00	4.07	.03	4.35	9.08	.48	5.8	0	93.5	.7
Colorado.....	.39	00	9.08	3.37	12.84	23.34	.55	3.0	0	70.9	26.1
New Mexico.....	00	1.74	(*d*)	*g* 2.08	3.82	3.99	.96	0	45.4	(*d*)	*g* 54.6
Arizona.....	00	(*h*)	6.75	.06	6.81	10.65	.64	0	(*h*)	99.2	.8
Utah.....	00	4.87	10.87	.80	16.64	13.43	1.24	0	29.3	65.3	5.4
Nevada.....	5.92	.43	4.64	.01	11.00	23.02	.48	53.8	3.9	42.2	.1
Idaho.....	.41	1.46	2.67	.52	5.06	6.98	.73	8.0	28.8	52.8	10.4
Washington.....	*i* .64	*k* 3.99	5.69	.23	10.55	19.55	.54	*i* 6.0	*k* 37.8	53.9	2.3
Oregon.....	1.00	00	6.66	1.65	9.31	12.30	.76	10.8	0	71.5	17.7
California.....	*a* .40	*a* 4.97	4.69	.17	10.23	16.51	.62	*a* 3.9	*a* 48.6	45.9	1.6

a Approximately.
b State appropriation for colored schools.
c Includes United States appropriation.
d Not reported.
e Includes poll tax.
f Includes some miscellaneous receipts.
g Includes all receipts in cities.
h Included in local taxes.
i One-half the income of two years.
k Includes some local funds.

TABLE 16.—*Progress of school expenditure.*

State or Territory.	Total amount expended for schools.				Expended per capita of population.			
	1870-71.	1879-80.	1889-90.	1897-98.	1870-71.	1879-80.	1889-90.	1897-98.
1	2	3	4	5	6	7	8	9
United States	$69,107,612	$78,094,687	$140,506,715	$194,020,470	$1.75	$1.56	$2.24	$2.67
North Atlantic Division	29,796,835	28,538,058	48,023,492	75,902,063	2.38	1.97	2.76	3.75
South Atlantic Division	3,781,581	5,130,492	8,767,165	12,163,944	.63	.68	.99	1.23
South Central Division	4,854,834	4,872,829	10,678,680	13,219,921	.73	.55	.97	1.03
North Central Division	28,430,033	35,285,635	62,823,563	78,157,540	2.14	2.03	2.81	3.04
Western Division	2,244,329	4,267,673	10,213,815	14,577,002	2.15	2.41	3.37	3.63
North Atlantic Division:								
Maine	950,662	1,067,991	1,327,553	1,614,330	1.51	1.65	2.01	2.46
New Hampshire	418,545	565,339	844,333	a 1,040,309	1.30	1.63	2.24	a 2.61
Vermont	499,961	446,217	711,072	933,424	1.51	1.34	2.14	2.79
Massachusetts	5,579,363	4,983,900	8,286,062	13,653,649	3.73	2.80	3.70	5.07
Rhode Island	461,160	526,112	884,966	1,717,492	2.05	1.90	2.56	4.12
Connecticut	1,496,981	1,408,375	2,157,014	2,986,163	2.74	2.26	2.89	3.46
New York	9,607,904	10,296,977	17,543,880	28,588,871	2.17	2.03	2.92	4.17
New Jersey	2,302,341	1,873,465	3,340,190	5,723,424	2.48	1.66	2.31	3.12
Pennsylvania	8,479,918	7,369,682	12,928,422	19,644,401	2.36	1.72	2.46	3.17
South Atlantic Division:								
Delaware	153,509	207,231	b 275,000	b c 275,000	1.21	1.41	b 1.63	b c 1.63
Maryland	1,214,729	1,544,367	1,910,663	2,709,104	1.53	1.65	1.83	2.26
District of Columbia	373,535	438,567	905,777	1,251,655	2.77	2.47	3.93	4.39
Virginia	587,472	946,109	1,604,509	a 1,827,003	.47	.63	.97	a 1.07
West Virginia	577,719	707,553	1,198,493	2,046,623	1.26	1.14	1.57	2.36
North Carolina	177,498	376,062	714,900	931,143	.16	.27	.44	.53
South Carolina	275,688	324,629	450,936	a 697,068	.38	.33	.39	a .55
Georgia	292,000	471,029	1,190,354	1,758,106	.24	.31	.65	.84
Florida	129,431	114,895	516,533	668,242	.66	.43	1.32	1.30
South Central Division:								
Kentucky	b 1,075,000	1,069,030	2,140,678	a 2,650,190	b .80	.65	1.15	a 1.31
Tennessee	b 758,000	744,180	1,526,241	d 1,690,750	b .59	.48	.86	d .90
Alabama	b 370,000	b 500,000	b 890,000	a 800,273	b .36	b .40	b .59	a .46
Mississippi	950,000	830,705	1,109,575	a 1,165,840	1.11	.73	.86	a .81
Louisiana	531,834	411,858	817,110	956,888	.71	.44	.73	.71
Texas	b 650,000	b 1,030,000	3,178,300	a 4,320,271	b .74	b .65	1.42	a 1.53
Arkansas	b 520,000	287,056	1,016,776	1,220,362	b 1.02	.36	.90	.94
Oklahoma	.....	.....	.....	415,347	.....	.....	.....	1.28
North Central Division:								
Ohio	6,831,035	7,166,963	10,602,238	12,563,949	2.52	2.24	2.89	3.21
Indiana	b 2,897,537	4,491,850	5,245,218	7,846,139	b 1.70	2.27	2.39	3.47
Illinois	6,656,542	7,014,092	11,645,126	16,468,055	2.57	2.28	3.04	3.28
Michigan	2,840,740	2,775,917	5,349,366	6,281,003	2.33	1.70	2.55	2.79
Wisconsin	1,932,539	2,177,023	3,801,212	5,132,063	1.70	1.65	2.25	2.44
Minnesota	960,558	1,328,429	4,187,310	4,893,678	2.06	1.70	3.22	2.77
Iowa	3,269,190	4,484,043	6,382,953	8,451,504	2.70	2.76	3.34	4.02
Missouri	1,749,049	2,675,364	5,434,262	6,248,961	.99	1.23	2.03	2.04
North Dakota	b 23,000	245,000	626,949	1,288,031	b 1.29	1.81	3.43	3.66
South Dakota			1,199,630	d 1,280,663			3.65	d 3.15
Nebraska	365,520	1,108,617	3,376,332	3,712,017	2.61	2.45	3.19	3.18
Kansas	904,323	1,818,337	4,972,967	3,991,477	2.24	1.83	3.48	3.00
Western Division:								
Montana	b 35,600	78,739	364,084	776,150	b 1.62	2.01	2.76	3.16
Wyoming	b 7,000	28,504	b 225,000	213,291	b .71	1.37	b 3.71	1.90
Colorado	67,395	395,227	1,681,379	2,341,311	1.44	2.03	4.08	4.00
New Mexico	b 4,900	28,973	b 85,000	154,532	b .05	.24	b .55	.85
Arizona	0	61,172	181,914	229,323	0	1.51	3.05	2.64
Utah	b 117,000	132,194	394,685	1,047,174	b 1.28	.92	1.90	3.95
Nevada	b 85,000	220,245	161,481	203,642	b 1.93	3.54	3.53	4.96
Idaho	19,003	38,411	169,020	274,377	1.17	1.18	2.00	1.75
Washington	b 35,000	112,615	958,111	1,795,795	b 1.30	1.50	2.74	3.80
Oregon	b 160,000	307,031	805,979	1,274,937	b 1.65	1.76	2.57	3.41
California	1,713,431	2,864,571	5,187,162	6,266,470	2.93	3.31	4.29	4.19

a In 1896-97. *b* Approximately. *c* In 1889-90. *d* In 1895-96.

TABLE 17.—*The school expenditure of 1897–98 classified.*

State or Territory.	Paid for sites, buildings, furniture, libraries, and apparatus.	Paid for teachers' and superintendents' salaries.	Paid for all other purposes, principally maintenance.	Total expenditure, excluding payment of bonds.
1	2	3	4	5
United States	$32,814,532	$123,809,412	$37,396,526	$194,020,470
North Atlantic Division	19,069,570	42,159,891	14,732,602	75,902,063
South Atlantic Division	1,262,625	9,086,421	1,814,898	12,163,944
South Central Division	1,020,848	10,960,464	1,228,609	13,219,921
North Central Division	9,876,461	51,709,616	16,571,463	78,157,540
Western Division	1,635,028	9,893,020	3,048,954	14,577,002
North Atlantic Division:				
Maine	260,000	1,104,796	249,534	1,614,330
New Hampshire (1896–97)	80,583	651,647	208,079	1,040,309
Vermont	210,957	620,910	101,557	933,424
Massachusetts	3,270,916	a 7,733,138	2,649,595	13,653,649
Rhode Island	451,224	989,267	277,001	1,717,492
Connecticut	492,383	1,901,933	591,847	2,986,163
New York	9,518,233	15,269,277	3,891,361	28,588,871
New Jersey	1,241,245	3,556,163	926,016	5,723,424
Pennsylvania	3,484,029	10,332,760	5,827,612	19,644,401
South Atlantic Division:				
Delaware (1889–90)	b 23,795	a 225,000	a 26,205	a 275,000
Maryland	315,851	2,027,615	365,638	2,709,104
District of Columbia	300,879	769,150	181,626	1,251,655
Virginia (1896–97)	171,089	1,459,959	195,955	1,827,003
West Virginia	280,848	1,168,191	597,584	2,046,623
North Carolina	54,001	761,772	115,370	931,143
South Carolina (1896–97)	43,814	599,180	54,074	697,068
Georgia	c 22,508	1,515,698	219,900	1,758,106
Florida	49,840	559,856	58,546	668,242
South Central Division:				
Kentucky (1896–97)	248,217	2,145,178	256,795	2,650,190
Tennessee (1895–96)	182,636	1,342,870	165,244	1,690,750
Alabama (1896–97)	a 100,000	588,047	112,226	800,273
Mississippi (1896–97)	34,260	1,057,735	73,845	1,165,840
Louisiana	32,769	746,690	177,429	956,888
Texas (1896–97)	272,504	3,723,603	324,164	4,320,271
Arkansas	101,957	1,065,288	53,117	1,220,362
Oklahoma	58,505	291,053	65,789	415,347
North Central Division:				
Ohio	1,061,281	8,588,191	2,914,477	12,563,949
Indiana	a 1,120,000	4,762,347	1,963,792	7,846,139
Illinois	2,602,518	10,939,318	2,926,219	16,468,055
Michigan	707,545	4,152,879	1,420,579	6,281,003
Wisconsin	655,941	3,577,978	898,144	5,132,063
Minnesota	1,173,190	3,235,879	484,609	4,893,678
Iowa	442,718	5,315,157	2,693,629	8,451,504
Missouri	d 1,025,299	4,230,504	e 993,158	6,248,961
North Dakota	198,236	693,403	396,392	1,288,031
South Dakota (1895–96)	144,728	829,083	306,852	1,280,663
Nebraska	552,713	2,449,834	709,470	3,712,017
Kansas	192,292	2,935,043	864,142	3,991,477
Western Division:				
Montana	192,466	483,221	100,463	776,150
Wyoming	26,340	160,222	26,729	213,291
Colorado	251,258	1,473,276	616,777	2,341,311
New Mexico	15,923	122,729	15,880	154,532
Arizona	19,457	175,031	34,835	229,323
Utah	236,513	563,119	247,542	1,047,174
Nevada	12,934	162,322	28,386	203,642
Idaho	27,052	205,849	41,476	274,377
Washington	158,773	1,081,008	556,014	1,795,795
Oregon	109,743	795,052	370,142	1,274,937
California	584,569	4,671,191	1,010,710	6,266,470

a Estimated.
b For city of Wilmington only.
c Cities included in col. 4.
d Includes payments on bonded debt.
e Includes expenditure for libraries and apparatus.

TABLE 18.—*(1) Expenditure per pupil (based on average attendance); (2) average daily expenditure per pupil; (3) percentage analysis of school expenditure.*

State or Territory.	Average expenditure per pupil (for the whole school year).				Average daily expenditure per pupil.		Per cent of total expenditure devoted to—		
	For sites, buildings, etc.	For salaries.	For all other purposes.	Total per pupil.	For salaries only.	Total.	Sites, buildings, etc.	Salaries.	All other purposes.
1	2	3	4	5	6	7	8	9	10
					Cents.	*Cents.*			
United States	$3.19	$12.04	$3.63	$18.86	8.4	13.2	16.9	63.8	19.3
North Atlantic Division	7.35	16.29	5.69	29.33	9.3	16.8	25.1	55.5	19.4
South Atlantic Division	.96	6.91	1.33	9.25	6.1	8.2	10.4	74.7	14.9
South Central Division	.55	5.86	.66	7.07	5.9	7.2	7.8	82.9	9.3
North Central Division	2.47	12.94	4.15	19.56	8.5	12.8	12.6	66.2	21.2
Western Division	3.17	19.15	5.91	28.23	12.6	18.6	11.2	67.9	20.9
North Atlantic Division:									
Maine	2.66	11.32	2.56	16.54	8.3	12.1	16.1	68.4	15.5
New Hampshire (1896-97)	1.69	13.66	6.45	21.80	10.2	16.2	7.7	62.6	29.7
Vermont	4.39	12.92	2.12	19.43	8.4	12.6	22.6	66.5	10.9
Massachusetts	9.37	a22.16	7.57	39.10	a11.9	21.0	24.0	a56.7	19.3
Rhode Island	9.53	20.88	5.85	36.26	10.7	18.6	26.3	57.6	16.1
Connecticut	4.69	18.11	5.64	28.44	9.6	15.1	16.5	63.7	19.8
New York	11.50	18.45	4.60	34.55	9.9	18.5	33.3	53.4	13.3
New Jersey	6.20	17.75	4.63	28.58	9.3	15.0	21.7	62.1	16.2
Pennsylvania	4.03	11.95	6.74	22.72	7.5	14.3	17.7	52.6	29.7
South Atlantic Division:									
Delaware (1889-90)	b1.21	a11.45	a1.33	a13.99	a6.9	a8.4	b8.7	a81.8	a9.5
Maryland	2.35	15.07	2.72	20.14	8.3	11.1	11.7	74.8	13.5
District of Columbia	8.75	22.39	5.26	36.40	12.1	19.7	24.0	61.5	14.5
Virginia (1896-97)	.80	6.84	.92	8.56	5.7	7.1	9.4	79.9	10.7
West Virginia	1.76	7.31	3.74	12.81	6.6	11.5	13.7	57.1	29.2
North Carolina	.25	3.55	.54	4.34	5.2	6.3	5.8	81.8	12.4
South Carolina (1896-97)	.24	3.28	.30	3.82	3.9	4.6	6.3	86.0	7.7
Georgia	c.08	5.44	.79	6.31	4.7	5.4	c1.3	86.2	12.5
Florida	.67	7.57	.79	9.03	7.3	8.7	7.5	83.8	8.7
South Central Division:									
Kentucky (1896-97)	.80	6.95	.83	8.58	6.0	7.4	9.4	81.0	9.6
Tennessee (1895-96)	.54	3.97	.49	5.00	4.4	5.5	10.8	79.5	9.7
Alabama (1896-97)	a.45	2.64	.50	3.59	3.3	4.5	a12.5	73.5	14.0
Mississippi (1896-97)	.15	4.73	.33	5.21	4.7	5.1	2.9	90.7	6.4
Louisiana	.25	5.66	1.34	7.25	5.3	6.8	3.4	78.0	18.6
Texas (1896-97)	.67	9.21	.80	10.68	8.1	9.4	6.3	86.2	7.5
Arkansas	.53	5.56	.29	6.38	8.0	9.1	8.4	87.3	4.3
Oklahoma	1.19	5.92	1.34	8.45	6.6	9.3	14.1	70.1	15.8
North Central Division:									
Ohio	1.71	13.88	4.71	20.30	8.6	12.5	8.4	68.4	23.2
Indiana	a2.59	11.00	4.54	18.13	7.6	12.6	a14.3	60.7	25.0
Illinois	3.57	15.00	4.01	22.58	9.5	14.2	15.8	66.4	17.8
Michigan	2.03	11.94	4.10	18.07	7.4	11.2	11.3	66.1	22.6
Wisconsin	2.29	12.47	3.12	17.88	7.8	11.2	12.8	69.7	17.5
Minnesota	d4.82	13.30	e2.00	20.12	8.5	12.9	d24.0	66.1	e9.9
Iowa	1.19	14.33	7.27	22.79	8.8	14.1	5.2	62.9	31.9
Missouri	2.33	9.60	2.25	14.18	6.8	10.0	16.4	67.7	15.9
North Dakota	4.82	16.85	9.63	31.30	11.0	20.5	15.4	53.8	30.8
South Dakota (1895-96)	2.65	15.18	5.62	23.45	11.0	16.9	11.3	64.7	24.0
Nebraska	3.18	14.09	4.07	21.34	10.8	16.3	14.9	66.0	19.1
Kansas	.75	11.42	3.37	15.54	9.2	12.5	4.8	73.5	21.7
Western Division:									
Montana	8.23	20.65	4.29	33.17	13.8	22.1	24.8	62.2	13.0
Wyoming	3.03	18.42	3.07	24.52	16.7	22.3	12.3	75.1	12.6
Colorado	3.59	21.06	8.82	33.47	13.2	21.0	10.7	62.9	26.4
New Mexico	.94	7.24	.94	9.12	7.5	9.4	10.3	79.4	10.3
Arizona	2.16	19.43	3.86	25.45	14.9	19.6	8.5	76.3	15.2
Utah	5.89	14.02	6.15	26.06	8.9	16.6	22.6	53.8	23.6
Nevada	2.60	32.58	5.69	40.87	21.2	26.5	6.4	79.7	13.9
Idaho	1.26	9.56	1.93	12.75	9.6	12.7	9.9	75.0	15.1
Washington	2.47	16.84	8.67	27.98	11.4	18.9	8.8	60.2	31.0
Oregon	1.75	12.66	5.89	20.30	10.2	16.4	8.6	62.4	29.0
California	3.15	25.19	5.46	33.80	14.6	19.6	9.3	74.5	16.2

a Estimated.
b For city of Wilmington only.
c Cities included in expenditure for "All other purposes."
d Includes payments on bonded debt.
e Includes expenditure for libraries and apparatus.

TABLE 19.—(*1*) *School expenditures per capita of population; (2) same per capita of average attendance.*

Year.	Expended per capita of population.						Expended per pupil.					
	United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.	United States.	North Atlantic Division.	South Atlantic Division.	South Central Division.	North Central Division.	Western Division.
1870–71	$1.75	$2.38	$0.63	$0.73	$2.14	$2.15	$15.20	$18.31	$10.27	$9.06	$14.87	$21.87
1871–72	1.83	2.40	.68	.81	2.31	2.27	15.93	18.86	10.46	9.08	16.36	23.57
1872–73	1.84	2.44	.68	.74	2.31	2.42	16.06	19.89	9.25	8.39	16.53	25.04
1873–74	1.88	2.51	.76	.68	2.38	2.40	15.85	19.89	9.01	7.55	16.57	24.36
1874–75	1.91	2.55	.80	.73	2.36	2.76	15.91	20.17	8.98	7.51	16.69	26.85
1875–76	1.85	2.45	.79	.55	2.37	2.78	15.70	19.14	8.65	6.70	16.91	26.35
1876–77	1.72	2.29	.72	.51	2.21	2.61	14.64	17.89	7.68	6.25	15.93	24.69
1877–78	1.67	2.15	.70	.56	2.14	2.73	13.67	16.55	7.21	5.98	15.08	25.82
1878–79	1.56	2.03	.63	.55	2.00	2.53	12.97	16.05	6.76	5.65	14.22	23.39
1879–80	1.56	1.97	.68	.55	2.03	2.41	12.71	15.64	6.60	5.40	14.39	22.59
1880–81	1.63	2.08	.72	.58	2.09	2.54	13.61	17.14	7.22	5.72	15.19	23.81
1881–82	1.70	2.11	.78	.64	2.19	2.59	14.05	17.35	7.63	6.25	15.79	24.32
1882–83	1.89	2.22	.82	.68	2.34	2.74	14.55	18.17	7.46	6.17	16.69	25.39
1883–84	1.88	2.25	.84	.74	2.48	2.83	14.63	18.37	7.44	6.26	16.90	24.69
1884–85	1.96	2.38	.88	.82	2 53	2.90	15.12	19.19	7.32	6.74	17.53	26.31
1885–86	1.97	2.36	.88	.87	2.54	2.88	15.06	19.11	7.33	6.93	17.45	25.52
1886–87	1.97	2.35	.90	.87	2.55	2.76	15 07	19.33	7.33	6.88	17.45	24.85
1887–88	2.07	2.48	.95	.87	2.68	2.96	15.71	20.60	7.61	6.60	18.29	27.38
1888–89	2.17	2.59	.98	.94	2.76	3.23	16.55	21.64	7.77	7.12	19.30	29.37
1889–90	2.24	2.76	.99	.97	2.81	3.37	17.23	23.58	7.78	7.28	19.70	30.57
1890–91	2.31	2.79	1.06	1.04	2.85	3.78	17.54	23.66	8.52	7.78	19.42	33.42
1891–92	2.40	2.94	1.07	1.06	2.94	4.03	18.20	24.89	8.74	7.82	20.13	33.55
1892–93	2.48	3.04	1.10	1.06	3.07	3.97	18.58	25.91	8.65	7.72	20.62	33.57
1893–94	2.53	3.14	1.12	1.07	3.20	3.53	18.62	26.21	8.61	7.58	21.29	29.06
1894–95	2.54	3.32	1.13	1.06	3.12	3.49	18.41	26.84	8.58	7.69	20.26	27.32
1895–96	2.60	3.49	1.15	1.07	3.11	3.52	18.76	28.45	8.87	7.60	20.09	27.16
1896–97 (*a*)	2.62	3.62	1.19	1.02	3.08	3.49	18.56	28.56	9.12	7.14	19.52	26.40
1897–98 (*a*)	2.67	3.75	1.23	1.03	3.04	3.63	18.86	29.33	9.25	7.07	19.56	28.23

a Subject to correction.

II.—TABLES OF SCHOOL EXPENDITURE IN THE SOUTHERN STATES, CLASSIFIED BY RACE.

Table A gives the school expenditure, classified by race, in each Southern State that reports the expenditure so classified, as far back as the record goes in each. In Maryland the expenditure for negro schools for the first three or four years is mainly in the city of Baltimore. The totals, of course, include only the States tabulated.

Table B gives the white and colored school population (children 5 to 18 years of age) in each case where the school expenditure is given in Table A. The relative white and colored school expenditure, it is evident, possesses no significance unless considered in connection with the relative number of children of each race for whose benefit the expenditure was made.

Table C gives the expenditure for white schools per capita of white school population and the same for the negro schools. The averages are for the States recorded each year.

In making an estimate of the white and colored school expenditure of the remaining Southern States, the most obvious assumption to make in the absence of any positive information is to consider that their white and colored school per capita expenditures bear the same ratio to each other each year as the average per capita given in Table C. It is upon this basis that the classifications by race have been made that are given in Table D, except for the years 1870–71 and 1871–72, in which the ratio of white to colored per capita was taken at about 6.

TABLE A.—*Expenditure for white and colored schools.*

Year.	District of Columbia.		Kentucky.		Maryland.		North Carolina.[a]		Total.	
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored,	White.	Colored.
1	2	3	4	5	6	7	8	9	10	11
1869–70	.....	.....	.....	.....	$1,234,349	*b*$30,912	.....	.....	$1,234,349	$30,912
1870–71	.....	.....	.....	.....	*c*1,120,145	*b* 28,571	.....	.....	1,120,145	28,571
1871–72	.....	.....	.....	.....	1,153,035	55,390	.....	.....	1,153,035	55,390
1872–73	.....	.....	.....	.....	1,250,615	*b* 70,572	*d*$112,175	*d*$45,954	1,362,790	116,526
1873–74	.....	.....	.....	.....	1,389,165	*b* 94,759	*d*182,647	*d*77,615	1,571,812	172,374
1874–75	*d*$132,872	*d*$62,914	.....	.....	1,470,022	*b*119,080	*e*180,000	*e*84,000	1,782,894	265,994
1875–76	303,986	101,843	.....	.....	1,413,088	119,856	*e*178,000	*e*90,000	1,895,074	311,699
1876–77	263,722	107,274	.....	.....	*e*1,400,000	*e*150,000	176,863	98,167	1,840,585	355,441
1877–78	267,300	106,306	.....	.....	1,385,334	179,500	*e*185,000	*e*108,000	1,837,634	393,806
1878–79	269,491	98,852	.....	.....	1,383,221	*b*154,032	193,467	115,859	1,846,179	368,743
1879–80	334,233	104,334	$1,007,101	$32,906	1,368,740	*b*150,426	210,575	124,010	2,920,649	411,676
1880–81	*f*273,130	*f*108,184	1,146,848	41,542	1,417,167	*b*151,544	225,643	143,792	3,062,788	445,062
1881–82	*f*298,017	*f*100,238	1,188,682	69,441	*e*1,375,000	*e*155,500	297,150	151,590	3,158,829	476,769
1882–83	*f*294,337	*f*125,258	1,149,797	155,329	1,334,982	*b*159,569	306,805	181,039	3,085,921	621,195
1883–84	*f*397,657	*f*127,376	1,184,930	158,299	1,477,835	171,048	303,767	184,925	3,274,189	641,648
1884–85	*f*344,399	*f*125,152	1,387,605	197,537	1,509,941	172,254	356,647	224,061	3,598,592	719,004
1885–86	*d*286,698	*d*108,996	1,429,631	193,835	1,611,637	176,989	395,206	219,831	3,723,172	699,651
1886–87	*d*289,306	*c*131,633	1,564,621	208,369	1,611,319	178,450	383,554	209,547	3,848,800	727,999
1887–88	*d*301,699	*d*143,437	1,629,973	264,894	1,598,251	184,630	403,547	213,885	3,933,470	806,846
1888–89	*d*321,688	*d*150,192	1,834,553	296,733	1,662,026	190,741	*g*318,712	*g*160,382	4,136,979	798,048
1889–90	*d*368,964	*d*144,137	1,930,794	278,576	1,688,010	222,653	421,441	211,489	4,409,209	856,855
1890–91	*d*397,588	*d*151,925	2,029,542	292,810	1,994,920	226,360	404,005	193,321	4,826,055	864,416
1891–92	*d*424,918	*d*161,468	*e*2,240,000	*e*283,000	1,920,475	229,496	450,622	215,116	5,036,015	889,080
1892–93	*d*448,945	*d*170,660	*e*2,450,000	*e*272,000	2,009,392	237,719	455,124	217,469	5,363,461	897,848
1893–94	*d*472,245	*d*178,830	2,663,859	262,091	2,056,696	244,423	455,950	214,844	5,648,750	900,188
1894–95	*d*498,097	*d*188,778	*e*2,770,000	*e*320,000	2,047,502	268,059	487,573	231,659	5,803,172	1,008,496
1895–96	*f*654,700	*f*242,310	2,878,296	374,202	2,216,525	287,825	473,468	246,946	6,252,989	1,151,283
1896–97	823,678	287,620	2,586,032	322,322	2,302,836	291,865	482,139	243,703	6,194,685	1,145,510
1897–98	*f*692,547	*f*273,382	*h*2,586,032	*h*322,322	2,388,721	320,383	454,976	240,446	6,122,276	1,156,533

a Excluding certain small sums not classified by race and a few counties not reported.
b Does not include permanent improvements in Baltimore City.
c Does not include permanent improvements outside of Baltimore.
d Includes salaries of teachers and superintendents only (or cost of tuition).
e Approximately.
f Does not include permanent improvements.
g For 8 months.
h In 1896–97.

TABLE B.—*Estimated number of children 5 to 18 years of age.* a

Year.	District of Columbia.		Kentucky.		Maryland.		North Carolina.		Total.	
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.
1	2	3	4	5	6	7	8	9	10	11
1870 *a*	.....	.....	.....	.....	188,234	56,220	.....	.....	188,234	56,220
1871	.....	.....	.....	.....	190,700	57,000	.....	.....	190,700	57,000
1872	.....	.....	.....	.....	193,200	57,900	.....	.....	193,200	57,900
1873	.....	.....	.....	.....	195,700	58,800	235,300	150,100	431,000	208,900
1874	.....	.....	.....	.....	198,300	59,600	239,300	155,000	437,600	214,600
1875	27,140	12,960	.....	.....	200,800	60,500	243,400	160,000	471,340	233,460
1876	27,800	13,300	.....	.....	203,500	61,400	247,500	165,200	478,800	239,900
1877	28,480	13,620	.....	.....	206,100	62,300	251,800	170,400	486,380	246,320
1878	29,170	13,930	.....	.....	208,800	63,200	256,100	175,900	494,070	253,030
1879	30,700	14,600	.....	.....	211,500	64,200	260,400	181,600	502,600	260,400
1880 *a*	32,310	15,417	455,895	90,560	214,297	65,115	264,890	187,274	967,392	358,366
1881	32,850	15,910	461,900	90,500	216,500	65,400	273,000	189,900	984,250	361,710
1882	33,390	16,410	468,000	90,400	218,600	65,800	281,300	192,600	1,001,290	365,210
1883	33,840	16,880	474,200	90,300	220,800	66,100	289,800	195,400	1,018,640	368,680
1884	34,300	17,350	480,500	90,100	223,100	66,300	298,700	198,000	1,036,600	371,750
1885	34,760	17,840	486,800	90,000	225,300	66,700	307,800	200,800	1,054,660	375,340
1886	35,330	18,390	493,200	89,900	227,600	67,000	317,100	203,600	1,073,230	378,890
1887	35,920	18,960	499,700	89,700	229,900	67,300	326,800	206,200	1,092,320	382,160
1888	36,510	19,540	506,400	89,400	232,200	67,600	336,800	208,900	1,111,910	385,440
1889	37,120	20,140	513,000	89,300	234,500	68,000	347,000	211,700	1,131,620	389,140
1890 *a*	37,730	20,754	519,810	89,036	236,890	68,307	357,593	214,411	1,152,023	392,508
1891	39,960	21,980	527,800	90,400	239,470	69,030	362,000	217,000	1,169,230	398,410
1892	42,320	23,280	535,900	91,800	242,120	69,880	364,650	218,650	1,184,990	403,610
1893	42,930	23,620	544,100	93,200	244,750	70,550	373,100	223,700	1,204,880	411,070
1894	43,630	24,000	539,770	92,460	247,400	71,400	379,940	227,800	1,210,740	415,660
1895	44,300	24,370	550,960	94,300	258,700	74,600	379,940	227,800	1,233,840	421,070
1896	44,800	24,640	557,400	95,400	263,300	75,900	389,700	233,700	1,255,200	429,640
1897	45,440	25,000	563,900	96,600	268,000	77,200	388,650	233,050	1,265,990	431,850
1898	46,720	25,700	570,000	97,500	272,700	78,700	387,600	232,400	1,277,020	434,300

a The figures for 1870, 1880, and 1890 are from the United States census.

TABLE C.—*Expenditure per capita of school population, white and colored (that is, per capita of children 5 to 18 years of age).*

Year.	District of Columbia.		Kentucky.		Maryland.		North Carolina.*a*		Averages.	
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.
1869–70	.....	.....	.....	.....	$6.56	*b* $0.55	.....	.....	$6.56	$0.55
1870–71	.....	.....	.....	.....	*c* 5.87	*b* .50	.....	.....	5.87	.50
1871–72	.....	.....	.....	.....	5.97	.96	.....	.....	5.97	.96
1872–73	.....	.....	.....	.....	6.39	*b* 1.20	*d* $0.48	*d* $0.31	3.16	.56
1873–74	.....	.....	.....	.....	7.01	*b* 1.59	*d*. 76	*d*. 50	3.59	.80
1874–75	*d* $4.90	*d* $4.85	.....	.....	7.32	*b* 1.97	*e*. 74	*e*. 53	3.78	1.14
1875–76	10.93	7.66	.....	.....	6.94	1.95	*e*. 72	*e*. 54	3.96	1.30
1876–77	9.26	7.38	.....	.....	*e* 6.79	*e* 2.41	.70	.58	3.78	1.44
1877–78	9.16	7.63	.....	.....	6.63	2.84	*e*. 72	*e*. 61	3.72	1.56
1878–79	8.78	6.77	.....	.....	6.54	*b* 2.40	.74	.64	3.67	1.42
1879–80	10.34	6.77	$2.21	$0.36	6.39	2.31	.79	.66	3.02	1.15
1880–81	*f* 8.31	*f* 6.80	2.48	.46	6.55	2.32	.83	.76	3.11	1.23
1881–82	*f* 8.93	*f* 6.11	2.54	.77	6.29	2.36	1.06	.79	3.15	1.31
1882–83	*f* 8.70	*f* 7.42	2.42	1.72	6.05	2.41	1.06	.93	3.03	1.68
1883–84	*f* 8.97	*f* 7.34	2.47	1.76	6.62	2.58	1.02	.93	3.16	1.73
1884–85	*f* 9.91	*f* 7.02	2.85	2.19	6.70	2.58	1.16	1.12	3.41	1.92
1885–86	*d* 8.11	*d* 5.93	2.90	2.16	7.08	2.64	1.25	1.08	3.47	1.85
1886–87	*d* 8.05	*d* 6.94	3.13	2.32	7.01	2.65	1.17	1.02	3.52	1.90
1887–88	*d* 8.26	*d* 7.34	3.22	2.96	6.88	2.73	1.20	1.02	3.54	2.09
1888–89	*d* 8.67	*d* 7.46	3.58	3.32	7.09	2.81	*g*. 92	*g*. 76	3.66	2.05
1889–90	*d* 9.78	*d* 6.95	3.71	3.13	7.13	3.26	1.18	.99	3.83	2.18
1890–91	*d* 9.95	*d* 6.91	3.85	3.24	8.33	3.28	1.12	.89	4.13	2.17
1891–92	*d* 10.04	*d* 6.94	*e* 4.18	*e* 3.08	*e* 7.93	*e* 3.28	1.24	.98	4.25	2.20
1892–93	*d* 10.46	*d* 7.23	*e* 4.50	*e* 2.92	*e* 8.21	*e* 3.37	1.22	.97	4.45	2.18
1893–94	*d* 10.82	*d* 7.45	4.94	2.83	8.31	3.42	1.20	.94	4.67	2.17
1894–95	*d* 11.24	*d* 7.75	*e* 5.03	*e* 3.39	*e* 7.91	*e* 3.59	1.28	1.02	4.70	2.40
1895–96	*f* 14.61	*f* 9.83	5.16	3.92	8.53	3.79	1.21	1.06	4.98	2.68
1896–97	18.13	11.50	4.59	3.34	8.59	3.78	1.24	1.05	4.89	2.65
1897–98	*f* 14.82	*f* 10.64	*h* 4.54	*h* 3.31	8.76	4.07	1.17	1.03	4.79	2.66

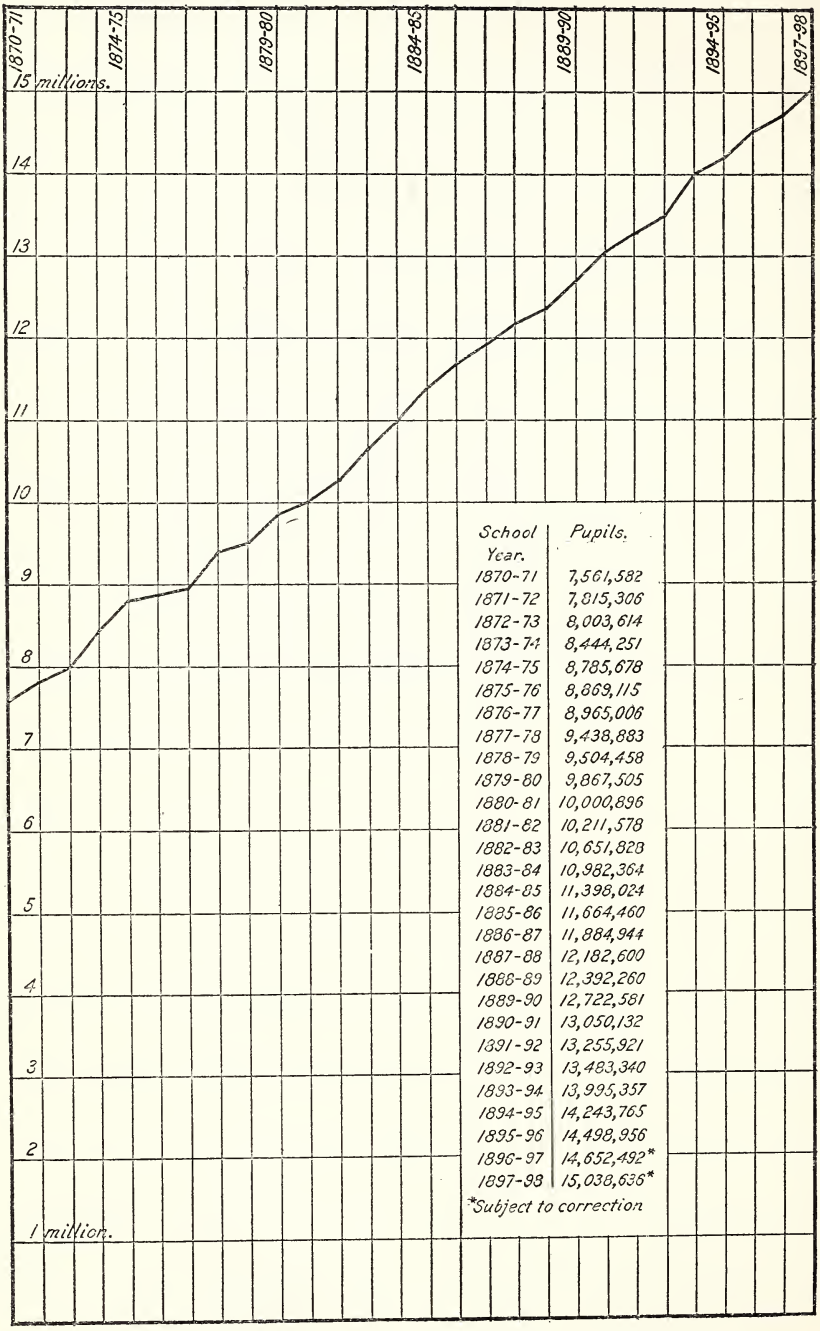
a Excluding certain small sums not classified by race, and a few counties not reported.
b Does not include permanent improvements in Baltimore City.
c Does not include permanent improvements outside of Baltimore.
d Includes salaries of teachers and superintendents only (or cost of tuition).
e Approximately.
f Does not include permanent improvements.
g For 8 months.
h In 1896–97.

TABLE D.—*School expenditure of the sixteen former slave States and the District of Columbia, approximately classified by race.*

Year.	Total expenditure for both races.	Estimated expenditure for each race.		Estimated school population (i. e., children 5 to 18 years of age).		Expenditure per capita of school population.	
		White.	Colored.	White.	Colored	White.	Colored.
1	2	3	4	5	6	7	8
1869–70				a 3,164,729	a 1,528,381		
1870–71	$10,385,464	$9,605,158	$780,306	3,236,630	1,578,170	$2.97	$0.49
1871–72	11,623,238	10,742,316	880,922	3,310,920	1,629,880	3.24	.54
1872–73	11,176,048	10,271,448	904,600	3,387,360	1,683,040	3.03	.54
1873–74	11,823,775	10,636,792	1,186,983	3,466,120	1,737,980	3.07	.68
1874–75	13,021,514	11,297,560	1,723,954	3,547,430	1,794,870	3.18	.96
1875–76	12,033,865	10,308,360	1,725,505	3,631,400	1,853,400	2.84	.93
1876–77	11,231,073	9,389,620	1,841,453	3,717,920	1,914,080	2.53	.96
1877–78	12,093,091	9,931,260	2,161,831	3,807,290	1,976,910	2.61	1.09
1878–79	12,174,141	10,123,542	2,050,599	3,900,250	2,042,150	2.60	1.00
1879–80	12,678,685	10,558,200	2,120,485	a 3,996,806	a 2,109,050	2.64	1.01
1880–81	13,656,814	11,312,573	2,344,241	4,096,800	2,145,990	2.76	1.09
1881–82	15,241,740	12,532,246	2,709,494	4,199,900	2,183,660	2.98	1.24
1882–83	16,363,471	12,730,938	3,632,533	4,306,000	2,221,930	2.96	1.63
1883–84	17,884,558	13,967,752	3,916,806	4,414,900	2,261,040	3.16	1.73
1884–85	19,253,874	14,969,261	4,284,613	4,527,300	2,301,270	3.31	1.86
1885–86	20,208,113	15,924,766	4,283,347	4,641,500	2,341,520	3.43	1.83
1886–87	20,821,969	16,392,646	4,429,323	4,759,100	2,382,570	3.44	1.86
1887–88	21,810,158	16,864,157	4,946,001	4,880,100	2,424,330	3.46	2.04
1888–89	23,171,878	18,158,290	5,013,588	5,004,900	2,467,040	3.63	2.03
1889–90	24,880,107	19,461,742	5,418,365	a 5,132,948	a 2,510,847	3.79	2.16
1890–91	26,690,310	21,245,685	5,444,625	5,230,115	2,551,511	4.06	2.13
1891–92	27,691,488	22,117,570	5,573,913	5,322,805	2,590,751	4.16	2.15
1892–93	28,535,738	23,028,495	5,507,243	5,435,840	2,654,040	4.24	2.08
1893–94	29,223,546	23,801,133	5,422,413	5,530,620	2,711,410	4.30	2.00
1894–95	29,443,584	23,589,891	5,853,693	5,679,755	2,761,205	4.15	2.12
1895–96	31,149,724	24,706,561	6,443,163	5,776,980	2,799,390	4.28	2.30
1896–97	31,144,801	24,665,509	6,479,292	5,809,430	2,816,340	4.25	2.30
1897–98	31,217,479	24,561,594	6,655,885	5,828,980	2,844,570	4.21	2.34
Total	546,630,246	442,895,065	103,735,181				

a United States census.

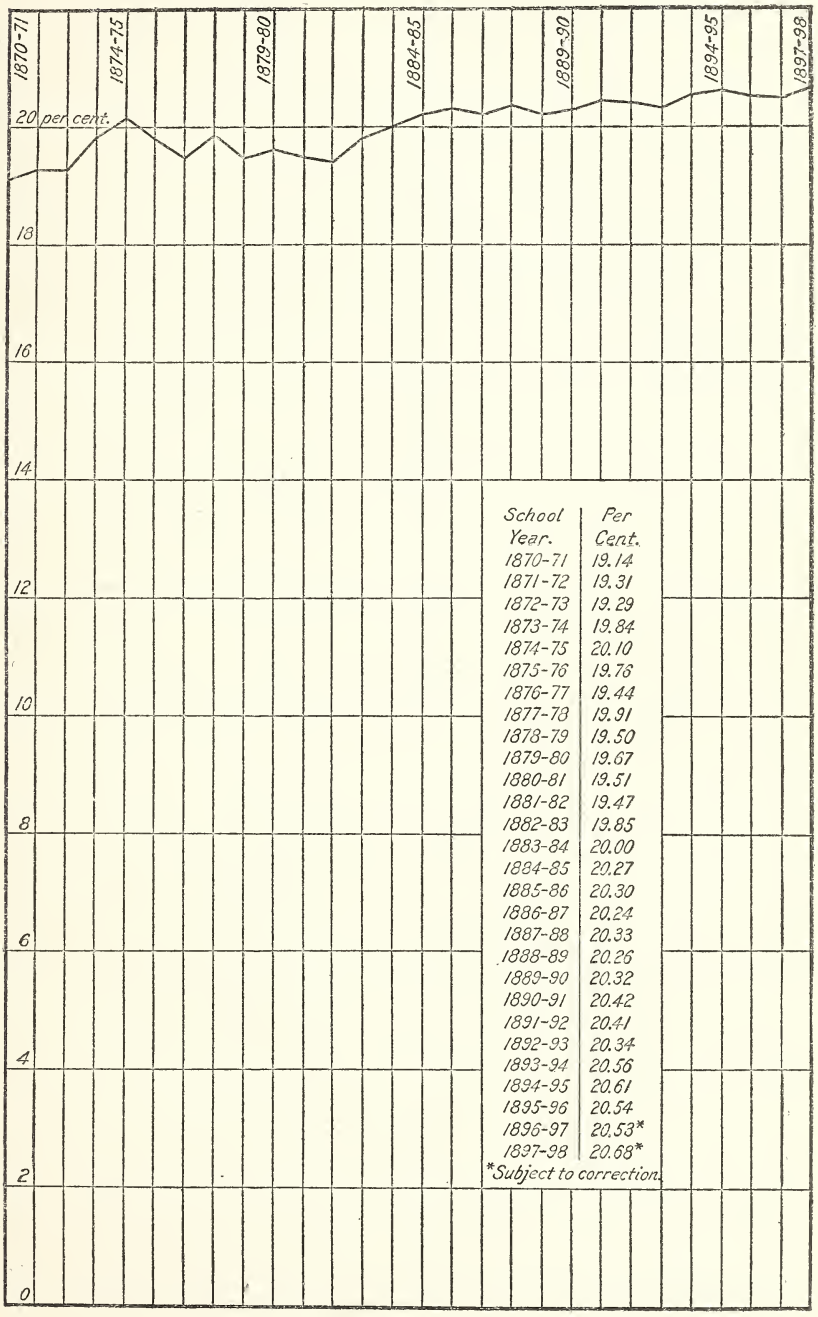
DIAGRAM 1.—*Number of pupils enrolled in the common schools of the United States each year since 1870–71.*



School Year.	Pupils.
1870-71	7,561,582
1871-72	7,815,306
1872-73	8,003,614
1873-74	8,444,251
1874-75	8,785,678
1875-76	8,869,115
1876-77	8,965,006
1877-78	9,438,883
1878-79	9,504,458
1879-80	9,867,505
1880-81	10,000,896
1881-82	10,211,578
1882-83	10,651,823
1883-84	10,982,364
1884-85	11,398,024
1885-86	11,664,460
1886-87	11,884,944
1887-88	12,182,600
1888-89	12,392,260
1889-90	12,722,581
1890-91	13,050,132
1891-92	13,255,921
1892-93	13,483,340
1893-94	13,995,357
1894-95	14,243,765
1895-96	14,498,956
1896-97	14,652,492*
1897-98	15,038,636*

*Subject to correction

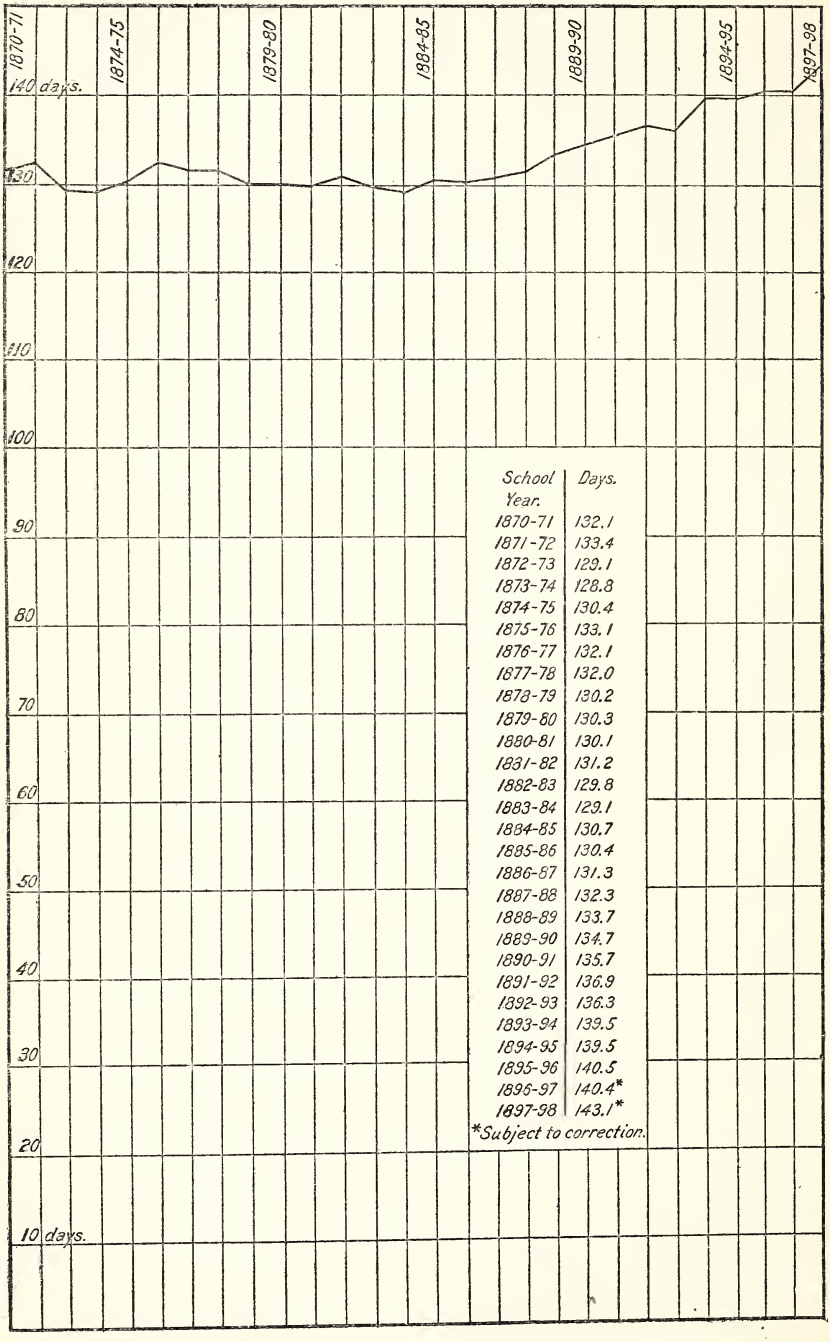
DIAGRAM 2.—*Showing the per cent of the total population enrolled in the common schools each year since 1870–71.*



School Year.	Per Cent.
1870-71	19.14
1871-72	19.31
1872-73	19.29
1873-74	19.84
1874-75	20.10
1875-76	19.76
1876-77	19.44
1877-78	19.91
1878-79	19.50
1879-80	19.67
1880-81	19.51
1881-82	19.47
1882-83	19.85
1883-84	20.00
1884-85	20.27
1885-86	20.30
1886-87	20.24
1887-88	20.33
1888-89	20.26
1889-90	20.32
1890-91	20.42
1891-92	20.41
1892-93	20.34
1893-94	20.56
1894-95	20.61
1895-96	20.54
1896-97	20.53*
1897-98	20.68*

*Subject to correction.

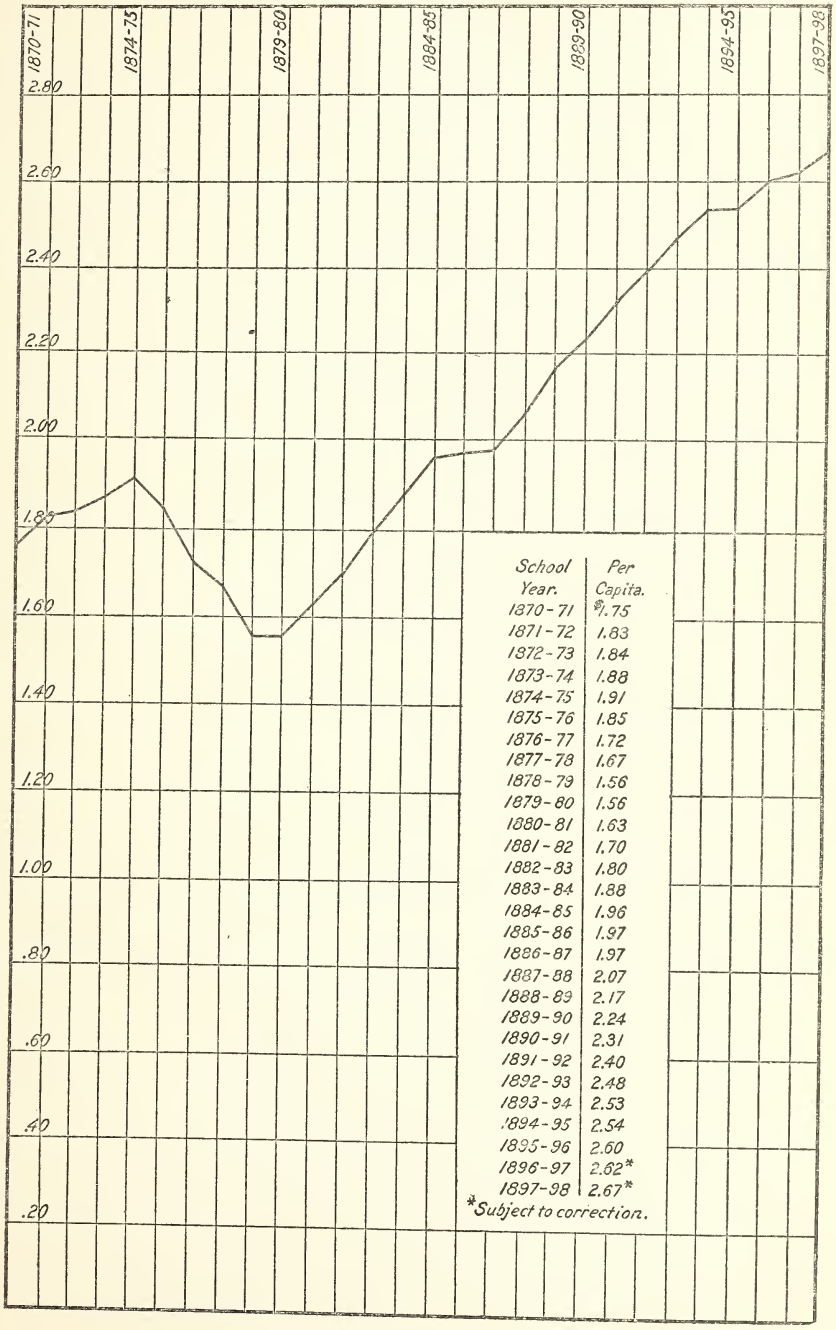
DIAGRAM 3.—*Showing the average number of days the schools were kept each year since 1870-71.*



School Year.	Days.
1870-71	132.1
1871-72	133.4
1872-73	129.1
1873-74	128.8
1874-75	130.4
1875-76	133.1
1876-77	132.1
1877-78	132.0
1878-79	130.2
1879-80	130.3
1880-81	130.1
1881-82	131.2
1882-83	129.8
1883-84	129.1
1884-85	130.7
1885-86	130.4
1886-87	131.3
1887-88	132.3
1888-89	133.7
1889-90	134.7
1890-91	135.7
1891-92	136.9
1892-93	136.3
1893-94	139.5
1894-95	139.5
1895-96	140.5
1896-97	140.4*
1897-98	143.1*

*Subject to correction.

DIAGRAM 4.—*Shewing the amount expended for common schools per capita of population each year since 1870–71.*



School Year.	Per Capita.
1870-71	$1.75
1871-72	1.83
1872-73	1.84
1873-74	1.88
1874-75	1.91
1875-76	1.85
1876-77	1.72
1877-78	1.67
1878-79	1.56
1879-80	1.56
1880-81	1.63
1881-82	1.70
1882-83	1.80
1883-84	1.88
1884-85	1.96
1885-86	1.97
1886-87	1.97
1887-88	2.07
1888-89	2.17
1889-90	2.24
1890-91	2.31
1891-92	2.40
1892-93	2.48
1893-94	2.53
1894-95	2.54
1895-96	2.60
1896-97	2.62*
1897-98	2.67*

*Subject to correction.

DIAGRAM 5.—*Showing the amount expended on the common schools for each $100 of the true valuation of all real and personal property.*

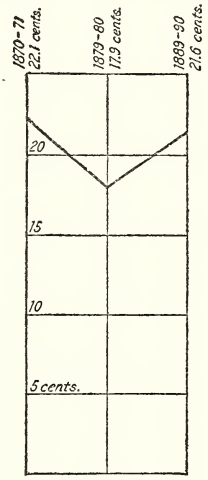
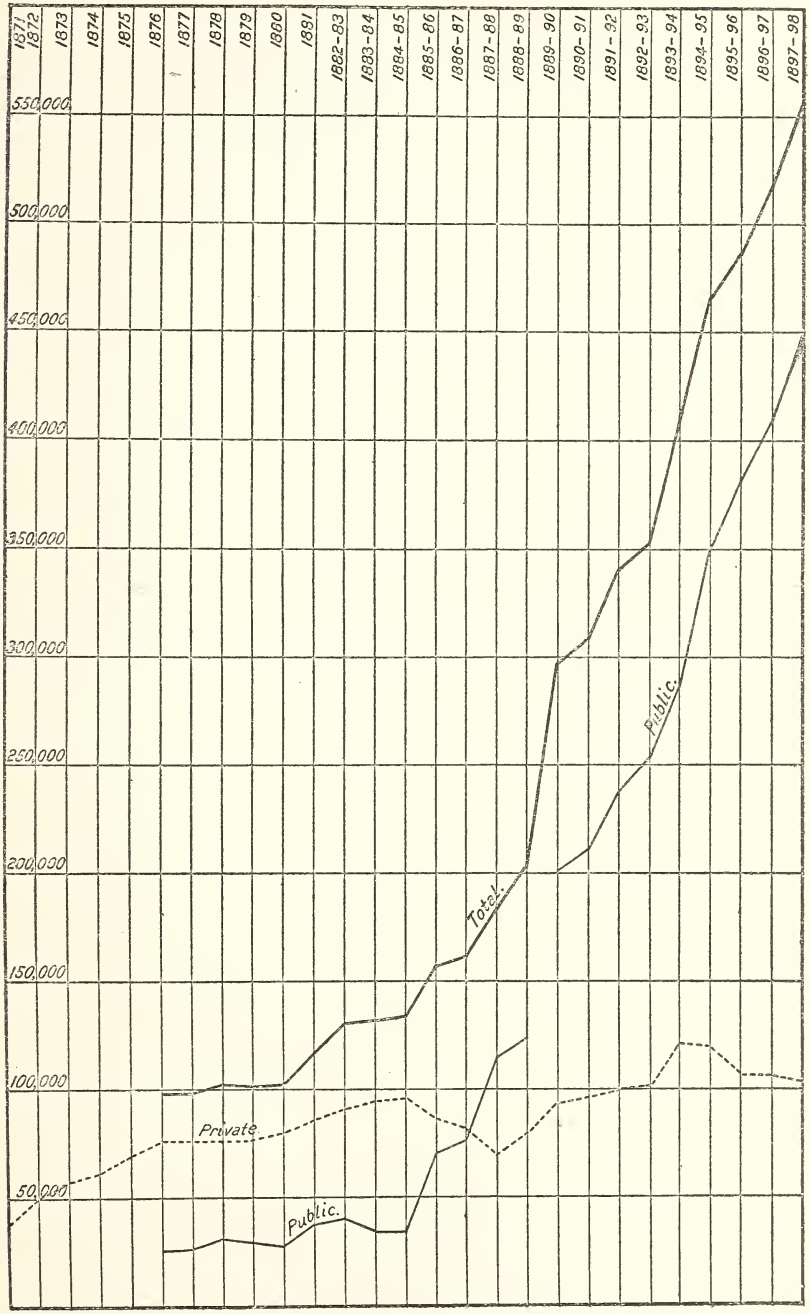


DIAGRAM 6.—*Showing the number of secondary students in public and private high schools.*



NOTE.—In connection with this diagram, see the accompanying table and explanation, p. XCIV.

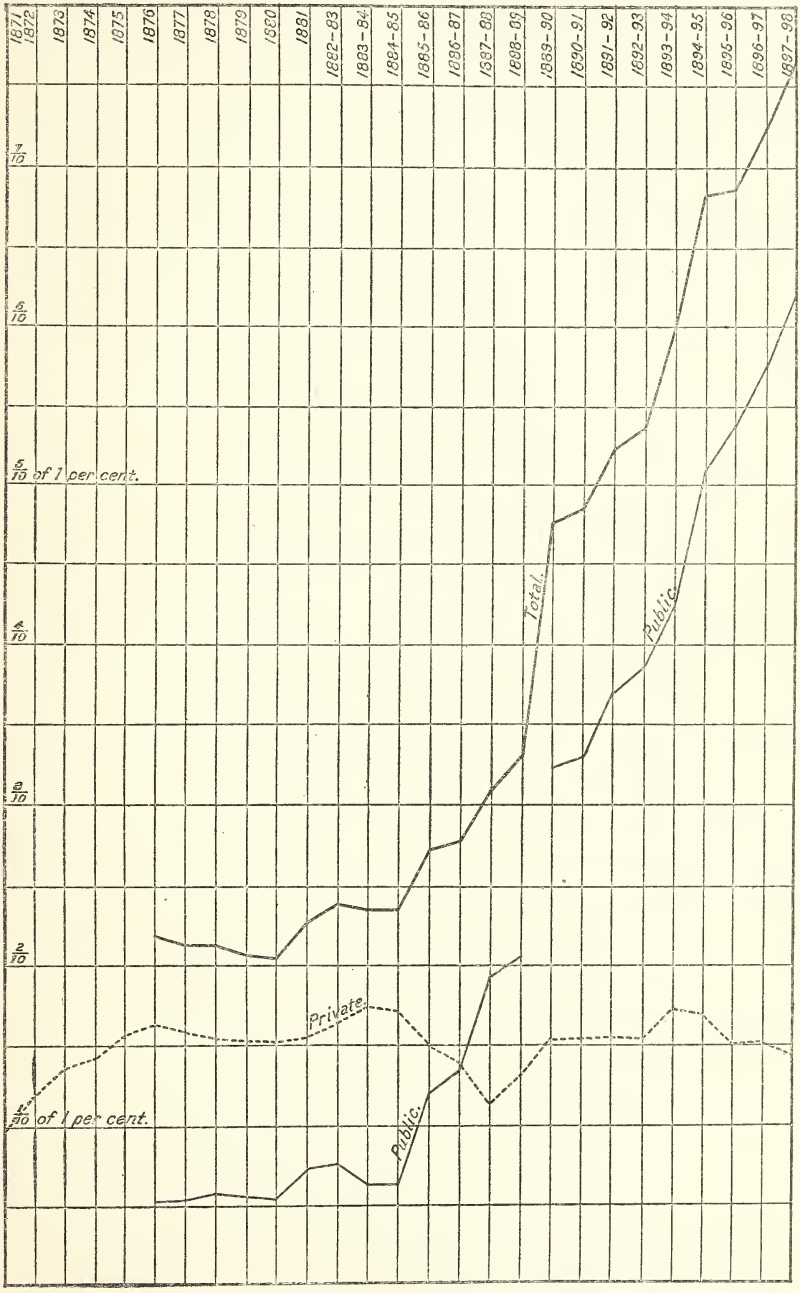
Number of secondary students in public and private high schools.

Year.	Secondary students.					
	In public high schools.	Per cent of population.	In private high schools.	Per cent of population.	In both classes of schools.	Per cent of population.
1871	.....	.....	a 38,280	0.097	.....	.....
1872	.....	.....	a 48,660	.120	.....	.....
1873	.....	.....	a 56,640	.137	.....	.....
1874	.....	.....	a 61,860	.145	.....	.....
1875	.....	.....	a 68,580	.157	.....	.....
1876	22,982	0.051	a 73,740	.164	96,722	0.215
1877	24,925	.054	a 73,560	.160	98,485	.214
1878	28,124	.059	a 73,620	.155	101,744	.214
1879	27,163	.056	a 74,160	.152	101,323	.208
1880	26,609	.053	a 75,840	.151	102,449	.204
1881	36,594	.071	a 80,160	.156	116,754	.227
1882–83	39,581	.074	a 88,920	.166	128,501	.240
1883–84	34,672	.063	a 95,280	.174	129,952	.237
1884–85	35,307	.063	a 97,020	.173	132,327	.236
1885–86	70,241	.122	a 86,400	.150	156,641	.272
1886–87	80,004	.136	a 83,160	.142	163,164	.278
1887–88	116,009	.194	a 69,600	.116	185,609	.310
1888–89	125,542	.205	a 79,440	.130	204,982	.335
1889–90	b 202,963	b .324	94,931	.152	297,894	.476
1890–91	211,596	.331	98,400	.154	309,996	.485
1891–92	239,556	.369	100,739	.155	340,295	.524
1892–93	254,023	.383	102,375	.154	356,398	.537
1893–94	289,274	.425	118,645	.174	407,919	.599
1894–95	350,099	.509	118,347	.172	468,446	.681
1895–96	380,493	.539	106,654	.151	487,147	.690
1896–97	409,433	.574	107,633	.151	517,066	.725
1897–98	449,600	.618	105,225	.145	554,825	.763

a From 1871 to 1887 this Bureau did not ask principals of private high schools and academies to report the number of students pursuing each secondary study. Prior to 1890 the number of students reported by a large number of these private schools included the total number in attendance, the elementary pupils as well as the secondary students. For the past nine years the two classes of students have been reported separately. Taking the reports from 1890 to 1895 as a basis, the number of secondary students in private high schools from 1871 to 1889 has been carefully estimated for each year.

b Previous to 1890 only the pupils in public city high schools are given. From 1890 onward all public high schools are included.

DIAGRAM 7.—*Showing the percentage of the population enrolled as secondary students in public and private high schools.*



NOTE.—See explanation to diagram 6.

DIAGRAM 8.—*Showing number of college students each year since 1872.*

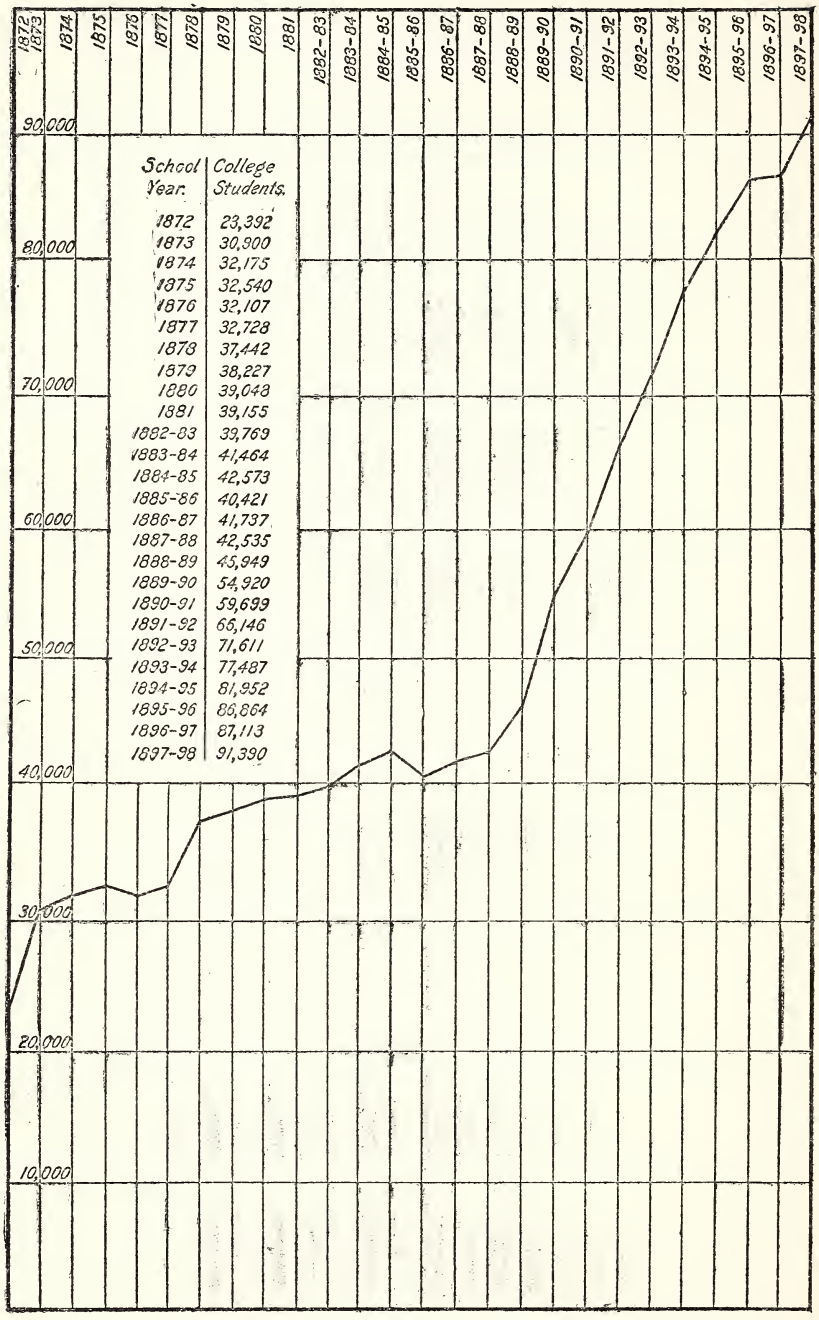
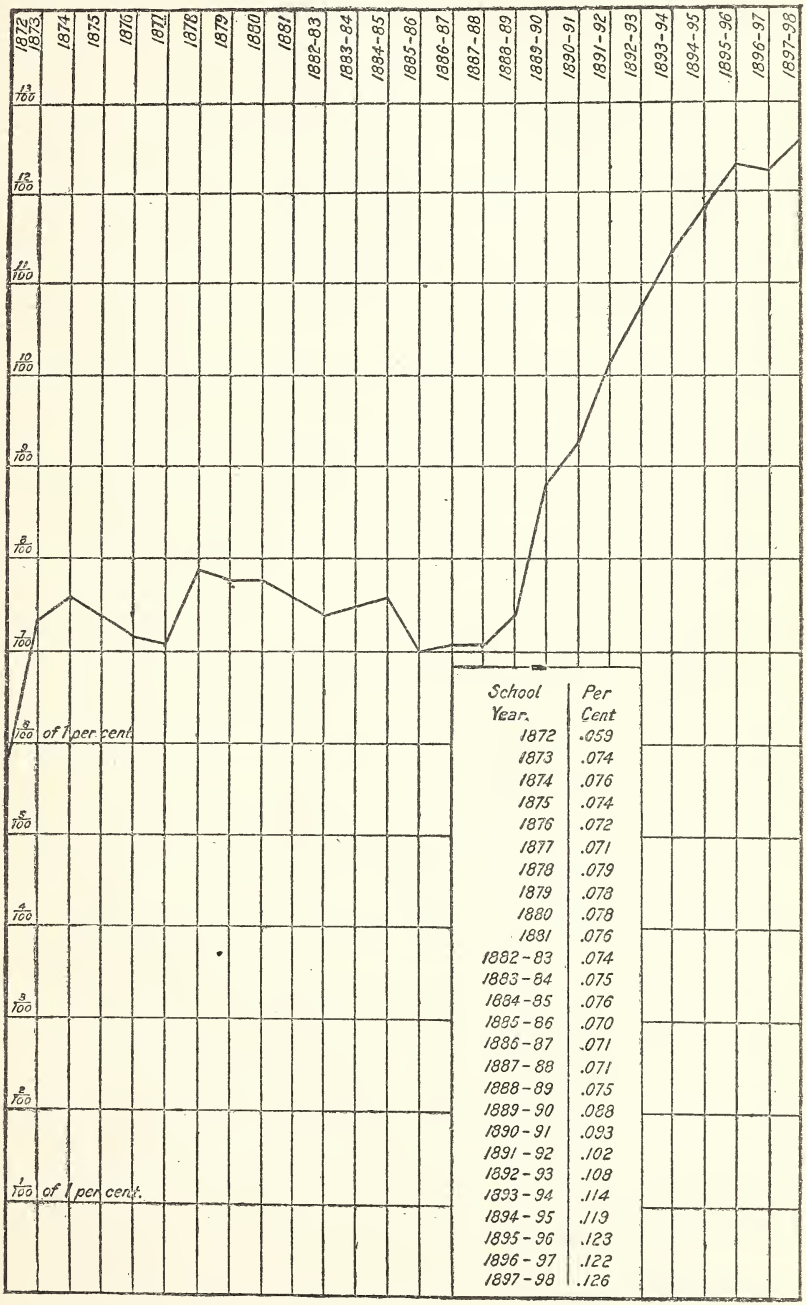


DIAGRAM 9.—*Showing what per cent of the total population was enrolled as college students during each year since 1872.*



School Year.	Per Cent
1872	.059
1873	.074
1874	.076
1875	.074
1876	.072
1877	.071
1878	.079
1879	.078
1880	.078
1881	.076
1882-83	.074
1883-84	.075
1884-85	.076
1885-86	.070
1886-87	.071
1887-88	.071
1888-89	.075
1889-90	.088
1890-91	.093
1891-92	.102
1892-93	.108
1893-94	.114
1894-95	.119
1895-96	.123
1896-97	.122
1897-98	.126

III.—COURSES OF STUDY IN MEDICAL SCHOOLS.

[NOTE.—The figures after each subject denote the number of hours *per week* given to that subject, unless otherwise stated; thus Anat, lec 3, rec 2, lab 3, denotes Anatomy, 3 lectures, 2 recitations, and 3 exercises in the laboratory per week. A lecture or recitation is supposed to continue one hour. The work in the third year to some extent and in the fourth year very largely is clinical and practical, and cannot be fully shown in a tabular statement. Except in a few instances the courses of such schools as did not give the number of hours have been omitted. The abbreviations will be readily understood: Biol, biology; Chem, chemistry or chemical; Clin, clinic or clinical; Diag, diagnosis; Dispen, dispensary; Dissec, dissection; Gen surg, general surgery; Genito-ur, genito-urinary; Histol, histology; Hosp, hospital; Lab, laboratory; Lec, lecture; Mat Med, materia medica; Med, medical or medicine; Micros, microscopy or microscopical; Obstet, obstetrics; Pathol, pathology; Phys, physical; Prac, practical; Rec, recitation; Ses, session; Surg, surgery or surgical.]

Institution.	First year.	Second year.	Third year.	Fourth year.
Birmingham Medical College, Birmingham, Ala. 1898-99.	Anat, rec 3, dissec 12; Chem, lec 2, rec 1, lab 4; Physiol, lec 2, rec 2; Histol, rec 1, lab 1; Mat Med and Therapeu, lec 2, rec 1; General clin, med and surg.	Anat, descriptive, surg and regional, rec 3 with demonstra, dissec 12; Chem, lec 2, rec 1, lab 4 a wk for ½ ses; Physiol, lec 2, rec 2; Mat Med and Therapeu, lec 2, rec 1; Practice, lec 2, rec 1; Obstet, lec 2, rec 1; Gen Pathol and Morbid Anat, rec 1, lab 2; Phys Diag, lec 1, prac work at hosp; Bacteriol, rec 1, lab 2; Gen clin, med and surg.	Anat, surg and regional, lec 1, rec 2, demonstra; Practice, lec 2, rec 1; Clin med, lec 2, bedside instruc; Phys Diag, lec 1, prac work at hosp; Toxicol, lec 1, rec 1; Mat Med and Therapeu, lec 2, rec 1; Gen Path and Morbid Anat, rec 1, lab 4; Obstet, lec 2, rec 1; Gynecol and Abdom Surg, lec 2, clin 1; Gen Surg, lec 2, rec 1; Clin Surg, lec 2, operations 2; Hygiene, lec 1, rec 1; Med Jurispru, lec 1, rec 1; Diseases of Children, lec 1, prac work at hosp; Neurol, lec 2; Eye, Ear, Nose and Throat, lec 2, clin 1; Minor Surg and fracture dressing, lec 1, demonstra; Genito-ur Surg, lec 1; Clin.	Practice, lec 2, rec 1; Clin med, lec 2, bedside instruc; Phys Diag, lec 1, prac work at hosp; Gen Surg, lec 2, rec 1, review quizzes; Clin Surg, lec 2, operative surg in sections; Minor Surg and fracture dressing, lec 1, demonstra; Genito-ur Surg, lec 1; Obstet, lec 2, rec 1; Gynecol and abdom surg, lec 2, clin 1; Diseases of Children, lec 1; Neurol, lec 2; Eye, Ear, Nose and Throat, lec 2, clin 1; Clin Micros, lab 2; Clin med and surg.
University of Southern California, College of Medicine, Los Angeles, Cal. 1898-99.	Rec, lec and lab work as follows: Anat 5; Physiol 3; Mat Med 2; Hygiene 1; Chem, rec 2, lab 2; Histol, rec 1, lab 8; Dissec 3 or 4 parts.	Rec, lec and lab work as follows: Anat 4; Physiol 3; Mat Med 2; Chem, rec 2, lab 2; Pathol, rec 2, lab 8; Surg 2; Obstet 2; Therapeu 1; Surg Anat 1; Dissec 2 or 3 parts.	Rec, lec and lab work as follows: Bacteriol 12 for 6 wks; Surg 2; Med 2; Obstet 2; Therapeu 1; Orthopedic Surg 1; Physical Diag 1; Surg Anat 1; Anat of Nervous System 1; Diseases of Children 1; Hosp clin 10; Dispen clin 6.	Rec, lec and lab work as follows: Orthopedics 1; Gynecol 1; Gynecol clin 4; Med Jurispru 1 a wk for 4 mos; Med 2; Med clin 3; Insanity 1 a week for 12 wks; Nervous Diseases 1 a wk for 20 wks; Neurol clin 2; Surg clin 2; Skin and venereal clin 2; Genito-ur clin 1; Eye clin 2; Ear, Nose and Throat clin 2; Dispen clin 6.
University of California, Medical Department, San Francisco, Cal. 1899-1900.	Comparative Anat; Human Anat, descriptive. Particular attention given to osteol, dissec; Physiol, with lab courses; Histol, with lab courses; Chem, with lab courses; Mat Med, with lab courses; Pharmacy.	Descriptive Anat, dissec; Physiol; Histol; Chem, lab courses in urinalysis and toxicol; Electro-Physics, with lab courses; Mat Med; Pathol, with lab courses; Bacteriol, with lab courses.	Surg Anat; Hygiene; Med Jurispru; Pathol, with lab courses; Therapeu; Prin and Practice of Med; Prin and Practice of Surg; Gynecol; Obstet; Diseases of Children; Nervous and Mental Diseases; Clin Med; Clin Surg; Dispen clin.	Therapeu; Prin and Practice of Med; Prin and Practice of Surg; Gynecol; Obstet; Diseases of Children; Nervous and Mental Diseases; Ophthalmol; Otol; Laryngol; Applied Chem, pathol and bacteriol in clin lab; Clin Med; Clin Surg; Dispen clin.

Institution.	First year.	Second year.	Third year.	Fourth year.
University of Colorado, Colorado School of Medicine, Boulder, Colo. 1898-99.	Anat, osteol, lec, rec, and demonstra 3 a wk for 3 mos, muscular system, lec, rec, and demonstra 3 a wk for 6 wks, circulatory system, lec and rec 3 a wk for 6 wks, regional anat, lec and demonstra 3 a wk for 6 wks, spinal nerves 3 a wk for 2 mos, dissec lab 3 a wk for 3 mos; Physiol, lec and rec 90 in yr, lab 6 a wk; Chem; Histol.	Anat, lec, rec, and demonstra 84 in yr, dissec, lab 2 a wk; Physiol, lec, demonstra, and lab 4 for ½ yr; Chem; Histol; Mat Med; Therapeu; Pathol; Bacteriol; Hygiene; Phys Diag; Med and Surg clin.	Pathol, ½ year; Therapeu; Phys Diag; Practice; Clin Med; Surg; Clin Surg; Operative Surg on Cadaver; Orthopedic Surg; Minor Surg and Bandaging; Genito-ur diseases; Obstet; Gynecol; Diseases of Children; Diseases of Nervous System; Ophthalmol; Otol; Laryngol and Rhinol; Gen and special clin in med, surg, and the specialties.	Practice; Clin Med; Surg; Clin Surg; Operative Surg on cadaver; Diseases of mind and nervous system; Med Jurispru; Diseases of Children; Obstet; Gynecol; Ophthalmol and Otol; Laryngol and Rhinol; Special lec; Gen and special clin in med, surg, and the specialties.
University of Denver, School of Medicine, Denver, Colo. 1899-1900.	Anat, lec 2, dissec through the yr, rec and demonstra, quiz on dissec; Physiol (including lec, rec, and demonstra) 3; Chem, lec 3 a wk 1st semester, lab 3 a wk 2d semester; Histol, lec, rec, and lab; Mat Med, lec 1½ hrs a wk 1st semester, rec; Pharmacol, lec, demonstra, and lab.	Anat, lec on nervous system 2, on regional anat 1 a wk 2d semester, dissec through yr, rec and demonstra 2, quiz 2; Physiol (including lec, rec, and demonstra) 3; Bacteriol, lec 1, lab 4 for 6 wks; Embryol, lec and rec; Mat Med and Toxicol, lec and rec; Pharmacol, lec 2; Therapeu, lec 1 and rec; Gen Pathol, lec and rec and lab; Bandaging and Surg dressings, lab; Phys Explor of Normal Body.	Med, lec 4, rec 2, lec and demonstra, phys diag and clin micros, 1 a wk 2d semester; Surg, lec 1, rec 1 and lab; Therapeu, lec 1; Obstet, lec and demonstra 2; Phys Diag, lec, rec and clin; Hygiene, lec and rec; Post Mortem; Gynecol, clin; Nervous diseases, clin; Clin Micros, lab; Urinary analysis, lab.	Med, lec and rec and clin by appointment, dispen clin 6, hosp clin 2; Surg, lec 3+, rec, clin 1+; Diseases of Children, lec, rec; Orthopedic Surg, lec and rec; Neurol, lec, rec and clin; Obstet, lec, rec and clin; Gynecol, lec 1, rec 1, clin 1+; Dermatol, lec or rec 1, clin; Ophthalmol, lec 1, clin 1+; Otol, lec 1 a wk 1st semester, clin 6; Laryngol and Rhinol, lec 1, clin 6; Med Jurispru, lec and rec.
Yale University, Department of Medicine, New Haven, Conn. 1899.	Anat, rec, lec and demonstra 3 hrs, lab, dissec 15 a wk for 12 wks; Histol, lec and rec 1 a wk for 23 wks, lab 4 a wk for 23 wks; Embryol, lec and rec 2 a wk for 12 wks, lab 4 a wk for 12 wks; Physiol, rec and demonstra 2; Gen Chem, rec and demonstra 4 a wk for 11 wks, anal chem	Anat, rec and demonstra 3, lab and dissec 15 hrs a wk for 12 wks; Physiol, lec, rec and demonstra 4; Mat Med, pharmacy lab, 4 hrs a wk for 11 wks, demonstra and rec 2 a wk for 12 wks; Pharmacol, lec and rec 2 a wk for 11 wks; Pathol, rec and demonstra 3, micros lab 4 hrs, bac-	Pharmacol, lec and rec 2; Pathol, lab 2 hrs; Med, lec and rec 4 a wk for 23 wks + 2 a wk for 11 wks, clin 2 hrs, phys diag, 2 a wk for 12 wks; Surg, lec 2, bandaging 1 a wk for 12 wks, surg anat, 1 a wk for 12 wks, clin 4 hrs a wk; Otol, lec 1 a wk for 12 wks; Obstet, lec and rec 2, demonstra with manikin 1 hr a wk for 11 wks; Gynecol, rec 2 a wk for 12 wks.	Therapeu, lec and rec 1, clin 1; Obstet, demonstra with manikin in sections 11 wks, midwifery clin, demonstra clin; Gynecol, clin, lec 1, section work, diagnosis and treatment, 23 wks; Surg, lec 1 a wk for 23 wks, dispen clin 2 hrs, section work 6 hrs a wk for 12 wks, hosp clin 3 hrs; Operative Surg, rec 2 a wk for 11 wks, section work on cadaver 12 wks; Genito-ur surg, lec and rec 1 a wk for 11 wks; Orthopedic Surg, lec 1 a wk for 11 wks, clin and sec work 1 a wk for 23 wks; Ophthalmol, lec 1 a wk for 11 wks, clin 1 a wk for 23 wks,

	1 hr a wk for 11 wks, lab 12 hrs a wk for 11 wks and 6 hrs a wk for 6 wks, organic chem, rec 2 a wk for 23 wks; Physiol chem, lec and rec 2 a wk for 23 wks, lab 6 hrs a wk for 12 wks and 9 hrs a wk for 11 wks.	teriol 6 hrs a wk for 6 wks; Med, lec 2 a wk for 11 wks.		section work thro yr; Laryngol and Rhinol, lec 2 a wk for 11 wks, clin 1 hr a wk for 23 wks, section work with manikin 2 hrs a wk for 12 wks; Med, lab, clin micros 2 hrs a wk for 11 wks, dispen clin in sections, conferences 2 hrs a wk for 23 wks, hosp clin, ward classes and lec 2 hrs a wk for 23 wks; Dermatol, lec and rec 1 a wk for 11 wks, clin, lec and demonstra 1 hr a wk for 11 wks + 2 hrs a wk for 23 wks; Pediat, rec 1 a wk for 11 wks, clin 1 hr with section work for 12 wks; Neurol, clin 1 hr with section work; Mental Diseases, rec 1 a wk for 12 wks with clin; Sanitary science 1 hr a wk for 12 wks; Med Jurispru, lec 1 a wk for 11 wks.
Columbian University, Medical Department, Washington, D. C.	Anat, lec 2 before, 3 after Xmas; Physiol, lec 2 before, 3 after Xmas; Chem, lec 3 before, 2 after Xmas, lab 3; Mat Med and Therapeu, lec 3 before, 2 after Xmas, lab 1; Prac Anat, dissec-room open daily.	Anat, lec 2 before, 3 after Xmas; Physiol, lec 2 before, 3 after Xmas; Chem, lec 3 before, 2 after Xmas, lab 4; Mat Med and Therapeu, lec 3 before, 2 after Xmas; Histol, lab; Prac Anat, dissec-room open daily.	Surg, lec 3 before, 2 after Xmas; Practice, lec 2 before, 3 after Xmas; Obstet, lec 3 before, 2 after Xmas; Minor Surg, lec 1 from Oct 5 to Dec 14, bandaging, etc, in manikin-room; Dermatol, lec 1 from Jan 4 to Mar 16; Ophthalmol, lec 1 from Oct 3 to Dec 5; Bacteriol and Pathol, lab 8 hrs per wk; Surg Pathol, lec 1 from Oct 7 to Dec 9; Clinics.	Surg, lec 3 before, 2 after Xmas; Practice, lec 2 before, 3 after Xmas, clin and lab instruc; Obstet, lec 3 before, 2 after Xmas; Gynecol, lec 1 from Jan 4 to Mar 8; Mental Diseases, lec 1 from Jan 2 to Mar 13; Med Jurispru, lec 1 from Oct 5 to Dec 14; Nervous Diseases, lec 1 from Jan 6 to Mar 10; Pediat, lec 1 from Oct 2 to Dec 4; Otol and Laryngol, lec 1 from Oct 30 to Dec 18 and from Jan 2 to Mar 19; Orthopedic Surg, lec 1 from Jan 8 to Mar 10; Hygiene, lec 1 from Jan 3 to Mar 7; Clinics.
Georgetown University, Medical Department, Washington, D. C. 1898-99.	Anat 2; Prac Anat 3; Chem, lec 3, lab 3; Histol, lec 2 and lab 2; Physiol 3; Physics 1; Osteol 2; Embryol 2.	Pathol, lec 2, lab 1; Prac Anat, lec 2, lab 1; Chem, lec 2, lab 3; Hygiene 2; Therapeu 3; Anat 2; Physiol 3.	Pathol, lec 2, lab 2; Surg, lec 2, clin 2; Surg Pathol, lec 1; Minor Surg 1; Med clin 2; Hygiene, lec 2; Therapeu, lec 3; Gynecol, lec 2; Practice, lec 3.	Surg, lec 2, clin 2; Obstet, lec 2, demonstra 1, clin 1; Practice, lec 3; Med clin 2; State med, lec 1; Ophthalmol, lec 2, clin 2; Phys Diag, lec 2; Dermatol, lec 1; Gynecol, lec 2; Surg Pathol, lec 1; Mental Diseases, lec 1; Ward Classes 3.
American Medical Missionary College, Chicago, Ill. 1899-1900.	Anat, descrip, lec 110 hrs for whole session, lab 5 hrs daily for 5 wks; compar anat, lab 3 hrs daily for 3 wks; Physiol, lec 110; Normal Histol, lec 80, lab 3 hrs daily for 6 wks; Biol, lab 3 hrs daily for 10 wks; Chem, gen, lec 80, organ, lec 60, physiol, lab 3 hrs daily for 4 wks, qualitative lab 3 hrs daily for 8 wks; Hygiene, lec 70; Med Physics, lec 30.	Anat, lec 80 hrs for whole session, lab 5 hrs daily for 5 wks; Physiol, lec 100, lab 3 hrs daily for 5 wks; Bacteriol, lec 60, lab 3 hrs daily for 9 wks; Embryol, lec 50, lab 2 hrs daily for 5 wks; Physiol Chem, lec 60, lab 3 hrs daily for 10 wks; Sanitary Science, lec 40; Hydrotherapy, lec 50; Mat Med and Toxicol, lec 100; Mat Med, lab 3 hrs daily for 2 wks.	Hydrotherapy, lec 50; Gen Therapeu, lec 90; Electro-Therapeu, lab 2 hrs daily for 5 wks; Practice, lec 100; Surg Anat, lec 60; Surg, lec 60, lab 2 hrs daily for 5 wks; Pathol, lec 80; Diseases of Women, lec 50; Obstet and Diseases of Women, lab 2 hrs daily for 5 wks; Obstet, lec 50; Diseases of Eye and Ear, lab 2 hrs daily for 5 wks; Phys Diag, lab 2 hrs daily for 5 wks; Nervous Diseases, lab 2 hrs daily for 5 wks; Applied Physiol, lab 2 hrs daily for 5 wks; Morbid Histol, lab 3 hrs daily for 10 wks; Anat, lab 4 hrs daily for 5 wks; Clinics, lab 2 hrs daily for 20 wks.	Nervous and Mental Diseases, lec 80; Practice, lec 100; Pathol, lec 50; Surg, lec 50; Diseases of Eye and Ear, lec 30; Obstet and Diseases of Women, lec 50; Genito-ur and skin diseases, lec 30; Diseases of Children, lec 30; Medical Gymnastics, lec 20; Med Jurispru, lec 20; Clin, 4 hrs daily for 36 wks.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
Bennett College of Eclectic Medicine and Surgery, Chicago, Ill. 1897-98.	Anat, lec and rec 3, dissec 12 hours a wk for 8 wks; Chem, lec and rec 3; Osteol, lec and rec 2; Histol, lec and rec 2; Mat Med, lec and rec 3; Physiol, lec and rec 3; Lab in Chem. Physiol, Pharmacy and Micros.	Anat, lec and rec 3, dissec 18 hrs a wk for 8 wks; Chem, toxicol and urinalysis, lec and lab 2; Physiol, lec and rec 2; Phys Diag, lec and rec 1; Pathol, lec and rec 2; Therapeu, lec and rec 2; Minor Surg and Bandaging, lec and rec 1; Micros and Bacteriol, lec and rec 2; Physiol Chem, lec and rec 3.	Surg, lec and clin 5; Orthopedic Surg and clin 5; Surg Emergencies, lec 1; Practice and clin 5; Diseases Respiratory and Circulatory Systems 3; Diseases of Children 2; Med Jurispru, lec and quiz 1; Gynecol and clin, lec and demonstra 3; Obstet, lec and demonstra 2; Electro-Therapeu and clin, lec 2; Therapeu, lec 2; Venereal Diseases and clin, lec 2.	Gen and Operative Surg and clin 5; Orthopedic Surg and clin 5; Orificial Surg, lec 1; Practice and clin 5; Diseases Nervous System and clin 2; Diseases Children and clin 2; Dermatology and clin 1; Eye and Ear, Nose and Throat and clin 3; Gynecol and clin 3; Hygiene 1; Mental Physiol, lec 1; Obstet and clin 2; Dislocations and Fractures 1; Med Jurispru, lec and quiz 1; Dispen clin.
College of Physicians and Surgeons, Chicago, Ill. 1898.	Biol and Embryol, lab 4; Anat, lec and rec 5, dissec 120 hours during term; Histol, lab 6; Mat Med, lec and rec 4; Chem, lec 2, lab 4; Physiol, 5.	Physiol of Nervous System, lec 2; Anat, lec 4, dissec 120 hours during term; Gen Pathol and Path Anat, lec 2, lab 4; Bacteriol, lec 1, lab 4; Jurispru, lec 1; Surg Pathol, lab 2, lec 1; Therap, lec 2; Organ Chem and Toxicol, lec 2, lab 4; Preventive Med, lec 1; Den Surg, lec 1 for ⅓ term.	Practice, rec 6; Surg, rec 4; Orthopedic Surg, lec 1; Operative Surg, lec 1; Phys Diag, 2; Surg Anat, lec and demonstra 2; Genito-ur Surg and Venereal Diseases, lec 1; Otol. lec 1; Gynecol, rec 2; Obstet, rec 2; Dermatol, lec 1; Laryngol and Rhinol, lec 1; Dispen clin 4, other clin.	Practice, lec 4; Surg, lec 4; Obstet, lec 3; Diseases of Chest, lec 2; Gynecol, lec 2; Ophthalmol, lec 1; Children's Diseases, lec 2, clin; Mind and Nervous System, lec 2; Gen Diag, lec 2; Clin 22.
Hahnemann Medical College and Hospital, of Chicago, Chicago, Ill. 1899-1900.	Physics, lec 2; Anat, lec 5, dissec 3; Physiol, lec 2; Chem, lec 2, lab 5; Histol, lec 1, lab 2; Mat Med, lec 1, clin 1; Botany, lec 1; Clin Gen Med 2; Clin Operative Surg 6; Diseases of Children, clin 1; Pharmacol and Prescription writing, lec 1; Organon lec 1.	Sanitary Science, lec 2; Obstet, lec 2; Minor Surg, lec 1; Embryol, lec 1; Phys Diag, lec 1; Physiol Chem, lec 1, lab 2; Gynecol, clin 2; Biol and Embryol, lab 2; Bacteriol, lec 2, clin 1; Mat Med, lec 1, clin 1; Med Bot, lec 2; Anat and Physiol of Special Sense Organs, lec 1; Gen Med Clin 2; Anat, lec 2; Operative Surg Clin 6; Physiol, lec 1; Organon, lec 1; Diseases of Children, clin 1; Practice, lec 1.	Special Pathol, lec 1, clin 1; Gen Pathol, lec 1; Sanitary Science, lec 1; Med Chem, lec 1, lab 2; Mat Med, lec 3, clin 2; Obstet, lec 1; Dental Surg, lec 1; Surg, lec 2; Gynecol, clin 2; Electro-Therapeu, lec 1; Skin and Venereal Diseases, lec 1; Gen Med Clin 2; Med Jurispru, lec 1; Skin Diseases, clin 1; Eye and Ear, clin 1; Pediat, lec 1; Regional Anat, lec 1; Operative Surg, clin 6; Diseases of Children, clin 1.	Mat Med, lec 3, clin 1; Diseases of Women, lec 1; Surg, lec 2; Practice, lec 7; Gynecol, clin 2; Obstet, lec 1; Gen Med Clin 2; Skin Diseases, clin 1; Eye and Ear, lec 1, clin 1; Throat and Nose, lec 1, clin 1; Operative Surg, clin 5; Diseases of Children, clin 1.
Jenner Medical College and Hospital, Chicago, Ill. 1897-98.	Anat, descriptive, lec, rec, dissec, 6 hrs; Chem inorgan, lec, rec and lab, 3 hrs; Histol, lec,	Anat, surg and regional, lec. rec, dissec, 6 hrs; Physiol, lec, rec and lab, 3 hrs; Pathol, lec, rec	Dermatol, lec, rec and clin, 1 hr; Surg, lec, rec and clin, 2 hrs; Clin Surg, lec, rec and clin, 2 hrs; Dental Surg, lec, rec and clin, 1 hr; Gynecol, lec, rec and clin, 1 hr; Eye and Ear,	Clin Med, lec, rec and clin, 2 hrs; Clin Surg, lec, rec and clin, 2 hrs; Dermatol, lec, rec and clin, 1 hr; Gynecol, lec, rec and clin, 1 hr; Diseases of Children, lec, rec and clin, 1 hr;

	rec and lab 1½ hrs; Mat Med, lec, rec and lab 1½ hrs.	and lab, 3 hrs; Bacteriol, lec, rec and lab, 3 hrs; Chem, lec, rec and lab, 1½ hrs; Mat Med, lec, rec and lab, 1½ hrs.	lec, rec and clin, 1 hr; Obstet, lec, rec and clin, 1 hr; Phys Diag, lec, rec and clin, 1 hr; Diseases of Children, lec, rec and clin, 1 hr; Genito-ur, lec, rec and clin, 1 hr; Clin Med, lec, rec and clin, 2 hrs; Histol and Pathol, lec, rec and clin, 1 hr; Electricity, lec, rec and clin, 1 hr; Morbid Anat, pathol specimens, autopsies and lectures.	Neurol, lec, rec and clin, 1 hr; Genito-ur, lec, rec and clin, 1 hr; Orthopedic Surg, lec, rec and clin, 1 hr; Eye and Ear, lec, rec and clin, 1 hr; Obstet, lec, rec and clin, 1 hr; Med Jurispru, lec, rec and clin, 1 hr; Phys Diag, lec, rec and clin, 1 hr; Laryngol, lec, rec and clin, 2 hrs.
Northwestern University, Medical School (Chicago Medical College), Chicago, Ill. 1899–1900.	Chem, inorg, lec and demonstra 3 a wk 1⅛ semesters, organic, lec and demonstra 3 a wk ⅜ semester, lab 3 a wk; Anat, osteol, rec and lab 3 a wk for ¾ semester, dissec, rec 2, lab 4; Histol and Embryol, lec, rec, domonstra and lab, 6 hrs.+; Physiol, lec, rec, demonstra and lab, 8+; Pharmacol, rec, demonstra 3 a wk ½ semester.	Chem, physiolog, lec, demonstra 1, lab 2, electricity, lec and demonstra 1+ special lec and demonstra; Anat. lec, rec and demonstra 3+; Histol, lab 2 a wk for ½ semester; Physiol, lec, rec, demonstra and lab 5+; hygiene, lec and rec 2+; Pharmacol, lec 2 a wk for ½ semester, rec 2 a wk 1 semester, dispen 48 hrs; Pathol, lec, rec and lab and bacteriol, 6+; Phys Diag, lec, rec, lab and clin 3+; Surg, lec, rec, lab and clin, 6+; Med, lec, rec, clin 6 hrs + Optional courses.	Pathol, lec, demonstra, post mortem; Obstet, rec 2; Dermatol, lec, demonstra 3, clin dispen 6 a wk for 5 wks; Laryngol and Rhinol, lec 1, clin lec 1, dispen clin 6 a wk for 5 wks; Pediat, clin lec 1, dispen children's clinic, 6 a wk for 5 wks; Surg, lec, rec, demonstra and clin, 6+; Med, lec 2, rec 2 a wk for 1 semester, clin lec 2 + Optional courses.	Obstet, lec 1, demonstra on manikin and cadaver 16 in yr; Eye and Ear, lec 1, clin lec 1, dispen clin 6 a wk for 5 wks; Gynecol, lec 3+, dispen clin 6 a wk for 5 wks; Neurol, lec 2 a wk for 1 semester, clin lec 3, dispen clin 5 a wk for 5 wks; Mental Diseases 2 a wk for ½ semester; Med Jurispru 2 a week for ½ semester; Surg, lec 2, clin lec 7 +, ward visits, 1; Med, lec 2, clin lec 4 +, ward visits 1+; Optional courses.
Northwestern University, Woman's Medical School, Chicago, Ill.[1] 1899–1900.	Anat, rec, dissec, demonstra 6; Chem, lab 6, lec and quiz; Physiol, lec 2, lab 4, rec and quiz; Pharmacy, 2 hrs a wk 2d ½ yr; Physics 2 hrs a wk for ½ yr; Histol lab 3 hrs a wk for 2 terms, 2 hrs a wk for 1 term; Embryol, lec and lab 4 a wk for 2d ½ yr.	Anat, rec, dissec, demonstra, 6; Chem, including qual, anal, toxico[1], sanitary chem, physiol chem, with urinary analysis, lab 6 hrs; Physiol, lec 1, lab 2, rec and quiz; Histol of Nervous Sys, lec and demonstra 1 a wk for fall term; Mat Med, lec and rec 3 a wk for fall and winter terms; Pathol, 3 terms—lec 1, lab 4, clin 2; Hygiene, lec 16 during winter and spring; urinary analysis, fall and winter 2 hrs; Bacteriol, lab 12 hrs a wk for 20 wks, lec 1 a wk winter term.	Pathol, lab or clin 2; Practice, clin lec 2+; Nervous diseases, lec 3; Electrol and Physiol of nervous sys, winter term 1 hr a wk; Diseases of Children, lec 2, clin; Surg, lec 2, rec 2 operative surg, lec and demonstra 2 a wk for ½ yr, clin 6; Obstet, lec and quiz 2; Gynecol, lec 2, rec 3; Diag and treatment to sections 2 hrs, bedside instruc.	Pathol, fall term, lab 2 optional; Nervous Diseases, lec 3, rec 1; Diseases of Children, lec 2, clin; Med Jurispru, 2 terms 1 hr a wk; Surg, lec 2, rec 1; Orthopedic Surg, clin and didac lec 1; Opthalmol, clin and didac lec 3; Otol, clin and didac lec 1; Laryngol, clin and didac lec 1 a wk for fall term; Oral Surg, lec 1 a wk for fall term; Dermatol, lec and quiz 2; Obstet, lec and quiz 2, clin on manikin 2, bedside instruc; Gynecol, lec 2, operative 1; Diagnosis and treatment to sections 2 hrs, bedside instruc.

[1] The table imperfectly expresses the full privileges of the college in special courses and practical opportunity. The arrangement of the announcement is not readily tabulated. Medical jurisprudence receives more attention than shown under the respective years.

Institution.	First year.	Second year.	Third year.	Fourth year.
Rush Medical College, affiliated with University of Chicago, Chicago, Ill. 1899.	This institution gives hours per year. Anat, lec 60, rec 60, lab 110; Histol and Physiol, lec 60, rec 30, lab 150; Chem, lec 90, rec 30, lab 90; Med Phar, lec 30; Med Physics, lec 15, rec 30; Bacteriol, rec 30, lab 30.	This institution gives hours per year. Anat, lec 60, rec 60, lab 72; Physiol, lec 60, rec 30, lab 30; Chem, Urinalysis, Toxicol, lec 60, rec 30, lab 75; Mat Med, lec 60, rec 30, lab 60; Pathol, lec 30, rec 30, lab 60; Med, clin 60; Surg, clin 60.	This institution gives hours per year. Therapeu, lec 60, rec 30, lab 30; Pathol and morbid anat, lec 30, rec 30, lab 90; Topographical Anat, lec 30; Med, lec 30, rec 60, clin 120; Surg, prin of and clin, lec 60, rec 30, lab 40, clin 180; Obstet, lec 60, rec 30, lab 20, clin 30; Diseases of Chest, Throat and Nose, lec 30, rec 30, lab 20, clin 30; Skin, Genito-ur and venereal diseases, clin 60; Hygiene and Med Jurispru, lec 15; Dental Surg, lec 15.	This institution gives hours per year. Med, lec 30, rec 60, clin 120; Surg, practice of and clin, lec 60, rec 30, lab 30, clin 180; Obstet and Gynecol, lec 60, rec 30, clin 30; Diseases of Chest, Throat and Nose, lec 30, rec 30, lab 20, clin 30; Diseases of Children, lec 30, rec 30, clin 30; Eye and Ear, lec 30, rec 30, lab 16, clin 30; Skin, Genito-ur and venereal diseases, lec 15, rec 60, lab 15, clin 60; Mental Diseases, lec 10, clin 4; Preventive Med and Therapeu, lec 15, lab 30.
Central College of Physicians and Surgeons, Indianapolis, Ind. 1899-1900.	Anat 6, quiz 3; Osteol 12; Dissect 10; Physiol 4; Mat Med 4; Chem 4; Histol 6; Bacteriol 6.	Anat 6; Osteol 1; Dissec before Xmas 6; Physiol 3; Chem 3; Prin and Practice of Surg 2; Practice of Med 2; Phys Diag 2; Mat Med and Therapeu 3; Minor Gynecol 1; Pathol 3.	Mat Med and Therapeu 2; Pathol and morbid anat 1; Med 4; Ophthalmol 1; Obstet 3; Diseases of Nose and Throat 1; Genito-ur and venereal diseases 1; Med Jurispru 1; Surg 4; Gynecol and abdominal surg 3; Diseases of Mind and nervous system 3; Hosp Clin 8.	Med 4; Surg, practice of and clin 3; Obstet 3; Diseases of Nose and Throat 1; Diseases of Children 1; Ophthalmol and Otol 1; Skin, Genito-ur and venereal disease 1; Diseases of the Mind and nervous sys 3; Special Therapeu 2; Diseases of Women and abdominal surg 2; Hosp Clin 8.
Iowa College of Physicians and Surgeons, Drake Univ, Des Moines, Iowa. 1898-99.	Anat, lec and rec 4, dissec 12 a wk part term; Physiol, lec 4; Chem, inorgan, lec 2, lab 4; Mat Med, lec and rec 2; Histol, lab 4; Latin, rec 2.	Anat, lec and rec 4, dissec 12 a wk part term; Physiol, lec 4; Hygiene; Chem, organic and toxicol, lec 2, lab 2 1st part yr, 4 2d part yr; Mat Med, lec and rec 2; Pathol, lec and rec 3; Bacteriol, lec and lab, 3.	Practice, lec and rec 4; Phys Diag; Pathol, lec and lab 3; Surg, practice of or clin, 2, prin of, 2, minor surg, 2, genito-ur and rectal diseases 1; Ophthalmol, lec 1, clin ophthalmol and otol 1; Otol, Laryngol and Rhinol, lec 1; Dermatol, lec 1; Obstet, lec and rec 2; Therapeu, lec and rec 2; Gynecol, lec and rec 2, clin 2; Pediat, lec 1.	Practice, lec and clin 4; Nervous Diseases, lec and clin 2; Psychiat, lec 1; Surg, practice of and clin 2, prin of 2, genito-ur and rectal diseases 1; Ophthalmol, lec 1, clin ophthalmol and otol 1; Otol, Laryngol and Rhinol, lec 1; Dermatol, lec 1; Orthopedic Surg, lec 1 and clin; Obstet, lec and rec 3; Therapeu, lec and rec 2; Gynecol, lec 1, clin 2; Pediat, lec 1; Kidneys and Urinol, lec 1 a wk; Med Jurispru, lec 1 a wk after Jan 1.
Medical Department (regular) of the University of Iowa, Iowa City, Iowa. 1899-1900.	Anat, lec 4, rec 1, dissec 2 courses; Physiol, lec 3, rec 1; Gen Chem, lec 3, rec 4, lab 160 hrs in yr; Mat Med, lec 2, rec 1; Histol, lec 2, rec 1; Biol and Histol, lab 160 hrs in the yr; Bandaging 20 hrs in the yr.	Anat, lec 4, rec 1 before holidays, 2 after holidays, dissec 2 courses in term; Physiol, lec 3, rec 1 before holidays, 2 after holidays; Physiol Chem, lec 2, lab 60 hrs in term; Gen Path and Bacteriol, lec 2, rec 1, lab (path) 50 hrs in term; Mat Med organic, lec 2 before holidays, rec 1, inorganic, lec 1 before holidays; Therapeu, lec 1 after holidays; Obstet, lec 2; Med diag 1; Hygiene 1; Pharmacy, lec 10 during	Practice, lec 4, rec 1; Surg, lec 3, rec 1; Pathol, lec 2, rec 1, lab 52 hrs in term; Therapeu, lec 2, rec 1; Obstet, lec 2, rec 1; Gynecol, lec 1, rec 1; Toxicol, lec 1; Applied Anat (Med, Surg, and Nervous), lec 1; Applied Physiol of the nervous sys, lec 12 during term; Gen Med Surg, Gynecol and Ophthal clin 7 hrs; Bacteriol, lab 26 hrs during term.	Practice, lec 5, rec 1; Surg, lec 3, rec 1; Gynecol, lec 1, rec 1; Ophthal, lec 1; Otol, Rhinol and Laryngol, lec 1; Dermatol, lec 1 after holidays; Pediatrics, lec 1 after holidays; Operative Surg 12 hrs during term; Operative Obstet 12 hrs during term; Med jurispru, lec 12 during term; Dentistry, lec 5 during term; Hæmatol, 5 hrs during term; Insanity, lec 12 during term; Gen Med Surg, Gynecol, Ophthal, Aural, Rhinol, and Laryngol clin 9 hrs; Clin and Medico legal Micros 26 hrs in term.

		term, lab 30 hrs during term; Embryol lab optional; Gen University Clin when not otherwise engaged.		
Keokuk Medical College, Keokuk, Iowa. 1897–98.	Anat, lec 3, rec 1; Physiol, lec 3, rec 1; Chem, lec 2, rec 1, lab 160 hrs within the yr; Mat Med, lec 3, rec 1; Histol, lec 2, rec 1, lab 75 hrs within the yr; Dissec.	Anat, lec 3, rec 1; Physiol, lec 3, rec 1; Chem, lec 2, rec 1; Mat Med, lec 2, rec 1; Therapeu, lec 2, rec 1; Embryol, lec 1, rec 1; Diseases of Children, lec 1, rec 1; Dermatol, lec 1, rec 1; Med Jurispru, lec 1, rec 1; Pathol, lab 75 hrs within the yr; Dissec; Clin.	Practice, lec 3, rec 1; Surg, lec 2, rec 1; Obstet and Gynæcol, lec 3, rec 1; Diseases of Children, lec 1; Med Jurispru, lec 1; Ophthalmol, Otol and Rhino-Laryngol, lec 1; Dermatol, lec 1; Rectal Diseases, lec 1; Pathol, lec 1; Dentistry, lec 1; Bacteriol; Lab; Clin.	Practice, lec 3, rec 1; Phys Diag, lec 1, rec 1; Surg, lec 3, rec 1; Obstet, lec 2 rec 1; Gynecol, lec 1, rec 1; Diseases of the Nervous System, lec 1, rec 1; Ophthalmol and Otol, lec 1, rec 1; Operative Surg, lec 1, rec 1; Operative Gynecol, lec 1; Clin.
Sioux City College of Medicine, Sioux City, Iowa. 1897–98.	Gen Chem, lec 2 a wk for 56 wks, lab 3 a wk for 28 wks; Anat, gen, descriptive and regional, lec, 3 a wk for 56 wks; Histol, lec 1 a wk for 28 wks, lab 4 a wk for 28 wks; Mat Med and Pharmacy, lec 1 a wk for 28 wks, lab 2 a wk for 28 wks; Physiol, lec 3 a wk for 56 wks; Clin, 10 hrs; dissec, lab 12 a wk for 4 wks.	Med Chem, including toxicol and urinalysis, lec 1 a wk for 28 wks, lab 2 a wk for 28 wks; Anat, gen, descrip and regional, lec 3 a wk for 56 wks, Physiol, lec 3 a wk for 56 wks; Therapeu, lec 2 a wk for 56 wks; Hygiene and Sanitary Science, lec 1 a wk for 28 wks; Gen Pathol and Bacteriol, lec 1 a wk for 56 wks, lab 2 hrs a wk for 56 wks; Clin, 10 hrs; Dissec, lab 12 a wk for 8 wks +.	Therapeu, lec 2 a wk for 56 wks; Gen Pathol and Bacteriol, lec 1 a wk for 56 wks, lab 2 a wk for 56 wks; Obstet, lec 2 a wk for 56 wks; Gynecol, lec 1 a wk for 56 wks, clin; Practice, lec 3 a wk for 56 wks; Surg, lec 6 a wk for 56 wks; Orthopedic and Railway Surg, lec 1 a wk for 28 wks; Minor Surg and fracture dressings, lab 2 a wk for 14 wks; Operative Surg on Cadaver, lab 12 a wk for 4 wks; Ophthalmol, Laryngol, and Otol, lec 1 a wk for 28 wks; Diseases of Nervous Sys, lec 1 a wk for 56 wks; Med History and Ethics, lec 1 a wk for 7 wks; Genito-ur diseases, lec 1 a wk for 14 wks; Diseases of the Mind, lec 1 a wk for 8 wks in either 3d or 4th yr; Forensic Med, lec 1 a wk for 14 wks in either 3d or 4th yr; Electro Therapeu, lec 1 a wk for 7 wks; Clin 10.	Obstet, lec 2 a wk for 56 wks; Gynecol, lec 1 a wk for 56 wks, clin; Practice, lec 3 a wk for 56 wks; Surg, lec 6 a wk for 56 wks; Orthopedic and Railway Surg, lec 1 a wk for 28 wks; Minor Surg and fracture dressing, lab 2 a wk for 14 wks; Operative Surg on Cadaver, lab 12 a wk for 4 wks; Ophthalmol, Laryngol, Otol, lec 1 a wk for 28 wks; Diseases of Nervous Sys, lec 1 a wk for 56 wks; Med History and Ethics, lec 1 a wk for 7 wks; Genito-ur diseases, lec 1 a wk for 14 wks; Diseases of the Mind, lec 1 a wk for 8 wks in either 3d or 4th yr; Diseases of Children, lec 1 a wk for 28 wks; Forensic Med, lec 1 a wk for 14 wks in either 3d or 4th yr; Dermatol, lec 1 a wk for 14 wks; Clin 10.
Portland School for Medical Instruction, Portland, Me. 1899.	Histol, rec 2; Anat, rec 2; Physiol, rec 1; Dissec on lower animals latter part yr.	Physical examinations at hosp 2; Obstet 2; Anat 4; Mat Med 2; Minor Surg 2 for ½ yr; Physiol 2; Lec at hosp 2; Surg clin and operations 2 a wk in 1st term, 1 a wk in 2d term; Lec at hosp 1; Dissec at close of term.	Surg 2; Practice 4; Mat Med 2; Eye and Ear 2 for ½ yr; Minor Surg 2 for ½ yr (elective); Lectures at hosp 2; Med clin at hosp 2; Gynecol 2; Clinics and operations at hosp 2 for 1 term; Lectures and clinics at hosp, 2 hrs 1 term; Bacteriol and clin Micros at hosp 1 for ½ yr; Pathol and Path Histol at hosp 1; Diseases and Injuries of the Genito-ur Organs, lec 5 for ½ yr.	
Baltimore Medical College, Baltimore, Md. 1898–99.	Biol (including comparative anat and embryol), lec 3, lab 2; Human Anat, lec 1, lab from 3 to 5 p. m. in Feb and Mar; Ostcol and Syndesmol, lec or demonstra 2; Histol, lec 3, lab 2; Physiol, lec 2, demonstra 1; Chem, lec 3, lab 2; Clin.	Human Anat, lec 3, lab 5; Physiol, lec 2, demonstra 1, lab 2; Pathol, lec 2, lab 3; Chem, lec 3, lab 2; Mat Med, lec 1, rec 1; Clin.	Practice, lec or rec 1, clin 1, hosp and dispen 3; Surg, lec 1, hosp and dispen 3; Clin surg 1; Obstet, lec 1, lab 1, clin; Neurol, lec 1, clin 1, hosp and dispen; Therapeu, lec 3; Eye and Ear, lec 1, clin 1, dispen; Gynecol, clin 2, hosp and dispen 6; Med diag, lec 1, hosp and dispen; Hygiene, lec 1 per wk in 1st ½ yr; Med jurispru, lec 1 per wk in 2d ½ yr; Operative surg, lec 2, lab 2; Bacteriol, lec 1, lab 2; Dermatol, lec or clin 1; Bandaging; Clin.	Practice, lec 3, clin 1, hosp and dispen practice 3; Surgery, lec 2, hosp and dispen practice 3; Clin surg, clin 1, hosp and dispen practice; Obstet, lec 2, clin (10 to 15 cases by each student during session); Gynecol, lec 1, clin 2, hosp and dispen practice 6; Nose, throat, and chest, lec 1, clin 1, hosp and dispen practice 3; Therapeu, lec 3; Diseases of Children, lec 2, clin 1, hosp praetice; Clin Pathol, lec 1, lab 2; Clin.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
College of Physicians and Surgeons, Baltimore, Md. 1898-99.	Chem, lec 2, lab 3; Histol, lec 3, lab 3; Anat, lec 3, quiz 2; Hygiene, lec 1; Physiol, lec 3, quiz 2; Dissec 6; Osteol, lec 6; Mat Med, lec 3, quiz 2; Embryol, lec 1; Bacteriol, lec 1.	Bacteriol, lec 1, lab 4; Anat, lec 3, quiz 2, demonstra 1; Hygiene, lec 1; Physiol, lec 3, lab 3, quiz 2; Pharmacol, lec 3, quiz 2; Chem, Org, lec 1, physiol, lec 1, lab 3; Pathol and Med Jurispru, lec 2; Pathol, quiz 2, lab 2; Dissec 6.	Surg, lec 4; Practice, lec 3; Therapeu, lec 2, quiz 1; Diseases of nervous sys, lec 1; Obstet, lec 2, quiz 1; Surgical 2; Medical 1; Quiz 3; Genito-ur Surg, lec 1; Pathol, clin diag in lab 1; Diseases of Eye, lec 2; Phys Diag, lec 3; Gynecol, lec 1, clin 2; Operative Surg 2; Mental Diseases, lec 1; Diseases of Ear, lec 1; Diseases of Stomach, lec 1; Pediatrics, lec 1; Dermatol, lec 1.	Hosp work 6; Surg 4; Gynecol, lec 1, clin 2; Pediat, lec 1; Practice, lec 3; Genito-ur Surg, lec 1; Operative Surg, lec 2; Ward classes, surg and gynecol, med, and dispen, 5 hrs; Dermatol, lec 1; Obstet, lec 2; Operative Obstet, lec 1, demonstra 1; Diseases of Stomach, lec 1.
Johns Hopkins University, Medical Department,[1] Baltimore, Md. 1899-1900.	Osteol, lec and lab Oct 1 to Nov. 15, afternoons; Sys Anat, Nov 15 to Mar 15, afternoons; Conferences in Anat, Nov 15 to Mar 15, 3 times a wk; Histol and Histogenesis, Oct 15 to Nov 15 forenoons; Macroscopic Organol, Nov 15 to Feb 1, Friday mornings; Microscopic Organol, Nov 15 to Feb. 1, 3 forenoons a wk; Neurol, Feb 1 to Mar 15, 3 forenoons a wk; Seminary, Nov 1 to Feb 1, Friday, 12 o'clock (limited students); Advanced work, Mar 15 to June 1, daily (limited no. of students); Physiol, Jan 1 to June 1, lec rec and demonstra, 11 a. m. to 1 p. m. twice weekly until Mar 15, 5 days a wk after Mar 15; Physiol Chem, lab, Mar 1 to June 1, afternoons 5 days a wk, lec 2 or 3 a wk after Mar 1, rec 1 a week after Mar 1.	Anat, sys anat, Nov 15 to Mar 15 forenoons, regional anat, Jan 1 to Mar 15 forenoons, conferences in anat, Nov 15 to Mar 15, 3 times a wk; Neurol, lec Feb 1 to Mar 15, 3 times a wk, 9 o'clock, advanced work and original investigation, Oct 1 to June 1 daily (limited no. of students); Physiol, Oct 1 to Xmas, lab work in sec, 2 a wk 10 to 1, lec and rec 9 to 10, 5 a wk; Bacteriol, Oct 1 to Xmas, lab 2 to 5 in 3 days of wk, rec 1 a wk, lec on infection and immunity, once or twice a wk; Pathol (and post-mortem exam, gen pathol, pathol anat and histol and pathol demonstra), Jan 1 to June 1, lab 2 to 5 in 3 days of wk, rec 1 a wk, lec 1 or 2 a wk, post-mortem ex, demonstra of gross morbid specimens 1 a wk; Pharmacol and Toxicol, Jan 1 to June 1, lec, lab,	Practice, phys diag, twice a wk for each section, gen symptomatol of disease, dispen work with clin 3 days a wk, clin in hosp 1 a wk, rec 1 a wk; Clin Micros, lab 3 to 5 in 3 days of wk; Surg, dispen work with clin, mornings 3 days a wk, clin at hosp 10 to 1, once a wk, rec 1 a wk, lab work in surg pathol 3 to 5, twice a wk, prac course in operative surg, surg anat and operations on cadaver Jan 1 to Mar 15. twice a wk; Obstet, lec, rec and demonstra 3 times a wk, lab and manikin exercises, 2 hrs twice a wk; Diseases of Nervous System, dispen 10.30 to 12 daily, 1 a wk for each section, clin 1 a wk, rec 1 a wk; Pharmacy, lec and demonstra, 2 a wk for 3 mos; Prac Therapeu and Dietetics, lec, demonstra and conferences, 2 a wk; Hygiene, lec and demonstra on special topics, 1 a wk for 2 mos; History of Med, lec attended by all students.	Practice, hosp wards (ward work and ward classes), 8.30 to 10.30 a. m. daily, 2 mos for each section, clin 1 a wk, rec 1 a wk; Surg, hosp wards and operating room 9 to 12 daily, 2 mos for each section, clin 10 to 1, once a wk, rec 1 a wk, operative surg, Obstet, hosp wards, 8.30 to 10.30 a. m. daily, 2 mos for each section, out-patient obstet service 2 mos for each section, rec 1 a wk; Gynecol, hosp wards and operating room 9 to 12 daily 2 mos for each section, ward classes 2 a wk, touch course 1 a wk, lec 1 a wk, rec 1 a wk, lab work and demonstra in Gynecol Pathol 1 a wk; Dermatol, dispen 2 mos for each section. 2 to 2.30 daily, lec, rec, and clin 1 a wk; Diseases of Children, dispen 10.30 to 12 daily, 2 mos for each section, lec, rec and clin 1 a wk; Genito-ur diseases, dispen 10.30 to 12 daily, 2 mos for each section, lec, rec, and clin 1 a wk; Laryngol and Rhinol, dispen 2 to 2.30 daily 2 mos for each section, lec, rec, and clin 1 a week; Ophthalmol and Otol, dispen 2 to 3.30 daily 2 mos for each section, lec, rec, and clin, 1 a wk; Psychiatry, lec 1 a wk, clin at Bay View 1 a wk; Forensic Med, lec 1 a wk for 3 mos; Med Zool, 10 lec with demonstra and lab work on Animal Parasites.

		demonstra, 2 afternoons a wk. rec 1 a wk; Auscultation and Percussion, preliminary course, Apr 15 to June 1, 10 to 12 twice a wk.		
University of Maryland, School of Medicine, Baltimore, Md. 1898-99.	Physiol, lec and rec 3, demonstra 1; Chem, lec 2, lab 6 hrs a wk ½ yr; Anat, lec and rec 3; Osteol, in sections, rec and dem 1, dissec daily 2½ hrs; Mat Med, lec, dem, and rec 2; Normal Histol 1, lab and demonstra 6 hrs a wk for 2 mos.	Physiol, lec and rec 3, demonstra 1, surg bandaging in sections 3 hrs; Therapeu, lec and rec 2; Chem, organic and physiol, lec 1 and lab 4 a wk for 3 mos; Anat, lec, rec, demonstra 3, dissec in sections daily 2½ hrs; Embryol and special Histol, lab and demonstra 4 hrs; Pathol and bacteriol, lec and demonstra 1 and lab 6 a wk for 3 mos; Autopsies.	Practice, lec and rec 3, clin 2; Diseases of Children, lec and rec 1, clin 1; Diseases of Women, lec 1, clin 1; Med Jurispru and Hygiene 1; Phys diag in sections 1; Eye and Ear diseases, lec 1, clin 1; Surg, lec and rec 3, clin lcc 3, demonstra in sections 1; Obstet, lec 2, demonstra 1, clin 1; Therapeu, lec and rec 2; Diseases of Nervous System, clin 1; Diseases of Throat and Nose, clin 1; Diseases of Skin 1.	Practice, lec and rec 3, clin lec, ward and dispen instruc; Diseases of Children, lec and rec 1, clin lec and dispen instruc; Diseases of Women, lec and rec 1, clin lec, ward and dispens instruc; Eye and Ear diseases, lec 1, clin lec 1, demonstra; Clin Surg, clin conferences in surg; Genito-ur Surg; Obstet, clin conferences 1, attendance upon labor cases, ward visits; Special clin; Clin lab class in sections 2 hrs.
Woman's Medical College of Baltimore, Md. 1898-99.	Chem, lec and rec 2, lab 4; Physiol, lec and rec 2; Anat, lec and rec 3; Embryol, lab 4; Mat Med, lec and rec 1; Pharmacy, lec 1, lab 2; Osteol, lec and rec 1.	Chem, lec and rec 2; Physiol, lec and rec 2; Anat, lec and rec 3; Pathol, lec 1; Hygiene, lec and rec 1; Mat Med, lec and rec 2; Histol, lec 1, lab 1; Bacteriol, lab 4.	Practice, lec and rec 2, clin 1; Obstet, lec and rec 3; Pathol, lec 1, lab 4; Surg, lec and rec 2, clin 2; Operative Surg, lec and rec 1; Diseases of Women, lec and rec 2, clin 1; Mat Med, lec and rec 2; Diseases of Eye and Ear, lec and rec 1, clin 1; Diseases of Children, lec and rec 2, clin 1; Phys Diag, lec and rec 1; Med Jurispru, lec and rec 1; Clin on Stomach 1.	Practice, lec and rec 2, clin 1; Surg, lec and rec 2, clin 2; Diseases of Women, lec and rec 2, clin 1; Diseases of Eye and Ear, lec and rec 1, clin 1; Psychiatry, lec and rec 1, clin 1; Obstet, lec and rec 2, clin 1; Diseases of Children, lec and rec 2, clin 1; Neurol, lec and rec 1; Clinic on Stomach, 1; Nose and Throat clinics 1; Clin Micros 1, +2 hrs a wk after Feb. 1.
College of Physicians and Surgeons, Boston, Mass. 1897-98.	Gen Chem, lec 3 and lab 7½ a wk 1st ½ yr; Physiol Chem, lec 3 and lab 7½ a wk 2d ½ yr; Mat Med, lec 1 and rec 1 1st ½ yr; Physiol, lec, rec, lab, and demonstra 4; Biol, Histol, and Embryol, lec and lab 5 a wk 1st ½ yr, lec and lab 3 a wk 2d ½ yr; Anat, Osteol, 3 a wk 1st ½ yr, dissec 5 a wk 2d ½ yr.	Mat Med, lec or rec 1 a wk 1st ½ yr; Therapeu, lec or rec 2 a wk 2d ½ yr; Hygiene, lec 2 a wk 1st ½ yr; Phys diag, lec or clin 1 a wk 2d ½ yr; Bacteriol and Pathol, lec 2, lab 5; Anthropometry, lec 1 a wk 1st ½ yr; Electives, lec or exercises 2 a wk 1st ½ yr, lec or exercise 1 a wk 2d ½ yr; Histol, lec 3; Physiol, lec 3; Anat, exercises 3 a wk 1st ½ yr.	Pathol, rec 3; Clin 6; Phys Diag Clin, rec 1; Laryngol, lec and rec 1 a wk 1st ½ yr; Dermatol and Syphilis, lec 2 a wk 1st ½ yr; Operative Surg, lec 1 and rec 1 a wk 2d ½ yr; Elective (clinics), 1 a wk 1st ½ yr, 2 a wk 2d ½ yr; Surg, lec 1; Practice, lec 2; Obstet, lec 2, rec 1,	Clin 7; Elective 3; Surg, operative and clin, lec or rec 2; Gynecol and Abdom Surg, lec 1; Neurol, lec 1; Practice, lec 2, rec 1; Ophthalmol, lec 1 a wk 1st ½ yr; Pediat, lec 1 a wk 1st ½ yr; Otol, lec 1 a wk 2d ½ yr; Genito-ur Surg, lec 1 a wk 2d ½ yr; Obstet, lec 1 a wk 1st ½ yr; Med Jurispru, lec 1 a wk 2d ½ yr.

[1] For work in hospital wards and dispensary the fourth-year class is divided into four sections, each serving two months as clinical clerks or surgical dressers in the Medical, Surgical, Gynecological and Obstetrical Wards of hospital and also two months in special departments of dispensary, viz, Dermatological, Genito-urinary, Laryngological and Rhinological, Ophthalmological and Otological, and Pediatric.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
Harvard University, Medical School, Boston, Mass. 1898-99.[1]	Anat, 4 a wk till Jan, 3 a wk in Jan, Prof Dwight 2 a wk after Nov, rec 1; Prac anat with dissec 8 hrs daily Oct 15 till May in sections, demonstra; Histol, lec 1 a wk 1st ½ yr, lab 2 a wk 1st ½ yr; Bacteriol, lec 18 in 2d ½ yr, lab 18 in 2d ½ yr; Physiol, 4 a wk in 1st ½ yr, 6 a wk in 2d ½ yr, lab 3 a wk; Chem, 2 a wk in 1st ½ yr, 1 a wk in 2d ½ yr, clin 2, lab daily. (See footnote on next page.)	Anat, 2 a wk till Jan, 3 a wk in 2d term; Surg Bandage, etc, 1st term, rec in surg pathol 2 a wk in 1st term, lab 2 a wk 2d term; Theory and Practice of Physic 2, clin 1, auscultation and percussion 6 a week 1st ½ yr, bedside instruc; Therapeu and Mat Med, 2; Pathol 2, special pathol with demonstra and rec 2, lab 2 a wk till Mar; Autopsies. (See footnote on next page.)	Surg, lec and rec 3; Orthopedic Surg, lec 1 a wk for 4 mos, clin quizzes 3 a wk for 4 mos, clin exercises (elective) 2 a wk for 4 mos or 4 a wk in sections for 4 mos; Clin Surg, conference 1 a week from Oct till May, clin visits in hosp 1 and in small sections daily; Dermatol, lec 1, clin 1; Theory and practice of physic, lec 2, clin lec 2, clin 4; Neurol, clin 1 a week 1st term, 2 a week 2d term; Psychiatry, lec 1 a week 2d ½ yr; Pediatrics, lec 3 a wk till Jan, 1 a wk after Jan, clin 2 a wk in Feb, Mar, and Apr, rec 2 a wk in Jan and 3 a wk in May, phys exam 1 a wk Nov to Apr inclusive; Contagious Diseases 3 a wk Oct to Jan inclusive; Obstet, lec 2, rec 1, prac exercises; Gynecol, lec or rec 2 a wk 1st ½ yr, clin 6 a wk till Apr, then 3 a wk.	Anat (elective), Embryol, Histol (elective); Bacteriol, advanced (elective) 6 a wk till Jan; Physiol, advanced (elective) 2; Chem (elective) 2 ½ days a wk; Clin Surg, lec 2, visits 2, operations 2, surg diag 1, surg emergencies; Exercises illustrated upon cadaver twice a wk in Nov and Dec; Clin dermatol 2; Syphilis, lec 1 a wk in 1st ½ yr, clin 3 a wk in 1st ½ yr; Clin Med 2, conference 1, dispen 2 a wk 2d ½ yr; Neurol, clin 3 a week 1st ½ yr, 2 a wk 2d ½ yr; Psychiatry, clin 1 a wk 2d ½ yr; Gynecol, clin 2, conference 1 a wk 2d ½ yr, lecture on ovarian tumors 1 a wk for 6 wks; Ophthalmol, lec 1 a wk 1st ½ yr, clin 8 a wk 1st ½ yr, 4 a wk 2d ½ yr; Otol, lec 2 a wk till Jan, clin 3 a wk 1st ½ yr, 6 a wk 2d ½ yr, rec on anat of ear 2 a wk in Oct; Throat and Nose, prac exercises 3, lec 1; Orthopedics, lec 1 a wk 1st ½ yr, clin 3 a wk 1st ½ yr, 6 a wk 2d ½ yr (elective); Hygiene, lec and demonstra 3 a wk 2d ½ yr, lab 3 (elective); Genito-ur Diseases 1; Legal Med 3 a wk 1st ½ yr; Municipal Sanitation 2 a wk in Feb and Mar; Clin Microscopy, lab 3; Etiol of Infec Diseases 2 a wk 2d ½ yr; Cookery 2 a wk for 1 mo.
Tufts College Medical School, Boston, Mass. 1899-1900.	Anat, lec, rec, demonstra, dissec 5; Physiol, lec, dissec, lab 3; Histol, lec and lab 4; Gen Chem, lec and lab 5.	Pathol, lec, demonstra, lab 5; Bacteriol, lec and lab 4; Applied Anat, lec and rec; Mat Med and Therapeu, lec and rec 3; Med Chem and Toxicol, lec and lab, 6 hrs required, 20 hrs optional.	Practice, lec and rec 3; Surg, lec and rec 6; Obstet, lec, rec, conferences, clin, bedside instruc 3; Abdom Surg, lec 1 a wk for 21 wks; Gynecol, lec, rec, clin 3; Pediat, lec and demonstra 2; Hygiene.	Clin Med 4; Clin Surg, lec, rec, demonstra, clin, 6; Ophthalmol, lec and clin 1; Otol, lec and clin 2; Neurol, lec 1; Dermatol, clin 2 a wk for 12 wks; Laryngol and Rhinol, lec and clin 4 a wk for 3 mos; Diseases of the Rectum; Genito-ur Diseases; Orthopedic Surg, lec and clin 2; Mental Diseases, lec 1; Electro-therapeu; Legal Med, lec 1 a wk during 1st ½ yr.
University of Michigan, Department of Medicine and Surgery (regular), Ann Arbor, Mich. 1898-99.	Osteology, lec and rec 2 a wk 1st ½ yr; Gen Anat, lec and rec 2, lab 4 hrs a day for 12 wks; Gen Chem, lec and rec 5 hrs a wk 1st ½ yr, lab 4 hrs a day for 12 wks; Organic Chem, lec and rec 5 hrs a wk 2d ½ yr; Qualitative Analysis, lec and rec 2 a wk 1st ½	Anat of Nervous System, lec and rec 3 a wk 1st ½ yr; Regional Anat, rec and lec 1 a wk 2d ½ yr; Surg Anat, lec and rec 1 a wk 2d ½ yr; Anat, lab 4 hrs a day for 12 wks; Physiol, lec and rec 5, lab 16 hrs a wk for 6 wks; Hygiene, lec and rec 3 a wk 1st ½ yr,	Practice, lec and rec 4; Clin Med, lab and demonstra 24 hrs a wk for 5 wks; Gen Surg, lec and rec 2, clin 2, lab and demonstra 24 hrs a wk for 5 wks; Mat Med and Therapeu, lec and rec 5; Gen Pathol, lec and rec 2 a wk 1st ½ yr, lab and demonstra 24 hrs a wk for 8 wks; Obstet, lec and rec 4 a wk 2d ½ yr, lab and demonstra 12 hrs a wk for 5 wks; Gynecol, lab and demonstra 12 hrs a wk for 5 wks, clin 2; Nervous Diseases, lab and demonstra 24 hrs a wk for 5 wks, clin 1; Internal Med,	Practice, lec and rec 2; Internal Med, clin 4; Surg, lec and rec 3, clin 2 afternoons per wk; Obstet and Gynecol, lec and rec 3, clin 2 afternoons per wk; Diseases of the Nervous System, lec and rec 2; Dermatol and Syphilol, lec and rec 2, clin 2; Ophthalmol, Otol, and Laryngol, lec and rec 2, clin 2 afternoons per wk; Med Jurispru, 20 lectures during the year; Bedside and dispen instruc; Special lec.

	yr; Histol, lec and rec 4 a wk 2d ½ yr; Physics, lec and rec 4 a wk 2d ½ yr; Bacteriol, lec and rec 4 a wk 1st ½ yr, lab 4 hrs a day for 12 wks.	2 a wk 2d ½ yr; Embryol, 4 a wk 1st ½ yr; Physiol Chem, lec and rec 3 a wk 2d ½ yr, lab 4 hrs a day for 12 wks; Gen Pathol, lec and rec 2 a wk 2d ½ yr; Histol, lab 4 hrs a day for 6 wks; Electro-therapeu, lab 4 hrs a day for 6 wks.	clin 2; Ophthalmol, Otol, and Laryngol, lab and demonstra 24 hrs a wk for 5 wks; Ophthalmol, clin 2; Practical Pharmacol, 16 hrs a wk for 6 wks.	
University of Michigan, Homeopathic Medical College, Ann Arbor, Mich. 1899–1900.	Practice, lec and rec 1 a wk 1st ½ yr; Osteol, lec and rec 2 a wk 1st ½ yr; Gen Anat, lec and rec 2, lab 24 hrs a wk for 12 wks; Gen Chem, lec and rec 5 a wk 1st ½ yr; Organic Chem, lec and rec 5 a wk 2d ½ yr; Chem, lab 24 hrs a wk for 12 wks; Bacteriol, lec and rec 4 a wk 1st ½ yr, lab 24 hrs a wk for 12 wks; Mat Med, lec and rec 2 a wk 2d ½ yr; Pharmacy, lec and rec 1 a wk 2d ½ yr; Physics, lec and rec 4 a wk 2d ½ yr; Histol, lec and rec 4 a wk 2d ½ yr.	Mat Med, lec and rec 2; Minor Gynecol, lec and rec 1; Practice, lec and rec 1; Theory and Practice, lec and rec 1; Surg, lec and rec 2; Physiol, lec and rec 5; Hygiene, lec and rec 3 a wk 1st ½ yr, 2 a wk 2d ½ yr; Embryol, lec and rec 4 a wk 1st ½ yr; Physiol Chem, lec and rec 3 a wk 2d ½ yr, lab 24 hrs a wk for 12 wks; Anat, lab 24 hrs a wk for 12 wks; Histol, lab 24 hrs a wk for 6 wks.	Practice, lec and rec 3, clin 3; Surg, lec and rec 3, clin 4; Gynecol, major, lec and rec 2, clin 4; Gynecol, minor, lec and rec 1; Obstet, lec and rec 2; Mat Med, lec and rec 3; Ophthalmol, Otol, and Laryngol, lec and rec 2, clin 4; Pathol Histol, lec and rec 2; Prac Pathol, lab 24 hrs a wk for 8 wks.	Practice, lec and rec 3; Ophthalmol, lec and rec 1; Gynecol, lec and rec 2 a wk 1st ½ yr and 3 a wk 2d ½ yr, clin 2; Mat Med, lec and rec 2 a wk 1st ½ yr and 3 a wk 2d ½ yr; Surg, lec and rec 3 a wk 1st ½ yr and 4 a wk 2d ½ yr, clin 2; Nervous Diseases and clin, lec and rec 1; Med Clin 2; Clinics, Eye, Ear, Nose, and Throat, 2; Otol, lec and rec 1 a wk 1st ½ yr; Obstet, 1 a wk 1st ½ yr; Laryngol, 1 a wk 2d ½ yr; Homeopathy, lec and rec 1 a wk 1st ½ yr; Med Jurispru, 1 a wk 2d ½ yr.
Detroit College of Medicine, Detroit, Mich. 1899–1900.	Anat, lec and rec 3, lab 6 a wk for 12 wks; Physiol, lec and rec 3; Med Clin 3; Gen Chem, lec and rec 3, lab 6 a wk for 8 wks; Mat Med, lec and rec 2; Histol, lec and rec 2, lab 6 a wk for 8 wks; Clin 2; Embryol, lec and rec 1; Surg Clin 2; Biol, lec and rec 1.	Descriptive Anat, lec and rec 2, lab 12 a wk for 12 wks; Physiol, lec and rec 3; Med Clin 3; Hydro-Therapeu, lec and rec 1; Pathol, lec and rec 2; Bacteriol, lec and rec 2, lab 12 hrs a wk for 12 wks; Mat Med, lec and rec 2; Clinics 2; Org Chem, lec and rec 2, lab 12 a wk for 12 wks; Surg Clin 2; Hygiene, lec and rec 1; Electro-Therapeu, lec and rec 1; Surg Anat, lec and rec 1.	Minor Surg, lec and rec 1 a wk for ½ yr; Prin of Surg, lec and rec 1; Operative Surg, lec and rec 1; Genito-ur diseases, lec and rec 1 a wk for ½ yr; Therapeu, lec and rec 1; Med Clin 3; Practice, lec and rec 3; Special Pathol, lec and rec 1; Pathol of nervous sys, lec and rec 1; Clinics 2; Pathol lab 12 a wk for 8 wks; Med Jurispru, lec and rec 1; Obstet, lec and rec 2; Physiol Chem, lec and rec 1; Physiol lab 12 a wk for 8 wks; Ophthalmol and Otol, lec and rec 1; Surg Clin 2; Experimental Pharmacol, lec and rec 1; Physical Diag, lec and rec 1; Dietetics, lec and rec 1.	Surg, lec and rec 3; Orthopedic Surg, lec and rec 1 a wk for ½ yr; Operative Surg, 3 a wk for 8 wks; Therapeu, lec and rec 1; Med Clin 3; Section Clinics 6; Surg Clin 2; Clinics 3; Practice, lec and rec 3; Laryngol, lec and rec 1; Pediat, lec and rec 1; Ophthalmol and Otol, lec and rec 1; Obstet, lec and rec 2; Gynecol, lec and rec 1; Phys Diag, lec and rec 1; Dermatol, lec and rec 1; Neurol, lec and rec 1.

[1] Since this synopsis was prepared the Announcement for 1900 has been received, which says: "Beginning with this year (1899-1900) a new arrangement of the subjects taught in the first two years will be followed. During the first half of the first year the students will devote their time entirely to Anatomy and the correlated subjects Histology and Embryology, and during the second half of the first year to Physiology and Physiological Chemistry. They will devote the first half of the second year to Pathology and Bacteriology, and the remainder of the second year to a variety of subjects which more particularly prepare the student for the clinical work of the third and fourth years." In the fourth year the course varies each month, and is therefore difficult to describe briefly. There are also several elective subjects.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
Hamline University, College of Medicine (Minneapolis College of Physicians and Surgeons), Minneapolis, Minn. 1898-99.	Anat, lec, rec, and demonstra 3, dissec 6; Histol and Embryol, lec and rec 2, lab 6 and rec; Physiol, lec, rec, and demonstra 4; Chem, lec 3, lab 4 and rec; Mat Med, lec 2.	Anat, lec, rec, and demonstra 2, dissec; Physiol, lec 4, lab and rec; Chem, lec 2, rec, lab 3; Mat Med, lec 2; Pathol, lec 2, rec 2, lab 4; Clin Surg, apparatus and bandaging at hosp, clin 2.	Surg Anat, lec and demonstra, 1 a wk for ½ yr; Pathol, lec 2, clin pathol 1, lab 4, rec 2; Bacteriol, lec 2, rec 1, lab 2; Therapeu, lec, quiz, demonstra, and clin 2; Practice, lec 2; Diseases of Chest, lec 1; Phys Diag and Clin Med, lec 1, clin 2 in hosp; Dermatol, lec and clin 1 a wk for ½ yr; Genito-ur diseases, lec and clin 1 a wk for ½ yr, section clin at hosp and dispen 1; Surg, practice lec 2, principles lec 1, apparatus and bandaging; Obstet, lec 3, clin; Gynecol, lec 2, rec and demonstra, gen clin 1; Pediat, lec 1, clin at hosp in sections weekly.	Practice, lec 2, rec; Diseases of Chest, lec 1; Phys Diag and Clin Med, lec 1, gen and sec clin 2; Neurol, lec, clin, and demonstra 1; Psychol Med, lec 1 a wk for ½ yr; Surg, practice lec 2, principles lec 1, apparatus and bandaging; Ophthalmol and Otol, lec 1, clin in sections 2, clin 3; Laryngol and Rhinol, lec and clin lec, clin in sections at hosp and dispen; Operative Surg, 1 a wk for ½ yr; Clin Surg at hosp 2; Obstet, lec 3, clin; Gynecol, lec 2, rec and demonstra, clin in sections 2, gen clin 1; Med Jurispru, lec 1; Dental Pathol and Therapeu, lec 1 a wk for 12 wks, clin demonstra at dispen in sections 1 a wk for 12 wks.
University of the State of Missouri, Department of Medicine, Columbia, Mo. 1899-1900.	Anat, lec and rec and lab 6; Histol, lec and rec 3; Chem, lec and rec 3, lab 2; Physics, lec and rec and lab 3; Osteol and Syndesmol, lec and rec 3 a wk 1st ½ yr; Embryol, lec 1 and lab 2 a wk 2d ½ yr.	Physiol, lec and lab 6; Pathol Anat, lec and lab 3; Surg Anat, lec and rec 3 a wk 1st ½ yr; Regional Anat, lec and rec 3 a wk 2d ½ yr; Toxicol, lec and rec and lab 3 a wk 1st ½ yr; Mat Med, lec and rec 3 a wk 2d ½ yr.	Practicé, lec and rec 3; Bacteriol, lec, rec, and lab 3; Clin Pathol, lec 2 and lab 1 a wk 1st ½ yr; Hygiene, lec 3 a wk 2d ½ yr; Surg, lec and rec 3 a wk 1st ½ yr; Obstet, lec and rec 3 a wk 2d ½ yr; Therapeu, lec and rec 3 a wk 1st ½ yr; Diseases of the Eye and Ear, lec and rec 3 a wk 2d ½ yr.	Clin Med 3; Clin Surg 3; Obstet, lec and rec 3 a wk 1st ½ yr; Gynecol, lec and rec 3 a wk 2d ½ yr; Children's Diseases, lec and rec 3 a wk 1st ½ yr; Electro-Therapeu, lec and rec 3 a wk, lab; Dermatol, lec and rec 3 a wk 1st ½ yr.
Kansas City Medical College, Kansas City, Mo. 1897-98.	Physiol, lec 3; Rec 2; Osteol, lec 2; Anat, lec 4; Mat Med and therapeu, lec 2, rec 1; Chem, lec 2, lab 2; Histol, lab 2; Bandaging 1; Dispensary 2; Med and surg clin 7; Phys Diag 1; Dissec 12½.	Surg, lec 5, clin 4; Practice, lec 3, clin 5; Surg Pathol, lec 2; Physiol, lec 3; Rec 1; Neurol, lec 1; Anat, lec 4; Therapeu, lec 2; Chem, lec 2, lab 2; Obstet, lec 2; Diseases of Children, clin 1; Med and surg clin 8; Chem and Histol, lab in sections 4; Bandaging 1; Dissec 12½.	Surg, lec 5, clin in sections 5; Practice, lec 3, clin 2; Anat, lec 1; Pathol, lec in sections 2, surg pathol 2; Neurol, lec 1, clin 1; Diseases of Children, lec 1, clin 1; Abdom Surg, lec 1; Diseases of Skin, lec 1; Laryngol, lec 1; Applied Therapeu, lec 1; Obstet, lec 2, clin 1; Gynecol, clin 5; Ophthalmol, clin 2; Genito-ur diseases, lec 1; Med Jurispru 1; Obstet 2; Operative obstet, 1 hr a wk alternate wks, diag 1.	
Medico-Chirurgical College, Kansas City, Mo. 1899-1900.	Anat, compar and prac, lec and rec 3; Physiol, lec 3; Chem, lec and rec 2, lab 4; Mat Med, lec and rec 2; Pharmacy,	Anat, lec and demonstra 2; Surg anat 1; Physiol lec and rec 2; Toxicol 1; Pathol 4, lec and demonstra, autopsies and	Practice, lec 2, clin 3; Gen Surg, lec 2, clin 2; Prin Surg and Surg Pathol, lec 1; Neurol, lec 1; Orthopedic Surg, lec 1; Gynecol, lec 1, clin 1; Obstet, lec 2; Therapeu, lec 2; Genito-ur and venereal diseases, lec 1, clin 1;	Practice, lec 4, clin 2; Gen Surg, lec 3, clin 3; Neurol, lec 1, clin 1; Orthopedic Surg, lec 1; Gynecol, lec 1, clin 1; Genito-ur and venereal diseases, lec 1, clin 1; Dermatol, lec 1, clin 1; Eye and Ear, lec 2, clin 1; Nose and Throat,

	lec and demonstra 1; Embryol, lec and demonstra 1; Normal Histol, lec and rec 2, lab 2; Gen Hygiene, lec 1.	demonstra and lab; Therapeu, lec and rec 2; Obstet, lec and rec 2; Phys Diag, lec and demonstra 1; Minor Surg 1, bandaging; Clin, lec 10.	Dermatol, lec 1, clin 1; Eye and Ear, lec 2, clin 3; Nose and Throat, lec 1, clin 1; Bacteriol, 1 a wk for ½ yr, lab; Clin Micros, 1 a wk for 2d ½ yr; Med Jurispru 1; Phys Diag, lec. 1.	lec 1, clin 1; Diseases of Children, lec 1, clin 1; Rectal Diseases, lec 1; Dispen Work, 2 each day throughout yr.
University Medical College, Kansas City, Mo. 1898-99.	Anat, lec 3, dissec 10; Mat Med, lec 3; Physiol, lec 3; Chem, lec 3, lab 2, rec 3; Surg dres'g 1; Pharmacy 1; Histol, lec 1, lab 1; Practice, lec. t.	Anat, lec 3, surg anat 1, dissec 10; Mat Med, lec 3; Physiol, lec 3; Chem, lec 3; Practice, lec 3, med clin 3; Eye and Ear, lec 1, clin 1; Gynecol, lec 1; Obstet, lec 2; Surg, lec 3, clin 5½; Diseases of Children, clin 1; Neurol, lec 2; Phys Diag 1; Throat and chest, clin 1; Pathol, lec 1; Genito-ur, clin 1½; Dermatol, clin 1½.	Anat, dissec 10, surg anat 1; Practice, lec 2, med clin 3; Surg, lec 3, clin 3; Hygiene, lec 1; Gynecol, lec 1; Obstet, lec 2; Med Jurispru, lec 1; Diseases of Children, clin 1; Phys Diag 1; Eye and Ear, lec 1, clin 1; Neurol, lec 2; Bacteriol 1; Throat and chest, clin 1; Genito-ur, clin 1; Dermatol, clin 1.	
Woman's Medical College, Kansas City, Mo. 1898-99.	Anat, lec 3; Physiol, lec 3; Histol and Micros; Mat Med; Chem; Lab; Pharmacy, Nomenclature; Dissec, entire body in 2 yrs.	Descrip and Surg Anat, lec 3; Bacteriol and Pathol; Physiol, lec 3; Mat Med and Therapeu; Chem and Urinary Analysis; Practice; Surg; Clin Surg; Nervous Diseases 2; Obstet; Diseases of Women and Children; Clin Med and Gen Clin.	Practice and Clin Med; Surg and clin surg, through course; Obstet and Clin Obstet; Diseases of Women; Diseases of the Mind and nervous sys; Diseases of Nose and Throat; Diseases of Children; Diseases of Eye and Ear, lec 1; Diseases of Skin; Med Jurispru; Hygiene; Diseases of Genito-ur; Pathol and Bacteriol; Gen Clin.	
Marion-Sims College of Medicine, St. Louis, Mo. 1899-1900.	Anat, lec 2, rec 2, demonstra on cadaver, lab work in dissec 15 hrs a wk for 8 or 10 wks; Physiol, lec 4 a wk for ½ yr, rec 2 a wk for ½ yr, demonstra in conjunction with lec; Inorg Chem, lec 2 rec 1, demonstra in conjunction with lec, lab work 4; Osteol and Arthrol, lec 1, rec 1 and demonstra; Normal Histol, lec 3 a wk for ½ yr, rec 1 a wk for ½ yr, demonstra and lab 4; Embryol, lec 1 and demonstra.	Anat, lec 2, rec 1, demonstra on cadaver, lab work in dissec 15 hrs a wk for 8 or 10 wks; Physiol, lec 2, rec 1, lab 1 and demonstra; Org Chem, lec 1, rec 1, lab 1 and demonstra; Pathol, lec 2, rec 1; Pathol Anat, lab 4; Mat Med, lec 2, rec 1, and demonstra; Phys Diag, lec 1; Gen Med, clin lec 3; Gen Surg, clin lec 3; Anat of Eye and Ear, lec 1 a wk for ½ yr and demonstra in dissec room.	Practice, lec 4, clin lec 3; Surg, lec 4, clin lec 3, lab work 1 hr a wk in bandaging and preparation of surg dressings; Pathol Anat, lec 2, demonstra 4; Therapeu, lec 1; Obstet and Pelvic Anat, lec 1; Diseases of Chest, lec 1; Prac Diag, clin instruc at hosp 1; Bacteriol and Hygiene, lec 2, lab 2 and demonstra; Diseases of Children, lec 1; Clin Chem and Micros, lec 1, lab 1 and demonstra; Surg dressings, lec 1 and lab; Ophthalmol, lec 1; Otol, lec 1.	Practice, lec 4, clin lec 3, and demonstra; Surg, lec 4, clin lec 3, prac clin instruc to sections and lab work in operative surg on cadaver; Gynecol and Pelvic Diseases, lec 2, clin lec 1, and demonstra to sections; Obstet, lec 3, rec 1, and demonstra (incl confinements and demonstra of signs of pregnancy); Diseases of the Chest, clin lec 1; Diseases of Children, clin lec 1, demonstra to sections; Diseases of Nose and Throat, lec 1, clin lec 1, and demonstra to sections; Ophthalmol and Otol, clin lec 1, and demonstra 1 hr a wk; Genito-ur diseases, lec 1, clin lec 1 hr alt wk; Mental and nervous diseases, lec 2, clin lec 1; Med Jurispru, lec 1; Dermatol and Syphilis, lec 2, clin lec 1 hr alt wk, and demonstra to sec; Railway Surg, lec 1.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
The St. Louis Medical College, Washington University, St. Louis, Mo. 1898-99.	Gen Chem, lec and demonstra 3 hrs a wk 1st term, lab 4 a wk 1st term, lab in Qualita Anal 7 hrs a wk 2d term; Osteol and Syndesmol, lec and demonstra 3; Descrip Anat, lec and demonstra 3; Dissec 8; Histol, lab 6; Mat Med, lec and demonstra 4 hrs a wk 1st term; Physiol, lec and demonstra and conferences 4 hrs a wk 2d term; Pharmacy, lab 4 hrs a wk 2d term.	Descrip Anat, lec and demonstra 3; Regional Anat, 2 a wk 1st term; Dissec, lab 8; Physiol, lec and demonstra and conferences, 4 hrs a wk 1st term, lab 4 hrs a wk 1st term; Pathol, lec and demonstra 3; Path Histol, lab 4; Therapeu, lec and demonstra 3 hrs a wk 1st term, 1 hr a wk 2d term; Clin Chem and Chem Diag, lab 4; Auscul and Percus, 2 hrs a week 2d term; Gen Med Clin 1 hr a wk 2d term; Surg Dressings, 1 a wk 2d term; Gen Surg Clin, 1 hr a wk 2d term.	Principles of Med, lec 1; Phys Diag, 3 a wk 1st ½ yr; Practice, lec and demonstra 3 a wk 1st ½ of 1st term and 3 a wk 1st ½ of 2d term; Gen Med Clin 2; Diseases of Children, lec and demonstra 2, clin 1; Clin Conference 1 hr a wk 2d ½ yr; Neurol, lec and demonstra 2 hrs a wk 2d ½ yr, clin 1 hr a wk 2d ½ yr; Diseases of Nose, Throat, and Chest, clin 2; Surg, lec and demonstra 3, clin 5; Clin for Orthoped Surg 1; Obstet, lec and demonstra with manikin 3; Gynecol clin, 2 a wk 2d ½ yr; Diseases of the Skin, clin 1½; Diseases of the Ear, clin 1; Diseases of the Genito-ur organs, 2 a wk 2d ½ yr; Ophthalmol, lec and demonstra 1 a wk 2d ½ yr.	Practice, lec and demonstra 3 hrs a wk 2d ½ of 1st and 2d terms each; Gen Med clin 2; Clin conference 1 hr a wk 2d term; Diseases of Children, clin 1; Neurol, clin 1; Mental Diseases, clin 2 a wk 1st ½ yr; Diseases of Nose, Throat, and Chest, clin 2 a wk 1st ½ yr, 1 hr a wk 2d ½ yr; Surg, lec and demonstra and gen clin 5; Obstet Out-Clin, by appointment; Gynecol, lec and demonstra 1 a wk 1st ½ yr, clin 2 a wk 1st ½ yr, lec and demonstra 2 a wk 2d ½ yr, clin 1 a wk 2d ½ yr; Genito-ur Surg, lec and demonstra 2 a wk 1st ½ yr, clin 3 a wk 1st ½ yr, clin 1 a wk 2d ½ yr; Syphilis, clin 1, lec 1 hr a wk 2d ½ yr; Diseases of the Skin, clin 1½ hrs a wk 1st ½ yr; Ophthalmol, lec and demonstra 1 a wk 1st ½ yr, clin 1; Hygiene, lec and demonstra 2 a wk 1st ½ yr; Forensic Med and Toxicol, lec and demonstra and autopsies, 2 a wk 2d ½ yr.
John A. Creighton Medical College, Omaha, Nebr. 1898-99.	Anat 6; Physiol 3; Histol, lab 4; Chem, lab 4 to 6; Mat Med 3; Dissec.	Hygiene 1; Anat 6; Physiol 3; Mat Med and Therapeu 3; Chem 4; Bacteriol 4; Pathol 4 to 6; Dissec 6; Clin, dispen 18.	Gen Surg 3; Surg orthopedic 1; Surg military 1; Surg pathol 1; Gen Med 3; Phys Diag 2; Obstet 2; Gynecol 1; Diseases of Children 2; Ophthalmol 1; Otol, Laryngol, Rhinol 1; Dermatol and Genito-ur 1; Med Jurispru; Surg and Regional Anat 1; Applied Therapeu 2; Dispen clin 18; Hosp clin 12; Oral Surg 1.	Gen Med 3; Phys Diag 2; Diseases of Children 2; Obstet 2; Diseases of the Mind and nervous system 1; Gen Surg 3; Dermatol and Genito-ur 1; Gynecol 1; Ophthalmol 1; Otol, Laryngol, Rhinol 1; Rectal Surg 1; Dispen clin 18; Hosp clin 12.
Omaha Medical College, University of Omaha, Omaha, Nebr. 1898-99.	Anat, lec and rec 4, dissec 2 hrs daily after Jan 1; Chem and Physics, lec and rec 3, lab 4; Mat Med, lec 1, rec 1; Physiol, lec and rec 3; Biol and Embryol, lab 2; Histol, lec or rec 2, lab 2.	Anat, lec and rec 3, dissec 2 hrs daily after Oct 1; Physiol, lec and rec 3; Organic chem and Toxicol, lec and rec and lab 2; Mat Med and Therapeu, lec and rec 3; Gen Pathol, lec or rec 1, lab 2; Phys Diag, lec 1; Hygiene, lec 1; Clin (med) 2; Clin (surg) 1.	Therapeu 2; Med, lec and rec 3; Surg, lec and rec 4; Obstet, lec and rec 3; Pathol (special), lec 1, lab 2; Med Jurispru 1 a wk ½ yr; Surg Anat, lec 1, demonstra 1; Phys Diag 1; Physiol Chem, lab 2; Electro-Therapeu 1 a wk first ½ yr; Bacteriol 6; Bandaging and Surg Dressing 1; Gen Clin, med 3; Gen Clin, surg 3; Special clin 5.	Med, lec and rec 3; Surg, lec and rec 4; Obstet, lec and rec 3; Diseases of Children, lec 1; Neurol, lec 1; Insanity, lec 1 a wk ½ yr; Orthopedic Surg, lec 1; Dermatol, lec 1; Genito-ur and Rectal Surg, lec 1; Gynecol, lec or rec 1; Ophthalmol and Otol, lec 1; Laryngol and Rhinol, lec or clin 1; Dental surg, lec 6 during yr; Gen med, clin 4; Gen surg, clin 4; Special clin 6.
Dartmouth Medical College, Hanover, N. H. 1899.	Anat human, lec 3, dissec 3; Biol, lec 8; Chem, lec 3; Physics, lec 3.	Anat systematic, lec 3, dissec 11; Physiol, lec 3; Histol, lec 6 a wk ⅔ yr; dissec, 6; Bacteriol, lec 6, dissec 6 ⅓ yr; Chem, lec 8.	Anat regional, lec 3, dissec 3; Physiol, lec 2; Pathol, lec 12 with dissec; Obstet, lec 2; Gynecol, lec 1; Surg, lec 2; Therapeu, lec 2.	Practice, lec 6; Surg, lec 3; Therapeu, lec 2; Gynecol, lec 1; Obstet, lec 1, clin 6; Neurol, Med Jurispru, Hygiene, Ophthol, Laryngol, Otol.

Albany Medical College, Albany, N. Y. 1899-1900.	Anat, lec 3, rec 1, dissec 10 a wk for 4 to 6 wks; Inorganic Chem, lec 3, lab 4, rec 1; Physiol, lec 2, rec 1; Histol, lec 1, lab 4, rec 1; Mat Med, lec 2, rec 1; Pharmacy, lec 1; Gen Surg, clin 2 hrs. Total for wk, lec 12; rec 5; lab 8 hrs; clin 2.	Anat, lec 3, rec 1; Organic Chem, lec 2, rec 1; Physiol, lec 3, rec 1; Therapeu, lec 1: Med, lec 3, rec 1, clin 1; Surg (minor), lec 2, rec 1, clin 2; Pathol, lec 1, rec 1, lab 2; Embryol, lab ½ term; Hist of Med, lec 1 a wk ½ term; Clin med. Total for wk, lec 15½; rec 6; lab 2½ hrs; clin 3.	Anat, lec 2, rec 1; Bacteriol, lab 2, rec 1; Clin micros, lab 2; Therapeu, lec 2, rec 1; Electro-Therapeu, lec 1 a wk 1st ½ term; Obstet, lec 2, rec 1; Pediatrics, lec 1; Neurol, lec 1, clin 1; Surg, lec 3, rec 1, clin 2; Phys Diag, sec 3 hrs; Special clin 1 hr; Med clinic, 2 hrs. Total for wk, lec 11½; rec 5; lab 4 hrs; sec work 3; clinics 6.	Practice, lec 3, rec 1; Neurol, lec 1, clin 1; Gynecol, lec 1; Obstet, lec 1, rec 1; Surg (incl Orthopedics), lec 3, rec 1; Med Jurispru, hygiene, lec 2; Specialties, rec 1; Conferences (med), surg 1; Insanity, lec 1 a wk ½ term; Special clin med 2 hrs, surg 3 hrs, section work 4 hrs. Total for wk, lec 11½; rec 4; conf 2; clin 10; section work 4 hrs.
University of Buffalo, Medical Department, Buffalo, N. Y. 1899-1900.	Anat, rec and demonstra 5 in sections, dissec 8; Physiol. lec and demonstra 6; Chem, rec 4, lab 4 a wk 2d ½ yr; Embryol, lec 2 and quiz 1 a wk 2d ½ yr; Histol, rec 1, lab 4; Bacteriol, rec 2, lab 4; Med Diag, clin 1.	Anat, rec and demonstra 5 in sections, dissec 8; Comparative Anat, demonstra in sections 2; Gen Path, rec 3, lab 2; Practice, rec in sections 2; Therapeu, rec 2; Surg, rec in sections 2; Obstet, rec in sections 2; Mat Med, rec 1 a wk 1st ½ yr, lab 2 a wk 1st ½ yr; Med Chem, lec 1 and lab 4 a wk 1st ½ yr; Organic Chem, lec and quiz 1 a wk 1st ½ yr, 2 a wk 2d ½ yr; Phys Diag 1.	Practice, lec 2, clin 2, clin pathol 2, ward class 2; Surg, rec in sections 2, operative surg 1, surg pathol 1, clin 2, surg diag 1; Therapeu, conferences 2; Pathol, lec or rec 2, lab 2, demonstra in sections 1; Obstet, rec in sections 2; Applied Anat 3; Hygiene 1 a wk 1st ½ yr; Otol 1 a wk 2d ½ year; Laryngol, lec and demonstra in sections 1; Venereal Diseases, 12 lectures during 1st ½ yr; Orthopedic Surg, 1 a wk 2d ½ yr; Med Gymnastics, 10 lec during 1st ½ yr.	Practice, clin 5, ward class 3½, clin pathol 2; Surg, clin 6; Gynecol, clin 3, lec 3 and quiz 1 a wk 2d ½ yr; Obstet, lec 3 and quiz 1 a wk 1st ½ yr, clin conferences 2, operations on manikin; Special Therapeu incl Dietetics 1; Clin Therapeu 1; Comparative Pathol 1; Genito-ur diseases, clin 1; Dermatol, clin 1; Diseases of Children, clin and lec 1; Ophthalmol, lec 1, clin; Laryngol, clin 1; Med Jurispru, lec 1 a wk 1st ½ yr; Insanity, lec 1 a wk 1st ½ yr, clin 2d ½ yr; Nervous Diseases, clin 1.
College of Physicians and Surgeons, Columbia University, New York, N. Y. 1899-1900.	Physics, lec 3 a wk for ½ yr, lab 3 hrs a wk for ½ yr; Chem, lec 2, conferences 2 a wk for ½ yr, lab 2 hrs twice a wk for ½ yr; Anat, demonstra to sec 4, dissec 18 to 20 hrs for from 3 to 5 periods of 4 wks each; Normal Histol, lab 6 hrs a wk for ½ yr; Physiol, lec 3, demonstra to sections 1.	Anat, lec 3, demonstra to sections 4 a wk for ½ yr, 5 a wk for ½ yr, dissec 10 to 12 hrs for from 1 to 3 periods of 4 wks each; Normal Histol, lab 4 hrs a wk for ½ yr; Physiol, lec 3, demonstra to sections 1; Physiol Chem, lec 1 a wk for ½ yr, conferences, rec 1 a wk for ½ yr, lab 6 hrs a wk ½ yr; Path Anat, Autopsies, once a wk for 8 wks; Bacteriol lab 6 hrs a wk for ½ yr: Mat Med and Therapeu, lec 3; Obstet and Gynecol, rec in sections 1.	Mat Med and Therapeu 3; Path Anat, demonstra to sections 2; Gen Path and Histol lab 6 a wk for ½ yr; Practice, lec 3, clin lec 2, + 1 for ½ yr, clin instruc to sections 2 a wk for 16 wks; Neurol, lec 1 a wk Dec to May; Surg, lec 2, clin lec 3, clin instruc to sections 2 a wk for 16 wks, optional clin lec and operations; Obstet, lec 3 a wk Oct to Mar; Gynecol, lec 3 a wk Mar to May, clin lec 1, clin lec and operations 6 exercises during the yr, prac instruc to sections, 6 exercises during the yr; Venereal and Genito-ur diseases, clin lec 1, clin lec and operations 1 a wk for ½ a yr, prac clin instr to sections 10 exercises during the yr; Diseases of Ear, prac clin instr to ½ sections 6 to 8 exercises during yr, aural pathol and therapeu, lec 4.	Practice, lec 3, clin lec 2, clin instruc 1, at N. Y. Hosp 1 a wk for 3 mos, prac clin instruc to sections 6 hrs a wk for 8 wks, optional clin instruc 1; Neurol, lec 1 a wk Dec to May, clin lec 1, prac clin instruc to sections 10 exercises during the yr; Clin Micros, lab 6 hrs a wk for 8 wks; Surg, lec 2, clin lec 2, + clin lec and operations 1, surg demonstra 1 a wk for ½ the yr, prac clin instruc in hospital 6 hrs a wk for 7 wks and 2 a wk for 6 wks, operative surg on the cadaver 12 lessons during the yr, optional clin lec and operations in hosp, minor operations 1; Orthopædic Surg, clin lec 1, prac clin instruc to sections 10 exercises during the yr; Obstet, 2 wks residence at the Sloane Maternity Hosp and attendance upon confinements, prac clin instruc to sections daily for 1 wk; Gynecol, clin lec 1; Diseases of Children, clin lec 1, prac clin instruc to sections 10 lessons during the yr; Diseases of the Skin, clin lec 1, prac clin lec to sections 10 lessons during the yr; Diseases of the Throat and Nose, clin lec 1, prac clin instruc to sections 10 lessons during yr.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
Eclectic Medical College of the City of New York, N. Y. 1898-99.	Anat, lec 3, rec; Chem, lec 3, rec; Pharmacy, lec 1, rec; Physiol, lec 2, rec; Lab 4; Minor Surg, lec 1, rec; Clin Micros, lec 1; Dissec 11; Clin work, 1.	Anat, lec 4, rec; Chem, lec 5, rec; Physiol, lec 2, rec; Minor Surg, lec 1, rec; Lab 4; Clin Micros, lec 1; Hygiene, lec 1, rec; Specific Medication, lec 1; Dissec 11; Clin at hosp 1.	Chem, lec 2, rec; Anat, lec 1, rec; Specific Medication, lec 1, rec; Diseases of Children, lec 1, rec; Phys Diag 1; Practice, lec 3, rec; Bacteriol, lab 1; Clin Micros, lec 1; Hygiene, lec 1, rec; Eye, Ear, Nose, and Throat Diseases, lec 2, rec; Clin Diseases of Chest 1; Specific Medication, lec 1, rec; Surg, lec 2, rec, clin 1; Clin at hosp 3; Physiol, lec 1, rec; Mat Med and Therapeu, lec 3, rec; Obstet, lec 2, rec; Gynecol, lec 1, rec; Lab 2.	Phys Diag, lec 1, rec; Practice, lec 3, rec; Bacteriol, lab 1; Diseases of Eye, Ear, Nose, and Throat, lec 2, rec; Clin Diseases of the Chest 1; Clin at hosp 3; Surg, lec 2, rec; Mat Med and Therapeu, lec 3; Gynecol, lec 1, rec; Obstet, lec 2, rec.
University and Bellevue Hospital Medical College, New York, N. Y. 1898-99.	Anat, lec 2, rec 1 in sections, demonstra 2 in sections, dissec and osteol 10; Histol 2 hrs twice a wk for ½ ses, rec 2 a wk ½ ses; Physiol, lec 2, rec 1; Chem and Phys, lec 3, rec 1, lab 2 hrs twice a wk for ½ ses; Bact, lab 2 hrs 3 times a wk for 4 wks; Mat Med, lec 1, rec and lab 2; Hygiene, lec 1 a wk for 8 wks; Clin, 3 med and 3 surg.	Anat, lec 2, rec 1 in sections, demonstra 2 in sections, dissec 8 hrs; Physiol, lec 4, rec 1; Physiol Chem, lec 1, rec 1, lab 2 hrs twice a wk for ½ ses; Pathol, lec 1, lab 2 hrs in path histol twice a wk for ½ ses, rec 2 a week for ½ ses; Autopsies 1; Mat Med, lec 1, rec and lab 2 hrs; Therapeu, lec 1, and 2 for ½ ses, rec 1; Bandaging, 1 a wk for 8 wks; Clin, 3 surg and 3 med.	Practice, lec 2, rec 1 in sections, clin 4; Surg, lec 2, rec 1, clin 3; Genito-ur surg, lec or clin 1; Obstet, lec with clin dem 3, rec 1 in sections; Gynecol, lec 2 a wk for ½ ses, rec 1 a wk for ½ ses, clin 1; Therapeu, lec 1, rec 1; Pathol, lec 1, lab 2 hrs a wk in clin micros for ½ ses; Applied Bacteriol, lec with demonstra 1 a wk for ½ ses; Autopsies 2, demonstra 2 in sections; Neurol, lec with clin 1; Section teaching in hosp.	Practice, lec 2, clin lec 4, rec 1, conferences 1, clin; Mental diseases and med jurispru 1 a wk for 6 mos; Neurol, lec or clin 1, prac clin instruc in sections; Surgery, lec 2, clin 3, conferences 1, rec 1, prac clin instruc in sections; Genito-ur surg, clin lec 1, prac instruc; Orthopedics, clin 1, prac instruc; Obstet, prac instruc on manikin 1, clin lec for ½ ses; Gynecol, clin lec 1, prac instruc in sections; Pediatr, clin lec 1, prac clin instruc in sections; Therapeu, lec 1, electro therapeu 1 a wk for 2 mos; Ophthal, clin lec 1, prac instruc; Otology, clin 1 a wk for ½ ses; prac clin instruc in sections; Laryngol and Rhinol, clin lec 1 a wk for ½ ses, prac clin instruc in sections; Dermatol and Syphilol, clin lec 1, prac clin instruc in sections; Spec Pathol, lec 1; Hygiene, lec 1 a wk for ½ ses; Autopsies 1, autopsy conferences 1; Gross Pathol, 1; Section teaching in intubations, operations on the cadaver, phys and med diag, operative gynecol, etc.
Syracuse University, College of Medicine, Syracuse, N. Y. 1899-1900.	Anat, lec and rec 4, demonstra, lab work in dissec; Histol, lec and rec lab 2; Physiol, lec with demonstra and rec lab 5; Chem, lec and rec lab 5; Embryol, lec, demonstra, lab 3 a wk for ½ yr.	Anat, lec and rec, demonstra 3, lab work in dissec; Physiol, lec and rec, demonstra lab 3; Chem, rec and lab 2; Mat Med, lec and rec 3; Pathol and Bacteriol, rec and lab 2; Med, lec and demonstra in phys diag 1; Surg, rec 2 a wk for ½ yr.	Pathol, rec and lab 2; Therapeu, rec 2; Med, lec and rec 3, clin 2; Surg, rec 2, clin 2; Obstet, rec and demonstra 2; Surg Anat, lec, rec and demonstra 1.	Therapeu, rec 2; Med, lec and rec 3, clin 2; Surg, lec and rec 3, clin 2 a wk during 1st semester, 1 a wk during 2d semester; Obstet, rec and demonstra 2; Gynecol, lec and rec, clin 2; Pediat, lec or rec 1, clin 1; Mental Diseases, 1 a wk for 4 mos; Ophthalmol, rec 2 a wk during 2d semester, clin 1; Laryngol, rec 2 a wk during 1st semester, clin 1; Hygiene and Public Health, 1 a wk during 2d semester; Legal Med, lec during ½ of 2d semester.

Cincinnati College of Medicine and Surgery, Cincinnati, Ohio. 1898–99 [1]	Embryol; Histol; Anat; Chem; Physiol; Physics; Lab. [1]	Anat, descriptive, prac and surg; Chem; Physiol; Bacteriol; Pathol; Mat Med; Therapeu; Lab.	Surg Anat; Bacteriol; Pathol; Mat Med; Therapeu; Practice; Practice of Surgery; Obstet; Ophthalmol, lec 1; Pediat; Gynecol; Dermatol; Laryngol and Otol; Clin.	Gynecol; Pediat; Laryngol and Otol; Practice; Practice of Surg; Obstet; Ophthalmol, lec 1; Dermatol; Clin.
Ohio Medical University, Columbus, Ohio. 1898–99.	Anat, lec and demonstra 5, dissec 216 hrs during the yr; Bacteriol, rec and demonstra 1; Chem, rec 3, lab 80 hrs during the yr; Histol, rec and demonstra 1, lab with micros 80 hrs during the yr; Pharmacy, lab 1; Physiol, lec and rec and demonstra 3, lab; Med Latin.	Anat, lec and demonstra 3, dissec 216 hrs during the yr; Bacteriol, lab 80 hrs during the yr; Embryol, rec 1, lab 2 a wk for ½ yr; Mat Med, lec and rec 3; Med Chem, lec and rec 2; Minor Surg and Bandaging 1; Pathol, rec and demonstra 2, lab 60 hrs during the yr; Phys Diag 1; Physiol, lec, rec and demonstra 3, lab; Physiol Chem, weekly rec through the yr.	Electro-Therapeu 1; Practice, lec 3; Hygiene and Sanitary Science; Operative Surg and Surg Anat, lec and rec 2; Obstet, lec and rec 1; Surg, lec and rec 3; Therapeu, lec and rec 2; Minor Surg, lec and rec 1; Chem, lec and rec 1; Med Jurispru, lec and rec 1; Lab work 4; Physiol and Operative Gynecology, lec and rec 1; Dermatol and Ophthalmol, lec and rec 1; Mat Med, lec and rec 1 a wk 2d ½ yr; Orthopedic Surg, lec and rec 1 a wk 1st ½ yr; Therapeu, 1 a wk 2d ½ yr; Med Clin 2; Surg and Gynecol clin 4; Clin in sections 2; Dispensary clin, med and surg, 2.	Dermatol, lec and rec 1 a wk 2d ½ year; Obstet, lec and rec 1, + 1 a wk 1st ½ yr; Gynecol, lec and rec 1; Operative Gynecol; Genito-ur, lec and rec 1; Otol, lec and rec 2; Practice, lec and rec 2, + 1 a wk 1st ½ yr; Diseases of Children, lec and rec 1; Mental and Nervous Diseases, clin 1; Hygiene, lec and rec 1; Phys Chem, lec and rec 1; Surg, lec and rec 3, + 1 a wk 2d ½ yr; Military Surg, lec and rec 1; Rectal Surg, lec and rec 1 a wk 2d ½ yr; Operative Obstet, rec; Laryngol and Rhinol; Ophthalmol, rec and clin; Rectal Diseases, rec and clin; Dispensary clin, med and surg 2; Surg and Gynecol clin 4; Clin in sections 2.
Cleveland College of Physicians and Surgeons, Wesleyan University, Cleveland, Ohio. 1897–98.	Biol, Compar Anat, Embryol, rec and lab 3 periods (1 calendar hr lec or rec or 2 hrs lab or clin constitutes a recitation period); Histol, rec and lab 3; Anat, lec 5 a wk during ½ yr, dissec 5 a wk during ½ yr; Physiol, lec 2 a wk second ½ yr; Mat Med and Pharmacol, lec 2, lab 1 during second ½ yr; Gen Chem, lec and lab 4.	Anat, lec and dissec 4; Physiol, lec and lab 4; Pharmacol, lec and lab 1; Chem, lec and lab 3; Bacteriol and Pathol, rec and lab 4; Med Anthropom, ½ period during 1st ½ yr; Hygiene, ½ period during 2d ½ yr; Phys Diag, ½, during 2d ½ yr; elective, 2.	Pathol, rec and lab 3; Gen Therapeu, lec 2; Obstet, lec 2; Med, lec 2; Surg, lec 2; Operative Surg ½ (1 exercise a wk 2d ½ yr); Laryngol, Rhinol, Otol, lec 1; Clin, dispensary and hosp 6; Elective, 1½.	Med, lec 3; Surg, lec 2; Gynecol, lec 1; Neurol, lec ½ period; Pediat, lec 1; Orthoped, lec ½ period; Ophthalmol, lec ½ period; Med Jurispru, lec ½ period, clin 8; Dermatol and Genito-ur, lec ½ period; Obstet, lec 1; State Med, lec ½ period; Elective, 1.
Western Reserve University, Medical College, Cleveland, Ohio. 1899–1900.	Chem, rec 6 and lab 8 a wk 1st ½ yr, and lec and rec 4 and lab 8 a wk 2d ½ ses; Anat, rec 3, dissec 8; Histol, lec 1, lab 7 a wk 1st ½ ses; Bacteriol, 9 hrs after Mar 1; Mat Med 1; Pharmacy 1 a wk 2d ½ ses; Physics, lec 1 a wk 1st ½ ses; Biol 1 a wk 1st ½ ses.	Anat, lec 4, dissec 10; Applied Anat, lec 1; Physiol, lec 4, lab 7; Pathol, lec 2, quiz 1; Path Histol, lab 9, until Mar 1; Therap, lec 2; Hygiene, lec 1; Minor Surg, lec or exercise 1; Clin.	Therap, lec 2; Pharmacol, lec and rec 1 a wk 1st ½ ses and 2 a wk 2d ½ ses, lab 3 a wk 2d ½ ses; Gross Path Anat, demonstra 2; Obstet, lec 1; Phys Diag, lec 1; Practice, lec 4, clin 2; Surg, lec 2, clin 6; Gynecol, lec 1, Children's Diseases, clin 1; Nose, Ear, and Throat, lec 1; Genito-ur Diseases, lec 1 a wk 1st ½ ses, clin 1 a wk 2d ½ ses; Applied Anat, lec 1; Dispen and Clin.	Gross Path Anat, demonstra 2; Obstet, lec 2, clin; Practice, lec 4, clin; Surg, lec 2, clin 6; Gynecol, clin 4; Phys Diag 2; Neurol, clin 1; Dermatol, lec 1 a wk 1st ½ ses, clin 1 a wk 2d ½ ses; Ophthalmol, lec 1 a wk 1st ½ ses, dispen prac 2d ½ ses; Jurispru, lec 1 a wk 1st ½ ses; Preventive Med, lec and quiz 1; Dispen and Hosp Clin.

[1] The number of hours per week in different subjects is given in the catalogue without mention of classes, as follows: Physiol 3, Practice 2, Pediat 2, Surg 3, Gynecol 2, Laryngol and Otol 1, Mat Med and Therapeu 3, Ophthalmol 1, Surg Anat 1, College clin 2, Pathol and bacteriol each 2 hrs per day for 6 wks.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
Jefferson Medical College, Philadelphia, Pa. 1898-99.	Anat, lec 4, dissec 10, demonstra in osteol, 3; Histol, rec 1, lab instruc 8; Bacteriol, lec 1 a wk for ½ term; Physiol, lec 3; Chem, lec 2 with rec, lab 4 a wk for ½ term; Mat Med and Pharmacy, lec 1 a wk for ½ ses, lab 2; Bandaging and Fracture Dressings 1.	Anat, lec 4, dissec 10, rec over eadaver weekly for ½ term; Pathol, lec 1, rec 1; Hygiene, lec 1; Path Histol, lab 7 and rec part of term; Physiol, lec 3; Chem, lec 1 with rec, prac instruc 2 a wk for ½ term; Therapeu, lec 2 per wk until Jan 1, and then lec 3; Obstet, lec 1, rec 1; Surg 2; Symptomatol and Phys Diag 1.	Pathol, lec 2, rec 1; Bacteriol 6, for part of term; Morbid Anat 3, for part of term: Med Jurispru, lec 2 a wk for ½ term; Obstet, lec 2, demonstra 2; Therapeu, lec 2 until Jan 1, then 3; Surg, lec 2, class exam 1, clin 4, demonstra in operative surgery 1; Practice, lec 3, class exam 2, clin 2; Symptomatol and Phys Diag, lec 1, bedside demonstra 1; Ophthalmol, lec 1 a wk for ½ term, clin 1; Gynecol, lec 1, rec 1.	Pathol, one post-mortem a wk; Therapeu, lec 1 a wk for ½ ses, section work in electro-therapeu; Gynecol, clin lec 1, rec 1, section instruc 1; Obstet, clin 2, bedside instruc and attendance upon cases; Special Surg, lec 1, class exam 1; Clin Surg, clin lec 2, bedside instruc 1; Practice, lec 3, class exam 2; Clin Med, clin lec 1, bedside instruc 1; Ophthalmol, lec 1, clin 1, prac instruc 1; Clin Laryngol 1, prac instruc 8; Clin Otol 1, prac instruc 8; Clin Orthopedics 1, prac instruc 8; Clin Pediat 1, prac instruc 8; Clin Dermatol 1, prac instruc 8; Clin Neurol 1, prac instruc 8; Genito-ur Diseases, clin 1, prac instruc 8.
Medico-Chirurgical College of Philadelphia, Pa. 1899-1900.	Anat, lec 3, demonstra 2, rec 1, dissec 6; Histol, rec 1, lab 2, occasional demonstra; Physiol, lec 3, rec 1, lab 2; Chem, lec 2, rec 1, lab 4; Pathol, lec 2, rec 1; Bacteriol, lec 1, rec 1; Hygiene, lec 1, rec 1; Mat Med, lec 2, rec 1; Pharmacy, lec 1, rec 1, lab 2; Phys Diag, lec 1, rec 1.	Anat, lec 3, demonstra 1, rec 1, dissec 8; Physiol, lec 3, rec 1, demonstra; Chem, lec 1, rec 1, lab 2; Pathol, lec 2, rec 1, lab 2, autopsy 1; Bacteriol, lab 4 per wk for 6 wks; Morbid Anat, lec 1; Hygiene, lec 1, rec 1, lab 2 a wk for ½ ses; Pharmacol and Therapeu, lec 2, rec 1, clin on applied therapeu 1; Phys Diag, lec 2, ward class 1.	Applied anat, lec 1; Morbid Anat, lec 1, autopsy, 1; Toxicol Chem, lec 1, lab 2; Therapeu, lec 2, rec 1, applied therapeu 1; Practice, lec 2, rec 4; Clin Med, lec 2, bedside instruc 6; Med Jurispru, lec 1, rec 1 a wk for ½ the ses; Surg, lec 4, rec 1; Clin Surg, lec 2, bedside instruc 4; Obstet, lec 2, rec 1; Clin Obstet, lec 1, bedside instruc 8; Gynecol, lec 1, rec 1; Clin Gynecol, lec 1, bedside instruc 4; Ophthalmol, lec 1, rec 1, ward class instruc 2; Neurol, lec 2; Laryngol and Otol, lec 1, ward class instruc 4; Orthopedics, lec 1 per wk for ½ ses, clin lec 1; Genito-ur Surg, lec 2, rec 1 every alternate wk; Operative Surg and Bandaging 10 per wk for 5 wks.	Practice, rec 3; Clin Med, lec 2, and 6 hrs bedside or dispen instruc; Surg, lec 2, rec 1; Clin Surg, lec 2, bedside or ward class instruc 4; Obstet, lec 2, rec 1; Clin Obstet, lec 1, and 4 hrs bedside instruc and attendanee upon cases; Ophthalmol, lec 1, rec 1, bedside or dispen instruc 2; Clin Gynecol, lec 1, rec 1, bedside instruc 4; Neurol, lec 1; Applied Therapeu, clin 1; Laryngol and Otol, lec 1, ward class or dispen instruc 4; Orthopedics, lec 1; Genito-ur Diseases, lec 1, and 1 rec each alternate wk; Dermatol, lec 1, and 1 rec each alternate wk; Operative Surg, 10 hrs per wk for 5 wks.
University of Pennsylvania, Department of Medicine, Philadelphia, Pa. 1898-99.	Anat, lec 4, dissec and osteol 8 per wk during 8 wks; Histol, lab and demonstra 2; Mat Med and Pharmacy, lec 1 a wk before Feb 1, lec 2 a wk after Feb 1, lab 6 a wk during 4 mos; Gen Chem, lec 2, lab 3; Physiol, lec 4; Gen Pathol, lec 1; History of Med, Med Terminol, Ethics, etc, lec 1 a wk before Feb 1; Phys Diag, lec 1; Gen Symptomatol	Anat, lec 2, dissec 10 per wk during 8 wks; Med Chem, lec 1, lab 3; Physiol, lec 2; Gen Pathol and Morbid Anat, lec 2, lab 10; Phys Diag, demonstra 3 a wk during 8 wks; Therapeu, lec 2; Surg, lec 3; Obstet, lec 2; Bacteriol, lec 1; Prac Bacteriol, lab 10 a wk during 2 wks; Prac Physiol, lab 2; Gen Clin, med and surg; Special Clin in	Applied Anat, lec 2; Gen Pathol and Morbid Anat, lec 2; Morbid Anat and autopsies, demonstra 2; Therapeu, lec 2; Practice, lec 3; Clin Med, lec 2, bedside instruc 1, and Phys Diag; Surg, lec 3; Clin Surg, lec 1, bedside instruc 1; Minor Surg and Fracture Dressing, lec 1, and practice 1 a wk before Feb 1; Obstet, lec 3; Gynecol, lec 1; Skin Diseases, didac lec 1 and clin lec 1 a wk before Feb 1; Otol, didac lec 1 a wk before Feb 1, clin lec 1; Laryngol, lec 1 a wk after Feb 1; Genito-ur diseases, clin lec 1 a wk after Feb 1; Gen Clin, med and surg; Special Clin in nervous diseases, Pediat, Gynecol, Diseases of Skin, Eye, Ear.	Practice, lec 3; Clin Conference in Med 1; Clin Med, lec 2, bedside instruc 1; Laryngol and Rhinol, lec 1 a wk after Feb 1; Clin Surg, lec 2, bedside instruc 1; Operative Surg, lec 1 and prac instruc 3 a wk after Feb 1; Operative Obstet, prac instruc 1; Nervous Diseases and Electro-Therapeu, clin lec 1; Hygiene, lec 1; Gynecol, didac lec 1, clin lec 1, prac instruc 1; Pediat, clin lec 1 a wk before Feb 1; Skin Diseases, didac lec 1, clin lec 1 per wk before Feb 1; Genito-ur diseases, 1 a wk after Feb 1; Otol, clin lec 1, didac lec 1 a wk before Feb 1; Ophthalmol, didac lec 1, clin lec 1; Autopsies, prac instruc 1; Clin and Operative Obstet, prac instruc 1;

	and Diag, lec 1; Bandaging, lec 1, practice 4 hrs per wk during 4 wks; Prac Physiol, lab 2; Gen Clin Med and Surg.	Nervous Diseases, Gynecol, Diseases of Skin, Eye, Ear, alternating with work in Phys Diag and Pathol Histol.		Orthopedic Surg, didac lec 1, clin lec 1; Gen Clin, med and surg. Clin Electives: Nervous Diseases and Electro-Therapeu, 2 a wk for ½ yr; Skin Diseases, 2 a wk for ½ yr; Laryngol and Rhinol, 2 a wk for ½ yr; Otol, 1 a wk for ½ yr; Ophthalmol, 1 a wk for ½ yr; Orthoped Surg, 1 a wk for ½ yr; Genito-ur surg, 1 a wk for ½ yr; Pediat, 1 a wk for ½ yr.
Woman's Medical College of Pennsylvania, Philadelphia, Pa. 1899.	Lectures and rec on chem, anat, physiol, and mat med; lab work in chem, anat, histol, physiol, and pharmacy; bandaging.	Lectures and rec on toxicol, advanced anat, physiol, pathol, surg, and symptomatol; Phys Diag; lab work in clin chem, embryol, anat, physiol, pathol, and bacteriol; Clin in Woman's Hosp.	Lectures on applied anat, pathol, therapeu, surg, practice, obstet and gynecol; Med Jurispru, neurol, laryngol and rhinol, orthopedics, ophthalmol, and dermatol; work on manikin and cadaver in operative surg and fracture dressing, obstet diag and operative gynecol; Phys Diag; Clin; Rec on general therapeu, surg, practice, obstet, and gynecol.	Lectures on practice, obstet, hygiene, med jurispru, pediat, neurol, otol, laryngol, rhinol, orthopedics, ophthalmol, dermatol; Clin and hosp instruc.
Western Pennsylvania Medical College, Pittsburg, Pa.	Anat, lec 2, exam 1, lab 6; Histol, lec 1, rec 1, lab 3; Pharmacy, lec 2, rec 1, lab 1; Hygiene, lec 1, exam 1; Chem, lec 2; Biol, lec 1; Physiol 2.	Anat, lec 2, exam 1, lab 3; Mat Med, lec 2, exam 1; Practice, lec 2, exam 1, clin 3; Surg, lec 2, exam 1, clin 2; Obstet, lec 1; Chem, lec 2; Physiol, lec 1, exam 2; Pathol, lec 1, exam 1, lab 3; Orthopedics, clin 1.	Therapeu, lec 1, exam 1; Obstet, lec 1; Neurol, rec 1, clin 1; Orthopedics, rec 1, clin 1; Anat, lec 1, exam 1; Gynecol, rec 1, clin 2; Diseases of Nose and Throat, rec 1; Practice, lec 3, clin 3; Diseases of Children, rec 1, clin 1; Genito-ur Diseases, rec 1, clin 1; Operative Surg, 1; Neurol, clin 1; Surg, lec 2, exam 1, clin 2; Pathol, lec 1; Dermatol, rec 1, clin 1; Diseases of Eye and Ear, rec 1, clin 1; Splints and Bandaging 1; Phys Diag 1.	Therapeu, lec 1; Practice, lec 4, clin 3; Surg, lec 2, exam 1, clin 2; Neurol, clin 2; Operative Surg on Cadaver, 1; Orthopedics, clin 1; Obstet and Gynecol, clin 4; Diseases of Children, clin 2; Eye and Ear, clin 2; Bacteriol and lab, 3; Nose and Throat, clin 1; Dermatol, clin 1; Genito-ur Diseases, clin 1; Phys Diag 1.
University of Nashville, Medical Department, Nashville, Tenn. 1898-99.	Anat, lec 2, rec 1, dissec 15; Mat Med and Therapeu, lec 2, rec 1; Physiol, lec 2, rec 1; Chem, lec 2, rec 1, lab 6; Histol, lab 6.	Anat, lec 2, rec 1, dissec 15; Mat Med and Therapeu, lec 2, rec 1; Physiol, lec 2, rec 1; Neurol and Gen Pathol, lec 2, rec 1; Obstet, lec 2, rec 1; Surg, lec 2, rec 1; Practice, lec 2, rec 1; Diseases of Women and Abdom Surg, lec 2, rec 1; Pathol and Bacteriol, lec 2, rec 1; Clin.	Surg, lec 2, rec 1, clin 1; Practice, lec 2, rec 1, clin 1; Obstet, lec 2, rec 1; Neurol and Gen Pathol, lec 2, rec 1; Diseases of Women and Abdom Surg, lec 2, rec 1, clin 1, lab 6; Dermatol and Genito-ur Surg, lec 2, rec 1, clin 1; Diseases of Eye, Ear, Nose, and Throat, lec 1, clin 1; Bacteriol, lab 4; Pathol and Bacteriol, lec 2, rec 1; Clin; Med Jurispru, lec 1.	
Fort Worth University, Medical Department, Fort Worth, Tex. 1899-1900.	Anat, lec 3, quiz 1, section work, dissec, demonstra; Chem, lec and demonstra 2. lab 4, quiz 1; Normal Histol, lec 1, lab 1, quiz 1; Bacteriol, 2d term, lab 1, quiz 1; Physiol, lec and demonstra 3, quiz 1; Mat Med and Therapeu, lec 2, quiz 1.	Anat, lec 3, quiz 1, section work and dissec; Chem, lec and demonstra 1, lab 2, quiz 1; Normal Histol, lec 1, lab 1, quiz 1; Bacteriol, lec 1, lab 1, quiz 1, 2d term; Physiol, lec and demonstra 3, quiz 1; Mat Med and Therapeu, lec 2, quiz 1; Hygiene, lec 1, 1st term; Surg, lec and demonstra 3, clin lec 2; Practice, lec 2, clin lec 2.	Anat, lec 3, quiz 1, section work, dissec, quiz; Practice, lec 2, clin lec 2; Surg, lec and demonstra 2, clin lec 2, special lec 14 during the yr; Pathol, lec 1, lab 1; Obstet, lec 2, clin, quiz 1; Gynecol, lec 1, clin lec 2, surg clin; Neurol, lec and clin 1; Diseases of Children, lec 1, clin lec 1; Phys Diag, clin lec 1, 2d term; Genito-ur and Rectal Diseases, lec 1, clin lec 1; Dermatol and Syphilol, lec 1, clin lec 1.	Surg, lec and demonstrata 2, clin lec 2; Practice, lec 2, quiz 1, med clin 3; Pathol, lec 1, lab 1; Obstet, lec 2, clin, quiz 1; Gynecol, lec 1, clin lec 2, surg clin; Neurol, lec and clin 1; Eye, Ear, Nose, and Throat, lec 2, clin lec 2; Med Jurispru, lec 1 a wk for 10 wks; Genito-ur and Rectal Diseases, lec 1, clin lec 1; Dermatol and Syphilol, lec 1, clin lec.

III.—COURSES OF STUDY IN MEDICAL SCHOOLS—Continued.

Institution.	First year.	Second year.	Third year.	Fourth year.
University of Texas, Department of Medicine, Galveston, Tex. 1898-99.	Anat in sections 10; Biol, Histol, and Embryol, lec 2, lab 12 in sections; Botany, 2 a wk 1st ½ term; Physics, lec 2 a wk for 1st ½ term; Chem, lec 2, lab 4; Physiol, lec 2 a wk for 2d ½ term, lab 4; Gen Pathol, lec 2; Mat Med, lec 2; Botany, lec 2 hrs a week for 1st ½ term; Dissec, 8 to 12 hrs a wk; Normal Histol.	Anat, lec 11; Physiol, lec 3, lab 4; Chem, org and med, lec 2, lab 4; Gen Pathol, lec 2, lab 6; Phys Diag, lec 1; Dissec, 8 to 12 hrs a wk; Therapeu, lec 2; Minor Surg, lec 1; Obstet, lec 2.	Operative Surg, clin 3; Bacteriol to section, 7; Pediatrics, clin 1; Pharmacy, lec 2; Surg, lec 2; Surg Anat, lec 2; Therapeu, lec 2; Hygiene, lec 2; Obstet, lec 1; Pathol, lec special 2, lab 3; Nervous Diseases, clin 1; Practice, lec 2; Diseases of Eye, Ear, Nose, and Throat, clin 1; Ophthalmol, clin 1.	Operative Surg, lec 2, clin 6; Ophthalmol, lec 1, clin 1; Diseases of Eye, Ear, Nose, and Throat, clin 1; Med, clin 3; Gynecol, lec 3, clin 2; Pediatrics, lec 1, clin 1; Special Pathol, lec 2; Dermatol, lec 1; Outdoor, clin 6; Gross Morbid Anat, lec 2, dissec; Med Jurispru, lec 1; Climatol, lec 1; Dietetics, lec 1, Nervous Diseases, lec 1, clin 1; Obstet, lec 1; Practice, lec 2; Surgery, lec 2.
University College of Medicine, Richmond, Va. 1899-1900.	Anat, lec 3, quiz 1; Chem, lec 2, quiz 1, lab 2; Physiol Physics, lec 1 and quiz 1 for 1st semester; Histol, lec 1, quiz 1, lab 4; Lab in sections 4; Mat Med, lec 1, quiz 1; Med Pharmacy, lec 1 a wk for 2d semester; Osteol, demonstra in sections 3; Surg clin 2.	Anat, lec 3, quiz 1; Physiol, lec 2, quiz 1; Chem, lec 1, quiz 1, lab 2; Practice, lec 1, clin 1; Surg, lec 2, quiz 1, clin 2; Mat Med, lec 2, quiz (and therapeu) 1; Pathol, lec 1, quiz 1; Hygiene, lec 1, quiz 1; Med Jurispru and Toxicol, lec 1; Bacteriol, lec 1; Obstet Demonstra, lec 1; Lab, exercises in sections 3.	Obstet, lec 2, quiz 1, demonstra 1; Genito-ur Diseases, lec 1, quiz 1, clin 1; Surg, lec 2, quiz 1, clin 2; Practice, lec 2, quiz 1, clin 2; Nervous and Mental Diseases, lec 1, quiz 1, clin 1; Urinol, lec 1; Toxicol, lec 1 for 2d semester, Diseases of Women, lec 1, quiz 1, clin 1; Diseases of Children, lec 1, quiz 1, clin 1; Diseases of Eye, lec 1, quiz 1, clin 1; Diseases of Ear, Throat, and Nose, lec 1, clin 1; Dispen and Phys Diag, clin 2; Orthopedics and Dermatol, clin 1.	Ward classes in sections 6; Clin Dispen and Phys Diag 2; Med, clin 2; Diseases of Eye, lec 1, clin 1; Diseases of Women, lec 1, clin 1; Practice, lec 2, quiz 1; Practice of Surg, lec 2, quiz 1, clin 2; Nervous and Mental Diseases, lec 1, clin 1; Genito-ur Diseases, lec 1, clin 1; Obstet, lec 2; Operative Surg, lec 1; Oporative Obstot, lec 1; Diseases of Children, clin 1; Orthopedics and Dermatol, clin 1; Comparative Pathol and Clin Diag, lec 1; Therapeu, electro and special, lec 1.
University of Virginia, Medical Department, Charlottesville, Va. 1899-1900.	Biol, lec 3, lab 12; Chem, lec 3; Descriptive Anat, lec 3; Dissec 12; Physics, lab 4.	Bacteriol (1st ½ yr), lec 3; Gen Pathol, lec 3; Surg Diseases, lec 3; Physiol (1st ½ yr), lec 6; Hygiene (2d ½ yr), lec 3; Regional Anat, lec 2; Band and Pathol, lab 4; Chem, lab 4.	Embryol (1 mo), lec 6; Obstet (1st ½ yr), lec 6; Practice (2d ½ yr), lec 3; Special Pathol (1st ½ yr), lec 3, lab 3; Clin Diag (1st ½ yr), lec 3; Operative Surg (2d ½ yr), lec 3; Mat Med (2d ½ yr), lec 6.	Practice (2d ½ yr), lec 3; Therapeu, lec 3; Ophthalmol Surg, lec 3; Dermatol, lec 3; Gynecol (1st ½ yr), lec 3, clin 1; Med Jurispru (2d ½ yr), lec 3; Med, clin 1; Surg, clin 1; Phys Diag, clin 1; Eye and Ear, clin 1; Genito-ur, clin 1.
Milwaukee Medical College, Milwaukee, Wis. 1898-99.	Osteol, rec 3 a wk 1st ½ yr; Physiol, rec 2; Inorg Chem, lec 2 a wk 1st ½ yr, lab 4 a wk 2d ½ yr; Pharmacol, rec 2; Histol, rec 2, lab 4; Bacteriol, rec 1, lab 4 a wk 1st ½ yr, lec 1, lab 4 a wk 2d ½ yr; Dissec, 1st ½ yr; Syndesmol and Myol, rec 3 a wk 2d ½ yr; Comparative Osteol, 1 a wk 2d ½ yr.	Anat, rec 3; Physiol, rec 2; Med Chem, rec 2 a wk 1st ½ yr, lab 4 a wk 1st ½ yr, lab 2 a wk 2d ½ yr; Mat Med, rec 2; Pathol, rec 2, lab 4; Surg, rec 1; Med, rec 2; Comparative Anat, 1 a wk 1st ½ yr; Dissec; Hygiene, rec 1 a wk 2d ½ yr.	Therapeu, lec 2; Physiol, lec 1 a wk 1st ½ yr; Phys Diag, clin lec 1, rec 1; Practice, lec 2, clin lec 2, rec 2; Principles of Surg, lec 1, rec 1; Operative Surg, lec 1 a wk 1st ½ yr, demonstra 2d ½ yr; Practice of Surg, lec 2, clin lec 3, rec 2; Obstet, rec 2; Gynecol, lec 2, clin lec 2; Pediat, clin lec 1, rec 1; Venereal Diseases, clin lec 1; Dermatol, clin lec 1; Ophthalmol, lec 1; Otol, clin lec 1.	Practice, lec 2, clin lec 2, rec 1 a wk 1st ½ yr and 2 a wk 2d ½ yr; Phys Diag, clin lec 1; Dermatol, clin lec 1; Neurol, lec 2, clin lec 1; Laryngol and Rhinol, lec 1, clin lec 1; Ophthalmol and Otol, lec 2, clin lec 2; Practice of Surg, lec 2, clin lec 3, rec 2; Operative Surg, lec 1 a wk 1st ½ yr, demonstra 2d ½ yr; Obstet, lec 2, clin; Gynecol, lec 2, clin lec 2; Pediat, lec 1, clin lec 1, rec 1; Applied Therapeu, rec 1; Mental Diseases, lec 2 and clin lec 1 a wk 2d ½ yr.

Requirements for the Practice of Medicine in the Various States and Territories of the United States.

Alabama.—Every candidate for a license to practice medicine in the State of Alabama must pass an examination before the State board of medical examiners or before one of the county boards. County boards examine only graduates in medicine.

Alaska.—There are no regulations governing the practice of medicine in Alaska.

Arizona.—An examination is required before the board of medical examiners and the candidate must be a graduate of a lawfully organized medical college.

Arkansas.—The candidate for a license must be a graduate of a medical school, or must pass an examination before one of the county boards of medical examiners.

California.—The candidate must present a diploma from a medical college recognized as reputable by the State medical board.

Colorado.—The candidate must present a diploma from a medical college recognized as reputable by the State medical board, or must pass an examination before the State medical board, or have practiced medicine continuously for 10 years.[1]

Connecticut.—The candidate must pass a State medical examination.

Delaware.—Candidate must pass a State examination in medicine and in addition must hold a medical diploma and must have studied medicine four years, and have attended a medical college three years, and must have a competent common school education.

District of Columbia.—Candidate must pass an examination in medicine and in addition must hold a medical diploma and must have studied medicine four years.

Florida.—Candidate must pass an examination before one of the medical examining boards and in addition must hold a diploma of a recognized medical school.

Georgia.—Same as in Florida, and candidate must have attended three medical courses of six months each.

Idaho.—Candidate must be a graduate of a medical school.

Illinois.—Candidate must present a diploma of a medical school recognized by the State medical board and must pass an examination, but candidates who are graduates of medical schools in Illinois recognized as in good standing by the State board may be licensed without an examination.[2]

Indiana.—Candidate must present a diploma of a medical school. If satisfactory to the State medical board (which requires as a condition of graduation attendance upon four courses of study of not less than six months each), a certificate is granted; if the school is not recognized, an examination is required.

Indian Territory.—Candidates must pass an examination before the board of medical examiners in the Cherokee Nation and Choctaw Nation; in the Creek Nation a good moral character and payment of $25 is required.

Iowa.—Every candidate must pass a State examination and in addition must present a diploma of a recognized medical school and must have attended four courses in medicine of not less than twenty-six weeks each.

Kansas.—A diploma or certificate from some State or county medical society is sufficient. Practically no requirements.

Kentucky.—Candidate must present a diploma of a reputable medical college chartered by the State of Kentucky, or a diploma of some other medical school recognized as reputable by the State medical board (board requires 4 years of study).

Louisiana.—Candidate must present a diploma of a recognized medical school and in addition must pass a State examination in medicine. The board requires attendance upon three courses of lectures.

Maine.—Candidate must pass a State examination in medicine.

Maryland.—Candidate must present a medical diploma (or certificate giving right to practice in some foreign country), and must pass an examination, and must have attended three courses of lectures, and have a competent common school education.

Massachusetts.—Same as in Maine.

Michigan.—Candidate must pass an examination before the State board.

Minnesota.—Candidate must pass a State examination in medicine and must have attended four courses of 26 weeks each at a recognized medical school.

Mississippi.—Same as in Maine.

Missouri.—Candidate must present a medical diploma (of any medical school) or pass an examination.

Montana.—Candidate must pass a State examination in medicine and in addition must present a medical diploma and have attended four courses of 6 months each.

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[1] A new medical act was passed by the legislature of Colorado in 1899, but is said to have been vetoed by the governor.

[2] This law went into effect July 1, 1899. The board has announced that after January 1, 1900, it will recognize no college which does not require attendance upon four courses of at least six months each (See Jour. A. M. Asso., July 15, 1899.)

Nebraska.—Candidate must present a diploma of a medical school recognized by the State board, and must have attended four courses of 6 months each.

Nevada.—Diploma of a medical college is required.

New Hampshire.—The candidate must pass a State examination in medicine after graduating from a medical school recognized by the regent and requiring attendance on four courses of at least six months each, and candidate must have a preliminary education equivalent to a full course in a recognized academy or high school.

New Jersey.—Candidate must pass an examination and must present a diploma of a recognized medical school, and have studied medicine four years and attended three courses of lectures, and must have a competent preliminary education.

New Mexico.—Candidate must present a diploma of a medical school recognized by the Territorial board (the board requires four courses in medicine and a preliminary education equivalent to that of a high school). Otherwise an examination will be required.

New York.—Candidate must pass an examination in medicine and present a diploma of a recognized medical school (or license to practice in some foreign country), and must have attended four courses of at least six months each and must have the required preliminary attainments.

North Carolina.—Candidate must pass a State examination in medicine.

North Dakota.—Candidate must pass a State examination and must have attended three medical courses of at least six months each.

Ohio.—Candidate must present a diploma of a recognized medical school, and the State medical board will not recognize any school as in good standing unless located in a city of not less than 50,000 population (except in case of State institutions) and unless it requires attendance upon four medical courses of not less than twenty-six weeks each.

Oklahoma.—Candidate must present a diploma of a medical school or must pass an examination after having practiced five years.

Oregon.—Candidate must pass a State examination in medicine.

Pennsylvania.—The candidate must have a preliminary education equivalent to that of a high school course, must have studied medicine four years and have attended not less than three medical courses, and must be a graduate in medicine (or have a license to practice in some foreign country), and must pass an examination.

Rhode Island.—The candidate for a license to practice medicine must present a diploma of a medical college recognized by the State board (the board will not recognize any school which has a course of less than four years), or if he does not hold such a diploma he must undergo an examination as to his medical attainments.

South Carolina.—The candidate must present a diploma of a medical school and must pass an examination in medicine before the State medical board.

South Dakota.—A diploma obtained after attending three courses of at least six months each in a "lawful medical college" will entitle the holder to practice medicine.

Tennessee.—A State examination in medicine and as to the candidate's preliminary education will be required in all cases except where the candidate is a graduate of a medical school chartered by the State of Tennessee.[1]

Texas.—Under the civil code an examination is required; under the criminal code a medical diploma is sufficient.[2]

Utah.—A diploma from a medical college in good standing and a State examination are required.

Vermont.—A State examination is required after presentation of a medical diploma.

Virginia.—A State examination is required and the candidate's general education will be considered.

Washington.—A State examination is required.

West Virginia.—Same as in Virginia.

Wisconsin.—A State examination or a diploma of a medical college requiring attendance for three years of six months each, or after 1904 four years.

Wyoming.—A diploma of a medical school recognized as in good standing will be required, or if the school is not so recognized an examination will be required.[3]

Hawaii.—The candidate must present a diploma from a recognized medical school and pass a satisfactory examination.

Porto Rico.—A diploma of a medical school recognized as in good standing is required.

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[1] The last clause is from a recent amendment.
[2] The medical law in Texas has been interpreted in different ways.
[3] Law of 1899.

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PART I.

CHAPTER I.

HISTORY OF THE GERMAN SCHOOL SYSTEM.[1]

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[1] This paper is a translation of a concise statement of the history of public and private education in Germany from the earliest records up to the present day. The work does not, like many other histories, pay chief attention to theories and plans advanced by reformers, but sketches actual conditions for which documentary evidence is available. It touches upon pedagogical theories and reformatory plans of organization only when it can be proved that they have had perceptible influence upon the development of the system or any of its parts. The work is evenly balanced and noticeably just in its conclusions, hence it was thought proper to render it in English for insertion in this volume. The original appeared in Rein's Encyclopädisches Handbuch der Pädagogik, and found general commendation in the educational press.

IV. *The nineteenth century.*—The new humanistic classical high school. The system of modern high schools. The present public elementary schools. 1. Universities. 2. Classical schools. 3. Modern high schools and technological universities. 4. Combination of classical and modern high schools. 5. Advanced schools and burgher schools. 6. Public elementary schools up to 1860. 7. Later development since then. 8. Prospects.

INTRODUCTION.

The object of the following paper is to sketch the growth of the German school system from its origin through the different periods of its development. Only conditions which actually existed and for which there is documentary evidence available are considered. Pedagogical theories and plans of organization will be regarded only where it is obvious that they exerted decisive influence upon actual conditions and determined the structure of the school system.

The history of education in Germany to the present time has to record the production of four distinct forms of schools—the university, the gymnasium, or, properly speaking, the classical high school; the Real and burgher school, or modern high school; and the elementary or common school. The latter is the general school, in which attendance is obligatory up to a certain year of age—generally to 14—for every child, unless it is attending a school providing for a higher kind of instruction. The pupils of these public elementary schools enter the ordinary—that is, the simpler—occupations, such as trades, for which more extended instruction, especially knowledge of foreign languages, is not necessary. The burgher schools and other secondary schools of low grade keep the pupil until his 16th year of age and give him an education fitted for a little higher employment in practical life. The gymnasium, realgymnasium, universities and polytechnica, represent, together with the professional study in these higher institutions, the most advanced courses of education. This higher education is clearly divided into a general or preparatory and a special or professional course. The former closes with the 19th year of life, the latter, as a rule, rarely before the 24th year. The classical high schools offer the preparation for all higher professions, the learned as well as the practical. They graduate their students at the age of 19 or 20, after a rigorous examination, which entitles the students to enter the universities and polytechnica, in which the attendance is, on an average, four years. In the following pages we shall consider how these different types of schools have developed, one after another and one out of the other, and how the course of instruction has changed in the different epochs of their existence to suit the demands of the times.

The system of education of a country stands in the most intimate relation to the whole intellectual and economical life of the people. Political, religious, and social revolutions are never without a far-reaching influence on the methods and on the matter of instruction. The social order at a given epoch is reflected in the formation of the schools.

In the same manner every enlargement of knowledge leads to an increase of the matter of instruction. Every new science of a general character seeks very soon its representation in the instruction of youth. The organization of the schools in every epoch, therefore, may be regarded as an attempt to convey the knowledge, immanent in that epoch, to the different ranks according to social position and general or professional needs of instruction. We have tried to state these general relations, and to characterize them in their proper places.

I. First Part of the Middle Ages (700–1200).

ECCLESIASTICAL SCHOOLS; CONVENT AND CATHEDRAL SCHOOLS.

1. *The beginnings* of the German school system are almost contemporary with the introduction of Christianity into the country. The Irish and Anglo-Saxon messengers of the faith who came to the continent about the fifth century had brought with the new faith also the taste for Roman culture, and had implanted both at the same time. Boniface, the apostle of the Germans (died 755) worked for a strong foundation of schools within the church as well as for the extension of Christianity. He himself was well acquainted with the traditional knowledge of his time, and clever in the art of teaching. Monks and nuns came at his request from England to Germany with the intention of propagating elementary and higher knowledge. It was of important consequence that he prescribed the rules of the religious order of Benedict to the monasteries founded by him. In the Benedictine monasteries little boys were received into the order for the purpose of educating them for the monastic life, which could best be done in earliest youth. For these boys, ordinarily offered at the altar of God at the age of 5 to 7 years (the so-called *pueri oblati*) instruction was necessary, and the church of that period was liberal enough to add the "profane sciences" as far as occasion and pecuniary resources allowed.

It was of no less consequence that at the same time in the western Frankish Empire, Chrodegang of Metz (bishop from 742 to 766) ordered for the whole clergy of his cathedral a common life, similar to that of the convent, and that this was imitated in many places. Being admitted as boys in these "cathedral communities," and often expected to enter upon ecclesiastical service, appropriate instruction was necessary; hence the spread of cathedral schools.

2. *Charlemagne.*—These imperfect beginnings were greatly developed by Charles the Great. In pursuit of his policy, which turned with energy toward the extension and strengthening of the occidental church, his special attention was devoted to a better education of the clergy. That he himself esteemed intellectual education very highly added to his zeal. He tried to bring about a culture in his Frankish Empire similar to that which he had had occasion to observe in Italy; hence he surrounded himself with the foremost scholars of his time,

among whom Alcuin was his special counselor in matters concerning instruction. With these men and his entire family he cultivated literary and scientific pursuits. His court school for boys stood under his personal supervision and loving care.

Upon the suggestion of Charles, the synod of Aix la Chapelle issued, in 789, the regulation that in every monastery and cathedral chapter there should be schools in which boys should learn the Psalms, the letters, vocal music, calculation of church holidays, and grammar, i. e., of Latin. In consequence of this measure the two kinds of schools were established all over his empire, and their number was increased considerably. Charles, furthermore, did not consider the education of the clergy closed (as his regulations concerning education show) when they had mastered ecclesiastical matters, but he demanded a union of literary knowledge with a complete understanding of the Holy Scriptures. To obtain the latter seemed not to be easy in his time, because it was generally believed that the words of the Bible contained profound secrets. It seemed to meet the good intentions of the King, when, for instance, one of his bishops, Leidrad of Lyons, could report to him that he had in his schools singers, copyists, and reading men, and among the latter such as had deeply penetrated into the sense of the Bible texts.

Among the numerous schools existing in Charlemagne's time, some distinguished themselves by a profound cultivation of the sciences; thus, for instance, the school in St. Martin's Monastery at Tours, of which Alcuin was abbé in his old age. Young clergymen came to these institutions, often sent by their superiors to complete their studies, and from here again teachers were sent to other schools.

During the reign of Charlemagne monastery and cathedral schools began to enlarge their sphere of action. In the monasteries instruction was made accessible also to princes and noble laymen, who were destined for governmental offices; but especially to the future secular priests. In the same way other future clergymen participated in the instruction of the cathedral schools side by side with the canonical scholars, especially recruits of the poorer country clergy. This tendency of reaching into every class of society for worthy pupils was strictly followed after Charlemagne's death, though it was temporarily checked during the period of reaction under Louis the Pious, who for a time insisted upon strict asceticism in the church. In connection with this, it may be mentioned that there were double schools at several abbeys and monasteries, thus, for instance, at the Cathedral of Rheims and in the Convent of St. Gall, near the Lake Constance.

Of the latter place we still possess a ground plan, showing two separate school rooms; the "interior school" for future monks is within the inclosure of the convent, the "exterior school" outside.

Also the first establishment of schools for the common people is attributed to the great Frankish King. With the consistency so char-

acteristic of him, Charles demanded of every inhabitant of his realm, as a sign of his belonging to the general church, knowledge of the Latin confession of faith and prayers. When it became evident that this aim could not be reached, the rule was modified so as to require of parents and guardians as a sacred duty to send their children and wards into the monasteries for the purpose of learning the tenets of the Christian religion. This is the beginning of compulsory school-attendance and general education in civilized countries; knowledge being at that time, however, restricted to the most general items of religious observances. But to carry this out was not possible in Charlemagne's day, and during the next following centuries the church showed less and less inclination and capacity to carry the King's well-meant order into effect. Only isolated cases are known of zealous bishops admonishing the priests of their diocese to instruct the children of the community in religion.

3. *Celebrated schools during the Middle Ages.*—The institutions of Charles remained unchanged in all essential conditions during the next centuries. Under his immediate successor, Louis the Pious, the higher clergy asked the King to establish public schools in at least three cities of the Kingdom. They evidently thought of such schools as the one in Tours. It is not known whether the King complied with the request, but even without state and court influence such schools came into existence. We know that all through the early part of the Middle Ages ecclesiastical schools distinguished themselves by a profound cultivation of the sciences. Nearly every German country at that time could boast of one or several schools which attracted pupils from near and far by the fame of their instruction. In Hessia, soon after Charlemagne's death, the monastery school at Fulda, under the direction of Rabanus Maurus, a pupil of Alcuin, rapidly rose to high fame. During the eleventh century this was superseded by the monastery school of Hersfeld. In the country around the lake of Constance the school of Reichenau had a long period of fame from the ninth to the eleventh century, only surpassed by the school of St. Gall; of the former the name of Walafried Strabo, of the latter the names of Ekkehard and Notker remind us. During the eleventh century celebrated schools grew up along the Rhine, in Cologne, Mayence, Worms, and Speyer. In northern Germany, at different times during the Middle Ages, the schools at Corvey, Hildesheim, and Magdeburg became noted (in the latter city especially the cathedral school), also that of the monastery of Bergen (on the island of Rügen in the Baltic). In Bavaria the distinguished school of Freising, under Bishop Otto, rose to the greatest fame at a time when a new civilization began to wrestle with the old, while the school of Tegernsee-abbey, the cathedral school at Regensburg, and the school of St. Emmeram-abbey, in the same city, represented the old culture in its highest development during the eleventh and twelfth centuries.

4. *Instruction.*—The pupils of the monastery and the cathedral schools attended instruction from the seventh to the eighteenth year, hence in this point they set the example for the pupils of the so-called schools for the learned during the sixteenth or eighteenth century. The instruction offered in these early schools was very different from the uniformity in our modern institutions and exhibited great varieties. Partly following the more or less ascetic direction of the orders that supported them, and partly following the lead of special teachers, the extent of their courses of study ranged from the most necessary and limited knowledge of a clerical preparation to an all-embracing course of education so far as was possible at the time. The principal branches were theology and profane science, as they had been under Charlemagne's influence. The first of these branches consisted exclusively of the study of the Holy Scriptures. The profane sciences were taught in the form of the seven arts, i. e., "*artes liberales*," a form in which antiquity also had comprehended its knowledge encyclopedically. The "*trivium*," grammar, rhetoric, and dialectics, contained the *form-studies;* the "*quadrivium*" contained arithmetic, geometry, astronomy, and music; they were considered the *studies of real knowledge.*

Grammar, i. e., Latin language and literature, not only claimed the most important part in the "trivium," but in the entire course of study. It seemed the end and aim of all instruction. Latin was the language of the church, of the Bible, and generally that of all education and erudition of those times. The object of instruction in Latin, therefore, was to enable the pupils to use this foreign language orally and in writing. From a brief preparatory grammatical course the student went quickly over to a method which enabled him to speak the language, during lessons as well as in the daily intercourse with teachers and schoolmates. The Psalms were learned by heart before the little boy could understand them; reading, however, was thus practiced early and an ample vocabulary was rapidly acquired. It was a Latin method which made the dead language all his own, a method which continues to be used to this day and which rests upon daily oral application of new words gained.

The means to obtain this desirable skill were grammatical instruction combined with the reading of the Roman classics, especially of the poets. Reading was at first not an aim, but a means of learning to speak Latin. "The exegesis which was employed in reading the authors was only grammatical-linguistic. Even in the best schools there was no question of transmitting a full and clear understanding of the authors read, but the only aim kept in view was to learn quickly from the poets the exterior form and facility in Latin expression," says Specht in his "History of Education in Germany" (p. 103).

But though in this way the authors were used only for types of expression, and though for educational purposes they remained often enough mere dead objects, their contents could not be entirely ignored.

Without such intention they exercised an influence upon the young readers. The students not only picked forbidden fruit from Ovid, but their minds were often captivated by serious thoughts, not at all in harmony with church tenets. This is obvious from the persistent opposition which the profane sciences, and especially the classical studies, suffered from ascetic church dignitaries. Christianity, true to its origin, had not yet lost the tendency of despising the world and its treasures, and monachism itself had taken its origin from the persistent obedience to this thought, so that the church had serious scruples from time to time as to whether it should be permitted to devote time and talent to the reading of heathenish authors. But it is a token of the tolerance and sense of moderation of that time that such scruples and tendencies never became paramount. A comparison was repeated by means of which St. Augustine had justified it that the Christian church imbibe the culture of antiquity (De doctrina Christiana I, 60). As the Israelites, so he said, took away with them at their departure from Egypt golden and silver vessels and rich garments taken from the inhabitants of the country "for better use," so the Christian ought to snatch away gold and silver from the heathen, that is, their knowledge and science, and make them useful in the service of divine truth. Hence, classical studies (of course always to the extent permitted by available sources and the aims in view) found faithful and affectionate cultivation in monasteries. Beside the time of Charlemagne that of the Ottos distinguished itself in this respect.

Greek was almost wholly unknown in Germany and of no importance for practice in schools. Under the names of the other liberal arts were often concealed matters that differed greatly from their original meaning. Rhetoric, for instance, was not, as in antiquity, the art of oral speech, but comprehended instruction in the composition of letters, documents, and other writings, chiefly legal. This was an art very important for life during that time, and exclusively exercised by the clergy. But for this business a knowledge of the law was needed; hence during the earlier centuries of the Middle Ages a certain acquaintance with codes of law and Roman sources of law was maintained in convents. Dialectics at this period was the art of logical thinking and clever dispute. It was the weapon of the church militant, but only toward the close of the Middle Ages did it become of special importance.

The quadrivium supplied some knowledge of real things, but an extensive pursuit of these branches was not frequent and was considered difficult. Arithmetic and astronomy gave the dates and furnished the skill necessary for the computation or calculation of the church festivals. Music, an art which claimed a large space in divine services, was treated theoretically to a degree. There was no geometry as we understand the term; it consisted of geographical, natural, scientific, and medical knowledge, variously mixed with bits of theological knowledge.

We have written evidence of what toward the end of that period a

learned abbot imagined the course of study in ecclesiastical schools should be in complete execution. Wilhelm of Hirschau (abbot from 1069 to 1091), a student of the monastery school of St. Emmeram in Regensburg, was a promoter of strict monastery discipline, devoted, however, to the cultivation of ecclesiastical and profane sciences. He is said to have been well instructed in the arts of the quadrivium, and was a celebrated church dignitary. In a work concerning philosophic and astronomic instruction, he says: "The course, however, is that because all teaching is done by word of mouth (eloquentia), we are to be instructed in speaking first. This instruction is divided into three parts, to write and speak correctly, as prescribed by grammar; to prove what has to be proved, in conformity with dialectics, and to ornate the same, as taught by rhetoric. Thus fitted out, and provided with these arms, we must begin the study of philosophy, in which the order is, first, the quadrivium, and then the Holy Scriptures, arriving, through knowledge of that which is created, to the knowledge of the creator." (Specht, loc. cit., p. 385, rem. 3.) This is the system of ecclesiastical instruction at that time, not as it was really everywhere followed, but as an ideal formulated by a thinker.

5. *Nobility and people.*—The education outlined in the foregoing paragraphs was not only the only kind known at that time, but it was confined essentially to that class of the German people for which it was intended—that is, for the clergy. The nobility, during that period only, comprising the highest dignitaries of the Empire, found in the management of public affairs and in the use of arms a life task which was considered quite equal in importance to that of the clergy, and for which the study of the liberal arts was not at all necessary. The noble youth learned to ride, to chase, and the use of arms, but seldom did he learn to read and write. The noble knight thought it pernicious to keep his son at his books instead of letting him exercise from earliest youth the arts of his class. Only at the court a more active part in acquiring book learning seemed at times desirable. The chief magistrate of the Empire, the "Kaiser" or King, needed to read written Latin and to understand it. Sometimes he and his court attendants showed a desire for intellectual education for its own sake. Then the sciences, i. e., the liberal arts, found a zealous cultivation at the court, and their acquisition extended in ever-widening circles among the highest nobles of the realm. Thus it happened during Charlemagne's reign and again during that of the Ottos.

The women of nobility played a peculiar and to some extent a prominent rôle in the civilization of that time. Those belonging to religious orders, the inmates of nunneries and choir houses, received an education similar to that of monks. It is known that the nun Roswitha, of Gandersheim, composed Latin comedies after the model of Terentius, and her example was not an isolated one. If women lived "in the world" they often showed more inclination and found more time

than men to learn at least the elements of culture. In cloister schools more distinctly female instruction was given to the daughters of nobles, such as all kinds of female handiwork.

The great mass of the people received even less instruction than the nobles. The elementary knowledge taught in ecclesiastical schools had meaning and importance only in connection with the course for ecclesiastics. All instruction was fashioned to meet the needs of the clergy. Reading was practiced only in Latin; the art of writing, either employed in copying or in the composition of documents, was distinctly termed an ecclesiastical art; the art of calculating with numbers served ecclesiastical purposes. The squires and vassals of high nobility, the citizens of burgs that had only just begun to rise to prominence, and, above all, the masses of the rural population, lived their simple lives without school education. The man at that time who managed the plow, wielded the sword or his tools, felt his existence as well filled as his successors in later years when the printing press changed the aspect of life in every grade of society. During the predominance of ecclesiasticism the illiterate seemed well satisfied when the church took care of the welfare of his soul and joined the contents of his barren life to something higher.

II. Second Part of the Middle Ages (1200–1500).

Universities and particular schools—town schools.

1. *Chivalry and its effect.*—Up to the twelfth century there had been only one kind of education—the ecclesiastical. When noblemen felt an inclination to acquire intellectual education they could do so only by taking part in ecclesiastical instruction. The period of the Crusades produced a great change in this, as it did in so many other affairs. It created chivalry, which had its adherents beyond the narrowly defined circle of nobility proper, among squires and vassals, and which united them all to a special class with similar habitudes of life and a strong sentiment of rank. Chivalry caused a special and distinctly secular education to grow up in the social community of knights and their followers. The finest product of this education was German poetry of the second half of the twelfth and the first half of the thirteenth century. It flourished surprisingly in love songs, popular and art epics. In the poetic work of this time the highest joy in secular life is expressed. Wolfram, of Eschenbach, himself would ennoble, but never abolish, chivalry in favor of an ecclesiastical life.

Under the influence of this newly developed culture the knight and noble was obliged to give his children another education than the one that had prevailed hitherto. Instruction in poetry and music—for music was still intimately connected with poetic elocution—took the most important place. To this came the learning of foreign languages, especially the French, because chivalry found its model in the French

nobility. Artistic and literary skill were combined with athletic strength and dexterity, which had always been highly prized among the nobles. The seven liberal arts of the clergy were supplanted by the seven knightly virtues—riding, swimming, shooting with the bow, fencing, hunting, chess playing, and poetry (rhyming). From the ecclesiastical course of instruction only the arts of reading and writing were adopted, but that the education of a knight could afford to do without even these is shown by the example of Wolfram of Eschenbach. The form which chivalric instruction adopted was not that of a school. Private tutors instructed the boys in "knowledge and polite manners." Voyages and journeys into other countries and a sojourn at greater or smaller courts and castles were added as means of education. A system of tutorial education was thus formed, to which the nobility of later times also gave preference.

However important this new current proved to be for the intellectual life of Germany, it is of no special significance for the history of schools, because this first light-colored flash of a purely secular education did not create a school type of its own, unless it be that of private tutorship. Besides, it was of too short a duration. The blossom of German poetry and chivalry passed away as quickly as it had opened. Soon ecclesiastical education again had its sway, and only gradually a secular-civil education grew up in the cities, "from below," as it were. This was destined to be of longer duration, because it was based upon practical necessities—not upon cheerful enjoyment of life, but upon diligent and thorough labor.

2. *Universities; their origin.*—At the same time in which in Germany the education of chivalry was at its highest, at about 1200, there was founded in Paris a university which became a model for Germany—that is, the supreme ecclesiastical institution of learning. More than one hundred and fifty years passed before the first university of that kind in Germany was founded. The Parisian school was, however, the final result of a long course of development in which newly arising branches of science had sought and found appropriate forms of propagation. It is necessary to briefly analyze this course of development.

In lower Italy, at the point where Occidental and Arabian culture came in contact, medicine had been raised to an independent study. The medical school at Salerno was already celebrated in the eleventh century, and remained also during the following centuries the most frequented high seat of learning for that science. Praised less, but perhaps for Northern Europe of no inferior importance, was the more conveniently situated medical school at Montpellier, in Southern France. This school is mentioned as early as during the first half of the twelfth century. In 1137 Adalbert of Mayence attended the lectures of the learned physicians of that school.

The science of Roman law was not extinct in Italy. Old law schools existed in Rome, Ravenna, and Pavia. They all, however, were over-

taken in the eleventh century by Bologna, where the famous jurist Irnerius, who was named the "enlightener of the science of law," taught Roman law from 1088. This study led, first of all, to the formation of a new mode of instruction. During the political confusion into which Bologna as well as other cities in upper Italy was thrown, in consequence of the strife between the papal and the imperial power, the students (mostly men in early maturity and partly in important life positions) felt the necessity of securing solitude and safety in their studies within the city. They entered into a close corporation and tried to make this legally independent of the town community. In their endeavors to that end they found protection in the German Imperial Government. Frederick Barbarossa granted them important privileges in 1158.

Side by side with the study of Roman law (about 1140) that of church or canonical law developed and soon overtook the former in importance. In the later universities of the Middle Ages, except in Italy, canonical law prevailed over Roman law. Only since the middle of the fifteenth century Roman or imperial law was elevated to renewed importance in connection with the rapidly growing humanism.

The same epoch which brought the new sciences of medicine and law into prominence caused a notable change in the ecclesiastical study of theology as well as in its preparatory course. In northern France during the eleventh century scholasticism developed, in some of the more noted ecclesiastical schools, that science in which the newly awakening thought of European Christianity tried to come to terms with the doctrines of the church and to justify them before human reason. Dialectics now became the glorified form of all science. Theology left the simple study of the Bible of former centuries and turned to logical analysis of church dogmas. The new science immediately drew strangers, especially Englishmen and Germans, in great numbers to France, and hence it became quickly popular everywhere. Abelard taught in Paris, at about 1100, before a great concourse of students from all countries. He taught theology and dialectics according to the new method. In the course of the twelfth century there was made a valuable addition to this study, to wit, acquaintance with the most important philosophical writings of Aristotle. Philosophical study now made rapid strides forward, and during the thirteenth century, through Albertus Magnus and Thomas of Aquino, the abiding form of scholasticism was developed in which church creeds and Aristotelian philosophy appeared as the two halves of human knowledge, supplementing each other. Aristotle became the philosopher of the church.

By this turn not only was theology made an extended object of instruction with new and rich contents, but profane studies also were changed essentially. The place of grammar was assumed by dialectics or logic, which became the most important of the seven liberal arts, and between trivium and quadrivium there entered, as a new branch of

study, philosophy, the knowledge of the Aristotelian system. On the other hand, occupation with the Roman authors lost its value with regard to both—grammar and their contents. Knowledge of Latin, however, remained indispensable. Latin remained the language of science, but only as such had it importance. The more the Roman classics were pushed into the background the more did the purity of the language suffer. Latin had to be made to fit new conditions; a scholastic Latin was formed, which enabled the learner to follow all the windings and intricacies of dialectic demonstration. More generally speaking, in the course of instruction of "the learned youth" a turn from literature to science took place. The interest of the latter part of the Middle Ages was all aimed at the acquisition of knowledge, not, as in the earlier period, at culture through literary study. The science of the Middle Ages, however, was not self dependent, seeing with its own eyes; by means of abstract definitions it endeavored to arrive at conclusions concerning things themselves; it was essentially a constant repetition and transmission of the science of antiquity.

The contemporaries felt distinctly the gradually approaching change, and those who had grown up in the accustomed course of instruction saw with apprehension that the old ways began to be abandoned. Already the aforementioned William of Hirschau, at the close of the eleventh century, complained of the new youth, which was wafted by every new theory like blades of straw by a puff of wind; young men who returned from foreign schools filled with empty subtleties and who engaged in superficial talk, and who set everything in confusion. (Schmid, Encycl., vol. 4, p. 1069.) A French poet of the thirteenth century, Henry d'Audely, poetically utilized the opposition of the new to the old principle. He made the army of the Orleanists (Orleans distinguished itself even much later by a zealous adherence to the classics) march against the Parisians (the representatives of the new order). The banner of the former is grammar and their combatants are the ancient authors; while the Parisians fight for logic, their auxiliaries are theology, physics, and other sciences. The victory falls to the Parisians, but the poet predicts the future restoration of the classic authors to their former rank. (Willmann, Didactik, vol. 1, p. 267.)

The three new sciences, theology, law, and medicine, made necessary a higher or professional step over the former ecclesiastical instruction; this latter itself, with its already changed contents, became the preparatory step. Thus arose the prevailing form of the university in the Middle Ages, according to which it consisted of a faculty of arts as the preparatory, and of three higher faculties, theology, law, and medicine. It is the merit of Paris to have developed this form. In the city on the Seine during the whole of the twelfth century the new sciences flourished in numerous artistic and theological courses. At about 1180 a student of the University of Paris highly commended the instruction

there given "in the seven arts, in both the laws (Roman and canonical) and in the holy gospels." In the year 1200, after a bloody conflict between the students and the citizens of Paris, the students were put under ecclesiastical jurisdiction of the bishop, and thus withdrawn from that of the city authorities. This, as it had done in Bologna, gave an impetus for the formation of an independent corporation, the "universitas magistrorum et scholarium." In 1213 it appeared with its four faculties, that of theology, law, medicine, and arts. The latter had by far the greatest number of members. Later the university was divided into four "nations" or national corporations; in the middle of the century, the Gallian, Normannian, Picardian, and English "nations" are mentioned; to the last-named belonged also the German students. It is significant that the chief of the four nations was the rector who rose gradually to be the chief of the whole university. The students of arts, however, represented the great majority. Most of the students came to the university only for college studies, studies of general culture as they had been pursued in monasteries and cathedral schools, but which now invited students by their new contents to other places. The practical needs of the clergy pointed with some necessity to that course. The newly created higher step in the course of instruction, on the other hand, was not strong enough to lead an independent life; therefore the university course remained connected with the college course, to use a modern term—a relation which remained unchanged everywhere during the whole of the Middle Ages.

3. *German universities.*—As has been stated before, the German clergy (as early as the eleventh century) took a prominent part in the growing sciences. The journeys undertaken by students to the seats of the new culture produced, however, a vagabondage which became in time a public calamity. While during the thirteenth century many similar high seats of learning had been established in France, England, Italy, and Spain, after the model of the first universities, Germany continued to seek perfection of knowledge in foreign countries. Theological lectures in the churches offered only an inadequate substitute for it. At last the German Emperor, Charles IV, in 1348 established for his Kingdom of Bohemia the first German university in Prague, "so that," as it is said in the charter, "our faithful subjects who are ever hungry for the fruit of science will find in their own country a table for the meal, and will think it unnecessary to travel around the world for the purpose of seeking knowledge, to visit strange nations, and go begging in foreign countries." Now followed the rival institution of the House of Hapsburg, in Vienna, in the year 1365, reestablished in 1384; the university of Heidelberg, founded by the Elector of the Palatinate in 1385; the two municipal universities of Cologne and Erfurt in 1388 and 1392. During the next century were added Leipsic in 1409 and Rostock in 1419. A second series of foundations followed after the middle of the fifteenth century, under the influence of another change in the

intellectual life of Western Europe, to wit, under the influence of humanism. There were then established the university of Greifswald in 1456, Freiburg in 1457, Basel in 1460, Ingolstadt in 1472, Trier in 1473, Mayence and Tübingen in 1477, Wittenberg in 1502, Frankfurt on the Oder in 1506. At the close of this period no part of Germany, excepting the northwest, was without a higher seat of learning.

The exterior form, as well as the course of study, of German universities was different in nothing from that of the foreign institutions and corresponded to the general historical development of that form of higher education. The four faculties were present everywhere; that of the arts was always subordinate to the other three.

The course in arts, or the philosophical faculty, was again subdivided into two parts, of which each one concluded with an examination and with the obtaining of an academic degree. After a course of about two years, the student would become a baccalaureus; after two years more, master of arts. As a master he had the right, and generally also the duty, to confer with younger students about his science—that is, act as tutor. At the same time, he could, if so inclined, continue his studies in one of the upper faculties. He who finished the whole course could receive the degree of doctor, and thus obtain the right to teach his professional science in any university. There were at times also intermediate degrees. The studies that led up to the baccalaureate comprehended usually the old arts of grammar, rhetoric, and logic, the latter study in its new and considerably enlarged extent; philosophy and the branches of the quadrivium secured the degree of master. That the philosophical branches were predominant may be seen from the fact that in Prague, in 1366, in the faculty of arts of 33 lectures a week, 21 treated of logic and philosophy, 6 of grammar and rhetoric, and 6 of the branches of the quadrivium. Besides the lectures regular disputations played an important rôle in the universities of the Middle Ages.

In rare cases the whole course of study in the liberal arts and one of the upper faculties (theology, law, or medicine) was finished by the students. Only a small number of students had the intention of entering upon one of the three upper courses. For this reason the greatest weight of the whole institution, in Germany as everywhere else, was attached to the faculty of arts. But even in this faculty proportionally few students ever completed the course, and those who passed at the close of the first step of instruction in arts—that is, secured the degree baccalaureate—were less than one-half of all matriculated students. About one-fourth or one-third of all registered students received the degree baccalaureate, only one-twentieth to one-sixteenth that of a master. "The remainder left as simple scholars as they had come." (Paulsen in Sybel's Hist. Zeitschrift, 1881, p. 293.) The college character of the instruction as thus sketched is plainly noticeable also from the fact that the students at this stage were much younger

than our university students of to-day. In Heidelberg, for instance, in 1453 the fourteenth year of age was fixed as the lowest age limit for matriculation. Ordinarily students may have entered at 15 or 16 years of age, but Melanchthon, for instance, having been matriculated at 12 years of age, became, not yet 15 years old, a baccalaureus, and a master before he was 17 years old. With this fact the students' manner of living is indicated. For masters of limited means, immediately after the foundation of a university, study houses, so-called "colleges," were established in which they lived together and attended to their studies, while the scholars as a rule were collected in "burses" or dormitories for common living and study under the direction of masters.

In those times universities were ecclesiastical institutions throughout; they were the perfection of ecclesiastical education in the Middle Ages. The church granted prebends and scholarships for university instructors, and teachers as well as scholars belonged to the clergy. Among the sciences of the university the theological studies and, for a long period of time, also the studies in the arts were of importance for ecclesiastical functions only; in the faculty of law, church or canonical law was preponderating. The poorly attended studies of Roman law and of medicine, however, soon abandoned the ecclesiastical character; but it seemed a matter of evidence that the church should maintain within its pale of influence the whole course of higher education. On the other side it will be seen, from the interest which princes and city magistrates took in the establishment of new seats of learning, that the new school was of great importance, also, for secular life. Not only that it seemed to these authorities a great honor and material benefit to possess a seat of higher education within the limits of their own States or within the walls of their own cities, but the importance of education for public and private life was more and more recognized. Toward the end of this period the civil professions, which side by side with the ecclesiastical sought preparation at universities, gained immense importance. Well-educated judges, legal assistants of princes, rulers and city magistrates, city physicians, and physicians in ordinary to princes became more frequent. From among the members of the universities themselves, gradually, a profession of its own arose, the learned profession, which made attempts at emancipating itself from the church. During the conflicts between the ecumenic councils and the popes the university professors, through their authoritative opinions, formed a power of their own whose aid was enlisted by both contending parties. To the secular people of learning might be counted, also, the increasing number of masters and bachelors of the "particular" schools (see 4, below). Thus it came to pass that, at a time when the church was still keeping in its hands the whole course of higher education, science began to liberate itself, or, at least, to loosen the fetters of a purely ecclesiastical domination.

A university in the Middle Ages was termed "studium generale,"

which means an institution for general education. The name "universitas," as shown in the example of Paris, was not used in the modern sense for the whole range of sciences united in it, but for a union of teachers and students. In contradistinction to the "studium generale" the "schola particularis" was established to benefit a certain town or a limited territory.

4. *Particular schools.*—To the particular schools belonged, first of all, the old monastery and the cathedral schools. During the last centuries of this period the so-called foundation schools (Stiftsschulen) claimed similar rank; likewise institutions established by college churches, in which, as a rule, a college of clergymen acted as teachers. In this respect all the "particular" schools (secondary schools, as we term them in the United States) followed the example of the schools under direction of bishops and archbishops (cathedral schools).

The education of the secular clergy (not members of religious orders) in cathedral schools was regulated by new legal church statutes. According to the rules adopted by the fourth Lateran council, of 1215, which enforced those issued earlier (1179), there were required for cathedral schools a "grammaticus" and a "theologus," for simple church schools and others at least a "grammaticus." This led to the appointment of a teacher of Latin for simple church schools, while for cathedral schools (archbishops' schools), in addition to a grammar or Latin teacher, one for theology was required. In 1438 the council of Basel decreed the establishment of a chair of theology also in bishops' schools.

The religious order of St. Benedict gradually ceased to foster higher education. At the beginning of the thirteenth century its place was taken by the newly established orders, the Dominicans and Franciscans. They founded new monastery schools in the cities. In these schools opportunities were offered to the members of the orders as well as to laymen to attend the lower and middle stages of an ecclesiastical course. But the orders did not confine themselves to that. These new ecclesiastical societies quickly took possession of the new trend of higher education and tried to get in contact with the universities. The Dominicans in Paris, as early as 1219, had a strong hold on education. At the middle of the century their theological professors had succeeded in entering the theological faculty of the university, and at the same time they prescribed a rigid course for the education of the members of their order. It began with the study of the arts and logic, then took up that of "natural things" (studia naturalium), and ended with the so-called general study; hence was framed to conform with the hitherto customary course, as it was divided into Trivium, Quadrivium, and theology. For higher education the school of the Dominicans in Paris became the foremost institution of the world. Later the various orders established special study houses (colleges) in universities and provided them with their own professors; or, if that could not be done, they maintained their members studying in a university at the

expense of the order. Pope Urban VI, in 1366, advised, soon after the foundation of the University of Prague, the Bohemian monasteries of the Benedictines, Augustinians, and Præmonstratensians to send members of their orders to Prague; and he further decreed that the priors of the Dominicans, Franciscans, Augustinians, and Carmelites in Bohemia should engage a sufficient number of qualified teachers of theology for their order houses in Prague.

To the monastery, cathedral, and foundation schools came, during this period, a fourth kind of secondary institutions, the Latin city schools, to which we shall refer later.

The courses of all these "particular" or secondary schools differed greatly in the various institutions. As has been mentioned before, some of these schools reached with their theological instruction into the course of the university. Generally they undertook a larger or smaller part of the course in liberal arts. Some of them may have restricted themselves to the elements of Latin. Well organized schools of the later period, like those of the city of Nuremberg, and the St. Sebaldus school of Vienna, show a limitation in their courses of study which, in the light of our modern experience, seems very wise. Their pupils first received a careful instruction in Latin, and, in the upper grades, a kind of foretaste (Vorgeschmack) of higher education through the study of an elementary course in logic and rhetoric. Such schools, leading over into a course of liberal arts in the university, approached the limit of the baccalaureate degree, and thus were true preparatory schools.

However, the relation of the particular schools to the university was, generally speaking, not that of a prescribed preparatory institution. They offered instruction as far as the conditions of each school would permit, and left it to the student to utilize as much of it as he would, or to apply it in whatever way he could. From the biography of Thomas Platter and others (in Raumer's Geschichte der Pädagogik, I. Supplement) it will be seen how many traveling scholars rambled from one school to another. These young men, when occasion offered, entered the priesthood, or if not, grew old or perished in their unfinished state (Scholarenthum). It was possible in that period for an ambitious student to obtain also outside of a university the knowledge offered there. Besides theological lecture courses arranged by the Church itself, voluntary foundations of that kind were not rare. In Hamburg, which, geographically, lay somewhat aside from the territory of the German universities, the cathedral school taught not only grammar, logic, and rhetoric, but also philosophy. Furthermore, an ecclesiastic of that city, Magister Johannes Vrietze, established in 1408 a fund for the purpose of maintaining a theological lecture course, and secured for the professor the right to give academic disputations, engaging and paying to that end four preachers to take active part in these exercises. Thus it was made possible to the clergy of the diocese to pass through a complete theological course without leaving the city. This, however,

happened at a time when other Hamburg students lived at the University of Prague "for the purpose of studying." (Meyer, Hamburgisches Schul- und Unterrichtswesen.) In a similar manner, in 1415, some Augustinian monasteries, situated in the north and northeast of Germany, resorted to a makeshift by establishing an ambulatory university, which remained a year in every monastery of that section, and to which each sent a brother. The subjects of instruction were grammar, logic, philosophy, and theology. (Paulsen, Gelehrter Unterricht, I, page 28.)

On the other hand it became customary to regard the attendance at a "particular" or secondary school as the natural preparation for study in the university. This was the case with most of the scholars whose lives Muther describes (Aus dem Universitäts- und Gelehrtenleben im Zeitalter der Reformation). Their course may be considered typical for the Middle Ages. Among them was Hieronymus Schürpf, who attended the monastery school of his native city, St. Gall, and there followed the "grammatical course;" then he went to Basel to the university. It is well known that Martin Luther as a boy visited the school at Mansfeld, in which the elements of Latin were taught, and after his fourteenth year of age the schools of Magdeburg and Eisenach; in letters from Eisenach he praises the grammatical instruction of his teacher. Eighteen years old, in 1501, he went to the University of Erfurt. His further course of study may finish the picture of a Middle Age course of instruction. At the university he studied, besides the Latin authors, dialectics, physics, and ethics; i. e., the philosophy of the course in liberal arts. After two years he became baccalaureus, and master after two more years. In later years he acquired, as is well known, the degree of Doctor of Divinity.

5. *Latin city schools.*—The exclusively ecclesiastical education offered in universities and church schools was supplemented by a secular form of education in the cities after the first attempt at such an education during the chivalric era. Here the German culture found new centers when, during the first part of the thirteenth century, court life began to decline. Poetry itself came from the castles of the noblemen to the circumscribed territory of the civil communities; the minstrel song became the master song (Meistergesang). The German cities, having had their rise in the thirteenth century, saw in the fourteenth and fifteenth centuries a period of splendid development of power and importance in all activities of life. An increased desire for education followed as a matter of course. It was met occasionally in the patrician houses of people of wealth in the same manner which had been customary among the nobles—that is, by private tutors. For the majority of people in search for education, however, a desire for the establishment of schools became quite urgent. To this we may attribute the existence of Latin city schools, which have been mentioned before. They were called town or parochial schools. Built in proximity to the

parish churches of the cities, they were intended to offer to the citizens at least the elements of intellectual culture.

Also practical needs urged the establishment of schools. The relations of the cities, towns, or burgs with the outside world made necessary written communications of various kinds. For the interior administration likewise, documents, minutes of proceedings, records, and accounts had to be made and kept. In private life of these growing communities also the art of writing became a necessity, as records of contracts and donations, etc., had to be kept. Those who conducted this business during the first part of the Middle Ages were ecclesiastics. It was very natural that the administrative authorities of cities looked toward making themselves self-dependent. Therefore, not only secretaries became necessary who knew how to read and write and who understood Latin, but the members of the various boards and councils who had a part in the administration of public affairs found it most advisable to possess knowledge and skill in these arts. Lastly, in commerce and trade the possession of these arts became more and more urgent. The ecclesiastical schools in churches and monasteries, it is true, offered such instruction, but the rapid development of the towns and cities which took place during the thirteenth century soon proved them to be insufficient for existing needs.

The clergy had not the slightest inclination to comply with the new desire. Hence city authorities themselves were obliged to take the establishment of new schools into their own hands. In Cologne, city schools are mentioned in documents dating back to 1234, but the time of general establishment of such schools seems to begin at the middle of the century. Lübeck had been founded only a hundred years before that time (1143). But the territory of the burghers' dwellings had extended rapidly between the bishop's palace and the citadel, so that up to 1250 four parochial churches had to be erected aside from the cathedral. It was only a consequence of this development that, in 1252, the city authorities desired to increase the school facilities, and they determined upon the opening of a new institution near the market church in the middle of the city proper. They claimed that for little boys the way to the cathedral school was too far and too dangerous, situated as it was at the end of the city. The establishment was approved by the clerical authority, as well as ten years later the establishment of a second school in connection with another church of the city, that of St. Jacob's, which was still more distant from the cathedral. Two more schools, at St. Peters and St. Ægidians, were opened a little later.

In Hamburg the opening of a city school was contemporary with the expansion of the city territory. In the new part of the city, at the harbor, the congregation of St. Nicolai was formed. This, too, wished to have a school besides the old cathedral school. The permission was granted by the Pope in 1281, to whom the city authorities had addressed

the request, but the definite establishment was made possible only after settling a dispute, which lasted through eight years, with the headmaster of the cathedral school. The city council of Breslau was granted permission to establish a school at St. Magdalena in the year 1267. The city children had until then to take their way across the Oder River, because the cathedral school was situated on the opposite side of the river. The distance, as the authorities complained, was far, the state of the bridges bad, and the passage dangerous, especially for the little ones, on account of the people, vehicles, and horses crowding one another in passing over. The new school was located within the city limits, as well as another one established in 1293 at St. Elizabeth's Church. Similar establishments in other cities were numerous in the century referred to; also in the two following centuries. The existence of Latin city schools may easily be proved by documentary evidence through the whole German Empire. At the close of the Middle Ages no German town worth mentioning was without a school supported by civil authorities.

The necessity leading to the establishment of parochial or city schools was deeply felt by the city authorities, as has been stated. The city council (Stadt-Rath) everywhere acted as the body representing the community, and expressed the need of such schools in its own and the citizens' interest. The council shunned no trouble or expense to get the approval of the church authorities, and persisted in the struggle with the clergy when approval was withheld. For, as has been mentioned, there were abundant causes for conflicts with the clergy, especially with the local clergy. In the chapters of the cathedrals and prebendary churches the "scholasticus" (a clergyman to whom the principalship of the school was intrusted) had gained a dominant position since the twelfth century, and upon this influential priest devolved not only the supervision over all the schools of the diocese, but also the right to determine the distribution of their income. The new schools which the city councils intended to establish seemed to injure the prerogatives of the priest. Therefore the secular authorities were obliged to wrest the right of establishing such school, first, from the "scholasticus," sometimes from another person who made similar claims, such as an abbot of a monastery. The contest in many cities was carried on with great vigor. It sometimes happened that the "refractory city authority," or the entire city, was excommunicated, which action was answered by the city council by expelling the "obstinate clergy" from the city. Usually a compromise was effected, some years after the struggle, by higher ecclesiastical authorities, that is, bishops and the Pope, and the dispute terminated in granting the permission to establish city schools, in lieu of which the council again confirmed the privileges of the clergy of the town, perhaps also expressly promised to prevent a diminution of the revenues of the "scholasticus" or general educational director.

But in spite of these contentions the instruction in the city schools was no other than that offered in the ecclesiastical schools. With the establishment of city schools no reform in matter or method of teaching was intended. It did not occur to the council or anyone else at that time that matter or method of instruction in schools needed to be different from those in church schools. "The city schools were simply parallel institutions to the church schools." (Specht, page 249.) In the beginning, the establishment of advanced, grammar, and secondary schools was strictly reserved to the clergy of the town, who were also intrusted with the teaching of singing, owing to its importance for divine service in the principal churches. Hence these city schools may be said to have been elementary Latin schools. Later this limitation, as well as the ecclesiastical supervision, fell into disuse, as the example of the schools of Nuremberg of the fifteenth century shows.

6. *Schools for reading and writing.*—In the same cities in which thus, since the middle of the thirteenth century, the citizens tried to acquire at least the elements of a Latin education, purely German schools sprang into existence about a hundred years later (1350). These were the schools known in the history of popular education under the name "Reading and writing schools" of the Middle Ages. They were also called German schools, in contrast to the Latin schools of those times.

During the first part of the Middle Ages Latin was the only language of public judicial action in Germany, but in the second part of that period the vulgar tongue began to claim a place beside it. In the thirteenth century the first great law collections or codes were made in the German language; the "Saxon" and the "Suabian Mirror" date from that time, as do also municipal laws, guild statutes, and other codes all composed in German. In other documents the people began to employ the native language. As early as 1281 Rudolph of Hapsburg ordered a "public peace" (Landfrieden) in German. Furthermore, an increased need of education became urgent among the masses of the people. The desire to learn reading and writing became quite common, and the possession of these elementary facilities can be proven to have been very extensive from about the second half of the fourteenth century. In 1382 a citizen of Lübeck sent libelous letters to a councilor in Stettin, which he had nailed on the church door of the city, evidently for the general cognizance of the inhabitants. In 1400 it was the custom of the German merchants of Novgorod, in Russia, to affix at their front steps the names of Russian debtors who had proved themselves defrauders. In 1442 during the convention of the Hansa, held in Stralsund, it was resolved that certain regulations in the various cities belonging to the League should be brought to the knowledge of the public by placarding them at the city halls, "so that everybody might know how to avoid damage." At the same time (1443), in Brunswick, the members of the trade guilds could read, which is seen from

the fact that they teased one another by affixing satirical stanzas to their caps and hats. This was the time in which the burning desire for education caused the invention of the art of printing, which in turn still further increased the desire to learn. In a pamphlet printed at Mayence in 1498 it is said: "Everyone now wants to read and write." (Kopmann, Mittheilungen des Vereins für Hamburgische Geschichte, I, page 113.)

The Latin schools were not insensible to this general movement, and attempted to meet the awakened desire for instruction in reading and writing by devoting special attention to these subjects and by accepting, aside from their Latin pupils, also such as wanted to obtain only the elementary arts. In a document published in Hamburg (1456) recommending the concession to open simple German schools, it is left free to everyone to let his children learn to read and write in the Latin schools, where they may sit on separate benches. The Latin schools, especially the city schools, developed in this way the character of institutions that satisfied the general desire for education among the city population.

It seemed to become a duty of good and respectable parents to let their children acquire some school education and to make them share in the discipline of the school. This is explained in a very interesting way in the words in which the city council of Nuremberg in 1485 sustained the publication of a new programme for the four schools of the city. The preamble of this quaint document in quaint German says: "Since in these schools, there are many native and nonresident boys[1] who have not come for a definite purpose, or are sent merely to prevent them from running wild in the streets, and to give them some wholesome discipline by means of the good examples of other boys, so that they may get some useful knowledge and skill, and that perhaps some may learn to read and write, or become learned and later enter holy orders; therefore it has become necessary to enforce strict orders, rules, and regulations in these schools, so that each one may know what is due him and others," etc.

This public education led to the establishment of private schools and "home schools" (Schulzirkel). These came into existence as private enterprises at the request of persons who clubbed together to support the school. "Keeping" such a school was considered a business which assumed all the characteristics of a commercial venture. City clerks, vagrant ecclesiastics and scholars, pious sisters and nuns, or secular women for the purpose of earning their livelihood, or a little extra income, offered to instruct little children in numbers, reading, and writing, as they had learned these arts themselves. In a book of models printed at Augsburg and dated 1484, such a schoolmaster petitions the authorities that he may be allowed, like other tradesmen, to

[1] No one in those days thought of admitting girls to schools. Martin Luther was the first to urge upon the councils of cities to establish girls' schools.

practice his trade. Such teachers for children are mentioned in Frankfort on the Main as early as 1364; women teachers are spoken of in Speier in 1362; in Mayence already before 1300. (F. Müller, Quellenschriften, page 311.)

The clergy were not favorably inclined to these new efforts of the people, efforts that had their origin below the usual level of educated society, and they opposed these enterprises even more strenuously than those of the city authorities that had resulted in the opening of Latin schools. When in Lübeck, at about 1400, numerous private schools were opened, a protracted dispute arose with the clergy of the city, which was finally concluded in 1418 by a formal treaty between the city authorities and the general superintendent or "scholasticus." In this document it is said that many of such writing schools had been maintained by citizens without the permission of the scholasticus, and the schoolmasters had taken tuition fees and put them into their own pockets. The agreement provided that only four of such schools for writing should be retained, and these should be exclusively German schools, from which we may infer that the German schoolmasters often trenched upon the Latin instruction of older institutions. The city council appointed the masters and the "scholasticus" installed them. One-third of the tuition fees had to be handed over to the latter; two-thirds were the master's share. "The masters shall see to it that they instruct the pupils intrusted to them in reading and writing, and teach them good manners in a way that will assure them God's reward and contribute to the honor and dignity of the city of Lübeck." This addition again shows that these institutions were intended to give to the children of the citizens an education which not only served practical purposes, but which trained them to be well-mannered, and rescue them from total ignorance.

In the city of Brunswick, at about 1400, also, writing schools are mentioned. In a quarrel that arose in that city between the administration and clergy on account of the intended establishment of two Latin city schools, the opposition of the clergy turned at the same time to the German schools. The differences were settled in favor of the city, in 1420, by a formal treaty in which also the keeping of simple writing schools was conceded by the clergy. In that document it is made a condition that in these schools no master should teach more than "how to read and write the alphabet and German books and letters." In 1479 this clause had to be enforced again by a decree which said: "The conductors of these schools shall keep no master who teaches from Latin books and Latin authors." The new movement represented by these German schools turned in many places not only against the ecclesiastical schools, but likewise against the city Latin schools. There are evidences in documents of the city of Amsterdam to show that the Latin city schools had to fight at times against the writing and reading masters. (F. Müller, Vor- und Frühreformatorische

Schulordnungen, II, p. 323.) The closing Middle Ages exhibited a fierce competition on the field of public education. The "scholasticus" fought for his prerogatives, and still more for his revenues, against all new schools not established by the church, and the Latin schools, both church and secular, against the German schools; and again the German schools with their professional masters and privileged by the city council against others not belonging to the schoolmasters' guild.

In Hamburg German schools existed from the beginning of the fifteenth century; it is known that the authorities employed suitable persons to keep German schools of reading and writing. Later, differences arose between the council and the clergy of the city over this point. These difficulties were settled temporarily with a signal victory of the clergy. The city authorities were not allowed to establish more than one German school, the location of which, moreover, was to be designated by the clergy. The number of pupils was not to exceed forty; the city council appointed the schoolmaster, but the "scholasticus" paid his salary and supervised his work. One of the causes of the dispute, and perhaps the most important, arose from the provision that the "scholasticus" should receive annually as much of the tuition fees as he would receive from a similar number of pupils in the older Latin schools, that is, the cathedral and the city school.

But the flood, here as well as in the other cities, could not be checked. At the close of the Middle Ages, in 1522, the Hamburg "scholasticus" of that time complained that "almost daily new schools were opened by old women and other persons."

The number of distinct forms of schools which the Middle Ages developed is herewith concluded. Regular instruction did not penetrate into the villages at the close of this period, and a people's or common school education is nowhere to be found in the Middle Ages. As has been shown by examples, the idea was not uncommon that it would be laudable and becoming to every person to obtain useful knowledge at school; but the further idea to institute a general compulsion for that purpose was very remote. Only in modern history does this idea appear, first in the church, then in the state. If this be regarded a fault of the Middle Ages, it is mitigated by the fact that in earlier periods absolutely nothing had been done for public school education, and nothing ever develops in this direction unless it results from needs urgently and acutely felt.

III. From 1500 to 1800.

Humanism in secondary schools. Establishment of a public school system—The beginning of the realschule (secondary schools of the realities or modern high schools).

(*a*) The sixteenth century. (1) *Humanism and its effect.*—Toward the end of the Middle Ages there came a period for the classical schools in which men began to tire of the once highly prized scholastics,

and not to regard disputations in the universities as the highest proofs of human intelligence, but as idle jingling of words. Intelligent men looked for a new education. It was found in the occupation with classic antiquity, which just then awoke to new life. The scholastic method had founded its instruction on ancient authors, especially on Aristotle. But the new education gave the preference to other authors. It turned from Aristotle to the classic poets, who had been abandoned by the scholastics; also to ancient orators and historians. Though Latin had been the language of scholastic science, the language which was now to be learned was the pure Latin, written by the Romans of antiquity. Its study was commenced on account of itself, on account of its beauty and characteristic expressions. Soon Greek and Hebrew, as new subjects of study, were added. Humanism it was that took possession of emotions. It represented the idea of a more human and more natural education than that of former times. It was a member of the whole mental renovation of antiquity known by the name of "Renaissance." The change that occurred in the twelfth century from mere literary education of the earlier Middle Ages to the philosophic-scientific or scholastic education was now reversed. Scholars again began to esteem literature in its narrowest sense; i. e., those authors who treated upon subjects of human life or history in a rich variety and in beautiful forms. They found more pleasure in them than in scientific formulation and presentation. One might be induced to suppose that this shifting from science to literature, and vice versa, would repeat itself of necessity in the history of education after certain intervals. What men are looking for in all education is a definite view of the world and life (Welt- und Lebensanschauung) which comprehends the known phenomena in nature and history, as well as in the life of the individual. It seems that men find this view of the totality, at times, in the literature of a foreign nation, or in their own, where it is offered dogmatically, derived from the subjective assurance of the author. At other times they reject this source as deceptive, and find objective truth in science and its attempts at explanation. Then, for a period of time, salvation is sought in science alone.

Humanism had its rise in Italy. From the fourteenth century efforts were made here to renew the ancient Roman culture at the place of its past life. The new inhabitants of the country began to feel themselves the successors of the ancient people. Boccaccio (1313–1375) worked for the study of the classics, collected manuscripts, made copies, and learned Greek himself. Petrarca (1304–1374) studied Cicero and Virgil at the university against the will of his father, instead of law; he celebrated the older Scipio Africanus in a Latin epic, and joined the party of Cola Rienzi, who intended to reestablish the Roman Republic. He hated the scholastics and mocked them mercilessly. Humanism, after having spread over Italy by these and other noted men, was brought to Germany in the fifteenth century. From 1450 the younger

generation among German scholars tried to obtain the "new education" in Italy, and to bring it to their own fatherland.

What France had been in the eleventh and twelfth centuries that Italy became in the fifteenth and at the beginning of the sixteenth century. Italy was then the aim of all who would take part in the newly awakened mental culture. The chief interest in Italy and Germany centered in the Latin language and literature. Besides Greek, which during the Middle Ages had been as good as forgotten in the countries north of the Alps, assumed rising importance. Knowledge of Greek, already resuscitated in Italy, was further extended by the dispersion of Greek scholars after the conquest of Constantinople in 1453. Hebrew as a study was added later. In 1506 Reuchlin in Germany published the first grammar of this language. The purpose of the study of Hebrew was, above all, the ability to read the Old Testament in the original. The study of Greek had, as a matter of self-evidence, theological purposes. Quite in accordance with this, Erasmus of Rotterdam printed the New Testament for the first time in the Greek language.

Humanism, during the first two decades of the sixteenth century, caused a transformation of the German universities according to the new ideal of education. In Leipsic the university was reformed in 1519, during the reign of Duke George. In the preliminary discussions and transactions the masters of the faculty of arts complained that the humanists entered their course by giving lectures on classical poets and orators. Science had to treat, so they declared, with things, not with words. He who knew words was a "grammaticus," but that did not make him learned or a philosopher, and the university had expressly been founded to train philosophers. To know words belonged to boys (Paulsen, Gel. Unt. I, page 104). The contrast between the new and the old system could not be better defined from the standpoint of the former. The result of the transformation was that, instead of the old, barbarous translations of Aristotle, others, more elegant ones, were used. From the scholastic commentaries only a few were selected, edited by older scholars. Lectures on Cicero, Quintilian, and Virgil were admitted, and Greek was introduced as a study of the course. The university of Wittenberg had been established in 1502 under humanistic influence. From 1507 these teachers of the faculty of arts are mentioned as reading on Latin authors, like Virgil, Sallust, Suetonius, and others. Shortly after, Martin Luther began his work there as lecturer of philosophy and soon also of theology. He agreed with the humanists in the controversy against Aristotle and the old-established faculty of arts, and took an active part in the attempt at university reforms. But his position was not quite the same as that of the humanists. According to his opinion the Christian system of the Middle Ages had been corrupted by the study of Aristotle; and the scholastic philosophers and theologians with their commentaries, obscuring the

Bible itself, had taken their wisdom exclusively from [illegible] influence had to be broken, so that the doctrine of [illegible] might reappear in its purity, and hence for this purpose [illegible] after the new linguistic interpretation, and the church fathers [illegible] tine were the correct sources. His opposition, therefore, aimed high [illegible] i. e. against the theological faculties of the universities. In 1518 lecturers were appointed in Wittenberg for Hebrew and Greek. For the latter study Philip Melanchthon was called from Tübingen. At the same time a humanistic reform was brought about in Erfurt, and the other universities followed the precedent set by the three middle-German universities.

In like manner the new system gradually entered the so-called particular (secondary or preparatory) schools. As an example, the aforementioned schools of the imperial city of Nuremberg may be referred to. In 1485 the old management was modernized a little, according to the spirit of the time, by introducing some lessons on Latin classics. In 1496 a "poet" was employed by the city to satisfy the urgent desire for humanistic education. The same end was the aim in 1509 in another way, by granting an increase of salary for the two city schoolmasters, for which these men had to give a special literary instruction to a select class of students. In 1521, at last, a learned humanist, capable of teaching the three ancient languages, was appointed for the school of St. Sebaldus.

(2) *The Reformation.*—At the close of the second decade the humanistic revolution was replaced by another movement, going deeper and reaching further. It seized not only the scholars and the learned men of the time, but the whole people, and especially the middle and lower classes. This new movement was the church reformation. The clergy during the last centuries of the Middle Ages had developed by degrees a very exclusive aristocracy, which in all religious questions claimed exclusive mediation, and which even prevented the laity from obtaining admission to God on high without ecclesiastical aid. The clergys' secular dominion with all its pretensions appeared ever more oppressive, and its weight was felt the more the more directly it came from a foreign power, the Pope in Rome. Luther gave the signal for the liberation from this oppression, and the consequence was, as is known, that the one-half of the nation made itself independent in church matters forever.

These events, naturally, had great influence upon the then existing school system, which was closely attached to the church. In the beginning of the movement the whole school system was threatened with dissolution, at least for the moment. To extremists and enthusiasts it seemed as though for right faith, science and higher education were altogether superfluous. This menacing danger Luther vigorously attempted to meet by issuing an open letter in pamphlet form (in 1524) entitled "To the members of councils in all the cities of Germany,

enjoining them to establish and maintain Christian schools." In this document he developed the outlines of a Protestant secondary school system to be established. This he could not conceive possible without the study of languages. For, as the reformatory movement, at least among the leaders, had started from a scientific dispute over the foundations of church doctrines, so the future existence of the new church was dependent upon the possession of scientific weapons in the battle for the right creed, and for this purpose knowledge of the three ancient languages was absolutely necessary. He said: "May this be said, that we can not preserve the gospel without the ancient languages. They are the sheath wherein is contained the knife of the spirit; they are the shrine that holds the jewel." Hence humanism united with the church reformation for a reestablishment of the school system, just as their representatives, Luther and Melanchthon, worked shoulder to shoulder. But while Luther saw in the knowledge of ancient languages scarcely more than a weapon for theological purposes, Melanchthon's influence produced the idea, peculiar to humanism, that occupation with the ancient languages and literature offered immediate educational benefit to the student.

Luther also formulated the plan for the Protestant school system, which was followed for more than three centuries. It should prepare for both ecclesiastical and secular government. The necessity of a suitable preparation for secular professions having grown by degrees during the Middle Ages side by side with the ecclesiastical purpose of the schools, the education of officials in city and state government, of councilors and princely rulers and officers, was now made equally important with that of the clergy. The secondary and higher system of education developed (at least in the larger States) in such a way that it supplemented and assisted the form of government which became the dominating one in Germany at the beginning of the new epoch, i. e., the monarchy of the sixteenth, seventeenth, and eighteenth centuries, in which churchmen, lawyers, and the nobles were the three governing classes.

(3) *Protestant Universities.*—After the first great storms of the ecclesiastical commotion had abated, the establishment of a Protestant system of education was commenced in schools and universities. In 1553 the theological faculty of the university of Wittenberg obtained new statutes. The old scholastic theology was entirely abolished. The newly appointed four professors lectured on the Old and New Testaments, sometimes also on Augustine. Three years later a reformation of the whole university took place. The ten professors of the philosophical faculty were obliged to teach the three ancient languages, mathematics, dialectics, rhetoric, physics, and ethics. The old Aristotelian sciences taught by the faculty of arts were not abolished, but were henceforth treated with the use of a corrected edition of Aristotle, instead of the scholastic edition that had been obscured by many

commentaries. The text books for these sciences, prepared by Melanchthon himself, were introduced everywhere into the Protestant schools, and retained their hold for more than a century.[1] The Latin which had to be taught was, of course, classical Latin. For elementary language instruction of scholars who came to the university without adequate linguistic preparation a "pædagogium" was established in the university, as it had already been done in other places at the close of the Middle Ages to meet pressing needs. In this measure lay the germ of separation between lower and higher instruction in liberal arts. In the general course of study the philosophic course did not differ materially from the old. It was divided into the customary grades of which the first ended with the baccalaureate examination, the second with the examination for the degree of master of arts. Other universities which joined the Reformation made similar changes. The establishment of a "pædagogium" is seen in many of them. In Tübingen, from 1557, this institution had four grades and led to the baccalaureate degree. A "stipendiate" course of study in force at Marburg (dated 1560) prescribed that scholars of average intellect, after having passed through the philosophical course, in which also some theological lectures were given, might enter church and school service, and only the more intellectually gifted were allowed to enter one of the upper faculties. This shows that no uniform course of study for all professions was prescribed, no more than was done in the Middle Ages.

(4) *The new classical high schools.*—The "particular" schools, described in a foregoing paragraph, prospered during this period. The humanists of the first part of the century were obliged as a makeshift to teach in these preparatory schools. Of course they infused these schools with their own spirit. But soon men were found who made it their life task to conduct such institutions, both in a humanistic and a Protestant sense, and who were sincere and zealous in fulfilling this duty. Some of these men have become famous in the history of education, (see Raumer's Geschichte der Paedagogik, I, page 213); for instance, Trotzendorf of Goldberg in Silesia, Neander of Ilfeld on the Hartz mountains, Sturm of Strassburg, and Wolf of Augsburg. The cities and princes gained over to Protestantism showed a lively interest in preparing a firm foothold for the new scientific and religious system in their schools. From all this resulted a raising of the course of study of the old particular schools; they were also brought into closer connection with the universities. The rectors, or principals, set themselves the task to prepare their pupils for the university, releasing them in the age of between 16 and 18, aiming at their finishing, if not the whole, possibly a large part of the philosophical course. Thus the plan of our modern school organization was laid in which the "gymnasium," or classical high school, prepares its graduates for higher professional study. The classical school thus assisted the university in its endeavors to

[1] Hence his title "Præceptor Germaniæ."

abandon its preparatory departments, which, however, did not exclude vigorous remonstrance and claims upon ancient privileges when the new schools extended their instruction far into the course of the faculty of arts. Thus the university of Basel complained about Thomas Platter, who had reorganized the cathedral school, that he taught the best classical authors and also dialectics in his course, studies which by rights were recognized to be university studies.

As has been mentioned, it was Luther who addressed himself to the cities soon after the beginning of the Reformation (1524). Following this vigorous incitation, new establishments took place in Magdeburg in 1524, Eisleben in 1525, Nuremberg in 1526 and other cities. In the North the reformer Bugenhagen worked to induce the cities to reform their secondary school system, and to give these schools statutes and regulations. This was done in Brunswick, Hamburg, and Lübeck. Other cities, like Minden, Göttingen, Soest, Bremen, and Osnabrück, accepted the draft of his regulations. Entire states, such as Denmark, Sleswick-Holstein, and the Duchy of Wolffenbüttel, reformed their school system with his aid. For the cities of the Electorate of Saxony a new order was prepared by Melanchthon, in 1528, in his report as inspector-general of schools. Of the later establishment the school at Strassburg became specially known and influential through the work of its rector, Johannes Sturm (after 1538). This institution was regarded as a model, and had many foreigners among its pupils. The course of study and the school books of Sturm remained the general standard for a long time.

With the beginning of the fourth decade commences the period of princely (or State) regulation of classical schools, and important features were developed. Necessity proved that the State had to take care of this education (the State having assumed the Pope's authority in Protestant countries) to secure preparation for ecclesiastical and secular government service in the different principalities of the Empire. The schools of the cities supplied only the limited city territory in which they had been established. They were classical and burgher schools at the same time, and could not always extend their courses far enough to suit the State. Duke Moritz of Saxony therefore, in 1543, introduced a decisive innovation by establishing public or princely schools in three cities of his dominion—State schools in fact—namely, at Pforta, Meissen, and Grimma. Following this model, in the second part of the sixteenth century similar institutions were established everywhere in Protestant States. The new schools were reserved for the children of native citizens, and had the object to prepare them for the university of their own State, at public expense, in boarding establishments. Their graduates were also supported by public means in the university, and were obliged to serve their State later on in high official capacity. The money for these purposes was obtained from church property sequestered in consequence of the church reformation. These

schools did not give elementary instruction, but required for admission some knowledge of Latin; they were therefore purely classical institutions for secondary and higher education. In the upper grades of their course the three ancient languages, Latin, Greek, and Hebrew, were taught; but some of these schools restricted their course to Latin and Greek. To such a school the name "gymnasium" was given. In contradistinction to these were "city," "council," or simple "Latin schools," with a briefer course. The princes' (Fürstenschulen) or State schools (as we understand the term) having been established mostly at the expense of the property of ancient monasteries, were often colloquially called monastery (Kloster) schools—thus, for instance, in Würtemberg, where they were founded through the "church and school order of 1559," issued by the State.

The type of the Protestant classical school, created by the Reformation, remained authoritative for the next three centuries up to the eighteenth century. Classical education, being the center of gravity of the entire course, had a double purpose—to give the scholar ability to express himself readily in verse and prose, and to give him a certain amount of useful knowledge. This Melanchthon stated with precision to his students: "I always endeavor to introduce you to such authors as will increase your comprehension of things while they contribute toward enlarging your language. These two parts belong together, and have sworn friendship, as Horace says, so that one stands and is supported by the other, because no one can speak well if he does not understand what he wishes to say, and again, knowledge is lame without the light of speech." (Corpus Reformatorum, XI, page 112.) This epoch derived from the ancient authors increased knowledge of the life of men of their times, yea, even its general science. Homer was celebrated as a good preparatory school for the future official of a community, showing in the Iliad the arts of warfare, and in the Odyssey those of peace. Thucydides seemed to represent German home affairs; from the "Metamorphoses" of Ovid, besides moral truths, various bits of knowledge of geography, astronomy, natural history, etc., were taken.

Humanism, leaning toward literature, in contradiction to scholasticism which was based on scientific knowledge, was introduced into the German schools for this reason, and remained there during the following centuries. One may be disposed to include the present century, to regard the entire history of the secondary school system in Germany from the sixteenth century to the present time, as one period, and term it the period of "modern humanism," thus distinguishing it from the two earlier periods, that of "humanism of the middle ages," and that of "scholasticism." All the influences that were exerted upon the schools during the seventeenth and eighteenth centuries were foreign influences, but they were incapable of changing their character. Whether humanism, after experiencing a splendid renewal at the

beginning of the nineteenth century, and maintaining itself up to the present day, is weakening and losing its hold upon the present generation, or whether it will in the near future arise from the present depression and take a new lease of life, is a question concerning which opinions differ widely.

In this period the form of speech was fully as important as the contents. But also in this point it was thought best to borrow forms from foreign nations. This is the period of Latin poems and orations for all events in public life, of Latin inscriptions on the houses of the living as well as on the tombstones of the dead, and of Latin phrases and words in the German language.

(5) *The schools of the Jesuits.*—In those territories of the Empire which remained Catholic, the entire secondary and higher school system passed into the hands of the Order of the Jesuits during the middle of the sixteenth century. Established for the purpose of preventing a further falling off of members of the old church, or, if possible, of regaining parts of what was lost, the new order sought to counteract Protestant education by equally good Catholic education. It not only provided for a better education of the clergy, but also offered instruction in its school gratuitously to every one who would make use of it. Children of citizens, as well as of nobles and princes, were admitted. The order embraced in a large circle, from the Rhine through south Germany to Poland and Eastern Prussia, the territory of Protestantism, entering everywhere the old gymnasia and universities, or establishing new gymnasia and "colleges." The latter in many cases included gymnasial and university studies. The theological and philosophical faculties of the order soon obtained from the Pope the privilege of granting academic degrees as the old universities did. The course of study was essentially the same as that in Protestant schools, i. e., a humanistic course was followed by a three years' study of philosophy according to the Aristotelian compendium; then followed the four years' theological course. The study of medicine and law was not entertained by the order. Secondary and higher education in Germany therefore, in spite of the schism, could be considered to a certain degree as a unit. In the Protestant North as well as in the Catholic South, humanism had become the most important part of education. The Catholic church of the sixteenth century had adopted the new education of the epoch as completely as its predecessor had adopted scholasticism in the twelfth and thirteenth centuries. The ecclesiastic-political purpose, however, of the Jesuits was, that science and education remain under strict church control in the schools. For this reason the order of studies of the Society of Jesus (Ratio studiorum, reg. comm. omn. prof. sup. fac. 6) was ordered which said: "Also in things which contain no danger for creed and faith nobody shall introduce new questions on any important topic, nor an opinion, without sufficient authority or without permission of the superiors; nor shall any one teach anything against the doctrines of the church fathers and the

commonly accepted system of school doctrines; but everybody shall follow the approved teachers and the doctrines accepted and taught in Catholic academies."

In this way the inner development of this school system was in effect made impossible. While the Protestant schools were open to the influences of the varying spirit of the times during the following centuries, the higher Catholic institutions remained unchanged upon the old basis. Not until the second half of the eighteenth century did new currents of thought in these schools begin to exert themselves, which in turn aided in abolishing the order of the Jesuits (1773).

(6) *Protestant public elementary schools.*—The Reformation created something new in the public-school system as it existed at the close of the middle ages. At the beginning of the struggle, it is true, the attention of the reformers was directed above all toward higher schools. They depended upon them especially to prepare the weapons for the impending struggle. Therefore Luther, in a pamphlet dated 1524, blamed those who thought unnecessary the knowledge of languages, deeming it sufficient to teach the Bible and the word of God in German. This pamphlet, as has been mentioned before, is a sincere appeal to take care of the further development of secondary or preparatory schools, both princely or state, and municipal or city schools.

A simpler school education for "the common people," he thought, might be sufficiently supplied if the boys attended school one or two hours a day; the girls, one hour. From these elementary pupils the best qualified should be selected for teaching, preaching, and other ecclesiastical functions and to that end receive further instruction. In a similar way Bugenhagen planned the different stages of school education. According to the "school order" of Brunswick, dated 1528, those entirely without talent should attend the Latin school only till their twelfth year of age, others should attend till they were 16 years old, to prepare for "practical professions;" lastly, selected scholars should enter upon higher studies (gelehrte Studien). He allowed purely German schools to exist side by side with Latin schools. The Saxon "school order," framed by Melanchthon in 1528, expressed the same plan. It divided the pupils into three "groups" (Haufen). Only the most talented and skillful should be admitted to the highest (third) step. It provided for these schools that German need not be taught separately, which evidently meant the abolishment of the special German classes arranged as parallel classes in the Latin schools. Hence, it is plainly seen that elementary instruction at that time appears in close connection with secondary and higher studies.

But soon the establishment of an independent lower public school system became necessary in consequence of the Reformation. Laymen in the new church were to be conducted to the very source of faith—the Holy Scriptures. In the German Bible Luther had given to the common people the fundamental book of their religion in the native language. It was a self-evident presupposition that the people should

be able to read it themselves. The new church, however, more than the old church, depended upon intelligent comprehension of the creed; therefore special instruction in religion was necessary, and for this purpose Luther offered in his catechism an appropriate text-book. In many places, in consequence of the Reformation, instruction in the catechism was arranged which was conducted in most cases by the sacristans. Similar conditions are disclosed by Bugenhagen, who ordered that presents should be given every year from the general church treasury to the two German schoolmasters, employed by the city council, who taught their pupils something of the word of God, the decalogue, the creed, and other things.

This kind of instruction assumed a more settled form through the school orders issued by the princes after the middle of the sixteenth century, and in this Würtemberg set the model for other German states. In the same principality in which Duke Ulrich (1546) had ordered the abolishment of German schools that existed side by side with Latin schools in small country towns, because they drew scholars from the Latin schools, and also because Latin pupils would write Latin with German script and read with German accent, his successor, Duke Christopher, in his school regulations of 1559, gave to the German schools a position of self-dependent members of the State school system, independent of secondary or higher institutions. These German schools were to be consolidated in the larger settlements of his principality and placed in care of sacristans, and the children of the working people were to be instructed in German reading and writing, in religion and church hymns. The consistory was told to employ intelligent persons for these schools and sacristies, persons who had proved their fitness by passing an examination. Arithmetic is not mentioned as a branch of study, but the candidates for a teacher's position were examined in it. Also the method of teaching is prescribed; the course of study is divided into three grades, and the "community of pupils into three groups." Attention was to be paid to exact pronunciation of words, etc. The schools were inspected by church officials, first by the local pastor, then by special superintendents, and lastly by members of the state consistory. For lessons in the catechism the duty of attending was made obligatory; the parents were punished for absence of their children from "catechism school." This State school order (which had the force of law) was imitated in Brunswick in 1569, and in the electorate of Saxony in 1580.

As their name indicates, these schools were on a level with the purely German schools already existing during the Middle Ages, especially in the cities. They assumed, however, a special character since religious instruction in them appeared the principal object. It must also be borne in mind that they had been established by authority of the state, while the former German schools had been the result of municipal or private initiative to meet economic needs. Thus, in the domain of the

common school, we see a separation take place between the state or church school and the free burgher school of the Middle Ages. The actual conditions, of course, did not always correspond with the well-intended attempts of the authorities. Especially in the villages schools did not often exist, and their maintenance was precarious. In Würtemberg, for instance, the schoolmasters had to be admonished (in 1588) to establish, if possible, summer schools, and for a long time the classification of teachers into "full term" and "winter" schoolmasters was kept up. In other church and school regulations of that period, as in the Pommeranian school order of 1563 and in the Brandenburg consistorial order of 1573, village schools are not mentioned at all.

7. *Private schools.*—In contradistinction to these new "people's schools," the German schools that had existed in earlier times flourished to the same, or perhaps to a larger extent, and this must be remembered in trying to obtain a complete view of the school system of that time. The desire for the elementary arts of reading and writing had become more general. The laboring class and the trades had not yet declined; city life was still rich and manifold. The church reformation had very greatly increased the participation of the people in general affairs, and the political and religious battles fought during the greater part of the century kept the people's energy in public affairs alive. In the "Mittheilungen der Gesellschaft für deutsche Erziehungs und Schulgeschichte" (1891, No. 1) an interesting document will be found giving information of this private city school system of the sixteenth century. According to this source there existed in Munich, in 1560, nineteen schools kept by German schoolmasters, besides three Latin schools. These men taught a shorter or longer period of years, but one, who was at the same time teacher of Latin and of German, had held his position forty-six years. Most of these men stayed at the same city and school, some with brief interruptions caused by a sojourn in other places. Some of them had been at the university; one had even obtained the baccalaureate degree, but most of them had never studied Latin. It is stated that one had "learned his trade" from a clerk in Landsberg, another from his father, who had also been a schoolmaster in Munich for twenty years; a third "had learned from Hans Reitter, at this place, to read, to write, and to reckon." Such a master had between 20 and 80, sometimes as many as 120 pupils, boys and girls. One of the masters seemed to have been more aristocratic than the others, for he had many children of the nobility, and took for his instruction double the customary fees. Most of these private masters asked 10 to 15 kreuzer (40 to 60 cents) tuition from each pupil for a term of three months. For teaching to write the fee was 15 pence, otherwise, i. e., if writing was omitted, 12 pence. Those who learned to "reckon with figures" generally paid 30 pence. These private teachers also included religious instruction in their course. The document from which these items are gleaned is a report of a visit of inspection through the private schools of the city,

undertaken to sound the masters' true Catholic faith. The masters made their pupils pray and sing, and prepared them, if the parents desired it, for confession and communion. Several of them had been asked by their patrons, that is, by "common artisans and tradespeople," to teach their children to sing psalms and hymns, according to the Protestant custom.

It is not astonishing that under such flourishing conditions in some cities the German schoolmasters, following the tendencies of the time, should form a special "guild" with "guild box," officers, and solemn ritual. The name "hedge schools" (Winkelschulen), schools without license, which had formerly been applied to all private schools as against institutions established by the state or the church, was now given only to schools the masters of which failed to join the guild, and these were designated as trade bunglers, called "Bönhasen," "Kalmäuser," etc., and persecuted in petty ways. Such guilds are mentioned in the sixteenth and seventeenth centuries, for instance, in Lübeck, Frankfort on the Main, and Nuremberg. In the latter city the guild of the masters of writing and reckoning still existed in 1808, the date of the incorporation of this free city into the Kingdom of Bavaria. In Hamburg the reformer Bugenhagen had settled, in the church order of 1529, that no "hedge schools" should be allowed, as they would be a disadvantage to the newly established high school at St. Johannis. They could not be so easily abolished, however. About 1550, again, complaints were raised about them, and the city authorities tried to remedy the evil by taking the establishment of smaller or lower schools in their own hands; for the express purpose of abolishing the "disorderly German hedge schools" public sacristan schools for children were to be established in every parish of the city. Some years later all the principals of schools were placed under the inspection of certain official persons. This is an example of how a city administration tried to prune that flourishing branch of the school system, and to regulate its growth. Generally speaking, the church and state school system was still too weak and inadequate to check successfully the growth of private schools. For that very reason the existence of the latter was justified; they did not merit the abuse with which State school officials tried to injure them.

(8) *Catholic public schools.*—In Catholic countries, the Jesuits who, as was stated before, were engaged in maintaining secondary schools, generally objected to people's or elementary schools. The tendency of the order was directed toward the scientific battle with the educated men of the Protestant world, therefore they could not devote themselves with the same zeal to lower schools. The constitution, issued by Loyola, excused this with the plea of want of a sufficient number of teachers for reading and writing schools. (Note C to IV, page 12.) Nevertheless, in the Catholic churches catechism schools were established, also. The ecumenical council of Trent recommended them,

and the Jesuit Canisius published a catechism which was much used. In Bavaria Duke Albrecht V framed school regulations which placed schoolmasters under supervision, and prescribing instruction in the Catholic creed and in reading and writing. At another occasion he admonished the clergy of his duchy to establish German schools. Hence to a certain degree, the Protestant movement in behalf of lower schools was imitated by a similar move on Catholic territory.

(*b*) THE SEVENTEENTH CENTURY. (1) *National and new education: Ratichius and Comenius and the classical schools.*—The movements which the Reformation had produced continued in Germany until the end of the sixteenth century. It was not until the beginning of the seventeenth century that German civilization entered upon new ways. National aspirations came to the surface at that time. The educated commenced to perceive something alien in the humanism in schools and universities, and attempts were made to establish a purely German education. As an indication of this desire the formation of the "Fruit-bearing Society" in Weimar (in 1617) may be mentioned. Its object was the cultivation of the German language. Nobles and citizens worked together to this end; the nobles, after having been almost strangers to national life for a long time, came again in contact with public life during the sixteenth century, by joining their forces with the increasing power of the princely sovereigns, while the society of denizens of the cities still enjoyed the fruit of its great political power gained during the previous centuries.

Another change was caused by modern science which in that period experienced a great impetus in all the nations of the South and West—in Italy, France, Holland, and England. In these countries, humanism, although itself of mere literary tendency, led to a new rise of science. Because abandoning the culture of the Middle Ages, humanism liberated at the same time scientific thought which had lain in the bondage of Aristotle and religious belief. The battle against scholasticism fought by the humanists in the interest of classical languages and literature, at the same time delivered science from the oppressive authority with which Aristotle had burdened it. A number of men, for the most part living in the time before and after 1600, introduced a new science. Copernicus and Kepler created a new astronomy, Galileo a new physics; in Descartes was found the first philosopher of the new science, in Bacon its great methodician.

Germany did not keep pace with this progress, although it gave the first two names to this list of learned men. The German nation remained behind others in science, and soon also in regard to national wealth. At the German universities, after the Reformation, Aristotle continued to reign supreme. The reformers, it is true, had banished his scholastic commentaries from their instruction, but the contents of the philosopher's own books remained the only and unassailable basis of all instruction in science. When in 1569, Peter Ramus,

who saw his life's task in combating the doctrines of Aristotle, came to Heidelberg, and the ducal government wanted to employ him as lecturer on ethics, the faculty refused to accept him, "because his manner of teaching would not agree with that of Aristotle, whose philosophy was acknowledged to be the best in Germany and in all of Europe. That Greek philosopher remained the undisputed authority in university instruction until the end of the seventeenth century. Modern science passed over Germany, and the German people have only recovered from this neglect during the current century. Nevertheless, influences arising from this evolution could not be entirely ignored. It is a noticeable fact, that of the two greatest pedagogical reformers of the seventeenth century, Ratichius and Comenius, the latter received his strongest impetus from Roger Bacon. In connection with the tendency toward nationalizing culture (Germanizing it, as it were), the doctrine of independent science caused some noteworthy changes in the advanced education of Germany which, however, did not outlast the frightful ravages of the thirty years' war. The period from 1600 to 1648 deserves to be characterized briefly.

The new ideas found expression in the reform plans of Ratichius (1571–1635), and in the works of Comenius (1592–1671), and were advocated by a few of their disciples. In the field of higher education they intended to lead youth quickly to science and a knowledge of things themselves. Humanism, it seemed to them, gave only a knowledge of words, books, and opinions, and when it did lead to knowledge of realities it dragged the student on such a roundabout road that he hardly reached the end. Therefore they offered new methods and new books for the study of languages by means of which the learning of classical languages (as yet the vehicles of all knowledge) could at least be shortened. "The schools," says Comenius, "do not show the things themselves as they really are, but teach what one or another, or a third party or a tenth, thinks and writes, so that at last the perfection of knowledge consists in knowing different opinions of many men about many things." (Didact. magna, XVIII, page 23.) He himself tried to compile in several of his Latin books words and expressions and group them so completely and conveniently that they might furnish "in a short time with little trouble an easy, agreeable, and safe transition to the authors who treat about things themselves." (Janua reserata, praef. sec. 11.) The humanists saw clearly what turn things were taking. They complained that the reformers would take out of the hands of youth those authors who had been teachers of culture and oratory, and intended them to dispute philosophical and theological questions, just as in the twelfth and thirteenth centuries. The representatives of the old school had complained about the young scholastics who, full of dialectic fancies, had thrown aside the classics.

However, at the time, a complete defeat of humanism was not accomplished. The ideas of the reformers found occasional admissions in

new school regulations, and the books of Comenius were used in several places. But the classics remained the principal part of secondary and higher education; only Greek was gradually pressed into the background, and Latin became the dominant study. Soon Greek was studied only as far as theologians needed it, and the lectures on Greek were confined to the New Testament. The Greek-Latin school of the Reformation became the Latin school of the seventeenth and eighteenth centuries.

(2) *Modern French education—academies for the nobles.*—After the thirty years' war the general situation for the system of advanced education had radically changed. The denizens of cities were depressed and had to work hard to maintain their bare existence. The formerly influential citizens were obliged to leave to the nobles the dominating position in the nation. For the nobility there arose a new model of a splendid civilization which they tried to imitate, as in the sixteenth century antiquity had been the model. In France, under Louis XIV, the State, represented by royalty, assumed such power and perfection, developed such dazzling forms of life in the higher classes of society, and such a rich and flourishing literature grew up, that the German nobles sought compensation in them for what the life of their own nation could not offer them after the devastations of the terrible war. Now began the period of French influence whose superiority was not to be broken for a hundred years. With French civilization there entered Germany those new sciences which had been developed by western nations—philosophy, mathematics, physics, and the new science of law. Of course they must not be considered in that theoretical abstraction in which they are elements of education to us, but in their relation to practice and in connection with the supplementary sciences depending upon them. Mathematics and physics aroused interest in their application to technology and science of war; and, besides, the proper science of government, history and geography, statistics, genealogy, and heraldics were cultivated.

The ideal of education of German nobles was accordingly composed of the knowledge of French and other modern languages, and of various accomplishments, seemingly indispensable for a nobleman educated according to French ideals, such as the arts of courtly conduct and of physical accomplishments as dancing, fencing, riding, etc. Such an education, however, could not be given by the old humanistic gymnasia and universities. Therefore special schools for young nobles were established, the so called "knights' academies" (Ritterakademien), of which some have been preserved up to date without being distinguished at present in their course of study or methods from other secondary schools. They originally corresponded in their organization to a complete gymnasium with some higher or academic studies added. Greek and Hebrew were omitted in these schools; in their place, beside the indispensable Latin, modern languages, French, Italian, also Spanish

and English, and the new sciences were taught and careful instruction in all "knightly" arts was given. The necessity for a special education of the nobility having existed in earlier times, similar schools could be found occasionally also before that time, but the flourishing period of academies for the nobility was the time after the great war. Thus, for instance, in 1653 in Colberg, 1655 in Lüneburg, 1682 in Vienna, 1687 in Wolffenbüttel, institutions of that kind were established; others came into existence later.

For this reason the education of the nobility was segregated from the intellectual life of other classes. The latter, as before, found its culmination in the classical schools and universities, but had a pitiful existence; its representatives were scoffed and given the term "pedants," while on the other hand the sciences and their representatives were called "gallants." Only toward the end of the century the new education approached and entered the old universities and preparatory schools.

(3) *Instruction in German—Duke Ernest (the pious) of Gotha.*—It was important for so called German instruction of the seventeenth century that Ratichius and Comenius and their partisans demanded a better cultivation of the vernacular; first, in the classical school, the pupils should not enter upon Latin "before they could read German fluently, write and speak it." This demand was not superfluous, because the old method was still in vogue, according to which the pupils were, soon after the simplest primary work in German was completed, introduced to a foreign language; sometimes they were taught reading in Latin first. Instead of this, it was urged, good instruction in German should be given in the lower grades, and it was repeatedly demanded that the pupils of Latin schools should learn grammar not in Latin, but in German first. For this reason, for instance, the native language was taught in the three lower grades of the school which Ratichius established in Kœthen, that is, reading and writing of German in the first two, and German grammar in the third grade, for those who intended to study Latin. This reenforced and independent German instruction offered the benefit of a purely German education to the people, since the classical schools in the cities were the common or burgher schools in their lower grades. The purely German schools, not connected with classical schools, did even more in that direction, for they offered a complete and methodical instruction in the native language exclusively. The educational reformers intended to give German education dignity and self-dependence. This education, they claimed, should no longer remain in uncertain dependence upon classical schools, but be represented partly to a larger extent in exclusively German schools, partly serve as a basis for classical education. For this reason in the school organism, which Comenius planned in his "Didactica magna," home education by the mother was followed by a school of the mother tongue ("schola vernacula"), which he wished established in every community, and which should be attended from the sixth to the twelfth year by all

children of the community, also by those who were intended for higher studies. Upon this common school should follow the classical studies in gymnasium and university.

In this plan, it will be noticed, Comenius advocated a general compulsory education. He demanded that all men, poor as well as rich, should partake of this instruction. Of course he saw that the times were not ripe for the realization of his idea. In many places, so he himself affirmed, no schools at all were established; in other places provision was made only for the children of the better-situated classes. But this advice resulted in the fact that in some small States well-disposed princes decreed compulsory education for all children. For existing schools Comenius, following the tendency of the time, demanded the introduction of modern sciences; the child should become "acquainted mentally with the realities surrounding it." In the "schola vernacula" the course should therefore contain, beside religion and singing, reading, writing, and arithmetic; also a general view of history, a little cosmography, and a description of trades and arts.

In the Duchy of Weimar the principles of the reformers found their application as early as 1619, where, through the agency of Superintendent Kromayer, a disciple of Ratichius, a new school system was organized. All children, boys as well as girls, should, "as much as possible," attend school. More important, however, is that which a few decades later was done in the Duchy of Gotha by Duke Ernest, the pious. The advancement and organization of public instruction in his State is by far the most important action taken during the seventeenth century. The duke, immediately after his accession to the throne (1640), ordered Andreas Reyher, also a partisan of the educational reformers, to prepare a plan for a new school system, the so-called "Schulmethodus," which appeared in 1642. In this document was ordered what should be done in the whole State with boys and girls in villages, and with the "lowest groups" of the school children in the cities in regard to German education. In three grades, following one upon the other, religion, hymns, reading, writing, arithmetic, and natural sciences were to be taught. Religious instruction is specially emphasized, but also reading and writing in German, which is to proceed to exercises in composition. In the sciences the children are to learn to measure time by the hourglass or sundial, the rising and setting of sun and moon, the cardinal points, plants, and animals; furthermore, ecclesiastical and secular things, as, for instance, the Thuringian country and what is found in it, "as trenches, roads, offices, hospitals; something about authorities, judges, merchants' business," etc.; and lastly, a little instruction in geometry and physics. General compulsory education was decreed. The parents should send their children to school from the fifth to the thirteenth year of age; in cases of withholding children from school the parents were to be punished with fines, which fines should be employed to support poor pupils. The schools were to be kept open in winter and summer. The

teachers were directed to keep a roster of the pupils and note their attendance. Clergymen were the supervisors and inspectors of the schools. But the duke did not rest satisfied with ordering and decreeing. He took care that better teachers were available; he had schoolhouses built, and organized a regular system of school inspection, while Reyher prepared the necessary schoolbooks "according to the new methods." The duke furthermore gave from his own exchequer large sums for increasing the teachers' salaries, and induced large landowners to do the same; he began also to take care of teachers' widows and orphans. He regarded it as a Christian regent's duty to interest himself in the education of his subjects. The idea of a State-church school system as advanced by Protestantism found much support in this manner. Unfortunately, among his successors, to whom the imitation of the court of Versailles seemed a higher object, all that was done in behalf of education was lost.

In other States of Germany similar attempts were made, but they were not carried on with the same consistency. The lower-school system had naturally suffered most by the devastations of the thirty years' war. In some districts it had entirely perished. But in Würtemberg regulations were issued during the last years of the war which were intended to reestablish the German schools. In 1672 (twenty-four years after the war had closed) things had advanced no farther than that in some places elementary schools were opened in summer once or twice a week. In the archbishopric of Magdeburg, after the close of the war, Administrator August endeavored to establish a system of German schools, but he met with insurmountable difficulties in rural districts. In Brandenburg the Great Elector Friedrich Wilhelm, in his church order of 1662, invited churches and communities to see to it that in villages as well as in towns well-appointed people's schools be established. He thereby laid the foundation of the Prussian public-school system, which, though ordered by the state, remained an institution of the church, and more particularly of the local communities in regard to management and material support.

(4) *Private schools.*—The great elector, in his church order, had strictly prohibited the hedge schools (Winkelschulen). Indeed, the public school system in this century also was obliged to fight for its existence, because the system of private schools lost nothing of its popularity. In the cities the complaints of the licensed Latin and German schoolmasters continued against their less privileged competitors. Artisans and women too lazy for other work, it was said, opened schools. Their pupils were those who had run away from the city schools without paying their fees, and who, moreover, scoffed at their old teachers. The hedge-school teachers were taking the bread out of the mouths of poor school assistants, who might be employed by the rich as private tutors after school hours. The Hessian "school order" of 1656 undertook to regulate these private schools. It contained the

following provisions: No private schools (Nebenschulen) should be kept without the permission of the authorities; teachers, as well as pupils, should be under the supervision of the rector (principal) of the city schools; private schoolmasters should urge their pupils to frequent church attendance and introduce no other books in their religious lessons than those used in the public schools; nor should they charge disproportionately high tuition fees. This order and similar ones in other States show plainly that the German private schools were still an important factor of the entire system of education.

(5) *Catholic elementary schools.*—For the Catholic countries it remains to be said that in the seventeenth century the order of the "Patres piarum scholarum," commonly called the "Piarists," took public elementary education in hand. Their system was established in 1600 and authorized in 1622 by the Pope. The branches of study taught by the order are essentially the same found in other schools—reading, writing, ciphering, and religion.

(*c*) THE EIGHTEENTH CENTURY. (1) *Evolution of the modern university.*—Modern civilization, which developed after the great war, began to enter the German universities during the last decade of the seventeenth century. Christian Thomasius, when professor in Leipsic, vigorously attacked the teaching of jurisprudence and philosophy in vogue in the universities. It was an unheard of innovation when he announced in 1687 that he would lecture in the German language upon a modern philosophical book, for up to that time Aristotle and the Latin language had held undisputed sway in the universities of Germany. Thomasius soon made himself impossible in Leipsic by his opposition to old-established customs, but he found a warm welcome in the neighboring state of Brandenburg, where the Elector Friedrich III, later the first King of Prussia, was inclined to favor the new tendency. Chiefly influenced by Thomasius, this monarch undertook to establish a new university at Halle in 1694. This new institution was intended to be the first representative of modern education. Thomasius himself was intrusted with the reform of legal and philosophical education. For theology, among others, August Hermann Francke was called, who had also been expelled from the university of Leipsic on account of his modern views. Francke was one of the promoters of pietism, of that religious doctrine which in the first part of the eighteenth century tried to establish a life of faith in the individual. Pietism and modern science joined hands as formerly in Wittenberg reformation and humanism had done. From Halle the reform soon spread to other universities. The innovations which took place concerned all the faculties of the old universities. Theology, which already in the sixteenth century, soon after the death of the church reformers, had returned from the mere study of the Old and New Testaments and Augustine to a perfect dogmatism, was soon filled with that deeper theory of faith advocated by Francke. Jurisprudence

changed according to the newly developed science of state and law that had only recently been represented in Germany by Pufendorf, who died in Berlin in 1694. The medical science of the Middle Ages, which had chiefly consisted of reading texts of Hippocrates, Galen, and others, now commenced to turn to individual observation and deduction. Taken as a whole, the university, it may be said, only just then began to become a modern institution. That which constitutes the characteristic of the modern German university, free scientific research and investigation, was now turned to account, and that change dates from the close of the seventeenth century. The place of scientific knowledge fixed in the writings of ancient authors and handed down from generation to generation was taken by the new science which must prove the truth of its axioms before every new generation, and which may be changed and extended by anyone through his own investigations. The philosophical faculty was severely shaken by the new method. Not only that the ancient philosophy of Aristotle had to give way to modern philosophy, but also that the humanistic studies had to recede during that time of transition. The classical authors gradually disappeared from the university course and were relegated wholly to the gymnasia or preparatory schools. On the other hand, the philosophical sciences, in consequence of their modernization, approached nearer to the standard of the three professional sciences, theology, law, and medicine, and resulted in a development of the former preparatory course of arts which made it equal in rank with the three professional faculties. Hence the modern division of the university into four faculties is traced back in its beginnings to the educational revolution at the close of the seventeenth century.

(2) *Gymnasia (classical schools) to the middle of the eighteenth century.*—Modern education entered the gymnasia also at about 1700. The "gallant" sciences were taught at first in private or supplementary courses outside of the regular instruction, as in former times humanistic studies had been joined to the scholastic system. By degrees, however, they were introduced into the usual courses of study, first in small towns, later also in the schools of large cities. Knowledge of the French language became more and more desirable in urban society, also some knowledge of history, geography, and mathematics. The famous "Pædagogium," which Francke founded in Halle (1700), framed its course of study to suit these requirements; it became a model preparatory or finishing school for a large population. Besides Latin there were taught at this institution Greek and Hebrew, but only as optional studies. Reading in Greek was restricted to the New Testament. On the other hand French, geography and history, mathematics, and German composition were regular studies. The tendencies of the time, which inclined to a knowledge of civil life and occupations, as well as to training in polite manners, were met by visiting artisans in their workshops, artists in their studios, by giving instruction concerning

the cultivation of the field, garden, and vineyard, and exercises in carving meat, folding napkins, peeling apples, etc. Despite this variety in the course of this school, as in others, Latin was still the chief branch of study, and required the largest amount of time. The subordinate nature of the nonlinguistic scientific branches was characterized in Francke's pædagogium by devoting to them only one daily afternoon lesson. In Latin the aim was still, as it had been in the sixteenth century, "to master this ancient language orally and in writing," and the purpose for which this was done was still the same, "to obtain from the classics a treasure of general human knowledge which could be put to use as occasion required in Latin letters, orations, poems," etc. The schools were still following the old routine which the well-known author, Nicolai, ridiculed when saying, "they declined, conjugated, expounded, analyzed, scanned, phrased, and what not." As in centuries past, the advice to avoid pride and presumption was still derived from Hesiod. Cicero's work on "Duties" was still read owing to its "fine moral contents." Humanism still held its position in classical education in spite of the hostile influences that played upon it. Outside of school, however, there had grown up another world from which people looked with contempt upon the narrow circles within which school education moved and had its being. In the words of young Lessing: "As a pupil I believed that there were many things learned in school which would be of no use in the world, and as a student I recognized this fact still more clearly." This characterizes the situation of the actual life and work of the school at that time.

(3) *The new humanism.*—Under these circumstances it might have been expected that with further progress of the realistic-scientific elements of education they would soon have been placed in the center of the classical school course, and that the old classical humanities would have disappeared. Philanthropinism, the well-known pedagogical phenomenon of the second half of the eighteenth century, went further in this direction: It would give to the realistic sciences in the gymnasia at least the same position which the humanistic studies occupied. But that which might have been expected from the previous development did not occur. Realism, or modern education, so called, having influenced classical education since 1600 in various ways, came to a standstill about 1740. In its place humanism rose to a new period of vigor. In a soil that had been tilled so long, and from which people already began to turn away with contempt and weariness, suddenly new treasures were discovered. The ancients became again the teachers of the present—only in a different manner.

This unexpected revolution was closely connected with the change that took place in the entire intellectual life of Germany at that time. The nation began to make itself independent of French influence. In literature Klopstock and Lessing broke the fetters of French classicism. An ardent desire for a deeper culture peculiar to the German

people asserted itself. But the soil of national life was too poor in germs for a purely German culture, hence scholars looked for new models and found them in classic antiquity. The ancient authors became again the masters of culture and taste; with this difference, though, that it was not desired to learn how to express their thoughts as well as the learner's thoughts in Latin, but to become familiar with their manner of thinking and feeling, for the purpose of enlarging and ennobling German thought and speech. From this standpoint Greek, on account of its more valuable literature, assumed a higher importance, and, by degrees, a superiority over Latin. The intellectual life of the nation was more and more subjected to the directing influence of Greek during the second part of the eighteenth century. Winckelmann awakened that view of Greek art which has since become the standard, not only for the comprehension of sculpture, but also for poetical works. Homer and the Greek tragedians were the incomparable models of Goethe and Schiller in epic and dramatic poetry, and in a well-known letter Schiller praised his friend Goethe as a Greek genius whom fate had thrown into a northern climate, and who now produced Greek art and literature out of his own consciousness. The period of classic German literature shows a fusion of Greek and German thought. To prove this we merely recall "Hermann und Dorothea," "Iphigenia," and "Die Braut von Messina."

The university which was the most prominent nursery of modern humanism was that of Göttingen, established in 1734. Here it was where Joh. Math. Gesner, and after him Chr. Gottlob Heyne, labored for the revival of classic learning, both being convinced of the highly instructive value of the ancient authors. "He who reads the works of the ancients," said Gesner, "will enjoy the acquaintance of the greatest men and of the noblest souls who ever lived, and will get in this way, as it happens in all refined conversation, beautiful thoughts and expressive words." In the same sense, and at the same time, Joh. Aug. Ernesti labored in Leipsic as rector of the Thomas School, and as professor in the university. He, too, pointed to the benefit derived from the study of the classics: "That thus we receive in early childhood, doctrines of philosophy and wisdom of life from the wisest and best educated men of all ages; furthermore, that we thus learn to recognize and understand clearness, dignity, charm, ingenuity, delicacy, and elegance in language and action, and gradually accustom ourselves to them." Friedrich August Wolf, who taught in Halle subsequently to 1783, enlarged and partly finished this work. He raised philology to a "science of antiquity," and won for it an independent place among the branches taught in the universities, as well as among sciences in general.

This newly arisen culture was not confined to universities; it entered the gymnasia at the same time, finding there a particularly favorable fostering place. Göttingen, Leipsic, and Halle furnished the teachers

for this new view. For the two States Brunswick and Lüneburg Gesner prepared a new school law in 1737 (Schulordnung), and Ernesti prepared one for the electorate of Saxony in 1773. In Prussia the new humanism was introduced into the schools by the minister of Frederick the Great, Baron von Zedlitz, in 1771. But immediately another need became apparent. The profession of teaching in secondary schools until then had been a stepping stone to the church pastorate, or a harbor of rest for wrecked students, and the necessary preparatory study for the high school teacher had been an appendix of the study of theology, or was per se considered a part of theology. This idea had to be given up. In the second part of the eighteenth century the want of a special education for teachers of secondary schools was felt very acutely. Already Aug. Herm. Francke had in his time tried to provide for this emergency by establishing a seminary with free board for indigent students, and inducing them to become teachers, first of all, for his own schools; but this example had remained without imitation. It was not accidental that Gesner in Göttingen opened a philological seminary for theological students, but with the well-understood intention of giving special education for the art of teaching. Fr. A. Wolf founded a similar one in Halle. He labored with energy toward self-dependence of the science of philology, by preparing professional philological teachers for high schools. As a student of Heyne in Göttingen he had insisted upon being matriculated as "studiosus philologiæ," contrary to all existing customs; later he emphasized, as university professor, the necessity of independent philological study with professional examination. This resulted in the recognition of teaching as a separate profession. This tendency to separate the classical school system from the church naturally resulted in establishing, in 1787, in Prussia a supreme school board (Oberschulkollegium). The newly developing humanism also began to separate internally from the church. Regarding the ancients as representatives of a view of life and world worthy of imitation, it absorbed ideas pregnant with paganism. This contrast, however, was not perceived at first, but became glaring during the next century.

The new system could not remain without influence upon the form of the universities. The philosophic faculty, formerly only a preparatory department, had now fully attained the rank of the other three faculties. This part of the universities not only received a scientific enlargement of its sphere of instruction with the addition of philology, but also a practical purpose in the task of preparing teachers. Since then this work of preparing teachers for advanced schools has become the most prominent object of the former faculty of liberal arts, in the same manner and with the same validity that the professional education of physicians, clergymen, and lawyers is the object of the other three faculties. It is reasonable to assume that this situation is an advantage to all concerned; it saves the faculty, whose function is the more

general cultivation of the sciences, from having its work dissipated in tempting diversions of scientific interest, and gives it a backing of uniform practical requirements.

(4) *The German school system—Potent influences.*—The system of purely German schools (elementary schools in which the mother tongue was the medium of instruction) experienced a considerable advancement during the eighteenth century. Three tendencies of the intellectual life during that period were of importance for elementary instruction: Pietism, enlightenment, and the absolutism of the State. Pietism (see previous pages) not only tried to awaken the individual to a higher religious consciousness, but produced in its adherents an ardent desire to promote the welfare of their brethren by Christian charity. During the time of enlightenment (Periode der Aufklärung), which influenced everybody, especially in the second half of the century, French realistic doctrines remained dominant. Modern science led the Western people to a criticism of everything existing in state, church, and society. It became a principle of thinking to take nothing for granted that could not be justified before human reason. With this was combined a general tendency toward utilitarianism, because only the useful seemed reasonably to be a justifying aim of acting. A lively desire to advance the happiness of the individual and the state, the people, and, in fact, all of mankind, manifested itself; and that period must be credited with having worked with energy and enthusiasm in realizing that desire. The time of enlightenment finally found its personification in the absolute state. The sovereign principality of the sixteenth and seventeenth centuries developed, theoretically and practically, the idea that guiding its "subjects" toward a reasonable and happy life was a task which, as a matter of self-evidence, devolved upon the sovereign, and upon him exclusively; no objection was raised to investing him with the necessary absolute power.

(5) *Francke and Friedrich Wilhelm I of Prussia.*—Pietism, then, it was which, at the beginning of the century, gave a considerable impulse to the system of German schools. The before-mentioned Francke had begun, as clergyman and professor in Halle, in 1694, to provide the most necessary instruction for poor children of his community. From this private enterprise a school for the poor developed, with the branches of study then customary in German elementary pay schools. When numerous children of citizens of Halle who were willing to pay asked admission to this school the city authorities were induced to establish several German burgher schools under the direction of Francke. Soon an asylum for the education and support of poor orphan children was added. These attended the German schools, or if they showed unusual talent, the Latin school of Francke's institution, for this remarkably active man had also a Latin or classical school connected with his institution. In 1705, of the 100 boys in the asylum 55 were intended for higher studies, 45 for trades. Francke became in this way the intel-

lectual founder of all the orphan asylums and schools for the poor, which increased in number rapidly all over Germany, for his example was readily imitated. It may be said that this contributed to the advancement of elementary education, especially in cities. Education became thus accessible to the poorest, through Christian charity. Francke also set an example for other cities in his German burgher pay schools, and by preparing students in his seminary for the work as teachers in purely German schools. To advance the principle of professional preparation of teachers for classical as well as for elementary schools is to be regarded as great progress in the field of education, considering the time. But Francke's seminary was merely a seedcorn, for the country schools remained almost impervious to reform. The ultimate purpose of all the schools of Francke's great institution, however, was, according to the founder's own words, "that the children may be led, first of all, to a vivid knowledge of God and Christ, and to an honest, active Christianity."

The ideas of this man were realized to a larger extent in the Prussian State by Friedrich Wilhelm I, who held the scholar of Halle in high esteem. Francke's ideas guided the indefatigable activity of the king, who devoted his entire reign to the promotion of public education. "If I build up and improve the country," he said in regard to East Prussia, "and make no Christians, my work will be of no account." He represented the absolute sovereignty of his period, although in more original forms. But to show what he did for elementary education, and to place the various measures in its behalf in their proper light, it will be necessary to state that the term "people's school" (Volksschule, or common school) did not come into use until the close of the eighteenth century, and that its definition as the fundamental form of public education in city and country was not understood then.

In the cities, elementary education had been provided for in various ways, partly in the lowest grades of the Latin schools, partly in purely German burgher schools, to which just then were added the new orphan asylums and schools for the poor. But in rural districts public education was much neglected. To understand this, it must be remembered that during the preceding century civilization in the villages had been entirely destroyed by the thirty years' war, and that the rural population had not yet found the means to rise to a higher level of existence. It had fallen into the most depressing dependence upon the landowners, and lived an apathetic existence. From the denizens of cities the peasant felt separated as though by a deep abyss; to educated men he often appeared as though belonging to another and lower race of human beings. It is to this class of people that the eighteenth century, in its memorable endeavors to benefit mankind, gave its deep-felt sympathy, and the great efforts made in advancing the so-called people's school system of that time, concerned, above all, the rural or country schools (Dorfschulen).

Friedrich Wilhelm I, soon after the beginning of his reign, introduced compulsory education, however with extensive limitations, necessary on account of the prevailing economic conditions. By an order of 1717 for places where schools existed, the parents were urged to send their children to school for the purpose of learning to read, write, and calculate and "all that could serve to promote their happiness and welfare." Delinquents were threatened with "vigorous punishment." Tuition fees were not uniform; for poor children they should be paid out of the poorbox of the community. More important than these orders was the fact that the King himself was very active in establishing new rural schools, especially for the entirely neglected province of East Prussia. He there provided the large villages with schoolmasters, to whom tracts of land were given rent free, and in 1737 he gave to this province not only the sum of 50,000 thalers for building schoolhouses ("to build up the empire of God"), but also in the "Principia regulativa," a fundamental school law. In a few years over a thousand country schools were established through the King's incessant urging. In a similar manner he took care of the schools of the province of Pomerania, of which one part had only recently been wrested from Sweden and added to Prussia. The necessity of a better preparation for teachers was recognized well enough by Friedrich Wilhelm, but for state institutions for this purpose there was no money available. The old conditions, in which artisans were taken for the positions of sacristan and schoolmaster in villages, men who continued to ply their trade because the positions did not yield a livelihood, remained unchanged during the reign of the King. His orders are humorously quoted, which were to the effect that "for sacristans and schoolmasters in the country no artisans should be accepted except tailors, weavers, blacksmiths, wheelwrights, and carpenters" (1722), and "that in the open country besides the sacristan and schoolmaster no other tailors should be allowed to ply their trade" (1738). Still, toward the close of his reign he had the satisfaction of referring to some private enterprises in behalf of normal schools for teachers, such as the one founded by the abbot Steinmetz in the monastery of Bergen, near Magdeburg (1736).

(6) *Friedrich II and his general code of school regulations.*—Friedrich II (the Great) followed in the steps of his father. He combined in himself the idea of the absolute sovereign, who at the same time is "the first servant of the State," with the then prevailing ideas of enlightenment. It was an evidence of practical sense, however, that he restrained himself from introducing this enlightenment, which was inclined to let general ethics take the place of positive religion, into the lower schools. "The teacher ought to see to it"—these are his own words—"that the people retain 'attachment' to religion." And in framing the most important school regulation issued during his reign, a clergyman, Joh. Julius Hecker, took a considerable part. The King

was so fortunate in his efforts in behalf of the schools as to be assisted by men of his own mind. Besides the afore-mentioned Hecker it was particularly his minister of state, von Zedlitz (1771), and von Rochow, a nobleman and landowner, who worked hard for a reform of the rural schools in his own possessions.

Hecker, since 1739 preacher at Trinity Church in Berlin, had as a student listened to Francke in Halle, and had later acted as teacher in his famous institution. Quite in harmony with Francke, he devoted himself with great zeal to the school system in all its parts. His "Realschule" (realistic high school) will be mentioned later. For the German city schools his work was of importance, inasmuch as he tried to reform those of his own community, and induced his assistants to elaborate elementary school methods. The most important step he made, however, was that he established a seminary for sacristans and schoolmasters which, in 1753, was changed to a royal institution and granted a subsidy from Friedrich II. The King, on every fitting occasion, called the attention of school patrons to this institution when they were about to nominate teachers. For positions in cities and villages where he himself held the decision, especially in his "Kurmark," only teachers who had been prepared in this normal school could be appointed. Hecker's wise example was imitated in other German States. Similar institutions were opened in Hanover in 1751, in Wolffenbüttel in 1753, in the county of Glatz in 1764, in Breslau in 1765 and 1767, in Carlsruhe in 1768.

Like his father, Friedrich II directed his care for the public schools to particular provinces. The efforts were to him, as they had been to his father, an integral part of the activity in establishing colonies, which the Prussian kings directed to the newly acquired or specially needy parts of their Kingdom. In Silesia, conquered from Austria in three wars, the Catholic school system was much neglected, but the King could make use of certain beginnings of reform, as they could be found at that time everywhere in Catholic countries. The abbot Felbiger, induced by Hecker's efforts, had established an improved school in Sagan, which also prepared teachers. The King took this institution as a starting point by ordering, in 1764, that normal schools be established and that clergymen should be obliged to make themselves familiar with improved school methods in such schools. In 1765 the "Catholic school order for Silesia" was issued; in the same year a Catholic normal school was opened, and two years later a Protestant school of that kind. Friedrich was no less active for the promotion of public education in the province West Prussia, which came under his rule in 1772 by the first division of Poland. Gustav Freitag has given in his "Bildern aus der deutschen Vergangenheit (IV, 268) a vivid description of the state of these countries and of the King's attempts for their improvement. His own electorate of Brandenburg and the province of Pomerania were very dear to him. In both he distributed subsidies

for the reform of their school systems. The electorate soon became a model for the schools of other provinces. Its schools were specially recommended to the care of the superior consistory.

In 1763, Friedrich the Great published the General Code of Regulations for Rural Schools. It was the first school code for the whole Kingdom, and was intended, as its title indicates, to regulate the Prussian country or village school system. The Christian demand for better elementary education, and the interests of the state in a high moral and intellectual quality of its subjects, joined hands to give a purpose to this part of the school system, to wit: "The law was issued in order to obviate the extremely dangerous and, to Christians, unbecoming ignorance, and to prepare by instruction and training in school more skillful and better subjects for the future." The provisions of this law going into minute details are of a masterly clearness, and exhibit a resolute will. Compulsory education was again decreed. Fees were to be paid for poor children from public poor funds; punishment, and if necessary, attachment of property for unpaid tuition fees, or for unexcused absence from school were prescribed. All new teachers were required to pass an examination before being appointed. The course of study included religion, reading, writing, and for the older children a little arithmetic; religious instruction occupied a large amount of time. The elementary schools were all placed under the supervision of the church and made parish schools. The preachers were ordered to visit the schools of their community twice a week, and to hold monthly conferences with the schoolmasters; failing in this duty they were to be suspended or deposed from their positions. The superintendents had to visit all the schools of their districts once a year. Incapable schoolmasters were reported by the clergymen and preachers to the superior consistory.

This general code has become the foundation of the Prussian elementary school legislation (Volkschul-Verfassung). It has been correctly stated that it did not bring already existing institutions into a legal system, but rather set up standards and duties for an elementary school system which was to be built up in future. In this fact, of course, lies the cause why the execution of the law remained at the time very much behind well-meant intentions. The law met with resistance everywhere—among the noblemen and city patrons, in the country and in small towns, among the clergy, and, not the least, among the parents of the school children. Besides, the money for its execution was not everywhere available.

The cabinet ministers, in publishing the code, were obliged to omit the financial part and to insist upon its execution only where the necessary money could be raised. It has been regarded as a specially sad symptom of the conditions of the time that the King in 1779 was again obliged to employ army invalids or veterans as teachers. Though he may have been moved to this step by the pitiful condition of the

war veterans who had fought his battles and won his victories, the measure does not appear quite so monstrous if we compare it with the conditions then existing. If the veterans answered the requirements, "to be able to read, write, and calculate, and otherwise suit as schoolmasters in rural districts, and were well-behaved," they could not be worse than the artisans, shepherds, etc., who continued to be employed. But there was still a great gulf between the aim set up by the code and the actual conditions. Even at the close of the century, after the death of Friedrich, the state of the Prussian rural-school system was yet far from being satisfactory. The number of schoolmasters prepared for their profession did not at all meet the needs; others were entirely without professional preparation unless the clergymen instructed them scantily. "When these also had to pass an examination before the clergyman of the place by order of the inspector, the local authorities, owing to the lamentable life of a schoolmaster, were glad to find persons at all who were willing to accept an engagement for such a position. In consequence an otherwise intolerable indulgence in examining and employing teachers took place, especially in districts where large landowners had patriarchal sway." (Schmid, Encyclopädie, VI, page 287.) The eighteenth century left to the present century the task of endowing the public-school system according to its ideas and intentions, of instituting a general and adequate professional teachers' preparation, and of providing the system with the necessary financial support.

At the same time an important change had come about in the elementary education of the people in quite another direction. A year after the death of Friedrich II, the aforementioned superior school board (Oberschulcollegium) had been established. Secondary education had been severed from the organization of the church, as has been stated before; and now the system of elementary education was emancipated from the church, and obtained a self-dependent position under an authority of its own. Friedrich, as late as 1763, as stated before, had left the public schools under the direction and inspection of the church; but it was a consequence of the era of enlightenment, with the ideas of which he himself was imbued, that the state now assumed the place of the church and took this part of public life under its own administration. Friedrich's minister, Von Zedlitz, became the first president of the new central school authority. With this act Prussia effected a transition from the church school of the Reformation (which in its turn had placed itself beside the city school of the Middle Ages) to the public (or people's) school of the nineteenth century. The same turn in sentiments will be recognized in the institutions of the general civil code which, although published after Friedrich's death (1794), emanated from the spirit of his reign. In the part referring to the school system this sentence was placed at the head: "Schools and universities are state institutions." There had been a difference of

opinion in framing this code concerning the directive powers of the elementary schools, as is stated by Gneist (Die staatsrechtlichen Fragen des preussischen Volksschulgesetzes, 1892, pp. 22), as to whether these powers should be given to the clergy or to state authorities. The opinion prevailed that the latter would be the more competent. For this reason it was determined that the secular authority and the clergy should share in the control of the schools, but both according to the rules laid down by the state; also, that in doubtful cases, or in disputes between authorities, the decision should lie with the higher secular authority which stood at the head of educational affairs in the province in which said dispute arose. In this connection the interconfessional character of the Prussian elementary school of the eighteenth century may be mentioned. As Friedrich had taken care of the Catholic school system in Silesia, so Friedrich Wilhelm I, following the example of the Great Elector, had published a code for the evangelical-reformed school system (in 1713), and Friedrich supplemented it in 1782.

(7) *Other States in Germany.*—Also in other States of Germany the elementary school system received the strongest impetus during the eighteenth century. In Würtemberg an "improved code" for the lower schools was issued in 1729, which remained essentially intact during the century. It exhibits pietism in spirit and language, of course not that of Aug. Herm. Francke, but that later pietism in which the individual began to retire wholly into his world of feelings. Hence arose the aversion against any practical aims of the schools. "Schools," so it is said in that code, "are not to be regarded as preparatory institutions for common life only, but also as workshops of the Holy Ghost, because the Lord will not only have skillful, but also pious people." However, various reforms of the school system were made here during the century—school attendance was regulated, the payment of tuition fees facilitated for poor parents, and the clergyman's attention called to the necessity of preparing the teachers. Nevertheless, the actual conditions were very imperfect. In many places there were no schoolrooms in 1778, and about a hundred schoolhouses were in such bad repair that they were nearly useless. In Saxony the law of 1773, concerning classical schools, had an appendix that treated of elementary and rural schools. The conditions of the teachers' professional education were comparatively favorable in Saxony. Friedrich of Prussia, therefore, took occasion to call teachers from there or to recommend them for employment in his Kingdom.

In Catholic States, with 1760, a new life began in public education under the influence of the era of enlightenment. The efforts of Abbot Felbiger in Silesia have already been mentioned. * * * With its secondary schools the order of the Jesuits remained upon the standpoint of the sixteenth century; it entirely shut out the ideas of the new education, and left the care of the lower schools to others, notably to the Piarists, in whose hands they made no perceptible progress.

The Catholic reforms of the second half of the eighteenth century appear to us as though being made on soil which had remained fallow for a long time, and upon which nearly all the work must be done anew, while State efforts in Protestant countries had often to be made in opposition to existing customs. The abolition of the order of the Jesuits in 1773 at last opened the door for reforms.

In Austria, Maria Theresa, after the losses caused by the seven years' war, devoted herself to the intellectual and economic renovation of the Empire. In 1770, in Lower Austria, a school commission was appointed for the reform of public schools. In 1771 the first normal school was established in Vienna, and the school reform spread rapidly into the other crown lands of Austria. The general current of thoughts during this time will be recognized by the propositions of Count von Pergen, according to which the State should undertake the organization and supervision of all the educational institutions; it should exclude the members of religious orders from all professorships, and employ secular priests only during the period of transition. In 1774 Felbiger was called to Vienna. He there induced the Government to frame a "General school code," which was issued during the same year. It provided that in places where parish churches or chapels existed so called "trivial" (or primary) schools should be established by the communities with the aid of fiscal subsidies, in which schools religion, reading, writing, and arithmetic be taught, and lessons in "morals and economy" be given. Superior to these, a principal or central school should be maintained, at least one in each district (county). In these schools should be taught the elements of Latin, geography, history, written composition, and the principles of horticulture and agriculture. Superior to these central schools there should be normal or other model schools, to be established at the seat of the provincial school board. These schools should offer secondary instruction, but the preparation of teachers should be the main object. Of teachers a certificate of qualification was demanded. The beginning and close of school attendance was fixed, and neglectful parents and guardians were prosecuted. Maria Theresa herself showed deep sympathy in the promotion of this work. The necessary means were raised by taxation, levies upon the clergy and corporations, and appropriations from the ex-Jesuit funds. At the death of the Empress, in 1780, more than half of the schools of Austria were thus reformed according to the provisions of the law. During the reign of Joseph II (1780–1790) a good deal of regulating by decree took place in elementary schools. Among other measures a definite compulsory school attendance was decreed. By means of fines, for which compulsory labor could be substituted in case of poverty, negligent parents were forced to fulfill their duty. In connection herewith a regular enrollment of all children of school age was ordered. The enlightened tendency of these reforms may perhaps be best recognized in their contrast to that which followed. Under Francis I (1792)

a reaction set in, which had the avowed intention to curtail the rural school system to "absolutely necessary limits." This reaction found authoritative expression in the "political constitution of elementary public schools" of 1805. According to this decree "common people shall get in elementary schools only such ideas as will not trouble them in their work, and which will not make them discontented with their condition; their intelligence shall be directed toward the fulfillment of their moral duties and prudent and diligent fulfillment of their domestic and communal obligations."

In Bavaria the reform of the system of German schools (so called in contradistinction to Latin or classical schools) was carried on, during the same period, by Dr. Heinrich Braun, a Benedictine from the monastery Tegernsee, who was called to the newly established academy of sciences by the grand elector, Maximilian Joseph. New school laws were issued in 1770 ("for the German or trivial schools"), and in 1778 ("for the civil education in city and country schools"). That the higher Catholic clergy also were imbued with the ideas of the time, and actively encouraged public education, is seen from the example of the Bavarian bishop, Clemens Wenzeslaus. (See Mittheilungen der Gesellschaft für deutsche Erzieh. und Schulgeschichte, I, 1, page 31.) In 1783, in a pastoral letter, he admonished the clergy of his diocese to interest themselves in the public schools. Quite in the language of the era of enlightenment, he calls the public schools "colonies where virtue and science, the trees of life for all happiness, are nursed." The clergymen, he advised, should urge the establishment of schools, see to the employment of suitable teachers, and frequently visit the existing institutions. Clemens Wenzeslaus, at the same time, with the aid of Prof. Joseph Anton Schneller, adopted the new Austrian plan in his own diocese, Augsburg. (See previous paragraph.) For this purpose new schoolhouses were built, better teachers employed, and new schoolbooks published.

(8) *Private schools.*—Side by side with the public elementary schools, private, or so-called "hedge schools," continued to exist to the same extent as before, at least during the first part of the century. In Prussia Friedrich Wilhelm I, who did so much for the establishment of a State school system, took occasion to regulate the private schools in his capital, Berlin, by a decree of 1738. This decree bears witness to the fact that the State, during that period, was far from the idea of establishing in cities and in the country a uniform public education, but took the initiative only where economic instincts acting independently were missing; existing institutions were readily recognized. In this decree, it is true, the State's authority is maintained, in a certain manner, also, in regard to private schools. It seemed a matter of course that nobody was allowed to keep a school without a certificate of the ministry of ecclesiastical affairs. School-keepers in possession of certificates of capacity were, however, not allowed to open schools

wherever they pleased, but where they were needed; this was to make possible an even distribution of school facilities. A certain tuition fee, the amount of which was determined by ancient custom, was prescribed for all. Religion, also, in private schools should be the chief subject of study; but the masters were not allowed to release their pupils before they could read fluently, knew the catechism, and had learned to write "a little." The condition of these schools changed when, during the sixth and seventh decade, throughout Germany State regulation of elementary education was adopted. No law or decree issued in that period with reference to school affairs was without an energetic prohibition of "hedge schools." State institutions, however, had often to compete with private institutions to gain a foothold. The Prussian general school law of 1763 strictly prohibited the keeping of "hedge schools" in rural districts and small cities. The general civil code of 1794, however, relaxed this severity a little. It allowed private schools in villages and small cities, though not without special permission where public schools existed. School laws of other States prohibited the "hedge schools" throughout the States, in cities as well as in villages. The execution of this prohibitory measure was not always adequate; but the authorities took every occasion to advise energetic procedure against private schools in favor of the State school system. The Bavarian school law of 1770 tried to sever the public schoolmasters from community with artisans. "They shall not be pushed among the guilds and kept on a level with artisans against the custom of all well-instituted States"—a custom, of course, which was only just beginning to assert itself. In the cities private schools had still a large scope, even after the law came in force. It has already been mentioned that in Nuremberg the guild of the masters of writing and arithmetic existed throughout the eighteenth century, and even at the beginning of the nineteenth. In Cassel and Frankfort-on-the-Main the private schools flourished. In Leipsic there was no public school until 1792, in which year the city free school was established. He who did not like to send his children to one of the two Latin schools of the city, or would not have them educated at home—a case which was rare in that time (compare the description in Goethe's "Wahrheit und Dichtung," Part I, Book I)—was obliged to send them to one of the numerous "hedge schools." The least that could be done by the city authorities was to subject these schools to inspection, which was ordered as far back as 1711 by the city council. During the nineteenth century, at last, the private schools were generally superseded by public elementary and burgher schools.

(9) *Realschulen* (*schools of realities*), *modern high schools.*—During the period in which Latin and the purely German schools opposed each other, on principles and with vigor, there opened a middle gap between them. The German, or vernacular school, offered too little secondary work; the Latin school, on the other hand, aimed too high for many

people; now came into existence the realschule, which claimed an equally independent position. It was owing to a new social factor in the nation. A large middle class began to form which represented higher economic professions and occupations, and which claimed a place between the nobles and scholars on the one hand and the mass of the working people on the other. The "citizen class" had begun to recuperate from the dire misfortunes of the last century. German commerce again obtained importance in international intercourse. The social position of the merchant was elevated, and the amount of knowledge necessary for his business had increased. The technical or mechanical professions developed and assumed importance; knowledge of the latest scientific discoveries and inventions became indispensable for them. Also military men, courtiers, even farmers and artisans, may be mentioned as among those to whom mere elementary school education was not sufficient. But they found no satisfaction in the only other existing form of education, the classical. For military men, though, some provision had been made in the institutions for the nobility (Ritter-Akademien). Now people began quite generally to demand appropriate education for the group of professions mentioned; an education which should be distinguished from that given in the purely German schools, as well as from that of the classical high schools. According to the nature of the case, it could be only a "realistic education"—that is to say, an education which preferably offered knowledge of real things. This new necessity had been felt as far back as the beginning of the eighteenth century. A. H. Francke was familiar with the idea, but in his own schools he established only the customary departments of German and Latin education; the boys of his orphan asylums were assigned to the one or the other, according as they were destined for a trade or for a learned profession. In the same city of Halle, Rev. Mr. Semler, in 1706, established a "mathematical and mechanical realschule," which, however, was abandoned after two and a half years. In 1738 it was reopened by the founder. Semler's intention was to show visibly, in pictures or models, objects from real life, the knowledge of which would be necessary for everybody. This tendency was, so to speak, a reaction against the book learning of the classical schools, and an attempt to make new mathematical and mechanical knowledge useful for general education. It is interesting to note, that according to Raumer (Geschichte der Pædagogik, II, page 163) the Association of Sciences in Berlin inquired into the working of the new institution, and arrived at the following conclusion: It entirely agreed with its plan, and saw in it the germ of a kind of school that would take a position between the elementary and the classical schools. As there were schools for the preparation of future servants of the state and the church, it would seem advisable to prepare in technical secondary schools boys who had only an elementary vernacular education, so that they might obtain knowledge of materials, machines, etc., and that

later they might make use of this knowledge for the purpose of inventing "new, useful contrivances." This idea remained paramount. The education thus defined and ardently desired, was obliged, in the nature of the case, to gain space in the curriculum by occupying that hitherto reserved for Latin; hence it was frequently proposed to establish special classes for future merchants, artisans, etc., in the secondary burgher schools. Johann Julius Hecker undertook to carry out this idea practically. In his "realschule," established in 1747, he included the three kinds of instruction for boys, i. e., a German, a Latin, and a realistic course or school. With this act a division of the secondary school system was made, each branch of which has been developed during the present century—at least a good beginning in that direction has been made. The social classes whose educational needs the three school forms serve, are, according to Hecker's opinion: (1) Farmers or peasants and day laborers; (2) Citizens (by which term he meant well-to do denizens of cities), artists, soldiers, and large landowners; and (3) The class of men pursuing learned professions. The realistic school tried to give knowledge of all things pertaining to practical life by means of object lessons, especially by the showing of models. In the hall of models of the institution there were objects to be seen for all branches of human activity, besides straightedges, drawing and measuring instruments, also machines and contrivances of various kinds, buildings, ships, plows, mills in miniature, complete merchants' shops, collections for the manufacture of leather, the textile industry, and the culture of the silkworm, etc.; furthermore, a botanical garden and a mulberry plantation were joined to the institution. The "realschulen" were not at first all uniform in organization and curriculum, but represented sections. Thus one was a manufactory, another an architectural, a mining, an engineering section, etc. The realistic-technical education of our latter days exhibits the same characteristics. It begins with special education, which meets certain local or national needs. These separate sections of education are in no organic connection, but gradually they develop into complete schools, and either offer or require, as a condition of admission, a general education.

Institutions similar to that of Hecker were established in Wittenberg, Stargard, Züllichau, Breslau, and Erlangen, but they were all either abandoned or changed in their character. The Berlin institution, however, remains unchanged, and became under A. G. Spilleke (from 1820) again an important model for the development of the system of realistic schools. The problem never ceased to be discussed during the eighteenth century. A pamphlet relating to this problem by the abbot Resewitz, on "Die Erziehung des Bürgers zum Gebrauch des gesunden Verstandes und zur gemeinnützigen Geschäftigkeit," 1773, was dedicated to King Friedrich II. But only the revolutions at the close of the century and the great commotion during the early part of the present century produced new conditions which furthered the object of realistic secondary schools.

IV. The Nineteenth Century.

THE UNIVERSITIES—THE NEW HUMANISTIC CLASSICAL SCHOOLS—THE SYSTEM OF REALISTIC HIGH SCHOOLS—THE PRESENT PUBLIC ELEMENTARY SCHOOL.

(1) *The universities.*—Upon the territory of classical education the nineteenth century accepted the inheritance of its predecessor. Through the classic period of German literature (Goethe, Schiller, Wieland, Herder, Lessing, and others) the influence of Greek philosophy upon German culture was decided. At the same time scientific knowledge of antiquity was considerably advanced by Fr. A. Wolf and his successors; philology was the dominant science in the universities at the beginning of the century. The rapid extension of this science was noticeable in the growing number of philological seminaries in the universities, for this was the form in which the new century attempted to satisfy the necessity for a better preparation of secondary teachers. It did not correspond of course entirely to that which had been intended, for while the seminaries of the eighteenth century tried to give pedagogical education, those of the nineteenth century offered philological exercises. It was thought sufficient for educational practice if the students were qualified in their science and knew what to teach.

The reform in the organization of the university prepared during the eighteenth century was completed during the early part of the nineteenth. An equalization of the four faculties was perfected. The further history of the German universities to the present time would be a history of the growth of modern science. It would show how, according to the enormous increase of knowledge, the various faculties have enlarged their equipment with means of instruction, etc., but the organization remained essentially the same: The preparatory or college course was definitely excluded from the university; the philosophical faculty is now a school for adults, as well as its three sisters. In some universities the increase in knowledge, or rather the multiplicity of sciences, has led to experiments with a new organization. Thus, for instance, a division of the philosophical faculty into a linguistic-historical and a mathematical-scientific section, or the constitution of a special faculty of political economy or science of state, has been attempted. These experiments, however, do not seem to have obtained large importance; they are still without influence upon the uniform character of the institutions. This uniform organization is kept intact resolutely, and to foreigners it appears as a decided advantage of the German university system. Our university whose character has been formed in historical evolution is, on the one hand, an institution for professional preparation, on the other hand a school for general culture. With regard to the latter, it may be said that it continues the general training of the gymnasium or college. Furthermore, it is not only the highest kind of school and the last stage of higher education, but also the scientific

workshop of the nation. Only with reference to the former condition does it belong to the state school organization; but the scientific character of its instruction is regarded as indispensable. By means of the university science is spread to the remotest domain of practical life; the representatives of the higher professions are not to accept dogmatically the theoretical principles of their procedures, but they must be enabled to understand them fundamentally, to prove them to themselves and to others, to examine, and, when occasion offers, also to transform and enlarge them. In this bright picture which our universities offer to German as well as to foreign observers, there are shadows, of course. Their purely scientific purpose threatens to confine and obscure their practical purpose. Of late, voices are heard from the legal and pedagogical professions which complain that the universities do not sufficiently pay attention to the demands of professional practice. (Paulsen, Wesen und geschichtliche Entwicklung der deutschen Universitäten, 1893.)

(2) *Classical high schools.*—With the new century humanism entered upon its undisputed domination in the classical schools. The new humanistic gymnasium was founded; it remained during the whole century the prevailing form of secondary education, and with its spirit German education has ever since been filled. The gymnasium is the embodiment of the idea that an intense occupation with Græco-Roman literature and familiarity with the philosophy of classic antiquity will give the best general preparation for every higher profession. The clearness and noble simplicity of the Greek, the earnestness and dignity of Roman thought and feeling are to be comprehended by the German youth in the gymnasia; they are to fill his soul, so that they will induce similar thought, feeling, and action. It was but natural that this aim, even during the best period of the existence of this school form—i. e., during the first part of the century—was not always reached by the students, but the enthusiasm of the teachers for this ideal often enough carried away the students. This modern humanism did not always keep itself free from that superfluity of Latin writing and rhetorical exercises which characterized the humanism of preceding centuries. It seemed to be necessary for the purpose of becoming familiar with antiquity that the beloved language of the Latin authors, especially that of Cicero, could be used orally, and often the whole system of instruction was disarranged in the endeavor to impart that facility.

Humanism in Prussia was made the governing center of the classical schools (gymnasia), when, after the breakdown of the State in 1806 (battle of Jena), the necessity was felt of filling the life of the nation with more ideal contents for its rejuvenation. Wilhelm von Humboldt, the friend and companion of the Weimarian poets, as well as Fr. A. Wolf, was placed in 1808 at the head of the newly established section of education in the department of the interior; he took the most prominent part in this work. Under the ministry of Altenstein (1817–1840)

the privy councilor, Johannes Schulze, added to the course of classical education in the gymnasia the modern branches of scientific study. He established the Prussian gymnasium, which tried to realize the ideals of humanism and to satisfy as much as possible the modern wants of education. Complaints of overburdening were consequently soon heard, and they have continued to the present time. As early as 1837 they were vigorously expressed in a sensational publication by the physician Lorinser.

The new classical school education took another course in middle and south Germany. Here, through the influence of the scientific activity of Gottfried Hermann, the Leipsic philologist, and also in consequence of the organization of the Bavarian classical schools by Friedrich Thiersch (1829), humanism was made the center of gymnasial education, while mathematics, physics, history, geography, and other branches were considered of inferior importance. The students lived an intellectual life wholly within the world of antiquity—a life which surpassed, perhaps, in intensity and warmth, but also in narrowness, that which filled the Prussian schools. Latin compositions and orations, Latin carmina and disputations, and interpretations of the authors were made in fluent Latin and regarded as a most praiseworthy application of life in a foreign range of ideas. Taken as a whole, humanism agreed with that period in which the political conditions of the country induced the individual who would waste his strength in political dreams and doctrines to seek a satisfying philosophy and a world's view far from the present time in the solitude of past historical events.

Hand in hand with the renewed humanization of the classical schools went the more minute defining of their aims in relation to the higher and lower steps in the system of state education. As the universities excluded the preparatory course during that time, the latter was more clearly defined thereby. From among the many Latin schools (differing greatly in their courses) from which graduation to the university had been rather arbitrary those institutions were selected which, on account of their sufficiently extended course of study, were granted in future the exclusive right of preparing for the university. The remaining schools became simple Latin schools, progymnasia (incomplete gymnasia), or were changed to burgher schools. Examinations for graduation were provided by the state authorities in the selected institutions, which from that time alone bore the name "gymnasia." Examinations for the teaching profession in secondary schools were also ordered, and for this purpose regulations were issued concerning the amount of knowledge necessary. Finally the schools received special plans of instruction in detail. In connection with this systematization may be mentioned the progressing secularization of the entire secondary system of education. The teacher's office was more and more detached from the pastorate. The administration was taken out

of the hands of ecclesiastical consistories and given over to secular school boards (curatoriums). Lastly, departments of education were established in nearly all States of Germany. This process of establishing a strictly gymnasial course and of making classical education independent could be observed in all larger German States during the first decades of the century. In Prussia, the example of which was followed by the other States, the graduation examination was decreed as early as 1788—at first only for the purpose of proving qualifications for the use of stipends and scholarships, later for the purpose of proving qualification for attendance in the university. In 1834 entrance examinations in the university itself were abolished. They had been obligatory for candidates who had not entirely finished a gymnasial course. Upon the establishment of a superior school commission (in 1787), and upon that of an educational section in the department of the interior (in 1808), followed, in 1817, the establishment of a special ministry or department of public worship and education. Rules for the examination of teachers were issued in 1810, and again in 1831, and model-school programmes in 1816, and again in 1837.

The rigid organization thus produced has brought with it undeniable advantages to the system of secondary schools. It guarantees the success of the work in each institution and secures to the whole system a uniform support or income independent of advantages or disadvantages of the times. But, on the other hand, time has also thrown into bold relief the faults of the system. Liberty of interest in intellectual work has been suppressed in the student, and the necessary severe fulfillment of the duties officially required has led to extreme and exhausting exertion. For this reason, in the present, a desire is expressed in many places to restore to the gymnasium a greater liberty of action. Even the venerable leader of the Prussian secondary school system, Ludwig Wiese, when resigning from his office in the department of public instruction, pronounced it to be his opinion that the state, after having secured to the gymnasium its definite position, should relax in the severity of its supervision and the minuteness of its regulations, in order not to prejudice the intellectual life of the students. "The strength and fertility of the policy of the Prussian State," he said, in his Paedagogische Ideale und Proteste (page 103), "has been proved in the schools during a long period, but there is danger lest, upon the field of intellect, this power become a tyranny." Outside of Prussia the schools kept free from this evil for some time, but the greater uniformity of the political institutions has aided the same policy since 1870 in the other States also.

The classic time of modern humanism is, as has been stated, the first part of the present century. After 1840 other interests began to gain advantage over it. New sciences, such as general and comparative philology, German and Romance philology, etc., grew up; others, such as history, commenced to develop, and the natural sciences occupied the

attention of the learned, by their theories as well as by technological inventions which resulted from them. Besides, church and political revolutions excited ever larger circles. People began to criticise the humanism of the classical schools. It was said that it had already deviated considerably from its original idea; Greek had receded behind Latin, and the interminable Latin writing and grammar lessons prevented the reading of ancient authors. The demands of modern educational elements also became very prominent. The men of 1848[1] expressed, as they did in other matters, the demands of the time with reference to secondary schools, and it was done with no uncertain sound. "It is," said Köchly, one of the leaders of the revolution, "an old and grievous error to confound the old classical education with speaking and writing Latin." However, with other wishes of the time, the reform of gymnasia was brushed aside. In Prussia, during the ministry of von Raumer (1851–1858) gymnasial instruction was modified somewhat, but not in the sense alluded to. Ludwig Wiese, who from 1852 stood at the head of the section of secondary schools in the department of public instruction, agreed with the minister that a greater concentration in the course of study of the gymnasia was necessary. He said of the minister in his "Lebenserinnerungen und Amtserfahrungen" (p. 184): "He inclined toward the old simplicity in the course of study, and would have liked to confine it to instruction in religion, ancient languages, and mathematics." But Wiese was impartial enough to acknowledge the impossibility of this simplicity in the face of the demands of modern education, which he thought justified to a large extent. These modern tendencies found expression in the revised course of study of 1856, although the changes made in it were not great. The means of concentration were found, by a large number of the philologists of that time, in a stronger emphasis of the study of the Latin language; formal grammar was made intentionally the main branch of study.

In Austria, on the contrary, a gymnasial reform took place which met modern demands to a very large extent. It was undertaken by Ministerial Councilor Exner and the philologist Herman Bonitz, who had been called from Prussia. Also in Bavaria, a new school order was issued in 1854 which, however, turned into the old ways and did not much deviate from the former limitation to humanistic subjects. Würtemberg followed the other States in so far as it separated philological from the theological studies and made them self-dependent. The management of classical schools in this Kingdom shaped itself gradually in accordance with a programme published in 1852. In Baden the authorities imitated north German institutions; Saxony, also, since the middle of the century turned away from the south German toward the north German gymnasial pedagogics.

[1] The year in which the political upheaval took place that changed the old absolute monarchies into constitutional governments.

The great elevation which national life experienced in Germany after the war of 1870 and 1871 was, of course, not without influence upon the secondary schools. Questions relating to it were ventilated with great candor. It was asked whether the schools which prepared students for the university were really giving a national education to German youth destined for higher professions. The Germans found themselves suddenly face to face with a number of practical problems, educational as well as political and economic, which could be solved only by a thorough comprehension of the time. One thing was plain, the people felt obliged to meet the growing need of providing youth with modern means of education in a more extensive manner than formerly. It was observed that physical power and energy of will did not suffice for the increased demands of practical life. The discussion of educational conditions existing in the Empire soon spread from the limited sphere of teachers' clubs to a wider sphere embracing all men of education. Questions of school management and organization, education, and training have become, especially since the close of the seventh decade, ever fresh subjects of public discussion in daily papers and reviews, and they continue to agitate the nation as never before. A number of popular societies have been established which in various ways attempt a solution of the school question; among their members laymen are often in the majority. The unification of the German States into an Empire has resulted in attempts at greater uniformity of the various school systems. For the purpose of arranging this uniformity an imperial school commission was appointed in 1875. This commission succeeded in prevailing upon the four kingdoms—Prussia, Bavaria, Würtemberg, and Saxony—to reform their classical schools in 1891–1893 by adopting new programmes and time-tables in their gymnasia, which on the one hand meet the demands of modern life by limiting the time devoted to humanistic studies, and on the other hand establish a most desirable uniformity concerning preparatory studies for the university.

Prussia, first of all, began with new courses of study in 1882, of which the preliminary work is traced back to the ministry of Falk. These new courses signify a return from the preponderating grammatical practice of Latin to the older humanism which laid stress upon the contents of the classics. These courses prescribed a reduction in the linguistic instruction: Latin lost nine hours a week, Greek two, and at the same time the beginning of the latter study was postponed two years. Reading the classics was placed in the foreground, but a certain ability in the written use of Latin was demanded, and Latin composition retained its former importance. But a new phase for the development of the classical schools came with the beginning of the reign of Wilhelm II (1888). Filled with the idea that the schools should meet the danger which threatened the State through social democracy, he ordered an investigation by the Prussian educational

authorities into the means by which this could be done. A consequence of this was the convocation of a conference of schoolmen and educated laymen, which took place in December, 1890, in Berlin. It was natural that their deliberations should embrace all the questions which at present interest secondary education. The assembly, owing to the character of the men selected for it, inclined toward leaving the humanistic studies of the gymnasium intact and preserving the position of these schools as the most important and exclusive preparatory schools of the university. An indirect influence of the resolutions passed by the conference became obvious, however, in the new programmes published in 1892. In the latter the object of doing away with overburdening the students by mental work is clearly demonstrated, and more physical exercises are prescribed. For this purpose not only the time for gymnastic exercises is increased, but also the whole number of intellectual lessons per week is diminished. This is done at the expense of the humanistic studies; Latin lost fifteen and Greek four hours a week. Latin compositions, which had been discredited before, were now abandoned, and Cicero was rejected as a model for style. The object of teaching Latin is now restricted to "linguistic-logical training and familiarity with Roman literature;" that of Greek, the knowledge of literature alone; as purpose of the entire humanistic education is assigned, "Historical comprehension of antiquity." The good intention to give more time and space to modern educational elements also prompted these changes. English, as an optional study, was introduced everywhere, and drawing was re-enforced. The gymnasium, it was thought, was now able to give preparatory education to all higher professions, the technological included, and do it either alone or together with other kinds of secondary institutions. To another point of view attention was called in the new programmes, namely, the training of character. Religion, German, and history are especially to serve this purpose. Lately (since 1895) it is officially permitted to increase the number of Latin lessons in the upper grades one lesson a week.

Also, in most other German States changes were made in the time-tables of gymnasia during the seventies and eighties; for example, in the Grand Duchy of Hessia in 1877 and 1884, in Saxony in 1882, in Baden in 1883. Bavaria in 1874 extended the course of its gymnasia from eight to nine years, for the purpose of establishing more complete uniformity with the north German schools, the realistic branches being still a little neglected. The new programmes, given since 1891 in Bavaria, Würtemberg, and Saxony disclose the same tendencies that prompted the Prussian authorities in 1892. Everywhere the education of the mind and the training of the character are strongly emphasized, and modern culture, especially natural science, is treated with more consideration than before. The number of lessons in classical languages, as in Prussia, is decreased everywhere; for the method of instruction it

has become an axiom that reading the classics should be the main point, while Ciceronian writing exercises are abolished. Thus, for instance, it is said in the Würtemberg programme: "Training the students as though they were all to become philological teachers should be avoided. In gymnasia the object should be to impart the elements of classical culture and to open up ancient intellectual life." Latin composition was abandoned also in Saxony. Likewise the partition of the matter of instruction upon the various grades has become more uniform. French generally (except in Bavaria) begins in the second grade (from below), Greek in the fourth.

Thus humanism in the classical schools experienced a setback at the close of the century at the beginning of which it had undisputed dominion. It might be said, of course, that it only now begins in earnest to free itself of the barnacles that have impeded its progress—that is, the dry, tedious Latin exercises of the earlier times. It is certainly a laudable tendency of the various courses lately adopted to bring the real content of humanism, which is to be acquired only by reading the authors, to its fullest effect upon the mind and character of the students. However, it is not generally believed that the new courses of studies (or programmes) have finally and in the best way solved the gymnasial questions of the present. It may not be right that the old philological teachers pretend not to be able to accomplish what is prescribed, owing to the diminished number of hours allotted to them. More important is the other consideration, whether the classical school can carry the additional load of ancient and modern culture. But most important, perhaps, is the fact that humanism has lost in the life of adults the place it used to take. It will be a question for the nation in future to decide, if, and to what extent, it can further preserve that medium of education in the center of classical education without prejudice to other interests.

(3) *Realschulen* (*modern high schools*)—*Technological universities.*—Side by side with classical schools the system of modern high schools (of which the beginnings during the eighteenth century have been mentioned above) obtained, during the nineteenth century, such an extension in breadth and height that it could assume equal importance with the classical and the elementary instruction. This development is based upon the rise of the natural sciences during the same period; upon the applications which their results found in technology immediately; and upon the elevation of the middle citizen class, and other circumstances. By way of exact research the natural sciences soon experienced a rapid development in the first decades of the century. They kept on progressing, and soon occupied a considerable part in the enormous enlargement of the philosophical faculty of the university. As a natural consequence they soon commenced to claim their place in the education of the nation and in the instruction of youth, side by side with the philosophical sciences. At the same

time, in the economical life of the people, especially since the third decade, the most notable changes have taken place, in consequence of new discoveries and inventions. As early as 1818, steam vessels plied on German rivers; twenty years later the trans-Atlantic steamer routes were opened, which became of vast importance to Germany. In 1833 the first telegraphic wire was strung, and in the same decade the first railroads were built in Germany. Through all these things commerce and industry received a powerful impetus. The development of the tariff system in Germany acted in the same direction.

In Prussia, at the beginning of the century, even the separate provinces were locked against each other. The tariff orders of the second decade of the century created a freer motion, and later (in 1834) this freedom was extended by the establishment of a tariff union (Zollverein) beyond the frontiers of Prussia to a large number of German States. The ultimate consequence of all these economic changes was the elevation of the citizen class, especially of the wage-earning classes in industrial and mercantile pursuits. How much, indeed, needed to be done for them can be seen from the biography of the Prussian state councilor, Fr. von Knuth, by P. Goldmidt (Berlin, 1888). Knuth, who had been tutor of the two Humboldts, and who afterwards entered the Prussian Administration, attempted earnestly, shortly after the war of liberation, to inaugurate a better education of the wage-earning classes. The actual state of their knowledge was very low. Many of them could not write; foreign inventions and scientific discoveries were not utilized; enterprising spirit they had none; they had to be pushed and persuaded by governmental officials to everything that was in their own interest. To see the difference between then and now one need only compare the present extent and importance of every kind of industry in Germany.

Finally, a profession of its own, of technical men, grew up in consequence of these economic, industrial, and scientific revolutions, represented by men upon whose professional and general education life made ever-growing demands. This development is reflected in the growth and development of technological universities, which had their beginnings in secondary technical schools, and are now institutions which are justly ranked with the old universities; at any rate, they lay claim to equality with them. In 1794, first of all in Paris, an "École Polytechnique" was established; following this model, in 1806 in Prague, and in 1815 in Vienna, polytechnical institutions were established.

In Prussia as early as 1799 the Royal Architectural Academy was founded. In 1821, on the advice of Beuth, the "Technical Institute" was added to it. This was an industrial school of two grades, after the model of which schools of only one grade were established in the provinces. Similar schools came into existence in the first part of the century in different places of Germany.

They ordinarily required as a preliminary education not more than the common or elementary branches, but they represented, on the other hand, the highest stage of technical instruction. Since about the middle of this century some of them have widened their scope and become polytechnical institutions, and assumed the character of universities. Thus the school in Hanover in 1845, that in Dresden in 1851, that in Karlsruhe in 1863, etc. For this kind of school, especially, the Polytechnicum of Zurich (established in 1854) became the model, partly through the prominence of its distinguished teachers and partly through its organization; because here a philosophical department with political economy was opened, which seemed to offer full compensation for the work of the philosophical faculty at a university. In 1868, in Munich, a similar institution for technological instruction was opened. In Prussia the "Industrial Institute," which had resulted from the old "Technical Institute," became in 1866 an "industrial academy," and was, in 1879, combined with the old-established "Architectural Academy" and called "Technical University."

The polytechnica of Hanover and Aix-la-Chapelle were changed to conform with that of Berlin.

The new universities thus developed have the purpose "of affording higher instruction for the technical professions in state and community service, as well as in industrial life, and of cultivating sciences and arts which are intimately connected with the field of technology." (Berlin, provisory statute, 1879.) They prove themselves equal to universities in the following points: They claim for their matriculated students the same preparatory education required by the old universities, namely, one of nine years at a classical high school; they grant and insist upon perfect freedom in teaching and learning, and are under the direction of rectors elected for one year, instead of having principals chosen for life, as in secondary schools.

(4) *Combination of classical and modern high schools.*—The modern high schools, or realschulen, in their various forms, since the first decades of the century tried to answer the demand for preparatory education made by these newly established polytechnica, as well as those which high-standing industrial private enterprises made upon their leaders and technical men. Furthermore, they tried to meet the demands of the middle class of citizens for a suitable general education upon a modern basis—that is, a general education without a study of the classics. During the second and third decades such schools, mostly called realschulen or burgher schools, were established in nearly all German States. The endeavors of Spilleke (see above), Scheibert, Mager, and others for the theoretical and practical organization of such schools fall in this period. They still combined the higher and lower stages of realistic instruction. But soon a more advanced preliminary education was claimed, especially for the technological professions, which could not be given by these simple realschulen or burgher schools.

Neither could that preparation be had in the classical schools as they were then organized. Higher mathematics and natural sciences were necessary for this kind of education; also modern languages, as an important auxiliary means of modern commerce.

For this reason another kind of preparatory school came into existence, a combination of classical and modern high school, the so-called realgymnasium, which, owing to the higher studies for which it prepared, introduced the study of Latin in its programme. Thus a combination high school was opened in Berlin in 1828, in Gotha in 1836. In the Duchy of Nassau the diet, in 1839, urged the establishment of such an institution in Wiesbaden, and the Government evinced much interest in the plan; in 1845 the school was opened. Concerning the object of such schools, the law ordering the establishment says as follows: "The realgymnasium of Wiesbaden has the purpose of a general scientific preparatory education for those who intend to devote themselves to a technical-practical profession, and who, immediately after graduation, enter upon it, or who intend to continue their studies in a professional school or polytechnical university." The institution, from its beginning, had Latin in its course of study; in this it went as far as reading Horace, following the programme afterwards adopted elsewhere, and required a Latin composition at the maturity examination. It only consisted of three upper grades of its own, the lower ones agreeing with those of the classical school.

As a matter of course, in their further progress of development these schools turned their eyes also toward the universities, for it was obvious that they were able to give at least as good a preparation for mathematical, scientific, and modern-language studies as the humanistic gymnasia. The year 1848 emphasized the consequences of the case in question. At the Prussian state school conference of 1849 the Government proposed to raise above a common foundation both a gymnasium and a realgymnasium, to which proposition the conference added the other demand—that graduation from the latter should entitle to admission to the philosophical faculty of the university. The epoch following was not favorable to this modern high school of a higher kind. However, the same length of course which the classical high school maintains, i. e., nine years, indicates that to a certain degree an equalization could not be denied them. This was acknowledged in Prussia by an order concerning instruction and examination in realschulen and burgher schools in 1859, which took the place of the "preliminary instructions" of 1832 for modern high schools without any distinction.

According to this new order, modern high schools of first and second rank were distinguished. For the first, a course of nine years, like that of a gymnasium, was laid down, and Latin was made a compulsory study. In 1870 these schools were granted the right to prepare for mathematical, scientific, and modern linguistic studies in the university, which implied admission of their graduates to the university without entrance

examination. Already in 1864 Bavaria had secondary schools of this kind, with the same qualification, and bearing the name "Realgymnasia." They had the same length of course as the Bavarian gymnasia, and were enlarged in 1874 to institutions of nine grades.[1] The three lower grades agree with those of the gymnasia. In Würtemberg, in 1867, a "realgymnasium" was branched off from the Stuttgart gymnasium; later a similar school was opened in Ulm. These combination high schools of Würtemberg claim to have more of a humanistic character than those of modern Germany, on account of their extended Latin practice. Their graduates are admitted to the polytechnicum and to the agricultural academy, also to studies in the philosophical, the scientific, and the law faculty of the university. Prussia followed these States in 1882 by also giving the name of "realgymnasia" to the "realschulen" of the first rank; the enlargement of their gymnasial character was to be seen in a greater number of lessons devoted to Latin. In Saxony such combination high schools of a nine-years course have existed since 1884.

Gradually the "realschule" (the realistic high school in contradistinction to classical school) has changed also. As the technical professions rose to an equality with the old so-called learned professions, modern secondary education assumed more importance, especially since the reestablishment of the Empire after 1870, so that the former merely technical preparatory institutions gradually changed to secondary schools for general culture. It has even been asserted that since these schools had to a great extent been divested of this purely technical or industrial character, they should now give that modern education which the times demanded for the sons of leading men in all occupations. The most radical advocates saw, and still see, in the realistic school (without classical languages) the gymnasium of the future; those who like to preserve existing institutions endeavor to secure full equalization of both modern and classical high schools. This is especially obvious in reference to the qualifications for admission to the university, and the next step to this aim is the admission to the study of medicine. But others deny the justice of such a step, and wish to see the realistic high schools pushed back into their old place of technical preparatory institutions. At the present time these questions are vigorously discussed in the educational press. The Prussian Government in its last reform measure, in 1892, has taken a position with regard to these questions which was not expected after the issue of the courses of study in 1882. The December conference of 1890 concluded that the combination high schools (realgymnasia) should be suppressed, and that in future, besides the classical high schools (gymnasia), only insti-

[1] It must be borne in mind that this does not include the four elementary grades. High schools in Germany, as a rule, begin with pupils of grammar-school age. The two or three upper grades of all secondary schools are of two years each; hence a student in a German secondary school rarely graduates before he is 20 years old.

tutions without Latin, the so-called upper realschulen, should exist. But the new courses of study prepared by an executive committee of that conference do not follow that plan, except in reducing the time allotted to Latin in the combination schools. In these new courses the upper realschulen are made nearly equal with them in their privileges of preparing for higher studies, and the question as to whether the combination school is still entitled to exist side by side with the classical and the realistic schools is left open. The steps taken lead to no solution.

Recently general attention has been bestowed upon the experiments made in postponing the beginning of Latin at the gymnasia, as well as the combination schools to a higher grade, and thus to establish a common foundation for all schools of nine grades (Altona and Frankfort courses of study).

The just-mentioned upper realistic high schools (without Latin) came into existence in Prussia during the seventh decade. They grew out of the former industrial schools (Gewerbeschulen), and were soon classed among the secondary institutions of nine grades—that is, schools which attempt to give general modern education based upon modern languages, mathematics, and natural sciences, without Latin. After having lost, in 1886, the privilege of sending their graduates to the Academy of Architecture, they regained this privilege in 1892, as has been mentioned. Furthermore, they gained for their graduates admission to the philosophical faculty at the university, at least for the study of mathematics and natural sciences. In Würtemberg the corresponding school form, a modern high school without Latin, obtained, in 1876, the qualification of sending its graduates to the polytechnicum and to the natural science faculty of the university. Schools of this kind exist also in the States of Oldenburg and Brunswick.

(5) *Lower realschulen and burgher schools.*—While thus, during the nineteenth century, frequent remodeling of the former realistic or industrial high school has resulted in a system of schools for general culture which are at the same time preparatory institutions for higher education, the original form of it, the so-called "burgher school" was neglected and lagged behind in development. It tried to give a suitable secondary education for practical pursuits. The problem which the eighteenth century proposed, i. e., to meet the needs of the rising "burgher class," has not yet been solved satisfactorily in the present century. Only in a few German States and cities the burgher schools could freely develop in the economical interests of the wage-earning classes. Thus, for instance, in the three republican States of Germany, the free cities, Hamburg, Bremen, and Lübeck. In other States, the original object of such schools was turned aside by alien considerations, and often "the Latin of the classical schools was superimposed upon them." This was done in Prussia by means of the "preliminary instructions of 1832." The "examination order of 1859" classified these middle schools as burgher schools or realschulen of the second rank.

The study of Latin seems to have been thought indispensable for the

privilege of "one year's service in the army." Only when after the sudden territorial expansion of the State[1] in 1866 the Prussian school authorities came in contact with other than Prussian institutions which had shaken off Latin, the need of "burgher schools without Latin" was felt more acutely. In 1873, first of all, in Breslau such a school (conducted by Rector Dr. Bach) was granted the privilege of giving the certificate of one year's service in the army. (Boys who have only an elementary education must serve three years in the army.) In the courses of study issued by the minister of education in 1882 these secondary schools of an inferior grade were officially prevented from amalgamation with realschulen of the first rank. The introduction to the official programmes contains these words: "An obvious need has shown that secondary schools must be established for an advanced education which in six years,[2] by excluding Latin, may lead to a certain degree of completion; schools which do not aim at preparing for higher education, but which will enable qualified pupils to acquire the military certificate of one year's service." Nevertheless, the number of these schools increased but little in the following years. Their development was hindered by the fact that the other high schools usurped their functions to a large extent; that is, they kept a great number of students only until they obtained the certificate referred to, a circumstance which is considered favorable neither for the education of students preparing for higher studies nor for the burgher school pupils. The December conference of 1890 (see above) recognized this evil and proposed a number of remedies which the executive committee, kept in session to complete the work of the conference, adopted in 1892. Among other remedies a closing examination was required of the students who left the gymnasium in the sixth year of the course. This was done to make them equal in this respect to the students of the burgher schools and to take away from them an apparently undeserved privilege. The difference between institutions of seven and those of six year courses was abolished and the name "Realschule" was given to schools of six grades only. Also in other German States attempts were made during the seventh and eighth decades to foster schools without Latin for the middle class of society. In Bavaria such schools were established in 1877, in Saxony and Hessia in 1884, in Baden in 1885; in Würtemberg they had existed already for some time. Latin is excluded from them as a regular branch of study, but some have Latin as an optional study, because they have to perform the task of a pro-gymnasium or incomplete gymnasium in small towns.

Generally, it may be said, the opinion is prevalent that the extension of this kind of schools has proved a social benefit for the nation, especially for industrial communities. A special advocate of these high

[1] Prussia acquired the Duchy of Sleswick in 1864, the Duchy of Holstein in 1866, the Kingdom of Hanover, the Grandduchy of Hesse-Cassel, the Duchy of Nassau, and the Free City of Frankfort in 1866.

[2] Counting from the tenth year of age, at which all secondary schools begin in Germany.

schools of six years without Latin, School Councilor Dr. Bertram, in Berlin, has expressed this opinion in these words: "More and more has the idea ripened among industrial people that their welfare and happiness is based upon two facts. The one is that they can readily earn a livelihood and find suitable spheres of activity; the other and more potent fact is that by means of these high schools, specially designed for their needs, they participate in the general education of the nation. They feel that they receive a satisfactory preparatory education, and hence assume an adequate position in the economy of the nation." (Proceedings of the Dec. Conf., p. 354.)

(6) *Public elementary schools up to 1860.*—The public elementary schools, or Volksschulen, only called so generally during the nineteenth century, increased at first only in number and improved in external conditions. The governmental authorities endeavored to approach the aim set for the State by drawing into the influence of compulsory elementary instruction all children who could not aspire to secondary and higher education, owing to the want of means. This aim has nearly been reached at the close of this century. In Prussia, for instance, the percentage of children illegally withheld from school was found to be 0.02 per cent for 1891; the percentage of those who were released temporarily or for good before the age of 14, having completed the course or otherwise been taught, was 1.55 per cent. The other 98.43 per cent were educated in public or private schools or in asylums, owing to physical or mental defects. The result is that the conscription of military and naval recruits shows the small percentage of illiteracy of 0.16 per cent in 1897, and even that small fraction of 1 per cent does not represent absolute, but only relative illiteracy. But these numbers can not disguise the fact that there still remains much to be done by the State toward a complete performance of its civilizing task. In many places the number of pupils to each teacher still surpasses the number prescribed by law. The distance many children have to walk to reach school is often too far, and a large number of children are not seated according to educational and hygienic principles. The funds and the annual appropriations by communities and the State are considerably larger than in former years, although in this respect, considering the magnitude of the task, not all justifiable claims are met. The teachers' salaries have been increased of late, the pension and annuity funds augmented, and for the construction of schoolhouses and their equipment large sums have been appropriated and expended.

Greater, even, than the exterior changes which the public elementary schools have experienced have been the interior changes since the close of the last century. These changes, which may be termed reforms, are intimately connected with the name of one man, that of the Swiss citizen Heinrich Pestalozzi (1746–1827). The effects which his influence has had upon the organization and management of public instruction are threefold: (1) He awakened a deep-rooted interest on the part of

the State in elementary education; (2) he has deepened elementary instruction and worked great improvements in its methods; (3) we owe to him the formation of an elementary teacher's profession, the members of which do their work with devotion, being active not only in the welfare of their own profession, but also in the progress of their professional science. Pestalozzi, who was still under the potent influence of the era of enlightenment, directed all his thoughts and emotions toward educating and elevating the people mentally and ethically to a higher level of civilization and culture. "I saw your tears," he wrote to a friend who was the witness of his first trials in teaching, "and in my bosom there surged up a rage against the man who said that the ennobling of the people is only a dream. No; it is not a dream. I will give the art of ennobling into the hands of the mothers, into the hands of the children, into the hands of innocence, and the evil ones will cease saying it is a dream." But the public education he meant was not intended to be the customary education which consisted in reading, writing, arithmetic, and perhaps a little knowledge of nature, and which had been offered because it was necessary in common life, but it was to have the high aim to develop the mental and moral faculties of the pupils and to awaken even in the poorest child a noble sense of humanity. A minute methodical treatment of elementary branches through Pestalozzi and his successors resulted from this principle. And lastly, it may be said the activity of a profession of elementary school-teachers is recognizable everywhere in the entire history of the public school of the nineteenth century.

That State which at the beginning of the century made the nearest approach to the pedagogy of Pestalozzi was Prussia, which, after the disaster of 1806 (Napoleon's victory at Jena), saw in Pestalozzi's ideal one of the means to reestablish the State. Men like Fichte and Stein called attention to the new method of education, and expected from it a renovation of the entire public life. Young teachers were sent to Pestalozzi to learn his manner of teaching by personal observation, and they became eager to transplant it into Prussia. Soon astonishing activity was displayed on the part of the Government, as well as by professional men of all kinds, in behalf of the schools. With the reaction, however, which set in in all political affairs after the war of liberation, the Government withdrew from this activity before the spontaneous impetus of public spirit; but it continued to care for the increase and better material foundations of the school system. While thus the Government withdrew from influencing the inner working of the schools after having engrafted upon it the spirit and methods of Father Pestalozzi, the teachers personally devoted themselves zealously to the further development and improvement of his methods in theory and practice. A vivid description of this epoch, in which the schools were free on the one hand from politics, and on the other hand from minute official regulations, is given by Kellner in the first part of his

"Lebensblätter" (Freiburg, 1892). The most prominent representative of the elementary school system during this epoch was Adolf Diesterweg, from 1832 to 1847 director (principal) of the newly established normal school for city teachers in Berlin. But after 1840 the State authorities began to take energetic measures for the purpose of counteracting enlightening tendencies in normal and elementary schools. A suitable pretext to this was given by an undue exaggeration of the objects of public instruction in normal and lower schools which had taken place in some institutions. These attempts on the part of the Government were soon considerably increased when it was found that some teachers had taken part in the oppositional movements of the year 1848.[1] The reaction following that eventful year turned also against the public school. Instruction in normal and lower schools was to be reduced "to that simplicity which is required by actual conditions." This intention was plainly expressed in the well-known regulations of Stiehl of 1854. In these governmental regulations the education offered in the ungraded school of rural districts was made the standard for the whole system of elementary schools. Religious instruction was made the center of the daily programme and the core of the entire course; so-called realistic or secular knowledge was greatly restricted to the bare elements, and even for religious instruction the memoriter practice was prescribed as the mode of procedure to be followed.

Similar counter movements and reactions took place at various times in other German States. In Bavaria a reorganization of the public schools began with the year 1802. The compulsory feature of elementary education was made more severe, school discipline was regulated by law, and a course of study was elaborated which showed the deep influence of Pestalozzi's pedagogy, but which for this very reason was not free from extravagant demands. A restricting revision of the course was deemed necessary as early as 1811. Toward the end of the third decade a complete reaction set in under the ministry of Abel. A strictly religious character was made the end and aim of the public school, and this tendency prevailed till the end of the fifth decade. In Würtemberg, which had been a purely Protestant State up to the beginning of the nineteenth century, the necessity of reorganizing the public-school system came with the immigration of new citizens belonging to other confessions. A decree for Catholic schools was issued in 1808, a new decree for Protestant schools in 1810, and in the following year the first public normal school for the preparation of elementary teachers was opened. Both school laws rested upon Pestalozzi's principles and practice. Of course this potent influence was banished from the schools by the Government after a few years, probably because it acted in the beginning more destructively than constructively. However, to some extent Pestalozzi's influence remained active among the teachers for many years. In 1836 a school law for elementary schools was

[1] The so-called revolution of 1848, which resulted in changing the form of government from an absolute to a constitutional monarchy.

issued, which has remained to this day the basis of the Würtemberg public-school system. The laws of other States are dated as follows: Nassau, 1817; Weimar, 1821, 1822; Baden, 1834; Saxony, 1835.

(7) *Later developments of the public schools.*—Since the sixth decade a counter movement of great strength has followed upon the preceding reaction, at first during the ministry of von Bethmann-Hollweg (1858–1862). In the course of study of the elementary schools the realistic branches[1] were strengthened by allowing them more time; the memoriter work in religion was diminished; the professional preparation of the teachers assumed a more liberal character—for instance, by admitting German literature in the normal schools, a branch which had been excluded by the regulations of the former period. With this step there began a gradual revision of the former rules by practice—that is to say, the teachers themselves went beyond the restrictive regulations. This had been going on for some years when a reorganization was undertaken with great vigor by the minister of education, Mr. Falk (1872–1879). In 1872 a law defining school supervision was prepared and passed by the diet (legislature). Upon the authority granted him by the law, he issued his "general regulations," which gave to the elementary schools, both lower and advanced, a modernized course of study; the professional education of teachers in preparatory and normal schools was greatly improved by the new decree, also the examination system belonging to it. The motive which dictated the law of school supervision was, as is well understood, to strengthen the hands of the Government in its struggle with the Catholic hierarchy, which was then prominent before the public. The law affirmed again the sovereign right of the State over the whole school system, including the elementary or people's schools. The general civil law of 1794 had already declared the principle of the State's sovereignty over the schools, but the supervision of elementary schools until 1872 had been left to the church. Now, it was by law claimed by the functionaries of the State, and only in exceptional cases were ecclesiastical inspectors retained, but with the understanding that they were acting under orders of the State. In practice clergymen have been acting as school inspectors even since the passage of the new law, but since then the State has gradually increased the number of local secular school inspectors, especially in the eastern and western frontier provinces; these men act as professional supervisors and superintendents, and report to superior State authorities. The renewed claims upon supervision by the State became especially important in regard to religious instruction, for the Falk law denied the interpretation of the former custom, according to which the teacher of religion received his authority from the church and was ultimately responsible to it. With reference to the denominational character of the schools which had hitherto been

[1] The German term is "Realien," in contradistinction to formal studies, such as reading, writing, spelling, grammar. The Realien are geography, history, nature study (both natural history and natural science).

retained, a change was made, to wit, the so-called simultaneous schools[1] were admitted wherever it was commendable to have combined instead of separate schools. The purpose was to facilitate the organization and management of schools. The new course of study greatly restricted memoriter work in religious instruction and suggested in its place emotional assimilation of religious matter. Nature study was greatly emphasized in the new course and provided with a larger number of hours per week. Furthermore, in this period (the Falk era) the material basis of the schools was improved by larger annual appropriations, by raising the teachers' salaries, increasing the number of schools and class rooms, by granting more liberal equipment with means of instruction, and other measures.

The ministry of Gossler (1881–1891) generally adhered to the principles of the administration of Falk, but in the proposed school law which Minister von Zedlitz prepared and presented to the house of deputies a decisive retrograde step was noticeable. The religious denominational character of the lower schools was again recognized in this bill; instruction in religion was placed in the center of the teacher's work. The motive of this bill was the endeavor to equip the schools with means for the struggle of the State with social democracy. The excitement which Zedlitz's project produced in Prussia as well as in other German States is not yet forgotten. In parliamentary as well as in other public discussions decided disinclination of educated people against the principles underlying the bill was manifested. It was urged that the public school had purposes outside of religious and moral education, namely, the imparting of a considerable amount of realistic knowledge for theoretical and practical purposes, and furthermore, that as contrasted with unnecessary separation along the line of religious confession the homogeneity of all citizens in a national and civil respect should be emphasized. The purely ecclesiastical and the conservative parties in the house of deputies saw in the bill the best expression of their wishes and opinions. The Government withdrew the bill, although it is alleged that its passage seemed secured by a sufficient number of votes. Up to the present time no law for elementary schools has been passed in Prussia, and under prevailing circumstances will not be passed in the near future, much less a general school law, though the Government has tried to frame such a law ever since the beginning of the century and the constitution adopted in 1850 specifically prescribed it. It seems the prevailing view that neither the one nor the other law will be passed if submitted to the legislature. Hence it has been thought best, for the purpose of avoiding violent clashing of opposing views, to restrict the action of the Government to providing better financial support of the schools and thus improving them.

Similar struggles agitated other German States at an earlier date.

[1] Schools attended "simultaneously" by Protestant and Catholic children.

In Baden, for instance, in 1860, a law was passed concerning the relation of the church to the state, which law affirmed the general principle with regard to the schools, namely that the management of the schools was a function of the state. Religious education might be conducted and inspected by the church authorities, but "without prejudice of the uniform state authority over institutions for instruction and education." A secular central authority was established in 1861 in the supreme school council. The real struggle began when in 1864, by a special decree, state inspectors were appointed for public elementary schools. The presidents of local school boards, who were the superintendents or inspectors by ancient custom, were to be appointed by the Government; clergymen ordinarily, as heretofore, might be chosen for that office, but the law acknowledged no obligation for such a choice. District (county) school commissioners, as State officials, Catholic and Protestant, were also appointed. The Catholic hierarchy opposed these appointments vigorously by refusing all assistance in school matters, and by breaking off all communication with the Government. The Protestant clergy likewise showed discontent with the provisions of the new law. The struggle was interrupted by the events of the war of 1866, and afterwards was concluded by a compromise in form of a new law (1868) which in some points yielded to the demands of the clergy. In Bavaria, from the beginning of the sixth decade, the desire for a school law was strongly felt, and attempts were made to meet the wishes of the people. As a first step to this end may be considered the passage of a teachers' salary law, dated 1861. A bill for a school law dated 1867 produced much agitation all over the State. The cause was here as elsewhere the proposed separation of the school from the church. A compromise between the two chambers of the diet was not accomplished. In place of a law, the minister of education, von Lutz, during the seventh decade, introduced by decree some of the modern features of organization and management into the public-school system. Thus, for instance, secular was acknowledged side by side with ecclesiastical inspection, and the mixed school (containing both Catholic and Protestant children) was declared permissible. Other States also regulated their school system during the second part of the century upon a modern basis. Thus Würtemberg did so by the many additions to the law of 1836 (mentioned before), which additions were all decreed since 1858. A model course of study for ungraded schools was issued in 1870. In Saxony, in 1873, the public-school law of 1835 was replaced by a new one; the normal-school system was regulated and given an official course of study. In the duchy of Gotha a school law was passed in 1863 and revised in 1872.

Also in Austria considerable changes occurred during this century in the field of public education. After the passage of the "Political constitution of the German public schools" of 1805, which was an expression of retrogressive conservatism, the schools remained for over

forty years upon a low plane of development, partly in consequence of this law, partly because of the general stagnation under the domination of Metternich. Only since the revolution of 1848, which put an end to the régime of Metternich, the State again turned its attention to public education. A new and powerful impetus was given the improvement of the schools by the disasters of the year 1866,[1] which led to the passage of a liberal imperial public-school law in 1869 applicable to all the crown lands of Cisleithania.

(8) *Future prospects.*—The history of the German school system can look back upon a long development. It shows that the school has ever been closely connected with the most important interests of the German people and always nearly related to everything that has deeply agitated the people. It is obvious that the present time is anything but a time of satisfied reposing in a position reached after long struggles; in many respects it is a time of investigation and transition. In the foregoing pages it has been the object to indicate this.

In the secondary schools (formerly represented exclusively by the gymnasium or classical school, now by a variety of school forms) modern education will not cease to claim equality with the classical; the future perhaps will have to decide whether it deserves equality with classical education. Of course, with reference to the separation of higher professions into learned and technical, it will have to be determined how far preparatory education and school organization must provide for them. At present this is an open question in Germany. The lower high schools, so-called burgher schools, justly demand more attention and better development of their own character. The elementary school will need an undisturbed growth and continuous development in future, and will need to keep in contact with the entire intellectual life of the nation, especially in regard to the matter of instruction. Even the universities can not decline to listen to the demands for improvement in their methods of teaching. Other questions will arise in future. A new social order and new transformations of science will not fail to demand the establishment of new forms of institutions and give the system new matter of instruction.

Those now living may desire that in the new much of the old may be preserved which has proved of benefit. In the university the liberty of teaching and learning, and the strictly scientific character of all that is taught; in the various kinds of secondary schools an education toward severe and, at the same time, free intellectual labor; in the burgher schools the endeavor to offer a rounded and well-grounded practical education, and in the elementary schools the aspiration to perform the noble civilizing task claimed for it, as far as the energy of society and the state will admit.

[1] War with Prussia.

CHAPTER II.

SUMMER SCHOOLS IN ENGLAND, SCOTLAND, FRANCE, AND SWITZERLAND.

By Herbert B. Adams, Ph. D.

Contents. I. *The National Home Reading Union—Summer meeting at Chester.*—Chautauqua in England; the summer assembly; summer excursions; summer lectures.

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THE NATIONAL HOME READING UNION AND A SUMMER MEETING AT CHESTER.

In May, 1887, appeared in the Contemporary Review an interesting article entitled "Chautauqua—A popular university." It was written by Dr. John H. Vincent (now Bishop Vincent), one of the two founders of that great educational organization which takes its Indian name from a lovely lake in southwestern New York, where summer meetings are still held. The article was due to a suggestion of the Rev. Dr. J. B. Paton, of Nottingham, a friend of Dr. Vincent and a strong believer in popular education. For the first time many Englishmen learned of the existence of the so-called "Chautauqua Literary and Scientific Circle," which offers a systematic course of reading in history, literature, science, art, and religion. It was stated that the membership included more than one hundred thousand persons and extended not only through the United States and Canada, but reached even Europe, India, China, South Africa, and the isles of the sea. Dr. Vincent described the beneficial influences of a well-planned course of good reading, occupying a period of four years and supplemented by special reading courses of various kinds. He pictured the gathering of the people, "probably seventy-five thousand different persons during the summer," to hear lectures on science, history, and philosophy, to enjoy concerts and other pleasant recreations in that wonderful academic grove on the shore of Lake Chautauqua.[1]

Dr. Vincent concluded his descriptive and inspiring article with these prophetic

[1] For a full account of "Chautauqua," see monograph by H. B. Adams in Report of Commissioner of Education for 1894–95, vol. 1, p. 977.

words: "Whether or not a similar movement may be begun in England I do not know. All that is best in its educational features is already carried on under the 'University Extension Movement' and other noble enterprises of this great English people. The summer gathering like that at Chautauqua may be impracticable in the moist and uncertain climate of the British Isles; but in imagination I have already seen old Haddon Hall[1] aglow with torches and hearth fires, its empty chambers for a time again occupied, its great dining hall echoing with song and speech and prayer, its green lawns filled with people who have come from the busy scenes to rest and recreate, and the meanwhile to enjoy instruction and to receive inspiration from those who are able to give it, and whom but for some such unique and special occasion they might never have seen. In my dreams I have seen what good work for the homes and the schools and the homeless and the out-of-school multitudes of England might be accomplished by noble lords and men of princely fortune, whose ample palaces and gardens seem to have been waiting these many years for a use and service which would make them pleasant and goodly places in the eyes of the Lord who loveth the children of men, and who loveth them also and especially who love and help their kind. But then, these are only the dreams of 'A stranger and a foreigner.'"[2]

Chautauqua in England.—Dr. Vincent's article and Dr. Paton's enthusiastic initiative led, in July, 1887, to the foundation in London of the National Home Reading Union, which in its aims, management, methods, and summer meetings has consciously or unconsciously reproduced many of the best features of the original Chautauqua. Both of these educational societies attempt to guide readers of all ages in the choice of books. Both seek to enroll members in a great reading association or guild. Both group their members, wherever it is possible, into local reading circles for mutual help under class leadership. Both enjoy the advice and cooperation of educational experts, college and university men, bishops and other clergy, in the selection of good literature and in the shaping of courses. Both publish an educational magazine for the practical direction of the work. Both have to some extent their own special editions of text-books and reading matter. Both issue syllabi and bibliographies on a great variety of special subjects, and both have succeeded in placing their best students under the personal direction of good teachers.

For many years in America, college professors and college presidents have ministered to the needs of Chautauqua. From the beginning Oxford and Cambridge men have guided the National Home Reading Union. The energetic organizer of the great and growing University of Chicago has served also as the principal of the Chautauqua system of popular education. Dr. Percival, formerly headmaster of Rugby and now the lord bishop of Hereford, is to-day the chairman of the council, and Dr. Hill, master of Downing College, Cambridge, is chairman of the executive committee of the English Chautauqua. On a recent "Recognition day," or Chautauqua commencement, August 19, 1896, President Eliot, of Harvard University, gave

[1] Haddon Hall is an old English baronial mansion, the seat of successive English families, the Avenells, the Vernons, and the Rutlands. The house overlooks the Wye in Derbyshire. Various styles of architecture from the Norman to the Mid Renaissance are embodied in Haddon Hall. Sir Walter Scott refers to it in his "Peveril of the Peak."

[2] Bishop Vincent's dream regarding the popular use of some of the old "halls" of England is not altogether visionary. The city of Birmingham long ago, aided by workingmen and other benefactors, purchased "Aston Hall," a fine old mansion of the Jacobean period, and converted it into a free public museum and art gallery. This stately hall, built by Sir Thomas Holte, contains more than a hundred apartments. Among the finest rooms are the splendid entrance hall, the chapel, the great drawing room, and the magnificent "Gallery of presence," said to be the finest in England with the exception of Hardwicke and Hatfield. Aston Hall is open to the public every week day from 10 a. m. till dark, and on Sundays from 2 to 5 p. m. Street cars run frequently to Aston Hall. The park of fifty-five acres attracts crowds of Birmingham people every afternoon. There are beautiful flower gardens and a bowling green. In front of the hall is the old plaisance and toward the sunset are sloping terraces still attractive to the eye. For the children and working people of Birmingham the park is truly a paradise.

the address[1] to the graduating class amid assembled thousands of enthusiastic Chautauquans. A corresponding English event occurred at Chester, June 29, 1896, on the occasion of the eighth annual assembly of the National Home Reading Union, when the bishop of Peterborough, Dr. Creighton, formerly professor of ecclesiastical history in the University of Cambridge, discoursed on "The moral aspect of history," and agreed with Napoleon's definition of civilization, that it consists partly in material, partly in intellectual, but chiefly in moral progress. Thus, from various examples in two English-speaking countries, we notice that representative men in church and university are lending their aid to these great modern movements for the higher education of the people.

There are certain features in the English system of home reading which deserve mention: (1) The preference shown by the management for standard and long-approved literature; (2) extensive use of popular and cheap editions of good books; (3) excellent bibliographies, or book lists, on a great variety of historical and literary subjects; (4) circulation of portfolios of prints, photographs, and other illustrative material for quickening the interest of local reading circles; (5) employment of printed syllabi or suggestive outlines prepared by university men for the helpful guidance of class leaders and local reading circles; (6) examination papers for testing home reading; (7) encouragement of local lectures, or university extension courses, in connection with local reading circles; (8) summer meetings in academic centers like Oxford or places of historical interest like the cathedral towns of Salisbury and Chester; (9) summer holidays by the seaside or in the lake district or in Scotland, for groups of fifty or sixty persons, a week at a time, from the last of May to the 1st of October, under the leadership of university men or well-known representatives of the Home-Reading Union; (10) utilization of the best directive, social, educational, religious, and scientific forces in the realm, and of the most interesting historical and natural environments.

Old Chester.—At the summer meeting in Chester it was most instructive to observe how local, archæological, architectural, and regional interests were all combined to make a national assembly of English people a pronounced success. The city itself is most interesting and picturesque. Chester is the municipal development of an old Roman camp or castra, where altars and inscriptions belonging to the Twentieth Legion may still be seen in the Grosvenor Museum. The very streets and walls of the city are of Roman origin. Underneath the quaint, mediæval rows of shops and arcades one may find the remains of Roman baths and ancient pottery. From the walls of Chester one may look down upon Roman pillars and sculptured stones. The walls afford a noble view of the grand old cathredal and its burying ground, as old at least as the Abbey of St. Werburgh, founded in 660 A. D. She was the daughter of a king of Mercia. Not far away are the ruins of a still older cathedral, St. John's, one of the earliest stone churches in England. There in the distance flows the winding Dee, between which and the river Wye is still traced Offa's Dyle, which no Welshman was supposed to cross. The Dee Bridge was built two centuries before Columbus and the Cabots sailed. Yonder, beyond Hawarden Castle, is the blue range of Welsh hills, from which the ancient Britons repeatedly made tribal forays against Roman, Saxon, and Norman invaders. The Dee Bridge is contemporary with the final conquest of Wales and the first prince of that name. Viewing the borderland from the walls of Chester, one realizes the strategic importance of that old Roman camp and Norman citadel.

Chester is a city of historic contrasts. Ships laden with supplies from Rome once

[1] This Chautauqua address on "Five American contributions to civilization," by President Charles W. Eliot, was published in the Atlantic Monthly, October, 1896. The five contributions are: (1) The substitution of discussion and arbitration for war. (2) Acceptance in theory and practice of the widest religious toleration. (3) The safe development of manhood suffrage (4) The welcoming of newcomers to political freedom. (5) The diffusion of well-being among the people. This address has since been published in a volume of educational papers by President Eliot, entitled American Contributions to Civilization.

sailed up the river Dee to the very walls of Chester. Now the old Roman harbor is a beautiful green meadow, called the "Rood Eye," or Island of the Cross. From a grand stand upon the Roman wall the Chester populace can look down upon a modern English race course, the Campus Martius of the Cheshire militia.

But the contrast which pleased me most was the conspicuous notice of the summer meeting of the National Home Reading Union posted by ecclesiastical authority upon the cloister walls of the cathedral. Within those sacred precincts, which once sheltered a band of Benedictine monks and still earlier a convent of nuns, upon the wall opposite the garth where Dean Howison and his daughter lie buried, was a printed announcement of the various lectures and excursions from June 27 to July 6, 1896. From that Norman wall, built long before America was discovered, I copied with great delight into my notebook the chief features of that popular educational programme.

It interested me afterwards to find that most of the lectures were given in an old ecclesiastical building once known as St. Nicholas's Chapel, now the Music Hall, close by the cathedral, where the curfew still rings every night at 9 o'clock, an historic reminder of old Norman dominion over Welsh and Saxon. Some of the peripatetic talks on architecture were given in the cathedral itself to classes of convenient size by archæological experts, Mr. D. H. S. Cranage, of Cambridge, and Mr. W. H. St. John Hope, of the Royal Archæological Institute. The chapter house, the old refectory, the cathedral aisles, and the Lady Chapel were all opened to educational visitations. It was pleasant there to have pointed to you in the cloisters not only monastic stalls for study and writing, but upon the stone seats the holes for "nine men morris" and "fox and geese," which sinless games the choir boys or less pious monks sometimes played when not under observation.

The cathedral itself is a wonderful object lesson in the varying styles of architecture, from the Norman and Early English to the Early Decorated and Perpendicular. Within that noble edifice were given instructive talks and frequent organ recitals. One evening Dr. J. C. Bridge, the organist of the cathedral, gave in Music Hall a lecture on "Samuel Pepys and his music" and, aided by choir boys and musicians, illustrated this subject by vocal and instrumental means. The bishop of Chester and the dean and canons of the cathedral were present at various lectures and did all in their power to make the summer meeting in an historic diocese enjoyable as well as educational. The clergy themselves doubtless profited by hearing a most instructive lecture by Mr. St. John Hope on "The plans and arrangements of mediæval monasteries." The subject was well illustrated by original diagrams and solved in a simple way many historical and architectural problems. He derived the mediæval monastery from the Roman house, and attributed the origin of the college dormitory to the monastic "infirmary," originally a large and comfortable common hall finally cut up for greater peace and comfort into separate rooms or studies.

The summer assembly.—The town hall of Chester afforded headquarters and reception rooms for the summer assembly. The mayor of the city was the chairman of the local committee, which included nearly 100 of the leading citizens. Mr. R. A. Yerburgh, member of Parliament for Chester, and Mrs. Yerburgh graciously received the 400 or more guests in the mayor's parlor. The company gradually divided through the various rooms of the town hall, which had been tastefully decorated. Simultaneous entertainments, musical and scientific, were in progress in various parts of the building. It was all done by the authority and at the expense of the corporation. Americans should take pains to visit some of the better town halls of Great Britain, for example, Glasgow, Manchester, and Birmingham, and see what people's palaces those self-governing, self-respecting cities rear for their own use and benefit, and how well the mayor's parlor and the town council rooms lend themselves to social functions when public interest requires it.

Mr. Yerburgh is an Oxford graduate and the vice-chairman of the council of the National Home-Reading Union. He presided at the public conference on "The

benefits of reading and how to diffuse them." He said the object of the union was to develop a true taste for reading and to check the growing fondness for the "Shilling shocker" and the "Penny dreadful." He quoted Milton as saying, "A good book is the precious life blood of a master spirit embalmed and treasured up on purpose to a life beyond life." Mr. Yerburgh gave some interesting facts showing the increasing popularity of the movement for encouraging home reading. He said that during the last season no fewer than 8,210 readers had been enrolled, and that since 1889 as many as 27,464 persons had been in the union. It had members not only in Great Britain and Ireland, but in Egypt, Turkey, Japan, Switzerland, Germany, the Channel Islands, France, Belgium, Madeira, South Africa, and Palestine. In the light of events in the Transvaal, Mr. Yerburgh thought the English public might like to know that the Home-Reading Union had a local center at Johannesburg.

Dr. J. B. Paton, the honorary secretary of the union, said there was a sister society in Australia numbering 3,000 members. He deplored the fact that the pupils of the board schools of England, after being taught to read, were thrust out at an early age and left to devour literary garbage. He advocated closer connection between the Home-Reading Union and the national system of schools. He said Sir John Gorst, of the education department, and Her Majesty's inspectors had been urged to open all the common schools in England for evening recreative classes in good reading for the benefit of ex-pupils.

Miss Montgomery, honorary secretary of the Technical and University Extension College in Exeter, gave an admirable extempore talk upon the benefits of good reading (1) as a mental discipline, (2) as a means of positive knowledge, and (3) as a delightful recreation. She made an earnest plea for a little serious reading every day. She thought this would train the judgment, quicken imagination and sympathy, and expand the mental horizon.

An American visitor, present by invitation, was called upon for his views, and said Miss Montgomery had alluded to the lack of intelligent sympathy between England and America in the time of George III. He admitted that there had been a little misunderstanding between the nations about that time. In fact, there had been one or two misunderstandings between governments since that date; but, whatever the varying views of English and American cabinets about the territorial interests of others, there is to-day no lack of sympathy and appreciation between the people of the two countries. They are always borrowing things from one another. Dr. Paton and the Chester Summer Assembly had borrowed Chautauqua ideas, but America is now introducing the methods of English university extension and even borrowing English lecturers. The Home-Reading Union had improved in some respects upon the American system; the chosen literature is better and cheaper; more use is made of cheap reprints of standard authors. The English work is more truly national. The idea of encouraging good reading in connection with evening continuation schools is very noble. It is impossible in America to hold a summer meeting in such an interesting historical environment as Chester or Oxford; but there is fine scenery at Chautauqua, Plattsburg, and Niagara Falls. The English plan of cooperative summer holidays at the seaside or in lake and mountain districts might easily be introduced. The Young Men's Christian associations in America are already doing something in this direction. The educational work of these American Christian associations is, on the whole, better than corresponding work in England, although there is still much to be desired in the way of systematic teaching and continuity of classes.

Summer excursions.—One of the most enjoyable excursions from Chester was on Saturday, the 4th of July, to Llangollen and the abbey of Valle-Crucis, the finest architectural ruin in North Wales. There, within ivy-covered chapel walls, under the open sky, on grassy ground, assembled a pleasant company of young people from various parts of England to listen to an instructive talk on Cistercian architecture by the clever and lucid St. John Hope. He stood upon a block of masonry, with his

Derby hat on, and talked simply and naturally, without a trace of pedantry, concerning the characteristic features of the building and of Cistercian life and religious worship. Afterwards he led his faithful followers through the ruined monastery, from chapel and chapter house to refectory and dormitory. Then the little company returned through green fields where sheep were grazing and soldiers were camping out. Through turnstiles and country lanes, along hedgerows and the banks of a quiet stream the young folk of England wandered. They visited a hillside park belonging to a country gentleman. Picturesque beyond description was the return to the village of Llangollen in a fleet of boats moving slowly along an old canal on the hillside above the river valley. Through the trees were ever-changing outlooks over field and meadow. At one point four historic ways of travel came close together—the river, the canal, the highway, and the railway.

At Llangollen before taking the train we all took tea. We had already lunched there in the morning after seeing "Castell Dinas Bran" and the curious Welsh museum which now fills the quaint, old-fashioned country house called "Plas-newydd," once occupied by Lady Eleanor Butler and Miss Sarah Ponsonby, two gentle maids who ran away from matrimony and the world and settled in Llangollen. They are buried now in the parish churchyard, and the last thing that some of our company did in that little Welsh village was to buy the picture of those charming old ladies who had the educated sense to put this among other mottoes upon their walls: "There is no darkness but ignorance." So delightful was that summer day in North Wales that an American citizen forgot it was Independence Day until he was reminded of the fact by a Chester geologist, who presented him with a fossil dug up from carboniferous limestone at Llangollen and labeled "July 4."

Excursions were also made to that old border fortress, Hawarden Castle, where an American visitor saw the "Grand Old Man" driving in the park with his wife. Mrs. Gladstone's orphan boys were playing cricket on the lawn, while a group of aged women, also dependent upon Mrs. Gladstone's bounty, sat under the shade of ancient trees. The boys live in an old manor house and the women in an old brewery close by. Mr. Gladstone did not live in the ruined castle, but in an eighteenth century country house. The old castle was built by the Normans soon after the conquest of Chester on the site of an earlier British hill fort. An interesting description of the ruin was given us by Mr. Henry Taylor, F. S. A. The parish church (built about 1275) and churchyard and the village library at Hawarden are well worth visiting. Li Hung Chang's call upon Gladstone at Hawarden afforded the unique opportunity to a Chester artist of photographing the two grand old statesmen side by side.

Mr. Gladstone's son, the Rt. Hon. H. J. Gladstone, is now a member of Parliament and one of the vice-presidents of the Eighth Summer Assembly of the National Home-Reading Union. Mr. Gladstone's younger son, the Rev. S. E. Gladstone, besides the parish church has five other churches and school chapels in his charge and is aided by six curates. The popular village and church festivals held in the great park at Hawarden impress the beholder with the social utility of these great landed estates. In his retirement from public life Mr. Gladstone was still doing great things for popular education. Witness his local addresses and his writings for newspapers and magazines, in the summer of 1896.

At Eaton Hall, the country seat of the Duke of Westminster, the visitor was courteously shown out of marble halls through the front door after seeing the family chapel and the magnificent suite of frescoed rooms. It was pleasant to sit down under a great tree in that noble park.

The Duke of Westminster is the patron of all honest efforts for the public good. He gives all the shilling fees paid by visitors to Eaton Hall to the Chester Infirmary, and raises the annual subscription to the fixed sum of $2,500. He was president of the eighth summer assembly and allowed all the home readers to visit his hall and gardens free of expense. The company afterwards walked through the beauti-

ful park to the river Dee and the iron bridge, and there took tea in a restaurant on the bank. Down the river, nearer Chester, is another charming restaurant, at Eccleston Ferry, once popularly known as "Jimmy the Boats." Here tea and nice suppers are served for parties, small or great. The duke allows no intoxicating liquors to be sold upon his estates; consequently, these river restaurants are highly respectable. It is pleasant to see the great number of people from Chester and from the whole country round coming in rowboats or steam launches to these picturesque resorts on the river Dee. They visit Eaton Hall and gardens, stroll through the park, take supper at the bridge or at Eccleston Ferry. Children and young folk dance on the smooth grassy banks of the river and then row back to Chester, singing well-known songs. Next to a walk around the walls of Chester there is nothing so fine as a walk or a boating party up the winding Dee. On one side are groves of lime trees and overhanging woods; on the other, green meadows and distant parish churches. No wonder that Charles Kingsley and Thomas Hughes were so fond of Chester. The Romans must have built villas on that lovely stream, as the English are doing to-day. What strange events the shores of this little river Dee have witnessed! Think of the massacre of the monks of Bangor, 1,200 of them, at the old Roman ford, by Ethelfrid, the Saxon, because they had come out from North Wales to pray for the success of British arms. Picture Edgar in his royal barge with six subject British kings rowing him up and down the river in front of St. John's Church and the "Groves" for a public spectacle. Edgar must have felt, on this occasion, something of that supreme satisfaction which Adonibezek once enjoyed when three score and ten kings, having their thumbs and their great toes cut off, gathered their meat under his royal table (Judges i, 7).

Summer lectures.—The summer meeting at Chester was not altogether "education by picnic." Almost every day for a week there were morning and evening lectures in Music Hall. Some of the lectures were designed to form a continuation of the studies which had been already pursued at home by the members of the reading union. English history was illustrated by suggestive talks on Sir Robert Walpole, the younger Pitt, and George Washington. Professor Lawrence, formerly of the Chicago University, now rector of the parish of Girton, treated the Father of our Country as a typical Englishman of the eighteenth century.

English literature was represented by lectures on Milton, George Eliot, and Matthew Arnold. A most interesting and novel lecture was that on "Cotton and the cotton industry," by H. Yule Oldham, M. A., lecturer on geography in the University of Cambridge, who showed the world-historic significance of this subject and illustrated it by maps and lantern views. Mr. Oldham has a similar lecture on "Coal." In no way can the new geography be better presented than in connection with economic history.

Natural science, particularly of the Chester district, was happily taught to young people by Professor Marr, of the University of Cambridge, who lectured on "Geology" and conducted geological expeditions; also by G. F. Scott Elliot, who described the botany of the district, and by Dr. C. W. Kimmins, who talked most delightfully to children on "Flowers and their insect visitors." An enjoyable lecture on "Japan and the Japanese," by the Rev. Walter Weston, was illustrated by lantern slides made by Japanese artists. On the whole, the best educational features of the Chester meeting were the lectures on "Architecture" and the visits to Chester Cathedral and Valle-Crucis Abbey.

There was sufficient variety and recreation in the proceedings to make the assembly at Chester well suited to different tastes and really refreshing to both teachers and students. It is a serious mistake in summer weather for people to take too much intellectual food. Many will profit more by outdoor excursions, by walks and talks in regions of scientific or historical interest. For this reason most stress is laid in this review of the Chester summer meeting upon the object lessons of that wonderful environment. It would be an educational delight for any overworked American professor or teacher to spend his summer vacation in Old World centers of historic

interest and natural beauty. A fortnight at Chester is not too long for a person who likes to combine in a leisurely way summer reading with pleasant excursions to places worth the seeing. Most Americans try to take in Chester, with its two thousand years of history, in a single day or a few hours.

In Watergate street, Chester, there is a quaint old-fashioned timbered house bearing this pious inscription: "God's providence is mine inheritance." Something of the spirit of this house motto comes over the American traveler as he views and reviews the ancient monuments, the mediæval walls, churches, abbeys, and cathedrals of England. He rejoices over their preservation through all the storms of war and the devastations of time. Spared to the modern beholder by the divine providence of history, they seem to belong to the living age, and to be as truly the inheritance of appreciative Americans as they are of conservative Englishmen. It was a source of great gratification to an American sojourning in Chester to hear on every hand most grateful expressions by our English kinsmen for what Americans had done to aid the late Dean Howison in his extensive restoration of that ancient cathedral, now the sacred and common inheritance of the English-speaking world.

A SUMMER MEETING IN CAMBRIDGE.

It is now an established custom for one of the two great English universities to become a summer rendezvous for extension students. Oxford has been the center for seven seasons; Cambridge for five. In order to concentrate interest and economize effort the two universities have arranged to hold alternately the summer meeting. It was Cambridge's turn in 1895 to keep open house for visitors, but in midsummer of that year the city streets were torn up for the purpose of introducing a new system of sewers, and so Oxford obligingly took the responsibility of entertaining the summer school. In 1896 Cambridge was in good order and hospitably disposed.

The summer session of 1896 opened Thursday evening, July 30, and lasted until Saturday, August 22. In the absence of the vice-chancellor, the master of Trinity College, Dr. Butler, gave the address of welcome and the opening lecture. He said the university would feel a great pleasure and pride in placing at the service of the visitors any and all of those Cambridge institutions, the oldest and youngest, that conduced to study, and also, if the visitors would condescend to accept them, those that conduced to something less austere than study. He cautioned the students against flitting about from lecture to lecture, from literature to science, and to all parts of the intellectual garden, lest they get somewhat confused, not to say inebriated, by the variety of honey they would gather. He recommended a wise limitation to a small number of serious subjects.

Dr. Butler's own lecture was upon the subject of "William Pitt the younger." The master of Trinity said his object was to create an interest in a great man. There were some great men whose acquaintances in history we could not make unless we were first introduced to their fathers. William Pitt the younger without William Pitt the elder—in a word, Pitt without Chatham—was an incalculable quantity, like America without a previous England, or university extension without a previous university. Pitt the elder, the great commoner, was the first Englishman of his time, and he made England the first country in the world. He selected those great commanders—Generals Amherst and Wolfe—who won America from France. On the 28th of May, 1759—the year when Wolfe captured Quebec—the younger Pitt was born. Many of his father's finest qualities came to the second Pitt by inheritance. The boy was delicate and was never sent away to a public school, but he came to Pembroke College, Cambridge, at the age of 14.

After the lecture the master of Trinity gave a reception at Trinity Lodge and showed his guests the original letter written by Chatham to Mr. Turner, a tutor of Pembroke, when the boy entered that college. The younger Pitt studied at Cambridge not less than seven years. He entered the House of Commons before he was 22 years of age, and two years later—February 23, 1783—made that speech which

Lord Stanhope said was the greatest piece of oratory delivered, either in ancient or modern times, by any man under 25. At that age the younger Pitt became prime minister. Almost alone he led his country through the crisis which followed the war with America. In later life he was the great antagonist of Napoleon. When called "the saviour of Europe," he said England had saved herself by her exertions and would save Europe by her example. Pitt died January 23, 1806. For over twenty years he was the chosen member of Parliament from the University of Cambridge. To an American visitor this introductory lecture by the master of Trinity was a noble historic illustration of a Cambridge scholar in politics. This example will, perhaps, suffice to show what English university training has done in the past.

Historic associations.—It was a pleasant experience for American students to walk daily for three weeks past Pembroke College and its beautiful gardens, where William Pitt studied for seven years before entering public life. Not far away, upon Sidney street, on the site of an old Franciscan monastery, stands Sidney Sussex College, where Oliver Cromwell entered as fellow commoner, April 23, 1616, the very day of Shakespeare's death. It brings the beholder very near to the great protector of England to see the room which he is said to have occupied, and to look upon his portrait in the dining hall of the college. Oliver was not quite 17 years old when he entered Sidney Sussex, and on account of his father's death he left without taking his degree; but he always cherished a deep affection for his alma mater. He became a freeman of the town of Cambridge and represented it in Parliament. He was elected high steward of Cambridge in 1652, and held that honorable office, along with the Protectorate of England, until his death in 1658.

Of great historic interest to a New England man in Cambridge is Emmanuel College, that nursery of English puritanism. The college stands on the very site of a mediæval monastery of the "Black Friars," who were the great preachers of the Middle Ages. From Emmanuel College were graduated the leading clergymen of Massachusetts. Most of them had held comfortable livings in English parish churches before going out to America. "It is estimated," says Dr. John Brown in a recent book on the Pilgrim Fathers of New England and their Puritan successors (page 307), "that between 1630 and 1639 the number of university men who went to Massachusetts from the mother country had increased to between sixty and seventy, three-fourths of these remaining within that colony, and that by 1647 their number had mounted up to at least ninety. These men conserved the interests of education and learning till the colleges of Harvard and Yale commenced their great career, and thus in New England's life 'the guiding and directing force were supplied by an element which was itself molded on the banks of the Cam and the Isis, under the influence and refinements of the best culture which the England of that day could give.'" (Compare "The Influence of the English Universities in the Development of New England," by Franklin B. Dexter.)

It inspires an American student with a deep feeling of historic reverence for Emmanuel College and its ancient quadrangles when he reflects that here is the institution which educated John Harvard for four years, from 1627 to 1631. He became not only a Puritan minister, but as Edward Everett called him, the "ever-memorable benefactor of learning and religion in America." It was a noble example of University Extension when the Puritan preacher laid the historic foundations of Harvard College by giving that colonial institution one-half of the estate which he had inherited from his mother.[1] He also gave his library of 320 volumes, of which only 1 is now preserved. With John Harvard's legacy was begun the first college

[1] John Harvard's mother came from Stratford-on-Avon. She kept a tavern called the Queen's Head Inn at Southwark. Her second husband was one Elletson, who probably removed from Southwark to the Middlesex side of the Thames, for John Harvard was enrolled at Emmanuel College as "from Middlesex." Mr. Thayer, the author of the above-mentioned article in the Harvard Graduates' Magazine says: "There seems no reason to doubt that the money which Harvard himself bequeathed to the college came from the sale of the inn." The sale of beer, however, was probably an earlier and constant source of family revenue.

building in New Town, afterward called Cambridge, in honor of the great English university from which John Harvard came. He died in 1638, and that year his name was conferred upon the college. It was worth a voyage across the sea to visit the quadrangles of those ancient colleges of Cambridge and Oxford, the mothers of theology and learning in the New World of America. In the Harvard Graduates' Magazine for September, 1896, there is an illustrated article on "Buildings associated with John Harvard," with a picture of Emmanuel College.

The arrangements for the convenience of summer visitors to Cambridge were carefully made. There was a general reading and reception room at Fitzwilliam Hall, on Trumpington street, opposite the Fitzwilliam Museum. Here all students registered, paid their fees, and received the necessary information regarding the various classes and lecture courses. Here syllabuses of instruction could be purchased, as also the published reports of proceedings. Light refreshments were served upon the premises, and a ladies' restaurant was conducted on a liberal plan. A ladies' committee, wearing a light-blue bow, made themselves helpful to young women desiring counsel. A list of good lodgings was published in the official programme, with exact information regarding accommodations and terms.

The lectures were given at various places in Cambridge: (1) The New Theater on St. Andrew's street, near Emmanuel College; (2) in the large Chemical Lecture Theater on Pembroke street; (3) in the Archæological Lecture Theater in Little St. Mary's lane; (4) in the Divinity Lecture Rooms at the Divinity Schools, opposite St. John's College; (5) the large Anatomical Lecture Room on Pembroke street; and (6) in the Perse Grammar School on Hills road. Of course, different lectures were in progress at the same hour, but, in accordance with the advice of the master of Trinity, the students generally elected those subjects which were most congenial. Some paid special attention to history, others to literature, still others to natural science, philosophy, art, or education.

Of all the educational influences of a Cambridge summer meeting most important, at least to an American, were the historical associations of the place. An interesting lecture upon "Cambridge" was given by Mr. J. W. Clark, author of an authoritative volume upon this subject. He called attention to the original historic landmarks of the town, e. g., Castle Mound, fortified successively by the British, Romans, Saxons, and Normans, and now, like so many ancient strongholds, the site of a county jail. In Saxon time Cambridge was known as Grante Brydege. This was Latinized into Cantabrigia. A noteworthy mention of the present name of the town in modern literature was by the poet Spenser, who spoke of "My mother Cambridge."

At first the town was called from the river Granta, but afterwards the river was renamed from the town. Bridge street was once a Roman road. This old Roman camp became in the Middle Ages the seat of various monastic houses of the Benedictines, Augustinians, Franciscans, and Dominicans, all of whom laid institutional foundations upon which colleges were afterwards built.

The origin of the University of Cambridge antedates all existing colleges, and was probably due to the presence of monastic schools and establishments first founded by great religious bodies in the vicinity. The Benedictine order flourished at Ely, and was especially devoted to the promotion of art, education, and sound learning. The custom of holding annual "fairs" in Cambridge had much to do with the economic development of monasteries and of the town itself. The material advantages of the place had their influence upon later secessions of students from Oxford, which university originated in a secession of English students from Paris. The first colleges, however, were not intended so much for undergraduates as for groups of scholars, masters, and teachers. The site of the earliest collegiate institutions in Cambridge was determined by the proximity of parish churches in which the master and fellows could worship. The first college building at Cambridge was Peterhouse, founded in 1284 by Hugh de Balsham, Bishop of Ely.

There are now seventeen endowed colleges in Cambridge. All of them are built more or less completely around inner court yards or quadrangles. Some colleges—

for example, Trinity—are so extensive that they embrace several quadrangles which open into one another through archways. Some of the "quads" are beautiful grass plots, and some are paved courts. The architecture of different college buildings was a delightful object of study for all the summer visitors. Among the most interesting colleges are St. John's, Trinity, King's, Queen's, Corpus Christi, Jesus, and Pembroke.

The essentials of an English college, architecturally speaking, are an entrance gateway and porter's lodge, for gating or shutting in students at night, a chapel (usually on the right hand as you enter), a dining hall and kitchen (opposite the college entrance), a library, a combination room for the fellows and masters of arts, a lodge for the master, and dormitories or chambers for the students. The fellows occupy the best rooms in college and are made very comfortable, although agricultural depression in England has greatly reduced the revenue of many fellowships. Every college has honors and emoluments to bestow upon its best men, who give character and distinction to their alma mater by literary or scientific pursuits, by publications and lectures.

The whole teaching force of the English colleges was once confined to doctors and masters of arts, who alone had the right to lecture. The titles of doctor and master were originally much the same. They signified authority to teach. Both were equivalent to that much enduring modern term "professor," but gradually masters came to be restricted to the philosophical faculty or the liberal arts, whereas doctors were regarded as experts in law, medicine, or theology. The English are just beginning to introduce the German degree of doctor of philosophy. Until lately the degree of master of arts, obtained in course and not by work, has sufficed for all academic needs.

Colleges founded by women.—The first regular professorship in Cambridge, a chair of divinity, was founded in 1502 by a woman, Lady Margaret, Countess of Richmond, mother of Henry VII and of the Tudor line. She founded St. John's College and also Christ College. You may still see her portrait in the combination rooms of St. John's, and over the archway of that college are Lady Margaret's emblems—the Tudor Rose and the Daisy or Marguerite. Her good example was not lost. In 1540 came the endowment of the five royal professorships, divinity, law, physic, Hebrew, and Greek, by Henry VIII, grandson of Lady Margaret.

In this connection it is interesting to notice how many different colleges at Cambridge were founded by women. Besides St. John's and Christ, already mentioned, there was Queen's College, founded in 1448 by Margaret of Anjou, the Queen of Henry VI, who himself founded King's College in 1441. Elizabeth Woodville, Queen of Edward IV and a friend of Margaret, completed her work. Pembroke College was endowed in the fourteenth century by Mary de St. Paul, widow of the Earl of Pembroke. Tradition says she was "maid, wife, and widow all in a day," her husband being killed in a tourney after the wedding; but history says this is not so. She did not become a widow until three years after her marriage. Clare College was endowed and named by the Countess of Clare in 1338, and her portrait is still to be seen in the combination room. Sidney-Sussex was founded in 1595 by Frances Sidney, widow of the third Earl of Sussex, on the ancient site of Grey Friars, a Franciscan monastery. But most interesting of all foundations laid by women at Cambridge is Jesus College, established in 1495 by the Bishop of Ely in the very buildings and with the original revenues of the Benedictine nunnery of St. Mary and St. Rhadegund, a cloister dating from early in the twelfth century. The college chapel of Jesus was once the nun's chapel and still shows traces of Norman architecture. Not many years ago the removal of plaster in the cloisters disclosed to view some beautiful thirteenth century arches, once perhaps the entrance to the nuns' chapter house, a mediaeval anticipation of a women's college or a women's club.

In modern Cambridge there are, then, at least seven historic colleges founded by women: (1) St. John's (the college of Ben Jonson, Bentley, Wordsworth, Sir John

Herschel, and Professor Adams, both astronomers); (2) Christ (the college of Sir Philip Sydney, Latimer, Milton, and Darwin); (3) Queen's (the home of Erasmus and his pupil Tyndale, and of Greek studies in Cambridge); (4) Pembroke (the college of Spenser—"prince of poets"—of Gray and of William Pitt); (5) Clare (the nursery of English bishops); (6) Sidney-Sussex (the college of Cromwell); and (7) Jesus (the college of Cranmer and Coleridge). Seven distinct colleges established by women for the education of men and one of the seven a transformed nunnery!

There are two colleges established in or near Cambridge by women for their own sex. These institutions are Girton and Newnham. The first was started in 1869 in a hired house at Hitchin and was transferred in 1873 to statelier mansions in Girton Parish, two miles from Cambridge. I lunched with the rector of Girton, and visited with him the college, which occupies three sides of a quadrangle, opening, like the University of Virginia, to the south. Girton has attractive lecture rooms and reading rooms, a growing library, a pleasant dining hall and chapel, an isolated hospital, rooms for nearly two hundred girls, and a shed for countless bicycles.

The higher education of the English people and the higher education of women received a great impulse in the system of local examinations instituted under the auspices of Oxford and Cambridge universities. The system was formally extended by Cambridge from boys' schools to girls' schools in 1865. In 1868 came a memorial to the university asking for advanced examinations for women above 18 years of age. Such examinations were instituted in 1869. In order to prepare for these examinations lecture courses for women were started at Cambridge as early as 1870.

In the following year a house was opened in Cambridge by Miss A. J. Clough [1] for the benefit of lady students coming from a distance. This was Newnham Hall, the germ of Newnham College.

In 1873 an association was formed for promoting the higher education of women in Cambridge by lectures. This association was one of the first fruits of University Extension, begun about this time by Prof. James Stuart, of Cambridge, for the benefit of lady teachers in Sheffield, Leeds, and the North of England. Newnham College was the institutional result of a union of the above association with "Newnham Hall." Miss Clough became the first principal, and "Clough Hall" was named in her honor. She is now dead, but her cause lives. A fine portrait of Miss Clough may be seen in the large and handsome dining room of Newnham.

The buildings are of red brick, and of the Queen Anne style of architecture. There are pleasant lecture rooms and parlors, tea rooms, a library, laboratories, gymnasium, tennis courts, extensive lawns, and gardens. Mrs. Sidgwick is the present principal. Miss Helen Gladstone, one of the vice principals (now resigned) took the very best care of the students as regards their diet and general health.

A college course for women at Newnham or Girton now requires three or four years. The college charges amount to about $400 a year for everything. Certificates are awarded only to those women who pass a Tripos examination and thus win honors. The equivalent of an ordinary "poll degree," or bachelor of arts, is not as yet granted to women at either Oxford or Cambridge. The objection seems to be that if women win the first degree there is nothing to prevent their obtaining the second or master's degree in the usual course of time. Thus they will require the right to vote in university convocation with other masters of art, and accordingly share in the government and legislation of the university. Thus, gradually, say the croakers, women will undermine the existing system, including the fellowships and faculties.

All Cambridge was echoing in the summer of 1895 with recent discussions of this question of admitting women to university honors and privileges. The progressive academic party was led by such men as Professor Sidgwick and Dr. Cunningham, rector of Great St. Mary's. A leading spirit among the women is Miss E. A. McArthur, an historical lecturer and an assistant of Dr. Cunningham in his great work

[1] A recent biography of Miss Clough tells the story of the beginnings of Newnham College.

on English economic and social history. She was for some years vice-principal of Girton College, and has rented a private house[1] in the heart of Cambridge for graduates of women's colleges. This is a forward step taken by the woman's party in England. It means a graduate school for women in a university town by the old and familiar process by which churches, colleges, and universities have historically developed. First, an upper room, or a hired house; then the conventicle, hall, or hostel; and finally a corporate and endowed institution. There is no hurry about the processes of history or of nature. They that believe do not make haste.[2] The reactionary graduates of Cambridge voted in 1897, by a large majority, not to allow the giving of degrees to women, but majorities in England have been known to melt away through a dawning sense of justice and the sunshine of educated public opinion.

Summer student life.—For the encouragement of the Cambridge summer meeting Newnham College provided accommodations for forty women, at a charge of 25s. a week for board, lodgings, and attendance. The Cambridge Teachers' College offered rooms for fifty-four women at about the same rate. Two women sharing the same room were charged only 21s. a week.

At Selwyn College, in the immediate vicinity of Newnham, fifty or more young men, some Cambridge graduates, some extension students, and many foreigners, found comfortable lodgings, with board and attendance, at the rate of 25s. per week. Selwyn is a comparatively new institution, founded in 1882 and built by public subscription in memory of George Augustus Selwyn, late Bishop of Litchfield, formerly Bishop of New Zealand. The master in 1896 was the Right Rev. John Richardson Selwyn, D. D., son of the first Bishop Selwyn, and himself at one time a missionary bishop. Selwyn College is for Cambridge what Keble College is for Oxford, that is to say, a high church institution, founded for students desirous of an academic education and willing to live economically. The college was designed to encourage sober living and Christian culture, and to foster especially the principles of the established church.

No religious requirements, however, were made of the extension students, who were admitted to residence during the session of the Cambridge summer school. Many of the undergraduates were absent, so that there was sufficient accommodation for the visitors. They occupied each a student's room in the dormitory and took all their meals in the common dining hall. It is not usual for Cambridge men to breakfast in common. In the older and richer colleges, students breakfast and often lunch in their own rooms, although at Kings I found graduates, including the author of "Dodo," lunching in hall. They order from the college kitchen such things as they like or can afford. Selwyn College is really a "hostel," or common hall, like the earliest collegiate institution. From motives of economy Selwyn students are accustomed to take all their meals together at a fixed price per week. The system is like the old-fashioned "commons" of Harvard College, or like the new-fashioned "commons" in Memorial Hall.

The tutors and lecturers of Selwyn, as at other English colleges, breakfast and lunch in their own rooms, but dine together at high table in hall. The scene at Selwyn, and indeed in any English college dining room, is very like that of the well-known "commencement dinner" of an American college, where the dignitaries sit at a high table and the graduates at long tables on the floor space below. At an English college, however, the so called "dons" are the resident professors, tutors, lecturers, fellows, in short, ordinary masters of art, who have the right to teach. Both the dons and the students wear gowns in hall. The students always stand up when the dons come in, and remain standing until Latin grace has been said or read

[1] Miss McArthur opened in October, 1897, a new hall at Cambridge for women with college degrees or the equivalent. The expense per annum, exclusive of fees for instruction, is from $250 to $300. This covers the cost of board and residence.

[2] The progress that has been made in university education for women is shown in Miss Madison's Handbook of Courses open to Women in British, Foreign, and Canadian Universities, 1896-97.

by the master or his representative, when all take their seats and the dinner is brought in by serving men, who in Cambridge are called "gyps," in Oxford "scouts," in Dublin "skips."

In English colleges, as you find them to-day, there are certain common rooms where professors and students meet together: (1) The chapel, (2) the dining hall, (3) the library, (4) the common or combination room for seniors, (5) the common or combination room for juniors. Of these various features the American college or university has preserved the following: (1) The chapel, (2) the library, and (3) the academic hall. In their secret societies our collegians still have the common or combination room and sometimes a club mess, or common refectory. Among all the college libraries that I saw in England there was not one which excelled in beauty, attractiveness, good light, and general convenience the library of the Johns Hopkins University, on the top floor of McCoy hall. Nor did I anywhere see such seminary libraries as are found in Baltimore. Professor Thompson, of Cambridge, during a recent visit at the Johns Hopkins, said the historical seminary was unique. Perhaps the most attractive reading room which I saw in England, was that in Owen's College, Manchester. Generally speaking, English college libraries are mediaeval in their aspect. They remind you of dimly lighted chapels, with side alcoves and historic shrines. They are interesting as literary museums, but they are not good places for studious work.

In English colleges and universities an American is most impressed with the common life. It is an historical inheritance from the Middle Ages and the monastic system. The monks used to meet together in a common chapter house, eat together in a common refectory, and sleep in a common dormitory. These were the original and prevailing customs in all early English colleges. The practice of occupying separate rooms is of late origin. In every monastery there was one large airy upper room in which each monk occupied a separate bed or cot. Besides this great dormitory there was the so-called infirmary, where sick monks used to go for greater comfort and better fare. It became apparent, in the course of experience, that separate rooms were better adapted to peace and quiet than was the dormitory or infirmary with its many occupants. Thus originated separate chambers in monastery and college. The old custom is, however, still kept up in the wards of modern hospitals and in the public schools of England. In a modern and model school at Clifton, near Bristol, I found the boys occupying large common rooms for sleeping at night and little studies for quiet work in the daytime.

The custom of dining in common is universal in English colleges. After dinner the dons usually retire to the combination room, or college parlor. This is the talking place—the social center of the institution. Here coffee is served. Here the wine still goes round when guests are present, although not perhaps as freely as in olden times. Here there are interesting portraits of college worthies. Here, too, are new books, also the newspapers of the day and the best periodicals. The combination room serves many good social and academic purposes. It is the daily meeting place of the senior members of the college. It is a reception room for their friends and guests. It is a place where the gowns and burdens of academic life are thrown off and where men indulge in familiar conversation on congenial themes. All that is going on in town and college, and in the world at large, is likely to find entertaining expression sooner or later, in this *withdrawing* room of the college. After an hour of pleasant conversation, with perhaps a little music, the college party breaks up and the dons go to their own rooms or elsewhere.

Undergraduates are encouraged to have their junior combination rooms for social purposes, and very delightful scenes have there been witnessed by American visitors. One Saturday evening at Selwyn the resident undergraduates entertained many of the extension students at "a smoker" in the junior combination room. Long pipes, so-called "church wardens," of which Thomas Carlyle was perhaps too fond, were used by those who liked them. Songs were sung in various languages by student representatives of foreign nations. The English students were particularly strong

in their choruses, e. g., "A soldier of the Queen," led by Mr. Edwards, one of their most popular college tutors, who on this occasion wore a "blazer," or light coat of many colors; but at Aldershot, where he camps out in summer, he wears an officer's uniform. Speeches were made, stories were told, solos were sung, and the loving cup was handed around and drunk in ancient fashion, men standing and bowing very ceremoniously. Then "Auld Lang Syne" was sung, the whole company standing up, joining hands and beating time in the most approved manner. Of course the evening ended, as do all things in England, with "God save the Queen," in which musical prayer all student nations joined.

On another Saturday night the master himself, Bishop Selwyn, gave a reception in the hall for the extension students who were occupying rooms in college. The dining tables and long wooden benches were cleared away. A large number of comfortable armchairs were brought in by the "gyps." Little tables were placed at convenient points for holding tobacco and glasses. Claret cup, Devonshire cider, and other mild refreshments were served throughout the evening to "extensioners," resident undergraduates, and the Dons, who were present in great force.

It was all very friendly and pleasant, without any intemperance or disposition to abuse the master's hospitality. The guests contributed to the general entertainment. The Swedes and Danes sang their national songs with fine effect, and the Germans also sang theirs. Americans were encouraged to sing old plantation ditties, and the whole company joined in the chorus. One tutor played the piano accompaniments, and all the visitors did their share toward making the evening a social success.

At the close one of the Americans thanked the Bishop, on behalf of the extensioners, for his generous hospitality, and reminded the assembled company, Scandinavians, Germans, Austrians, and Franks, of their ancient Germanic kinship. He quoted the late Professor Freeman as lecturing in America on the English people in their three homes, Schleswig, Middle England, and New England, or, in a larger sense, the United States. He also called attention to the remarkable international character of the summer meeting at Cambridge, and to the fact that it was an unconscious revival of the original type of a university and of the true cosmopolitan spirit of the wandering students (errantes scholares) of the Middle Ages. University men in Europe and America still sing the old student song—

"All around the world I'm straying,
Every sea and mountain o'er;
Free as air, I'm never staying
On the north or southern shore;
Merry here and merry there,
Ubi bene, ibi patria."

The bishop caught the spirit and humor of the occasion and responded handsomely. He said he had been told that more German than English was spoken at Selwyn College in this long vacation, and that some of the great Germanic race had expressed the desire to get lodgings in town, where the English language might still be occasionally heard. All he could say was that if any German was spoken to him he should reply in a South Sea dialect. The good bishop then proceeded to develop the friendly Anglo-American and Germanic sentiment into the larger doctrine of peace on earth and international good will, the coming brotherhood of men and nations. Then, of course, we all sang "God save the Queen."

Conferences on University Extension.—A general conference upon university extension was held one evening in the Guildhall. Mr. James Stuart, M. P., the original pioneer of the extension movement, presided. He gave the principal address of the evening, and said that, while local colleges were now doing a great deal to educate the English people, the old methods of university extension from great academic centers must be continued. He maintained that the industrial classes ought to receive the same kind of education that everybody else received. Higher education was not to be reserved altogether for any particular class. Mr. Stuart deprecated

the idea of offering technical education as a substitute for higher education. To make a man good at his trade was not necessarily to educate him. Mental discipline was the one thing needful, and that was secured only by the higher education. The bread-and-butter side was not the most important, even from the technical point of view. Education has far wider objects and loftier aims than simply enabling a man or a woman to get on in the world. "What does it profit a man if he gain the whole world and lose his own soul?" The full possession of one's soul is secured only by liberal training. A man's happiness consists not in the abundance of worldly goods which he possesses, but in what lies without him and within him. What are riches and honor and power compared with a cultivated mind? The universities are full of shortcomings, but they have spun a golden thread which runs through many centuries. They hand down to us a noble tradition. The university-extension movement has for its object the opening of this tradition to all classes.

Mr. M. E. Sadler, formerly secretary of the Oxford Syndicate for University Extension, was present. He now represents the education office at London, and is in charge of special inquiries and reports. He said that the universities in England accomplished two things: First, they partly train specialists. This work is really a form of technical education. Second, the universities train all-round men of action and affairs. Mr. Sadler thinks specialists or experts are a by-product. The staple product is known in the market as a well-turned-out Englishman. Experts are prepared to take positions in the technical business of commerce; for example, in manufactories and breweries. People who seek a university education in the hope of getting more wages will quickly find out their mistake. Workingmen need intellectual stimulus and the criticism of competent companionship. Economic forces are steadily producing greater opportunities for study and mind leisure among the industrial classes. There is a splendidly growing number of workingmen who are now forming an excellent body of students in many university-extension centers. Mr. Sadler instanced the enthusiasm of the workmen at Oldham, where extension lectures were so popular that the managers had to turn out the gas in order to get rid of the audience. England's industrial development has been enormous, but a social organization adapted to it has not yet been built up. Mr. Sadler thinks that men need reciprocal respect for one another's honesty of purpose and stability of character. The universities of England should lead the English people in this matter.

Another and more important conference at the Cambridge summer meeting was devoted to the future of the extension movement. The discussion was held in the Senate House one Saturday afternoon in the presence of a large and sympathetic audience. Sir John Gorst, M. P., from Cambridge, occupied the chair. He represented the education office, and his views were indicative of the present attitude of the English Government toward higher popular education. He called attention to the fact that there are now several organized bodies aiming at the same or similar educational objects. Besides the university-extension movement there are the science and art classes, managed by local committees under the general control of the science and art department of the English Government, and receiving grants from public funds. There are also technical schools and colleges in various parts of England sustained by local committees of the county councils. These committees originated about 1890 in consequence of Government grants of the so called "whisky money," an excise tax at first intended to compensate liquor dealers for the reduction of the licensed houses. Every county in England, in consequence of this Government grant, has become a center of technical instruction. In the third place, there are the numerous school boards which are now endeavoring to provide for the higher training of pupil teachers.

In consequence of these three active agencies for promoting higher popular education there is considerable waste of effort. There is great need of some coordinating power to prevent the overlapping of educational work. Sir John Gorst urged that the universities should attempt to harmonize and systematize efforts for higher popular education. He thought that university extension might be of great service to

the county authorities in providing liberal courses of instruction. The counties were required by law chiefly to promote technical training. It is quite feasible for local and academic effort to be combined. The county authorities possess what the universities enjoy—money. The universities possess what the counties require—namely, antiquity, prestige, and the right of giving certificates of proficiency. There is too much local rivalry and jealousy for the school boards and county authorities to come to an agreement at present, but both might be willing to act in harmony with university authority. Sir John Gorst said there was no reason to suppose that the Government would give any more money at present for the promotion of higher education. The fate of the education bill had not encouraged further educational legislation.

Mr. Marriott, secretary of the Oxford syndicate for University Extension, also took part in this conference, and laid decided emphasis upon the past success and present tendencies of the movement. He said that England was honeycombed with local lecture courses. The universities are cooperating with local centers for the establishment of continuous and permanent educational agencies. Reading and Exeter showed the possibility of such cooperation. He thought there should be a multiplication of so-called extension colleges, for these are the most elaborate and highly organized products of the whole movement. The great difficulty lies in the lack of funds for the maintenance of literary teaching and of unapplied science. There ought to be an alteration of the present financial basis of granting money to county councils. The Government should foster liberal education as well as technical education. There must also be leaders and teachers of academic distinction, who shall carry into the work something of the high hopes and generous enthusiasm of the original founders.

A gentleman from the north of England, Mr. Barrow, of Packworth, spoke of the progress of University Extension in the mining district of Northumberland and of the limitations of city work caused by the arduous labors of the miners themselves. However, the partial success of the movement justified its existence. While technical education is necessary, something more than this is required to complete a man's education. University Extension supplies the liberal element which tends to make men better citizens. Mr. Barrow thought the movement deserved national recognition. There is a touch of nature in this popular educational work which makes the whole intellectual world akin. He thought that a portion of the money now given by the Government to the county councils in promoting technical education should be devoted to the purpose of teaching national and industrial history.

Dr. Lawrence, formerly of the University of Chicago, now rector of Girton, also favored Government grants for promoting University Extension. He recognized that it was the first duty of universities to do their own educational work and use funds for the benefit of university students. If called upon to do another kind of work, they should be given at least a portion of the necessary funds by the nation which is benefited. Dr. Lawrence said it would be an ill day for the universities of England when they found themselves outside of the great current of national life. He thought the universities ought to aid in University Extension.

Sir Joshua Fitch, an eminent educationist, one of Her Majesty's examiners of schools, said a good word in favor of University Extension as a missionary work among teachers. He thought teachers' lives needed to be varied and improved by other influences than those of the schoolroom. It was not for the sake of securing marks and higher appointments that teachers should follow extension courses, but for the sake of culture, which enriches teachers' lives and enlarges their range of illustration in the lessons which they teach. "The best thing that a teacher learns," said Dr. Fitch, "are not always those which he can bring directly to bear upon his profession."

Excursion to Ely.—One Saturday afternoon over 150 Extension students went by train or bicycle to Ely. The company, including many ladies, assembled in the cathedral itself, and there, in one of the transepts, were edified by the Rev. Prof.

Stanton, who talked pleasantly on the history and architecture of Ely. Afterwards the visitors divided into three parties, each under the guidance of one of the cathedral authorities, and wandered around the aisles and cloisters of that famous old Benedictine abbey. The Lady Chapel was built in the fourteenth century, by Alan de Walsingham, and was badly defaced by the Puritans. Probably more characteristic features of mediæval monastic building have been preserved at Ely than in most of the cathedral towns of England. The dean and his canons explained to the extension students the historic plan of the cathedral and of the various outlying buildings, which still serve useful ecclesiastical purposes. Some of the houses are now occupied by resident clergy, but the visitors were allowed to go through the various rooms which contain traces of monastic architecture. At the usual afternoon hour a choral service was celebrated in the cathedral, and the whole company of visitors found rest and peace in attending that noble ritual which the Church of England has worthily perpetuated. Tea was afterwards served in the canon's garden, and then the company, after revisiting the cathedral, made their way back to the station and returned to Cambridge.

It is not often that visitors to an English ecclesiastical town enjoy such distinguished instruction and guidance as did that little company of extension students. In no way could the ecclesiastical authorities have more effectively illustrated the eternal charm of those mediæval buildings than by explaining their original object to the sons and daughters of the English people. On the Sunday following this visit to Ely the dean of the cathedral addressed the Christian Social Union in Cambridge. The next day he lectured to extension students on Alan de Walsingham, subprior and architect of the monks of Ely, and the creator of that famous octagon tower and vault—"the only truly gothic dome in existence."

Garden parties.—One of the most delightful experiences of the Cambridge summer meeting was the open-air entertainment of the whole company in college gardens. One Saturday afternoon, after the University Extension conference in the senate house, the visitors proceeded by invitation to the fellows' garden of Clare College. There for an hour or two the assembled company found pleasure in the sight of the beautiful flowers and of the fine green turf, product of centuries of cultivation. The Clare gardens are among the most lovely of those famous Cambridge "backs" or pleasure grounds west of the river Cam. The land slopes gently eastward toward the river, and is charmingly diversified by trees and shrubbery, through which are winding walks. In this paradise of beauty extension students found good opportunities for social converse and making acquaintances. Sir John Gorst, Dr. Fitch, and other distinguished visitors were among the guests, and many of the professors, fellows, and lecturers of Cambridge were also to be seen. Tea was afterwards served in the combination room of Clare College.

Another interesting feature of the Cambridge summer meeting was the presentation of pastoral plays in the beautiful gardens of Downing College. One afternoon Shakespeare's As You Like It was given in open air amid the most picturesque surroundings. The stage was bordered by a fringe of trees, and a troop of "Woodland players" rendered the comedy in the most pleasing fashion.

On another occasion, in the garden of Merton Hall, Shakespeare's Much Ado About Nothing was cleverly presented. Instead of a gorgeously decorated playhouse, real trees and the walls of an ancient college building afforded the scenic background of the play. A chorus of voices singing in open air under green-wood trees had more than the charm of novelty.

Lectures.—Among all the lecture courses given at the Cambridge summer meeting I was most interested in that of Mr. J. R. Tanner, fellow and lecturer of St. John's College, who described the dissolution of the monasteries. The subject was of special significance to students desiring to understand the historic origin of Oxford and Cambridge colleges, for many of these institutions rest economically as well as architecturally upon monastic foundations. Mr. Tanner said that the total spoil of

the monasteries by Henry VIII and his willing tool Thomas Cromwell amounted to £4,108,000 or $20,500,000. In order to get the modern equivalent of this sum it should be multiplied at least by ten, so that we have a grand total of at least $205,000,000. Of this vast sum more than one-half went to the King's favorite courtiers by gift or nominal sale. Confiscated monasteries were the economic origin of many noble houses in England.

The displacement of mitered abbots from the House of Lords changed the balance of power from spiritual to temporal. Henry VIII packed the upper house with laymen, and thus secured his own way with the church. Of the remaining monastic spoil a considerable sum was spent for public purposes, and almost as much went into the King's private purse, to pay his debts and living expenses. A paltry sum was restored to the church at large and was used for the establishment of six new bishoprics, all greatly needed, and the rest went direct to Oxford and Cambridge for the encouragement of collegiate learning. Mr. Tanner said that 8,000 ejected monks and nuns went down into silence and oblivion.

The lecturer thought that the immoral condition of monastic life in the later Middle Ages had been greatly exaggerated for purposes of spoliation. The records of the visitations by the bishop of Norwich from 1499 to 1532, published by Dr. Jessop, show conclusively that the crimes of the monks were eclipsed by those of two greater criminals, Thomas Cromwell and his master, Henry VIII. The so-called evidence was largely a tissue of lies fabricated by interested parties. The horrors of the Black Book existed only in the evil imaginations of Cromwell's commissioners. Monastic morals depended largely upon the personal character of the abbot. In the preamble of the statute for the dissolution of monasteries the larger houses were described as those in which religion was right well kept, and yet the charges incriminated the greater monasteries as well as the poorer and the meaner. There were some instances, no doubt, of relaxed discipline, drunkenness, and disorder, but the published records of episcopal visitations in East Anglia during the period above mentioned show that the more serious charges can not be sustained.

Among other historical lectures were those of Professor Waldstein on the "Influence of Greece and Rome on modern life." Dr. Waldstein asserted that the artistic spirit is the highest expression of civilization; indeed, the expression of all culture. He defined the character of a gentleman as a perfect human being in his relations to other human beings. He said the Greeks first established the claim of reason and reasonableness as the supreme guide in all that is right. Mr. A. J. Grant, of King's College, lectured on the "Influence of Greeks on modern life." The only lady lecturer was Miss Jane Harrison, who discussed the "Influence of Greek mythology." Professor Ryle gave a series of lectures on "The progress of Old Testament revelation." Professor Haddon, of Dublin, in his course on "Anthropology," made a good point in favor of college education for ordinary students, called "poll men," at Cambridge. Poll men are those who aim at simply a bachelor's degree rather than honors. Honor men at the age of 19 have larger brains than ordinary students, but between that age and 25 poll men improve twice as much in the size of their brains as do men of genius. This fact would tend to show that the average boy really improves more at the university than does the brilliant student.

Professor Macalister gave an illustrated course of lectures on the "Peopling of Europe." More attention is paid in English universities than in American to the subject of historical and commercial geography. Mr. H. Yule Oldham, an Oxford graduate, now a Cambridge lecturer on geography, gave an interesting lecture on "The evolution of the map of Africa from the time of Homer, Herodotus, and Phœnician sailors down to the modern scramble of European powers for African territory." He said that France now controlled 3,500,000 square miles in Africa, England 2,000,000, Germany 900,000, Spain nearly as much, Portugal about 800,000, and Italy 500,000.

The tendency of the Cambridge summer meeting is toward greater popularity. In

this respect Cambridge is consciously leaning toward the policy of Oxford, which, from the beginning of English summer meetings, in 1888, welcomed all comers,[1] men and women, extension students of all grades. At first Cambridge was more exclusive. Her declared policy was to encourage only teachers and more advanced students, especially those who were competent to pursue laboratory work. Consequently the Cambridge courses at the beginning were more strictly scientific, whereas the Oxford courses were more decidedly literary and historical.

It is interesting to note that even in their summer meetings, as well as in their extension work, Cambridge and Oxford have both been true to their own academic ideals. In the modern history of English higher education, broadly considered, Cambridge has stood for science and Oxford for letters. Each university has supplemented the other and each has tended to improve and enlarge the other. Thus the Cambridge higher educational ideal of continuous and protracted extension lecture courses has undoubtedly constrained Oxford to develop higher standards of university recognition for extension work. On the other hand, the more popular, more democratic, more practicable ideal of Oxford with respect to summer meetings has influenced Cambridge to open her gates more widely to summer visitors.

Experience has conclusively shown that better results accrue from this liberal, humane, democratic policy than from the setting up of more exacting or so-called "scientific" standards of admission. After all, it is not "science" and "laboratories" that extension students and their friends especially want at the English universities in the long vacation. Some few ambitious teachers or isolated specialists may perhaps crave, and should certainly be allowed, larger scientific opportunities, but in general good laboratory advantages are now afforded in all the local colleges and technical institutes throughout Great Britain. What the larger body of extension students and summer visitors really crave at Cambridge, as well as at Oxford, is a larger insight into the historic significance and intellectual associations of an English university. Lectures are needed on English history and literature, European education, ancient and modern art, college architecture, the biography of great leaders in Oxford and Cambridge movements, the men who have gone forth from academic cloisters to shape the destinies of England and the world. These are some of the subjects that most interest Englishmen and Americans who are drawn in the summer season to academic centers. It is, however, first of all, the place itself and the university environment that the people want to see and know about. Hence the wonderful success of all those truly local lectures at Oxford and Cambridge, those pleasant instructive itineraries through the various colleges, gardens, quadrangles, libraries, chapels, and art museums, with the accompanying peripatetic talks by kindly well-informed university men on English local history and college architecture.

There is no danger of damage to college buildings or college property from these inroads of so-called "barbarians," "extensioners," "trippers," or summer visitors. They are probably much more appreciative of academic shrines and their historic associations than are most persons who are more familiar with the place—for example, irreverent undergraduates (usually sons of the people), and those hardened old dons, fellows, or pensioners who keep up in perfunctory ways the ancient forms and ceremonies in such a praiseworthy manner. They are *all* harmless folk.

It is in any case wise public policy which everywhere nowadays opens to occasional public view ancient chapels, churches, cathedrals, palaces, picture-galleries, museums, and college buildings. Oxford and Cambridge are no exceptions to the prevailing tendency. They are both centers of architectural interest, historic and literary museums, educational object lessons, and religious shrines. As such they deserve annual pilgrimages from all English-speaking lands, like those mediæval social pilgrimages to the tomb of Thomas à Becket, as narrated in Chaucer's Canterbury Tales.

[1] There is a certain propriety in universities reopening their doors to the public, for the origin of Oxford and Cambridge was a "Studium generale," or schools open to all comers.

There are many historic shrines in Cambridge, and some of them I visited. Among the best were the libraries of Corpus Christi, St. John's, and Trinity colleges, and the student rooms of Sir Isaac Newton. But the place that interested me most keenly was the college lodgings of Erasmus, the great humanist, to whom in no small degree Cambridge owed the renaissance of Greek studies. From Erasmus, Luther and Melanchthon derived their New Testament learning. Back to Erasmus the modern world traces its classical scholarship, its Biblical culture, and critical insight.

One afternoon I was strolling alone through the quadrangle of Queens' College, without the aid of a cicerone, or even of a guidebook. Thinking I had seen all there was worth seeing on the premises, I was about to leave, when I met a bright-looking working lad who had come to the Cambridge summer meeting from Bolton on a prize scholarship. Having already seen him elsewhere, I asked him in a somewhat patronizing tone what he had found of interest in Queens' College. He replied by asking me if I had seen the lodgings of Erasmus. "No," I said. "Where are they?" The intelligent youth from the mills of Bolton then guided an American college graduate, a whilom lecturer on the Italian Renaissance, to a shrine more genuine than Sir Isaac Newton's bridge or Milton's mulberry tree or Shakespeare's doubtful birthplace. I found the lad from Bolton knew more about Queens' College and its associations than I did. He had attended peripatetic lectures and read his guidebook like a faithful student.

It was on the bridge over the Cam, back of King's College, that I encountered another and older representative of the English working classes, Mr. R. Halstead, of Hebden Bridge, which is now a famous center of productive cooperation and university-extension lectures. I had first met Mr. Halstead at a tea given by Miss Montgomery, the honorary secretary of the University Extension College at Exeter. I afterwards heard him speak at a university-extension conference in Guildhall. Some good-natured complaint had been made by Dr. Hill, the generous master of Downing College, because the workingmen of England did not better improve their opportunities for higher education and come to Cambridge in larger numbers. Mr. Halstead replied in a strong and effective speech, showing the hard conditions which the workingman must face in his attempt to study or read. He had to rise early in the morning—too early for much study after a scanty breakfast—and hurry into the mills for long hours of fatiguing labor, which in the end destroys a man's inclination toward intellectual effort, even if he is disposed to devote his dinner hour to combined study and indigestion. At nightfall he returns for more poor food to a noisy boarding house or into a distracting family environment. Is it any wonder that multitudes of tired artisans prefer the bright saloon or cheerful public house, with its club privileges and cheap billiards, to wearisome study at home under the discouraging limitations of close rooms, bad air, poor light, and uncomfortable surroundings? Mr. Halstead wondered how many university men would remain loyal to their high intellectual ideals amid such an environment as now belongs to manual labor. How many English or American students would go to college without stipends and scholarships, or even to a summer meeting, if it should cost them not only the incidental fees, but their very means of subsistence? It is not always remembered that a workingman, even if he gets a fifty-dollar scholarship, covering a month's expenses at an Oxford or Cambridge summer meeting, forfeits by such a vacation his daily wages for a month's time. By some such line of concrete argument Mr. Halstead made it plain to academic minds why so few workingmen could afford to visit Cambridge.

There, upon the Cambridge River, in sight of the noblest colleges in England, it was interesting for an American to meet and hear this Mr. Halstead again and to inquire about the progress of education and cooperation among the workingmen of England. He himself embodied in his own experience replies to most of my questions. He referred me, further, to his published views in the report of a royal educational commission. He had been summoned, among others, to give testimony

before members of Parliament upon the educational movement among the working classes of England. In spite of all obstacles and limitations there is such a movement, and to discover it any doubter has only to use his own eyes and ears in English industrial neighborhoods, like Hebden Bridge, where the Rev. Hudson Shaw and Mr. Sadler have lectured successfully to large audiences of workingmen and have tested their remarkable zeal and knowledge. To an American observer the present enthusiasm among English artisans for sound learning in economics, politics, history, and the world's literature is really phenomenal. All the men need is more leisure—i. e., a shorter day's labor and improved environment. One has only to talk, as I have repeatedly done, with intelligent and representative men, like Mr. Halstead and Mr. Vivian (who lectured at Cambridge on cooperation), to realize the intellectual progress already made by English labor and the hopefulness of the combined educational and cooperative movements of our time.

It was worth a visit to Cambridge to hear English workingmen speak in public and to see how churchmen, university men, and workingmen have at last met together, and how the Lord is really the maker of them all. In the High Church dining hall at Selwyn College, where I sometimes dined with the bishop and other clergy, I breakfasted and lunched almost daily with representatives of colleges and factories. On my right hand at Commons was a graduate of Trinity College, now headmaster of a boys' classical school, a man of true culture and good will, the son of an English clergyman. On my left was a son of labor from Hebden Bridge, who had raised himself by sheer native ability, honest work, and hard study to the position of a capitalist and employer of labor. He, too, was a man of good sense and good will. For years he had followed University Extension courses, and he knew more than most college graduates about economics and some other things that are worth knowing. For example, he knew something of the educational and political history of England and the great cooperative movements of our era. He put me upon the track of many leading men and publications that proved valuable in my various inquiries. Since my return to America he has frequently sent me papers of educational and social interest. In the summer of 1897 Dr. Frederick Robertson Jones, my department deputy at the Oxford Summer Meeting, met this same Mr. Ashworth, from "Todmorden Hall," Hebden Bridge, and continued the friendly relationship already established between Johns Hopkins University students and the intelligent workingmen of England.

One of the pleasantest features of the Cambridge Summer Meeting was the institution, for the benefit of some English workingmen, of an international scholarship of $50 by the small individual contributions of American and foreign students who were in attendance. Preliminary meetings for organization were held in the Junior Combination room at Selwyn College. An American, who had studied in Heidelberg, was made chairman. Committees and collectors were appointed to represent the various "nations," and thus the money was quickly and easily raised. Lady students from America and other lands, lodging at Newnham, added their quota to the common fund, which was formally presented in the office of the Cambridge syndicate by an international committee to Dr. R. D. Roberts, the director of the summer meeting. The object of the proposed scholarship, as agreed upon by the contributors, was to enable, not a foreigner, but a native English workingman to attend a summer meeting at Cambridge or Oxford, under such conditions as Dr. Roberts might prescribe. This international expression of good will toward English labor is but a sign of the times. It resulted from that conference on University Extension in old Guildhall, where again and again the voice of modern labor has been heard.

Tokens of international appreciation of the advantages of attending a summer meeting at Oxford or Cambridge or Edinburgh are not at all unusual. In 1892 the Americans who had attended the Oxford Summer Meeting collected, with the aid of friends at home, the sum of $150, to enable some one of their countrymen to attend the next summer session. This scholarship was awarded to a lady under conditions fixed by Mr. M. E. Sadler and printed in "University Extension" (Philadelphia) September,

1893. The subject of the prize essay which won the scholarship was "The influence of puritanism on national character."

Expenses.—The cost of attending a summer meeting at Cambridge or Oxford for three weeks' time varies, of course, with the student's mode of living. As we have already seen, the necessary expense for board and lodging is about $6 a week. Something ought to be allowed for fees and extras. A season ticket admitting to all the privileges of the summer meeting costs $7.50. There is a small fee of 2s. 6d., for the use of the university library, which is open daily from 10 to 4. The charge for the use of boats on the river is only a sixpence per person for morning or afternoon. Cab fare is very reasonable, only a shilling for any distance not exceeding a mile. A fair criterion of the necessary expense of residence in Cambridge or Oxford for three weeks is the ordinary scholarship of £5, or $25, allowed to an extension student. A more liberal allowance of $50 would cover all extras and traveling expenses for an average English student.

For an American, of course, the cost of getting to England and back again is the chief item. Most people are so eager for a quick voyage, with all the luxury of the best modern steamship, that they pay as much to cross the ocean as it would cost to live quietly in England or at home all summer. It was possible in 1896 for a man to get a round-trip ticket from Philadelphia to Liverpool and back for $75. A shipload of Presbyterian ministers bound for the Glasgow assembly voyaged in this way, and so do professors from the University of Pennsylvania. From New York, on some lines, one can cross the ocean ferry and return for a mere bagatelle. The charges are also very low from Montreal to Liverpool by the various Canadian lines. The more money the voyager saves from a steamboat company the more he has to spend in summer travel and summer meetings in England, Scotland, France, or Switzerland. These particulars are suggested in order to encourage Americans to cross the Atlantic Ocean and enjoy a pleasant and profitable summer instead of wasting time and money in tiresome hotels and boarding houses on this side of the water, where in some sections the heat is more or less intolerable from June to October.

THE EDINBURGH SUMMER SCHOOL.

I.

Town and Gown.—In the university city of Edinburgh a Town and Gown Association was formed in the year 1896, for cooperative undertakings in the joint interest of citizens and students. It was for the common good of city and university. The association is a stock company representing academic interests for the purpose of providing residential halls or house accommodation for students and other persons connected either with the university or with the liberal professions. Although Edinburgh University has been in existence more than two centuries, it has never enjoyed the benefit of college halls or hostels like those which have given such architectural character and social charm to Oxford and Cambridge. Students and professors have lived in Edinburgh wherever they could find lodgings. There has been no real unity to academic life, no college center or Latin quarter, where students dwell and educate one another in their own society—perhaps the most effective of all academic means of culture. The English colleges have always been strong in social education, but herein the Scotch and German universities are weak.

To remedy a long-standing and manifest defect in Edinburgh student life the Town and Gown Association was organized by the energy and enterprise of Prof. Patrick Geddes, who lives near the Outlook Tower, on Castle Hill, and surveys from his charming apartments, at the top of an airy citadel, the historic city of Edinburgh and the picturesque country round about. While Professor Geddes has had in mind the need of the better associated collegiate life in Edinburgh, he has also sought the material and architectural improvement of the city. It is well known by all visitors to this ancient capital of Scotland that the historic and picturesque old town, extending from Castle Hill eastward to Holyrood, was until lately the most dilapidated and unsanitary part of the city. Municipal and architectural

improvements, which Professor Geddes has greatly promoted, have now transformed some of the worst of those ancient rookeries, narrow passageways, and noisome courts into spacious college halls and modern apartment houses.

The beginnings of this remarkable movement, which is at once "civic and academic, architectural and educational," date from the year 1887. Then a new social life was instituted for students in Edinburgh by the renting and furnishing of three small flats on the so-called "Mound," which connects Old and New town. At first only seven students entered upon this common or associated life, but the number increased, and soon an entire house was needed to supply the demand. By a perfectly natural law of growth, and upon a sound business basis, the first residential hall in Edinburgh was established. It is now a student home for members of New College. In 1890 another house was purchased in Riddle's court and reconstructed for student residents. In the same year was acquired an historic locality once occupied by the Scotch poet, Allan Ramsay, author of The Gentle Shepherd. Gradually a range of new houses was built on two sides of Ramsay Garden, so that now there is a large number of comfortable flats, or sets of chambers, occupied by professors and their families, and a large building called "Ramsay Lodge," with numerous rooms, occupied by students in residence.

The visitor in Edinburgh, as he strolls along Princes street (said to be, for noble views, the finest street in Europe), will find himself looking upward to that natural acropolis where "Edwin's Burgh" gave name and fame to the old town on the hill. Extending eastward from the castle and the walls of the Esplanade is an attractive range of buildings. These are the most conspicuous beginnings of college halls in Edinburgh.

From my hotel on Princes street I moved bag and baggage in a cab one afternoon in August to "Ramsay Lodge" on the heights, where students attending the Edinburgh Summer School were quartered. I had previously made arrangements with Mr. Marr, the secretary, and the matron of the College Hall at Ramsay Garden promptly assigned me to a large, airy room looking northward across Princes street, beyond the New Town and toward the Firth of Forth and eastward toward Calton Hill, with its crown of historic monuments in memory of Robert Burns, Dugald Stewart, and other celebrities.

Scotch history read backward.—It was worth a long journey to Edinburgh to behold that magnificent prospect which I enjoyed morning, noon, and eve. There before my very eyes I could read Scotch history backward from the living present to the time of King Edwin, on whose very hill I was lodging. Ramsay Garden lies close to the ancient burgh or castle, which still shelters the chapel of Queen Margaret, the oldest church in Scotland. From my northern windows I could look away toward the Queen's Ferry, over which Margaret and her children, rescued from siege and carried down the crags one night, were safely transported into the adjoining kingdom of Fife. There below me at the foot of Castle Hill lay outspread the beautiful gardens which occupy the basin of the old North Loch. It was a rare pleasure, on a sunshiny Sunday afternoon, to watch from those ancient heights the happy modern groups of people—men, women, and children—on the green hillside and in the gardens below. The great parks of Chicago, New York, Philadelphia, and Baltimore have shown me greater crowds of happy people in summer, but nothing so picturesque as those grassy slopes of Edwin's Burgh all alive with children and their admiring parents. I spent one entire Sunday afternoon among people on the hillside and in the gardens below. I learned more of the characteristics of Edinburgh's mixed population than I had read in books or heard in lectures.

Life in a Scotch college.—In the College Hall at Ramsay Garden there was in August and September a considerable number of medical students in residence. These men were an entertaining source of sociological and academic information. We met at least three times daily, for we all boarded in commons. The dining hall was in the basement, where a substantial dinner was served at the close of day. Breakfast and luncheon were simpler and more frugal than in America. The "halesome par-

ritch, chief of Scotia's food," we enjoyed every morning, with good coffee, which every student poured out for himself. There was always some hot dish or cold meat at both breakfast and luncheon, with, of course, bread and butter, and marmalade from Dundee. Students are allowed in Scotland, as in England, to have wine and beer at their own expense, but very little drinking is done. After luncheon and after dinner the company adjourned to the common room, just above the dining hall, and helped themselves to coffee, read the papers, played on the piano, sang songs, and amused themselves in conversation for a little while before dispersing to their rooms and their work.

Life in a Scotch college is well and economically ordered upon the basis of student self-government. There is no needless interference on the part of the authorities. There is no watching or supervising, no "gating," or shutting in of students at an early evening hour, as in an English college. In Edinburgh a student lodger, as in America, has his own pass-key and comes or goes when he likes. A college hall in Scotland is managed very much like an American city club or college fraternity house. The hall chooses its own officers. A house committee has general charge of all matters of interior concern. Only those students are received as members who are approved or elected. Any obnoxious member may be disciplined or expelled. The charges made for rooms, which are furnished with all things needful, are according to location. The cost of board is assessed pro rata upon the members of the common mess, exactly as in old-fashioned student commons, or dining clubs, at Harvard and Yale.

In the Scotch, as well as in the English colleges, a visitor is impressed with the good administration and efficient household service. There is a well-developed spirit of social unity and good fellowship. In these points our American dormitory system at boys' schools and men's colleges is, in most cases, weak. Our service and management are usually bad. Our American colleges for women are far superior to the old-fashioned dormitories for men. At Smith and Bryn Mawr, as in English and Scotch colleges, you will find common dining rooms and common parlors in the buildings where students lodge. This, of course, promotes sociability, and the common life, which, in men's colleges, is too often relegated to the fraternity house, the gymnasium, the "cage," or the ball field. To this general rule there are wholesome exceptions at Lawrenceville, Worcester Free Academy, Rutger's College, Trinity College, North Carolina, and other well-known places north and south.

Club life in colleges.—The experience of Oxford, Cambridge, and Edinburgh universities has shown the possibility of good social organization in dormitories and of a real common life in large academic towns, where the individual, unless living in some college, is in danger of isolation and a more or less hermit mode of existence. Especially in Edinburgh has the institution of university halls, on Castle Hill, socialized and unified the hitherto separate and scattered elements of the great student body. It is both feasible and desirable in American college towns to bring together, in the form of students' unions, little bands of congenial spirits who can form social clubs or open fraternities, to which desirable members may be gradually elected, upon a broad and liberal plan. The upper rooms of the clubhouse, as in our present fraternity houses, should be rented to members. There should be a common room, or parlor, and a dining room on the first floor, a club cuisine in the basement, and bathrooms in all the upper stories. A club mess can easily be sustained by residents and boarders under the direction of a student manager or steward, who should cater for the club mess and regulate expenses according to the wishes of its patrons. The business affairs of the club, the election of new members, the collection of rents, dues, etc., should be in charge of a house committee. This kind of administration is well understood in some of our American college fraternities, but it needs social extension and academic popularization.

In the Scotch College Hall at Ramsay Garden I was greatly impressed with the interior art decorations. As you ascend the winding stairways, you find the walls beautifully adorned with hundreds of photographs of old Edinburgh buildings.

Modern improvements in the "Old Town" on the hill have caused the removal of many ancient landmarks and historic monuments, architectural façades, and picturesque courts, or ancient "wyndes," which were once the artist's and tourist's delight. You will now find them all preserved in artistic ways, by drawings and photographs, on the staircases of the College Hall at Ramsay Garden. In the common room of this hall the walls are artistically frescoed to represent certain scenes in Celtic mythology. There is an earnest attempt every year at the Edinburgh Summer School to revive old Celtic decorative art, of which a pleasing exhibition is made on academic premises and in prints and publications.

Edinburgh is a wonderfully beautiful town, a queenly city, a modern Athens, set upon hills, with broad thoroughfares, noble monuments, and public buildings, lovely gardens, extensive parks and drives, magnificent outlooks toward the mountains and across the Firth of Forth. But some idea of what the condition of the town once was can be obtained by glancing at the squalid "survivals" of filth and misery in "Cowgate" and other old-time streets and alleys, in which now dwell "the submerged tenth," apparently sunken below the present level of the city, whose traffic and modern promenades are more conspicuously seen along those gigantic causeways which cross the old historic ravines or gullies of Edinburgh.

In the newest art gallery of the city you will find in an upper room a large collection of sketches and water colors, showing Old Edinburgh in all its picturesque squalor. Almost every bit of quaint architecture, every nook and corner of the ancient town, is thus immortalized by the faithful hand of art; but we must remember that those old rookeries on High street and Canongate, while interesting to look at, were not sanitary places of abode. As Robert Louis Stevenson says: "It is easy to be a conservator of the discomforts of others. * * * Assuredly, in driving streets through the black labyrinth, a few curious old corners have been swept away, and some associations turned out of house and home. But what slices of sunlight, what breaths of clean air, have been let in! And what a picturesque world remains untouched!"

Robert Louis Stevenson.—Whoever visits Edinburgh will be grateful to the memory of Robert Louis Stevenson, and will read and reread his Picturesque Notes on this fascinating old city. No writer has better caught the spirit of the place or sketched its salient features with a truer hand. The visitor will surely encounter this *genius loci*, Robert Louis Stevenson, in the National Portrait Gallery of Edinburgh, where a marble bust of the charming author of St. Ives greets you with an almost life-like welcome. The man truly lives in literature and in art. The following brief extracts from his Picturesque Notes describe Edinburgh:

"Few places, if any," he says, "offer a more barbaric display of contrasts to the eye. In the very midst stands one of the most satisfactory crags in nature—a base rock upon dry land, rooted in a garden, shaken by passing trains, carrying a crown of battlements and turrets, and describing its warlike shadow over the liveliest and brightest thoroughfare of the new town. From their smoky beehives, ten stories high, the unwashed look down upon the open squares and gardens of the wealthy, and gay people sunning themselves along Princes street, with its mile of commercial palaces all beflagged upon some great occasion, see, across a gardened valley set with statues, where the washings of the old town flutter in the breeze at its high windows. And then, upon all sides, what a clashing of architecture! In this one valley, where the life of the town goes most busily forward, there may be seen, shown one above and behind another by the accidents of the ground, buildings in almost every style upon the globe. Egyptian and Greek temples, Venetian palaces, and Gothic spires, are huddled one over another in a most admired disorder, while, above all, the brute mass of the castle and the summit of Arthur's Seat look down upon these imitations with a becoming dignity, as the works of nature may look down upon the monuments of art. * * *

"The ancient and famous metropolis of the north sits overlooking a windy estuary from the slope and summit of three hills. No situation could be more commanding

for the head city of a kingdom; none better chosen for noble prospects. From her tall precipice and terraced gardens she looks far and wide on the sea and broad champaigns. To the east you may catch at sunset the spark of the May lighthouse, where the Firth expands into the German Ocean, and away to the west, over all the carse of Stirling, you can see the first snows upon Ben Ledi.

"But Edinburgh pays cruelly for her high seat in one of the vilest climates under heaven. She is liable to be beaten upon by all the winds that blow, to be drenched with rain, to be buried in cold sea fogs out of the east, and powdered with the snow as it comes flying southward from the Highland hills. The weather is raw and boisterous in winter, shifty and ungenial in summer, and a downright meteorological purgatory in the spring. The delicate die early, and I, as a survivor, among bleak winds and plumping rain, have been sometimes tempted to envy them their fate. For all who love shelter and the blessings of the sun, who hate dark weather and perpetual tilting against squalls, there could scarcely be found a more unhomely and harassing place of residence. Many such aspire angrily after the somewhere-else of the imagination, where all troubles are supposed to end. They lean over the great bridge which joins the new town with the old—that windiest spot or high altar in this northern temple of the winds—and watch the trains smoking out from under them and vanishing into the tunnel on a voyage to brighter skies. Happy the passengers who shake off the dust of Edinburgh and have heard for the last time the cry of the east wind among her chimney tops. And yet the place establishes an interest in people's hearts. Go where they will, they find no city of the same distinction. Go where they will, they take a pride in their old home. * * *

"The Old Town occupies a sloping ridge or tail of diluvial matter, protected, in some subsidence of the waters, by the castle cliffs which fortify it to the west. On the one side of it and the other the new towns of the south and of the north occupy their lower, broader, and more gentle hilltops. Thus, the quarter of the castle overtops the whole city and keeps an open view to sea and land. It dominates for miles on every side, and people on the decks of ships, or plowing in quiet country places over in Fife, can see the banner on the castle battlements and the smoke of the Old Town blowing abroad over the subjacent country. A city that is set upon a hill. It was, I suppose, from this distant aspect that she got her nickname of Auld Reekie. Perhaps it was given her by people who had never crossed her doors. Day after day, from their various rustic Pisgahs, they had seen the pile of building on the hilltop and the long plume of smoke over the plain; so it appeared to them; so it had appeared to their fathers tilling the same field; and as that was all they knew of the place, it could be all expressed in these two words. * * *

"It was Queen Mary who threw open the gardens of the Grey Friars, a new and semirural cemetery in those days, although it has grown an antiquity in its turn and been superseded by half a dozen others. The friars must have had a pleasant time on summer evenings, for their gardens were situated to a wish, with the tall castle and the tallest of the castle crags in front. Even now it is one of our famous Edinburgh points of view, and strangers are led thither to see, by yet another instance, how strangely the city lies upon her hills. The inclosure is of an irregular shape; the double church of Old and New Grey Friars stands on the level at the top; a few thorns are dotted here and there, and the ground falls by terrace and steep slope toward the north. The open shows many slabs and table tombstones, and all around the margin the place is girt by an array of aristocratic mausoleums appallingly adorned. * * *

"It was here, on the flat tombstones, that the covenant was signed by an enthusiastic people. In the long arm of the churchyard that extends to Lauriston the prisoners from Bothwell Bridge—fed on bread and water and guarded, life for life, by vigilant marksmen—lay five months looking for the scaffold or the plantations. And while the good work was going forward in the Grass Market, idlers in Grey Friars might have heard the throb of the military drums that drowned the voices of the martyrs. Nor is this all, for down in the corner farthest from St. George there

stands a monument dedicated, in uncouth covenanting verse, to all who lost their lives in that contention. There is no moorsman shot in a snow shower beside Irongray or Co'monell; there is not one of the two hundred who were drowned off the Orkneys; nor so much as a poor, overdriven covenanting slave in the American plantations, but can lay claim to a share in that memorial, and, if such things interest just men among the shades, can boast he has a monument on earth as well as Julius Cæsar or the Pharaohs."

II.

The summer school.—The character of the Edinburgh Summer School, to which I early made my way on the hilltop of Old Town, is best illustrated by its historic development. The work began in the month of August, 1887, with courses in seaside zoology in the medical school at Edinburgh, and Mr. G. F. Scott-Elliott, the African traveler and a demonstrator of botany in the university. The first zoological course was given at the Granton Marine Station, and doubtless resembled those summer courses conducted by Professor Agassiz at Penekese Island in 1873–74, and later by other teachers at Woods Holl, where some of the best American naturalists have been trained to habits of original observation and the drawing of marine life. The first botanical course was held at the Royal Botanic Garden in the outskirts of Edinburgh, where the wealth of flora in the various conservatories and plantations is only surpassed by the natural beauty of the park and the woodland walks, which every tourist should see.

In the summer of 1888 botanical and zoological courses were united at Granton, a charming seaside resort near Edinburgh. Mr. Scott-Elliott had now gone abroad, and his place was taken by Prof. Patrick Geddes, a trained biologist and botanist, who now lectures at the University of Dundee, but resides in Edinburgh. Mr. J. Arthur Thomson continued to lecture in the summer school, and Mr. Andrew Herbertson, one of Professor Geddes's favorite students, early lent assistance as a demonstrator in botany and as an adjunct and promoter of the school. Gradually the courses in botany and zoology were doubled and the plan of instruction was adapted to the needs of more advanced as well as of elementary students. Mr. R. Turnbull, lecturer on botany in the school of medicine for women, joined the summer staff, as did Mr. E. Fothergill and others, including a lady demonstrator.

In the summer of 1888 special attention was paid to the theory of evolution, and since that time evolutionary doctrines have been conspicuous in various courses of summer lectures. Professor Geddes, the practical founder and chief promoter of the Edinburgh school, is himself a pronounced evolutionist, and is joint author with his colleague, Mr. J. Arthur Thomson, of a remarkable book on the Evolution of Sex, published by Scribner & Welford, 1890, in the Contemporary Science Series.

The Edinburgh summer school advanced gradually from a study of nature to the study of man and society. Professor Geddes is one of the few professional biologists who have sought to associate biology and sociology, natural history and social science. Auguste Comte and Herbert Spencer early attempted to treat the development of society and human institutions as parts of a great organic process and to show that nature and history are really one. Professor Geddes has succeeded in introducing this idea into practical pedagogics in a variety of interesting and suggestive ways. He has encouraged in the study of civil history and social science the same observational and experimental methods which have long characterized the study of natural history, geology, and botany. He has taught his students in the summer school at Edinburgh to go with him into the open fields and to use their own eyes; to discover historic and scientific truth in the environment of a great city or a fishing village. Under his instructive guidance the familiar sights and scenes of Scotland become instinct with meaning. His interpretation gives new vitality to the commonplace facts of everyday life. To him a game of golf on the links of St. Andrews affords materials for Scotch history.

According to Professor Geddes's system of teaching, every man becomes his own historian and sociologist. He learns to observe facts and conditions as they have

been and actually are. He interprets both the past and the present, which flow into each other and are really one. The sociological explanation of history is, after all, the truest philosophy of history. Every keen observer of social conditions can become a philosopher and a sociologist.

In a pamphlet published in 1890 on Experimental Studies in Higher Education, containing an account of the "Summer school of science" and "Vacation science courses at Edinburgh," Professor Geddes said: "The courses correspond broadly to those of the 'Teachers' retreat,' held annually in connection with the University Summer Gathering at Chautauqua, United States of America, and with the classes for special study which have similarly followed the summer gathering at Oxford for the past two years. They were, in fact, largely undertaken in the view of preparation for, and ultimate association with, similar university gatherings at Edinburgh. * * * The classes are attended by persons of both sexes, of all ages, and various occupations, including not only teachers, and students of the universities and of University Extension courses, but by many others whose interest in science has been otherwise aroused."

The Edinburgh Summer School was clearly the historic outgrowth of the University Extension movement and of the summer school examples first set by Chautauqua and by Professor Agassiz. But there was a bold attempt made at Edinburgh to utilize the regional environment for historical and social as well as for scientific purposes. Professor Geddes returned, as it were, to nature for the illustration of all the sciences. His work began at a time when representatives of the English academic world were beginning to revolt from what Jevons called "the degrading rite of examinations."

Professor Geddes says of the Edinburgh experiment: "The teaching is based upon personal observation and interpretation of actual facts, which the lectures systematize and extend; and, as far as possible, the lectures accompany or follow the practical work and excursions, instead of preceding them. Bookwork and the taking of detailed lecture notes may be dispensed with, but the student is assisted to keep a record of laboratory work and of other personal observations; and he is invited to take part in the preparation of the summaries and diagrams, which are distributed, as nearly as possible, daily. It is found that these conditions, together with the inquiry and discussion to which they give rise, furnish not only an incentive to work, but, if need be, a sufficient test of individual progress. As regards the matter of study, the first object of these courses has been to furnish an adequate introduction to the study of the natural sciences, and this in a way more consistently physiological and evolutionary than that of examination programmes, which are inevitably precluded from entering those fields of actual discussion and contemporary research upon which the living interest in a science so much depends. In brief, to awaken or increase an intelligent interest in a science, and to help to vivify study and teaching alike in school or college—these have hitherto been the primary objects."

Municipal hygiene.—Among lectures illustrating the municipal environment of Edinburgh, past and present, I heard a series on civics and hygiene by city engineers and medical experts. Some curious facts were stated regarding the gradual evolution of a proper care for the public health of Edinburgh, the Athens of the North. It gives the student of historical sociology a startling idea of mediæval city life to learn that there was no street cleaning in Edinburgh before the time of the Reformation. A kitchen midden or refuse heap stood before every front door, just as I have seen in my Heidelberg student rambles in some of the little villages of the Odenwald and Black Forest in South Germany.

Scotch farmers were among the first city scavengers. They bought and carried off city compost heaps for fertilizers. Street cleaning was first undertaken by citizens for self-preservation and then by contractors, but finally by the city itself. Before the town began to take care of its streets and its public health Edinburgh was visited with a succession of plagues in consequence of its dirty condition and

bad sanitation. The last visitation of the pestilence was in 1645. In Leith, the port of Edinburgh, one-half of the population died of the plague. In all cases of infectious diseases isolation of the patient was the rule. An apartment where a person had died of the plague was abandoned. Leper hospitals once existed in Edinburgh. Poor lepers were allowed to beg at the doorway, but not to walk abroad. A gibbet stood before the door of lazar houses to remind inmates of the penalty for leaving the premises.

The water supply of Edinburgh, down to the seventeenth century, was from wells and springs, often the source of fever and other diseases. It took the conservative townsmen sixty years to introduce water from the country in pipes. For many generations of city life fresh water was carried upstairs in all the high houses of Edinburgh, and the foul water was thrown out of the upper windows into the streets below. For centuries the streets of Edinburgh were open sewers, but luckily the land slopes downward on three sides of the city.

Scarcity of water in Edinburgh houses led, of course, to great neglect of personal cleanliness. The only opportunities for a good bath were at the seaside or in the Firth of Forth in warm weather. No wonder that Sam Johnson used to call Edinburgh a very dirty place. There was, moreover, dense overcrowding, particularly of Old Town, High street, and Canongate down to our own times. From 1830 to 1860 Edinburgh suffered various epidemics of cholera, smallpox, typhoid fever, etc. It was not until 1864 that the clearing away of the slums began. Then it was that many dark and dismal courts were first opened to sunlight and to the circulation of fresh air. More open spaces were secured by the removal of old tenements. Better care began to be taken of the public health. The death rate dropped from over 26 in a thousand residents to less than 16.

New geography.—One of the most distinctive features of the Edinburgh summer meetings is the attention given to the new geography. This is to be distinguished from the old geography, which most adult Americans were taught in their youth, as life is distinguished from death. The old system was as arid as the desert of Sahara. The new geography is as fresh and vitalizing as a Scotch landscape. It makes all the difference in the world whether or not the earth is studied in relation to man and nature. Geography is not a matter of names and places. It is the scene of human history. It is more than a mere shell of the earth's surface. It is a part of cosmos still in process of evolution.

Some idea of the scope and beauty, the local and universal interest, of the new geography may be derived from the following syllabi, representing two courses, of ten lectures each, given by my friend Mr. Andrew J. Herbertson, Fellow of the Royal Geographical Society, who secured for me the first good relief map I ever saw of Scotland:

GEOGRAPHY.—I. The area of the Firth of Forth—Typical studies in local geography. Ten lectures by Andrew J. Herbertson, F.R.G.S., research scholar, University of Edinburgh. First fortnight (August 6 to 17)—10 to 11 daily.

I. The region around Edinburgh—Descriptive and physical geography.—(1) The view from Edinburgh Castle considered geographically; observations; records; interpretations. (2) The ground mass of the Lothians and southern Fife; configuration; constitution; interpretation. (3) The waters in the Firth of Forth basin; course; composition; properties. (4) The atmosphere of east central Scotland; the processes of meteorology. (5) The plants and animals in and around the Firth of Forth; the relations of organisms to their environment.

II. The forces at work in the Edinburgh district—Physiological and economical geography.—(6) The climate of east central Scotland; its influence on the country physically and economically. (7) The waters and their work; physical action; fisheries; influence in industry and commerce; water supply; pollution. (8) The riches of the rocks; the products of the soil. (9) The people of the district; organization; internal activities. (10) The relations of the Forth area to the world outside; economic; intellectual; æsthetic.

II. The earth, past and present—An outline of geographic methods and principles.—Ten lectures by A. J. Herbertson. Second fortnight (August 20 to 31)—10 to 11 daily.

III. The evolution of our world.—(11) The origin and development of the solar system; theories old and new. (12) Birth and growth of our globe in the solar system; relations to sun, moon, and planets. (13) The solidifying earth. (14) Phases of geological history. (15) Old World climates; geological chronology. (15) The coming and going of plants and animals.

IV. The world to-day—A study of modern maps.—(16) Development of geography; the story of map making and its relation to discovery; varieties of modern maps. (17) Orographical and hydrographical maps; a study of the distribution of land and water. (18) Meteorological and climatological maps; studies in atmospheric distribution. (19) Botanical and zoological maps; the distribution of plants and animals. (20) Ethnographical and demographical maps; the distribution of man and his industries.

The writer attended in Edinburgh a delightful course on the "History of rivers and river civilizations," by that great master of geographical science, Elisée Reclus, author of the Géographie Universelle. The course was given in the French language to a sympathetic audience of students and teachers, men and women, who frequently testified by their applause to the marvelous insight of a man of genius into the creative processes of nature and the formation of rivers, which first made possible the civilization of the world. It is impossible in this connection to reproduce the living words of the master, but the following syllabus, printed in French, exactly as it appeared in the Edinburgh programme, will serve at least to give a synopsis of that wonderfully instructive course:

GEOGRAPHY AND GEOLOGY.—I. L'histoire des fleuves et des civilisations fluviales. Four lectures, August 24, 25, 27, 28, 11-12 a. m., by M. Elisée Reclus, author of "Géographie Universelle."

I. Genèse des fleuves: Neiges, glaces, pluies. Sources, Ouadi—Fleuves, êtres géographiques variant avec les pluies de l'atmosphère, la forme du relief et les contours du bassin—Régularisation du lit. Escaliers de lacs—Balancement des fleuves. Réciprocité des anses—Embouchures fluviales, les fleuves et la mer.

II. Les fleuves aux temps préhistoriques: Barrière, la séparation entre les peuplades—"Chemins qui marchent" incitant aux migrations—Voies historiques naturelles—Commencements de la navigation—Commencements de l'agriculture.

III. Les fleuves pendant l'histoire: Les fleuves et l'agriculture—Les fleuves et les villes—Les fleuves et les empires.

IV. Les fleuves dans la période actuelle: La canalisation—Les irrigations—Les rectifications des lits—Les endiguements, les levées et les crevasses—Les ports de rivières—Les embouchures—La beauté de la nature—Les ingénieurs et les artistes.

One evening at Edinburgh the writer attended a geographical conference conducted by Mr. Herbertson. The principles of the new geography were clearly and succinctly presented, and then followed a critique of certain maps and atlases and a comparison with those of more scientific value. The lecturer recommended the consultation of published charts of the Edinburgh Geographical Institute and the frequent use of a convenient hand atlas like the so-called Shilling Atlas.

There was some discussion of the subject of relief maps and of French and American plans of constructing, on a large scale outdoors, physical representations of a whole country like France or the United States. The writer described the excellent relief map of Ireland now to be seen in the museum at Dublin, and also the stone and turf map of Palestine built on the shore of Lake Chautauqua, according to the English ordinance surveys of the Holy Land. M. Reclus was interested in both of these reported examples of relief-map making, and laid great stress upon illustrating the curvature of the earth in large physical charts and outdoor

representations of the earth's surface. One of the chief lessons of all history and geography is that the world is round and mankind is one.

Geographical excursions.—The geographical excursions, under the guidance of Scotch experts like Professor Geddes, Mr. Herbertson, and Mr. Marr, are among the most instructive and delightful experiences enjoyed by the Edinburgh Summer School. The object of the excursion was "to familiarize students with the relation between the physical features of a district and its history, economic and political." In August, 1896, afternoon excursions were made to the following interesting historic places, all combining human events with Scotch geography in the most approved way:

(1) Roslin castle and chapel and a walk of 2 miles through lovely Hawthornden.

(2) The old kingdom of Fife. The students went by train to Anstruther; thence on foot along the coast to Pittenweem, where historic caves were visited; thence to St. Monans to see an ancient church. Proceeding from Elie by train to Largo, the party sought out the birthplace of "Robinson Crusoe" (Alexander Selkirk).

(3) Linlithgow. A visit to the old palace where Mary, Queen of Scots, was born.

(4) The country of King Arthur. This is reached by train via Glasgow to the castle rock of Dumbarton, where Arthur fought the Saxons. From Dumbarton, the capital of the British kingdom of Strathclyde, students could reach the head of Loch Lomond by train, take a steamer down the loch, and see much of the Rob Roy country.

(5) Dunfermline Abbey, the tomb of Scottish kings. Here is the shrine of early Scotland. Here are the ruins of a famous monastery and a royal palace, the tower of Malcolm Canmore, and the cave of Queen Margaret.

(6) Melrose and the Tweed Valley. Imagine an historical pilgrimage to Melrose Abbey by daylight, a walk along the Tweed to Dryburgh Abbey, and then a return by Tweedside past Melrose again to Abbotsford, the home of Sir Walter Scott. On such ground history is transformed into poetry and romance. Geography becomes a thing of scenic beauty.

(7) Stirling and the Forth Valley. In one day a visit to Stirling Castle, the field of Bannockburn; a drive over the Ochil Hills to Sheriffmuir (scene of the battle in 1715, at the time of the Jacobite rising), and a view of the old Roman camp at Ardoch. A wide range of Scottish history was thus reviewed in one day's geographical outing.

(8) A two weeks' tour through Scotland was suggested by the managers of the Edinburgh Summer School after the close of the lectures. This itinerary was followed out in more or less detail by individuals from various countries: From Edinburgh to Glasgow; then through some of the finest scenery in Scotland, along the line of the West Highland Railway to Fort William, where Nevis can be ascended and various lochs explored; thence by the Caledonian Canal to Inverness, in the northeast of Scotland; thence by rail to Nairn (one of the most charming summer resorts); on to Elgin and the old university towns of Aberdeen and Dundee, to St. Andrews (with its cathedral and other historic landmarks, to say nothing of its golf links by the sea), and thus back to Edinburgh across the Firth of Forth.

MUSICAL RECITALS.

Music has not been neglected at the Edinburgh summer meetings. Almost every year a series of evening recitals has been given in Odd Fellows' Hall, Forrest Road, for the benefit of visitors and townspeople. A series of four weekly concerts costs only five shillings to outsiders, and is entirely free to students holding tickets for the summer course of lectures. Efforts have been made in successive seasons to offer programmes illustrating different national schools of music, such as the French, German, Hungarian, Slavonic, Scandinavian, and British. The concerts were accompanied with brief historical lectures or explanatory remarks, so that the evening entertainments might have a real educational value. The printed programmes themselves contain instructive notes and comments, thus forming a kind of musical syllabus. As everywhere in England, so in Scotland, programmes are not given away,

but sold for a penny. The concert goer appreciates what he has paid for, and preserves his programme for reference or exhibition at home. Popular music in England and Scotland is not as highly developed as in Germany, but it is steadily acquiring more educational value. The musical recitals of Edinburgh are much above the level of some of the concerts which the writer attended in England; but there is a vast field for musical development in all English-speaking countries before they can rival the popular concerts of Germany.

Edinburgh summer meeting, 1897.[1]—The following notes on the Edinburgh summer meeting in August, 1897, appeared in the Daily Chronicle, London, September 25 of that year, under the title of "A sociologist's holiday:"

Summer meetings in connection with the University Extension movement are now so generally known that almost everyone has heard of, if not actually attended, the gatherings at Oxford or Cambridge. The Edinburgh summer meeting, which is just over, though an older institution, is not nearly so well known or so largely attended as the others, not being connected with any organization of University Extension work during the winter months, and having no means of gaining recruits such as are afforded by the autumn and spring courses of lectures at Oxford or Cambridge centers. Its beginning was very simple. Eleven years ago a few students met during August for courses of seaside zoology and garden botany. The next year a course of lectures on evolution was added; then other courses on the social sciences. This origin has given it a character different from that of the other summer meetings. In Oxford, for example, the interest is mainly historical, although the educational side is becoming more prominent; in Edinburgh the study of social and economic questions strikes one as predominating, and all the other lines—historical, scientific, educational, and artistic—lead up to or spring out of this. In Oxford one is taken to see the old colleges and churches which illustrate the historical lectures on the period being studied; in Edinburgh the lectures all have reference to the people, places, and conditions among which one is actually living. In fact, the meeting has been from the first an educational experiment with a definite aim—the connection of the natural and social sciences.

The illustration of this aim that most naturally rises in the mind is the Outlook Tower—the headquarters and central point of the meeting. The ground floor, where one enters, is hung with maps showing in brief the history of the discovery of the world and the chief geographical facts of production. As one mounts from story to story maps and diagrams and photographs bring one, through narrowing stages, to the Scotland and Edinburgh of the past and present. At the top of all is a camera obscura, in which one sees the moving life of to-day. Descending again from floor to floor, one begins to realize that the tower is an embodiment of the aim of the whole meeting, with its lectures and excursions—to start from the life of the present city and its surroundings, and so pass out in widening circles to the study of the world; and again to bring the accumulated knowledge of the past to bear upon the actions and aims of to-day. The Outlook Tower stands midway between the castle and the Lawnmarket, and from the roof one sees old and new Edinburgh at one's feet—the soldiers at drill on the castle esplanade just below, and all the busy city life around.

[1] I am indebted to the Citizen, June, 1897, for the following programme of the eleventh summer meeting, held at University Hall, Edinburgh, from August 2 to 28, in 1897: "Contemporary social evolution in the East, the evolution of war and peace," Professor Geddes; "The historical evolution of the Turkish people," ten lectures, Mr. Victor B. Branford, M. A.; "The structure of society," Prof. Charles Zueblin, Chicago; "The study of comparative literature," five lectures, Dr. John G. Robertson; "The philosophy of Fröbel in its educational bearing," five lectures, Miss Glidden, Pratt Institute, Brooklyn; "The evolution of Scottish scenery," ten lectures, Mr. J. G. Goodchild; "Places and people in Scotland," ten lectures, Mr. T. R. Marr; "Map making and map reading," five lessons, Mr. A. J. Herbertson; "Relief modeling for teachers," five lessons, Mr. George Guyou; "The geology of the basin of the Forth," ten lessons in the field, Mr. J. G. Goodchild. Classes in the botany and zoology of the Forth district were arranged. The studio of the old Edinburgh School of Art was open to students of fine art during the meeting, under the direction of Miss Helen Hay. Musical recitals and popular evening lectures were arranged during the course of the meeting.

The social and economic lectures, and above all Professor Geddes's course of lectures on "The evolution of war and peace," sent one to look at this scene, as it were, with fresh eyes. We are taught to see the economic basis of war and peace and their works, whether in the East or West, in Armenia as in Scotland. Around the city lie the hills, Arthur's Seat, the Pentlands, and the mountains of Fife rising across the Forth. These form the text of the course of geological lectures on "The rivers, mountains, and seacoast of Scotland" and the scenes of the afternoon geological excursions. Besides these, two general excursions were planned in each week to localities abounding in historical, geographical, antiquarian, and economic interest, for which our preparation was the course of lectures on "Places and people in Scotland" and the shorter descriptions given on the spot; and for illustrations nearer still, walks through old Edinburgh were arranged, which were full of historical interest, and also brought home vividly some aspects of the social and industrial problems of the present and the thought and effort now being given toward their solution. In addition to these there were also biological and botanical walks, specially intended for those engaged in teaching. In all these exp ditions lies a large part of the social charm of the summer meeting. One finds friends so easily and naturally; and in the contact with the cultivated foreigners who form a large element of the gathering many prejudices, whether insular or continental, have a good chance of getting rubbed off.

One striking feature of the meeting is the warm-hearted kindness and hospitality shown to all the students by the lecturers. The smaller number of the students itself makes more intercourse possible, and it must surely be the common feeling that was expressed by one who said, "One comes a stranger, and finds friends everywhere."

A word in conclusion as to the arrangements made for students, and as to cost. Some of the houses of University Hall are given up for their residence, board and lodging being 25s. a week. The fees for the lectures are £3 3s. for the month; £1 11s. 6d. for either fortnight, or 7s. 6d. for each course of lectures; and so far the meeting has been held each year during August, as in Oxford and Cambridge. Anyone, therefore, whether a teacher or not, who wishes for a pleasant and by no means costly holiday in Scotland can combine a good deal of "sight-seeing" with mental stimulus by attending the Edinburgh summer meeting.

AN OXFORD SUMMER MEETING.

By Frederick Robertson Jones, Ph. D. (J. H. U.).

To the observant visitor at Oxford during the summer meeting of University Extension students in 1897 one question persistently presented itself: What has brought this great company of men and women together in the "city of the dreaming spires?" I may be considered by some rather a sour critic and by others one of those "sneering prophets, endeavoring to crush the spirit out of a new movement that tends to give the great mass of the people the benefits given of old, almost wholly to the sneerer's own cost." Yet I shall take this risk, and I shall state the answer to the above question as it was pressed upon me after a month's residence there among those self-same students.

It is my earnest conviction that of the 900 or more men and women (largely the latter) who were enrolled at Oxford as students of the summer meeting very few would have been there had the place been other than it was. Even time-honored Cambridge, with her fairy-land "Backs" and incomparable King's College Chapel, the one rival of Oxford, has never been able to attract near so large a number. The number this year at Oxford was considerably in excess of the number last year, when the meeting was held at Cambridge. Some may urge that this difference is due to a more conservative policy on the part of Cambridge in the arrangement of courses and in the method of study following. There is a certain amount of truth in this explanation. Cambridge is more conservative in her University Extension and summer meeting methods. A severer, more university-like course of study has the tendency of keeping away a certain class of pleasure seekers who would attend if the course were of a lighter character. But I do not think this explanation reveals the whole truth, and even if it did, it would still strengthen my point of view. For if men and women are kept away on account of a stiff course, it is because either

they do not consider themselves equal to the task or because they prefer the pleasures and associations of the place to the close following of a series of rather dry, though well thought out, lectures. Whichever reason they have, it practically amounts to the same thing—the choice of the pleasures and pleasant associations afforded by the place in preference to the unalloyed intellectual work of the summer meeting. And I must confess I admire visitors for their choice. To my mind it is a wise one. Of course there are people who would prefer the lectures to everything else; who would shut their eyes to all the pleasures and beautiful things around them. But such people are very few and found among the middle classes (who largely make up the lists of summer meetings) in a less proportion than among other classes. These lecture fiends may be considered abnormal. The more reasonable explanation of the difference in the number of students attending the summer meetings at Oxford and at Cambridge is that the former is the more attractive place. To the unprejudiced foreign visitor to these university towns Cambridge is almost a disappointment after Oxford, with her domes and towers, has been visited. Even great London, with its enormous population and various attractions, will probably not be able, in 1898, when the summer meeting is held there, to attract the numbers who eagerly flocked to Oxford.

Historic associations.—To the careful observer, nothing could be more evident than that it is not the lectures, excellent though they may be, that draw the majority of the people to Oxford at the time of the summer meetings, but it is Oxford, historic old Oxford herself. The majority of these students frankly acknowledge it; those who do not confess, betray themselves in their attitude toward the lectures after the novelty has worn off, and in their happy, laughing faces, flushed by a row upon the Cherwell, or brightened by memory pictures of dreamy, fairy-like gardens and beautiful, elm-canopied walks. There is no town in all England within which is found a richer store of tradition, sentiment, and historic association. The quiet, romantic, spirit-moving influence of the natural beauty of Oxford intoxicates everyone who visits her. You are drawn toward her, and must be moved. You can not remain passive; you must love her, as you yield yourself to her subtle charms.

Some of Oxford's sons have professed to despise her. But with the summer-meeting students there is only the passion of love. "Time-honored, peaceful, picturesque Oxford, which to know is to love, and to leave is to regret." If you doubt the influence of the town upon the average University Extension student, learn the impression made by the holder of a local summer-meeting scholarship: "What a revelation is the University Extension student's first visit to an Oxford summer meeting! The glorious old city herself, with her marvelous wealth of spires and towers, her stately buildings and venerable colleges, her quiet quadrangles and spacious gardens, so rich in memories of the past, would transport one in spirit to the Middle Ages were it not for the ubiquitous bicycle, the rumbling trains, and the fiendish steam roller, which forcibly remind one that civilization has not yet attained its ideal, at least, not in concrete and outward form." I select another quotation, this time from the holder of the Cambridge scholarship: "For many this was a first visit to Oxford, and to them the glorious weather with which the meeting opened showed in her fullest beauty this 'sweet city with her dreaming spires.' The quiet quadrangles with their beautiful and quaint buildings whispering to our enchanted ears tell tales of the Middle Ages, the lovely gardens bathed in golden sunshine, the shady avenues and river walls, with glimpses at every turn of towers and pinnacles and domes, outlined against cloudless blue skies, are pictures that will long remain with us."

Surely there is no city in the world, at least for an Englishman, with such sacred memories and such stirring associations as Oxford. It does not require any unusual amount of insight to discover what impresses the summer student most. If the holders of the summer meeting scholarships, who ought to be most enthusiastic for the lectures, betray so ingenuously what is uppermost in their minds, what are we to expect from the average student? I am not urging a case against summer meetings, but rather for them. The fact that the students take away more of Oxford than they do of lectures does no discredit to the lecturers or the lectures. The lectures are, on the whole, fairly good. The intellectual feast is set; let those who so desire partake to the extent of their several appetites. If some choose to have little or nothing of formal lectures it is because we prefer the lessons nature and history are teaching us upon every hand. All Oxford is a course of lectures. There are historical lectures in the very stones of the beautiful buildings and monuments; ethical lectures in those quiet gardens and shaded walks; art lectures in those quiet gardens and shaded walks; art lectures in those towers and spires. Those students who prefer Oxford, her pleasures and associations, to discourses upon "Hegel," "Faust," or "The Poor Law of 1834" are not wholly to be condemned, for even the most careless can hardly escape the subtle influence of an academic city like Oxford. Whenever you see her she is interesting, instructive, and beautiful.

Walk down the "High," that unrivaled street which a certain great art critic pronounced the most beautiful in all Europe, "with St. Mary's steeple looking down upon you, past the pinnacles of All Souls, and the barbaric splendor of Queen's, and the solid majesty of University, and at the end of the pleasant Cherwell and Magdalen's matchless towers;" thence along the shady walks of Addison and Broad, to Christ Church College Chapel, the Cathedral, and you have seen one of the most beautiful sights it will be your pleasure to see in a lifetime. Continue your walks through Carfax and down the "Corn" to Broad, past the spot where Cranmer, Latimer, and Ridley were burned, or to the old Ashmolean, the Sheldonian Theater, and the Clarendon—wherever you go or turn you are struck with the solemn grandeur of these monuments of stone. You can not see Oxford in a day, a week, or even a month; but, at least, at the end of a summer meeting you will probably have better impressions of the twenty-one colleges and two halls than did Mr. Verdant Green, better even than the muddled memories of an ordinary summer tourist.

The town.—Let us inquire into the history of this old university town, which has such a subtle effect upon all who pass a night within her limits. In fact, the secret of this subtle influence is the traditions and the historical associations that cluster around her ancient walls. Antiquity imprints itself upon the mind of the visitor to Oxford. It is not a crumbling, dead antiquity, but a live, vigorous old age; having the beauty and strength of youth but preserving the conservatism and experience-bred wisdom of maturity. Yet, one's eyes deceive him, for, comparatively speaking, Oxford is not old, not one of the most ancient of English towns. Yet she "shows more legibly than the rest the handwriting, as it were, of many generations." As the limbs of a tree tell us something of its history, so the buildings of Oxford are representative of the historic periods through which she has passed. "Most old towns," says Andrew Lang in his admirable book on Oxford, "are like palimpsests, parchments which have been scrawled over, again and again, by their successive owners. And how truly this can be said of Oxford! The life of England for some eight centuries may be traced in her buildings."

There seems to be no reason to doubt that the town of Oxford can claim an antiquity of at least a thousand years. The story of St. Frideswyde, though itself a legend, found in documents of a comparatively late date, seems, according to Wells, to embody an historic fact. Round the shrine of Frideswyde grew up Oxford—a town of importance long before it was the home of a university. Its position gave it importance, "lying, as its name implies, where cattle drovers could cross the river and mount the low slope of a gravel spit" between the Thames and the Cherwell. In 912 is the first notice of the name Oxford. At that time King Edward the Elder incorporated with his kingdom of Mercia lands on either side of Watling street and took, according to the Anglo-Saxon Chronicle, "Lundenbyry and Oxnalford, and all the lands that were obedient thereto." A careful and detailed account of Oxford is given in Domesday Book, compiled in 1186 A. D., but mention is not made of the existence of the university.

The university.—To the question, When did the history of the University of Oxford begin? no definite answer can be given. Its beginnings are buried in a profound obscurity, and must be relegated to the region of things unknown. Yet this much seems to have an element of truth in it—that around the foundation of St. Frideswyde, the germ of the cathedral and of Christ Church College, there gathered a settlement of wooden houses, from which arose in aftertimes the town. Out of the schools which were attached to the same foundation there developed by slow degrees the historic university. It owed its existence to the church. What brought students to Oxford no one is able to say; but one fact seems reasonably certain, that there were "schools" in Oxford as early as the first part of the twelfth century. Furthermore, students were probably attracted there by the palace of the scholar-king, Henry I (Beauclerc). There are frequent references to Oxford students during the reign of Henry II. During that monarch's quarrel with Becket there is no doubt but that there was a decided migration of students from Paris to Oxford. In the year 1187, at the very end of the reign of Henry II, there is definite evidence that the university was in existence. Giraldus Cambrensis records how he lectured in Oxford in that year. He had lately written his "Topographia Hiberniæ" (1185), and "being desirous not to hide his light under a bushel, but to place it on a candlestick so that it might give light," he resolved to read his learned work at Oxford, "where the clergy of England chiefly flourish and excel in clerkship." The reading lasted three days, and was for the benefit, first, of the poor of the town, then of the doctors of the different faculties, and, lastly, the rest of the scholars. It appears that before the end of the reign of Henry II Oxford was a great student center, where faculties were arranged and degrees mentioned.

Oxford has always been conservative. In disputes between the people and their kings, with a few notable exceptions, she has been found upon the side of the sovereign. Yet throughout her whole history she presents many anomalies. Intimately connected with the church and owing her existence to it, she was by no

means included in the church organization, and, in fact, even without it, and in some cases in direct rebellion to its demands. "It has been the mainstay of orthodoxy, and yet also the chosen haunts of heresy. A firm supporter of the Roman Church and in turn the English Church, yet she gave birth to Wycliffe and Lollardism, and Wesley and Methodism." Firmly rooted in her faith, yet she produced Gibbon and Shelley. "Free thought on most sacred subjects—proscribed elsewhere—flourished here." Her influence was greatest when her destinies were managed by the heretic Wycliffe and his persecuted followers. Says Henson, "If Oxford must yield in point of antiquity to Bologna and in that of cosmopolitan influence to Paris, yet it may claim to be more truly national than either. Of English institutions there are few that have entered so deeply into the national life as the University of Oxford. For centuries past it has mirrored that life, alike in greatness and shame, in faith and sin, with unvarying fidelity. To Englishmen, then, the history of the university must always be interesting," and I may add with equal truth, to Americans.

In the contest against Henry III the students of Oxford were on the side of liberty, and on one occasion that king found them so troublesome that he threatened to hang them all, and was with great difficulty persuaded from doing so. The new learning was at first warmly received in Oxford, but conservatism got the upper hand and the movement passed from Oxford to Cambridge under Cranmer. During the civil strife of the seventeenth century Oxford was Jacobean.

Summer lectures.—With such historical associations is there any wonder that English people and Americans go to Oxford during the summer meeting, when the university authorities throw wide open the doors of the institution? I met some old-fashioned university students who believed in the "sacred solitude of Oxford during the 'Long'" who sneered at the presumptuous outsiders who tried to create a little term of their own during the absence of the regular university inhabitants. But truly a sneer is not the proper comment even on those who go there for a holiday, and surely not on those who go there to get knowledge and to work faithfully during that stay. Even in the case of the mere visitor enjoyment is tinctured by some intellectuality. There is a certain amount of intellectual ozone in the atmosphere that even the most frivolous unconsciously breathe; and who will deny that even the most careless is strongly influenced by the historic associations of the place?

Much of the adverse sentiment and hostile criticism to these summer meetings arise from the mistaken notion of what they attempt to do. These mistaken views, I am led to believe, are held chiefly by overzealous supporters, and are circulated by too enthusiastic, sensational, or badly informed newspapers. Our own newspapers are often accused by our English critics of being sensational and "jingoistic," and I sincerely believe the charge is deserved. Yet we are not the only sinners in this respect; even some of the best English metropolitan dailies err grossly. Read what one of them says about the Oxford summer meeting: "There is something peculiarly gratifying about this year's summer meeting in Oxford of the university-extension students. One is thoroughly convinced that this is a real university course in miniature. Here for a few pounds one may spend a fortnight under the tuition of our most esteemed teachers at the very season when the fairest of our cities is seen in her glory. The work of a term may be compressed into the space of a week, and what the student loses by lack of leisure for meditation he gains in an immediate survey of the whole scheme of such subjects as he is studying, and the details of which he may spend the winter months in mastering." "A real university course in miniature!" "The work of a term may be compressed into the space of a week!" It is expressions like these, uttered by friends or foes, that do the movement harm. The aims of the summer meeting are modest, and the hopes of its most active supporters are not excited. The meeting was, however, a success, even from the point of view of mere lectures.

The meeting, as in previous years, was divided into two parts—the first lasting from July 31 to August 11; the second from August 11 to August 25. The main sequence of lectures was "The history, literature, art, and economics of the revolutionary epoch, 1789-1848." This course was a continuation of those given at the summer meetings of 1891, 1892, 1894, and 1895, and was so arranged as to be available for those who had not been present in previous years. Various other courses of lectures were arranged: (1) "Natural science," including chemistry, botany, elementary physics, anthropology, zoology, astronomy, and bacteriology; (2) "History and theory of education," with special reference to child study and the kindergarten method, and with a lecture on the teaching of geography and classes in the history and theory of education; (3) a special class in the "English language" was intended primarily for foreigners; (4) "The study of architecture," with special reference to the buildings of Oxford and its neighborhood, and with special architectural excursions illustrative of the lectures; (5) "Greek and Latin;" (6) "French language and literature," a course conducted in French on the romantic school, Victor Hugo, Balzac, George Sand, and on original authorities for the study

of the French Revolution; (7) "Theology," and a course of six lectures on "Ethics," given by the London Ethical Society.

For the most part this comprehensive and rather ambitious programme was carried out, although several of the courses were conditional upon a sufficient number of students subscribing to them. The inaugural lecture was delivered by the Bishop of Ripon on "The romantic revival in English literature." The vice-chancellor of the university, the Rev. J. R. Magrath, D. D., provost of Queen's College, presided and welcomed the students. He said that he desired, on behalf of the delegacy and the university, to welcome students to this summer meeting, and especially those who had come from other lands. During the happy and eventful year, when Englishmen had been celebrating the termination of the sixtieth year of the Queen's reign, they had had the pleasure of welcoming many distinguished foreigners, who had helped them in doing honor to the occasion. Oxford had been able to welcome some of these visitors and had derived very great pleasure and satisfaction from so doing. It had now great satisfaction in welcoming those who had come, not, as he understood, to celebrate any particular occasion, but to give a fortnight or a month, as the case might be, to studies in Oxford. To those who were most interested in the study of history he would say that this year the programme was completed. In previous summer meetings students had been taken through the earlier stages, and those who had been here before had derived benefit from them. But he would not like to discourage those who were present for the first time, because a very eminent historian and historical teacher, Professor Seeley, was of the opinion that we should begin the study of history with the history of our own time. He trusted that every arrangement had been made under the diligent and energetic action of the secretary, Mr. Marriott, for the convenience of those who were going to study at Oxford. If there was any branch of university life which was not open to them as they wished, they should make an application to Mr. Marriott. The usual facilities would be offered for visiting the various colleges and using the laboratories for scientific work.

Of all the men connected with the summer meeting the vice-chancellor is one of the two who impressed me most. The reserved, scholarly, patriarchal-looking Dr. Magrath, provost of Queen's College and vice-chancellor, and Professor Caird, master of Balliol, were the most prominent men at Oxford. Their faces, stamped with great intellectual strength, yet with modesty and simplicity, impressed every beholder. Among the lecturers, the following deserve special mention: Mr. M. E. Sadler, on the "Educational struggle;" Rev. Canon Gore, on "Crabbe;" Prof. A. V. Dicey, on the "English constitution under George III;" Mr. W. A. S. Hewins, on the "Economic policy of Pitt;" Prof. R. G. Moulton, on "Faust;" Mr. Graham Wallas, on "Reform in England;" and Mr. W. H. Hadom, on "Schubert and Chopin."

Considering the lectures apart from the question of whether or not they were particularly adapted to the wants and intellectual capacity of the average summer student, there is little room for criticism; but as to the adaptability of most of them to the needs and understanding of the hearers I have grave doubts. In fact, some of the best lecturers, according to the usual standards of measurement, were least adapted to the abilities of the attending students. For instance, I heard the two admirable lectures of the master of Balliol on "Hegel." The large hall at Balliol College was crowded to overflowing with school teachers, ranging from tender to doubtful years. There were probably not over a half dozen men in the audience. These school teachers sat upon tables, chairs, and window sills while the famous master of Balliol lectured for an hour on the abstruse, metaphysical teachings of Hegel and his relation to other philosophers. It was one of the ablest lectures given during the course; but whether those pupil teachers understood anything the master was saying is very doubtful. Many of the younger students looked tired before the hour was half over, and the moral effect was shown next day when the attendance fell off one-half.

I use this illustration, not as an isolated case, but as representing largely the character of many of the Oxford lectures. I do not believe they were adapted to the needs and capacities of the average summer-meeting student. Yet, on the other hand, the criticism of the London Times seems to be rather severe, although containing an element of truth: "In the account of such a gathering as this, the first thing that strikes us is the extraordinary variety of the intellectual pabulum provided for these students, who we presume are young men and girls (possibly a majority of the latter) from provincial towns or country districts, such as usually attend University Extension lectures, with perhaps a sprinkling of elementary school teachers. For such as these the programme seems unusually ambitious, and if it really represents the practical work of university extension in the provincial centers there would be some reason for the charge that this movement is not a very serious educational force, and that the best it can do is to overlay provincial ignorance with a thin veneer of culture that will soon rub off. We do not assert that the charge is true, but neither do we think that the proceedings of a summer meeting go far to disprove it."

Mr. Marriott, the secretary of the Oxford University Extension, does not seem to answer a part of this criticism when he states that it is true there was a sprinkling of elementary school teachers, and these were men and women of all ages, but of the teachers who were present the vast majority came from secondary schools, with a considerable sprinkling of teachers from foreign universities. The question still remains whether or not it is the province of the summer meeting to provide an intellectual bill of fare suitable to the tastes of teachers from foreign universities and their like. Nevertheless it must be said to the credit of some of the lecturers that they showed good judgment in their choice of subjects and mode of treatment.

Conferences.—A most interesting feature of the summer meeting was the conference. Five were scheduled: "The relation between University Extension and the cooperative movement," "The training of pupil teachers," "Relation between University Extension lectures and the National Home Reading Union," "Local finance," and "Relations of poor law and charity." I attended the first three and found them exceedingly interesting. It seems to be the object of the University Extension delegacy to conduct conferences on all movements in any way associated with University Extension. This policy seems to me to be perfectly legitimate, for it is pursued with the evident intention of creating and of increasing interest in the extension movement on the part of the laboring classes, and of making more effective the work that is already being done. Yet it is upon this very policy that the severest criticism falls. Critics hold that it is the tendency to identify University Extension with objects which, however good in themselves, have very little to do with a mission to extend university teaching, properly so called. They hold that the cooperative movement is no doubt an excellent thing, and brings benefit where it takes root to the wage-earning classes; but what in the world, they say, has cooperation to do with the higher education, which is the special province of the universities? If, as others appear to think, the ideal of University Extension lectures is that they should embrace a sort of propaganda of cooperation, the movement is not likely to be very popular among a class which eminently needs the enlightening influences of higher education—the trades people in country towns and their families. Cooperation is a good thing, but is it the business of the universities to preach it?

The next point of criticism seems to me, however, to be better taken, namely, concerning the rather pretentious claim of the summer meeting to be an international conference on educational matters in general and the dragging in under that claim of the conference upon the training of pupil teachers. The training of pupil teachers is undoubtedly a most important question in elementary education, but what has it to do with the extension of university teaching? The Times remarks that the claim of this harmless and agreeable summer meeting of extensionists, that it should take rank as an international conference upon educational matters in general, reminds one of the frog in the fable, who swelled himself out to look as big as the ox and burst in the effort.

I fail to see, however, wherein any of these conferences will be of harm to the University Extension movement, and I can see wherein they will do good, although there may not be any organic relation between the subjects discussed. These conferences are, to say the least, interesting and probably instructive to those who attend. Much good may come from them, and I should dislike to see them excluded from the programme. The conference on the relations between the University Extension and the cooperative movement was the most interesting. The very democratic Marquis of Ripon presided and called vigorously "Hear! hear!" during the speeches of several of the workingmen delegates. It was voted finally that the delegates were in favor of some organized attempt being made to secure a larger attendance at the University Extension summer meetings of students drawn from the wage-earning classes, and more especially from the ranks of cooperators. The conference upon the training of pupil teachers was an effort, first, to encourage pupil teachers to attend, where possible, University Extension lectures, and, second, to give the lecturers expert advice as to how they should be of the greatest possible help to these pupil teachers. In the conference on the relations between University Extension lectures and the National Home Reading Union it was suggested that the latter might do a very valuable work in continuation of and preparation for organized courses of University Extension lectures; that it should prepare students for the extension courses and should guide them after the lecturers had left; that it could deal with individual students scattered throughout the country and stimulate reading; that it could reach boys and girls just leaving school, whereas University Extension students must be over 16; in short, that the Home Reading Union could admirably supplement the work of the extension lecturers.

Worcester College.—A limited number of men students were received at Worcester College. Women students were cared for at Somerville College and Lady Margaret Hall. The gates of Worcester were thrown wide open to those who secured quarters. Those of us who were fortunate enough to make that institution our home were in a position to enjoy some of the pleasures of student life. Worcester is situ-

ated apart from the other Oxford colleges. As you enter the gate at the porter's lodge you are struck by the contrast the buildings present. Upon the right are the "spacious and dignified but somewhat monotonous erections of the eighteenth century; on the left are the *mansiones*, among the most picturesque things in Oxford, which belonged to Gloucester College." Antony Wood admirably describes these old monastic buildings. They are "divided by particular roofs, partitions, and various forms of structure, and known from each other like so many colonies and tribes, by urns and rebuses that are depicted and cut in stone over each door." Most of these emblems are now defaced, the one over my staircase being entirely obliterated. But over the door at the southwest corner of the building is a shield, on which the "W" some say refers to Windicombe Abbey. These interesting old *mansiones* carry us back to 1283, when John Giffarde, baron of Brimsfield, donated the site on which was founded a house of study for thirteen monks. Within ten years all Benedictine houses were allowed to send students, whose expenses they defrayed. In one of these old thirteenth-century *mansiones*, staircase 9, second floor, I was domiciled. Two rooms make up the section, a small bedroom or "camara" and a large sitting room, both of which look out upon the wonderful beauty of Worcester College gardens. My study commanded a full view of the beautiful green "Quad" and the stately though plain buildings of the eighteenth century. Adjoining the sitting room, in staircase 10, are the rooms which De Quincey occupied.

Here in these college dormitories dwelt 50 summer visitors—25 Englishmen, 7 Germans, 4 Swedes, 4 Americans, 3 Frenchmen, 2 Danes, 2 Austrians, 2 Dutchmen, and a Scotchman. All were members of the Cosmopolitan Club, a temporary organization of the resident students, designed to cultivate good fellowship and especially to make foreigners feel at home. Especial efforts were necessary in this direction, as a number of the foreigners did not have a very good command of English. The sessions of the club were held every other evening immediately after the lecture. A permanent secretary and treasurer were elected, but a different chairman presided at each meeting. Each nationality contributed to the programme something characteristic of its own university life. Some of us, on being called upon suddenly to give something characteristic of American-college life and not being at all accomplished in musical or dramatic arts, were compelled to resort to the Johns Hopkins University yell, which we gave with a hearty good will. Imagine our surprise at the great sound of applause with which it was received! Many declared it was the most characteristic college custom yet given.

As the foreigners were mostly university men, this club soon became a kind of international clearing house of ideas. Very pleasant were the discussions that often occurred between students of different nationalities. Usually it was a German versus an Englishman, or a German versus a Frenchman, or a Frenchman versus an Englishman. We Americans were not, as a rule, considered foreigners. Meals were served in common in the college "hall." This was different from the custom in term time when dinner only is served in common, breakfast and lunch being served in the students' rooms. The daily routine was sometimes varied, but was usually as follows: A plunge in the public baths or the river in the early morning; a lecture or two; then an afternoon of boating, bicycling, sight-seeing, with tea drinking.

One event from which three of us derived more than ordinary pleasure was an afternoon tea given in my rooms to our young lady friends from Baltimore who were resident at Oxford at the time. After tea had been served, we visited the college chapel and grounds. It so happened that a certain military organization was giving a band concert in the garden at the time, which lent interest to the occasion. The freedom with which the townspeople are permitted to enjoy those beautiful gardens was an agreeable surprise. At Worcester College I met Mr. Ashworth, of Todmorden Hall, Lancashire, who has attended every summer meeting except one. The fact that he had met Prof. H. B. Adams, of the Johns Hopkins University, at the summer meeting held at Cambridge the year before (1896) and had there exchanged ideas with him, was a sufficient introduction for us. Mr. Ashworth gave me more new ideas of English people, customs, and institutions than I succeeded in getting from any other man. I look back upon the four weeks spent at Worcester College as the brightest of my experience in England.

Case of Joseph Owen.—Perhaps one of the most interesting facts in connection with the summer meeting of Extension students was the attitude of the university and some of the colleges toward the education of the working class. In connection with a conference held during the summer meeting, what is described as "A University Extension romance" was current. Two years ago Balliol College broke through many of its regulations and made special provisions to give a student workman an opportunity of studying at Oxford. At present one of the Brackenbury scholars of the college is Joseph Owen, of Oldham, the son of a Lancashire artisan, who himself at one time worked in an Oldham mill. At 13 young Owen left school, after which his chief means of education were free libraries and University Exten-

sion lectures. For a number of years he showed special persistence and aptitude in following the work outlined by Extension lectures. In 1895 he was advised to go up to Oxford. There were many difficulties. He was 23 years of age, married, and had no knowledge of Latin or Greek. Nevertheless, the college admitted him on the strength of his University Extension work, and by the generous help of friends and by a special exhibition from the college of £50 a year he and his wife were able to take up their residence in Oxford. His career has been remarkable. Six weeks after his entrance he won in open competition a scholarship of the value of £80, tenable for four years. Within eighteen months from learning the Greek alphabet he had passed all necessary examinations, and is now embarked on an honor course in history, with every prospect of a brilliant degree. He has been well received by the men, and takes his part in the life of the college. What is said to be the most refreshing feature of his wonderful success in his college is that he does not regard education at all as a sure means of rising in the world. He has no desire, it is said, to leave the working class from which he sprung, and intends at the end of his four years' residence to return to his former pursuit at Oldham, to be of service to his fellows in the "discussion and solution of those grave problems of industrial life with which the twentieth century, even more than the nineteenth, will in all probability be occupied."

The Conversaziones.—The termination of the first part and the inauguration and close of the second part of the summer meeting were observed by two large conversaziones in the evening at the schools. These functions were attended by a numerous company of students, while prominent supporters of the movement, among others Prof. and Mrs. Max Müller, attended in considerable numbers, many coming from a distance to participate in the proceedings and to hear an account of the progress of the cause. At the first conversazione, while the guests were arriving, an exhibition of the cinematograph was given, after which the company adjourned to another hall for refreshments and to hear short addresses on "University Extension, past, present, and future," by Mr. M. E. Sadler, Miss Montgomery, and the Rev. W. Hudson Shaw, respectively. These gatherings, although large, were very interesting. * * *

Recreation.—Certain days were set apart for excursions to different places of interest in the vicinity at Oxford. One Saturday afternoon was devoted to Blenheim, in response to an invitation by the Duke of Marlborough. Some 360 students left Oxford by special train at half past two, and, arriving at Blenheim half an hour later, divided into several parties, some proceeding direct to the palace while others, like myself, made a tour of inspection of the gardens. In the course of the afternoon all the students were shown over the various rooms and were entertained in the long library with an organ recital. Tea was served in a large tent near the lodge. It was a beautiful day and all were pleased with the trip. Other excursions were made to Nuneham Park, Compton Winyates, Stanton Harcourt, and Dorchester. With the exception of the Blenheim excursion I did not go with the students, as I found the crowd too large for pleasure and preferred to go more leisurely, in a small company.

Visits were also made to the principal colleges and places of interest in Oxford. Usually a university official in cap and gown accompanied the students to point out the things of particular interest. Some of us were fortunate in having the master of Balliol point out the objects of interest in the Balliol library and hall. Every student was doubtless remembered in invitations to teas and garden parties. One of the most memorable of these was given by Prof. and Mrs. Max Müller. The invitations were extended almost exclusively to foreigners, thus making the gathering very cosmopolitan. Mrs. Max Müller is an ideal hostess in that she can converse with her guests in English, French, or German with equal facility. We Americans had an interesting chat with her and were introduced to the Professor. One of the Baltimore young ladies asked Mrs. Max Müller why the Professor has not visited America, and was somewhat surprised to receive the answer, "The Professor is afraid of American hospitality." At this garden party twelve distinct nationalities were counted, besides representatives from three of England's largest colonies. Among the foreigners were several teachers who held scholarships given by their respective governments. Another memorable garden party was given by our Baltimore young ladies to a number of their friends. Garden parties and afternoon teas were a delightful part of the summer's recreation.

During the first week of the meeting a congregation was held in the Sheldonian Theater for the purpose of conferring degrees upon the "honor men." There was a large audience present, and the ceremony was particularly interesting to foreigners. The ancient custom from which the expression to be "plucked" is derived is still continued. After the list of names is read out the proctors walk up and down the hall. Originally a creditor of any of the candidates could "pluck" the proctor's gown as he walked down the hall, and in this way prevent the degree being given until the debt was paid. * * *

Special religious services were held in the university church (St. Mary's), while services were also conducted at Christ Church, the Cathedral, and Manchester and Mansfield colleges.

Gardens and boats.—Too much can not be said in praise of the beauty of English college gardens. With their soft, velvety grass carpets, with their flowers, shrubbery, and venerable trees, with their ancient walls almost hidden by the ivy, and with the quiet that envelops all save when broken by the singing of the birds, they charm every summer visitor. When I expressed wonder at the softness of the sward of Wadham College gardens, the old keeper to whom I was speaking remarked: "When you understand that this grass has been watered, trimmed, and carefully attended these two centuries, you will cease to wonder." The "backs" of Cambridge may be finer than any one of Oxford's college gardens—although it is doubtful—yet each Oxford garden is almost unique in itself. Those of Magdalen are probably the most beautiful of all, although rivaled by those of Wadham and Worcester. It is easy to understand that many find it a weary task to read in sight of the beauty of the groves of Magdalen and of St. John. "When Kubla Khan a stately pleasure dome decreed, he did not mean to settle students there and to ask them for metaphysical essays and for Greek and Latin prose compositions." Kubla Khan would have found a palace to his desire in the gardens of Laud, or where Cherwell, meandering with a mazy motion, stirs the green weeds, and flashes from the mill wheel, and flows to the Isis through meadows white and purple with fritillaries.

> And here are gardens bright with sinuous rills,
> Where blossoms many an incense-bearing tree.

You sit in those gardens and you are enchanted—you are intoxicated. Outdoors there is rarely a place for deep study; nature is distracting. I do not wonder that Oxford produced Shelley, Southey, Swinburne, and Ruskin. They are the natural growth of such an environment. Blackstone, Hobbes, and Bishop Stubbs are surely of exotic growth.

The rivers have always been Oxford's greatest natural attraction. "What can be more charming than to float lazily down the Cherwell, shaded from the sun by the overspreading trees, or listlessly to saunter beneath elms and beeches in the fine old gardens." How indelibly printed upon my mind are boating parties up the Thames to Godstow Nunnery where fair Rosamond was educated, and up the Cherwell toward Magdalen Bridge, with the best of company and good cheer! * * *

A critical review.—Oxford in summer—what an ideal place in which to spend a month! You may not derive much that is lasting from the lectures you attend, but you get that which is far better—the spirit of the place. Some few enthusiasts may cherish the idea that the summer meeting, in affording a month's residence, supplies the only element that is necessary to make a university-extension course the equivalent of at least a part of a university training. But, to my mind, just to the extent this claim is made for the summer meeting and is supported by those who are closely associated with the management, just to that extent does it fail of its purpose, and the whole movement is prejudiced in the minds of the educated classes. The claim, if it is honestly made, is not at all consistent with the avowed policy of the management to offer inducements to educated foreigners to attend—of whom there were 150 present at this last summer meeting. To give young people who attend the idea that they are receiving the equivalent of even a part of a university training would be to do them great injustice and cruelty to deceive them. It would, indeed, be overlaying provincial ignorance with a thin veneer of intellectual varnish that will soon rub off. To cause summer visitors to take themselves too seriously would be to make them the laughing stock of thoroughly educated people. Those enthusiasts who are doing the movement a great injury by making such high-sounding claims could learn a wholesome lesson by studying our own American Chautauqua summer meeting, from which the idea of an Oxford summer school was borrowed in the first instance.

Nevertheless, in its proper sphere the Oxford summer meeting is doing, and can continue to do, with increasing good results, a most admirable work. That sphere, as I understand it, though a modest one in comparison to that of the university, is nevertheless important. It is to broaden the mind and arouse the dormant intellectual faculties. Some absorption of the Oxford spirit will do this. The lectures will do no harm. As someone bluntly though truly remarks of the visitors, "They will carry away with them memories better worth the keeping than those which cluster round a fortnight spent in the noisy, if healthy, vulgarity of the seaside, with its eternal promenade on the pier, its brazen bands, and blatant Ethiopians from the East End."

The Extension students chose well, and they will not regret their quiet holiday in the old university city. Let me venture the assertion that those who attended the Oxford summer meeting in 1897 will not carry away with them Professor So-and-So's lectures, however excellent, but memories of the beautiful gardens of Magdalen,

the graceful spire of St. Mary, the "sinuous windings" of the High, the cool shades of Addison's Walk, the old Sheldonian, Radcliffe, the excursions to Blenheim, Nuneham, and Iffley Mill, the numerous "quads," halls, and chapels, and, last of all, the student good-fellowship. "One will have learned much at Oxford which is more valuable than mere book-learning. No one can live free from the influences that surround him; and the influences of Oxford are unrivaled. The glory and romance of her past, her great work in the present, her fine old buildings, where each gray stone has its history, appeal with irresistible force to the dullest soul."

Let me close with a quotation from one of Oxford's most honored sons—Matthew Arnold: "Beautiful city! So venerable, so lovely, so unravaged by the fierce intellectual life of our century, so serene! And yet, steeped in sentiment as she lies, spreading her gardens to the moonlight and whispering from her towers the last enchantments of the Middle Ages, who will deny that Oxford, by her ineffable charm, keeps ever calling one nearer to the ideal—to perfection?"

VACATION COURSES IN PARIS.

[*By H. B. A.*]

In July, 1883, was founded the Alliance Française, a national association for extending the French language in the colonies of France and in foreign lands. This patriotic alliance now numbers over thirty thousand. Among the declared objects of the association are the establishment of better social and commercial relations with their colonies and dependencies, and of developing in peaceful ways, beyond the seas, the French race, which, on the continent of Europe, is increasing too slowly. The alliance proposes also to cultivate and unite the French elements which are now scattered in many lands, to encourage everywhere a knowledge of the French language and literature, to draw closer the ties of intellectual and moral sympathy which already exist between France and other countries, and to aid French missionaries and teachers in the Orient and elsewhere to found and maintain schools.

Among the ways and means for promoting these objects the alliance has established, wherever practicable, courses of instruction for adults. It has given subsidies to existing schools favoring the work of the alliance. It has instituted prizes and stipends. It has sent out French books to local libraries and committees engaged in this work of French propaganda. It has trained professors of French for foreign lands. It publishes bulletins of information. There are now over one hundred local committees in France engaged in this work of French propaganda, and in foreign lands over seventy committees in active cooperation with the alliance. It expends annually in this missionary work of extending French culture not far from $50,000. The French Alliance was approved by the minister of the interior in 1884, and was recognized as an establishment of public utility by decree of the President of the French Republic October 23, 1886. The general secretary of the alliance is Monsieur Pierre Foncin, 45 rue de Grenelle, Paris. Annual membership costs $2; life membership, $36. A founder pays at least $100, a benefactor $200. Women are allowed to join.

In October, 1893, the question was first raised by a lady teacher, Mlle. Porte, whether it would not be fitting for the French Alliance to institute an examination board for the purpose of awarding a special diploma to foreigners certifying to their acquaintance with the French language and literature. After due consideration of the project by the administrative council and a special commission it was finally determined, January, 1894, that the French Alliance should organize, during the summer vacation, courses of instruction specially designed for foreigners and teachers who desired to perfect themselves in a knowledge of the language, literature, and institutions of France. At the end of these summer courses a committee on examinations should award diplomas according to merit. Monsieur Foncin, the general secretary of the alliance and inspector-general of public instruction, was authorized to select professors for the work proposed, to prepare programmes, and arrange details.

On the 9th of July, 1894, the so-called Cours de Vacance of the French Alliance were opened in Paris. From the outset this educational enterprise, resembling an

American summer school, was placed under the patronage of such eminent men as Ernest Lavisse, the historian, member of the French Academy; Gaston Paris, member of the Institute and professor in the College of France; Armand Colin, the well-known publisher; Gabriel Monod, editor of the Revue Historique, and certain ladies, Mmes. Victor Duruy and De Lacroix, and Mlle. Salomon, a director of the Collège Sévigné. The first season only about fifty men and women were enrolled for the vacation courses, but the zeal manifested was so great that the French Alliance was encouraged to continue the experiment. Five superior diplomas indicating proficiency were awarded to candidates from various countries, for example, Finland, Holland, Hungary, and Roumania. Seven elementary diplomas or certificates of faithful work were also conferred. The first season closed August 6, 1894.

The second season opened July 2, 1895, with attendance more than doubled, viz, 117, and continued until July 31. The courses had been early arranged in accordance with the expressed desires of the students in attendance the previous summer. The director of the work was M. Brunot, master of conferences at the Sorbonne and at the Superior Normal School of Paris. Thirteen superior diplomas were awarded the second season. Dutch, German, and Swedish candidates were most numerous.

The growing international success of this interesting educational experiment moved the council of the French Alliance, in 1896, to arrange for two series of vacation courses in Paris, the first for the month of July and the second for August. Each of the two series included 26 superior-class exercises and 26 elementary-class exercises on the French language and literature (classic and contemporary), French style and pronunciation; 12 lectures on the institutions of contemporary France; 12 visits, under guidance, to see the museums, monuments, and works of art in Paris and vicinity, including an excursion to Rouen, and 12 evening conversational conferences for groups of 12 persons.

A more detailed statement of the first or July course of superior instruction shows that Professor Brunot gave 10 lessons or class exercises to a comparative study of the forms and syntax of French verbs and tenses in the seventeenth and in the nineteenth centuries. M. Thamin, a professor from the Lycée Condorcet, devoted 5 lessons to the French moralists of the second half of the seventeenth century. He considered especially La Rochefoucauld and the religious moralists, Protestant and Catholic. Professor Doumic, of the Collège Stanislas, gave 7 lectures on the life and work of Chateaubriand. Professor Berr, sociétaire de la Comédie-Française, gave 6 lessons in French diction and dramatic reading.

In the elementary course for July, 10 class exercises were devoted to French syntax; 5 to French classic literature, Molière and Racine; 5 to contemporary French literature, Dumas fils, Augier, Sardou; 8 to elocution and pronunciation. Students in both the elementary and superior courses were allowed to follow certain other courses in common, for example, an instructive series of 12 lectures on the institutions of contemporary France, with special reference to its political organization since 1875, its social life, and the system of national education. This course was given by the publicist, M. Chailley-Bert, secretary-general of the Colonial Union of France.

All students, whether in the advanced or in the elementary course, are allowed to join in the systematic visitation of the various museums, monuments, and works of art in and near Paris. Under special guidance, in 12 successive parties, the visitors saw the art treasures at the Trocadero, the Louvre, the Palace of Versailles and Luxembourg; also Saint Germain des Prés, Sainte-Chapelle, Hôtel Cluny, Église Saint-Séverin, Hôtel de Sens, Saint-Germain-l'Auxerrois, Saint-Eustache, Fontaine des Innocents, Église Saint-Paul, Hôtels Sully and Sévigné, and other good exemplifications of French civil and religious architecture of various epochs. There were special advantages for foreigners in these well-directed excursions in and about Paris. The art history of France was illustrated in proper sequence by the noblest object lessons.

The charges for all these privileges were very reasonable. A general ticket, good

for all courses, conferences, and art visitations, for both the July and August series, altogether about 200 exercises, could be purchased for 160 francs, about $32. A package of 25 coupons, good for any 25 exercises, could be obtained for 25 francs, or $5. A package of 52 coupons for 50 francs, or $10; or 78 coupons for $15.

At the close of each monthly series of class courses oral and written examinations were instituted and diplomas or certificates duly awarded. For teachers desiring good testimonials of ability to teach the French language in foreign countries, these official recognitions by French scholars in Paris must have some practical value. The tests made of candidates for the higher certificates were (1) a French essay upon one of two proposed subjects, for example: "What was the influence of the Pensées de Pascal upon French literature in the seventeenth century?" (2) An oral examination upon the history and theory of French grammar. The tests made of candidates for the lower certificates in the elementary course were (1) a French composition, for example: A sketch of the life of Molière; or an easy familiar narrative or children's story; (2) an oral examination on modern French grammar and on the elements of French literature. To the certificates is appended a note regarding the candidates' pronunciation of French. It is noteworthy that out of 31 successful candidates for the higher certificates in the summer of 1896, 5 were awarded to Americans. Thirteen superior candidates were men, 18 were women. Only 17 elementary certificates were awarded, 10 to men and 7 to women. Certificates of attendance were given to all students who were regular and faithful in their class work.

Of the 326 attendants upon the summer courses of 1896 only one person was French, a striking evidence of the missionary and international character of the enterprise. There were 137 Germans, 52 Americans, 41 English, 13 Austrians, 1 Cuban, 18 Danes, 2 Spaniards, 2 Finlanders, 1 from Haiti, 14 Dutchmen, 5 Italians, 1 Japanese, 7 Norwegians, 21 Russians, 12 Swedes, and 8 Swiss. The great majority were teachers. Of the total number, 166 were men; 160 were women. It is of no small importance to the good cause of extending French culture to other countries that in one season 48 persons, with diplomas or certificates from French masters, returned from Paris to their own homes, there to teach the French language and literature according to the most approved methods. American summer schools of French are losing their prestige and best patronage. Superior students and teachers are now going abroad to attend vacation courses in Paris.

Academic appreciation of the French Alliance and of its vacation courses at Paris is shown in the following remarks, July 2, 1896, in the grand amphitheater of the Geographical Society, by Gaston Paris, member of the Institute and professor in the College of France:

"The French Alliance in instituting the cours de vacances, which from their beginning have succeeded so well, desires to complete the work which it has pursued for the past thirteen years, a work to which we all, foreigners and French, bring our contribution. This work, as you know, is in no way political. It is wholly in the interest of civilization, and I may say of international fraternity. The idea is to extend as far as possible the knowledge of our language, considered, as it always has been and what we hope it always will be, the clearest, most practicable, and most familiar medium of conveying those ideas which bind together cultivated men in all lands. It is marvelous to see with what rapidity this idea has been grasped and with what warmth it has been welcomed. In countries the most distant from France, the Alliance counts to-day home centers of which the number and activity, when we happen upon them in the course of travel, surprise and move us profoundly. In the face of responses made so spontaneously and so cordially from all parts of the world to our appeal, we may be wholly unconcerned with the false interpretations that might be put upon our work, and continue it with that confidence which is inspired in us by so much cordial sympathy. The vacation courses, which now for the third time have just opened in Paris, will give to this work more solidity and establish its true character. Strangers who really desire to know not only the French language, but the environment in which it was formed, the litera-

tures to which it has furnished expressions, the people whose genius is incarnated in it, could not be satisfied with mere lectures and lessons. They feel the need of coming to France, of living awhile among us, of breathing the air of Paris, which, like the air of Athens or of Florence, gives to the lips over which it passes an accent not elsewhere heard, that which the Romans called urbanity and which, ever renewed without ceasing to be the same, receives and translates the first, the lightest ébranlement of every evolution in our language, our thought and taste. But how many inquiring minds are kept far from us during the greater part of the year and are unable to visit Paris except at the time of their vacation, when all the courses are closed and when most of the Parisians themselves have left town? The Alliance receives every year from abroad expressions of regret and disappointment. Some of our best professors, the most enthusiastic friends of our cause, conceived the idea of devoting themselves and organizing for visitors a large intellectual hospitality during the summer vacation, up to that time so unfavorable to strangers. Thanks to these efforts, visitors who now come to us in the months of July and August will find not merely courses of instruction, but courses prepared expressly for them, in which the main task will be to explain and put in bold relief, in the study of our language, our literature, and our art, whatever is most attractive and interesting. So well thought out is this project that, at the close of the summer courses, a diploma, given under the best guaranties, will certainly be for those who carry it away a most valuable testimonial. Not to speak of the material service, however worthy of appreciation, which the Alliance renders to our guests in securing them board and lodgings, what shall I say of the art excursions, of those visits to the monuments under competent and friendly direction? Such visits will surely be envied by Parisians, to whom their own grand city is less known than it soon will be to our visitors who tarry but a few weeks."

M. Brunot, director of the vacation courses and master of conferences at the Sorbonne, in his opening address, July 2, 1896, said among other noteworthy things characteristic of the good work of the French Alliance: "We desire to make known, and I say it frankly, to make loved the language of France, its literature, its art, its genius. To that end one of the best means, although there are others which we ourselves employ, is that you should come and see France at home. You will thus make acquaintance, not with that pseudo-France, often the only one that strangers know, which seems to be bounded by a boulevard and a racecourse, built on a café concert and a few pleasure resorts, which amuses with its folly les riches désœuvrés de partout, but rather with the true France, which works, which thinks, which creates without ceasing, which also laughs, but with as much decency as esprit—a France which some pretend to think dead, but which nevertheless is neither less active nor less earnest nor less devoted than of yore."

On another public occasion, August 3, 1896, at a public banquet over which M. Lavisse, the historian, member of the French Alliance, presided, M. Brunot said the French Alliance had founded a very original university, one that worked while others reposed, a vacation university, a French university for foreigners, a private university, a free university. He said the French Alliance had given one of the first and one of the best examples of what the united good will of a few men could accomplish when there is some one able to follow out a pioneer thought and to hold good wills together in a group as his friend Pierre Foncin had done. Brunot said in praise of Foncin that he was one of the most useful men of his time. The French Alliance affords the best proof of its increasing vitality by always creating some new organ. Certainly one of the most powerful is this entirely new educational organ, this popular university which has just been founded, which may be called "Franco-universelle."

In the summer of 1897 the vacation courses of the French Alliance were much the same as those given the previous year and already described.

VI.

Summer schools in Switzerland.—The Rev. Dr. H. S. Lunn, editor of The Review of the Churches, deserves the credit of carrying out a very interesting experiment, begun in 1892 and continued for several years. It combined continental holidays and Swiss mountaineering with certain Chautauquan devices for social, religious, and educational purposes. Grindelwald was the hotel rendezvous of successive parties of English tourists. The first season nearly one thousand of them, representing various denominations, rallied there. For a modest fee of 10 guineas they enjoyed in successive seasons a twelve-days Swiss outing from England at any time from June 5 to September 14.

The experiment was avowedly for the promotion of Christian unity. Clergymen of different denominations were encouraged to visit Grindelwald and to take part in evening discussions of general religious and social interest. Such speakers as Dr. Newman Hall, Rev. H. Price Hughes, Rev. F. Herbert Stead, Mr. Edmund Gosse, Mr. W. T. Stead, Mr. Percy Bunting (editor of The Nineteenth Century), the Dean of Bristol, the Archbishop of Dublin, the Dean of Armagh, and the Rev. Canon Hammond were engaged. Particular attention was devoted to social and church problems and to the history and politics of Switzerland, which was viewed as an object lesson in democracy for Europe. Pilgrimages were made to the most interesting places in Swiss history, to the scene of William Tell's reputed exploits, the meadow of Rütli, where the three Swiss prtriots are believed to have taken their famous oath to free their land from Austrian tyrants.

Mr. W. T. Stead, who was particularly helpful in developing the educational ideal at Grindelwald, first suggested "that as at Ober-Ammergau the peasants gave their wonderful representation of the greatest event in Christian history, so patriotic Swiss peasants might reproduce in some village hall a few of the many thrilling incidents of their national life." Dr. Lunn found that the peasants of Hochdorf, a village near Lucerne, were already in the habit of thus cultivating their patriotism by such scenic exhibitions during the winter months. He accordingly arranged with them to present to an audience of English pilgrims an unpublished patriotic play written by a Swiss pastor, also some extracts from Schiller's "Wilhelm Tell," and some tableaux representing the Three Men of Rütli, Arnold von Winkelried, and other Swiss heroes.

Among the lectures given in the season of 1894 on Switzerland were those on its Educational System, by the British consul at Zurich; the Communal System, by Dr. W. Vischer, of Basle, and Professor Wuarin, of Geneva University, and on Swiss Neutrality and Switzerland's Place Among the Nations, by Prof. Robert Harvey, of the same historic institution of learning. The educational use of historic environments is something that is now cultivated more and more by our English kinsmen, as well as by the Swiss, the French, and the Germans.

The opportunities for short tours and excursions in Switzerland from Grindelwald are both numerous and varied. For 10 guineas a choice was offered of any one of the following four itineraries, each comprising a week's hotel accommodation at Grindelwald, with five extra days for travel, expenses all paid:

Tour 1. Berne, Grindelwald, Lake Brienz, the Brunig, and Lucerne.

Tour 2. Berne, Grindelwald, Meiringen, the Brunig Pass, and the Stanserhorn.

Tour 3. Berne, Grindelwald, Meiringen, the Brunig Pass, Goeschenen, and the Lake of Lucerne.

Tour 4. Berne, Grindelwald, the Scheidegg Pass, Meiringen, the Grimsel Pass, the Rhone Glacier, Goeschenen, and the St. Gothard.

A series of extension tours was also offered for those desiring to prolong their outing more than twelve days:

(1) An extension to the Italian lakes, Venice, and the chief towns of north Italy.

(2) An extension to the St. Gothard, and thence to Zermatt for the Matterhorn, and Chamounix for Mont Blanc, returning home by the Lake of Geneva.

(3) An extension to Zurich, Constance, and the Falls of the Rhine.

(4) An extension to the Engadine, including a portion of the Italian lakes.

These are all very attractive extension courses by means of travel. They are quite as legitimate for liberal educational purposes as courses of lectures and courses of reading. Man does not live by books and laboratories, lectures and sermons alone, but by every word that proceedeth out of the heart of nature. Wordsworth disclosed to the English mind this fresh source of divine revelation and inspiration. He found—

books in the running brooks,
Sermons in stones, and good in everything.

Books! 'tis a dull and endless strife:
Come, hear the woodland linnet.
How sweet his music! on my life,
There's more of wisdom in it.

And hark! how blithe the throstle sings!
He, too, is no mean preacher:
Come forth into the light of things,
Let Nature be your teacher.

Enough of Science and of Art;
Close up these barren leaves:
Come forth, and bring with you a heart
That watches and receives.

The modern Englishman, be he scholar or artist, needs no encouragement to take vacation holidays in Switzerland, Normandy, Brittany, Scotland, Wales, or the lake district. Even the great industrial schools and polytechnics are now organizing their class excursions to France, Italy, Germany, and Norway. Higher education by travel and grand tours is now the attainable ideal of intelligent and thrifty artisans, as it long used to be and still is for university men, the clergy, and the gentry.

But there is one thing which our English kinsmen have learned from the American Chautauqua, namely, the practical advantages of summer meetings abroad as well as at home. Instead of gadding continuously about Europe, every man for himself, every family independent of all others, Englishmen have now not only organized travel and excursions in a wonderful manner, but have also begun to colonize and to camp out, so to speak, in their summer wanderings. The primitive instincts of the Aryan race are reasserting themselves in the Old World as well as in the New. Local assemblies or social folkmotes of English men and women are becoming more and more attractive. The Grindelwald Conference is a good illustration of an English summer meeting on the Continent. The English recognize the advantages of a local center or social rendezvous, where travelers can rest and recuperate, and be intelligently if not profitably entertained.

The Oxford Gazette for May, 1894, speaking of the Grindelwald Conference, said: "The fact that within two years over three thousand persons have availed themselves of Dr. Lunn's arrangements for combining the advantages of a continental holiday with the other attractions of these gatherings proves how wisely the recreative and intellectual elements in the conference are adjusted to each other. The days are devoted to mountaineering and other excursions, and the evenings, which are ordinarily felt to be so tedious by the Swiss traveler, are rendered the most interesting part of the day by addresses, lectures, and discussions, some of which have already had an historic importance."

As regards the educational influence of Chautauqua upon this English summer meeting in Switzerland, Dr. Lunn said, in an interview quoted by the Oxford Gazette, May, 1894: "My intention this year is to somewhat widen the scope of the confer-

ence. I am anxious that the strong religious character of these gatherings should be maintained, and that their influence for Christian unity should, if possible, be intensified. At the same time, I have endeavored this year to give a distinctly educational character to the latter part of the conference, approximating it as far as is possible under European conditions to the excellent organization developed by my friend Bishop Vincent at Chautauqua." In the educational, scientific, and literary section Dr. Lunn describes the Grindelwald Conference as "the European Chautauqua."

University of Geneva.—In 1892 a summer school devoted to the study of modern French was opened in Switzerland, on Lake Geneva. This school has been successfully continued, in a delightful environment, down to the present time. In 1897 there were two courses of instruction, accompanied by lectures. One was a summer course, from July 17 to August 30; the other was an autumn course, October 1 to 20. Both programmes comprise courses on what is especially needed by Americans—contemporary French literature, with French lectures and familiar discussions.

The director of this is Prof. Bernard Bouvier, of the University of Geneva, an institution of particular historic interest to Americans because Thomas Jefferson once planned to remove its entire republican faculty to Virginia. Geneva is still attractive to American students and teachers in the summer season. It is conducive to liberal education to spend a few weeks on the shores of Lake Leman; to visit Ferney, the old home of Madame de Stäel; to tarry at Lausanne, where Gibbon completed his Decline and Fall of the Roman Empire; to wander through the old castle of Chillon, so charming for situation, so famous in Swiss history, so familiar to all readers of Byron (the vade mecum of a summer pilgrimage in Switzerland), and to watch the effect of sunsets on the Dent du Midi and the mountains of Savoy. The writer once spent a summer at Lausanne in the study of French and of Swiss scenery, in excursions around Lake Geneva, in walks and talks along those upland hills, and feels prepared to recommend a Swiss environment to his fellow-countrymen who wish to learn the French language in most delightful ways.

Prof. John M. Vincent, who spent some time in Geneva in the summer of 1897, says: "The lectures and classes of the summer school are held in the university buildings and the privileges of the university library are extended to members. The persons who avail themselves of these opportunities are chiefly foreigners, and among these the Germans have predominated, as they find it a most convenient way to combine vacation with improvement in French. A certain amount of previous education is required for entrance. Applicants must be matriculated university students or be able to show a teacher's certificate. The audiences are, in fact, mostly teachers, and include both men and women. The fees for lectures are very small, amounting to $6 for the summer course and $3 for the autumn course. The average attendance since the beginning has been about 200 persons.

"The social part of the programme is very successfully carried out. Every Saturday there were excursions to points of interest, and members of my family frequently reported the enjoyable days they had passed with some insignificant outlay of money. The success of the whole thing is due to the energy and thoughtfulness of Professor Bouvier. He is very popular among the students, and deservedly so, for it requires a great deal of labor and thought to provide courses and entertainment for two summer schools in one season. I watched the return of one of the steamboat excursions on Lake Geneva, and could see not only that the party had had a delightful time, but also that Professor Bouvier was the central figure."

One other university in Switzerland provides for the study of language during the summer. At Neuchâtel vacation courses are offered in French and Italian.

CHAPTER III.

EDUCATION IN GREAT BRITAIN AND IRELAND.[1]

Great Britain and Ireland, constitutional monarchy; area, England and Wales, 58,186 square miles; population (estimated 1896), 30,800,527; Scotland, 29,820 square miles; population (estimated 1896), 4,189,270; Ireland, 32,583 square miles; population (census 1891), 4,704,750.

For previous articles on education in Great Britain see the following:

Title of article.	Report of—	Pages.
Detailed view of the educational system of England	1888–89	78–111
Religious and moral training in public elementary schools, England and Wales	1888–89	438–457
Brief view of the educational system, with current statistics	1889–90	237–248
Educational system of Scotland	1889–90	187–236
Elementary education in London and Paris	1889–90	263–280
Brief view of systems of England and Scotland, with current statistics and comparison with 1876 (England); 1883 (Scotland)	1890–91	125–134
Provision for secondary and for technical instruction in Great Britain	1890–91	135–150
Educational system of Ireland	1890–91	151–164
Elementary education in Great Britain and Ireland, 1892	1891–92	97–104
Technical instruction in Great Britain	1891–92	105–137
Elementary education in Great Britain	1892–93	203–208
Religious instruction under the London school board	1892–93	208–218
Great Britain and Ireland, educational statistics and movements, 1893	1893–94	165–185
Educational systems of England and Scotland, with statistics and movements, 1893–94	1894–95	257–273
The English education bill of 1896	1895–96	79–121
Education in Great Britain and Ireland, 1895–96, with detailed statement of the development of the English system	1895–96	123–135
Education in Great Britain and Ireland:		
Statistics, legislation, 1870–1897	1896–97	3–14
Elementary education in London	1896–97	15–27

TOPICAL OUTLINE.—Brief conspectus of the English system of elementary education—Educational statistics—Important facts in the current history of the system: The defeated education bill of 1896 replaced by bill granting special aid to "voluntary" schools; effects of the new law—Improved condition of elementary schools indicated by the advancing ideal as shown in public utterances; in enlarged curriculum and better methods of instruction; in financial progress; in improvement in the teaching corps, as regards salary, age, quality of training, and public conception of the office—Efforts for unifying elementary and secondary schools—Secondary education: Scope of proposed legislation; central authority; local authorities; public funds available for secondary classes of schools to be recognized; specialized curricula—Statistics of secondary schools—Mr. James Bryce on educational progress—University notes: Statistics for specified years; university colleges and their relation to the education department; brief conspectus of Oxford and Cambridge, showing governing bodies and requirements for the bachelor of arts degree—Appended papers: (1) Report of the departmental committee on the pupil-teacher system; (2) teaching of cookery in English schools by Mrs. Davies, ex-inspectress of cookery.

[1] By Miss Anna Tolman Smith.

Brief conspectus of the English system.—Elementary education alone has been organized into a system which is maintained by the combined effort of State and local authorities.

The action of the State is limited to securing through local agencies adequate provision for the instruction of all children. An annual grant is made by Parliament—$27,539,505 in 1897—which is distributed to the managers of schools, public and private, that fulfill specified conditions. These pertain to the equipment and staffing of the school, the duration of the annual session, the course of study, and the results of instruction. A grant in lieu of fees is also made for schools remitting the same. This grant amounted in 1897 to $11,351,725. Although fees may still be charged, they have generally been remittted since the law of 1890 providing the fee grant. Of the inspected schools 84 per cent have become free schools and 86 per cent of the enrolled pupils pay no fees. The annual grant and the fee grant, amounting as is shown above to $38,891,230 in 1897, provides 61 per cent of the entire school expenditure.

A committee of council (education department) is charged with the distribution of the grant and maintains a force of inspectors, who must make an inspection of every school twice a year and report as to its efficiency, equipment, etc. The report of the inspector determines the amount of the grant to which the school is entitled.

The inspectorial force comprises 12 chief inspectors, 107 inspectors, 45 subinspectors, and 152 inspectors' assistants. There is also a special inspector of music, a directress of needlework, and an inspectress of cookery and laundry work. The experiment of appointing women to serve as subinspectors, first tried in 1896, has proved eminently successful. The local school authorities are elective school boards, representing 68 per cent of the population in 1897, and private managers. The schools are characterized as board or voluntary, according to the management. Board schools, which enroll about 45 per cent of the elementary pupils, are maintained in part by local taxes, yielding $10,627,422 in 1896. Voluntary schools, chiefly parochial, have no claim upon these, but draw a portion of their support—41 per cent in 1896—from endowments and subscriptions. Board schools must be nonsectarian, and private schools, even if parochial, are restrained by a "conscience clause" in the education law of 1870 from forcing religious instruction upon pupils.

In districts having no school board, comprising about 32 per cent of the population, school attendance committees are appointed to enforce school attendance.

School districts must enact compulsory by-laws applicable to all children between the ages of 5 and 14, unless they have obtained the educational certificate which alone entitles them to exemption. The age for exemption can not be less than eleven years, and under the by-laws of many districts exceeds that limit. The teaching force comprises certificated teachers, 44 per cent of the total; assistants, 30 per cent, and pupil teachers 26 per cent. The last named are regarded as teachers in training, and an additional grant is made to the school on their account.

Teachers' training colleges established by private managers also receive appropriations from the State. They number 44 residential colleges with 3,492 students and 14 day colleges with 814 students, and in 1897 received $795,489.

The system of education in Scotland, based upon the law of 1872, presents substantially the same features as that of England, i. e., it is a State-aided system in which local authorities have large liberty of action.

The Irish system, although differing materially from those of England and Scotland in respect to the nature and the relations of the central and local authorities, is maintained also by the combined action of the two.

The following tables present the statistical summary of education in Great Britain and Ireland for the current year, and corresponding particulars for previous years:

Educational statistics.

Institutions.	Date of report.	Registered students or pupils.	Professors or teachers.	Expenditures.
GREAT BRITAIN.				
England and Wales.				
Universities:				
Oxford (23 colleges)	1897	3,468	96	.....
Cambridge (19 colleges)	1897	2,929	125	.....
Durham (1 college)	1897	171	13	.....
Detached colleges (15)	1897	*a* 13,411	851	.....
University colleges for women (4)	1897	393	.....	.....
Bedford College for women	1897	192	.....	.....
Elementary day schools	1896	5,422,989	115,634	$49,694,940
Night schools	1896	298,724	.....	.....
Training colleges for elementary teachers	1896	4,380	.....	1,123,934
Scotland.				
Universities:				
Aberdeen (1 college)	1897	755	54	.....
Edinburgh (1 college)	1897	2,813	100	.....
Glasgow (1 college)	1897	1,789	101	.....
St. Andrews (2 colleges)	1897	236	32	.....
Glasgow College (technical)	1897	*b* 286	*c* 62	.....
Dundee University College	1897	175	24	.....
Elementary day schools	1896	709,478	15,708	7,136,482
Night schools	1896	50,822	.....	.....
Training colleges for elementary teachers	1896	963	.....	211,607
Ireland.				
Dublin University (Trinity College)	1897	1,100	61	.....
Belfast, Queen's College	1897	343	24	.....
Cork, Queen's College	1897	206	23	.....
Galway, Queen's College	1897	105	16	.....
Elementary day schools	1896	815,248	*d* 13,195	.....
Department of science and art.				
Science schools and classes	1896	196,185	.....	3,748,922
Art schools and classes		146,193	.....	

a Including 3,612 evening students, but excluding 2,463 evening students and 247 correspondence students at King's College, London.
b Not including 3,122 evening students.
c Including 18 trade instructors.
d Also $5,853 paid monitors.

Comparative view of statistics of elementary education at specified dates.

	England and Wales.				Scotland.	
	1870.	1874.	1876.	1896.	1880.	1896.
I. Estimated population	22,090,163	23,648,609	24,244,010	30,800,522	3,705,314	4,189,270
II. Number of schools, day and night (institutions), inspected	8,281	13,163	14,368	23,590	3,065	3,533
Pupils—accommodation:						
Day schools—						
Voluntary	1,878,584	2,626,318	2,870,168	3,638,963	602,054	824,448
Board	.....	245,508	556,150	2,433,411		
Night schools (not connected with day schools)—						
Voluntary	.....	10,507	14,421	.....	1,361	2,892
Board	.....	.....	389	.....		
Enrollment—day schools, board and voluntary	1,693,059	2,497,602	2,943,774	5,422,989	534,428	709,478
Average attendance, day scholars—						
Voluntary	1,152,389	1,540,466	1,656,502	2,465,919	404,618	592,934
Board	.....	138,293	328,071	1,956,922		
Night schools	.....	48,690	49,858	147,025	14,397	50,822
III. Number of teachers:						
Day schools—						
Certificated	12,467	18,714	23,053	56,712	5,330	9,565
Assistant	1,262	2,480	3,173	25,393	444	1,913
Pupil	14,394	27,031	32,231	33,529	4,582	4,230
IV. Current expenditures	.....	.....	$16,584,356	$49,694,900	$4,122,879	$7,136,482

RECENT MEASURES PERTAINING TO THE ADMINISTRATION OF THE SYSTEM.

The foregoing outline of the English system of elementary education will serve to make intelligible an account of present movements affecting it. The system was maintained on the lines laid down by the law of 1870, with but slight modifications and little opposition, for nearly fifteen years; but upon the return of the conservative party to power in 1885, the church school authorities became outspoken in their demand for a share in the local taxes, or increased aid from other public funds, and this, with certain inherent weaknesses in the system, which were recognized by all parties, led the Government to active efforts for its revision. The history of these efforts, from the appointment of a royal commission in 1886 to investigate the workings of the system down to the legislative measure of 1896, has been given in the previous reports of the commissioner. Apart from its historical interest, the record emphasizes certain principles of universal application. The English elementary system is peculiar in its separation from the agencies of higher education, but it has expanded in spite of official bounds and has thus brought about, by a practical experiment, the notion of educational unity which all sound theory admits. The record shows further the impossibility of raising to the same level two classes of schools, one under public, the other under denominational control. The opportunity of correcting the defects of the system by legislation was lost for the time through the defeat of the bill of 1896. The event gave a new direction to legislative action.

The bill introduced into the House and passed in the winter of 1897 provides a special grant for voluntary schools (that is, private schools, chiefly parochial), said grant not to exceed in the aggregate 5 shillings per scholar of the whole number of scholars in these schools. This is the first departure from the policy of impartial Government action in respect to the two classes of schools. Moreover, instead of simplifying school administration, which is desirable, the new law introduces an additional factor into the complicated system of local control. It provides for the federation of schools entitled to the special grant under governing bodies of their own choice. This policy does indeed increase the areas for the administration of this particular grant, and simplifies the work of its distribution so far as regards the educational department, but it tends to promote ecclesiastical authority, and thus emphasizes the distinction between the two classes of elementary schools.

The unit of federation is naturally the diocese, and the "governing bodies" have the right to apportion their share of the grant according to their judgment of the needs of the different schools of the diocese. The fear that teachers would have small place in the "governing

bodies" has not proved groundless, as indicated by the following summary showing the situation at the close of 1897:

Federations of—	Governing bodies.	Teacher members of same.	Percentage of teacher representatives.
Wesleyan schools	245	45	18
British and other schools [1]	205	26	12
Roman Catholic schools	48	5	10
Church of England schools	980	26	2

[1] British and Foreign School Society.

The difficulties in the way of an equitable division of the grant are endless. Complaint is also made that schools declining to join federations are coerced in various ways, although under the law their action should be voluntary. The opposition which this measure encounters from nonconformists can hardly be understood without considering how the pupils are at present distributed. Board schools starting in 1870 with no special advantages have drawn within their influence two-fifths of the school-going children. Church of England schools enroll nearly the same proportion, leaving one-fifth to be divided between Catholic, Wesleyan, and other schools.

The Established Church finds great difficulty in meeting the competition of board schools in the cities, but has a monopoly of education in many rural districts. Wherever this is the case, the trend of the school is sectarian in spite of the law forbidding compulsory attendance upon the religious exercises of the school. From a statement prepared by the National Education League of the Free Churches, it appears that nearly one-third of the population (9,242,000) have only sectarian schools within their reach. A special grievance of nonconformists is their exclusion from the teaching service in the church schools.

Their statement sets forth that—

(*a*) While the majority of the teachers in board schools belong to the Established Church nearly all the teachers of 13,000 Anglican and Roman Catholic schools are required to belong to those churches. This has been powerfully shown by the present Bishop of Hereford in a letter to the Times. If the proposals of the archbishops and cardinal are agreed to, the boycotting of nonconformists from the teaching profession will be seriously increased, for those proposals aim at the introduction of sectarian teaching into board schools and at the opening of new denominational schools without restriction in school board districts. The present system is so unjust in this repect that nonconformists will oppose with their utmost strength such attempts to make it worse. The injustice is all the more serious because the training of teachers in this country is so largely subject to sectarian tests.

(*b*) The children of nonconformists in thousands of villages and towns are by law compelled to attend schools where they can not become teachers, where sacerdotal and Romanizing doctrines are taught, and where nonconformist ministers and churches are not seldom held up to contempt. We protest against any increase of the amount paid to these schools out of taxes. Already they receive 3¼ millions sterling per annum, and spend it subject to no local representative control. There

are scores and in some cases hundreds of villages and towns in every English county where all children of school age are driven into Anglican schools, and where there is no other school available.

A list is given of 6,388 villages in 52 counties in which there is no school except that of the Church of England or of the Church of Rome.

The statement shows further that there are 39 towns with populations ranging from 2,600 to 120,000, in which "educational liberty is almost unknown." Out of a total of 503 schools in these towns all but 92 belong either to the Church of England or to the Church of Rome.

"These figures prove," says the statement, "that a large part of the country is under a law of compulsory sectarianism in education."

It is obvious from the conditions here considered that the English system of elementary education, which is often cited as affording impartial provision for people of different religious faith, has developed unjust tendencies from which a public secular system is happily free.

Signs of progress.—In spite of these disturbing elements there are evidences of progress in the actual work of the schools. These evidences may be classed under three heads—the developing ideal, increasing resources, improvement of the teaching body.

The ideal.—In the larger cities, London, Birmingham, Manchester, and others, the school boards have created vigorous systems and have won local support for a much higher grade of education than that originally recognized by the Government. There are now some sixty higher grade board schools, thoroughly organized and well equipped, especially for practical instruction in science. They have raised the standard of popular education for the whole Kingdom. No stronger proof of this influence is needed than the discussions in the Church Congress of 1897. Considering the ideal of popular education long maintained by the church, such views as those expressed by Arch-Deacon Wilson in the recent congress are little short of revolutionary.

As to the improvement of the system in general he said:

> We shall not improve our elementary education much until, by taking it further, and by watching its results, we get a clearer estimate of what ought to be the aims and tests of elementary education, and of the degree in which it has failed. For note well that, given their present ideal, our elementary schools have not failed. The best voluntary schools have attained it almost completely; and the best board schools have even more generally attained all that lies within their more limited scope. But the ideals of elementary schools are sure to undergo a transformation when the country begins to carry on the education of its children to sixteen in any serious degree. To continue the elementary education is the chief means for improving what we have got. * * * The tests of the way in which education has fitted people for life are their intelligent interest in the work of their life, their use of leisure, and the total effect of all educational influences on the dignity and worthiness of character. Keeping these points in view, elementary education should aim first at making the life of industry, which is the lot of the majority, more enjoyable and more productive by a thorough development of the physique, and by stimulating intelligence in all that bears on industry. It should aim at giving good tastes for the use of leisure for recreation, bodily and mental. Its supreme aim and test is

the resulting dignity and worthiness of character, as shown in manners, in domestic life, in civic life. The last aim, character, is not to be attained by any code. It is the result of personal influence, of the ideal of all who have to do with the children: parents, teachers, the street, the press, the total environment. And I hope no one will deny—certainly no one who knows the life of our towns will deny—that the bona fide and active membership of some religious body is the most practically effective help and security for such elements of character. There is nothing that replaces it in any degree; dissenters and churchmen will agree in this; to grow up without such membership is to be deprived of one of the strongest and best influences of life—of a natural right of every child in England.

The speech reveals much more than personal opinions; it reflects the two great influences that are forcing the schools forward—the industrial and political.

Effect of recent regulations.—Although the impulse to higher standards comes from the cities, the education department alone has the power of imparting an upward tendency to the whole system. This it may do in two ways: (1) By the regulations for distributing the public grant; (2) by the examination requirements. Recent changes in the first particular have promoted freedom in teaching. Since 1890, the greater part of the grant has been allowed on the basis of average attendance and the report of inspectors as to the general state of the schools, whereas, formerly, the grant was allowed upon the results of individual examinations in the obligatory subjects.[1]

It should, however, be stated that in order to share in the grant a school must show that it has adequate provision for teaching the required branches, its head teacher must have a Government certificate, and if the average attendance exceed 60 there must be a due proportion of assistant teachers.

The change from an annual prescribed examination to visits of inspection, without notice, at the discretion of the inspector, tends also to free the schools from mechanical routine.

Regulations respecting particular branches of instruction.—The department concerns itself also with the details of school work in regulating the programme for each year of the seven that make up the elementary course.

From time to time special efforts are made to improve the teaching of particular branches. Reading and drawing have been the subjects of most recent effort. A circular dealing with the former was issued by the department in December last. It discusses the methods of teaching the subject and the better preparation of teachers in this respect.[2]

The methods and purposes advocated show some regard to child nature and to mental development in themselves considered; they have

[1] The obligatory subjects are reading, writing, arithmetic, needlework for girls, object lessons in the three lower grades, drawing for boys in schools above the infant grade. All other subjects are classified as class or specific subjects. At least one class subject must be taken by all pupils above the third grade, but no more than two class subjects may be taken by pupils at the same time. The specific subjects comprise what would be regarded as high school studies in this country.

[2] Text of the circular on the teaching of reading:

"The main object to be attained by the teaching of reading aloud seems to be the cultivation of, first, audibility of speech, and, secondly, intelligent expression. Intelligent expression may be taken to mean such modulation of the voice as correctly interprets the meaning of a writer for a hearer. It

a grounding, as it were, in psychology and philosophy which elevates them above mere attempts at measurable results.

The increased importance attached to drawing was shown in 1891 by

is sometimes called shortly 'intelligence,' an abbreviation which has been at once the cause and the effect of a good deal of confused and futile teaching.

"It is generally admitted that the reading in schools and the teaching of reading are unsatisfactory; nor are the reasons far to seek. They are, probably,

"1. *The largeness of classes and the presence of many classes in one room.*—It is obviously impossible to give sufficient individual practice in classes consisting of forty, fifty, or of even a greater number of children; or any practice worthy of the name in the midst of confusion and clatter. The least of the evils for which this vicious organization affords an excuse are the generally harmful, because slovenly, practice of simultaneous reading, and the neglect of individuals; the commonest and the worst result is the cultivation of a slipshod indistinctness of utterance, and the production of a monotonous or sing song intonation which is clearly recognizable as the effect of unison practice in a primary school.

"And even in learning to recognize the printed symbol the children of primary schools are slower than they would be if teachers did not frequently fall back on the device of the collective or simultaneous exercise, which encourages unthinking uniformity and represses individual effort.

"2 *A premature and ill judged regard for 'expression';* and the consequent neglect of those mechanical parts of the reading exercise which are well within the range of the young pupils' power of achievement. Teachers are naturally anxious to impart a fluent modulation which shall indicate the comprehension of shades of thought and phrasing, and in pursuit of this complex and all but unattainable end they leave the attainable and simpler physical excellences unsecured. With ordinary care, children can be made to read with all due attention to the precise rendering of final consonants—of the highest importance in a language which throws its accents back and persistently slurs its final vowels—and can be made to produce their vowels ore rotundo. But to cultivate modulation and intonation by setting a short pattern to be imitated is to encourage a kind of hypocrisy that exposes itself in an unprepared passage at once and unmistakably.

"Under most circumstances short 'pattern reading' is of doubtful value, though special justification is claimed for it in those parts of the country where the popular speech is a droning monotone. If given by a teacher to children before they have themselves tried a passage, it discourages the effort to get naturally at the right rendering through a 'first-hand' comprehension of the meaning. When 'pattern reading' is considered necessary, it is best to choose a passage which the class is not, on this occasion, about to read; and the passage worked out by the children under the direction of the teacher may be read aloud by the teacher, or by a bright pupil, at or toward the end of the lesson, serving a purpose like that of a 'fair copy' of a written exercise or of a properly corrected and worked sum.

"3. *Neglect to insist on careful articulation at all times.*—Many teachers reserve such attention as they bestow on articulation for the reading lesson, whereas it should be obvious that success in securing precision depends on the cultivation of a good habit of speech at all times. Truncated and 'woolly' enunciation should be permitted in no circumstances. No answer to a question should be accepted from a child (unless he is conspicuously lacking in self-confidence) which is not clearly heard by every member of the class, and children should be encouraged to acquire the power of continuous audible speech by the exaction of reasonably long descriptions, résumés of lessons heard, and careful recitation. Nor is it necessary that in a reading lesson a book should lie open before every member of the class. Variation in procedure is valuable in every part of the school curriculum, but in the reading exercises perhaps more than any other. A practice full of profit to every member of a class (including the teacher) is to make each in turn read exclusively to the ears of his comrades, and not, as is usually the case, to their eyes alone.

"4. *Confusion of an expository or information lesson with practice in reading aloud.*—Any lesson in which books are used may serve the purpose of 'cultivating intelligence,' and it is not the reading lesson alone that gives fit opportunities for varied illustrations. But teachers too commonly overload themselves in a reading lesson with materials and information in order to make it interesting, and then try to communicate or evoke all sorts of knowledge, stopping occasionally by the way to hear the children read and to correct mistakes in the rendering. This is satisfactory neither to the teacher, whose resources it wastes, nor to the class, whose attention it weakens and dissipates. Teachers do best to divide reading lessons into two separate parts and to determine in what order these shall receive chief (not necessarily all) attention, according to the attainments of the class and the character of the passage to be read. Attention should be continuously given at the one time chiefly to the matter read, and at the other chiefly to the manner of reading.

"Children should not usually be asked to read a passage aloud until they have had sufficient time to master its general meaning by silent study. Until they have been allowed to do this, it is neither fair nor profitable, nor even reasonable, to expect them to read with 'intelligence.' It is a peculiar and marked defect of our common primary school practice to give the children so little at any time and in any subject to 'get up' for themselves; they suffer from lack of what has been called 'a little

making the subject obligatory for boys. The grants for this branch have been hitherto allowed by the science and art department, but after August 31, 1898, they will be given by the education department. This change brings drawing into closer relation with the whole scheme of elementary study. Greater stress is also placed upon manual training, which is advocated for educative rather than utilitarian reasons. The following statement and statistics from the official report for 1897 indicate the progress in branches included under this head:

Manual training in schools; carpentry, needlework, cookery, and laundry work, practical housewifery, cottage gardening.

The movement for the introduction of manual training into all classes of schools as a corrective to an excess of bookwork seems to be gaining strength in this as in other countries. It is felt that the exercise of hand and eye, as well as of the memory and the powers of verbal expression, is necessary to true education. It appears to be true that the process of growth in a child's mind is furthered by manual training, and that the latter promotes the attainment of power and accuracy in other studies. These considerations point to a closer corelation between manual training and the other subjects of school curriculum, the former being rightly regarded as an integral part of school training and not as an optional or disconnected appendix to it. In this wider sense the training of hand and eye finds a place in the kindergarten, as well as in schools for older scholars, but in the latter case it naturally takes other forms. Varied occupations in the former class of schools, and in the latter brushwork, clay modeling (with special reference to lessons in history and natural science), and cardboard work have all been found useful in stimulating the activity and developing the inventive powers of the children. But in the case of the schools for older scholars there is some danger lest manual training should be advocated and introduced less for the purpose of cultivating the general powers of the child than from a mistaken desire to impart premature dexterity in some particular craft or home employment. It is happily the case that manual training, when wisely planned, does carry with it the incidental advantage of enabling the scholar to acquire useful skill which will increase the comfort and economy of home life. Yet it is not on this side of the matter, important as it is, but on the educational value of the training that stress must be laid, if we are to escape the disappointment which followed on the excessive attention paid to narrow forms of manual instruction in the older schools of industry.

We are glad, therefore, to observe that increasing attention is being given in our public elementary schools to such subjects as cookery,[1] housewifery, woodwork, and gardening. When properly arranged, these lessons have great influence on the efficiency of the school. Many children who are backward in literary expression show a compensating aptitude for expression with their hands, and others are saved from the dangerous discouragement which sometimes forces them without desert into the dunce's place. Carpentry is a delight to most boys when they are old enough to use necessary tools; and we have sanctioned during the past year an addition to our building rules with the object of securing that rooms for woodwork should be planned with the simplicity and economy suitable for workshops. The manual training of girls naturally takes the form of needlework, cookery, and laundry work, and is therefore specially liable to the errors of treatment which convert what should be an educational discipline into a premature form of technical instruction. At the same

wholesome neglect;' the teacher too often tells or 'elicits' all that they are expected to know. There is, therefore, too little intellectual activity, readiness, discursiveness, or originality in some of the best of our schools, and in consequence there are too few signs in reading aloud of the individuality of expression which we call 'intelligence.'"

[1] The actual status of cookery instruction is shown in an article on the subject by Mrs. Mary Davies, late Government inspectress of cookery, extracts from which are given among appended papers, p. 165.

time we observe with satisfaction that more thought is being given to the ways of teaching these subjects, and we are far from desiring to substitute unreal or fanciful forms of instruction for the more homely, but withal scientific, lessons which best arouse the interest of the children, because they are nearer to their personal experience of daily needs and to the actual circumstances of their home life.

It is a grave blunder in a cookery lesson to ignore the humbler and more ordinary forms of food, or to provide stoves or appliances of a kind necessarily unknown in cottage life. Equally serious, on the other hand, is the mistake of giving merely rote instruction in subjects which admirably lend themselves to the teaching of the principles underlying wise action and to the training of those powers of observation and judgment which are essential to the wise husbanding and economical employment of narrow means. We observe, however, from the general reports of the directress of needlework and of the inspectress of cookery, that much still needs to be done in order to raise the educational value of the instruction in cookery and needlework in many schools. In others, on the other hand, the teaching of cookery has been so efficient that the lessons have been found to produce a perceptible and satisfactory improvement in the homes of the working classes.

We are glad also to recognize cottage gardening as capable of being made a valuable instrument in education. Encouraging reports reach us of the interest which is being taken in school horticulture and of the pride of the children in their trim, well-kept gardens. Gardening is so widespread an interest in English life, and is in so many ways a useful recreation for men and women of all classes, that we have drawn the special attention of Your Majesty's inspectors to the conditions on which we desire its encouragement in connection with the schools. We have pointed out that the main object of a school garden is not the putting boys as apprentices to the gardener's craft We fully recognize the improvement which a thorough knowledge of cottage gardening may effect in the condition of the working classes in agricultural districts, but as a school subject its teaching also serves a general educational purpose. In order to effect this purpose we have recommended that the lessons in elementary science which are given in the schoolroom should be illustrated by practical work in the garden, in order that the science may escape being mere book learning and the gardening may become something more than mere technical training.

England and Wales.—Table showing for specified years the number of schools in which certain branches have been taught and the number of pupils securing grants for the same:

Date.	Cookery.		Laundry work.		Dairy work.		Domestic economy.		Drawing.	Manual instruction.
	No. of day schools.	No. of girls securing grants.	No. of day schools.	No. of girls securing grants.	No. of day schools.	No. of girls securing grants.	No. of day schools.	No. of girls securing grants.	No. of schools.	No. of schools.
1876	29	.....	.....	.....	.....	.....	.....	.....	.....	.....
1877	125	.....	.....	.....	.....	.....	.....	.....	.....	.....
1878	178	.....	.....	.....	.....	.....	.....	.....	.....	.....
1879	223	.....	.....	.....	.....	.....	.....	.....	.....	.....
1880	276	.....	.....	.....	.....	.....	.....	.....	.....	.....
1881	299	.....	.....	.....	.....	.....	.....	.....	.....	.....
1882	347	.....	.....	.....	.....	.....	.....	.....	.....	.....
1883	420	1,251	.....	.....	.....	.....	.....	.....	.....	.....
1884	541	7,597	.....	.....	.....	.....	.....	13,676	.....	.....
1885	715	17,754	.....	.....	.....	.....	.....	12,428	.....	.....
1886	812	24,526	.....	.....	.....	.....	.....	12,879	.....	.....
1887	921	30,431	.....	.....	.....	.....	.....	14,250	.....	.....
1888	1,086	42,159	.....	.....	.....	.....	.....	14,840	.....	.....
1889	1,355	57,539	.....	.....	.....	.....	.....	15,765	.....	.....
1890	1,554	66,820	.....	.....	.....	.....	.....	16,464	.....	.....
1891	1,796	68,291	36	632	.....	.....	.....	19,326	6,075	145
1892	2,113	90,794	153	2,766	.....	.....	.....	19,196	17,048	285
1893	2,419	108,192	213	5,640	.....	.....	.....	28,455	17,793	430
1894	2,634	122,325	273	7,238	1	8	.....	32,562	18,063	677
1895	2,775	134,930	411	11,720	1	0	.....	35,964	18,145	949

In 1895 cottage gardening for boys was introduced in the elementary schools. That year one school made provision for the subject. In 1896 the number had increased to 42 schools, of which 27 received grants for 475 boys who successfully passed the Government examination.

Financial progress.—The possibility of realizing the advancing ideals depends largely upon the financial resources. The increase in school expenditure which has already been noted is due in part to the extension of the programmes and the employment of better teachers. From 1872 to 1896 the current expenditure per capita of average attendance rose in voluntary schools from £1 7s. 5d. to £1 19s. 6¾d., an increase of 45 per cent, and in board schools from £1 8s. 4¼d. to £2 11s. 11¾d., an increase of 83 per cent.

More significant than either the fact or rate of increased expenditure is the larger share borne by public funds. That implies not only greater public interest in the work, but also the substitution of permanent and stable resources for those that are fitful and capricious.

Public appropriations consisted from the beginning of the annual grant applied to both classes of schools and local taxes for board schools only. To these was added in 1891 a grant in lieu of fees. Excluding the last named, the grant per capita of average attendance rose in voluntary schools from 11s. 10¼d. in 1872 to 18s. 7¾d. in 1896, an increase of 57.5 per cent, and in board schools from 8s. 10¼d. to 19s. 7¼d., an increase of 121.41 per cent. The local taxes applied to board schools rose in the same time from an average per capita of 10s. ¾d. to £1 1s. 2d., an increase of 110.35 per cent. The appropriations above considered take no account of the moneys expended for buildings, structural improvements, etc.

Improvement of the teaching force.—The largest proportion of the current expenditure for schools goes always to teachers' salaries. This fact alone gives an economic reason for making the choice of teachers the most important of the responsibilities that fall upon those who administer the school system. Reasons far deeper than the economic increase this responsibility; hence it may be said that the most effective of all measures for advancing the schools are those that tend to improve the quality or the condition of the teaching force. In the English system advance in this respect is marked, though gradual. It is shown by the higher rate of salaries, by the relative increase in the number of adult teachers, and by larger and better provision for the training of teachers. The average annual salary for certificated masters is now $610, or 30 per cent above the average in 1870. The average salary for certificated mistresses is $403, an increase of 40 per cent since 1870. This statement takes no account of free residence, which is provided for about one-fourth of the masters and one-seventh of the mistresses.

The increasing proportion of adult as compared with pupil teachers must also be regarded as a sign of progress. Between 1876 and 1896 this proportion rose from 61 per cent to 72 per cent of the total.

A marked impetus was given to the training of teachers by the

establishment in 1890 of day training colleges, most of them in connection with colleges of arts and science. The recent experiment of sending selected students from the training colleges for a third year of professional study in France and Germany has proved highly successful. Students who have the benefit of this foreign experience, the report says, show signs of enlarged culture and of greatly increased power.

From a desire to encourage persons who have received a university education to enter the profession of teaching in elementary schools, the department allows graduates, or persons who are qualified by examination to become graduates, in arts or science of any university in the United Kingdom to be recognized as certificated teachers, provided that they hold a certificate of proficiency in the theory and practice of teaching issued by a university or collegiate body and approved by ourselves. The certificates recognized by the department at the present time are the schoolmaster's diploma granted to graduates by the University of Edinburgh; the certificate of the University of Cambridge in the theory, history, and practice of teaching (if accompanied by the certificate of practical efficiency in teaching); the teacher's diploma of the University of London; the teacher's diploma of the Victoria University; the diploma of associate, licentiate, or fellow of the College of Preceptors (if accompanied by the special certificate of ability to teach), and the Durham University certificate of the theory and practice of teaching.

The number of students in training in 1896 was 4,461. Taking this number as a basis, it implies with a three years' course the possible graduation of 1,400 students yearly—a number quite inadequate to supply the yearly waste, estimated at 6,000 in the adult teaching force (82,105). Vacancies are filled in part by assistant and pupil teachers who, without going through training colleges, prepare to pass the Government examination. It is estimated that about 6,500 pupil teachers annually become eligible for the post of assistant teachers.

The education department recognizes the importance of the due supply of efficient teachers, and in December, 1896, appointed a committee to inquire into the working of the pupil teacher system. The committee were directed to consider the existing arrangements with respect to their effects upon the pupil teachers themselves and upon the general supply of teachers, and to suggest what, if any, changes are desirable.

A summary of the introduction and the recommendations of their report is included in the appended papers.

The change that is taking place in the general conception of the elementary teacher tends also to elevate the calling. This change was happily characterized by the Right Rev. J. Percival, Lord Bishop of Hereford, in an address before the church congress already referred to. The address also discusses the class distinctions that tend to depress

the calling in England, and thus forms an interesting commentary on a condition that must in time pass away or be radically modified.

As regards the estimation in which the work of the teacher is held by the general public [said Dr. Percival], it is true that we have made considerable advances of late years. As I look back, my thoughts travel to the Scotch dominie and the English usher, and I am bound to acknowledge the great change that has taken place during the last half century. When Dr. Tait succeeded Dr. Arnold about fifty-five years ago in the head mastership of Rugby, an aged Scotch relative is said to have thrown up her hands in astonishment and to have sorrowfully exclaimed; "To think of our Archie being a dominie!" Such was the esteem in which the head mastership of Rugby was then held by an aged Scotch lady. Since that time the hands of the clock have certainly moved forward. Still, if the dignity of the teacher's office is to be duly recognized, and if the teacher is to attain his true position or status in the hierarchy of occupations, we have to think of his calling more distinctly than hitherto as one of the liberal or learned professions. And this must imply the official registration of all teachers, which presumes clearly defined terms of admission, the door of entrance officially guarded by strict requirements. And this again presupposes a system of preparatory training. If we recognize the fact that the education of the young is one of the highest and most difficult and most responsible of all callings and of special moment to national prosperity and life and character, we shall not hesitate to say that it is the duty of the State to require the registration of all classes of public teachers; and that the conditions of such registration must include not only trustworthy testimony to fitness, as regards character and temperament, but also adequate preparation, training, and probation. Further, if our educational system is to be made as good as possible, through and through, we must aim at placing all teachers under one administrative system, so that there may no longer be what is practically an impassable barrier of separation between primary and secondary teachers. We may observe several good results which would flow from such a unifying arrangement. Teachers would thus be brought to look upon themselves as all belonging to one and the same body, and the ablest and most successful men and women in primary schools would have opportunities of passing from elementary to secondary schools, so that the career of such teachers would be enlarged and their office made all the more attractive. And if every soldier in Napoleon's army was stimulated by the thought that he might some day grasp the marshal's baton, the same principle of a career open to merit without let or hindrance would doubtless have a similar effect in the great army of our elementary teachers. On the other hand, men and women educated in secondary schools and of various classes in society would thus be led to look to the profession of teachers in elementary schools, and we might thus hope gradually to sweep away the feeling of class distinction which now separates the primary schools from the rest of our educational system, and so put an end to one of the chief defects in the education of the poor, that of leaving it almost entirely in the hands of teachers belonging to their own class. This leads me to dwell for a moment on the shortsightedness of many middle-class parents, especially the poorer clergy and others similarly situated, in not educating their daughters and, I might add in many cases, their sons also, for the very useful, influential, and happy position of elementary school teachers. In our elementary school system it is a cardinal defect that the teacher is confined throughout the whole period of his education within the circle of his own class and never mixes freely with students of any other class. He begins as a pupil in the elementary school; he passes on to be a pupil teacher and next proceeds to the isolated training college, and from this he returns to the elementary school. To remedy the defects of this isolation, I hold that it ought to be made comparatively easy for those who are to be teachers in elementary schools to complete their course of education and training at Oxford or Cambridge, so that a considerable portion of them may be thus brought out of their own narrow circle and may carry into their life and work

some of the best university associations and influences. Moreover, I should be glad to see at least one elementary teachers' training college established in each of our great universities, so that all the members might have the advantage of university associations. I have, indeed, often wondered that some of the wealthy churchmen who are so earnest about maintaining the influence of the church in the field of education do not spend a little of their wealth in founding Church of England training colleges for teachers at Oxford and Cambridge, as I can hardly imagine any other policy which would be so efficient for the purpose they have in view. Give me the training of the teachers and I count all other matters as of secondary importance. My last suggestion on this point is that steps should be taken to invite and attract students from secondary schools to enter the elementary school training colleges with the view of becoming elementary school teachers.

On the influence of the teacher, Dr. Percival said further:

The influence of the school-teacher on the character of the young is probably greater than that of any other person outside the family circle. Every day in manifold relationships, all through the growing and impressible life of early years, the teacher's personality is acting on the mind of the pupil, and it is proverbial that all the strongest and best influences on life and character, as also those that are most mischievous, act upon us through the direct influence of some personality. The power of the Saviour himself in human life has been described with much truth and suggestiveness as His revelation multiplied by the power of His personality. What a vast field of opportunities this implies, and what a weight of responsibity it lays on those who take up this office, both as regards their character and conduct and their personal training for it. Thus the teacher's success or failure depends very largely on the effect of his own personality, and showing itself in his manners, temper, character, and tastes, and on the ideal of work and duty which he impresses on his pupils by the spirit of his life and by his own example. It will, for instance, make a vast difference to your work and its fruits whether the aim which chiefly occupies your thoughts is simply to satisfy the examiner or to earn a grant; in other words, the narrow utilitarian aim which is certain to infect your pupils with the same utilitarian spirit, or whether in all your teaching you are possessed with the feeling that you are placed in your office to cultivate their tastes, to build up their character, to train their faculties, and to refine their tempers and their manners; in fact, to make them as far as your opportunities enable you to do it men and women of the true Christian type. This being so, we can not too emphatically impress on everyone who proposes to undertake the teacher's office the weighty words of Matthew Arnold: "The best thing for a teacher to do," he said, "is to put before himself in the utmost simplicity the problem he has to solve. He has first of all to instruct the children committed to his charge in certain elements of learning. He has also to bear in mind that they have for the most part a singularly narrow range of words and thoughts. He has consequently to give them some knowledge of the world in which they find themselves and of what happens and of what has happened in it, and he has to do all that within him lies toward opening their mind and opening their soul and their imagination; and," he added in words which deserve to be graven in the memory of every teacher, "the teacher will open the children's soul and imagination the better the more he has opened his own, and he will also clear their understanding the better the more he has cleared his own."

Need of closer relations between elementary and secondary teachers.—Dr. Percival not only recognized the need of enlarging the sphere of the elementary teacher, but he urged that teachers of secondary schools shall have special training for their vocation. With respect to these he said:

We have to lament the long delay in establishing any system of professional training for the office of teacher. The universities of Oxford and Cambridge are

prepared to do their part, and have already done something, and women have very wisely taken advantage of the facilities provided at Cambridge, but among men the opportunities offered have been very generally ignored. And I feel that these efforts of the universities will meet with little success until the state requires that every teacher in a public (i. e., secondary) school must undergo a period of professional training and probation. I desire to see such a requirement, both because it will raise the status of teachers, and so make them better teachers, and because it will increase their efficiency in all that large portion of their work which is affected by accumulated and transmitted experience and the training that is based upon such experience; but I desire it even more because it will be the means of bringing young men under the influence of the great prophets of education—those men of genius and inspiration of whose mind and work many of our young masters are totally ignorant—thus stimulating their intellectual and moral faculties and changing and uplifting their ideals of duty.

This conception of the teaching profession accords with the views advanced by the royal commission on secondary education. They advocated the unification of all grades and a system of official registration, open alike to all teachers without respect to the class of schools in which they seek employment.

The narrow course of elementary schools an obstacle to union of grades.—The narrow course of the average elementary school is a greater obstacle to such union even than the social and scholastic distinctions between the teachers. Pupils who have been taught the merest elements, whose minds have never been opened to any real subjects of thought, are in no state to enter upon secondary courses. This consideration was urged upon the attention of Parliament, during the debate on the annual appropriations, by Sir John Lubbock, who moved "that it is desirable to assimilate the provisions of the English education code, as regards class and special subjects, to those in the Scotch code of 1897."

The report of the debate given below affords an interesting view of the manner in which the elementary-school programme has been gradually developed. After offering the resolution, Mr. Lubbock continued:

Greater encouragement should be given to the teaching of geography, elementary science, English, and history. These were class subjects, and only two of them could be taken in English elementary schools, whereas the number across the border was three. With regard to specific subjects, which included physics, chemistry, mechanics, shorthand, foreign languages, and so on, a child, whether in England or Scotland, could receive instruction in only two, but the Scotch scholar might earn 4s. for each, while the English child was not permitted to earn more than 2s. for each. One result was that of five million and a half school children in the southern half of the island, only 140,000 were presented for examination in specific subjects.

Mr. Jebb seconded the motion. Though a firm believer in the importance of learning a few things well rather than many things superficially, he believed that advantage would be found in the way pointed out by Sir J. Lubbock, because it would lead to attractiveness in education.

Sir J. Gorst sympathized with the desire to make education as good in England as in Scotland, but he pointed out that it could not be done by merely equalizing their rules for class and specific subjects. In Scotland, as compared with this country, a greater percentage of the children went to school. They remained there to a more advanced age, and the proportion of teachers was larger. The English education department had come to the conclusion that two class subjects, with the compulsory

lessons, were as much as the children could profitably study, considering the tender years of most of the scholars in this country. Even Scotland had not found the third-class subject an entire success, and discretion with regard to it was no longer with the school managers; the inspector, at the beginning of every year, determining whether one, two, or three such subjects should be taken. The officers of the education department were quite alive to the desirability of teaching as much as possible, but he hoped the motion would not be pressed to a division.

Sir W. Harcourt said he had listened to a most instructive debate. What was the answer—he was afraid the conclusive answer—to the proposal of his right honorable friend, the member of the university (Sir J. Lubbock)? It was that we had neither the material nor the machinery in this country for giving to English children a decent education; that it was impossible to teach in the schools of this country the elementary science and other subjects that were taught in the schools of other countries. The vice-president of the council had told them that English education was inferior to Scotch education; that in England the children remained at school a shorter time; that they had worse instructors; fewer certificated masters in proportion to the number of children, and that altogether there was a low-grade education in England as compared with Scotland. But the outcry of the last few years has been that the board schools had given too high a class of education. Yet the Scotch education, which was so superior to the English, was not up to the mark of that of the countries which were our competitors. Every man interested in the education of this country ought to read what the Germans had been doing. What a confession it was that we were unable to give to English children such an education as was given in every country in Europe. And we were without any secondary education which was one of the first requirements of this country. We had continuation schools, but no compulsion. All the regular education of this country was a miserable modicum given to children of 11 and 12. Many of the subjects of party discussion were not half so important as this question. Why was it that we had fallen back in the national competition? He believed that the artisans of this country were equal to any in the world, and that no better work than theirs could be turned out. But what the Germans had been devoting their attention to in the schools was the teaching the people the arts of solicitation in commercial life, and of the distribution of their goods to every country in the world. What was needed for that purpose was a general education, and elementary education ought to lead up to that, it ought to lay the foundation of a general sound education. But we did not keep the children at school hours enough, nor years enough, nor did we have competent teachers to teach them what they ought to know. The first thing to do was to awaken the minds of the people of England to the greatest of all their deficiencies. Why was Scotch education superior to English education? Because the people of Scotland cared more about education than the people of England, and understood better the practical value of it. The debate had served a useful purpose by enabling those who were best acquainted with our educational machinery to make plain a state of things that ought to be made plainer every day.

Sir W. Hart-Dyke wished to put a little pressure on his right honorable friend (Sir J. Gorst) and the education department. What was wanted was that a child should have a useful and practical education, and that the code should be so drawn as to be elastic in all details of a practical kind, and with regard to any extra class subject. He would ask his right honorable friend who had spoken of the experiment being tried in Scotland whether he could not give some indication (next year, for instance) that this same experiment would be applied to England.

Mr. S. Smith remarked that education was a matter of time, and that in Germany and Switzerland a large proportion of the children remained at school until the age of 17. Our present method was not so much education as a system which addled the brains of the children and led to mental confusion. Many of those who went to continuation schools at the age of 16 had forgotten nearly everything they had learned and could hardly read and write.

Sir J. Lubbock hoped the vice-president would listen to the suggestion of Sir W. Hart-Dyke, and that if he found the Scottish system worked well he would, at the end of the year, give them the advantage of it in the English elementary schools. He begged to withdraw the motion.

The motion was by leave withdrawn.

In the debate on the proposal for a special grant Mr. Lubbock urged again the importance of more extended and more systematic teaching of English history. In respect to this branch, both the history of the native country and universal history, England is not only inferior to Scotland, but is behind other civilized countries.

At this moment, then, it may be said, so far as regards elementary education, that the efforts for the advancement of the system and for its closer relation to other parts of educational work have been shifted from the administrative to the scholastic side. Meanwhile, legislative action is invoked in the interests of secondary education.

Secondary education.—It was expected and still is expected that a bill dealing with the problems of secondary education would be introduced at the present session of Parliament. The measure is delayed, but from the public discussions of the subject, and the various proposals that have vigorous support, the main points which must be settled by law may readily be inferred. These are the constitution of a central authority, of local authorities whose duty it shall be to create and foster secondary schools in their respective areas, and definition of the nature and scope of secondary education.

The central authority.—As regards the first point, it need hardly be said that in England there will be no thought of conferring arbitrary powers on a central authority. The ideal toward which, apparently, the English mind is working is thus characterized by Mr. James Bryce:

A central educational authority ought to be able to advise local authorities, to aid them by its knowledge, to stimulate them when inert, to adjust the differences likely to arise between the higher authorities (town and county boards) and the governing bodies of schools, to serve as a sort of court of appeal when a body of trustees seeks to resist the proposed diversion of an endowment either to an educational purpose or to some other locality. Such an authority ought, however, to have a wider scope than the field of secondary education only. It ought to receive the powers and functions which now belong to the education department, and therewith ought also to receive certain functions in reference to the higher education of the country, the so-called university colleges and the universities themselves, functions which are now either feebly discharged by the privy council, or are not discharged at all. In other words, what is needed is a ministry of education, whether under that name or any other, a department of State which shall be able to draw to a center the still unconnected threads of our educational system, and facilitate that organization of it upon intelligible pervading principles which it now lacks.[1]

This ideal is not likely to be attained at present; it is thought probable that the education department will be merely charged with the distribution of Government aid to secondary schools and with advisory functions in regard to the same.

[1] Studies in Secondary Education, Introduction, pp. xxiii, xxiv.

The local authority.—The most pressing need in respect to secondary education is that of funds for its adequate provision; the duty of raising the funds, other than those appropriated by Government or supplied by existing endowments, will fall chiefly upon the local authority. From the success of the elementary school boards and the effects of the Welsh intermediate education act (1889) it is evident that a tax levied by a local authority is the most efficient means of "raising the level of education and of associating public interest with it." Hence, it is generally conceded that the local authority must have the right of taxation and also some control over existing endowments. The trend of opinion seems to favor the county councils for this duty, as these already have the right (law of 1890) to levy a tax for technical education and also the disbursement of the surplus from the liquor duties, of which the larger part is applied to the same interest. Opposition to the choice of the county councils is urged on the ground that it is preferable to confide so important an interest to a body created for this purpose alone, and further, because the school boards in the larger boroughs have already developed "higher-grade schools," which are in fact secondary schools. Having arisen spontaneously, as it were, out of local conditions, these higher schools are deeply rooted in the sympathies and interests of their respective communities. The school boards have proved their ability to deal with an important phase of secondary education by their management of these higher-grade schools, and it will not be easy to wrest the work from them. On the other hand, it is not deemed practicable to extend the province of the boards, hence, either a new local authority must be created acting independently of the school boards, or one in which the boards and other agencies may be represented. The question of local control appears then as the most complicated and the most vital in the whole problem.

Public funds available for secondary education.—The public funds already available for secondary education amount to very nearly $11,000,000 annually. They comprise the annual grant disbursed through the science and art department, about $4,000,000, of which the larger part is used to foster science and art classes in secondary schools, and the surplus from the liquor duties, about $3,000,000, which may be so applied. The existing endowments which the local authority may control, yielding about four millions more, may properly be classed as public funds, as they have been brought under the control of Government and are now administered under the endowed schools law of 1869, amended in 1873 and 1874.

Classification of secondary schools.—It is impossible either to constitute a local authority or to systematize the application of these various funds without determining what shall be regarded as a secondary school. The question is not new. It was considered at length by the British schools inquiry commission of 1864, and their classification of secondary schools was adopted substantially by the royal

commission of 1894. The words of the later commission on this point are as follows:

There are two sides from which the question of providing schools of various types may be approached. We may, on the one hand, inquire what sorts of schools are needed in order to secure for every class in the community the kind of education it desires and will profit by. We may, on the other hand, survey the schools which actually exist, and determine how and with what changes they can best be fitted into a comprehensive system and made to provide the several kinds of instruction, more or less advanced and more or less general or special, which experience shows to be required.

The various types of schools needed, and in particular the types of instruction they ought to give, are broadly conditioned and determined by the length of time during which various sets of scholars may be expected to remain at school. The schools inquiry commissioners of 1864–67 distinguished three such sets of scholars: First, the scholars who were to remain at school till the age of 18 or thereabouts, and a respectable proportion of whom were to enter the universities; secondly, the scholars who left school about 16, and were intended for some of the professions or for the higher walks of commercial life; thirdly, the scholars who left school about 14, belonging as a rule to a humbler social stratum and designed to begin forthwith to earn their living in shops, or warehouses, or in some industrial occupation. Corresponding to these three sets of scholars the commissioners recommended three sets of schools to be distinguished, not by their social rank, but merely by the length of time during which they were to retain their pupils, and for these they proposed the names of first-grade, second-grade, and third-grade schools, respectively. This classification has been followed by subsequent writers, and indeed has largely passed into common speech, although circumstances have so far changed since 1867 that the boundaries, of the three so-called "grades" are much less easily definable now than they were then, while elementary schools have largely encroached on the province which the commissioners allotted to their third-grade schools. We resort to these terms with some reluctance. But no better nomenclature has been yet suggested; and we have had, and shall have, frequent occasion to use it as a convenient if somewhat rough, loose, and conventional way of classifying schools.[1]

The conception here presented, whether it be regarded as based on social distinctions or on the duration of the school period, is opposed to the American idea, in which, as stated by Mr. J. J. Findlay,[2] in his report to the commission, "the principle of the unity of all forms of education is clearly illustrated."

In discussing "the proper curriculum of instruction for schools of the three types specified" the Royal Commission, though much less explicit than that of 1864, still incline to distinctions following the different ends proposed by the three classes of schools. In this respect they differ from the opinion reached by the "Committee of Ten" in our own country. The American committee unanimously agreed that—

every subject which is taught at all in a secondary school should be taught in the same way and to the same extent to every pupil so long as he pursues it, no matter what the probable destination of the pupil may be, or at what point his education is to cease. * * * It has been [they say further] a very general custom in American high schools and academies to make up separate courses of study for pupils of supposed different destinations, the proportions of the several studies in

[1] Report of the Royal Commission on Secondary Education. Volume I, page 282.

[2] Mr. J. J. Findlay was appointed assistant commissioner to report on secondary education in the United States and in Canada.

the different courses being various. The principle laid down by the conferences will, if logically carried out, make a great simplification in secondary school programmes. It will lead to each subject being treated by the school in the same way by the year for all pupils, and this, whether the individual pupil be required to choose between courses which run through several years or be allowed some choice among subjects year by year.[1]

The English idea lays stress on the practical uses of training above the elementary grade, whereas the American plan emphasizes the importance of culture for all. "The American plan," says Mr. Findlay, "is democratic, for it delays as long as possible the division between the child intended for the university and the child intended for the workshop; the German plan tends to narrow and specialize its education at too early an age."

The royal commission define secondary education as "the education of a boy or girl not simply as a human being who needs to be instructed in the mere rudiments of knowledge, but it is a process of intellectual training and personal discipline conducted with special regard to the profession or trade to be followed."[2] As the old endowed schools, Eton, Harrow, etc., have had in mind the forming of a governing class or a professional class, so now, under the pressure of modern industry, and especially the fierce competition of European rivals in the industrial and commercial worlds, scientific and technical training is demanded for the artisan classes. A peculiar feature of the discussion as it has developed in England is the coupling of the term secondary with technical. The relation has been promoted by the action of Government, whose appropriations through the science and art department have been chiefly applied to foster art and science instruction in secondary schools. The technical instruction law of 1889 defines the expression "technical instruction"[3] as "instruction in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments. It shall not include teaching the practice of any trade or industry or employment, but, save as aforesaid, shall include instruction in the branches of science and art with respect to which grants are for the time being made by the department of science and art, and any other form of instruction (including modern languages and commercial and agricultural subjects) which may for the time being be sanctioned by that department by a minute laid before Parliament and

[1] Report of the Committee on Secondary School Studies, p. 17.

[2] Report of Royal Commission on Secondary Education, Vol. I (1895), pp. 135, 136.

[3] The scope of the word "technical," as determined by the English law, is somewhat more limited than that implied by its use in the United States. In the article on technical schools in Johnson's Encyclopedia, Dr. Mendenhall includes the following under the head of technical schools:

Polytechnic institutes, institutes of technology, schools of technology, schools of applied science, mining schools, all schools, in fact, in which the sciences are taught with a view to their practical application to the promotion of the material interests of man.

Among the individual schools treated in the article are the École Polytechnique in France, the School of Mines at Freiberg, Rensselaer Polytechnic Institute, Sheffield Scientific School, etc. The term is used in the article interchangeably with schools of technology. Trade schools are treated as a separate class.

made on the representation of a local authority that such a form of instruction is required by the circumstances of its district.

"The expression 'manual instruction' shall mean instruction in the use of tools, processes of agriculture, and modeling in clay, wood, or other material."

The tendency to regard technical instruction as a part of secondary has been increased by the title of a powerful organization, "The National Association for the Promotion of Technical and Secondary Education," which is indefatigable in its efforts to promote the interests covered by its double name. The relation which has been brought about as a matter of expediency rather than of sound doctrine is opposed by many leaders. At this moment there is a decided reaction against it.

Existing provision for secondary education.—The existing provision for secondary education consists of endowed schools, proprietary schools, and private schools. To these classes should be added the higher grade board, although these are not officially recognized as secondary.

The want of complete statistics as to the number of secondary schools and pupils is a serious obstacle to the perfection of plans for supplying the deficiency in this provision. With a view to securing this necessary information, the education department issued an inquiry in 1897 to all types of schools distinctly recognized as secondary. The inquiry did not extend to Wales and Monmouth county, which have the benefits of the Welsh intermediate act. It excluded all pupils on whose account grants are obtained from the education department, which, of course, threw out the higher grade board schools. Furthermore, it did not apply to university colleges and technical institutes, which have a certain proportion of secondary students. Responses to the inquiry were received from 6,209 schools within the limitations indicated. Of these, 1,958 are for boys only, 3,173 for girls, and 1,078 mixed. They enroll 291,554 pupils, of whom 158,502 are boys, 133,042, girls. The pupils range in age from 8 to 19 years and over; 40.6 per cent of the boys and 45.7 per cent of the girls are under 12, which shows that a large part of the work of the schools is below secondary grade.

According to Mr. H. Macan, a leading authority on questions of secondary education, the return shows that the existing schools provide for only 3.8 boys and 2.7 girls between the ages of 10 and 17 years in every 1,000 of the population. Taking 20 in every 1,000 as the actual proportion of youths for whom secondary schools should be provided, it appears that there are 6 boys and 3.7 girls per 1,000 of the population still lacking secondary school provision. Estimated roughly, this amounts to 180,000 boys and 110,000 girls. The main lessons which Mr. Macan draws from the return are as follows:

(1) That most of the modern education outside the public elementary sphere is still "elementary."

(2) That the existing schools, "secondary" and "others," are not necessarily inefficient if we know what they really are intended for.

(3) That there is a vast deficiency of real secondary education.

(4) That county councils generally, and school boards in a very few areas, are supplying this deficiency.

(5) That many more day schools, especially in smaller towns or suburban districts, should be supplied at once.

The following tables give in concise form particulars which afford a very interesting view of the general status of these schools:

TABLE A.—*Showing classification of secondary schools according to management.*

Form of control.	Schools for boys.				Schools for girls.				Mixed schools.			
	Number of schools.	Per cent.	Boys in them.	Per cent.	Number of schools.	Per cent.	Girls in them.	Per cent.	Number of schools.	Per cent.	Pupils in them.	Per cent.
Private enterprise	1,311	66.9	46,617	38.1	2,886	91	80,286	70.3	970	90.1	26,027	65.3
Subscribers	70	3.6	8,719	7.1	99	3.1	6,321	5.5	28	2.6	3,626	9
Companies	48	2.5	5,188	4.2	99	3.1	13,238	11.6	3	.3	308	.7
Endowed, etc	502	25.6	59,517	48.6	86	2.7	14,119	12.3	31	2.7	3,035	7.5
Local authority	27	1.4	2,272	1.8	3	.1	3,275	.2	46	4.1	6,996	17.4

TABLE B.—*Showing the number and proportion of graduates and of nongraduates on the staffs of the various schools, inclusive of the head master or head mistress.*

Schools.	Men teachers.						Women teachers.					
	Regular staff.			Visiting staff.			Regular staff.			Visiting staff.		
	Graduates.	Nongraduates.	Graduates, per cent of whole.	Graduates.	Nongraduates.	Graduates, per cent of whole.	Graduates.	Nongraduates.	Graduates, per cent of whole.	Graduates.	Nongraduates.	Graduates, per cent of whole.
Boys'	4,165	3,285	55.9	545	2,410	18.5	117	925	11.3	107	471	18.5
Girls'	35	85	29.2	829	2,590	24.2	1,534	10,472	12.7	401	3,885	9.3
Mixed	205	587	25.8	42	358	10.5	150	1,782	7.8	14	326	4.1

TABLE C.—*Showing the number of schools having on their staff nongraduates exclusively attached to the school, inclusive of the head master or head mistress.*

Schools.	Number of schools in which the regular staff is wholly composed of—			Total schools having only nongraduates on regular staff.	Percentage total number.
	Nongraduate men.	Nongraduate women.	Nongraduates of both sexes.		
Boys'	351	151	125	626	32
Girls'	2	2,269	53	2,324	73.8
Mixed	43	705	128	876	81.3
Total	396	3,125	306	3,826	61.6

The statistics are incomplete[1] as regards the number of pupils pursuing secondary courses, but they give a fair idea of the conditions

[1] An estimate made in 1893 gives 600,000 as the total number of pupils under instruction in the private schools. Mr. J. J. Findley gives 800,000 as the number of pupils in secondary schools or pursuing secondary studies, including 25,000 instructed at home or on the continent, and excluding the 90,000 pupils of higher board schools. It should be observed that the elementary departments of secondary schools are included in these totals.

under which such courses are now maintained. The details as classified indicate very clearly the particulars in which the average secondary school is inferior to the high schools that have been created by the school boards.

The official report of 1897 gives the number of pupils examined in specific subjects (really high school branches) as 138,814. About one-half of this number are in schools organized as higher grade schools. To be so recognized they must fulfill certain requirements in respect to buildings, equipment, and teaching staff. Pupils are not admitted until they have passed a satisfactory examination in the studies of the sixth standard (grade or year) of the elementary course. The higher course must include science, mathematics, drawing, manual instruction, English subjects, and at least one modern language. Science must be taught by means of laboratory and other practical exercises, and all subjects included in the programme must be submitted to inspection. The course prescribed extends over four years, and during the first two years grants are not paid on individual successes in examinations, but are paid as capitation grants, the amount of which depends on the efficiency of the teaching, the school equipment, and the average attendance. The department of science and art, which gives the grants for science and art branches, further insists that classes shall not be allowed to contain many more than thirty students, and for practical work they fix the absolute maximum at twenty-five. These rules have made it possible to give in the higher grade schools a thoroughly satisfactory general education, a fact so palpable that in some places the board high school has half emptied the local secondary school. The significance of the board schools in the present crisis is that of quality rather than of numbers.

The attempt has here been made simply to set forth the present aspects of a problem which has been the subject of discussion, experiment, and legislation in England for nearly fifty years. The settlement of the problem, at least in respect to the three points that have been here considered, namely, the central authority and the local authorities for the control of secondary schools and the scope of the schools to be recognized as such, can not long be delayed. On the authority of an Englishman thoroughly competent to judge of the policies of his own country, it may be asserted that the secondary department has been left behind in the educational progress which is so marked a feature of the Victorian period. The record can not, indeed, be more fittingly summed up than in the words of so dispassionate a judge as Mr. James Bryce:

> Under the act of A. D. 1870, England and Wales have been so covered with schools that comparatively few places remain in which the accommodation is unequal to the needs of the population, swiftly as that population grows. The quality of the schools no doubt lags behind their quantity, yet it shows evident marks of improvement. Elementary teachers, taking them as a whole, are more competent, their methods more intelligent, the organization of teaching freer and more flexible than

in the days that immediately followed the Revised Code. So, at the other end of the field we are surveying, higher education has also been remarkably developed. Within the last quarter of a century the number of students at the two ancient universities has doubled. Seven or eight new colleges giving university teaching have been either created or immensely expanded, and three of the foremost among these have been included in a new university of high promise. Hundreds of courses of lectures dealing with advanced subjects, from what may be called a university point of view, are being delivered in great cities and other populous districts—lectures which, though they may not always meet the needs of a serious student desiring to go thoroughly and accurately into a subject, have nevertheless done much to stimulate and even to instruct those whom other agencies might have failed to reach. As in the case of elementary schools, so in that of universities and colleges, the advancement in the character and methods of teaching has been less palpable, largely owing to the unhappy predominance in Oxford and Cambride of the examination system, with its cramping influences and its tendency to induce a narrow and sordid view of learning and culture. Still, taking the higher education as a whole, the record of progress during the last twenty-five years is an encouraging one, not unworthy of the efforts of the many able and public-spirited men who, especially in the north and center of England, have labored in this cause. If, however, we proceed to inquire what has been done in the field of intermediate or secondary education during the same quarter of a century, we are met by very different results. The progress made—for progress no doubt there has been—is far less general and far less evident than as regards the two other departments.

UNIVERSITIES AND UNIVERSITY COLLEGES.

Statistics.

	1895.		1896.		1897.	
	Students.	Professors.	Students.	Professors.	Students.	Professors.
England and Wales:						
Universities[1]	6,266	213	6,431	220	6,508	234
University colleges	11,778	757	13,221	760	13,411	851
Colleges for women	569	.....	573	.....	585	.....
Scotland:						
Universities	5,573	274	5,602	278	5,593	287
University colleges	107	19	434	89	461	86
Ireland:						
Universities	1,123	64	1,123	64	1,100	61
University colleges	685	69	703	64	654	63

[1] Oxford, Cambridge, and Durham.

The university colleges.—The recent establishment of university colleges in the great centers of industry and population is intimately connected with the movement for promoting secondary and technical instruction. These colleges, which are intended to make local provision for higher education, are either of private origin, as Owens College, Manchester, or the outcome of municipal action, as University College, Liverpool. They present great divergence in respect to government, endowment and facilities, but they are alike in making special provision for science instruction, and in maintaining also the courses required for degree examinations. Women share freely in this provision. The two London colleges, King's and University, enter many

candidates for degrees at the University of London. Owens College, Manchester; University College, Liverpool, and Yorkshire College, Leeds, are associated together as the Victoria University, and the Welsh colleges at Aberystwith, Bangor, and Cardiff as the University of Wales.

In 1889 Parliament allowed a grant of £15,000 ($75,000) to the English colleges, a policy which has been renewed each succeeding year. In consideration of this allowance the colleges participating in the £15,000, and also the three colleges in Wales, which receive from the treasury an annual grant of £4,000 each, were invited in 1893 to furnish a report to the education department. The reports comprise in each case a historical outline, a statement of the constitution and purposes of the college, and its present status.

The department is also brought indirectly into relations with the university colleges through the medium of the day training colleges. All the university colleges in England which share in the grant, except Bedford College, London, and University College, London, have day training colleges, under the education department, attached to them; and day training colleges are also attached to the three university colleges of Wales.

Universities.—The University of London is only an examining body, with power to grant degrees to all candidates who pass its examinations. In 1897 it had 79 examiners, and in 1896, 6,117 candidates underwent its various examinations.

The following brief statement as to the organization of the two chief universities, Oxford and Cambridge, and the requirements for degree examinations is compiled from Whitaker's Almanac and the calendars of the universities:

Oxford.—The University of Oxford at present numbers upward of 12,000 members. Of these about 3,000 are in residence in Oxford; the remainder, with a few exceptions, have finished their academical course, taken a degree, and are scattered over the country following various professions. The resident members of the university consist of undergraduates going through a course of instruction and study and of graduates giving instruction or engaged in research. The resident graduates are 400 or 500 in number, and the undergraduates in residence are about 3,000.

The government of the university is in the hands of three bodies: 1. Convocation, which consists of all masters of arts and doctors of civil law, medicine, or divinity who remain members of the university, whether resident or nonresident; 2. Congregation of the university, which consists of resident members of convocation; 3. The hebdomadal council, which consists of certain officers and 18 members elected by congregation. The hebdomadal council alone has the power of initiation; congregation can amend, confirm, or reject its proposals; convocation can only confirm or reject them; it may, however, amend certain proposals relating to money. The election of the university representatives in Parliament is vested in the members of convocation. The ancient house of congregation, which must not be confounded with the congregation of the university, has now nothing to do with legislation in any form, but confines itself to granting degrees and electing examiners. In order to "matriculate," or become a member of the university, it is necessary to be admitted into one of the colleges or halls, or into the body called noncollegiate students.

Candidates for admission must pass an examination held by the college or hall, or by the delegates of noncollegiate students, or pass some test accepted in lieu of this examination.

Terms and examinations.—There are four terms in each year. The usual course for students extends over four years, though it may be taken in three years. The average age at which students proceed to the university is nineteen years, as most of the open scholarships at the various colleges are for persons who have not exceeded their nineteenth year, and the English public schools retain pupils till the close of their nineteenth year.

There are three examinations to be passed before the bachelor of arts degree is conferred: (1) Responsions or matriculation; (2) moderations (the first public examination) or its substitute; (3) final schools (the second public examination).

All examinations are of two kinds—pass or honor. The matriculation is only a pass examination; that is, it represents a fixed standard to which all students must attain before they can be admitted to other examinations, as members of the university; those who fall short of this standard fail; among those who exceed the standard there is no distinction of merit. Moderations and finals are either pass or honor, according to the choice or ability of the candidates; no candidate is debarred from taking a pass examination by previous failures or lapse of time; but it is worthy of special attention that in the honor examinations no candidate can try for honors more than once, or after a fixed number of terms from the date of his matriculation.

For the master of arts degree the only requirement is that the candidate should have taken the bachelor of arts degree and had his name on the books for twenty-six terms since his matriculation. The bulk of the instruction at Oxford is given by the college tutors and lecturers under a system which allows members of one college to attend lectures given in any other. The remainder of the instruction is given by the university professors and readers.

Cambridge.—The University of Cambridge is an incorporation of students in all and every of the liberal arts and sciences. It consists of seventeen colleges, one public and one private hostel, founded "for the study of learning and knowledge, and for the better service of church and state." These are maintained by the endowments of their several founders and benefactors; each of them is a corporate body, and is bound by its own statutes, but is likewise controlled by the paramount laws of the university. A new code of statutes for the university was approved by the Queen in Council in 1882. In each of the colleges there are eight separate orders. These are: (1) head; (2) fellows; (3) noblemen graduates, doctors in the several faculties, bachelors of divinity, masters of arts and masters of law, who are not upon the foundation; (4) bachelors of arts, physic, and law; (5) fellow-commoners; (6) scholars; (7) pensioners, forming the great bulk of the students, and (8) sizars, students of narrow means and in receipt of various emoluments. The head of each college has supreme disciplinary authority in educational matters, and he, together with the foundation fellows, or a council elected by them, form the governing body. The great legislative assembly of the university is called the senate; it is composed of all those who have obtained the degree of doctor or master and whose names are

still on the register. There is a council of the senate (consisting of the vice-chancellor and sixteen members of the senate, of whom eight vacate their office every second year, the office being held for two years), by whom every university "grace" or decree must be approved before it is offered to the senate.

There are three terms in each year.

In order to obtain the B. A. degree a student must complete nine terms in residence and pass examinations as follows:

A previous examination (popularly known as the "Little Go"), held in the Easter and Michaelmas terms of each year.

A general examination, held toward the end of Easter and Michaelmas terms in each year.

A special examination in one of the following subjects: Theology, logic, political economy, law, history, chemistry, physics, geology, botany, zoology, physiology, mechanism and applied science, music, modern languages, mathematics, classics.

Honors may be obtained in any of the following: Mathematics, classics, moral sciences, natural sciences, mechanical sciences, law, history, theology, Semitic, Indian, and modern languages.

Special regulations are issued for the honors examination (Tripos) in each subject.

For the degree of master of arts no examination is required. Candidates must have obtained the bachelor's degree and must present a thesis.

THE NEW OFFICE IN THE EDUCATION DEPARTMENT.

As the conception of public education expands and the interdependence of all its agencies is more and more clearly disclosed, the province of the Education Department is naturally extended. The functions of the General Government in respect to higher institutions will necessarily be, as in our own country, simply suggestive and advisory. In view of these growing responsibilities, the Education Department has recently organized a division of special inquiries and reports, modeled in a measure upon our National Bureau of Education. Its purpose is that of disseminating information. By this means the education of a country proceeds in full view of the accumulated wisdom and experience of the world. The action of the English Government in this respect is an interesting confirmation of the judgment affirmed by our earlier effort in the same direction. The first report issued by the new office bears date 1896–97. It contains 26 articles treating of different phases or problems of education in many different countries, all of them exceedingly valuable and timely.

REPORT OF THE DEPARTMENTAL COMMITTEE ON THE PUPIL-TEACHER SYSTEM.

The conditions that made imperative the inquiry into the pupil-teacher system are thus summed up in The Schoolmaster of March 12, 1898:

While the curriculum of the schools on the one hand and the work of the training colleges at the other extreme have, in recent years, undergone considerable modifications, the work of the pupil teacher—intermediate in position between the certificated teacher and the elementary scholar—has undergone fewer changes, so that both in position and studies he has been in danger of falling out of line with the system of which he forms an integral part. At the same time the rise and rapid development of the center system[1] and the increased interest now shown in the problem of juvenile labor have combined to direct attention to the system—its merits, its defects, its possibilities, and its limitations.

The committee comprised the following members, all persons engaged in educational work:

The Rev. T. W. Sharpe, C. B., H. M., senior chief inspector of schools (chairman); Mr. H. E. Oakeley, and Mr. W. Scott Coward, H. M., chief inspectors of training colleges; Mr. P. A. Barnett, H. M., assistant inspector of training colleges; the Rev. G. W. Gent, late of St. Mark's Training College, Chelsea; Miss Manley, of the Stockwell Training College; Mr. G. N. Richardson, of the Oxford Day Training College; Miss Hughes, of the Cambridge Secondary Training College; Mrs. Bannister, of the pupil-teacher center, Trafalgar square, Stepney; Mr. G. Collar, of the pupil-teacher center, Hackford road, Stockwell.

Subsequently Mr. T. Clancy, of St. John's Cathedral School, Portsmouth, and Mr. Woodward, of the Liverpool Day College, were added to the committee. Mr. Barnett was designated as secretary; but during his enforced absence in the early sessions his place was taken by Mr. Mayor. While the inquiry was in progress, Mr. Richardson officially entered the service of the education department as examiner.

The report is introduced by a history of the system, which is summarized by The Schoolmaster (March 12, 1898) as follows:

The history of the pupil-teacher system begins with the labors and influence of that devoted and enlightened educationist, Dr. Kay (afterwards Sir James Kay-Shuttleworth), who, in the course of his labors as poor-law commissioner in the eastern counties, being convinced that education was the best cure for pauperism, and dissatisfied with the inefficiency of the monitorial system established by Bell and Lancaster, devised the system of educational apprenticeship known as the pupil-teacher system. The report thus details what one might term its almost accidental origin:

Observations made in one of these schools (influenced largely, we believe, by the extraordinary service rendered by a lad named William Rush) suggested to Dr. Kay a plan for the preliminary training of monitors by head teachers, a regular apprenticeship, leading on to a course at a training college conducted on some such lines as that of Mr. David Stow in Glasgow. This development of the monitorial plan is what is known now as the pupil-teacher system.

In the following year Dr. Kay and Mr. Tufnell went to study education abroad, and the former to his surprise and delight found in Holland the whole pupil-teacher system in full working order, and its development in England so much anticipated that in Haarlem and other towns the head teachers had organized centers for the instruction of their apprentices. Returning with his sheaves of experience we learn

[1] "Center system," the system of training pupil teachers in a central school, to which they are brought from the various schools where they are employed.

that "balked in his first attempt to establish a State normal school, he was more successful in his advocacy of reform of the monitorial system." Ultimately—

the way was now open to a complete scheme, and the minutes issued by the committee of council in 1846 (regulations of determinative importance to the future of English education), established an elaborate scale of bounties in aid of the salaries of pupil teachers, Queen's scholarships toward their subsequent maintenance at training colleges, and certificate examinations for adult teachers who had gone through one form or other of professional preparation. The pupil-teacher system was thus definitely established as a link in the general scheme for improving the staff of the elementary schools. But Dr. Kay always looked forward to a time when a larger proportion of adult teachers should gradually take the place of a considerable number of the pupil teachers, just as the latter were now to fulfill the same functions as the monitors who preceded them.

The Duke of Newcastle's commission in 1861 on the whole blessed the new system, but—

the commissioners noticed, however, three main defects in the existing arrangements, (1) the overwork of some of the pupil teachers, (2) the inadequacy of their salaries, and (3) the imperfections of their education.

To meet these three evils the commissioners proposed the following remedies: (1) The course of instruction was to be somewhat altered, (2) the length of school hours was to be diminished, and (3) all assistance to the school from State grants was to be paid, in consideration of its efficiency, in a single sum, "to be disposed of by the managers according to their own views. The managers would thus make their own bargains with the pupil teachers, according to local circumstances."

We may just recall to the minds of our readers that one great change effected by the revised code of 1861 was to abolish direct payments to adult teachers. Simultaneously the direct payments to pupil teachers also ceased, but the great majority of managers continued to pay at the old rate, viz, £10, £12 10s., £15, £17 10s., and £20 for the five successive years of apprenticeship. This code adversely affected the pupil-teacher system as it did every other portion of the education system, so that in 1867 Mr. Corry, the then vice-president, tried to improve matters by offering a special grant to schools staffed beyond the minimum requirements, and a bounty to the school when any apprentice had become a fully certificated teacher.

In 1875 were introduced the grants of £3 and £2 for passing "well" and "fairly" respectively, though from that day to this the department has never succeeded in effecting the approach to a uniform standard, which ought to be the accompaniment of these grants. Succeeding codes brought minor alterations, limiting the numbers and raising the age of the pupil teachers.

The royal commission on the working of the elementary education acts in 1888, reported inter alia on the pupil teacher system:

"(*d*) That pupil teachers should be allowed, especially in their first year of service, more time for their own studies during school hours than is now common, and that without in any way superseding the responsibilities of the head teachers, their private instruction should, whenever possible, be supplemented by central class teaching in respect of some compulsory, as well as additional, subjects.

"(*e*) That to encourage managers of voluntary schools as well as school boards to extend the advantage of central class teaching to their pupil teachers, extra grants should be offered to those managers or boards who successfully adopt that course.

"(*f*) That in districts where central class instruction is obviously impossible, extra grants should be made to managers who successfully employ other special means to secure the thorough instruction of their pupil teachers.

"(*g*) That more time and attention should be given by inspectors to the annual examination of pupil teachers."

Some of the members in a minority report emphasized the admitted defects of the system as also the call for improved instruction and less responsibility. In fact they supported the change which has gradually been going on since 1870 to make the pupil teacher more of a pupil and less of a teacher.

With respect to the system as a whole the committee say:

We are agreed in thinking that, for the present, the system is established so firmly in the economy of national education, that it would be impossible, even

if it were admitted to be desirable, to sweep it away or make any violent and revolutionary changes. But we are satisfied also that although it is the main, yet it is not the only nor even ultimately the cheapest source of supply, and our recommendations are made with a double purpose in view, that is, on the one hand through this and other channels to increase the number of properly qualified candidates for employment in the primary schools, and on the other hand to improve the education, training, and conditions of service of those who enter into the ordinary course of apprenticeship. But we wish to record as emphatically as possible, at the outset of this report, our conviction that the too-frequent practice of committing the whole of the training and teaching of classes to immature and uneducated young persons is economically wasteful and educationally unsatisfactory, and even dangerous to the teachers and taught in equal measure. We do not, however, wish to see at present the entire abolition of a system which insures an early acquaintance with the process of teaching, and we have felt ourselves bound to recognize the established place which an existing institution has made for itself.

After an exhaustive summary of the evidence collected and submitted, with extended comments on the same, the committee proceed to their recommendations. Those relating immediately to the pupil teachers are as follows:

ACTION TO BE TAKEN BY EDUCATION DEPARTMENT.

The majority of the practical changes which we have proposed for the improvement of the pupil-teacher system could, we believe, be effected without additional legislation by the administrative action of the education department. We desire to see these changes introduced in such a manner as to safeguard the interests of all existing teachers, and to avoid unnecessary inconvenience to managers and others engaged in the work of elementary education. We recognize, therefore, that it will not be found desirable to carry into immediate effect all the changes which we have recommended; and we have in certain cases specified the dates to which we think that action might be postponed.

With these qualifications we recommend that the education department should proceed to take action to the following effect, either by alterations of the code or by such other means as may in each particular case be found requisite.

1. Employment of children as teachers.

It should be made a condition of the payment of annual grant to a school that no children shall be employed to teach in any capacity who are less than 13 years of age, or who, if more than 13 years of age, are not qualified for employment under the first schedule of the elementary education act of 1876.

2. Probationers.

(*a*) The department should cease to recognize probationers in urban schools.

(*b*) Candidates for the office of pupil teacher should be recognized as probationers in rural schools only under the following conditions:

(i) They must be over 13 and under 15 years of age.

(ii) The same certificates as to health and as to character of homes should be required as in the case of pupil teachers.

(iii) They must be presented to the inspector for approval, and pass to his satisfaction an examination in Standard VI[1] in the three elementary subjects, and in two class subjects, of which needlework must not be one.

(iv) If it is desired that their recognition should be continued for a second year, they must pass a similar examination in Standard VII.[2]

(v) Their employment in school must be conducted in accordance with the conditions proposed below for the employment of first and second year pupil teachers.

3. Admission of pupil teachers.

[1] That is, in the studies of the sixth year of the elementary school course.

[2] In the studies of the seventh year of the elementary school course.

(i) Pupil teachers should not be admitted in urban schools until the age of 15, but might in rural schools, with the special consent of the inspector, be admitted from the age of 14.

After 1900 the age of admission should be raised to 16 for urban schools and 15 for rural schools.

(ii) Candidates for the office of pupil teacher should be required to produce a satisfactory certificate, given by some medical officer approved by the department. The certificate should be in a form fixed by the department, and should contain special reference to the condition of the eyesight, hearing, and teeth.

(iii) Managers should be required to certify, as at present, that the candidates are of good moral character and come from satisfactory homes; and, further, that their homes are such as to offer proper opportunities for private study.

(iv) Candidates should be required to pass either an examination conducted by the education department in accordance with a prescribed syllabus or the Oxford or Cambridge local examination for junior or senior students.

(v) Candidates who have passed an examination in the subjects prescribed for candidates, or for the first, second, or third year, should be admitted for an engagement of four years, three years, two years, or one year respectively; candidates who have passed the junior Oxford or Cambridge local examination should be admitted for an engagement of three years or two years; candidates who have passed the senior Oxford or Cambridge local examination should be admitted for an engagement of two years or one year; provided, that in each case the termination of the engagement falls beyond the end of the candidate's eighteenth year.

4. Condition of employment in school.

The following conditions for the employment of pupil teachers should be prescribed by the department. Managers should be required to certify, and inspectors should be instructed to report, whether these conditions are observed. The department should refuse to recognize pupil teachers in a school in which they are satisfied that any of these conditions are being disregarded.

(i) No pupil teachers should be employed in a school in which there are not at least two adult teachers employed.

(ii) The number of pupil teachers employed in a school should not exceed two for the principal certificated teacher and one for each additional certificated teacher.

(iii) After the year 1900 pupil teachers should be employed in those schools only in which the head teacher is recommended by the inspector as qualified to superintend pupil teachers. Teachers who become qualified to superintend pupil teachers before that date should continue to be regarded as qualified to do so.

(iv) The time for which pupil teachers are employed in schools should not exceed four meetings a week in the case of first and second year pupil teachers, or six meetings a week in the case of third and fourth year pupil teachers.

A longer time of employment might, with the sanction of the inspector, be permitted in the case of pupil teachers who are admitted for one year, or who have been wholly under instruction in secondary schools for a part of their engagement.

(v) Pupil teachers should not be required to spend any time outside the ordinary school hours in preparing needlework or other material for school work.

(vi) First and second year pupil teachers should not be counted on the staff required by the education department, and should not be responsible for a class, but might be allowed to undertake the following among other duties:

(*a*) To correct exercises, copies, and sums;

(*b*) To assist in superintending the children in the playgrounds, and their egress and ingress from and into school;

(*c*) To read dictation;

(*d*) To recapitulate lessons observed, with blackboard drawing, but not to give any original lessons;

(*e*) To assist an adult teacher in the management of a class.

(vii) Third and fourth year pupil teachers should be allowed, in addition to under-

taking the above-mentioned duties, to take charge, under the supervision of the head teacher, of a class not exceeding 25 in average attendance, and to mark the registers.

(viii) As a rule, the pupil teacher should once a day either give a lesson before some certificated teacher or hear a lesson given by some certificated teacher. Once a week the pupil teacher should give a lesson before the head teacher of the school, of which a record should be kept to be seen by the inspector.

5. Instruction of pupil teachers.

The managers should be required to see that the pupil teachers under their charge are properly instructed, for at least five hours a week, in accordance with the prescribed syllabus, or in accordance with such alternative course of instruction as may be approved by the department.

Such instruction should, where possible, be given in a center conducted in accordance with the conditions specified in section 9 below, or in a secondary school under arrangements approved by the department.

The arrangements approved by the department for instruction of the pupil teachers in a secondary school might include an arrangement whereby the pupil teacher should attend wholly at the secondary school for a certain portion of his engagement, and in such cases the conditions above specified as to the employment of the pupil teacher in school might, with the consent of the department, be relaxed during the remainder of his engagement.

The manager of the school in which the pupil teacher is engaged should in all cases be required to provide for the supervision of the studies of the pupil teacher, for the examination of any reports that may be sent from the center or secondary school in which the pupil teacher is instructed, and for special instruction of the pupil teacher in all the obligatory subjects of the pupil teacher's course in which instruction is not otherwise provided; and the department should refuse to recognize pupil teachers in any school where they are satisfied that these duties are not properly performed.

6. Collective examination of pupil teachers.

(i) Pupil teachers should be examined annually in accordance with the syllabus laid down, except when such examination is excused under the circumstances specified below.

(ii) The collective examination should last two full days.

(iii) A list of the marks obtained by pupil teachers for each subject in the collective examination should be sent to the managers as soon as possible after the date of the examination; and the inspectors should be instructed to show as soon as possible to pupil teachers and their instructors the papers worked in the examination.

(iv) Pupil teachers obtaining less than 30 per cent of the total number of marks obtainable for obligatory subjects should be considered to have failed in the examination, and should cease to be recognized by the department from the date at which such failure is announced to the managers.

(v) The marks allowed in the collective examination for garments worked by pupil teachers should be assigned by the directress of needlework, and not by the inspector.

(vi) The collective examination should be excused in the case of pupil teachers who are instructed under the superintendence of a university or other body recognized by the department, upon condition (*a*) that a scheme of instruction is submitted to and approved by the department, and (*b*) that the inspector visits the center or secondary school where the pupil teacher is receiving instruction and reports that the instruction is carried out in accordance with the scheme approved.

(vii) The examination prescribed for the first and third years should be excused in the case of pupil teachers who are receiving instruction in centers approved for this purpose by the department or in approved secondary schools.

(viii) The Oxford or Cambridge junior local examination, or any equivalent examination approved by the department, should be accepted in place of the examination

prescribed for the second year, in the case of pupil teachers who are receiving instruction in centers approved for this purpose by the department or in approved secondary schools.

9. Centers.

(*a*) Classes for the instruction of pupil teachers which satisfy the following conditions should be recognized by the department as certified centers:

(i) The center must be under the direct control of a body of managers recognized by the department and responsible for the payment of teachers and all other expenses of the center. The managers should be required to appoint a correspondent with the department, who must not be any paid teacher in the center.

(ii) The center must be open at all times to the inspection of any of Her Majesty's inspectors.

(iii) The premises must be properly constructed and arranged for teaching, lighted, warmed, cleaned, drained, and ventilated; must be supplied with suitable cloak rooms, lavatories, and offices, and must contain sufficient accommodation for the scholars attending the center.

(iv) Proper furniture and apparatus must be provided, including suitable desks.

(v) The center must be in charge of a principal approved by the department, who must not undertake duties not connected with the center which might occupy any part whatever of the time appointed for instruction.

(vi) A staff consisting of more than two persons must, as a rule, include one or more persons who have had some training or experience of teaching in secondary schools, or who have had their education in secondary schools.

(vii) The center must meet at least six times a week during at least thirty-six weeks in the year.

(viii) Classes must not be held or continue after 5 p. m.

(ix) Reports as to the progress of pupil teachers attending the center must be sent periodically to the managers of the schools in which the pupil teachers are employed.

(x) In all centers attended by girls at least one-half of the permanent staff, other than the principal teacher, must be women, and men teachers under the age of 25 must not be employed except with the special consent of the department.

(xi) In mixed centers the entrances, cloak rooms, lavatories, offices and approaches to the offices must be separate for the two sexes.

(xii) The instruction given must be satisfactory.

(*b*) Classes for the instruction of pupil teachers in rural districts should be recognized as certified centers, providing that—

(i) They satisfy the conditions above laid down, with the exception of (vi) and (vii).

(ii) The center meets at least four hours weekly during at least thirty-six weeks in the year.

(*c*) Centers or other classes which do not fulfill the required condition should not, except under special circumstances, be recognized as providing proper instruction for pupil teachers.

TEACHING OF COOKERY IN ENGLISH SCHOOLS.

By Mrs. Mary Davies (late Government inspectress of cookery, England).

It is now upward of twenty years since cookery was first taught in elementary schools, but as yet little impression has been made by the teaching. Under the education department cookery is allowed as a specific subject, and, "after needlework," is held to be of importance to the girls; yet it is not deemed to be of sufficient importance to be placed under examination or even regular inspection (there being but one inspectress for the whole of England). When we come to the time allotted we find that, although the examination in needlework (which is comparatively a simple subject) requires a girl to spend about four hours a week during her school life (that is, about one hundred and sixty-eight hours a year), for cookery forty hours' instruction in the school year, twenty of which only need be spent in actual

practice, is deemed sufficient. On reference to the code it will be seen that the grant is paid on the attendance, the only other condition being that the teacher must hold a certificate from a recognized school of cookery. As many as 18 children—until recently 24—may be taught practically at one time by one teacher. Unless, therefore, the school boards themselves place the subject under supervision—as in a few instances they do—it is left to the average teacher to give any instruction she pleases. It is true that the education department has provided "hints" and "suggestions" for the teaching of the subject, but they are more generally ignored than acted upon.

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If a foreigner, after paying surprise visits to the cookery classes all over England, were to be asked what he considered from his observations to be the staple dish of the English workingman, he would undoubtedly answer, "rock cakes;" and if asked what he supposed the next in importance, "sausage rolls;" for, unfortunately, it is on rubbish of this kind that much of the limited time allotted to cookery is spent. "The children will buy these," explains the teacher, "and the board object to having any loss on the food cooked." If a stew is taught, the great advantages of stewing are dwelt on, but rarely seen. "There is not time to get the meat tender in the lesson," is the reason given. That the "best part of the potato lies next the skin," is invariably taught, but I have never once seen potatoes cooked in their skins, which is the surest way of preserving this best part. The teaching generally is extremely fragmentary, consisting of a few miscellaneous dishes arranged without method or adequate repetition. It can not, therefore, be considered that the teaching in elementary schools has reached the state of efficiency that could be desired. It is true that in some places the results are as satisfactory as possible under existing circumstances—that a class in this district, or those under that board, may be pointed out as doing useful work; but, speaking generally, the results are not good, and are not calculated to have any beneficial effect on the community. But how can this state of things be remedied? The first step would be the examination and inspection of all elementary classes receiving a grant for cookery. This, as in other subjects, would give an incentive to work, which is now lacking. It would weed out the bad teachers and encourage the good. The grant being paid on results, as well as attendance, the school boards would not retain teachers incapable of producing results. This would lead to more favorable arrangements with regard to the time allotted to the subject; and this, again, would have its effect on the training of teachers, for undoubtedly one great cause of the failure in the teaching of cookery is the incompetence of the average teacher.

Most unfortunately for the general improvement of our English cookery, the training of teachers has been hitherto more a matter of philanthropic enterprise than of business. It is impossible to speak too highly of the energy and devotion many ladies and gentlemen have given to the subject; but their zeal in the majority of cases has been in excess of their knowledge, with the result that the system of training generally adopted is not calculated to produce experts, nor even fair amateurs—hundreds of young women (many mere girls) being turned out as certified teachers, not only of all branches of cookery, but of the chemistry of food and physiology, in less time than it would take to train an efficient kitchen maid in a gentleman's kitchen. As a consequence we find that the average cookery teacher has no knowledge of cookery in any true sense of the word—no grip of her subject.

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At the present time there are some twenty-four training schools of cookery, many of which have sprung up with fungus-like rapidity during the last few years under the auspices of county councils, and which, in the majority of cases, have obtained recognition of their diplomas through affiliation with other schools. None of these are Government schools, all being under the management of committees of ladies and gentlemen; although during the last three years a step has been made in the right direction by putting them under inspection. So long as they do not grant certificates to the regularly trained teachers on less than a period of six months'

instruction—four hundred and eighty hours of twenty hours a week, one month of this time being spent in practical class teaching—they are free, with very trifling restrictions, to arrange their own systems and to train and examine in any manner they please. In some instances the practical examinations are conducted by the members of the committees themselves, who not infrequently know less than those they examine. In many of the schools a great portion of the instruction is given by the pupils themselves, who are generally but a few weeks in advance of those they teach. I need scarcely point out the extreme mischievousness of such a practice.

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Undoubtedly a second step toward the improvement of cookery teaching would be in the education department taking entire control of the subject, so far as its own teaching is concerned, conducting its own examinations, and granting its own diplomas. At first the subject of cookery teaching was more or less experimental, but now, when the subject has been taught for upward of twenty years, whatever need might have existed in times past for the department to recognize diplomas granted on varying standards, the time has surely come for it to fix its own standard and to expect the schools to conform to it.

Unquestionably the examinations would have to be of a very thorough character, otherwise the position of affairs would be made worse than at present. It is not advisable in the interests of any subject that Government recognition should be given to other than the best; certainly not with regard to cookery. It would, I think, be scarcely too much to require that the applicant for a certificate should be able to cook well any joint usually seen on English tables, any vegetables in ordinary use, any fish easily obtained; that she should be able to make plain soups and stews, porridge, cookery for the sick room, bread, ordinary puddings, pastry, etc., and that, as the preparation of meals is the chief object of cookery, she should be able to prepare a simple dinner and dish it in a given time. The preparation of a meal bears the same relation to cookery as the making of a garment does to needlework—it is a test of how far knowledge can be put to a practical purpose. (Contemporary, January, 1898, p. 109.)

CHAPTER IV.

EDUCATION IN CANADA.[1]

For previous articles on Education in Canada see the following:

Education in Ontario, Report 1892–93, Vol. 1, Chapter VI. Notes on Education at the Columbian Exposition, ibid, Chapter X, pages 1213–1215. Manitoba school question, Report 1894–95, Vol. 1, Chapter VII.

TOPICAL OUTLINE.—Current statistics and general survey of education in the Canadian provinces. Brief outline of the systems of individual provinces, showing for each the character of the central and the local control, requirements for teachers, and sources of school income, and additional historical or statistical particulars in respect to the systems of Ontario, Quebec, and Manitoba. Tabular presentation of institutions for higher education in Canada.

By the British North American act of 1867, the right to legislate on matters respecting education was left to the governments of the four provinces, which were then united under the general name of Dominion of Canada. The same privilege extends also to the provinces that have since entered the confederation.

The principal statistics of the public or elementary schools in the several provinces, as presented in the latest reports, are as follows:

Province.	Date.	Enrollment.	Per cent of population.	Average attendance.	Per cent of enrollment.	Teachers.	Expenditure.
British Columbia	1896	14,460	14.72	9,254	64	350	*a* $204,930
Manitoba	1896	37,987	24.96	23,247	61.11	1,093	*b* 714,049
New Brunswick	1896	*c* 61,918	19.3	37,176	60.04	1,829	461,733
Nova Scotia	1896	*d* 101,132	22	54,015	53.4	.....	813,335
Ontario	1896	441,102	20.86	246,724	55.93	8,254	*e* 3,846,060
Prince Edward Island	1896	*f* 22,138	20.29	13,412	60.5	569	*g* 153,316
Northwest Territories	1896	12,796	.....	.....	.....	433	274,648
Quebec	1895–96	*h* 197,993	13.30	*i* 139,876	70.6	*j* 5,628	1,523,807

a Also $29,405 for construction, repair, and furnishing schoolhouses. *b* Also $96,863 for school buildings and furniture. *c* Boys, 32,315; girls, 29,603. *d* Boys, 52,316; girls, 48,716. *e* Also $386,143 for sites and school buildings. *f* Boys, 12,145; girls, 9,993. *g* Also $5,577 for school buildings. *h* Also 91,997 in model schools and academies. *i* Also 76,235 in model schools and academies. *j* Lay teachers. There are also in Catholic schools many teachers belonging to religious orders.

The public institutions for the deaf and dumb and the blind were reported in 1895 as follows:

Province.	Number of schools.	Enrollment.
Nova Scotia	*a* 2	146
Ontario	2	390
Quebec	4	504

a New Brunswick supported 16 pupils in the school for the blind at Halifax, Nova Scotia, at an expense of $948.

Except British Columbia all the provinces of the Dominion have one or more universities, and several colleges which prepare for university degrees.

[1] Prepared by Miss Anna Tolman Smith.

The enrollment in public high schools included in the former table and in normal schools not therein included was as follows:

Province.	Year.	Enrollment.	
		High schools.	Normal schools.
British Columbia	1895	460	.....
Manitoba	1895	.....	136
New Brunswick	1896	1,155	240
Nova Scotia	1896	1,371	144
Ontario	1896	24,567	*a* 445
Quebec	1896	*b* 91,997	377

a Also 1,637 teachers in training in county model schools.
b In model schools and academies.

Teachers' institutes are maintained in the several provinces, the expense being borne in part by public appropriations. In Ontario, 75 institutes were held in 1895, comprising 7,383 members, on a total teaching force of 8,913. The receipts amounted to $13,623, of which the government contributed $2,125, and municipalities $2,302.

In Ontario, kindergartens have been made an integral part of the public-school system. They numbered 95 in 1895, with 201 teachers, an enrollment of 9,501 children, and an average attendance of 3,646.

In Nova Scotia, 587 pupils are also reported in public kindergartens.

In all the provinces there is a steady increase of school provision and continual improvement in the schools and in the means for securing school attendance. The particulars presented in the following tables serve as an index of the general tendencies:

Province.	Enrollment.		Average attendance.	
	1891.	1896.	1891.	1896.
Ontario	491,741	441,102	257,642	246,724
Quebec	*a* 183,981	*a* 197,993	*a* 131,675	*a* 139,876
Nova Scotia	85,792	101,132	50,820	54,015
New Brunswick	59,568	61,918	34,394	37,176
Manitoba	23,871	37,987	12,433	23,247
British Columbia	9,004	14,460	4,980	9,254
Prince Edward Island	22,330	22,138	12,898	13,412
Northwest Territories	5,652	12,796	.....	.....

a Elementary schools only.

The proportional parts of the school income from the government grant and local sources at different dates was as follows:

Province.	By Government.			By people.		
	1888.	1893.	1896.	1888.	1893.	1896.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Ontario	7.11	7.11	6.3	92.89	92.89	93.7
Quebec	9.25	12.81	10.25	90.75	87.19	89.75
Nova Scotia	31.24	23.46	29.79	68.76	*a* 76.54	70.21
New Brunswick	33.56	40.48	39.42	66.44	59.52	60.58
Prince Edward Island	73.82	77.34	78.09	26.18	22.66	21.91
Manitoba	21.58	17.18	17.63	78.42	82.82	82.37

a 1892.

The average expenditure for schools per capita of the population at the same dates is here presented:

Province.	1888.	1893.	1896.
Ontario	$1.87	$1.87	$1.90
Quebec	.81	.87	1.06
Nova Scotia	1.51	1.45	1.78
New Brunswick	1.26	1.31	1.43
Prince Edward Island	1.36	1.40	1.46
Manitoba	2.74	4.84	4.15
British Columbia	1.40	1.87	1.66
Dominion *a*	1.56	1.90	1.68

a Northwest Territories included.

It will be noticed that in Manitoba and British Columbia the per capita expenditure was less in 1896 than in 1893. This is due to the fact that the school provision in these newer Provinces has been brought up to the demand and only the normal increase in population has now to be provided for. This view is confirmed also by the fact that of the remaining Provinces the smallest per capita increase is in Ontario, where the school provision has been practically equal to the demand for the entire period considered.

The systems of public education in the several Provinces perpetuate, in a measure, the national, religious, and political tendencies characteristic of each. Ontario and the maritime Provinces, Nova Scotia, New Brunswick, and Prince Edward Island, says Goldwin Smith, "are in the main identical in all social and political respects." The difference in crude resources and in commercial politics accounts for the different industrial conditions. In Ontario, farming is the great industry; this is the case also in Prince Edward Island. In Nova Scotia and New Brunswick mining, shipping, and lumbering are of equal importance. The manner of life induced by the prevailing industry, the abilities which it fosters, and the skill it requires, all in time affect the character and progress of schools, but not necessarily the principles and general character of the system of education.

In their main features the systems established in these four Provinces differ as little as those of different States in our own country. Elementary schools are free and secular, except in Ontario, where provision is made for separate Protestant schools and Roman Catholic schools. Education is compulsory in this Province, although, for reasons similar to those that prevail in the United States, it is difficult to enforce the law in this respect. Quebec reflects clearly in its school system the widely different social, religious, and political influences under which it has developed. The schools are sectarian, supported in part by fees, and there is no compulsory measure. British Columbia and Manitoba exhibit the well-known characteristics of pioneer communities, absence of traditional opinions and customs, and the spirit of enterprise and high aspirations. They have made education compulsory and have

established secular free schools, and support the same with energy and liberality. Even in the unorganized Northwest Territories legal provision is made for the maintenance of schools. The religious problem has been met here, as in Ontario and Quebec, by the provision of separate schools.

The interest that these Provinces excite by their proximity to the United States may justify a further presentation of their theory of popular education as illustrated in their school systems. Brief conspectuses of the several systems are here given, showing the general character of the central and local control of schools, the requirements for teachers, and the sources of school income.

SYSTEM OF EDUCATION IN ONTARIO—HISTORICAL SURVEY.

The history of the organized system of public education in Ontario may be said to date from the passage of the school law of 1843. The practical establishment of the system was the work of Dr. Egerton Ryerson, who was appointed superintendent of education soon after the passage of the law. The services that he rendered, his catholic spirit, his administrative force, his untiring devotion to the cause have long since commanded universal acknowledgment.

The Province has been equally fortunate in the historian of the system, Dr. John George Hodgins, who was associated with Mr. Ryerson in the education office from 1844, and has maintained official relations with it to the present moment.

Dr. Hodgins at first held the position of clerk to the education office. His present official designation is librarian and historiographer. He has enjoyed ample facilities for the work with which he now crowns the service of more than half a century, namely, the Documentary History of Education in Upper Canada, from the passing of the constitutional act of 1791 to a very recent date. This work, of which five volumes are completed, bringing the history to 1846, is invaluable to all students of Canadian history for the light it throws on the various phases of its social and political development, and equally valuable to all students of educational history.

Here are brought to view the private efforts in which the system originated, the discussions, collisions, and legislative action by means of which it was gradually organized and perfected.

It is particularly interesting to American readers to trace in this record the influence of settlers from our own colonies and States upon the educational policies of the Province.

In the preface to the first volume Dr. Hodgins says:

> The question naturally arises, What first awakened the desire to establish schools and promote education in this Province? In his address at the opening of King's College (now the University of Toronto) in 1843, the Right Rev. Dr. Strachan, himself a prominent and noted educationist in Upper Canada, answers the question. He says:
>
> "When the independence of the United States of America was recognized by

Great Britain in the peace of 1783 this Province became the asylum of those faithful subjects of the Crown who had, during the Revolutionary war, adhered to their King and the 'unity of the Empire.' And it is pleasing to remark that in 1789, a little more than five years after their first settlement, they presented a memorial to His Excellency Lord Dorchester (Sir Guy Carleton), then a governor-general of British North America, on the subject of education, in which, after lamenting the state of their children growing up without any instruction, religious or secular, they requested his lordship to establish a respectable seminary at Kingston, which was at that early period the principal town in this division of the colony. To this representation Lord Dorchester paid immediate attention, and gave directions to the surveyor-general to set apart eligible portions of land for the future support of schools in all the new settlements."

Animated by the same spirit as possessed these early colonists, the United Empire loyalists established schools of a superior class early in the century in the chief centers of their settlements, such as Kingston, Cornwall, Bath, York, St. Catherines, and afterwards Newburg. Soon a grammar school was established in every district, and ultimately the common school, fashioned by the loyalists on the New England pattern, was put into operation in every settled township of the Province.

It is gratifying to know that the United Empire colonists from New England to Canada in 1783–1788 were true to their early British colonial convictions and instincts as to the necessity of schools for their children. They carried with them that English love for learning for its own sake which characterized the founders of Massachusetts.

The efforts of the New England Company for the education of the Indians who were transferred from New York to Canada upon the close of the Revolutionary war are also noted. Through their agency and that of settlers from our Eastern States, the spirit and purposes that worked so powerfully within our own borders were reproduced in the British Province.

When, in 1830, the subject of a university college was before the house of assembly the example of King's College, New York, was especially urged in support of the measure. The select committee in their report say:

> The University of King's College, in New York, now Columbia College, was established in 1754, when the people of the then colony of New York did not much exceed 70,000, or one-fifth of that of Upper Canada; and yet, says Mr. Butler, the present Attorney-General of the United States, the influence of the institution on the literary character of the colony was truly wonderful, for, though the whole number of students educated in the college previous to 1755 was but 100, many of them attained to great distinctions in their respective professions, and in public life distinguished alike by their genius and erudition, and illustrious in the annals of their country for their talents as writers and their services as statesmen.

The school law of 1843 embodied features drawn from the school systems of New England and New York, and it was especially the example of the United States that stimulated efforts in respect to technical education in the early seventies.

But if Ontario owes much to the example of the United States, it offers also to us most instructive lessons with respect to many questions of educational policy and organization.

In particular may be cited the lesson of the separate school policy,

whose history is embodied in these volumes and forms also the subject of a special work by the same author.

General features and central authority.—The Ontario system of public education, which was described in detail in the Commissioner's Report for 1892–93 (Vol. 1, Chapter VI), is justly celebrated for its thorough organization, the admirable balance of central and local control, the correlation of all grades from the kindergarten to the university, and the provision for insuring even in the rural districts the services of trained teachers. Elementary education is compulsory and free in the public schools. Subject to the approval of the provincial government, all regulations for public schools are made by the minister of education.

Local control.—The municipal system of Ontario affords a full measure of local self-government. The Province is divided into counties, which are subdivided into minor municipalities, consisting of townships, incorporated villages, towns, and cities. These corporations are given certain powers and have certain responsibilities with respect to education. Through their municipal councils counties are under obligations to make grants of money to high schools, and both counties and townships must contribute certain sums in aid of public schools. Each township is divided into school sections, and each of these sections is provided with a public school. There is a board of trustees for each school section, village, town, and city. The ratepayers (men and women) elect the trustees. These, within the provisions of the provincial statutes or regulations of the education department, appoint the teachers, who must have a Government diploma, and determine the amounts to be expended for buildings, equipments, and salaries.

Sources of income.—The provincial grant for education comprises (1) grants to elementary schools; (2) grants to secondary schools; (3) grants for the training of teachers; (4) grants for technical education. By statute the amount appropriated for public and separate schools is divided on the basis of average attendance in each, respectively.

In 1896 the grant for elementary schools was $310,851. The greater part of the school income is provided by the school section, village, town, or city. From these local sources the total received in 1896 was $4,575,261.

High schools.—Liberal support is given to high schools, and strenuous efforts are made to prevent pupils from dropping out of the schools until the advanced course is completed.

It is clearly recognized that the best means of stimulating the lower grades is to encourage pupils to qualify themselves for entrance upon the higher. The success of these efforts is shown in a comparison of the current statistics with those of earlier date.

The number of high schools in 1882 was 104. In 1896 they had increased to 130. The attendances at the same dates were, respectively, 22,348 and 24,567; the number of teachers, 332 and 574. The amount paid for teachers' salaries, which in 1882 was $253,864, had

more than doubled in 1896, reaching a total of $532,765. The cost per pupil rose from $27.56 in 1882 to $30.53 in 1896. The total expenditure for high schools at the latter date was $749,970. It should be observed that the high schools of Ontario are not free, as in the United States. While the public schools were made free in 1872, the privilege was still continued to the trustees of high schools to impose fees. In the majority of cases boards of trustees have availed themselves of this privilege, so that out of the 130 high schools in the Province there are only 44 in which no fees are charged. The total amount of fees collected from high-school pupils in 1882 was $29,270 and in 1896 $115,783. The fees from pupils and the legislative grant amounted to nearly one-third of the whole cost of maintaining the high schools, the remaining two-thirds being distributed between the ratepayers of the high-school district and county municipalities.

From the study of the classification of high schools and collegiate institutes two or three striking changes in the tendency of higher education are disclosed. In 1867 only 1,283 pupils, or 23 per cent of the whole number, studied commercial subjects, such as bookkeeping. In 1896 this subject was taken by 13,068 pupils, or 53 per cent of the whole attendance. In 1867, 5,171 pupils, or 90 per cent of the whole attendance studied Latin. In 1896 the number of pupils in Latin was 15,526, about 63 per cent of the number in attendance. In 1867, 15 per cent studied Greek; in 1896 only 6 per cent. In 1867, 38 per cent of the pupils studied French and none studied German. In 1896 these numbers had increased to 55 per cent and 18 per cent, respectively. There also has been a large increase in the number studying drawing, the total in 1867 being 676, and in 1896, 13,468.

The greatest progress, however, has been made in the study of English literature, composition, and history. These subjects, including poetical literature, introduced in 1887, are now taken substantially by all the pupils.

The influence of the high schools is greatly extended through the elementary teachers that receive in them their nonprofessional training. They constituted in 1896 nearly 24 per cent of the entire teaching force of the province.

The widespread influence of the high schools is indicated also by the varied classes from which their pupils are drawn. The occupations of parents of high-school pupils as reported in 1896 were as follows:

Agricultural	9,126
Commercial	6,792
Mechanical	6,162
Professional	2,487

SYSTEM OF QUEBEC.

Historical survey.—The school system of Quebec is much more complicated than that of the other provinces, and bears much less resemblance to those of our own States. The salient feature of the system is

the provision for the separate control of Catholic and Protestant schools. This dual character illustrates both the religious and national influences under which the system has gradually developed. During the French régime[1] (1615–1760) education was left to the religious orders that had come out to New France for the purpose of carrying on missionary work among the Indians. Of the five principal orders that established themselves in the province three were devoted to the education of boys; the other two were concerned solely with the education of girls. The separation of the sexes in elementary grades, which is still characteristic of the Roman Catholic schools, is thus seen to be a natural result of their origin. The religious orders were supported in their work by grants of land from the French kings, by private benefactions, and by the contributions of the church.

After the capture of Quebec (1629) the religious orders experienced some difficulty in continuing their work. Two of the orders, the Recollects and the Jesuits, were indeed temporarily obliged to withdraw. The Recollects did not return until 1670, but the Jesuits returned in 1632, immediately after the restoration of the country to the French. They resumed their educational work with great vigor, and established schools which rapidly developed, and which have had powerful influence in shaping the history of the province.

Among existing institutions which are traceable to the efforts of these religious orders are Laval University, the outgrowth of the "Petit Séminaire de Quebec," founded by Bishop Laval in 1668, and the Ursuline Convent, founded in 1639, the first girls' school in Canada.

The conquest by the English in 1760 prepared the way for many new agencies, and between that date and the date of the union of Upper and Lower Canada (1841) the number of schools was greatly multiplied.

The Christian Brothers began their efforts in 1837 as teachers of elementary schools. Here, as elsewhere, their work took deep hold of the community, and it forms to-day one of the most important features of Roman Catholic elementary education in the Province. The Protestant churches and Protestant societies were also very active in establishing schools; and the germs of a public-school system were implanted by settlers from the New England States, who established themselves in townships. "During the first year of their life in Canada the children of near neighbors were gathered in one of the dwelling houses, and taught by one of the older and better instructed of their sons and daughters. Very soon log schoolhouses were erected in many of the townships by the voluntary efforts of the settlers, and in these the children were regularly taught. The cost of erecting schoolhouses

[1] The résumé of the early history of education in Quebec is compiled from the introduction to the Manual of School Law and Regulations, prepared by Rev. Elson I. Rexford, B. A., formerly secretary of the department of public instruction. An important source of information is the History of Public Instruction in Canada, by M. Chauveau, formerly minister of public instruction for the Province of Quebec. The following sources are cited in Canada and the Canadian Question, by Goldwin Smith: The Relations des Jésuites, and Le Clercq's l'Établissement de la Foi, Mr. Parkman's Narratives, and the histories of Garneau, Christie, Miles, MacMullen, and Kingsford.

and maintaining schools had to be defrayed by the settlers themselves. Not satisfied with providing elementary schools for their children, the residents of the more thickly settled centers of the township endeavored, at an early date, to provide more advanced instruction by establishing 'academies,' or superior schools. The persons interested contributed to the erection of a suitable building and elected a board of trustees, to which was intrusted the management of the school. In the earlier years the teacher had to depend mainly upon the tuition fees for his salary. This was sometimes supplemented by subscriptions and other special provisions, and when grants were given by the legislature and by the Royal Institution, these institutions were recognized."

These different agencies, with their diverse and often opposite aims and methods, have been continued to the present time, with such modifications as were inevitable from the effort to include them in a State-aided system.

The first public elementary school act for the Province was passed in 1829. The subsequent law of 1846, amended in 1849, is substantially the same as the laws passed in 1869, 1876, and 1888.

Central control.—The law of 1841 provided for a superintendent of public instruction. The council of public instruction was instituted in 1856, and in 1869 the council was organized in two committees, one for the charge of Roman Catholic, the other of Protestant schools. The religious distinction was thus incorporated into the legal system and pervades its entire organization. For example, the school inspectors appointed by the lieutenant-governor are chosen from persons recommended by the committees. Among the requirements for the inspectorship is experience as a teacher, the possession of a diploma, and success in an examination before one or the other of the council committees.

Each committee makes regulations for the inspectors of the schools under its own charge, and has absolute control over the inspectorate, since it is also within the province of the committees to recommend the dismissal of teachers for causes specified.

Certain public officials are also recognized as "school visitors, who may visit the public schools as often as they think desirable, but visitors are entitled to visit only the schools of their own faith." It is further provided that the following are visitors only for the municipality in which they reside:

1. Roman Catholic and Protestant clergymen.
2. Members of the council of arts and manufactures.
3. The mayor and the justice of the peace.
4. The colonels, lieutenant-colonels, majors, and senior captains of the militia.

Requirements for teachers.—The religious distinction is maintained also in the appointment of teachers. Candidates are examined by boards appointed by the lieutenant-governor upon the recommendation of one or other of the committees. All persons desiring to act as

teachers must undergo examination unless provided with a diploma from one of the normal schools. Nevertheless, "every priest, minister, and ecclesiastic, and every person forming part of a religious order instituted for educational purposes, or being a member of a religious community of women, is exempt from undergoing an examination before any of the said boards."

Local control of schools.—The local unit of school administration is a "school municipality"—i. e., any territory erected into a municipality for the support of schools under the control of school commissioners or of trustees elected by the ratepayers.

The commissioners are empowered to divide a municipality into school districts and to maintain one or two schools in each district.

"If in any municipality the regulations and arrangements made by the school commissioners for the management of any school are not agreeable to any number whatever of the proprietors, occupants, tenants, or ratepayers professing a religious faith different from that of the majority of the inhabitants of such municipality, such proprietors, occupants, tenants, and ratepayers may signify such dissent in writing to the chairman of the commissioners.

"The notice having been duly served, the dissentients may proceed, after the lapse of two months, to elect three school trustees, who will have the same power with respect to dissentient or separate schools as the commissioners have with respect to the schools of the majority. The trustees alone have the right of imposing and collecting the taxes upon the dissentient inhabitants." So complete is the provision for minorities that trustees have the same powers and duties as school commissioners for the management of the schools under their control.

The division of school authority out of regard to sectarian predilections and the consequent preservation of original forms has resulted in a diversity of schools, whose scope it is not always easy to express in terms applicable to other systems.

A certain degree of uniformity is imposed upon the schools by the conditions for obtaining a share in the public funds.

Sources of school income.—Schools are supported by local taxes, fees, and provincial appropriations. The rate of fees is fixed by school commissioners and trustees, but may not be more than 40 cents nor less than 5 cents a month.

PAYMENT AND DISTRIBUTION OF THE COMMON-SCHOOL FUND.

The sums constituting the common-school fund of the province are paid to the superintendent in semiannual payments, and the superintendent pays their respective shares to the several boards of school commissioners and trustees in two semiannual payments.

To entitle any school to its share of the general or local school fund it is requisite and sufficient—

1. That it has been under the management of school commissioners or trustees in the manner directed by this law.

2. That it has been in actual operation during at least eight months.

3. That it has been attended by at least 15 children (periods of epidemic or contagious diseases excepted).

4. That reports have been made to the school commissioners or trustees by the teacher and by at least two of the commissioners or trustees.

5. That a public examination of the school has taken place.

6. That a report, signed by the majority of the school commissioners or trustees and by the secretary-treasurer, has been transmitted to the superintendent every six months, the first before the 15th day of January and the second before the 15th day of July in each year.

7. That a sum equal to the grant made by the legislature for the municipality has been raised, as herein provided.

8. That teachers with diplomas have been employed therein.

9. That the teachers have been paid every six months.

10. That only those books authorized by the committees of the council of public instruction have been used.

11. That the regulations of the committees and the instructions of the superintendent have been observed.

All sums arising from school grants, school taxes, and from any source other than monthly fees form the school fund in each municipality, and are distributed and employed by them:

1. Either in proportion to the number of children from 7 to 14 years of age in each school district residing therein and capable of attending school; or,

2. By making a common fund, out of which the school commissioners or trustees pay the expenses occasioned by the payment of teachers' salaries, the maintenance of schoolhouses, the purchase of books, school furniture, and other contingent expenses.

The school commissioners or trustees after having adopted one of the two methods mentioned in the preceding article can not change it within two years, unless by the authority of the superintendent.

In all cases the school commissioners or trustees are required to deduct from their share of the school fund the sum of $80 for the support of a model school, if there is one in the municipality, in addition to the share which such model school is entitled to receive from such fund.

* * * * * * *

The sum annually voted by the legislature in aid of poor municipalities is distributed by the superintendent according to the division made by him, and which has been approved by the committees of the council of public instruction.

Public appropriations are also made for superior institutions—i. e., for universities, classical colleges, academies, etc.—and the money so granted is divided between the total of the Roman Catholic and Protestant institutions, respectively, in the relative proportion of the respective Roman Catholic and Protestant populations of the Province according to the then last census.

Such grants are for the year only, and are not permanent.

Teachers have the benefit of a pension fund maintained by withholding 2 per cent of the annual salaries. The fund is available for teachers who have served ten years and have reached the age of 56 years.

EFFORTS FOR THE REORGANIZATION OF THE SCHOOL SYSTEM.

The dual system here outlined has not worked without friction and it is in many respects unequal to the demands of the present time.

A new education bill was submitted to the assembly in the session of 1897, but after passing that body by a large majority was rejected by the council.

The agitation of the subject has, however, awakened public interest in the schools, and the press devotes much space to their discussion. Among evidences of improvement noted by the superintendent in his report for 1896–97 are the abolition of local examining boards.

The new Protestant teachers must have a normal school diploma, and the Roman Catholic teachers will have to get theirs from a central board of examiners.

There are teaching in the Roman Catholic elementary schools 3,860 female teachers with diplomas, and their average yearly salary is $98.

The Roman Catholic committee, with the approval of the executive, has now fixed the minimum salary to be paid schoolmasters and schoolmistresses at $100, and every municipality that does not comply with regulation will forfeit its school grant.

In 1896 the sum of $50,000 was added to the usual grant, and, as a consequence, the grant to poor municipalities has been raised from $10,000 to $20,000.

From present indications it is probable that a renewed effort will be made in the next session of the legislature to secure the passage of a new school law.

SYSTEM OF NEW BRUNSWICK.

In New Brunswick, the governor, the members of the executive council, the chancellor of the university, and the chief superintendent of education constitute a board of education for the general control of public schools. The school district is the local unit of school administration, and the elementary schools are managed directly by trustees elected as in the other provinces. Applicants for teachers' places must show professional classification at the normal school, a license from the board of education, or hold a degree in arts from a chartered college or university, and comply with other requirements according to the position sought. Even graduates of arts without training at normal schools or two years' experience in teaching must give practical illustrations of methods of teaching before the principal of the normal school and a professor of the university.

There are three sources from which moneys are drawn for the payment of teachers' salaries: The provincial treasury, the county school fund, and district assessment. From the first-named source an allowance is annually made in respect of every legally qualified teacher in the service. Male teachers receive $135, $108, or $81, according to grade; female teachers, $100, $81, $63, according to grade.

Assistant teachers receive not more than one-half the above amounts. The county assessment in aid of schools must yield "an amount equal to thirty cents for every inhabitant of the county according to the last

preceding census, together with an amount not exceeding 10 per cent for probable loss and expenses of disbursing." This gross sum is apportioned among the several parishes, cities, and towns in the same proportion as other county taxes.

The district assessment consists of a poll tax levied at the per capita rate of $1 on every male person (except clergymen) between the ages of 21 and 60 years.

The balance of the sum to be raised by the district is assessed on real and personal property.

The law provides for the establishment of superior or high schools and for county grammar schools. These receive aid from the provincial treasury if they reach a certain standard of efficiency. The grant in each case is proportioned to the amount of local support which the school receives.

SYSTEM OF NOVA SCOTIA.

Nova Scotia maintains a system of free nonsectarian public schools, under the general charge of the executive council, which forms for this special interest a council of public instruction. The chief officer of the system is a superintendent, who is appointed by the governor in council. The council has power (1) to direct (in all cases not specifically provided for by statute) the expenditure of such sums of money as are appropriated by the legislature for educational purposes, such expenditure to be made on the requisition or certificate of the superintendent of education.

(2) To appoint a principal of the normal and model schools, and also such assistant teachers as may be found necessary, and to fix the salaries of the same.

(3) To make regulations for the conduct of the normal school and to prescribe the conditions of admission and graduation of students.

(4) To divide the province into inspectorates and to appoint an inspector for each upon the recommendation of the superintendent of education, and to regulate all the conditions as to teachers' licenses, length of school session, form of school registers, text-books, and courses of study as may be necessary to securing uniform standards of efficiency in the schools of the province.

The council also has power "to make regulations for constructing, locating, and controlling county academies, and to authorize the payment of provincial grants to the same." It may aid in the establishment and support of school libraries and provide for the training of teachers in agricultural sciences and foster the teaching of these subjects in the elementary schools.

Local control.—The province is divided into school commissioners' districts, in charge each of a board of commissioners appointed by the council, subject to the provisions of the town's incorporation act of 1895. Each school section shall have a board of three trustees elected by the majority of the qualified voters of the section.

The powers and duties imposed upon the trustees are discharged by the appointed commissioners in incorporated towns.

The city of Halifax forms one school section in charge of twelve commissioners, of whom six are appointed by the governor. These trustees or commissioners have immediate charge of the schools in their respective sections. They employ teachers, who must, however, be licensed, except that where necessary an unlicensed candidate may be appointed as assistant teacher.

Mode of support.—The fixed sum of $182,500 for each school year is paid semiannually, or as the council of public instruction may prescribe, to legally qualified teachers employed in the common schools in accordance with law, to be divided between such teachers in conjoined proportion to the number of days the respective schools are taught and the scale of the respective grades.

This distribution is made semiannually through the inspectors, or otherwise as the council may direct. In every county (except that in which the city of Halifax is situate) the clerk of the municipality is required to add to the sum annually voted for general municipal purposes at the regular meeting of the council a sum sufficient, after deducting costs of collection and probable loss, to yield an amount equal to 30 cents for every inhabitant of the municipality, and the sum so added shall form, or be a portion of, the municipal rates. Any sum further needed is determined by those who pay a property tax (ratepayers). Ordained ministers, widows, and unmarried women are exempt from sectional assessment on property to the amount of $500.

THE SCHOOL SYSTEM OF MANITOBA.

Historical survey.—Prior to the passage of the law of 1890 Manitoba maintained separate schools for Roman Catholic and for Protestant children.

The law of 1890 established a uniform system of nonsectarian schools and prohibited the use of public funds for denominational schools. The bitter contest to which this law gave rise, the appeal to the Dominion government, and subsequently to the English privy council, the remedial order issued by the Dominion government and the refusal of the Manitoba people to submit to this dictation are set forth in the Commissioner's Report for 1894–95 (Vol. 1, Chap. VII).

The answer of the provincial legislature to the Dominion government refusing to enact a remedial law was approved December 26, 1895, and the legislature at once dissolved, that an appeal might be made directly to the people. The election held on January 15 resulted in an overwhelming triumph for the premier, Mr. Greenway, and his policy of nonsectarian schools.

The Dominion parliament assembled January 2, on which day Lord Aberdeen, as governor-general, presented his address to the lawmakers and strongly urged the necessity of compelling Manitoba to submit.

It turned out that the Dominion cabinet was seriously divided on the subject, and on January 4 half of the ministers resigned their portfolios. Subsequently the retiring ministers were induced to withdraw their resignations. It was now clear that the only hope of the separate-school party lay in the promised interference of the Federal Parliament. No definite action was taken in the matter until March 2, 1896, when a remedial bill was introduced. The conservative government then in power had less than two months left to them before the necessary dissolution of parliament, and it was evident that the bill had no chance of being carried, or even fully considered, in the time remaining. Such discussion as took place was bitter, and the dissolution of parliament, on the 24th of April, carried the whole question back to the people of the Dominion. The question involved and the results of the election are thus set forth by an English authority:

It may be briefly stated that in the election struggle the Catholic school system was the main question, and that the Catholic bishops and clergy threw themselves vigorously into the contest and exerted their utmost strength to secure the return of members pledged either to establish separate schools, or else, in vaguer terms, to see justice done to the Catholic minority in Manitoba. But though the numerical key to the victory in the Dominion parliament was actually in the hands of the most Catholic province, Quebec, the Liberal opposition leader was returned to power by a considerable majority; and the Liberal party thus took the lead in Canadian politics for the first time in eighteen years. It is true that several considerations, rather political and economic, and even perhaps ethnological, helped to bring about Mr. Laurier's triumph; but the latter's solemn undertaking to settle within six months the Manitoba school difficulty, which had racked Canadian politics for over six years, was undoubtedly a strong element in the situation, since it was felt that if on the one hand a definitely coercive measure could never be put into operative effect in Manitoba, nor the Catholics, on the other hand, induced to accept the Manitoba public schools, the only hope of a settlement acceptable to both sides lay in some proposal emanating from a leader who would be at once a noncoercionist by political and a Catholic by religious conviction.

The next stage in the struggle is therefore the compromise at once put forward by Mr. Laurier, on the part of the Dominion, and subsequently accepted by Mr. Greenway, the premier of Manitoba. It was very much on the lines suggested by Sir Donald Smith's earlier commission, but was on the whole less favorable to the Catholics. The main points were these: On a petition signed by the parents or guardians of 10 children attending a school in a rural district, or of 25 children in a town or village, any clergyman or authorized religious teacher is to be permitted access to the school to give religious instruction at stated times. And in any town school where the average attendance of Roman Catholic children is 40 or upward (in rural districts 25 or upward) they may be entitled to the services of one Catholic teacher, who must, however, be fully qualified according to provincial or national school standards. In districts where the children speak French wholly they are to have a teacher speaking both French and English, so that the teaching may be on the bilingual system. But all schools are to be national, under provincial control, and subject to the same regulations and inspections. The same text-books are to be used, and all teachers must be properly qualified by passing the provincial examinations and taking the prescribed normal school course.

The settlement was not satisfactory to the Catholic authorities, and the Papal intervention was eventually sought. The encyclical of His

Holiness was conciliatory in tone, but condemned the settlement as unsatisfactory from the Roman Catholic standpoint.

Provisions of the law of 1890.—By the law of 1890 the general control of schools was vested in a department of education, which is to consist of the executive council, or a committee thereof, appointed by the lieutenant-governor in council, and also an advisory board composed of seven members, four of whom are to be appointed by the department of education, two by the teachers of the province, and one by the university council. Among the duties of the advisory board is the power "to examine and authorize text-books and books of reference for the use of the pupils and school libraries; to determine the qualifications of teachers and inspectors for high and public schools; to appoint examiners for the purpose of preparing examination papers; to prescribe the form of religious exercises to be used in schools."

The law provides "for the formation, alteration, and union of school districts in rural municipalities, and in cities, towns, and villages;" for the election of trustees in each district; for the maintenance and control of the schools.

All public schools shall be free schools, and every person in rural municipalities between the age of 5 and 16 years, and in cities, towns, and villages between the age of 6 and 16, shall have the right to attend some school.

SEC. 6. Religious exercises in public schools shall be conducted according to the regulations of the advisory board. The time for such religious exercises shall be just before the closing hour in the afternoon. In case the parent or guardian of any pupil notifies the teacher that he does not wish such pupil to attend such religious exercises, then such pupil shall be dismissed before such religious exercises take place.

SEC. 7. Religious exercises shall be held in a public school entirely at the option of the school trustees for the district, and upon receiving written authority from the trustees it shall be the duty of the teacher to hold such religious exercises.

SEC. 8. The public schools shall be entirely nonsectarian, and no religious exercises shall be allowed therein except as above provided.

The schools are to be supported by public grant and district assessments, but schools—

not conducted according to all the provisions of this or any act in force for the time being, or the regulations of the department of education, or the advisory board, shall not be deemed a public school within the meaning of the law, and shall not participate in the legislative grant.

THE SYSTEM OF BRITISH COLUMBIA.

In accordance with the school law of 1891, British Columbia maintains a system of free secular schools which are under the charge of a superintendent appointed by the lieutenant-governor in council. The superintendent is assisted by the council of public instruction. The local unit of school administration is the district. School trustees, elected by vote of persons who pay a property tax, are empowered to provide sufficient accommodation for all children of the district between 6 and 16 years of age, inclusive. The trustees must visit the schools

and see that they are conducted in accordance with the regulations, and report annually to the superintendent. School attendance is compulsory for all children between the ages of 6 and 12 years for six months in each year, unless they are under private instruction. Teachers must be provided with a Government certificate, of which there are six grades. The lowest is valid for one year, the next higher for two, and so on to the fifth; this and the sixth grade certificates are valid for life or during good behavior.

Graduates of arts of recognized British or Canadian universities are exempt from examinations on the art of teaching, school discipline and management, and the school law.

The strictly nonsectarian character of the schools is indicated by the following provisions of the law:

> No religious creed is allowed to be taught; the Lord's Prayer may be used at the opening and closing of the schools. No clergyman is eligible as superintendent, inspector, or master.

The schools are supported entirely by appropriations from the public treasury.

THE NORTHWEST TERRITORIES.

The report of the superintendent of education in the northwest territories of Canada presents an interesting view of the efforts for popular enlightenment in the northern part of our continent.

The territory under supervision covers an area of 302,000 square miles, with a population in 1891 of 66,799.

While the people are chiefly of British origin, other nationalities are represented in sufficient numbers to increase the school difficulties. The occupations are farming, ranching, lumbering, and mining, and the population widely scattered as a consequence. Nevertheless the report gives evidence of advanced ideas with reference to the conditions for effective schools. The system of public schools is under the control of a council of public instruction, comprising four members of the executive committee and four appointed members, of whom two must be Protestants and two Roman Catholics. The appointed members have no vote, their duties being purely advisory. A school district must not exceed in area 25 square miles, and must contain not less than four resident taxpayers (property tax) and at least twelve children of school age. Each district elects school trustees, who manage the local school affairs.

Provision is made for separate schools for religious minorities (Protestant or Roman Catholic), the ratepayers establishing these separate schools being relieved of taxes for the public schools. The decade 1886 to 1896 witnessed a remarkable growth in the schools. The number rose from 76 to 366, an increase of 381 per cent, and the enrollment from 2,553 to 12,796, an increase of 400 per cent.

At the latter date 433 teachers were employed. Efforts were early made to secure professional training for teachers, and by a regulation

dated April 1, 1893, it is declared that, to make it possible for remote districts to keep their schools open, "provisional certificates are issued to persons who present such evidence of scholarship that there is a reasonable probability of their being able to pass the next teachers' examination." These certificates are not issued till the trustees declare that they have advertised for a qualified teacher and have used all reasonable effort to secure one, but without success. Then, upon the application of the trustees—not of the would-be teacher—a provisional certificate is issued, valid for that school only, and terminating at the opening of the next examination for teachers.

Schools are maintained by legislative grants and by local taxation. From the former source was derived in 1896 the sum of $126,218, or 46 per cent of the total expenditure $274,648.

The elementary course of study includes the three R's, history, geography, grammar, nature study, and agriculture. Temperance is a compulsory subject for all grades.

There are no separate secondary schools, but the sixth, seventh, and eighth standards, the enrollment for which in 1896 was 126, 39, and 5, respectively, are termed "high-school standards," and have an entirely separate programme, based upon the matriculation examinations of the universities of Toronto and Manitoba.

Preparation for the "academic certificate" for teachers is given in these "high-school standards." The examination comprises the following subjects: Spelling and writing, the English language, rhetoric and composition, poetical literature, history, geography, arithmetic, algebra, geometry, trigonometry, chemistry, botany, and physics.

Preparation for the first and second-class professional certificates is given in the normal school at Regina during the last four months of every year. Sessions for third-class candidates are conducted at convenient local centers by the inspectors under the supervision of the superintendent, who delivers a course of lectures at each. Of the 433 teachers in the schools 96 (62 men) held first-class certificates, 207 (98 men) second-class, and 130 (51 men) third class.

Among the text-books recommended for the normal course are to be found White's School Management, Quick's Educational Reformers, Rosenkranz's Philosophy of Education, De Garmo's Essentials of Methods.

The higher educational institutions of Canada—1895.

Name.	Date of foundation.	Endowment.	Value of property owned.	Income.	Number of students (about).
UNIVERSITIES.					
University of King's College, Windsor, Nova Scotia	1789	$155,000	$250,000	$9,000	26
University of New Brunswick, Fredericton, New Brunswick	1800	*a* 8,844	.....	12,000	60
McGill University, Montreal, Quebec	1813	1,400,000	1,900,000	145,000	1,250
Dalhousie College and University, Halifax, Nova Scotia	1821	.....	.....	.....	169

a Government grant.

The higher educational institutions of Canada—1895—Continued.

Name.	Date of foundation.	Endowment.	Value of property owned.	Income.	Number of students (about).
UNIVERSITIES.					
University of Toronto, Toronto, Ontario	1827	$1,042,000	$1,800,000	$85,000	1,269
University of Acadia College, Wolfville, Nova Scotia	1838	100,000	100,000	12,000	130
University of Queen's College, Kingston, Ontario	1841	400,000	125,000	40,000	525
University of Bishop's College, Lennoxville, Quebec	1843	112,165	162,600	21,130	181
University of Ottawa, Ottawa, Ontario	1848	.....	.....	46,000	463
University of Trinity College, Toronto	1852	750,000	.....	30,000	350
Laval University, Quebec	1852	.....	1,000,000	.....	235
University of Mount Alison College, New Brunswick	1862	120,000	140,000	.....	275
University of Manitoba, Winnipeg	1877	150,000	.....	.....	320
Victoria University, Toronto, Ontario	1836	325,000	280,000	24,000	234
University of St. Francis Xavier College, Antigonishe, Nova Scotia	1854	.....	.....	.....	134
McMaster University, Toronto, Ontario	1887	.....	.....	.....	134
COLLEGES.					
St. Michael's College, Toronto, Ontario	1852	.....	.....	.....	120
Knox College, Toronto, Ontario	1844	240,000	470,000	18,000	119
Assumption College, Sandwich, Ontario	1854	.....	113,000	25,000	175
Presbyterian College, Montreal, Quebec	1867	225,000	160,000	150,000	84
Presbyterian College, Winnipeg, Manitoba	1870	15,000	50,000	15,000	87
Presbyterian College, Halifax, Nova Scotia	.....	120,000	.....	.....	30
Wesleyan College, Montreal	1873	50,000	60,000	6,000	71
Methodist College, Winnipeg, Manitoba	1888	.....	.....	.....	.....
St. John's College, Winnipeg, Manitoba	.....	.....	60,000	.....	.....
St. Boniface College, Winnipeg, Manitoba	1820	.....	50,000	12,000	105
Woodstock College, Woodstock, Ontario	1860	160,000	200,000	25,000	120
Wycliffe College, Toronto, Ontario	.....	63,290	65,000	10,000	40
Albert College, Belleville, Ontario	1857	.....	75,000	.....	250
Stanstead Wesleyan College, Stanstead, Quebec	1872	75,000	20,000	10,000	149
St. Francis College, Richmond, Quebec	1854	15,000	2,900	3,000	110
CLASSICAL COLLEGES, QUEBEC. *a*					
Chicoutimi	1873	.....	85,000	5,135	126
Joliette	1846	.....	75,494	11,205	303
L'Assomption	1832	.....	99,000	12,360	315
Lévis	1853	.....	179,817	11,358	331
Nicolet	1803	.....	255,000	10,724	267
Rigaud (Vaudreuil)	1850	.....	70,000	15,000	272
Rimouski	1854	.....	52,600	5,435	128
Sherbrooke	1875	.....	100,000	4,287	237
Ste. Anne (Kamouraska)	1827	.....	175,000	10,337	228
St. Hyacinthe	1816	.....	200,000	21,500	335
St. Laurent (Jacques Cartier)	1847	.....	129,000	24,800	466
Ste. Marie do Monnoir (Rouville)	1853	.....	62,000	7,794	190
Ste. Marie (Montreal)	1848	.....	303,000	35,000	501
Ste. Thérèse (Terebonne)	1827	.....	130,000	15,961	257
Three Rivers	1860	.....	97,500	10,300	235
College of Montreal *b*	1767	.....	.....	.....	.....
Seminary of Quebec *b*	1663	.....	.....	.....	.....
LADIES' COLLEGES.					
Wesleyan Ladies' College, Hamilton, Ontario	1860	.....	80,000	17,000	144
Hellmuth Ladies' College, London, Ontario	1869	.....	80,000	30,000	100
Brantford Ladies' College, Brantford, Ontario	1874	.....	60,000	20,000	70–140
Ontario Ladies' College, Whitley, Ontario	1874	.....	100,000	22,000	150
Demill Ladies' College, Oshawa, Ontario	1876	.....	55,000	14,000	138
Alma Ladies' College, St. Thomas, Ontario	1881	.....	90,000	25,000	170
AGRICULTURAL COLLEGES, ETC.					
Ontario Agricultural College, Guelph, Ontario	1874	.....	340,900	*c* 18,564	135
Provincial School of Agriculture, Truro, Nova Scotia	1885	.....	.....	*c* 1,967	25
School of Practical Science, Toronto, Ontario	1877	*c* 8,800	.....	.....	71
School of Agriculture, L'Assomption, Quebec	.....	.....	.....	4,500	24
School of Ste. Anne de la Pocatière, Quebec	1859	.....	.....	4,000	21

a The classical colleges in Quebec are a combination of school and college, attended by both boys and young men. They confer certain degrees and are mostly affiliated with Laval University.
b No returns.
c Government expenditure.

CHAPTER V.

SYSTEMS OF PUBLIC EDUCATION IN AUSTRALIA, NEW ZEALAND, AND TASMANIA.[1]

For previous articles on education in Australasia, see:

Secondary Education in New Zealand, by Sir Robert Stout, K. C. M. G. Report for 1890–91, Vol. 1, pages 45–94.—Education in New Zealand. Report for 1892–93, Vol. 1, pages 258–261.

TOPICAL OUTLINE.—Current statistics of public schools in the Australasian colonies—Brief account of the systems of public education, including administrative and controlling authorities, sources of income, and special schools for rural districts—Care of pauper children—State aid for higher, special, and technical schools—Tabular view of private schools and universities—Appended papers: Report of personal observations of the school systems of Victoria, New South Wales, and South Australia, by Mr. D. White, M. A., rector of the normal school, Dunedin, New Zealand; Extracts from an address on educational reforms, by Hon. C. C. Bowen, of New Zealand; Report on working of "The school attendance act, 1894," by J. Stormont Small, esq., truant inspector, New Zealand, and on Industrial schools in New Zealand, by Mr. Mark Cohen.

In the five divisions of Australia and the adjoining colonies, New Zealand and Tasmania, liberal provision has been made for education by both public and private agencies. The latest official reports present the following particulars respecting the public schools of these colonies:

Colonies.	Date of report.	Enrollment in public schools.	Per cent of population.	Average attendance.	Per cent of enrollment.	Teachers.			Expenditure for primary education.
						Male.	Female.	Total.	
New South Wales	1896	221,603	16.89	142,192	64.16	2,307	2,084	4,391	$2,889,537
Queensland	1896	81,754	17.75	54,316	66.44	798	917	1,715	933,484
South Australia	1896	59,944	17.23	40,143	66.96	396	768	1,164	632,742
Victoria	1896	208,542	17.71	138,126	66.23	1,760	2,737	4,497	2,887,664
West Australia	1896	9,008	.....	6,470	73	103	178	281	159,169
New Zealand	1896	131,037	18.62	108,976	83.16	1,424	2,091	3,515	2,053,316
Tasmania	1896	14,835	10.11	11,508	72.96	.....	.....	.....	165,689

Unlike the English system of public education, the systems established in Australia show a decided tendency to centralized control, a natural consequence, it would seem, of the social and political conditions of the country.

[1] Prepared by Miss Anna Tolman Smith.

CENTRAL AND LOCAL AUTHORITIES.

The State, or public schools, in the several colonies are controlled by a minister of public instruction, or secretary, as in Queensland. This chief officer has charge of the school properties, the establishment and classification of schools, the regulation, the course of studies, etc. A system of public inspection is maintained in all the colonies. Inspectors and teachers, excepting in New Zealand, are appointed by the minister, or as in Queensland, by the governor, and belong to the civil service. Local advisory boards, appointed also by the minister or governor, exercise a measure of supervision over the schools and advise the central authority as to the location of schools and the general condition of the school district. In New Zealand local control is more highly developed than in the other colonies. This colony is divided into thirteen educational districts, with at least one school in each. There are district committees, selected by the householders and parents, which committees in turn elect school boards. The minister controls and directs the school affairs, but the administration of the school law in the district falls upon the district boards. They erect the school buildings, appoint inspectors and teachers, etc. The local or district committees exercise advisory and supervising powers.

SOURCES OF SCHOOL INCOME.

The public schools are maintained in all the colonies by appropriations from the general treasury, supplemented by fees in New South Wales and Tasmania.

As a rule, the district contributes the site for the school building and bears a certain proportion of the cost of building and furnishing. Local effort is further stimulated by the very general policy of distributing the public appropriation on the basis of school attendance.

COMPULSORY LAWS.

A compulsory clause is embodied in the school laws of all the colonies, and in all the colonies, except Queensland, efforts are made to enforce the same, but this is extremely difficult, owing to the sparse and isolated population of the agricultural districts. In New Zealand the compulsory law is applicable even to the aborigines, and their interest in the schools is said to be constantly increasing. In 1896 there were enrolled in the native village schools of this colony 2,203 Maori children, or 5½ per cent of the Maori population. There were also 73 government pupils in boarding schools, natives maintained by private or denominational efforts, but receiving from the public funds appropriations for the expenses of government pupils.

PROVISIONS AS TO RELIGIOUS INSTRUCTION.

In Victoria, Queensland, and New Zealand the public schools are strictly secular; in South Australia, unsectarian religious instruction is allowed; in New South Wales and West Australia, provision is made for religious instruction in the schools at an hour when children may be withdrawn if their parents object to their presence.

SPECIAL SCHOOLS FOR RURAL DISTRICTS.

The efforts to adapt the public-school provision to the conditions of newly settled and isolated districts form an interesting feature of the history. The ideal school of each system is a graded school, with a prescribed course and definite standards for each year, under the charge of trained and duly certificated teachers, and housed in suitable public buildings, but the modifications of this ideal are the most convincing evidences of the earnest purpose to bring the means of instruction within the reach of the entire child population.

In New South Wales, besides the typical public schools, comprising five grades or classes, with the teaching staff and equipment required by the department, provisional schools are recognized; these schools are organized under conditions which preclude an immediate compliance with the standard regulations, but in time they may develop into complete public schools. House-to-house schools are also maintained. A school of this class "is composed of the children of families residing in localities several miles apart. Each locality forms a teaching station, and the teacher journeys from station to station, and collects as many children as possible at a central point. The number of stations under one teacher varies from three to five. The instruction is confined to reading, writing, dictation, and arithmetic. Every itinerant teacher is required to prepare a programme of his work, and to submit it for the approval of the government inspector. One of the essentials of such programme is that adequate provision shall be made for a systematic course of home lessons." Fifty-seven schools of this class were reported in 1895. Similar departures from the prescribed standard are tolerated also in the selection of teachers for what are known as the small bush school.

The majority of the teachers—about six-sevenths of those employed in the larger schools—are drawn from the two public training schools, while the remaining seventh employed in such schools have received their training in other countries. The teachers of small bush schools, on the contrary, are selected from local applicants who have been educated in one or other of the public schools of the colony. They must be at least 18 years of age, of good moral character, have received the necessary preliminary training in a public school, and have been furnished with a certificate to the effect that they are competent to manage a small school. The inspectors take the entire responsibility

of providing teachers for the smaller schools. Their training costs the State nothing; they are "accustomed to the bush," and they are usually to be found at short distances from the vacant schools. Provided they show fair aptitude for the work and otherwise give satisfaction—and the great bulk of them, it is said, do this—they become eligible at the end of two years for admission to the training schools. Many of the best and most successful teachers in New South Wales have entered the service in this way.

In New Zealand the law provides that in outlying districts or parts of the country where from the scattered state of the population it is not practicable to establish a public school, the district board may appoint itinerant teachers under special regulations. In remote districts, which it would be premature or inconvenient to constitute school districts, the district board, on the recommendation of the government inspector, may assist schools started by private enterprise. The aid may be in the form of text-books, school apparatus, or money, as the board shall think expedient, provided always that the school so aided shall comply with the requirements as to length of session and course of study for public schools. Similar provision of special schools, assistance to private schools, and house-to-house schools are made in the other colonies.

CARE OF FRIENDLESS AND PAUPER CHILDREN.

In respect also to friendless and pauper children these colonies have adopted a humane and intelligent policy. In New South Wales the boarding-out or family system is universal, the object of the legislature being "to bring to bear upon all destitute children the elevating influences of family life. The children of the State, as they are called, are placed in the care of people of good character as members of the family, and are regularly visited by ladies who give their unpaid services, as well as by officials, to see that they are properly treated. The whole system is known as the 'State Children's Relief Department.'" The department proceeds upon the principle that children, whether destitute or criminal, "are not likely in the one case to grow up virtuous, or in the other to be reclaimed from vice, if they are subjected to the companionship of paupers and criminals. Only such training as they are likely to receive in a well-conducted family can be relied upon to secure either result." In order to lessen the chances that mere greed should induce people to seek the charge of these wards of the State, the money allowance is small, simply enough to cover the actual cost of feeding and clothing the children. In the case of those under a certain age, the provision "that they must regularly attend school goes far to secure that they shall not be taken for the benefit of their labor in the house or the field. In the public elementary schools the State children are in no way distinguished from the other scholars, and, as a rule, it would appear that their peculiar position is known only to the

teacher, who has to report upon them from time to time to the government."

Queensland maintains six or eight orphanages for the reception and care of neglected children. "The ranks of the orphan children are recruited chiefly from neglected children found wandering in the streets by the police, and whose fathers are probably in jail; from the children of newly arrived immigrants who have lost one or both parents, and from orphan children who have no one to look after them. After the children reach the age of 12, they may be hired out for service."

Children also are boarded out at the rate of 10 pence a day to provide for all their wants, and this system continues to grow in favor.

The law requires that these children shall be sent regularly to school, and even in case the child is adopted by the foster parents the State maintains a watchful care over it.

In New Zealand the boarding-out system is employed, and the government also maintains three "industrial" or reform schools to which vicious children may be sent. It sometimes happens that unfortunate but innocent children are nominally sent to an industrial school by magistrates' warrant, but in reality they are sent temporarily to a boarding house until a suitable foster home is found for them and their outfit prepared; girls committed because they have begun to lead a flagrantly immoral life, or are in great danger of doing so, are at once sent to a suitable institution. The government also makes a money allowance to private industrial schools for the maintenance of uncontrollable children.

SECONDARY AND TECHNICAL.

In all the colonies public provision is made by means of scholarship funds for continuing the education of poor but promising youths beyond the elementary grade.

Technical education has been the subject of much discussion and of many practical efforts in the several colonies. The term is used in a broad sense, including "instruction in those branches which have an important bearing on the arts of production and manufacture, viz, mathematics, drawing (in which is included practical geometry), physical science, and manual training," and also instruction in the "scientific principles and manual processes required in any particular branch of industry." In the present tentative stage experiments and institutions of widely different character are classed under the head of technical. Without attempting here to discriminate between these or to define the scope of any one, a general summary of the provision reported under this head is given.[1]

New South Wales maintains a technical college, comprising scien-

[1] As this matter was passing through the press the office received the Report of the proceedings of the fourth meeting of the International Congress on Technical Education, held in London, June, 1897. Several papers presented before the congress are reproduced in this Report in the chapter entitled "Textile and other technical schools."

tific, technical, and art courses. In 1896 there were enrolled in the central and branch colleges 7,119 students.

In Queensland technical instruction is given in institutions connected with schools of art, where training in special subjects can be obtained at small cost. To accommodate those who are at work the instruction is generally given outside of working hours.

In Victoria there are 24 technical schools under the control of the education department, viz., 3 workingmen's colleges, 11 schools of arts, and 10 schools of mines. These institutions had a combined enrollment of 3,003 students in 1895. There are also 2 agricultural colleges in the colony. Tasmania has 2 technical schools, one at Hobart, the other at Launceston.

In the New Zealand legislature a bill is now pending which provides that any board of education may introduce manual training and technical branches under conditions specified. In the larger cities provision has already been made for these branches. The work was initiated at Wellington, from which it has spread to other places. With respect to the technical school established by the Wellington board of education, Mr. A. D. Riley, the director, writes the following particulars to this office:

The Technical School of Wellington was established in 1886 and was affiliated to the science and art department of South Kensington in the same year, and to the city and guilds of London Institute in 1892, thus being the first school in this colony to affiliate in each case. Since that time several bronze metals, national book prizes, third-grade prizes, and the highest certificates in art work have been obtained, while the highest awards in plumbing, the silver and bronze medals of the city and guilds of London, have also been awarded to students of this school. It was only last year (1895) that Dunedin and Auckland followed in our footsteps, in each case after sending committees to inquire into the working of the Wellington school.

Mr. Riley's report for 1895–96 gives the following details:

PRIMARY DRAWING.

The work in connection with the primary schools has been of a satisfactory character throughout the year. I am glad to report that clay modeling, pattern drawing, flat tinting, and cardboard work have made a steady advance in a fair number of schools.

Manual instruction.—The minister for education having practically guaranteed pound for pound for the cost of establishing a central class for manual instruction, the workshop at present in use by the school was provided with appliances to accommodate twenty boys. Mr. Barrett was appointed instructor, with Mr. Anderson as assistant. The number of boys present the first quarter was 68. This number fell in the second quarter to 38 and in the third to 32, although some of the boys attended the evening class during the last two quarters in preference to the day. As the classes were but a trial, the methods and arrangements were not perfect. Toward the end of the year arrangements were made for special drawing exercises being given to the boys in connection with their woodwork. A series of diagrams have now been prepared and will be used throughout the classes. Many boys were disappointed, inasmuch as they were expecting at once to make some object; others, again, retired after the newness had worn off. Until the nature of the instruction is understood steadiness can not be expected. Much opposition has been encountered from persons who have no understanding of what the aims are, but this will

steadily be overcome by the success of those boys who continue at work. There is no idea of teaching a trade in this work. The whole purpose is to cultivate handiness, and at the same time practical intelligence.

It would be absurd to try to teach young children a trade before they have acquired the rudiments of knowledge, but it is equally absurd to confine their early education to book learning, which gives no training to the eyes or hand. We wish to train the children to be handy and useful.

The object of the classes is to teach boys of the upper standards some simple hand work, such as how to use simple tools in working with wood, the work being done from patterns and examples drawn by the boys themselves.

First-grade drawing examination.—In this examination the following were the results: The total number of papers issued was 7,010, and the number worked, 6,384.

SUBDIVISION OF PAPERS.

Study.	Number worked.	Passed.	Failed.
Free-hand	1,970	1,020	950
Geometry	2,074	1,442	632
Scale	1,473	839	634
Model	867	449	418
	6,384	3,750	2,634

Of the above papers, 1,142 were taken by schools not under the Wellington board, and 634 passes were recorded.

Number of papers "excellent"	303
Number of papers "good"	706
Individual candidates	4,042
Individual passes	2,864
Schools presenting candidates	101

Increase upon 1894: Papers worked, 907; individual candidates, 455; individual passes, 425.

Undoubtedly this examination has done more toward developing a sound basis for technical education than any other primary work. The results speak for themselves in the following return, showing the number of passes recorded since the examination was established:

	Passes.
In 1884	80
In 1888	600
In 1890	1,966
In 1892	2,413
In 1895	3,750

The total number of certificates issued from 1884 to 1895 is 19,282. The number of full first-grade certificates (embracing passes in four subjects) issued up to date is 941.

The technical school includes day and evening classes, with courses as indicated below:

TECHNICAL SCHOOLS.

Number of students:	Fourth quarter.
Day classes—	
Drawing and painting (whole day students)	15
Drawing and painting (half day students)	34
Geometry and perspective	11
Secondary school scholars	51
Primary school scholars	46
Teachers and pupil teachers	100
Wood carving	14
Manual instruction	32

Number of students—Continued.	Fourth quarter.
Evening classes—	
Architectural and building construction	19
Mechanical drawing	31
Drawing	88
Life class	5
Practical plumbing	27
Theory of plumbing	21
Wood carving, carpentry, and modeling	17
Applied mechanics	14
Total	525

LIBRARY.

The library now consists of 380 volumes upon technical, science, and art subjects. Over 200 volumes have been circulated amongst the students in connection with their special requirements and trades.

During the year the school has been visited by several persons from other centers specially appointed to obtain information as to the system adopted, and a considerable correspondence has also been conducted with various committees and associations requiring information.

There can be no doubt that the success of the work is mainly owing to the thorough grounding given in the primary and elementary work, the value of which is now being felt throughout the entire district. The whole work, from primary to secondary and thence to the higher and individual trade branches, being controlled by one center, gives undoubted advantages which other centers lack.

With reference to the technical classes, it is disappointing to find the employers, with the exception of the iron founders and the builders' association, who contribute to the prize fund on behalf of their respective trades, do not sufficiently interest themselves in the matter of this education, for undoubtedly they reap the greater advantage. The success of the movement would, I believe, be almost doubled if the employers would show that they valued it, and would take a practical interest in the work of the school in connection with their employees. I hope sincerely that ere long they (the employers) will awake to the enormous importance to themselves, their workmen, and the colony, of the advantages of technical work, for it is undoubtedly a strong step toward commercial prosperity.

Finance.—The cost of the school to the board has, by the most rigid economy, been considerably reduced, and is now practically a profit to the board to the extent of £165 ($825). The total expenditure for the year is £1,761 16s. ($8,809). Receipts £1,163 15s. ($5,818).

Special schools.—In addition to the general provision of public elementary schools special schools are maintained in the several colonies for the training of the deaf-mute and the blind. These schools are of private origin, but receive subsidies from the colonial governments.

Private institutions.—Private schools are liberally supported and largely patronized, as will be seen by the statistics tabulated below. The universities which are included also in the table are either examining and teaching bodies, as in New South Wales, or merely examining bodies, as in New Zealand. In the latter case candidates for a degree pursue their studies in affiliated colleges. The universities have been subsidized by grants of land and by annual appropriations.

Tabular view of private schools, universities, and colleges.

Province.	Private schools.		Teachers.	Universities.		Affiliated schools or colleges.	
	Number.	Enrollment.	Number.	Number.	Students.	Number.	Students.
New South Wales	893	53,967	3,057	*a* 1	454	.....	.....
Queensland	175	10,570	553	.....	.....	.....	.....
South Australia	232	11,458	.....	1	.....	.....	.....
Victoria	1,157	63,270	3,084	1	*b* 129	3	.....
New Zealand	.....	.....	.....	*c* 1	.....	3	*d* 419
Tasmania	.....	.....	.....	*c* 1	.....	*e* 13	1,452

a Also three theological colleges and one college for women.
b Also 668 students attending lectures.
c Examining body.
d Matriculated, also 323 not matriculated.
e Superior schools and colleges.

This brief general survey of educational work in the Australasian colonies will serve to preserve the relation and due proportion of more detailed accounts here reproduced from various sources.

The first paper appended is by Mr. D. White, M. A., rector of the Otago Normal School, New Zealand. It is a report made from personal observation of the school systems of Victoria, New South Wales, and South Australia, and gives an intimate view of the public schools of the colonies named, and incidental comparisons of their systems with each other and with that of New Zealand. This paper is followed by extracts from an article by Hon. C. C. Bowen, founder of the educational system in New Zealand.

The two papers following relate to the working of the compulsory school law and the care of neglected and criminal children in New Zealand.

PRIMARY EDUCATION IN SOUTH AUSTRALIA, VICTORIA, NEW SOUTH WALES, AND NEW ZEALAND—REPORT OF PERSONAL OBSERVATIONS.

By D. White, M. A.

When a teacher from New Zealand is introduced to the educational institutions of the other colonies he is at first very favorably impressed with the results of their system of bureaucratic administration. I had a feeling that their large and numerous scholastic institutions must be in many respects superior to those with which I have been associated for a very long time; and this in face of the fact that I thought the New Zealand system of education was far ahead of anything I should see on the other side. I found, too, that the Victorian teacher thinks his system the best, the New South Wales thinks his the best, and so on. The teachers I met in Australia listened patiently enough to what I had to say about education in New Zealand, but you read in their faces that it is only little New Zealand you are talking about; and after all it does not matter very much what is going on in the Land of the Moa. It was only after putting a few facts about education in New Zealand before them, with regard to the number of our teachers and our school population, that they were able to see that in these respects, at least, New Zealand takes a very good position, indeed, when compared with our more populous and wealthy neighbors on the other side of the water. I posted myself up in the contents of the report of the minister of education in each of the colonies I visited, and was thus furnished

with statistical information regarding the state of education in the various colonies, and as these may prove not uninteresting to you I shall, by way of introduction, refer to one or two points bearing on school attendance and the cost of primary instruction.

The average attendance in round numbers is as follows:

South Australia	40,000
New Zealand	106,100
Victoria	134,000
New South Wales	139,000

The population of Victoria is half more than that of New Zealand. It will thus be seen that a proportionately larger number of children attend the national schools of our country than is to be found in either Victoria or New South Wales, and that absolutely in point of numbers New Zealand holds a very respectable third place. In explanation of the comparatively lower numbers attending the schools of Victoria and New South Wales than in New Zealand, I may state that there are in both colonies a large number of private schools, academies, colleges, the rolls of which show an attendance of 46,000 in Victoria and 53,000 in New South Wales. New Zealand has 14,000, and in South Australia the number is only nominal. If you compare these numbers with the total population or with the school population, in each case you will find that our education system is, in this sense, more national and representative than in the other colonies, except, perhaps, in South Australia, where, as in our own land, all classes of the community send their children to the State schools. Here you have one of the most important points of difference between the education systems of South Australia and New Zealand on the one hand and Victoria and New South Wales on the other. It is sometimes said that the people in the colonies do not really value education, but I do not believe this, and the large amount of money annually voted by popular Parliaments for the purposes of education easily disproves the statement. For instance, exclusive of the sum spent in school buildings, we find the colonies, in a time of deep commercial depression, expending per head in average attendance sums as follows: South Australia, £3 4s. 10d.; Victoria, £3 14s. 8d.; New South Wales, £3 14s. 10d., and New Zealand, £3 16s. 6d. Besides this the Government of New Zealand wisely, I think, spends some £10,000 a year on the primary education of the native race. If we look at our education system in the light of these facts, we hold the premier place in the Australasian colonies, and in making this statement I have not omitted to take into consideration the fact that in New South Wales over £60,000 annually is contributed by the parents in the shape of school fees. The generous support given to education is also shown in the money annually voted for school buildings and apparatus.

I saw great variety in school buildings, most of them large, substantial structures, but in many cases the internal arrangements and the dimension of class rooms were not designed with a view to educational advantages and good organization. In Melbourne the prevailing type consisted of long, rectangular rooms, in which two or three classes were taught at one and the same time. It is now generally admitted that class rooms of this kind are a mistake, and in the more recently built schools a different construction and design have been generally adopted. The architectural features of a class room have a very great influence on organization, management, and methods, and this is a subject in which I think educational institutes should take more interest than they have shown in the past. I had an opportunity in Victoria of seeing the effect of shape and size of the class rooms on the general tone and working of the school. In one school I visited the long rooms were partitioned off into two rooms. The head master was so convinced of the utility and feasibility of the plan that he had the partition put up at his own expense. In the same district there was a school of the same size and staff, but with the usual long, rectangular rooms. The improved order and attention of the one school over the other were conclusive proof of the superiority of the smaller class-room system. The

plan of the schoolroom materially assists or materially interferes with the real work of the school, and to a greater extent than we have any idea of until we see both plans working alongside of each other. In the past the architect and the colonial treasurer have between themselves determined what kind of school buildings are most suitable. I hope that in the future educational requirements the comfort of the teacher and the pupil and the general organization of the school will receive more consideration and attention in the plans of public school buildings. I visited some of the more recently built schools in Adelaide, and found them constructed on more modern principles. I place before you a sketch of the ground plan of one of these schools, from which you will see that the smaller class-room system is provided for, with its great educational advantages and facilities. The best kind of infant school class rooms are to be found in the Adelaide schools. Having nearly the whole of the infant room taken up with long, steep galleries is a very great mistake. The infant-class rooms of the school I refer to were seated with dual level desks, wide, ruled in squares, and amply spaced out, so that the teacher could pass behind the seats and see the pupils' work from the pupils' point of view. The lowest classes of the infant department were provided with desks and suitable seats. As soon as the little one is introduced into the school he has his own seat and his own comfortable desk for his slate and other school appliances.

The old-fashioned infant galleries and class rooms to be found in most large schools where the little ones have to sit without proper seats and desks for their slates, etc., are a reflection on our common sense, and ought to be replaced by more rational seating and desk accommodation. Observe those little ones at a writing or a drawing lesson in these galleries; notice the inevitable position of the body and of the slate. They naturally stoop forward, and they must seek to support their slate on the knees. The slate is held in a more or less upright and oblique position, and they are supposed under these conditions to write and draw correctly. But this is not the worst of it. Such attitudes as they must assume in these galleries are injurious to their healthy physical development, lead to incorrect positions of body, head, hand, eye, and to ineradicably bad methods of sitting and working, and that at a time, too, when above all things it is most necessary that the pupil should be taught the best method and under the most favorable surroundings. It is a very bad beginning to school work. If it were only for a month or two it might be tolerated, but consider that this state of things goes on for two years or more, and you will agree with me in saying that we need some reform in our infant-class rooms. On visiting the infant-class room I spoke of in Adelaide, I said to myself this is the kind of thing we require in Otago. The main room was all seated as I have described, with a small gallery, for oral lessons only, placed at right angles to the main room, and in a recess where the pupils were out of sight of those engaged at their desk lessons. I hope the education board will see that in future the infant rooms are seated and desked more in accordance with modern ideas, to suit modern infant-school work, which now includes manual occupations that can not be carried on with the present infant-school furniture and apparatus. In a considerable number of the higher classes the dual system of desks was adopted, but with such a modification of the principle of the system that the whole or nearly the whole of the advantages were completely lost. The desks were arranged on the dual system, generally on a rising gallery, but with no passage behind them. Now, to my mind, the economy of the teacher's time, which is one of the chief advantages of the system, is wholly nullified by such an arrangement. The teachers who were working under this system very generally disapproved of it, and said it was inconvenient, inasmuch as they had to stretch over another pupil to point out mistakes, and unsatisfactory, as the teacher lost rather than gained time under this arrangement of seats and desks.

A word or two with regard to the size of and the staffing of the schools. The efficiency of the instruction given under any public system depends somewhat on the size of the schools, and very largely indeed on the staffing of the schools. I was much

surprised at finding in the other colonies such diverse systems of staffing and organization. In Adelaide a school of 930 average attendance would have a school staff of 10 certificated teachers and 8 or 9 pupil teachers, while in Victoria a school of the same size would have 7 certificated teachers and 16 or 17 pupil teachers and monitors. In the latter colony I visited a school in which the head master told me that his staff was 6 assistants, 22 pupil teachers, and 4 monitors. The number of pupil teachers and monitors is often three or four times larger than the certificated teachers. The staffing of the South Australian school is one of the best features of their system. There are always more certificated teachers than pupil teachers and monitors. If you wish to institute any comparison between the quality of the instruction given, respectively, under the South Australian and Victorian systems you must bear in mind this important difference in the method of staffing their schools. The South Australian system is at present very similar to that adopted by us. Indeed, in our large schools, where an assistant takes the place of 2 pupil teachers, we have now in Otago a better equipment, so far as the staffing is concerned, than anything to be found in any of the Australian colonies. I was surprised at the number of very large schools in Australia. I do not think this is a desirable state of things. In Sydney I asked a head teacher the average attendance. He turned up his book and said there were 1,800 present that afternoon. It is, I believe, the largest school in Australasia. All the schools in all the colonies are classified on an average-attendance basis. In Victoria there are 5 or 6 classes, in New South Wales 10, and in South Australia 12, where a first-class school is defined as one having an average attendance of 600 and over. Of most importance in estimating the comparative merits of various systems of education is the qualification of the teachers.

A word or two with regard to this. My inquiries in this direction were not very hopeful. I was amazed, for instance, to find that out of a total number of 2,415 Victorian teachers nearly 1,000 have only licenses to teach or are unclassified. I have already referred to the inordinate number of pupil teachers in Victoria. Now, if we add to these the extraordinary large number having only licenses to teach, we shall not be far wrong in saying that three-fourths of the pupils in the public schools are in the hands of pupil teachers and other similarly qualified men and women. What effect must this have on sound methods of education? Education has been cut down to the lowest point in Victoria. For years the total cost of instruction was £662,000; last year it stood at £478,000, or an all-round reduction of nearly 30 per cent. But a people of such enterprise and intelligence will soon recover themselves in educational matters, as they are doing in commercial affairs. One can not but regret to find that Victoria has so many poorly classified teachers. They have only 31 teachers in their highest rank. In South Australia the teachers get a thoroughly good practical training, but there is a want of breadth about the literary side of their qualification. They should adopt the course of study at the Adelaide University as the basis of their classification of teachers. In the matter of the literary qualification of its teachers the New Zealand system stands at the head of the list. It has been said that the literary qualifications demanded from teachers in the higher ranks of the New Zealand system are really the highest expected from primary-school teachers in any part of the world. The New Zealand classification list of teachers contains over 250 university graduates. You will remember I said at the outset that one's first impressions of the systems of education on the other side were distinctly in their favor.

Now, so far as I have gone, you will see that New Zealand comes out very well in the comparison, after all. With regard to the appointment of teachers. The appointment of teachers is in the hands of the minister of education, who makes the appointment on the recommendation of a board of classifiers, or committee of senior inspectors. When I mentioned that in New Zealand the appointment rested mainly with local bodies, the teachers of the other colonies spoke very strongly against our popular and local form of administration. One teacher expressed his

opinion in this way: "We want neither their assistance nor their interference;" and another, who seemed to be speaking from some personal knowledge of local bodies, said: "I have no desire that the grocer and the draper should visit my school and afterwards report to his learned confrères that the order and attention were good, and that everything was going on to their satisfaction." Teachers on the other side look with disfavor on our school committees, and argue generally that it is difficult to keep them in their proper places, and that the inevitable tendency of all such local educational bodies is to interfere in matters over which they have no jurisdiction whatever.

I leave now the administrative and official side of the question and come to the more technical and professional aspect of education, as seen in the course of instruction. I have been asked what I thought of the course of education in Australia, and how it compares with New Zealand. It is very difficult to give an answer in correct terms to a question of this kind. I had no time for a thorough examination of the systems. I had to gather up what I heard; some of my information is secondhand. Under these circumstances my conclusions may be made in error, though so far as they go they are clear enough. Any specific tabulation of the comparative merits of the different standards and state of education will, of course, be subject to the reservation I have just made. The course of instruction in Victoria is of the ordinary school type. One sees nothing new in it—that is, nothing which will not be found in every primary school course. I expected to find kindergarten work a distinguishing feature of the infant schools, but I saw very little of it, and was told that systematic kindergarten work had disappeared altogether from the public schools of Victoria. With regard to other subjects, I may say I heard a great many pupils read, saw hundreds of copy books and drawing books. Most of this was average work, not higher, and the rest fell below that level. The standards are, in my opinion, somewhat lower than ours, and the programme age a little higher. One might expect to find the control a little weak in such large schools, but it was not so. There was, generally speaking, a quiet tone pervading all the school work and school movements. In New South Wales you have a very different course of instruction—a much wider and more liberal course, embracing subjects not usually considered to fall within the range of primary-school work. New South Wales has a very ambitious course of instruction. They have five standards. In the fourth standard [grade], besides all the usual subjects, provision is made for teaching twelve propositions of Euclid (Book I), and in the fifth standard—their highest—all the usual subjects and Scripture lessons, and, besides this, Euclid (Books I and II), with easy exercises, Latin (boys) to page 53 'Via Latina,' French (girls), mensuration, and algebra to chapter xiii Hamblin-Smith. These are compulsory subjects of instruction. Nor is this higher work confined to a few pupils in the highest class, as from the inspectors' reports I learn that 2,608 were examined in Latin, 3,107 in algebra, 2,203 in French, 6,365 in mensuration, and 8,908 in Euclid. It has been said that New South Wales attempts too much, and that the work is imperfectly done, but I do not care to put aside the inspectors' reports as valueless, and they state that the percentage of passes in these subjects ranges from 71 to 76. The teachers appeal to the junior examination held by the University of Sydney as a good test of their work. The quality of the work is gauged by the success which the pupils of the fifth class obtain at this examination. I looked into the subject of this examination, the conditions of passing, etc., and it seemed to me to provide a very indefinite test and standard of good work, but I may be mistaken.

Unquestionably a large amount of extra, or what we would call extra, work is done in the primary schools in New South Wales. How do they manage to do it? In making comparisons between the other colonies and ourselves we must always look at the average age at which the various steps in the course of instruction are passed. I do not find anything in the ministers' reports showing the ages of each class, but before leaving Sydney I ascertained the actual ages in one school—a very large one. I was told it would be found to be approximately correct for the colony;

and these furnish an explanation of the difficulty. The first standard is passed at 9 years 8 months, the second at 10.8, the third at 13, the fourth at 14, and the fifth at 15 years 3 months. If this be so, New South Wales has the longest school term—period of school life—in the colonies, being one year and three months above the average age (14) of the New Zealand sixth standard. In the New South Wales course there is variety of work. I had the pleasure of seeing some purely kindergarten lessons given by a teacher trained in Germany by a pupil of Froebel. I inquired what course of lessons she would recommend, and she said that the best books on the subject were "The Kindergarten Guide," by Maria Kraus Boelte and John Kraus, Steiger, N. Y., and "The Kindergartner," by Goldammer. Some training in the use of tools is given in all the large schools. The students at the Training College are required to pass a course of lessons in this subject. The work is taught both in the college and in the schools, not by the teachers, but by capable artisans. I place before you a photograph showing the requirements of the three years' course of work drawn up by the teacher in charge of the subject at the Training College, Sydney. It is the best I have seen.

I was more interested in the course of instruction adopted in South Australia than anywhere else. I have already spoken of the organization and arrangement of their infant rooms. Their course of infant school work is also worth studying. Those old time-honored lessons called "object lessons" have been abolished altogether from the school course, and in their place they have put a series of lessons known under various names, such as manual work, illustrated lessons, conversation lessons, constructive lessons, tactual training, kindergarten work. I don't like the word kindergarten. Everybody uses it nowadays, and nobody knows exactly what it means. These lessons, by whatever name you choose to call them, are very popular in South Australia.

Doing away with object lessons meets with the approval of the teachers. They would not return to the old system. Here is a course of instruction in actual use, showing the manual and illustrative methods of teaching adopted in place of object lessons: Junior classes: (*a*) Building up words on their desks with small, loose letters, each pupil being provided with a box of letters; two-stick exercises—each pupil has two small sticks, places them in any position, and then draws the position in which they have been placed on the slate, place them in another and draw again, and so with their sticks making letters and designs, and then drawing them on the slate. (*b*) Drawing in great variety from copies and from memory. (*c*) Paper folding. (*d*) Sewing on cardboard patterns. Class I, paper plaiting and mat weaving; Class II, paper cutting and designs; Class III and IV, wood carving and wood chipping; and Class V, modeling in clay. In Class III (girls), netting and macrame; and in IV and V, fancy needlework or cooking. In the South Australian schools a little science goes a long way. It may, indeed, be excluded altogether if the teacher chooses to adopt manual occupation in place of it. While the abolition of object lessons up to Class III met with general approval, the tendency to displace science in the upper classes was not so favorably spoken of. One teacher remarked to me that he had made a special study of a particular branch of science, had collected a number of valuable specimens, liked teaching it, and the class was always interested in the subject. He was no expert in manual occupations, and lessons of this kind would always be, comparatively speaking, a failure in his hands. It would be a mistake to exclude science in a case like this, but much of this so-called science taught in our public schools might just as well go with the object lesson for all the good it does.

Drawing holds a prominent place in all their classes, as the departmental regulations insist on three lessons weekly in this subject. The drawing, both in amount, in variety, and quality, is the best I have ever seen. They seem to see in drawing not merely a technical acquirement, but a great education force, having a beneficial effect on all the school subjects, and tending to an all-round quickening of the mental faculties. Several things contribute to secure a very high degree of excel-

lence in drawing. I place on the table a set of the drawing books and drawing copies in use, and you will notice that they contain some features quite new to us. They are all much smaller than ours, and the work, particularly in the infant classes, seems to me very appropriate and useful, while the tinted design work of the highest class, partly geometrical and partly free hand, is unquestionably an interesting and educative exercise. The drawing books are issued by the department, and were prepared by the art master. I saw him giving a lesson to the students in the Training College, and from what I saw I can quite believe that they send out capable teachers of the subject. It is taught in the schools, not by visiting masters, as in Victoria, but by the regular members of the staff. In every class two of these books must be finished in the year, and in the highest class three must be presented. The time-tables show that from two and a half to three hours a week are given to drawing. Is it wise to give drawing this place and this importance? I think it is. But you say some subject must suffer if all this time is given to drawing. Let me briefly sketch the attainments of the Adelaide fifth-class boy—the fifth is their highest class—and I'll ask you to compare them with a Dunedin sixth-standard pupil. They have the same number of subjects of somewhat the same range and difficulty as here, so far as one may judge from the prescribed course of instruction. The highest class read such books as Kingsley's novels, Southey's "Life of Nelson," Lubbock's "Pleasures of Life," etc. These are the kind of books prescribed for their fifth class. They are obtained at a very cheap rate—6d. each, I think. Our sixth pupils are certainly not ahead of this standard of work.

In this connection I should mention that South Australia was the first colony to introduce a school newspaper into the schools. This publication is called the Children's Hour, and is issued monthly. It furnishes the class reading for the month, and the whole year's numbers are stitched together for revision and read at the inspectors' examination. Some of the teachers say that it is more eagerly read than the ordinary reading books, and encourages a taste for reading. The advantages and disadvantages of this school paper as a substitute for a text-book require consideration. I should like to hear the subject discussed at some of our meetings. I may say, however, that Victoria has introduced two such papers into their school course, so convinced are they of its value as an auxiliary in getting the pupils into the habit of reading for themselves. I have on the table also the poetry text-books used in South Australia. I think it is a good plan to have the poetry in handy booklet form, such as this. In the fourth and fifth classes not fewer than 100 lines per quarter must be prepared. In language lessons (composition and grammar) they have laid down very sound general principles, as you may see from the following extract from their syllabus of instruction:

> It is admitted to be an essential part of the duty of the elementary school to train its pupils to use their own language correctly, both in speaking and writing. Experience shows that this is not to be accomplished by teaching formal grammar, with its long array of technical terms, but by steady practice in oral and written composition, beginning when the child enters the school and continued till he leaves. Conversation is intended to play a leading part in the instruction, and conversation in which the children should be active participators. The subjects will be found in daily life, in pictures, in the reading and poetry lessons.

I put before you copies of arithmetic papers set, and I think you will admit that they quite reach our standard. Geography and history are not so rigidly defined, but they may cover as much ground as ours. In all schools, too, certain moral lessons must be given at least once a week to every class. "These lessons will enforce the necessity of punctuality, industry, obedience, truthfulness, honesty, respect, and consideration for others. In order to be effective they must be the outcome of the teacher's own thoughts and the circumstances of the school. No text-book is specified. They can not be made to order, but the teacher must keep careful notes of the lessons."

To enable you to see the apportionment of time to each subject, I have analyzed a time-table I have brought with me from Adelaide, and place this statement side by side with one of my own time-tables, and the comparison stands thus:

Comparison of time-tables.

	Adelaide.	Dunedin.
Reading, spelling, and dictation	4.55	5
Arithmetic (mental and written)	4.55	5.5
Drawing	2.30	1
Grammar and composition	2.20	2.55
Writing	1.50	1.50
Geography	1.40	2
Singing	1.10	.45
Manual work	1	.....
History	.70	1.30
Drill	.40	.45
Moral lesson	.30	.....
Poetry	.30	.30
Science	.....	1

On a review of the course of education in the fifth class of South Australia, I think you will grant that it is quite equal to the requirements of our sixth standard. The only other factor I can add to aid in the comparison with which I started is to give the average age, and the inspectors told me that the average age at which the highest class was passed was 12.11, or one year younger than our pupils get through the sixth standard. I am at a loss to understand this. If I had been told that 14 years was the average I should have no difficulty, but how they manage to get nearly a year's work in advance of us remains to be explained. The conclusion I arrive at is this, that the South Australian lad of 13 seems to be considerably ahead of the New Zealand lad of the same age, though they begin school life at the same age. The primary-school life terminates at 13 in South Australia, if the inspectors' figures may be taken as an average age for the colony, while it stands at 14 years in New Zealand.

To put the matter as favorably as possible for the New Zealander of 14, he is very little ahead of the South Australian at 13 years of age. That, at least, seems to be clear, judging by the prescribed course of instruction; but the interpretation of the course—the actual work exacted from the pupils in the various classes—has also to be considered, and this leads me to say a word or two on the methods of examination and inspection.

In an efficient system of public-school education good methods of examination are almost as important as good methods of teaching. The system of examination is most complete, and I am told that every child, even in the infant department, is examined in all subjects of instruction and the results duly tabulated. The distinction between class subjects and pass is observed, geography and history being placed in the former. The pupils are passed by the inspector, if fit for promotion, but no certificate is issued for any class except the standard defined for legal exemption from school attendance. Throughout the whole system of examination you notice the hand of the practical teacher. I think New Zealand teachers would probably consider it too precise and too exacting. Perhaps it is, but it seems to be thorough; and thoroughness and definiteness in methods of examination are most essential to sound education. Slipshod methods of examination will produce slipshod teaching. I suppose by this time you think I am idealizing the South Australian system. If this is so, it is because I find there so many of the elements that go to make education good anywhere. I find most of the conditions present, whether perfectly or imperfectly.

AN IDEAL INSPECTOR.

The late Mr. Hartley seems to have been an ideal inspector of schools, and the effects of his wisdom, skill, and enthusiasm are seen everywhere. He was welcome

in every school. The teachers respected his judgment and his opinions. He was always on the lookout for improved methods of teaching, and practiced what he preached. I am told that he gathered the pupil teachers and student teachers at the training college on Saturdays, and, with a standard class before him, showed the teachers his methods of teaching arithmetic, etc., under the ordinary conditions of an everyday lesson. When the inspector ceases talking about teaching and takes a lesson from beginning to end under time-table conditions, you may easily conceive what an influence such an example would have on inspectors, teachers, and educational methods. Much of the success of the South Australian system is owing to the labors of their late inspector-general, Mr. Hartley. We must bear in mind, however, that the South Australian department is not a large one, and that an able man such as Mr. Hartley could make his influence greatly felt throughout the whole district. I believe that large education districts are not conducive to educational progress and efficiency. South Australia has always given her teachers a good practical training. Her schools are well staffed; the infant work has five hours a day given to it; the standard work seems well graduated; her inspectors and teachers are earnest and enthusiastic, and where these conditions exist the educational system must be good. There are also a number of collateral agencies in operation that tend to keep up a good spirit of work and good ideals, as, for instance, an annual exhibition of school work, a floral and school decoration society, some nine or ten teachers' associations (with inspectors as presidents), that meet regularly, not for theoretical discussion, but for practical work. All these things bring about a sort of comradeship and community of interest among inspectors, teachers, and schools that is worthy of imitation, and that can not fail to have a good influence on any system of education. On visiting the Adelaide schools I felt an increased enthusiasm in all educational work, and if my brief recital of what I saw and heard has given you any pleasure or profit I am fully rewarded for transcribing my rough notes on primary education in Australia.

EXTRACTS FROM PAPER ON EDUCATIONAL REFORM.

By Hon. C. C. Bowen.

Nearly twenty years have elapsed since New Zealand adopted the present system of national education. Questions have naturally arisen and difficulties have been encountered from time to time which must be faced with a clear understanding of the chief objects aimed at by the State in dealing with a matter so vitally affecting the interests of the rising generation. It is unfortunate that the word "education" has been officially applied in English-speaking countries to primary instruction in elementary knowledge. This misnomer has led to a confusion of ideas in considering the necessities and possibilities of such primary teaching as should be the birthright of every child in a free State. We have recognized in New Zealand the duty of the State to the children who will some day be the rulers of the country. Our system of primary teaching provides—in theory, at any rate—that no child should grow up ignorant of the elementary knowledge which is the key to every branch of learning. And we are gradually making provision for helping such children as show special aptitude to proceed to secondary and university teaching in proportion to their diligence and ability. It was provided at the outset that the State should not interfere unduly with the home education of children or with their religious training, nor run the risk of stamping out originality and diversity of character by a centralizing and stereotyped system of school discipline. These are the main principles which influenced the legislature in the long discussions which preceded the passing of the education act of 1877. And that act provided, so far as could then be foreseen, for State responsibility, for local initiative and supervision, for freedom of parental and religious education, and for making the annual cost a statu-

tory obligation. In view of recent criticisms it is advisable to consider how far the principles on which the act was based have stood the test of experience and in what direction we can benefit by that experience.

THE WORK OF THE PRIMARIES.

If we are anxious that no latent talent should be wasted for lack of opportunity, if we desire to provide for the progress of children, qualified by character and ability, from the lowest class in the elementary schools to the highest honors of the university, we must strenuously insist on the management of and provision for State schools being kept apart and distinct from the control and maintenance of higher education. The primary schools must be the first charge on the State, and the active interest of parents throughout the country must be elicited on their behalf. As it is, the strain on the State funds is very great, and there are not now schools enough for the increasing population. These must be provided, and the claims of secondary schools on the public purse must be considered after the necessities of primary teaching are satisfied. The movement to tack secondary education to the primary schools by way of seventh standards or otherwise is not wise. Anyone who knows the financial difficulty of providing even reasonably for the State schools, and the strain upon the revenue of the country to provide the present inadequate accommodation, must look with apprehension at any tendency to confuse elementary with secondary teaching. The more elementary teaching is relieved from the cramming of ill-understood "ologies" and smatterings of science, falsely so-called, the better it will be for the children, whether they proceed or not to higher schools. If all their time is given to sound instruction in elementary subjects the better will their minds be prepared for further learning and for practical life. Children who have been taught a little thoroughly, and whose minds have been stimulated by sympathetic teaching, will be better trained to acquire in after life any necessary branch of knowledge than if they had been puzzled at school by scraps of text-book teaching.

THE CRAZE FOR "COLONIAL" READERS.

And here I must protest against the craze for inventing reading books dealing chiefly with New Zealand subjects. In a small country our object should be to widen the prospect before the mind's eye rather than to contract it by concentrating the attention of children on their immediate surroundings. Of these they are only too ready to think exclusively. The children of a British colony have a heritage wider than the little country in which they are born. The interests of a world-wide empire, in which they have a share and in any part of which they may be called to take their part, should inspire a larger patriotism than that which cramps the aspirations of children in a petty State. Is it not lamentable to see geography (so-called) limited for the most part to a study of the coasts and mountains and rivers of these islands, and to hear teachers, goaded by the gadfly of examination, depreciating the teaching of history altogether? Surely it would be easy for an intelligent teacher to make outlines of history, seasoned with anecdote, very interesting to children. If they can once grasp some idea, however vague, of the relative position of New Zealand with reference to the British Empire and the world at large they will take a more intelligent interest in the history and geography even of this colony than if their attention was confined to our own shores.

Too many of our young people are neglected, chiefly those whose parents do not take the trouble to seek such means of instruction as are available. In too many homes there is no discipline, and parents appear to lose all control over their children. But it is a very gratuitous assumption that moral and religious teaching is generally neglected in this country, and that the offensive conduct of some of our colonial youth is attributable to the secular basis of our national system of instruction. Statistics lead to a very different conclusion; and in the Australian colonies we do not find such a suggestion borne out. Mr. Hill, the inspector of Hawkes Bay

schools, in an interesting pamphlet on the school systems of Australia, makes the following remark on the subject, after his inquiries in that country: "In Victoria, South Australia, Queensland, and New Zealand the State system of education is both secular and free, but the statistics of crime in New South Wales do not compare favorably with those of the colonies named. I do not suppose that a bad register of police convictions in New South Wales is the outcome of too much religious instruction, but the fact remains, nevertheless, that in spite of such instruction in the public and denominational schools of the colony the statistics of crime are higher than in either of the other named colonies."

LOCAL INTEREST MUST BE FOSTERED.

The best way to insure the success of the schools throughout the country is to enlist in every possible way the interest of the parents. Local administration through the education boards and committees should be jealously preserved. There is sometimes friction between the boards and the committees, and sometimes the committees, for want of experience, make mistakes and are inclined to be unreasonable. But, on the whole, they have done good work, which could not have been so well done by any outside authority, and they have kept alive among the parents of children a constant interest in the local schools. I venture to quote here what I said two years ago in addressing the North Canterbury Education Institute:

No present inconvenience or annoyance that may occasionally arise from local blunders should ever induce the country to give up the local boards and committees, which were intended to protect the schools from the deadening influences of centralization. Remember that the blunders of a central office are more deadly and far-reaching than the most stupid blunder of the most inefficient committee. Committees will become more and more educated to the level of their duties; but the more intelligent a central office is the greater is its tendency to usurpation. And the central office, with an absolute power of the purse, would very soon reduce the committees to mere nonentities without the intervention of the education boards, which represent and are influenced by public opinion in a larger sense than the committees, and whose discussion of important questions, from different points of view, tends to keep alive public interest and to preserve our system from a dead level of uniformity.

Not in educational matters only is it necessary to set up bulwarks against the craving for uniformity and symmetry, which is the besetting sin of well-regulated official minds.

EXTENSION OF SCHOLARSHIPS.

These are some of the reasons for putting our system of elementary education on a broad popular basis, and for inviting the active cooperation of parents. But, to prevent misconception, I must add that, in the best interests of our rising democracy, higher education should not be controlled or limited by the lowest or even the average learning and intelligence of the country. A high standard of learning has been maintained in Europe through all vicissitudes by means of the self-government enjoyed by the great universities. The less the State interferes with them the better, so long as they are energetically and faithfully doing their work. But, as it is in the interest of the State to encourage exceptional ability, it would be well if, before all waste lands are alienated, sufficient endowments were set aside to provide scholarships for deserving pupils from the elementary schools to enable them to pursue their education further. Such scholarships are already provided to a certain extent, both by private and public foundations. The more varied secondary schools are in origin and method the better it will be for the intellect of the country. The most dismal prospect conceivable for a nation would be that of an educated class turned out in one pattern from a State machine.

REPORT ON THE WORKING OF "THE SCHOOL-ATTENDANCE ACT OF 1894."

By J. STORMONT SMALL, Esq., Truant Inspector.

AUCKLAND, NEW ZEALAND, *March 19, 1897.*

The Secretary, Education Board.

SIR: After two years' experience in working the school-attendance act of 1894, together with eight years' previous knowledge obtained in administering the former compulsory clauses, I feel better qualified to report now than at an earlier period.

The preliminary enforcement of the new act was begun at the end of October, 1894. By the end of that year 213 notices had been served and 59 parents interviewed. This was really a time of transition from the old to the new order of compulsory attendance. Parents had to be warned; teachers acquainted with the provisions of the act; necessary forms framed and printed. During this stage no prosecutions were instituted, but the requirements of the act were as widely spread as possible.

The year 1895 may be regarded as the commencement of the systematic enforcement of the school-attendance act. During this year the head teachers of 15 school districts containing 22 schools forwarded the names of 6,232 children. After deducting the sick and those who were, as a rule, regular attendants, it was considered necessary to serve notices on 938 parents. The result was highly satisfactory, both as regards the improved attendance of those concerned and the indirect influence on many others. Four hundred and fifty-nine children were questioned during school hours in various public places; 287 parents were interviewed personally or by letter, and 24 were prosecuted, the fines amounting to £4 12s., without including court costs.

During last year, 1896, 2,204 names were received. The reduction from the former year is accounted for by fewer names of sick children being sent, and also through improved attendance. Five hundred and fourteen children were questioned in the streets, and 621 parents interviewed; 848 notices served, and 28 prosecuted and fined to the extent of £10, excluding court costs.

For the two years, 1895 and 1896, 973 children were questioned; 1,786 notices sent to parents; 908 interviewed; 52 were prosecuted and fined to the amount of £14 12s.

The number prosecuted under the old compulsory clauses was 202, which, added to the last two years under the new act, gives a total of 254 for ten years.

Let it be understood that a very small minority of those who are liable are prosecuted, but only such as they on whom repeated warnings have had no effect. This course of action entails a large amount of additional labor, inclusive of warning notices, and subsequent investigation of the circumstances surrounding each case. Numerous visits of parents have been received at my residence from 7 a. m. to 10 p. m.—visits which have been productive of much good, as in the majority of cases the requirements of the act have thus been obtained and further action rendered unnecessary. As a result of the notices many letters have been received from parents, including promises of amendment, satisfactory reasons for absence, doctors' certificates, thanks for information, and a few letters of defiance; but even the writers of these letters, as a rule, have since sent their children more regularly to school.

It may be seen that a large amount of patience, firmness, and courtesy is required to work the school-attendance act successfully, and yet without unnecessary hardships being inflicted on any class of parents.

The enforcement of the previous order of compulsory attendance was begun early in 1887 with an empty school in Albert street opened for the purpose of providing education for children wandering about and attending no school. My duty was to find these children and procure their attendance. How far this has been successful a visit to the Chapel Street School of to-day will prove. By the end of 1887 the

other four Auckland City schools and two other school districts were also placed under my jurisdiction, and in 1894 the number of districts had increased to thirteen, and under the new act in 1895 and 1896 to eighteen districts.

I have found the old compulsory clauses to work very well indeed, and the present school-attendance act much better, although the alteration of a few details would improve the working of the latter.

Through constant watching and prompt measures, there are few, if any, children in the districts under my supervision, of the required age and standard, who do not belong to some school.

From time to time reports of supposed cases have been received, which, upon investigation, have mostly proved to be irregular attendants at some school. The law may be complied with and still a number of children be seen playing during school hours about the streets. The act only really requires three days' attendance out of the five when in good health, and so does not by any means press unduly on parents. Yet it may be seen that bare compliance with the act does not enable teachers to give that degree of education to children which they should receive. In fact, where one year would qualify to pass a regular attendant to a higher standard, it would take at least two years to do the same for those who barely keep within the requirements of the act. But by judicious management, with comparatively few exceptions, many of the most regular class are now among the most regular attendants.

As a rule, teachers consider the neglected class undesirable pupils for several reasons, including the liability of the well conducted to acquire evil practices through association with those who have been deprived of moral home training.

In most cases, where there is a more or less sprinkling of the neglected, ill-clad class, the effect is to decrease the average attendance, first, through the irregular attendance of the latter; second, through good children being led astray; and third, that through the lowered tone of the school, parents send their children to other schools.

Perhaps, under the circumstances, masters are not much to blame if they weed out undesirable children, but still such a course is scarcely fair to others who in obedience to the law receive and retain them.

My duty is to see that all classes of children, without distinction, attend some school as required by law. To do this effectively it is necessary that every school send to the board regularly the attendance, and admitted and withdrawn returns.

Parents are at liberty to send their children to any school they choose when there is room in the public school which they select.

In nearly every instance the parents who have to be warned would not send their children to school at all unless compelled, and therefore seize every opportunity of evading the act. Teachers neglecting to forward regularly the necessary returns and information gives this opportunity, which these parents are not slow to avail themselves of, until rediscovered by the truant officer.

The irregular attendants are not by any means confined to the neglected children alluded to, for at least two-thirds of the reported irregular attendants belong to the most respectable parents, and a good deal of discrimination is needed to eliminate those who do not require to be warned from those who are frequently absent without just cause.

When this is done there still remains a majority over the neglected class. The mothers have kept them from school on a legion of pretexts, a notice in these cases has the desired effect until another fall away, when the same is repeated as occasion requires. When this ceases to be effectual then a summons follows.

This class of parents often try to evade regular attendance by flitting about from school to school in the vain hope, in most cases, of finding teachers not so particular. Private schools are also tried with the same object.

The difference between these parents and the parents of neglected children is that

the former will not send to school regularly if they can help it, while the latter will not send at all unless compelled.

It will be seen that the truant officer's duties are not confined to the street Arab alone, but also embrace a large proportion of others; that all are equally expected to obey the law in respect to regular attendance, or in default the parents are prosecuted.

Seeing that the law demands attendance at school, I respectfully submit that ample room should be provided.

Many of the schools have now become full, and several overcrowded. I would respectfully urge that every school should have accommodation for more pupils than the number in attendance, so as to leave space for increase. Every child has an equal right to the space necessary for education under healthy conditions, and no teacher should be in the position to turn children away because there is no room.

It may also be seen that when schools are overfull it enables teachers, if they choose to avail themselves of the opportunity, to weed out undesirable pupils instead of keeping their share. Of course this is scarcely fair to the schools where there is still room.

It may be said, Why not send these undesirable children to Chapel Street School? First, because parents can select what school they please; second, the distance may be too far; and, third, Chapel Street School is already overcrowded, and will soon again be so, when the enlargement is completed.

Every year at examination time I find children about the streets who inform me that the teacher told them not to attend school till after the examination is over. Of course I have only the children's word, and it is unsupported by the teachers, but I note the circumstance as it annually occurs. These absentees do not noticeably affect the average attendance at this time, through a general increase always to be found before examination.

Among other things which diminish regular attendance is wet weather, sickness, irregularity of those over and under compulsory age and passed Standard IV. To give some idea of how much the average attendance is affected by these causes, I submit the following table, compiled from the returns of irregulars received from Wellesley Street School during 1896:

Month.	Sick.	Over and under age.	Other lawful causes.	Total.
1896.				
February	73	39	20	132
April	64	34	4	102
May	107	21	8	136
June	55	11	3	69
August	56	25	3	84
September	74	24	6	104
November	75	41	9	125
Total	504	195	53	752

Names forwarded from this school during same period, and reported to be absent without lawful excuse, 76.

From this table it will be noticed that when the absences which are not preventable are deducted, a very high average attendance remains.

I would strongly urge the board to recommend the minister of education to amend the school attendance act, to the effect that all children, irrespective of age or standard passed, while on school rolls shall be (the same as those between 7 and 13 years of age) equally required to attend school, as provided in section 7, and subject to the same penalty. I respectfully submit that it tends to upset discipline if one section can with respect to attendance do as it likes, while the other is compelled to

attend regularly. Of course parents can keep over or under age children away altogether, but while attending school there should be no distinction.

For the information of the board I have prepared the attached tables:

AUCKLAND.

Under "the school attendance act, 1894," first two years.—Notices served on parents.

School district.	Number of schools.	Notices served, 1895.	Notices served, 1896.	Total.
Auckland City	5	275	297	572
Ponsonby	3	117	111	228
Newton	2	125	96	221
Grafton	1	18	40	58
Mount Eden	1	87	53	140
New Market	1	25	15	40
Mount Albert	1	48	31	79
Remuera	1	14	.....	14
Epsom	1	26	40	66
Ellerslie	1	6	11	17
Onehunga	1	40	17	57
Lake	1	25	11	36
Otahuhu	1	12	10	22
Devonport	1	76	42	118
Parnell	1	40	63	103
Mount Roskill	1	1	.....	1
Northcote	1	3	10	13
Tamaki West	1	.....	1	1
Total	25	938	848	1,786

	1895.	1896.	Total.
Children questioned during school hours	459	514	973
Parents interviewed by letter and personally	287	621	908
Names on lists from schools (irregular)	6,232	2,204	8,436
Parents prosecuted	24	28	52

Biennial totals for ten years.

Years.	Children questioned in public places.	Parents interviewed, exclusive of notices served.	Notices served on parents.	Parents prosecuted.	Number of school districts.
Under the old act:					
1887–88	3,268	548	575	24	7
1889–90	2,269	551	960	61	9
1891–92	1,761	255	771	76	12
1893–94	1,533	328	1,215	41	13
Under the new act:					
1895–96	973	908	1,786	52	18
Total	9,804	2,590	5,307	254	.....

During 1887 to 1892 all notices were served personally and the parents warned verbally at time of service.

INDUSTRIAL SCHOOLS IN NEW ZEALAND.[1]

Early in the history of New Zealand it was recognized that much of the future welfare of the colony depended on the proper care and moral training of children whose parents were of debauched or vicious habits; and in 1867 an act was passed under which "homes for neglected and criminal children" were established, and to such homes children were committed under certain provisions.

Experience proved that the name "neglected and criminal" child was a serious bar to inmates being found suitable places when they arrived at an age to go to work, and when the present act was passed, in 1882, the name was altered to "Industrial School," and under this name the present institutions are worked.

The principal provisions of the act of 1882 are: That the minister for education, who controls the department, is able to establish new schools, or to subsidize private schools (provided no child is sent to such school unless it belongs to the same religious denomination), appoint officers, etc. Children are committed to an industrial school on conviction by a stipendiary magistrate, if he is satisfied that such child (1) has no means of subsistence (in this case the maintenance is paid by the charitable aid board of the district in which the child lives, and the rate is 6s. 6d. a week); (2) is found begging or receiving alms, or being in any public place or street for the purpose of begging or receiving alms; (3) is found wandering about or frequenting any street, thoroughfare, or hotel or public place of resort, or sleeping in the open air, or not having any visible means of subsistence, or not having any home or any settled place of abode; (4) is residing in a brothel or associating with or dwelling with any person known or reputed to be a prostitute or habitual drunkard, or with any person convicted of vagrancy under any act or ordinance now or hereafter in force. (5) A parent may have his child committed if he proves to the satisfaction of the stipendiary magistrate that he is not able to control the child, and gives security for the maintenance of such child. A judge or magistrate may order a child who has been convicted of any offense to be sent to an industrial school, either at the expiration of a sentence of imprisonment or in lieu thereof; or, if not convicted, a child may be admitted to an industrial school by agreement between the manager of the school and the parent as to cost of maintenance and education. The governor may, if he thinks fit, order any person under the age of 18 who has been sentenced to imprisonment to be sent to an industrial school, either in lieu of or after serving his term of imprisonment.

When the child is committed the manager of the school becomes the guardian and the parent ceases to have any legal control. This guardianship lasts until the inmate is 21 years of age, unless he is previously discharged by the governor. The governor has power to transfer the guardianship to some other person. This is done in cases where the person to whom the inmate has been boarded, or by whom he has been employed, takes so much interest in the inmate as to wish to act in loco parentis. The age at which inmates are discharged varies, according to the character of the inmate. The earliest age is 17 for boys, 18 for girls. If the moral fiber is weak the inmate may not be released from control until the age limit—21 years—is reached. The whole cost of the schools is provided by the Government, but whenever a parent is able to pay for the support of his child he is made to do so, and, as already stated, the "charitable aid boards" pay the cost of maintaining all children committed as "indigent" out of the rates, at a cost of 6s. 6d. a week.

Ample provision is made for the inspection of the schools, and all members of the legislature, judges, and justices of the peace can at any time visit the schools.

The religious instruction of inmates in the Government schools is provided for, and the ministers of the various churches have access for that purpose.

The system of boarding out children has been found to give such satisfactory

[1] The office is indebted for the following paper to Mr. Mark Cohen, editor of the Evening Star, Dunedin, New Zealand.

results that an amendment in the act has been passed this year enabling the minister to board out children until they have attained the age of 14 years, or until they have passed the fourth standard of education in a State school. Previous to this the limit of the age to which foster parents could be paid for boarding children was 12. When children are committed to an industrial school, if they are under 12 years of age, they are boarded out with persons who are known to be respectable and fit to undertake the duties of foster parents. For this a sum of 6 shillings a week is paid, except in the case of infants, when the payment is 7 shillings a week for the first year.

Should children who are committed be deemed too unruly to be placed in foster homes, they are kept in residence and attend the day school attached to the industrial school, which is conducted on the same lines as the public schools, until they have passed the fourth standard or have attained the age of 14 years. Passing the fourth standard, or on attaining the age of 14, they are then "licensed out" to service with such persons as are desirous of employing them. The children receive a wage varying from £5 a year to 2s. 6d. a week for a start. If they get on well they receive an annual increase of 6d. a week. Wages are paid by the employers to the manager of the school the child belongs to. The money is then banked and a separate account kept for each inmate; interest is added yearly. These earnings of inmates are the property of the Crown, but are always paid over to past inmates if of good character and required for such a purpose as commends itself to the minister. Some inmates earn £40 and £50, and in many cases lads have bought sections of land on which they have settled; others buy horses and drays or express carts; others again start in some business. Girls generally receive their earnings when about to get married or wishing to start in business of some kind. Should an employer wish to return an inmate, the manager arranges for his or her return to the school, where employment is found until there is another place obtained. It has been found very satisfactory to allow inmates, on attaining the age of 16 or 17 and being of good character, to receive their own wages. This privilege is much valued by the inmates, as it enables them to feel a little less dependent on their employer for pocket money and such little trifles as they may require. It has also been useful to managers, as they could hold it out as an inducement to good behavior; and managers could also form an opinion as to the manner in which inmates would spend their money if discharged.

A pleasing feature in the boarding out is the strong attachment that is often to be seen between foster parent and child. This not seldom results in the legal adoption of the inmate, while in many other cases the foster home becomes in reality a home where the inmate, when grown up, is looked on as one of the family.

In favor of the residential system it may be said that the discipline, method, and training are of the utmost advantage in regulating unbalanced minds, correcting wayward dispositions, and, particularly, in turning out well-trained lads for farm work and girls for domestic duties.

A proper combination of these two systems has led to most satisfactory results, and throughout New Zealand are hundreds of most respectable citizens, well repaying the State the cost of their maintenance, thankful for the foresight of the representatives of the country which enabled them to be taken from homes of poverty, degradation, or vice to be educated and brought up in a manner to befit them to take their place with any of their fellows.

Attached is a statement of the number of children in the industrial schools in the colony, with other interesting particulars:

Inmates, 1895 and 1896.

	Boarded out.				In residence.				At service, etc.				Totals.			
	December, 1895.	December, 1896.	Increase.	Decrease.	December, 1895.	December, 1896.	Increase.	Decrease.	December, 1895.	December, 1896.	Increase.	Decrease.	December, 1895.	December, 1896.	Increase.	Decrease.
Government schools:																
Auckland	39	30	....	9	10	10	...	....	43	41	....	2	92	81	....	11
Burnham	164	176	12	...	107	105	...	2	269	243	....	26	540	524	....	16
Caversham	202	211	9	...	86	76	...	10	174	195	21	....	462	482	20	....
Private schools:																
St. Mary's, Auckland	....	....	....	...	46	46	...	....	14	20	6	....	60	66	6	....
St. Joseph's, Wellington	4	4	....	...	64	66	2	....	8	10	2	....	76	80	4	....
St. Mary's, Nelson	7	7	....	...	247	253	6	....	61	66	5	....	315	326	11	....
Total	416	428	21	9	560	556	8	12	569	575	34	28	1,545	1,559	41	27

Cost of Government schools, 1896.

School.	Gross cost of school.	Cost of boarding out (included in preceding column).	Recoveries.	Net cost.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Auckland	1,144 4 7	512 8 0	263 17 6	880 7 1
Burnham	6,864 12 6	2,535 19 10	2,316 15 5	4,547 17 1
Caversham	6,327 5 5	3,155 16 9	4,534 2 3	1,793 3 2
Total	14,336 2 6	6,204 4 7	7,114 15 2	7,221 7 4
Salary and expenses of visiting officer				391 1 0
Contingencies				12 17 9
Total				*a* 7,625 6 1

a Equals $38,126, reckoning $5 to the pound sterling.

CHAPTER VI.

EDUCATION IN CENTRAL EUROPE.

Articles on education in central Europe published in previous Reports of the Commissioner of Education.

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Comparison of the schools of Germany, France, and the United States, with diagrams	1888–89	32
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School population of the civilized world. Charts	1888–89	75
Bird's-eye view of the schools in central Europe	1888–89	150
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Promoting public play of school children	1889–90	293
Education of neglected and depraved children	1889–90	295
Juvenile wage-workers	1889–90	297
The schools of the Kingdom of Saxony	1889–90	299
Economic development of Saxony	1889–90	306
School gardens in Germany and Austria	1889–90	303
School population in the civilized world. Charts	1889–90	549
The December conference on secondary schools	1889–90	313
Brief view of the schools of Austria-Hungary	1889–90	419
Brief statement of the school system in Prussia	1889–90	455
Proportion of population in elementary, secondary, and higher institutions	1889–90	451
Industrial and technical education in central Europe	1890–91	165
Statistical summary of school population, teachers, and expenditures for schools in the civilized world	1890–91	369
Legal education in Europe and America	1890–91	377
Public kindergartens in European and American States	1890–91	676
The training of teachers in Germany, Austria, and Switzerland	1891–92	139
The Swiss school system	1891–92	197
School museums and educational exhibitions	1891–92	239
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Child study and experimental psychology, with bibliography	1892–93	357
Bibliography of Herbartianism	1892–93	393
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Criticism of educational exhibitions	1892–93	548
German view of American technological schools	1892–93	657
Statistical table of elementary instruction in foreign countries	1892–93	.....
Results of Prussian common school statistics discussed	1893–94	206
Common-school teachers of Prussia	1893–94	225
Development of the common school system of Berlin	1893–94	245
Attendance in secondary schools for boys in Germany	1893–94	298
Courses of study in history found in vogue in Europe	1893–94	302
Bibliography of the history of education	1893–94	306
Statistics of university libraries in Europe	1893–94	308
German bibliography of arithmetic	1893–94	314
The new education in Germany	1894–95	322
Is German pedagogy in a state of decomposition?	1894–95	329
Supplementary and industrial schools in Germany	1894–95	345
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Comparative review of courses of study in sixteen German cities	1894–95	406
Normal schools in Switzerland	1894–95	426
Mental fatigue in school	1894–95	449
	1895–96	1175
National features of female education	1894–95	460
Public instruction in the Grand Duchy of Luxemburg	1894–95	471
Pensions for teachers	1894–95	1123
Public industrial education in Berlin	1895–96	138
Salaries of elementary teachers in Germany	1895–96	147
Salaries of elementary teachers in Austria	1895–96	156
Statistics of higher education in central Europe	1895–96	165

Articles on education in central Europe published in previous Reports of the Commissioner of Education—Continued.

Title of article.	Report of—	Page.
Foreigners in central European universities	1895–96	180
Music in German schools	1895–96	187
Reform schools in the Grand Duchy of Baden	1895–96	158
How agriculture is taught in Prussia and France	1895–96	1199
Industrial schools in Germany, Austria, and Switzerland	1895–96	1215
Foreign universities	1895–96	1413
	1889–90	561
	1896–97	1365
Review of educational currents of thought	1896–97	126
Special schools for children of limited mental capacity	1896–97	141
School savings banks in Europe	1896–97	160
Attendance in boys' high schools in Prussia	1896–97	164
German view of educational movements in America	1896–97	178
German view of the report of the Royal Commission	1896–97	185
Manual training in Germany	1896–97	193
Recent German educational literature	1896–97	197
Comparative statistics of education	1896–97	200
Commercial education in Europe	1896–97	207
Teaching civics in Switzerland, France, and England	1896–97	233

The Objects of Polytechnica.

Prof. A. Riedler, of the Polytechnic School at Berlin-Charlottenburg, whose article on American technological schools appeared in translation in the Annual Report of 1892–93, pages 657–686, recently published an extensive article on the "Objects and aims of technological schools" in the Organ of the Society of German Engineers. This article caused a stir in Germany, and since the author's statements reveal actual conditions of the German polytechnical schools, it may be of interest to see in what respect they differ from the schools of this country. Professor Riedler is considered an authority in the engineering sciences. He visited America several times, and thoroughly studied some of our polytechnica. Hence it is reasonable to suppose that the condition of our technical schools has contributed somewhat to his convictions, which he utters without fear or favor. The following is an extract of his statement:

The present time is not only an age of commerce, but, generally speaking, an era of technical industry, which has changed all the conditions of life and given rise to great and new educational problems.

Education in the productive arts, and for a fruitful industrial activity, has become a great national task, the solution of which depends in a high degree upon the conditions of living of the individual and the masses. Though polytechnic schools, the fostering institutions of a higher industrial education, have developed at an exceedingly rapid rate in the last three decades, more rapid still has been the technical progress, and hence more emphatic have grown the claims for technical education. To meet these claims a reform of technical instruction is necessary. To know the direction this reform is to take we must first examine the peculiar features of technical education in general.

The foundation of productive work is recognition of the reality. The technologist must have the talent to comprehend everything as it really is, to perceive correctly in a given case the manifold simultaneous and often contradictory causes and effects; to consider the limits of knowledge, the errors of observation, and probabilities; that is, all the factors which at first can not be rightly apprehended, nor at the right time, but which play an important rôle in technical activity.

Reality can, however, be comprehended only by the cognition of nature. Nature is the teacher; cognition of nature, that is, insight into the physical world, is the foundation of technology, the real life element of the engineer; it is not mathematics, as is often erroneously pretended. The latter is only one of the necessary and fundamental agencies.

Cognition of nature must rise to a full contemplation of the collective phenomena of nature. The most thorough scientific knowledge about details is not sufficient for the working technologist. All the causes and effects must be seen, and, as it were, be felt as a totality; they must be united to a representation in the mind to a complete picture; otherwise there will be a great risk, and the danger may arise that only particulars be observed and important points be neglected.

But such a comprehensive apprehension through observation is only possible with a highly developed faculty of perception and apperception. All instruction, even in the highest grades, must be intuitive (anschaulich), and must be coupled with scientific severity. That, however, is wanting in the schools of to-day. How much the student is made to learn through words and definitions! how much is described to him with mere words! how much is he himself made to describe! and, on the other hand, how insignificant is that which is actually shown him, which he can examine, and which he must himself state or represent in design and outline sketches!

This want of appeal to the senses deceives us about the difficulties of reality, and the consequence is fear and avoidance of reality. Information on the basis of reality is attended by great difficulties. To master them requires hard work, the hardest for the teacher himself; they demand thorough and profound study and intuitive and complete comprehension of all conditions.

The preparatory school must develop the faculty of seeing rightly; practice in this and a developed power of observation and mental representation are what the student must already have when he enters upon a higher stage of study, as well as a command of language and of mathematics, and skill in drawing.

For technical work knowledge alone is not sufficient without the ability to employ it in any given case. To teach only scientific principles and not their application means to evade the difficulties instead of conquering them.

Practice alone leads to a complete conception of truth; it is the higher step of knowledge, of which general scientific knowledge is the first step. Knowledge alone might be classed equal with practice, if it were thorough and exhaustive; but it becomes so only by employing it. Knowledge itself is the result of application, not vice versa.

Knowledge without application is the cause of the growing fear youth has in the face of troublesome detail work. They rest content with understanding ideas, and hence the increasing unserviceability of scientifically, i. e., theoretically instructed men, and the preference given to plain practical men, who know how to employ a few ideas in the right way. A further consequence is the decrease of self-education by independent work. To this the school must give the direction; it must exercise the physical, mental, and moral powers of the students with tasks which can be completely understood by them, and let them perform these tasks without aid. Instead of this we have a full measure of school and examination requirements which effectually prevent young men from becoming self-educating.

The consequences are well known: Aiming at privileges, a strong pressure, especially of the most capable men, for sinecural "higher" positions, for places that secure a safe income and a social position; a dread of every struggle, of anything like creative activity, of responsibility, and, above all, of an uncertain future. If they fail to enter the peaceful harbor of a governmental position, uncertainty and discontent will follow.

All disposition to independent activity is wanting in diligent but weak natures. In the course of gaining knowledge without applying it they have lost their objective, and steer toward professional, i. e., bread and butter studies, toward the wherewithal of a sure living. A productive activity would be wrecked on the shoals of

their want of self-dependence. Only few people learn to know, after a long and expensive battle in the school of life, what ought to be the foundation of all learning, to wit, reality.

Less serious natures, however, develop pride, find their studied knowledge sufficient for every activity, confound suppositions with reality, and thus flourish superficiality, contempt of experience, and overestimation of unproductive learning. What there is in these men of mental energy turns to fruitless criticism which knows everything better, and to pride which despises everyone who did not reach the same goal in the manner they did.

The whole educational system should be permeated with practical sense. The Germans are inclined to become doctrinaires and dreamers, while the Anglo-Saxons grasp everything practically and technically from the very beginning. Unpractical sense is a German fault, inborn and inbred; therefore we must avoid excess in theoretical education, and keep in mind, above all, a technical education which teaches how to think and to apply practically, an education which will give us a practical, not a merely learned, posterity.

The standpoint of economy also must be more seriously considered in technical education than hitherto. Knowledge of the social life of one's own nation, as well as that of foreign nations, becomes more and more necessary. We live in a time in which economical errors have most serious effects; a time in which through such errors nations bleed to death more easily than on battlefields; a time in which our existence depends upon knowledge of economic and social relations. In our country the State and its officers are instituting a mischievous reaction upon practical and economic conditions, because all higher studies are cut to fit the future State officers' education. The State, it is said, is an administrative, not a productive organization (especially in the imagination of social democracy); it needs not free activity on the part of its employees. That is true, but the officer's education must not be the pattern after which national education is formed.

The scientifically educated engineer, with a good judgment in economics and with commercial insight, not unexperienced in questions of law, is the leader in demand in all work of national economy; but the studies themselves, especially their duration, must be considered from the standpoint of economics. The ideal German tendency that pursues studies only from thirst of knowledge and desire for creative activity ought not to disappear. But the disposition for conditions of actual existence must not be lost either; social existence and freedom, depending upon it, must not be undermined.

The immutable brevity of human life, the justifiable endeavor to make it humanely and socially effective, are opposed to a protracted student period and inimical to all unpractical education, to all education antagonistic to the economic tendency of the mind. A great economic obstacle is the age which students reach before they arrive at a practical activity. The maturity examination in secondary schools, for instance, very often takes place at the twentieth year of life, the maturity examination of an architect in the twenty-fifth; meanwhile our competitors in foreign countries have been actively engaged from five to seven years. On account of the close of the school year at Easter in secondary schools, and the opening of the course in the polytechnicum in the fall, a half year is lost, and the preparation for the academic or State's examination claims a year and a half or two years more. Something should be done to do away with this far-reaching injury. One year of military service being inevitable, a shorter and better preparation and only a three years' practical and productive course in the polytechnicum should be the aim. Both the preparatory department and the professional courses must be reformed.

At present technology has made such progress that science, practice, and economics can not any longer go their own ways, they are obliged to work together. To the scientific demands are joined those of practice and public economy, a division of work into theory and practice has become impossible; hence a fundamental reform

is necessary, which must correspond to organic, historically necessary, and uninterrupted national progress.

As in former years it was wrong to consider technological science unnecessary, so is it now still more wrong to consider the practical application of scientific principles, practical education, in fact, as subordinate.

From what has been said arises the necessity of a series of reforms in technological education, which may be designed in bold outlines as follows: The reform in the preparatory schools, so exceedingly important, must be left out of the question, because it has no chance at present. It may be merely stated that the secondary school, as it is organized now, has no interest in a special technical direction of the education it offers. The preparatory school does not prepare lawyers, physicians, philosophers, but men with certain capacities; to these capacities certainly belongs technical talent. To foster this talent we must develop the power of sense-perception and the faculty of representation—skill in drawing and sketching—but, above all, the faculty to see the reality correctly. The lowest measure of fundamental knowledge necessary for giving effect to these faculties must be mastered; manual training and the use of tools and implements must be acquired in the preparatory school. These conditions are not complied with by the secondary schools of to-day.

The scientific preparation in the polytechnicum must not consist of the teaching of abstract principles divorced from professional instruction, but must make plain from the beginning the difficulties of actual service and the practical application, which method alone leads to complete mastership of fundamental principles.

Between the preparatory and the professional study there should be no gap; not any more than between professional study and practice. This requires teachers who know how to apply their science practically and with responsibility; only such can teach application and thus lead their students to the mastery of scientific principles. The student is able to apply only that which he has mastered—that which he has fully digested. This requires the strictest limitation of the matter to be taught and time for its digestion.

All instruction in science must therefore be reduced to the necessary lowest measure for the average student; but this lowest measure must be thoroughly mastered and applied. After that scientific instruction may be deepened and continued to the close of the course, but only with selected students of great talent.

Professional study has not the object of preparing finished professional men; that is impossible. But it should develop the faculties in such a way that practical life will continue a natural outgrowth of school life, so that the student will not forget his knowledge gained in school. He must not be obliged to face right about before he can enter upon business. The school must furnish practically responsible co-laborers who understand the manifold conditions of reality, and can apply general principles in special cases. The school must teach application and execution and build a bridge between knowledge and the application of knowledge.

The professional sciences, also, should be taught to suit the average student; only the necessary lowest measure should be offered, but for that absolute mastery should be demanded. Special professional teaching begins in practice. In this department, of course, holds good what was said before: Deepen the knowledge by applying it; hence teachers must be had who can apply knowledge and who act in the sense of true practice and according to economic principles.

Professional teachers must have become acquainted with reality by their own actual work and must have a mastery of and be able to practice the art they undertake to teach. It is significant that it should be necessary at all to mention this. Common for all studies must be continuous practice and strict adherence to the minimum measure. The watchword should be: A minimum of teaching matter and a maximum of profundity.

On the other hand, there must be given an opportunity for the highest professional scientific training, which is absolutely necessary for the solution of numerous

special tasks, but which should be offered only to selected students, for it is one of the means of obtaining a leading position in practice. The highest aim should not be held out to all students; the ordinary student does not reach it and gets too old for mere colaborer's work. Learning and knowing too many things excludes profoundness of study and application and renders the student useless for practical work.

Examinations, of course, are necessary, equal to those prescribed for the State's civil-engineering service, but they should require technical activity and allow the development of individuality. The hitherto artificially fostered thronging to the State's service and a privileged education are the causes of the fact that a large number of students are improperly prepared.

In the technological institutes an intellectual competition among the teachers should be instituted. If in the military service insignificant causes lead to dismissal, in order to keep the army at a desirable degree of efficiency; if in the life of institutions and nations self-preservation demands such measures, then, for the polytechnica, at least a moderate degree of intellectual competition among the professors must be made possible. New teachers should be drawn from practice.

These are conditions upon which the future of technological institutes and that of national productive activity depends. The injury done to a whole generation and the nation by a single professor who is not equal to his task, or is surrounded by a halo of former usefulness, is much greater than the injury which dozens of pensioned staff officers could cause. The general departments of the technological institutes must accomplish much more than heretofore, in general as well as in technical education. General culture, which need not necessarily be equal to the well-known literary knowledge of classical universities, is of the greatest importance for technical activity. The engineer has to supervise the work of others, for practical reasons, in a scientific and economic manner, and this requires a high moral influence, ideals, and knowledge of men. Not only intellectual and professional education is necessary, but, more than that, a firm character, moral worth, and a high degree of general information and human culture are also requisites of successful engineering work.

In connection with the foregoing views a German correspondent of the New York Sun, in its issue of February 13, 1898, may be quoted, who shows that the tendency indicated by Professor Riedler is not exaggerated.

The position which the German workshop has attained among its rivals and the wonderful strides Germany has made in recent years to gain such a position have naturally aroused curiosity as to the cause that has produced so striking an effect. In these days every industrial enterprise must be worked on thoroughly scientific lines in order to insure even a chance of success, and naturally the first quarter to which one turns for an explanation is the educational system which supplies the necessary scientific knowledge. Germany being a country of universities and university students, there has naturally been an impression that the credit is due to them. It has been supposed that their curricula have been overhauled and brought up to date, so as to give the German students a practical knowledge of applied science in all its branches.

This, however, is not the case. Prof. Friedrich Paulsen, of Berlin University, declares that the curriculum of every university remains practically unchanged. Government officials, judges, surgeons, clergymen, etc., are the general output of the universities, and the savant is still their highest form of product. It is to the polytechnical institute that we must look to find the source of the German's knowledge of applied science in all its various branches.

Altogether there are nine polytechnical schools in Germany, the largest being at Charlottenburg, on the outskirts of Berlin. The others are situated at Munich,

Stuttgart, Hanover, Dresden, Brunswick, Aix-la-Chapelle, Darmstadt, and Carlsruhe. The Emperor desires to establish a new school at Danzig. As a rule the schools are divided into six departments. At Berlin (Charlottenburg) these departments are: 1, architecture; 2, general constructing engineering; 3, machine construction; 4, naval engineering; 5, chemistry and mining engineering, and, 6, applied science in general. In the other polytechnical schools the departments are generally the same, but in certain schools special attention is devoted to some one subject taught in a certain department. Thus the Munich polytechnicum has an agricultural branch, and Aix-la-Chapelle gives prominence to mining engineering. Electro-technics are taught in all the schools in the machine-construction department, it being considered that every constructing engineer to-day should be thoroughly familiar with electrical machines.

Prof. Adolf Slaby, of the technical institute at Charlottenburg, is one of Germany's most eminent authorities on electro-technics. He agrees with Professor Paulsen that the universities have no direct share in the application of science to industry. Professor Slaby thus expresses his views:

"Practical teaching is abhorred by the professors at most of our universities. I recollect attending a lecture by Helmholtz where I expected him to give some explanation of the dynamo. After making some theoretical observations, he merely said: 'Acting on these principles people have constructed some very ingenious machines called dynamos for engineering purposes.' That was all Helmholtz would deign to say about the dynamo. The professors of to-day are just the same in this respect. Their teaching is purely scientific, philosophical, philological, and historical, and has not varied for three centuries. Of course the greatest discoveries in physics have been made in the university laboratories, but the application of these discoveries has been neglected by the universities. Pure science is their aim, and we who, without concerning ourselves with studying the phenomena of nature, devote our whole efforts to giving our pupils the means of turning science to practical account are despised by the university scientists. There are, of course, a few exceptions. Thus, for instance, Professor Klein, of Göttingen University, is agitating for a more practical trend in university teaching. The only practical teaching given in the universities is in chemistry, which began with Liebig. To-day the students of chemistry are divided between the universities and the polytechnical schools. The former merely instructs in analysis, whereas we form chemists who have a practical knowledge of machinery. The demands of the epoch require that chemists attached to industrial concerns shall be familiar with machinery. When we have the right to confer degrees, for which we are now striving, we shall attract many students who are now allured to the universities by the prospect of a diploma.

"The Charlottenburg Polytechnicum, which will celebrate its centenary in 1899, furnishes a good example of the progress made in recent years. Ten years ago we had only 800 pupils. This session more than 3,000 young men are studying here, more than a third of whom are in the machine construction and electro-technic department. This increase is due not only to the progress of German industry, but also to the development of our towns as centers of activity. All our municipalities employ first-class engineers for the technical branches of the municipal service. In Berlin alone several hundred highly qualified engineers are employed by the city. Many of our engineers go abroad, chiefly to England and America. Many foreigners come to study in German technical schools. In this school we have between 300 and 400. They come chiefly from America, England, France, Russia, and Scandinavia. Every pupil costs the Government a clear sum of 600 marks annually. This fact has been the subject of an interpellation in Parliament, the result of which will probably be that we shall have to make foreign students pay higher fees than the present nominal ones.

"There is no danger of our teaching not keeping abreast with the times. Our professors are stimulated by the advice and opinions of former pupils who now

occupy important industrial positions. For instance, men who visited the Chicago World's Fair and were impressed by the splendid achievements of American methods urge us to accentuate even further the practical side of our teaching. Professor Riedler, one of our most eminent engineers, is at the head of this movement, and has published several pamphlets on the subject. Another point which indicates our movement forward is the difference—not to say quarrel—going on between the professors of engineering and the professors of mathematics in our polytechnical schools. Our present professors of mathematics are university men, permeated with the university spirit. They consider mathematics as a science per se. We look on mathematics merely as an instrument, and want to have mathematical professors who understand the practical application of mathematics to engineering, and for that purpose have studied machinery and acquired practical engineering knowledge. I mention these matters to show that we are not likely to rest on our laurels, but are moving ahead all the time.

"Germany has every reason to be proud of her polytechnical schools, which have given her a front place in the industrial world. Ours is not a rich country, but we have realized that sacrifices for educational purposes are good investments. No country of equal resources spends as much as we do on education and the army. Both are necessary and they go hand in hand, for our military training is a part of our general education."

TECHNOLOGICAL, AGRICULTURAL, FORESTRY, MINING, AND VETERINARY SCHOOLS IN EUROPE.

(According to Minerva, Jahrbuch der Gelehrten Welt.)

1. TECHNOLOGICAL INSTITUTIONS IN EUROPE.

Countries and location.	Date of founding.	Number of students in 1896.	Expenditures.	Date.
Germany:				
Aachen, Prussia	1870	363	$62,545	1897–98
Berlin, Prussia	1799	2,693	307,796	1897–98
Hanover, Prussia	1879	1,101	108,378	1897–98
Munich, Bavaria	1827	1,757	122,050	1897–98
Dresden, Saxony	1828	905	115,230	1897–98
Stuttgart, Würtemburg	1829	910	87,869	1897–98
Karlsruhe, Baden	1825	996	107,100	1897–98
Darmstadt, Hessia	1868	1,178	109,956	1897–98
Brunswick, Brunswick	1745	399	52,090	1897–98
Austria:				
Brünn, Moravia	1850	287	50,828	1895
Gratz, Styria	1811	253	58,265	1897
Lemberg, Galicia	1844	365	56,800	1896
Prague, Bohemia (2)	1806 and 1868	1,154	126,394	1897
Vienna, Austria	1815	1,235	158,550	1897
Hungary:				
Buda-pesth	1856	1,251	148,217	1897
Switzerland:				
Zurich (federal institution)	1851	1,333	188,500	1897
Italy:				
Milan	1863	441	36,440	1895
Naples	1863	230	30,398	1895
Turin	(?)	380	29,478	1895
France:				
Paris École Polytechnique	1794	220	300,898	1895
Paris École des Ponts et Chaussées	1794	117		
Paris École d'Électr.	(?)	17	(?)	.....
Russia:				
Riga	1832	1,081	196,206	1894
St. Petersburg (4 schools)	1828	2,071	315,821	1895
Moscow	1832	621	95,695	1894
England:				
London, Technical College with affiliating secondary schools	1884	210	120,000	(?)
Sheffield	1885	650	(?)	.....

Technological, agricultural, forestry, mining, etc.—Continued.

1. TECHNOLOGICAL INSTITUTIONS IN EUROPE—Continued.

Countries and location.	Date of founding.	Number of students in 1896.	Expenditures.	Date.
Denmark:				
Copenhagen (connected with university)	1829	431	$31,979	1896–97
Netherlands:				
Delft	1864	428	96,929	1897
Sweden:				
Stockholm	1798	315	47,497	1896
Portugal:				
Lisbon	(*a*)	(*a*)	(*a*)	(*a*)
Oporto				

a Two schools, no statistical data available.

2. AGRICULTURAL ACADEMIES IN EUROPE.

Germany:				
Berlin, Prussia	1806	702	$170,466	1897
Hohenheim, Würtemberg	1818	113	49,500	1898
Poppelsdorf, Prussia	1846	395	140,000	1898
Austria:				
Vienna	1872	291	68,200	1895
Hungary:				
Altenburg	1819	103	41,900	1896
Debreczin	1868	98	12,500	1895
Keszthely	1865	110	26,000	1896
Kolozsmonostor	1869	100	30,000	1895
Switzerland	(*b*)	(*b*)	(*b*)	.....
Italy				
France:				
Paris	.....	(?)	63,200	1895
Grignon	1828	(?)	(?)	.....
Belgium:				
Gembloux	1860	(?)	(?)	.....
Russia:				
Evois, Finland	1859	16	5,000	1896
Moscow *c*	.....	109	(?)	
Nowaja-Alexandria, Poland *c*	1892	254	66,200	1897
Denmark:				
Copenhagen *d*	1858	370	210,246	.....
Sweden:				
Stockholm *e*	1811	(?)	25,000	1896
Spain:				
Madrid *e*	.....	(?)	(?)	.....

b Institutions connected with other high seats of learning.
c Are also forestry academies.
d Also veterinary school.
e Schools of engineering, agriculture, and veterinary science.

3. FORESTRY AND MINING ACADEMIES IN EUROPE.

Germany:				
Aschaffenburg, Bavaria *a*	1844	103	$10,000	1897
Berlin, Prussia *b*	1860	(?)	51,000	1897
Clausthal, Prussia *b*	1775	172	25,000	1898
Eberswalde, Prussia *a*	1820	62	26,000	1898
Eisenach, Saxe Weimar *a*	1859	30	(?)	.....
Freiberg, Saxony *b*	1765	231	28,000	1897
Münden, Prussia *a*	1868	46	17,500	1895
Tharandt, Saxony *a*	1811	91	22,000	1897
Austria:				
Leoben, Styria *b*	1894	203	28,500	1897
Tribrau, Bohemia *b*	1849	101	20,400	1897
Hungary:				
Schemnitz *c*	(?)	200	(?)	.....
France:				
Nancy *a*	1824	27	26,000	1896
Paris *b*	1778	203	60,000	1895
St. Etienne *b*	1816	20	4,640	1896
Russia:				
St. Petersburg *c*	1773	752	83,390	1893
Sweden:				
Stockholm *a*	1823	*d* 252	11,500	1897
England:				
Coopers Hill *a*	1885	(?)	(?)	.....

a Forestry academy.
b Mining academy.
c Both forestry and mining academies.
d Only 36 of which are residents in Stockholm.

Technological, agricultural, forestry, mining, etc.—Continued.

4. VETERINARY SCHOOLS IN EUROPE.

Countries and location.	Date of founding.	Number of students in 1896.	Expenditures.	Date.
Germany:				
Berlin, Prussia	1790	460	$60,000	1897
Dresden, Saxony	1774	119	30,000	1897
Hanover, Prussia	(?)	230	25,500	1897
Munich, Bavaria	1790	249	34,500	1897
Stuttgart, Württemburg	1821	90	26,000	1897
Austria: *a*				
Hungary:				
Buda-pesth	1786	349	23,000	1896
Italy:				
Milan	1791	120	19,400	1897
Naples	(?)	177	18,700	1895
Turin	(?)	91	12,000	1896
Netherlands:				
Utrecht	(?)	56	32,000	1895
Denmark:				
Copenhagen (*b*)	1850	370	(*c*)	(*c*)
Russia:				
Dorpat	(?)	259	*d* 1,824	1896
Kasan	(?)	356	59,090	1896
France:				
Alfort	1766	281	80,000	1896
Sweden:				
Stockholm	1821	(?)	(?)	
Spain:				
Cordoba	1802	(?)	(?)	
Leon	(?)	99	(?)	

a Institution connected with agricultural schools.
b Connected with agricultural school.
c See agricultural school.
d From State only.

NOTE.—Several noted technological schools in European countries are connected with universities, hence can not be separately enumerated. Military and naval engineering schools are excluded from this list.

School Gardens in Europe.

The Annual Reports of the Commissioner of Education have from time to time called attention to the school gardens in Europe. (See Report of 1889–90, Part I, page 308.) The literature concerning this subject is limited, and even European official reports say little about these gardens. They continue to increase, however, and a survey made by Dr. Karl Ruland resulted in an article in the Cologne Gazette which sets forth in what countries such gardens can be found and to what extent they are introduced as an aid to rural school work. The question of improving rural schools is a live one at present, and hence it is thought that a statement based on Dr. Ruland's article may be welcome.

As early as the beginning of the fourteenth century in some cities of Italy, for instance, in Salerno and Venice, institutions were found in which plants from all the parts of the world and every climate were cultivated for the purpose of instruction and the promotion of science. These institutions, called botanical gardens, became, however, more universal with the revival of science. The rich cities of Italy, above all Ferrara, rivaled one another at that time in establishing such gardens. The universities of France and Spain followed their example. The establishment of a botanical garden in Paris toward the end of the sixteenth century proceeded, it is true, from a rather trivial cause—"because the embroiderers of the court dresses needed new floral designs." Not until 1626 was this garden, which

later obtained the name "Jardin des Plantes," devoted to the great scientific purpose of cultivating all the plants of the world. In Germany also a great zeal for botanical gardens has been noticeable since the close of the sixteenth century. Their establishment was usually simultaneous with the foundation of universities. At present no German higher seat of learning is without such a garden, which furnishes the material for instruction in botany and serves in many ways for experiments with agricultural plants.

In the face of these facts it seems strange that during all this time nobody thought of establishing gardens also for lower schools. Comenius, it is true, expressed the desire that every school have a garden in which the pupils could delight their eyes in seeing trees, flowers, and herbs. He saw in the school garden a means of awakening and nourishing the desire to learn. Also Pestalozzi, so enthusiastic for youth and popular education, demanded that children should be engaged in work in garden and field; but this demand was dictated by purely pedagogical considerations. Fröbel likewise laid great stress upon agreeable occupation of little children in the garden. But to establish in the school garden a means of instruction for the public elementary school, and to employ it for the purpose of instruction in horticulture and science of nature, has been thought of only recently, and only sporadically at that.

Above all countries it is in Sweden where the school garden has found the widest extension and greatest development. The authorities there have recognized that the people's schools can contribute toward the increase of the national wealth, in so far as it depends upon agriculture and practical direction in certain of its branches. In Sweden, which had, in 1876, 1,602 and in 1881 as many as 2,000 school gardens, scarcely any public school building is found without such a garden.

In Belgium, too, where a large part of the population depends upon truck gardening, the greatest interest is manifested in the establishment of school gardens, not only by agricultural and industrial communities, but also on the part of the central Government. This has been done for many years, and considerable sums are contributed annually to the efforts in that direction. The prosperity of the rural population in Belgium, which is derived chiefly from the extended cultivation of truck gardens, must be attributed primarily to the school gardens and the extensive knowledge of horticulture among the people.

The school gardens gained ground also in France after the introduction of agriculture into the public schools by a law passed in 1885. (See Annual Report of Commissioner of Education, 1895–96, Part II, p. 1139.) In Switzerland the Swiss Agricultural Union has taken in hand the establishment of school gardens with great zeal and considerable success. This union obtained from the Federal Government a subsidy of 3,500 francs for the year 1885, which sum was suitably employed as a first aid in establishing gardens for schools in rural communities. Since then annual appropriations have been devoted to the conservation of these gardens and to a gradual extension of the system. Owing to this governmental encouragement, there were in 1888 sixteen communities in Switzerland which had well-arranged school gardens. Since then their number has increased.

While the Swedes with their school gardens aim especially at the promotion of agriculture, the Belgians and French seek to promote the culture of fruit, vegetables, and flowers. In Switzerland, aside from practical considerations, chiefly pedagogical views were authoritative for the establishment of such gardens. The school gardens in rural schools of Switzerland, as it is officially stated, are to serve youth to acquire in a pleasant manner theoretical instruction of the growth of the most important and most useful plants, partly as a field of practice for rational nursing and treatment. These gardens are intended to promote love for horticulture, order, and rural embellishment.

Austria treats the school-garden question from a broader and higher standpoint. After the imperial law of 1869 prescribed instruction in agriculture in all normal

schools, and ordered the establishment of school gardens in villages for the purpose of aiding agriculture, a ministerial order of August 20, 1870, advised that instruction in natural history be connected with work in the school garden, arranged in accordance with the needs of the locality.

Mindful of the pedagogical and economical importance of school gardens, the school authorities in Austria aided the establishment and maintenance of these gardens, and paid much attention to proper plans, so that Austria has been able to overtake other civilized countries in that particular feature of education. The flourishing fruit culture of Bohemia can chiefly be attributed to the instruction which the inhabitants have received in the school gardens attached to local public elementary schools.

In the German Empire the States of Bavaria and Oldenburg have the greatest number of school gardens. Prussia has in this regard done comparatively little. School gardens, in the proper sense of the word, are not in existence in that State. In some public schools in the country, however, there are (especially in Hohenzollern) schools for arboriculture, although this is only one part of the work in a school garden, which teachers arranged of their own free will, being specially interested in the cultivation of fruit trees. In some schools there are institutions which pursue the objects of a school garden; that is to say, which give opportunity to the pupil to learn the most important families of plants and many of their species, and to observe their development. The city authorities of Berlin, for instance, have established in the "Humboldt-Hain" a kind of botanical garden from which all the city schools are provided with a sufficient number of plants and specimens serving to illustrate botanical and biological instruction. On specified days 50,000 to 100,000 specimens are delivered to the schools and classes studying botany. Both elementary and secondary schools are thus provided.

Efforts in other countries in promoting school gardens in furtherance of public welfare have found imitation in Germany. Lately, at a public meeting in a lower Rhenish industrial city in which home industry was languishing, the weavers were advised to devote themselves to other industries, especially to the raising of vegetables. Several years ago, in Breyell, in the district of Kempen, a school for the cultivation of vegetables was established for young people who are past school age, with the purpose of preparing expert horticulturists. This advice was certainly well meant, and the success of this school, according to reports, is worthy of praise. But the beginnings of agricultural knowledge must be made in the public elementary school, especially since the love and understanding of nature must begin in early youth.

Dr. Ruland says: Not only natural history and science, indispensable to the kitchen gardener and the basis of a practical profession, but the ability to enjoy beauty, to love nature, and to see in the gardener's occupation a task for life, are things that must be learned. The shortest and surest way to reach that end is through the school garden, because nobody is more sensitive to instruction, more accessible to persuasion and direction than children are. In establishing school gardens in rural schools, industrial communities especially should proceed without delay. They will thereby create a capital of which they will have almost immediate benefit, for it will result in higher rents and add to their wealth. In nearly all schools there may be found an appropriate place for a school garden. Often unused or waste patches are found in the neighborhood of the school which are not an ornament to the community, but may be made so.

That in the establishment of school gardens different opinions according to local needs will come to the surface, goes without saying. But the first principle should be that the school garden be considered by no means an appendage of the school, but that it ought to be considered rather an important member of its organism. Hence it is necessary that in the daily time-table for the upper grades of public schools some lessons be set aside for horticulture. The school garden, of course, must correspond to the needs of the locality in regard to the matter of instruction.

It should neither be made a botanical garden nor an orchard. The object of the school garden is to become a model of a well-tended rural home and kitchen garden, which may aid school work by offering information in connection with the studies pursued in class room, but especially aid the agricultural instruction of children past school age.

To describe such a school garden useful to a rural community is easy. It is necessary, first of all, that floriculture be taught, for it will be the means of enhancing the æsthetic side of education, a result devoutly to be wished. Special attention must be paid to the culture of fruit. While tall fruit trees, owing to the limited space in the school garden, should be reserved for play and gymnastic grounds, dwarf fruit trees would better answer the purposes of the school garden, because all the work of pruning and grafting trees could then be done by the pupils themselves. Fruit trees trained on trellises and dwarf trees reward any attention bestowed upon them with excellent yields, because their fruit ripens early in the season.

In regard to the high importance which the berry fruit has assumed in late years it should not be slighted in the school garden. How far the fruit-tree cultivation shall extend will depend upon the special talent of the teacher and his skill in nursing trees. There is scarcely a branch of horticulture in which old customs are preserved with greater tenacity than in the raising of vegetables; hence by introducing new and better kinds of vegetables through the school garden a thankful field of activity is opened. Also some commercially and agriculturally important plants may be admitted. Besides the cultivation of plants the animal kingdom ought not to be forgotten. In a school garden the beehive and provision for the protection of birds might find attention.

The size of the garden depends upon the locality and the wealth of the community. In all cases prudence should dictate the measures taken, and especially in the beginning the establishment should not assume too large a scale.

It is reasonable to expect from teachers that they will fulfill their duties willingly if gardens are added to their schools, for then they will aid in promoting the pecuniary welfare of their communities. So long as there is no school garden in normal schools with a complete outfit, and (it may sound strangely) so long as there are no theoretically educated gardeners, teachers will gladly avail themselves of any opportunities to obtain the capacity for directing work in school gardens. This may be done in especially arranged teachers' courses for arboriculture and horticulture. Here a great field for fruitful activity is opened to the profession of teaching. If the school garden, which seems especially fitted to acquaint youth, by teaching and example, with practical life, were introduced in all country schools there would unquestionably be less poverty and want.

The foregoing transcript of Dr. Ruland's article on school gardens in Europe gives a survey of what is being done in the old countries to promote nature studies in elementary and secondary schools, but his report does not say much of the methods employed in school gardens. This want may be supplied by quoting from an article by Henry Lincoln Clapp in Appleton's Popular Science Monthly (February, 1898). The author says, in the course of his illustrated article:

In March, 1890, a paper entitled "Horticultural education for children" was read in Boston before the Massachusetts Historical Society by one of its members. The interest aroused by the reading of this paper resulted in the establishment of a school garden in connection with one of the Boston grammar schools in the spring of 1891. A committee of the society promised such pecuniary support as seemed to be needed from time to time. Mrs. Henrietta L. T. Wolcott, then at the head of the committee, in presenting the claims of school-garden work to the society, said: "We desire to emphasize the true idea of a school garden. Growing plants, from the first sign of germination to the full perfection of blossom and fruit, and edible roots in

all stages, give constant opportunity for study. We believe that by means of the school garden children can be so trained to appreciate plants growing naturally that the present custom of laying out public gardens with flowering and foliage plants arranged in the form of grotesque designs, portraits of distinguished men, symbols of trades, spiritual suggestions or emblems, and rolls of carpeting framed and left out in rain and sunshine, will in time disappear. Setting rows of plants in military precision and replacing them by others like magic can have but little educational value."

Since the committee intended to offer premiums for the best school gardens they thought that persons might be induced to buy the ordinary cultivated plants of a florist, and with them make what they might choose to call school gardens. This, however, would not imply any proper knowledge of such plants, or more useful ones, nor ability to make use of them as objects for study. It was thought that troubles might arise from allowing a florist's garden to be taken as the standard for the gardens which they wished to see established. The one who spent the most money, or had the most persuasiveness among florists, might establish fine gardens, lay claim to premiums in good faith, and win them; and yet such gardens might not serve the purpose which the committee considered best. Accordingly, they decided that in the beginning only those plants which were the most suitable for educational purposes should form the main stock of the school gardens. The decision was expressed thus: "Ornamental plants, or those commonly cultivated in flower gardens, will not stock the school gardens contemplated by the committee. Native wild plants, such as ferns, grasses, asters, golden-rods, violets, native shrubs, and economic plants, such as grains, vegetable roots, and leguminous and cucurbitaceous plants must be the stock of the gardens."

Later, when children's natural love for color and the influence of beautiful flowers in the schoolroom in cultivating æsthetic tastes came to be considered, cultivated plants were allowed introduction, but in a secondary place. It was claimed with truth that teachers who have beautiful flowers on their desks and fine bits of color on the walls of their rooms were likely to have other matters in harmony, order, neatness, quietness, and an atmosphere conducive to study. The flowers seem to set the key, and other matters are tuned up to that pitch. Pupils appreciate the conditions and the teacher. Unscholarly conduct is felt to be a discordant note, and the sentiment of the class is against it. However, the committee had other and perhaps higher aims to accomplish. They wished pupils to take a positive, conscious part in the development of plant life.

In accordance with the conditions mentioned, the committee decided to start a garden where the circumstances seemed most favorable, and appropriated $10 for the purpose. A piece of ground 48 by 72 feet in the back of the boys' yard of the George Putnam Grammar School was found the most available, and a few teachers in the school offered all the assistance in their power to carry out the purposes of the committee.

The soil was such as one might expect to find where no thought of plants or plant materials for a moment entered the minds of those who were instrumental in the establishment of the school and the preparation of the course of study. The pupils brought in many wild plants and the fleshy roots of biennials—turnips in variety, carrot, parsnip, radish, beet, onion (bulb), cabbage, etc. In planting, they took turns in digging the holes and placing the plants in position. Observations were made during the flowering season. The structure of the flowers of the cruciferous and umbelliferous plants was studied, and the nature of biennials was revealed. Other economic plants, such as the potato, the tomato, and the gourd, were raised to show the individuality of plants.

A square yard of ground was assigned to each of the ordinary cereals—wheat, rye, oats, barley, and buckwheat. The first four being most important members of the grass family, were especially interesting in their development. After that, grains meant more to the pupils. Nineteen species of wild asters were planted in one row.

Ten of the finest flowering kinds formed another row. Later, it was discovered that those plants blossomed the most profusely which sprang from seeds scattered at random around trees and beside rocks and fences. In the fall seed vessels were collected for study in winter, and bulbs, corms, and tubers were stored away for spring planting.

Each member of the highest class had a particular plant to take care of and study. He dug around and watered it, took off all dead leaves and unseemly branches, and tied it up. Then he sketched its characteristic parts—flowers, leaf stem, habit of growth, etc.—and took such written notes as would enable him to write an account of his plant, and illustrate it with appropriate drawings. On one occasion each of the thirty-two members of the class studied his own clump of asters, there being just clumps enough to go around. The importance of seeing and studying plants growing in large masses is not likely to be overestimated if interest and thoroughness in learning about them are desired. Comparatively, a single cut specimen in hand means but little.

By the aid of the boys a fernery was made in an angle of the school building on the north side, in a shady, sheltered position. They took handcarts into the woods half a mile distant and collected leaf mold which they mixed up thoroughly with loam and sand, and then assisted in taking the ferns from scattered places in the garden and located them by genera in the fernery. The name of each species was written on a flat stick, which was stuck into the ground near the specimen to which the name belonged.

Seeing what one teacher had done, another, by means of a hand camera, made a series of lantern slides which proved to be of the greatest service for class instruction during the following winter. A solar camera and 12-foot screen completed the equipment for the most interesting and profitable kind of instruction on the subject of ferns.

The pupils of one class studied fifteen species somewhat minutely by means of the slides and pressed specimens. Spores, sporangia, indusia, sori, pinnules, pinnæ, rachis, stipe, general shapes, textures, and relative position of parts were carefully observed, drawn, described, and colored. Notebooks contained characteristic parts of all the different species, which were broken up and distributed for the purpose. This study prepared the pupils to appreciate the development of fern crosiers in the fernery in the following spring. Twenty-two pupils out of the class of thirty-eight introduced ferns into their own gardens at home. Other classes studied composite flowers, distribution of seeds, roots, corms, tubers, bulbs, and other material supplied by the school garden.

In the spring of 1895 the development of fern crosiers was studied with great interest. The collection of lantern slides soon included representations of the crosiers of the principal species in various stages of growth. In some respects the pictures served a more useful purpose than the crosiers themselves, because their representations on the screen were very large and could be seen easily by the whole class at once.

At present there are more than one hundred and fifty different species of native wild plants in the garden. No attempt has been made to arrange them in ornamental beds, since they can not be studied so well in that arrangement. When over fifty pupils are to study growing plants, such plants must be easily accessible, and therefore scattered as much as is consistent with other conditions, especially that of caring for the plants and mowing the grass about them. Three or four times as many children can examine twenty plants set in rows as can examine them arranged in a bed; and the work of weeding the plants and cutting the grass in the former arrangement is not half as much as in the latter. The useful arrangement always takes precedence of the ornamental. * * *

How the garden is supported, and how the necessary work is done are interesting questions to those who think of starting a garden. Since 1891 the Massachusetts Horticultural Society has offered every year a premium of $15 for the best school

garden in connection with the best use of it. This garden has competed with others, and won the premium every year. Five dollars pay for the annual enrichment of the soil, and $10 for the labor of the janitor, who, during the long summer vacation, weeds, hoes, and waters the plants, and cuts the grass periodically. In spring he wheels in and spreads fertilizing material, prepares new beds or rows, and resets old ones with plants changed from other localities. * * *

Reasons that are good for introducing the elements of science into elementary schools are equally good for supplying adequate and seasonable elementary science material to work upon.

Salaries of Teachers in Elementary Schools of Switzerland.

The Annual Report of 1895–96 contains, in Volume 1, pages 147–158, a minute statement of the salaries, together with annual increases, paid to teachers in Prussia and other States of Germany, as well as in German Austria. In the following table a similar tabulated statement from Switzerland is offered. It gives the number of teachers in groups ranged according to Cantons (or States) and according to the salaries they receive. It reveals the fact that few Swiss elementary teachers (to wit, 11 per cent) receive a higher salary than $400. In most cases, however, they live in dwellings connected with the schoolhouses. Many have fuel free and land for gardening. Still, nearly all of the men teachers who have families are obliged to earn money after school hours. They serve as organists in church, act as sextons, conductors of singing societies, secretaries of literary and social clubs, and as teachers of evening schools. This supplementary income is of course not counted in the table, not because it is beyond calculation, but because it can not rightly be estimated as belonging to the teacher's salary. It is not necessary to call attention to the fact that 1,151 teachers out of a total of 12,735 (or 9 per cent) have less than $100 fixed salary, nor to the almost inexplicable fact that three men and twenty-nine women are engaged as teachers without any pay. The table simply states the facts in the case as presented by the "Official Statistics of the Swiss School System, No. 34," from which the "Schweizerische Lehrerzeitung" quotes them.

Table showing the salaries paid to elementary teachers in Switzerland.

Cantons.	Number of men and women teachers.	$20 or less.	$20 to $40	$40 to $60	$60 to $80	$80 to $100	$100 to $120	$120 to $140	$140 to $160	$160 to $180	$180 to $200	$200 to $220	$220 to $240	$240 to $260	$260 to $280	$280 to $300
Zurich:																
Male	790	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	18	44	28
Female	66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	4	6
Bern:																
Male	2,079	.....	.....	1	1	.....	.....	18	128	268	281	216	244	271	161	91
Female	874	.....	.....	.....	.....	.....	.....	18	125	229	206	91	44	38	18	12
Lucerne:																
Male	325	.....	.....	1	.....	.....	1	.....	7	8	46	31	50	95	36	6
Female	57	.....	.....	.....	.....	.....	1	.....	7	7	5	9	1	2	6	1
Uri:																
Male	55	2	5	2	10	19	5	3	1	4	1	1	.....	1	1	.....
Female	29	2	4	2	5	15	1	.....	.....	.....	.....	.....	.....	.....	.....	.....

Table showing the salaries paid to elementary teachers in Switzerland—Continued.

Cantons.	Number of men and women teachers.	$20 or less.	$20 to $40	$40 to $60	$60 to $80	$80 to $100	$100 to $120	$120 to $140	$140 to $160	$160 to $180	$180 to $200	$200 to $220	$220 to $240	$240 to $260	$260 to $289	$250 to $300
Schwyz:																
Male	141	1	2	2	3	63	6	8	....	1	11	10	17	7	2	5
Female	*a* 84	1	1	1	3	63	6	7	....	....	....	....	....	....	....	....
Obwalden:																
Male	43	....	....	....	20	9	2	....	....	....	2	1	3	1	2	....
Female	*b* 34	....	....	....	20	3	2	....	....	....	....	....	....	....	....	....
Nidwalden:																
Male	39	1	....	....	13	13	3	....	....	2	1	....	1	1	....	....
Female	*c* 32	....	....	....	12	13	3	....	....	....	....	....	....	....	....	....
Glarus:																
Male	91	....	....	....	....	1	....	....	....	....	....	....	....	....	1	8
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Zug:																
Male	71	1	1	1	9	10	4	4	5	1	3	....	5	3	11	1
Female	*d* 39	1	....	1	9	10	4	4	3	1	....	....	....	....	....	....
Freiburg:																
Male	453	1	2	2	12	41	16	14	38	62	91	77	34	14	13	9
Female	*e* 203	1	2	2	11	41	16	13	32	24	18	11	6	7	8	4
Solothurn:																
Male	266	2	....	....	....	....	....	....	....	....	12	28	47	56	43	22
Female	17	2	....	....	....	....	....	....	....	....	....	....	1	3	2	2
Basel Stadt:																
Male	111	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2
Female	32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Basel Land:																
Male	161	....	....	....	....	....	....	....	....	....	14	20	44	15	17	17
Female	15	....	....	....	....	....	....	....	....	....	1	....	7	2	2	....
Schaffhausen:																
Male	123	....	....	....	....	....	....	....	....	....	....	1	7	6	8	10
Female	7	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....
Appenzell A. R.:																
Male	113	....	....	....	....	....	....	....	....	....	....	....	1	....	8	28
Female	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Appenzell I. R.:																
Male	30	....	....	....	....	9	....	1	....	2	4	5	5	1	2	1
Female	11	....	....	....	....	8	....	1	....	2	....	....	....	....	....	....
St. Gallen:																
Male	548	....	....	....	2	....	....	....	5	14	18	10	14	45	68	92
Female	34	....	....	....	2	....	....	....	5	3	3	....	3	1	1	3
Graubünden:																
Male	478	1	1	....	5	55	114	149	60	30	14	9	8	8	3	1
Female	*b* 51	1	1	....	1	22	12	....	2	1	1	....	....	....	....	....
Aargau:																
Male	583	....	....	....	....	....	....	....	....	8	....	....	146	201	108	40
Female	121	....	....	....	....	....	....	....	....	8	....	....	61	19	8	12
Thurgau:																
Male	290	....	....	....	....	....	....	....	....	....	8	10	30	37	48	60
Female	13	....	....	....	....	....	....	....	....	....	3	1	1	1	2	....
Tessin:																
Male	528	....	1	....	142	232	67	41	21	11	5	3	1	2	2	....
Female	367	....	1	....	141	163	32	12	9	7	2	....	....	....	....	....
Waadt:																
Male	990	....	....	8	14	10	20	16	27	62	116	82	39	14	104	123
Female	487	....	....	7	13	10	17	16	27	3	116	78	38	12	18	13
Wallis:																
Male	524	4	9	242	177	40	14	12	13	5	1	....	....	....	....	2
Female	*f* 231	2	7	141	53	20	2	2	....	1	....	....	....	....	....	....
Neuenburg:																
Male	410	....	....	....	....	4	1	2	....	69	22	25	37	46	19	13
Female	....	....	....	....	....	4	1	1	....	68	22	25	37	45	19	12
Geneva:																
Male	261	....	....	....	....	2	1	....	....	4	6	7	10	4	9	20
Female	....	....	....	....	....	2	....	....	....	4	6	7	10	3	6	18
Total:																
Male	*g* 9,503	13	21	259	408	508	254	268	305	551	656	537	748	846	710	579
Female	3,232	10	16	154	270	380	98	81	210	414	383	222	212	137	94	85

a Including two women without salary.
b Including three women without salary.
c Including four women without salary.
d Including six women without salary.
e Including one man and seven women without fixed salary.
f Including two men and three women without fixed salary.
g Including three men and twenty-nine women without fixed salary.

Table showing the salaries paid to elementary teachers in Switzerland—Continued.

Cantons.	$300 to $320	$320 to $340	$340 to $360	$360 to $380	$380 to $400	$400 to $420	$420 to $440	$440 to $460	$460 to $480	$480 to $500	$500 to $520	$520 to $540	$540 to $560	$560 to $580	$580 to $600	$600 to $620
Zurich:																
Male	65	54	64	65	43	26	22	20	17	20	15	17	19	28	9	33
Female	9	3	3	4	4	2	1	2	2	1	1	2	7	2	7	....
Bern:																
Male	74	32	43	20	21	37	19	42	8	13	13	10	21	3	13	....
Female	17	2	11	7	6	20	3	26	....	1	....	....	....	....	....	....
Lucerne:																
Male	6	5	2	11	....	1	4	1	4	3	1	....	6	....	....	....
Female	4	3	1	10	....	....	....	....	....	....	....	....	....	....	....	....
Uri:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Schwyz:																
Male	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Obwalden:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nidwalden:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Glarus:																
Male	27	23	9	7	2	8	3	2	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Zug:																
Male	....	4	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Freiburg:																
Male	4	....	....	1	1	8	5	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Solothurn:																
Male	11	5	7	10	5	3	4	2	5	2	2	....	....	....	....	....
Female	....	....	2	1	2	2	....	....	....	....	....	....	....	....	....	....
Basel Stadt:																
Male	1	5	7	....	2	2	....	6	2	1	1	3	2	1	....	4
Female	1	5	6	....	2	2	....	6	2	1	1	1	2	1	....	....
Basel Land:																
Male	10	5	7	10	....	2	....	....	....	....	....	....	....	....	....	....
Female	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Schaffhausen:																
Male	19	13	17	5	1	2	5	2	3	....	3	....	3	1	4	3
Female	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....
Appenzell, A. R.:																
Male	20	24	6	11	4	4	3	2	1	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Appenzell, I. R.:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
St. Gallen:																
Male	63	53	25	20	17	14	15	9	5	8	6	1	3	6	3	3
Female	....	....	....	....	....	2	2	2	2	4	....	....	....	....	....	....
Graubünden:																
Male	1	1	1	....	....	....	....	10	4	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Aargau:																
Male	22	16	13	3	6	10	1	2	4	2	....	....	1	....	....	....
Female	7	3	2	1	....	....	....	....	....	....	....	....	....	....	....	....
Thurgau:																
Male	32	23	14	10	10	1	1	2	3	....	....	1	....	....	....	....
Female	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tessin:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Waadt:																
Male	160	86	37	11	5	16	11	7	1	8	10	....	....	....	1	2
Female	11	37	15	....	....	....	....	....	....	....	....	....	....	....	....	....
Wallis:																
Male	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Female	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Neuenburg:																
Male	61	6	6	13	23	5	24	5	4	2	16	4	3	....	....	....
Female	36	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Geneva:																
Male	9	16	15	18	47	14	5	6	17	9	11	12	1	3	1	6
Female	5	11	13	12	42	6	....	2	3	5	....	....	....	....	....	....
Total:																
Male	585	372	273	216	188	153	122	118	78	68	78	48	59	42	31	51
Female	98	64	54	35	56	35	7	40	9	12	2	3	9	3	7	....

Table showing the salaries paid to elementary teachers in Switzerland—Continued.

Cantons.	$620 to $640	$640 to $660	$660 to $680	$680 to $700	$700 to $720	$720 to $740	$740 to $760	$760 to $800	$800 to $820	$820 to $840	$840 to $880	Salary, including incidentals.	Dwelling free.	Fuel free.	Land with dwelling.
Zurich:															
Male	6	35	....	4	31	4	98	....	....	....	....	390	384	83	216
Female	....	....	....	....	....	....	2	....	....	....	....	36	27	6	14
Bern:															
Male	27	....	....	....	1	1	1	....	....	....	....	488	1,350	1,064	723
Female	....	....	....	....	....	....	....	....	....	....	....	238	519	439	138
Lucerne:															
Male	....	....	....	....	....	....	....	....	....	....	....	283	39	11	5
Female	....	....	....	....	....	....	....	....	....	....	....	52	3	3	.....
Uri:															
Male	....	....	....	....	....	....	....	....	....	....	....	18	34	32	4
Female	....	....	....	....	....	....	....	....	....	....	....	5	24	24	3
Schwyz:															
Male	....	....	....	....	....	....	....	....	....	....	....	44	93	46	15
Female	....	....	....	....	....	....	....	....	....	....	....	12	68	39	10
Obwalden:															
Male	....	....	....	....	....	....	....	....	....	....	....	10	28	25	.....
Female	....	....	....	....	....	....	....	....	....	....	....	4	25	22	.....
Nidwalden:															
Male	....	....	....	....	....	....	....	....	....	....	....	10	28	14	3
Female	....	....	....	....	....	....	....	....	....	....	....	4	27	14	.....
Glarus:															
Male	....	....	....	....	....	....	....	....	....	....	....	83	6	4	.....
Female	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....
Zug:															
Male	....	....	....	....	....	....	....	....	....	....	....	45	20	16	8
Female	....	....	....	....	....	....	....	....	....	....	....	16	18	15	7
Freiburg:															
Male	....	....	....	....	....	....	....	....	....	....	....	67	362	306	218
Female	....	....	....	....	....	....	....	....	....	....	....	42	145	125	53
Solothurn:															
Male	....	....	....	....	....	....	....	....	....	....	....	51	98	202	20
Female	....	....	....	....	....	....	....	....	....	....	....	3	.....	14	.....
Basel Stadt:															
Male	5	....	6	1	4	2	6	9	10	16	12	111	.....	.....	.....
Female	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....
Basel Land:															
Male	....	....	....	....	....	....	....	....	....	....	....	20	111	120	94
Female	....	....	....	....	....	....	....	....	....	....	....	7	.....	.....	.....
Schaffhausen:															
Male	2	1	4	2	1	....	....	....	....	....	....	111	12	5	6
Female	....	....	....	....	....	....	....	....	....	....	....	7	.....	.....	.....
Appenzell, A. R.:															
Male	....	....	....	....	....	....	....	....	....	....	....	18	94	.....	17
Female	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....
Appenzell, I. R.:															
Male	....	....	....	....	....	....	....	....	....	....	....	5	25	12	1
Female	....	....	....	....	....	....	....	....	....	....	....	3	8	5	.....
St. Gallen:															
Male	22	2	....	3	....	....	....	2	....	....	....	276	263	15	111
Female	....	1	....	....	....	....	....	....	....	....	....	31	3	.....	.....
Graubünden:															
Male	....	....	....	....	....	....	....	....	....	....	....	365	100	64	.....
Female	....	....	....	....	....	....	....	....	....	....	....	31	17	8	.....
Aargau:															
Male	....	....	....	....	....	....	....	....	....	....	....	546	21	17	13
Female	....	....	....	....	....	....	....	....	....	....	....	119	1	2	.....
Thurgau:															
Male	....	....	....	....	....	....	....	....	....	....	....	42	236	24	212
Female	....	....	....	....	....	....	....	....	....	....	....	10	3	.....	.....
Tessin:															
Male	....	....	....	....	....	....	....	....	....	....	....	258	226	170	7
Female	....	....	....	....	....	....	....	....	....	....	....	171	162	124	5
Waadt:															
Male	....	....	....	....	....	....	....	....	....	....	....	250	702	455	479
Female	....	....	....	....	....	....	....	....	....	....	....	173	286	190	139
Wallis:															
Male	....	....	....	....	....	....	....	....	....	....	....	254	254	241	11
Female	....	....	....	....	....	....	....	....	....	....	....	109	115	109	.....
Neuenburg:															
Male	....	....	....	....	....	....	....	....	....	....	....	401	9	2	3
Female	....	....	....	....	....	....	....	....	....	....	....	265	6	1	3
Geneva:															
Male	4	3	....	....	1	....	....	....	....	....	....	202	58	.....	41
Female	....	....	....	....	....	....	....	....	....	....	....	143	13	.....	4
Total:															
Male	66	41	10	10	38	7	105	11	10	16	12	4,348	4,553	2,928	2,207
Female	....	1	....	....	....	....	2	....	....	....	....	1,516	1,471	1,145	379

Higher Education of Women in the Prussian Diet.

[Condensed from correspondence in New York Evening Post.]

By the declaration of the Prussian Government, given through the minister of public instruction, Dr. Bosse, in the Diet on April 30, 1898, the further extension of woman's education in Germany received a set-back so decisive as to amount virtually to a severe defeat. The facts that had led to it were, briefly told, the following: The municipal council of Breslau had asked the Government's permission to start a municipal college for girls, or "gymnasium," stating that no State help of any kind was looked for, the institution to be, on the contrary, self-sustaining. The Government, as is required by law, was requested to grant to this new institution the same privileges as the gymnasia for boys possess, viz, that graduates from it be given a testimonial of "maturity," enabling them to become students at regular universities. The petition itself was addressed to the Government last year. No reply was given to it until late in April, and then all the reply made was a refusal, without citing any reasons. To a letter from the Breslau municipal council asking to know what reasons had been involved in the refusal, no answer of any kind was vouchsafed.

In the Diet, after Delegate Gothein had summed up the above facts, Dr. Bosse replied at great length. He said that the Government was not, in principle, against higher education for women, as evidenced by the fact that permission to study and to attend lectures at the regular universities had been granted German and foreign women on its being shown that they possessed the maturity of body and mind required, and that several had been afterwards permitted to undergo examination for their "doctorate," and that in such cases there was no hindrance, so far as their sex was concerned, for their entering the service of the State or Government. These cases, he pointed out, had been, however, exceptions, and he had no scruple in saying that the Government meant them to remain exceptions. And then Dr. Bosse launched out into a series of arguments against the generalization of higher education among women. That part of his oration was evidently intended as an expression of the Government's policy, and the majority of the house sided with him. Dr. Bosse said, among other things, that the great majority of the girls and women of Germany still looked to marriage for their salvation; that the Government was bound to be guided in its decisions by the needs, wishes, and circumstances of this vast majority; that the few women and girls who had of late years signified a desire to receive the highest grade of education could not be taken into account; that logical thinking was not a strong feature of women, otherwise they must draw the logical consequences of their demand, to wit: To be admitted to full, equal rights with men in the matter of education and of choosing professions, they must assume the same burdens and duties, among these the duty of bearing arms, and of serving in the reserves

and in the landwehr; but, inasmuch as they are unwilling and unable to do that, conditions were not equal, and men would be at a serious disadvantage. In his reply, he said, he had the concurrence of the whole cabinet. To pack the brain of growing girls full of Latin and other difficult subjects meant ruining their health. If similar petitions, like the one from Breslau, should be addressed to him again, the minister said, he should decline to grant them in the same way.

The debate which followed could not change the decision rendered, but it was, nevertheless, of interest, as defining the present attitude of the majority parties in the Prussian Diet. Several conservative speakers, such as Count Limburg-Stirum, expressed a hope that the Government would entirely retrace its steps in this matter, as even the concessions hitherto granted went too far. The members of the center, though, such as Dittrich, Glattfelter, and Pless, declared the whole movement for higher female education an unmitigated evil. The delegates belonging to the liberal parties, such men as Wetekamp, Von Schenckendorff, and Gothein, warned the majority and the Government that they were trifling with a movement whose serious, just kernel was admitted to-day by nearly every civilized country, and by all men who had had occasion to study it, and that it would be found impossible to roll time backward. Dr. Bosse made reply that above all it was necessary for women to fit themselves for women's duties. It was impossible, he said, to fit women for the career of a physician with less of general knowledge than the men are required to possess; hence it would be necessary to teach them the classics to enable them to be admitted to the study and practice of medicine. Nothing, he said, had hurt the woman-movement in Germany as much as had the woman congress in Berlin, where the most extreme views were publicly ventilated without being checked by the other women present. Somewhat in contradiction of what he had said before, Dr. Bosse admitted that the so-called reform gymnasium in Frankfort-on-Main, where girls are permitted to attend, and the large private gymnasium in Berlin (whose degrees, however, have no public weight) were reasonably successful.

Thus ended the discussion of this topic in the Prussian Diet, and for some time to come, at least, it must be taken for granted that the views which there triumphed will guide the Prussian Government in all matters pertaining to the education of women. As a curious illustration, however, of the fact that the women of Germany themselves are not willing to accept this as a final dictum, it may be mentioned that almost on the same day that their hopes seemed to be shattered the first large and influential woman's club was organized in Berlin.

TABLE SHOWING PERCENTAGE OF ILLITERACY IN EUROPE.

Group.	Countries (or States).	Percentage.	Date.	Category of population.	How found.	Sources of information.
		Per ct.				
Teutonic nations.	German Empire	0.11	1896	Male	Army recruits	Imperial bureau of statistics, Berlin.
	Prussia	.16	1896	do	do	Do.
	Bavaria	.02	1896	do	do	Do.
	Saxony	.02	1896	do	do	Do.
	Würtemberg	.03	1896	do	do	Do.
	Baden	.02	1896	do	do	Do.
	Hesse	.10	1896	do	do	Do.
	Mecklenburg-Schwerin.	.05	1896	do	do	Do.
	Saxe-Weimar	.00	1896	do	do	Do.
	Mecklenburg-Strelitz.	.29	1896	do	do	Do.
	Oldenburg	.10	1896	do	do	Do.
	Brunswick	.11	1896	do	do	Do.
	Saxe-Meiningen	.09	1896	do	do	Do.
	Saxe-Altenburg	.00	1896	do	do	Do.
	Saxe-Coburg-Gotha.	.00	1896	do	do	Do.
	Anhalt	.00	1896	do	do	Do.
	Schwarzburg-Sondershausen.	.00	1896	do	do	Do.
	Schwarzburg-Rudolstadt.	.00	1896	do	do	Do.
	Waldeck	.00	1896	do	do	Do.
	Reuss, senior line	.00	1896	do	do	Do.
	Reuss, junior line	.00	1896	do	do	Do.
	Schaumburg-Lippe.	.00	1896	do	do	Do.
	Lippe	.00	1896	do	do	Do.
	Lubeck	.00	1896	do	do	Do.
	Bremen	.00	1896	do	do	Do.
	Hamburg	.00	1896	do	do	Do.
	Alsace-Lorraine	.10	1896	do	do	Do.
	Sweden and Norway	.11	1893	do	do	Hübner's Annual Tables.
	Denmark	.54	1891	do	do	Do.
	Finland	1.60	1892	Male and female over 10 years.	Census	Do.
Mixed Teutonic.	Switzerland	.50	1895	Male	Army recruits	Schweizerische Lehrerzeitung.
	Scotland	3.57	1893	Male and female.	Signing marriage certificates.	Statesman's Yearbook.
	Netherlands	5.40	1894	Male	Army recruits	Hübner's Annual Tables.
	England	5.80	1893	Male and female.	Signing marriage certificates.	Statesman's Yearbook.
Romanic, Teutonic, Magyaric mixture.	France	5.50	1895	Male	Army recruits	Levasseur's Statistique.
	Belgium	13.50	1896	do	do	Hübner's Annual Tables.
	Austria	13.80	1894	do	do	Army Returns.
	Ireland	17.00	1893	Male and female.	Signing marriage certificates.	Statesman's Yearbook.
	Hungary	28.10	1894	Male	Army recruits	Army Returns.
	Greece	45.00	1892	Male and female.	Census	Hübner's Annual Tables.
	Italy	38.90	1894	Male	Army recruits	Do.
	Portugal	79.00	1890	Male and female.	Census	Do.
	Spain	68.10	1889	Male	do	Do.
Slavic nations.	Russia	70.80	1887	do	Army recruits	Do.
	Servia	86.00	1890	do	do	Do.
	Roumania	89.00	1892	do	do	Do.

Examinations.

[Translated from the German of Dr. Friedrich Paulsen, professor of philosophy in the University of Berlin.]

The following article appeared in "Neue Jahrbücher für Klassisches Alterthum und Pädagogik," edited by Dr. J. Ihering, Leipzig. The author, whose lucid statement of the historical development of the German universities was published in English in the Annual Report of 1891–92, chiefly refers in this paper on examinations to secondary schools and higher seats of learning in Germany, but what he says is generally applicable:

1. *Definition of examination.*—Examination may be defined as the systematic inquiry into the state of knowledge and skill of the candidate, conducted by an expert. It occurs wherever sciences and accomplishments are cultivated through systematic instruction. Its place is chiefly in the school system from the elementary school to the university. The word *prüfen* (examine) is, according to Wiegand, derived from the Latin *probare;* it was taken in the twelfth century from the old French *prover*, new French, *prouver*, to prove, test, estimate.

2. *Classification.*—There are two kinds of examinations—school and State. School examinations are those which have grown out of the needs of the school itself, and are confined to teacher and pupil. State examinations I call those which are undertaken with an object differing from that of the school and conducted by State officials, or under their supervision.

School examination has always existed wherever there was systematic instruction. It grows, necessarily, out of the object of instruction. Every question, every task set by the teacher, is, at the same time, an examination in the broadest sense; is a determining of the pupil's state of knowledge. Examination in a technical sense is nothing more than the systematic conduct of this investigation at the close of a longer period of instruction.

The necessity for this arrangement lies upon the surface. Through examination the teacher (1) controls the result of his teaching and becomes familiar with the status of the individual pupils; (2) gives the pupil an incentive to rehearse and to impress upon the mind what he has learned and the opportunity to actively reproduce it.

Hence it follows that examinations occur, in the first place, at promotions, in order to determine the result of the course just completed and the possibility of progress in the new one.

State examinations (under which heading may be included church examinations also) do not grow out of the purpose of instruction, but rather out of an external need. Their object is, above all, the determination of the fitness of the applicant for an office or other benefits and advantages—for instance, scholarships, or the right of only one-year

military service. It goes without saying that these State or church examinations are not conducted by teachers as such. In so far as teachers are called upon to conduct them they are there only as commissioned by a given order (Prüfungsreglement).

Academic examinations occupy a middle position between State and school examinations. They resemble State examinations in so far as they confer public rights and dignities and are conducted by State authority; on the other hand, they are, as a rule, conducted by the teachers at the close of the academic term. In like manner the final examination on leaving secondary schools to gain admission to the university, and the new examination at the close of the sixth year for abbreviated military service, resemble school examinations in that they are conducted by the teachers at the close of the course; on the other hand, they approach State examination in so far as they are in charge of the State, and under State supervision, and conducted in accordance with an official regulation, and as certain public privileges are conferred by the certificate.

3. *Form of examination.*—Next appears the difference between written and oral examination, and written examination may again consist of extempore work in seclusion (Klausur-Arbeit) or of home work with every means for reference at hand. Each form has its advantages and disadvantages. The advantage in written examination lies in the fact that it affords the examiner and examined the best opportunity for deliberate reflection. Here questions and answers may assume the most precise form, whereas in oral examination accident plays a more important part. An awkward question or an ill-considered answer may, in the very beginning, exert an unfavorable influence upon the whole result of the examination. An essay done at home with abundant time, and in complete self-possession (especially on a topic of his own choice, as was the case in the dissertations or in the valedictories of former times) affords the candidate the best opportunity to show what he can do. Here he can show not only what he knows, but how he works, how he takes up and solves problems, how he utilizes means of reference. This form comes nearest to scientific work; that is, the form in which intellectual ability is tested ultimately and in the highest degree. Of course a danger is here incurred—the dishonest use of aids and references. In this respect an examination under close watch is better, although by no means wholly safe. The thousands of stratagems by means of which the candidates manage to smuggle in helps other than those afforded by memory and understanding are sufficiently well known, and compel those painful measures of vigilance which surround such examinations.

On the other hand, the examination under close watch is a good expedient for testing the breadth and amount of learning and the power of prompt and accurate thought. Lastly, it is probably easiest in this method to compare the work of many persons with tolerable

accuracy, provided the tasks given them are exactly alike. Moreover, this does away with the impression of the personal presence which is apt to prejudice the fairness of judgment, and which, in oral examination, may weigh so heavily in the balance for or against the candidate. All these advantages seem to render this system remarkably useful. For this very reason it prevails almost exclusively in England. True, on the other hand, it is not without very serious disadvantages. Rigid written questions can not explain themselves. A nervous disposition stumbles over a question and is unable to regain its equanimity; arrested association occurs, as is the case in all extemporizing. Furthermore, the reaction upon the preparation is unfavorable. The system operates most forcibly in the direction of the memorizing of ready-made answers to possible questions—it leads to cramming more than any other method of examination.

In contrast to the method of written examination, oral examination has two great advantages: (*a*) It completely excludes deception and fraud, and, what is worth more, even the attempt, or the thought of it; (*b*) it brings the participants into such close intercourse that an expert examiner can obtain the clearest image of the entire make-up and intellectual status of the candidate. Above all, it renders it possible for the examiner to follow up freely the answers of the candidate, to recognize as such merely apparent knowledge, and, on the other hand, to follow him into realms where he can show his power. This will most surely be the case where the work is done between two persons, without witnesses.

The simultaneous examination of several candidates, or examination in the presence of several persons, or even before a commission, limits freedom of movement. The reverse of the case is that personal weaknesses on both sides have special opportunity to make themselves felt. An awkward or a severe examiner confuses or intimidates; a slow or an excitable candidate will make a poorer showing than he would in a written examination. Moreover, fullest play is afforded in this to partiality in method and judgment or to the suspicion of partiality.

The practical conclusion is the union of written and oral examination as the most expedient mode of procedure. The mistakes of both methods to a certain extent will compensate for each other and unite their advantages. Accordingly, in Germany we find the two methods regularly combined. In closing examinations and examinations for graduation, we find in the schools written and oral examination. The essays afford the candidate opportunity to show his scientific culture; written examinations reveal, especially in the languages, the degree of acquired precision and facility in the use of the language. Oral examination facilitates the control of the judgment which the examiner may have formed on the basis of the written work handed in.

Historical.—Only during the nineteenth century have State examinations attained the broad development which at present they assume

in our public life. The Middle Ages really knew only school and academic examinations, although there was a church examination for the priesthood, conducted by the bishop. In modern times the system of examinations for promotion has developed, together with the more definite organization of courses of study. To these have been added the entrance examinations of the State schools established by the Reformation in the sixteenth century.

Especially well known is the Würtemberg examination, through which admissions to the monastery schools, which offered subsistence and instruction, were decided. Inasmuch as the applicants came to Stuttgart from all the Latin schools in the country, this examination acquired considerable influence upon school work. Among official examinations the scientific examination of theological candidates by the consistories (pro licencia contionandi) was the first to become more firmly established. The same boards also examined the candidates for positions in Latin schools. These examiners, however, till recent years were regular theologians. As for the rest, the academic examinations retained their significance in qualifying for the learned professions, especially in the medical and law faculties.

Previous to the nineteenth century the appointment to a public office was not made dependent upon a State examination.

Academic examinations have thereby been reduced to an affair of a more ornamental character. As an essential requirement they are retained only for an academic career, i. e., for teaching in a university. On the other hand, for callings which demand preparation in jurisprudence and political science, special boards of examination now exist everywhere in Germany, before which the applicant is required to show, in the first place, a general professional preparation before he is even admitted to the profession. After a practical preparation admission to the profession follows as the result of a regular official examination. Similarly the authority for medical practice is given only after a medical examination, and qualification for the profession of teaching is determined no less by officially constituted boards af examiners.

The incentive to this development of systems of public official examination lies in the very nature of the modern State, which constantly strives to render itself more and more independent of society; this is the purpose of the systems of public official examinations, to separate the office from social position and to place it in the hands of applicants whose sole recommendation is their efficiency. The system of examination as a method of sifting candidates for office has taken the place of the former system of patronage, which was in vogue during the previous century to the greatest extent in filling all positions. Examinations may also be said to constitute the democratic system, the principles of which are: Personal, instead of social selection; decision on the basis of individual efficiency, rather than on that of birth and family relations. The absolute monarchy had started the

establishment of this system, modern democracy, which began with the French Revolution, completed it. It coincides with the fundamental principle—la carrière ouverte au talent. A double interest impels in this direction. In the first place, the desire of the State to secure for its offices uniformly and thoroughly prepared servants, the gradation of certificates affording at the same time a further index for the proper placing of the applicants. Secondly, the interest of the individual; it is important that the applicants should be certain that they can count upon appointment in the measure of their efficiency, more especially that no one who is not adequately prepared should be preferred because of some social advantage.

In the nineteenth century the State entered also the schools with its system of examinations. The final examination, which was first introduced in Prussia in 1788—an examination of students about to leave the gymnasium, held under the direction of a public official [in Prussia, the provincial school councillor]—has since then been adopted throughout Germany and in a few of the adjacent countries; it has completely supplanted the former examination for matriculation at, or admission to, the universities. In a certain sense it also is a democratic measure; it answers the purpose of a preliminary selection from the possible candidates for the learned professions, inasmuch as it already renders admission to the university dependent upon a certain amount of mental capacity and personal energy. Without doubt this forces many who otherwise might attain to office and dignities through social relations to renounce such intention from the very start. To the influence of this examination may be chiefly ascribed the fact that now even families of high social standing are obliged to send their sons to the public classical high school, while during the seventeenth and eighteenth centuries the nobility had entirely disappeared from the Latin school, substituting private tutors for the school. True, it should not be forgotten that the final examination, on the other hand, by extending the course of the school, excludes persons without means from the university and the learned professions more frequently at present than in the past century. In addition to the final examination, Prussia has since 1892 introduced in her schools a second examination, the so-called closing examination (Abschluss-Prüfung) at the close of the sixth year of the course of the high schools, by passing which the candidate acquires the right of only one-year military service and admission to the upper grades of the school. The remaining German States have opposed the adoption of this measure for good reasons. Its pedagogical disadvantages are so overwhelming, that it is to be hoped that in Prussia, too, the school will soon be freed from it. This leads me to the last point:

5. *Concomitant effects of examinations upon school and instruction.*—Such effects are not apt to occur in school examinations which grow exclusively out of the needs of instruction and adapt themselves wholly

to the educational aim. On the other hand, all sorts of undesigned and undesirable side effects present themselves in all official or public examinations which are introduced for a purpose foreign to the needs of instruction. I mention the following: (a) The examination alters the inner relation of the learner to the subject. The prospect of an examination necessarily directs the attention away from the subject and to the examination. Knowledge thereby receives an external significance—a significance not lying in itself. Moreover, the idea is indeed to stimulate diligence and zeal through examination; but one is apt to forget that different interests do not necessarily stimulate each other; they may neutralize each other; the practical interest in the result of the examination may lessen the theoretical interest in the subject-matter. Expediency for the examination can impair the value of knowledge for the satisfaction of intellectual need. It is an old experience that learning for an examination easily becomes learning *in futuram oblivionem*. The pressure exerted by the examination leads not unfrequently to a dislike for the subject, and that which is taken up with dislike will be rejected as soon as the external pressure is relaxed. Plato already recognized this. "Learning by compulsion does not last," he says in his Republic. I think that since the days of Plato experience in this direction has been much accumulated. In our time many subjects are rendered positively distasteful to students by the examination pressure. Consider in this connection the compulsory memorizing, for the sake of the examination, of text-books for the acquisition of "general culture" in religion and philosophy, perhaps even a supplementary examination among candidates for a higher position. This concomitant effect is not a necessary attendant of the examination, but the tendency thereto will prevail the more strongly the closer the candidate has come to independence and years of discretion; and the more delicate and spiritual the subject, the more unexaminable it is, I should like to say.

(*b*) Examination turns the study in the direction of the external and examinable. In examination only that counts on which questions can be asked and which can be illustrated. The things suitable for this purpose are formulas, definitions, rules, facts, dates, in short, all things external that can be memorized and recited; not so suitable for this purpose are, what one thinks, infers, feels. It can not be otherwise. Examination questions appeal of necessity more to the memory than to the judgment. We can get, by questioning, the contests of the Iliad, the grammatical forms of Homeric language or the codices and editions of Horace and Lucretius, the history of the origin of Faust and Wallenstein. We can also get the distinctive dogmas of the different confessions of faith, and even the last words at the Cross; but how the poems of Homer, or the contents of the New Testament have entered the inner life of the student and become assimilated, we can not obtain by questioning; simply for the reason that the candidate could, on no

occasion, be less in condition and less inclined to reveal his own thinking and inner life than during an examination. The consequence is that such external things are given an importance which they do not, in themselves, possess, and the preparation for examination aims at memorizing them. For it can not be doubted that a person who, by diligent cramming, has mechanically acquired a large amount of external knowledge without much concern for the subject itself, will enter upon an examination with better prospects than one who has read and studied writings with inner interest in the thought, perhaps with much profit to his inner self, but who has neglected those things which yield to catechising. Indeed, we hear academic teachers complain of the low inclination of their students, which they indicate by immediately inquiring after the examination regulations and making these the standard of their studies. They possibly even seek to gain additional security against the mischances of an examination by questioning their schoolmates who have gone over the road before them and by practicing on the questions thus obtained. Surely it is not desirable that scientific study should become degraded to such mechanical drill, yet I should not have the heart to advise a student to permit himself to be guided exclusively by his desire for knowledge and by his interest in the subject without any regard to the rules and the character of the examination. Such idealism, which is by no means so very rare among students, easily leads to a somewhat rude awakening on coming in contact with actual life and its requirements. And, similarly, our pupils (not wholly without reason) must receive with some distrust the constantly repeated assurances that the final examination and the examination at the close of the sixth year do not in reality require special preparation at all; and also that their purpose is not to determine the standing of the pupil, but only to secure the approval by the advisory board of the judgment which the teachers had already formed.

Examination has its own peculiar character, which asserts itself even against the will of the participants. It fetters the judgment, especially if it is conducted by a higher authority, which becomes acquainted with the pupils only through this act, and then judges the teachers also by this result.

(*c*) Examinations tend toward uniformity and mediocrity. When the final examination spread from Prussia over the adjacent territories the measure met with strong opposition from many old school men, such as Ilgen of Pforta, Jacob of Lubeck. They felt it to be a limitation of freedom for teacher and pupil—a weight which would hinder the development of an independent, individually characteristic life in school. An examination upon which depends the judgment of the inspecting authority, not only regarding the individual pupils, but also regarding the teachers and the school itself, must, of necessity, operate toward uniformity.

The teachers will not be able to avoid directing the instruction toward those things on which the official who conducts the examination lays stress. They will do this for the sake of the pupils, who will be the first to feel and to suffer from an unfavorable judgment, from a failure to come up to his expectations. A particularly zealous teacher will also be apt to familiarize himself with the predilections and weaknesses of the man, and to avail himself of them. We know how a change of inspectors acts in the army. In this case, the thing may be said to be necessary; in the army, uniformity and the subordination of one's own judgment to that of a superior is absolutely necessary. It is all important in this case that there should be unity in the carrying out of orders, whether the order itself be the best possible or not. In mental life, on the other hand, unity and uniformity are by no means essential considerations; on the contrary, power and wealth here rest upon diversity and individuality. Similarly, examination makes for the average and for mediocrity; it has a tendency toward uniform, satisfactory marks for everyone in every branch. In all mass examinations superior merit has but a modest opportunity to make itself felt. The tasks must be set for the average; that which is below attracts more attention than that which is above. This is true of the individual candidate; it is true of the individual branches also.

A decided deficiency in one branch is more noticeable than excellence in another. And, in itself, such lack of uniformity in culture, even if the examination regulations tolerate it by the admission of compensatory work, is looked upon as a tendency to irregularity and eccentricity. In all examinations, therefore, those will have the best chances who, without strongly marked special inclinations and talents, tread the beaten track of uniform taskwork; whereas persons with a decided, pronounced individuality and special bent in talent suffer thereby. Without doubt the former represent a very respectable type of pupil and official, but there can be no doubt that in all departments of intellectual life progress proceeds not from conventional mediocrity but from strong, even one-sided and irregular natures. Conventionality is good for many things, but not for hewing out new paths for thought and action.

It appears, then, after all has been said, that official examinations have a tendency to suppress individuality, to foster lack of independence, to magnify the importance of external knowledge, and to blunt the power of independent judgment. The whole unfortunate business, which at present goes by the name of "culture," the "having studied," and "being able to talk about" things, is evidently also connected with the development of the system of public examination.

Examinations compel the taking up of studies without regard to the inner needs and natural faculty; they foster a habit of having studied things and of being able to speak about them; they prevent the search for what is suited to individual talent. Finally, by the certificate, they

tempt the student to a false self-confidence and self-esteem, for, naturally, if the official seal certifies to the "maturity" or to the "facultas," it follows that it *must exist*. Am I mistaken if I say that in the eighteenth century the spontaneity of the desire for culture and the feeling of personal responsibility were greater in the world of learned professions than they are to-day?

6. *Practical conclusions*—The exposition of the injurious accessory effects of examinations does not justify the demand for their abolition. Examinations are necessary evils. We can not wish to return to the system of individual pleasure and patronage; but it is well to realize that such concomitant effects exist and are unavoidable. For our first rule of conduct we shall therefore have to adopt the maxim, "Examinations must not be multiplied beyond necessity."

Examinations that can be dispensed with should be discontinued (for instance, the examination at the close of the sixth year). Bureaucracy favors them; they suit its predilection for regularity and mediocrity. Hence, Prussia is most richly blessed with them. As has been said by H. v. Treitschke, a man who in other respects accords abundant appreciation to the Prussian system, "Our pernicious examination nuisance—in fact, really a curse of Germany—is unfortunately of Prussian origin." (In the recently published Lectures on Politics, I, 43.)

But for the examiners it might be well to observe the following rules:

(*a*) Look for the positive acquisitions of the student. Examination as such has the opposite tendency—it gives prominence to the deficiencies.

(*b*) Begin with easy, simple, definite questions. The missing of a question and answer in the beginning frequently confuses and upsets the whole affair.

(*c*) Treat errors and blunders in accordance with Galatians vi, 1: "Brethren, if a man be overtaken in a fault, ye which are spiritual restore such an one in the spirit of meekness, considering thyself lest thou also be tempted."

(*d*) Do not forget that for most men an examination does not afford a good opportunity to appear in a favorable light; for this reason subjoin, as occasion may require, *additis addendis*.

(*e*) On the other hand, while attending to the *suaviter in modo* do not forget the *fortiter in re*. To recommend the lazy and ignorant is equivalent to robbing the diligent and capable.

Philosophy as a School Study.

[Translated from the German of Dr. Friedrich Paulsen, professor of philosophy in Berlin.]

[1. Past. 2. Future. 3. Content and form of philosophical instruction.]

1. *Past.*—Philosophy is originally the essence of all truly scientific or theoretic knowledge, as distinguished from casual empirical information and from practical technical science. As such was it first conceived in the Greek mind, and under this conception Aristotle has presented all sciences as parts of philosophy. Hence, philosophy from the beginning constitutes the substance of all truly theoretical instruction; it has its place in schools of philosophy. This is true both of ancient times and of the Middle Ages.

During the latter half of the Middle Ages, in which lie the roots of the present school and university systems, instruction had assumed the following form: Linguistic, philosophical, and professional instruction succeeded each other in three courses. The first of these was placed in the church and city Latin schools; it was followed in the university by the philosophical, the so called arts course, and by the professional course in the three higher faculties. The mediæval scholar carried away from the lower school the knowledge of the learned language—at least this is supposed to have been the case. At the university he studied the sciences (*artes*); first the general or philosophical sciences; then, if he desired to go farther and could do so, the professional sciences of theology, jurisprudence, or medicine. Philosophical instruction constituted the central part of the course; it was at the same time the chief constituent of the mediæval universities.

The great majority of students belonged to the *facultas artium;* the number of those who finished the professional course in the higher faculties was comparatively small.

The essential part of the instruction in the faculty of arts was the Aristotelian philosophy. In the lectures the writings of Aristotle in Latin translations were used as text-books and explained. Their contents were impressed upon the students through disputations and tested in examinations. The first half of the course, which led to the examination for the first academic degree (*baccalarius*), dealt chiefly with writings on logic and physics. In the second part of the course, which closed with the degree of master of arts, writings on metaphysics and ethics were added, together with mathematics and cosmology.

In the sixteenth century, under the influence of humanism and the Reformation, the following changes occurred: On the one hand, the school course was extended, more particularly in the newly established state schools of Protestant countries, and also in the Jesuit colleges of the Catholic domain the customary Latin instruction was broadened into instruction in classical languages and literatures; at the same time there was added preparatory instruction in philosophy and the

sciences. The elements of dialectics, mathematics, cosmology, and physics were taken up. On the other hand, the philosophical faculty added a humanistic philological course, based upon an imitation of the classical authors, to the former philosophical instruction, which, after a short interruption, had been restored by Melanchthon on the old foundation of the Aristotelian philosophy.

This philological-philosophical course remained even into the eighteenth century the authoritative method of universal scientific instruction in schools and universities. Gradually, however, a double remodeling took place. In the first place, philosophic-scientific instruction gained more and more at the expense of the linguistic and philological, first at the universities, afterwards, also, in the preparatory schools. In the second place, it became the custom to finish a professional course in one of the higher faculties, and at the same time it became customary to begin professional training with the philosophical course.

In the eighteenth century, therefore, the entering student, who, as a rule, brought with him from the school some rudiments of scientific knowledge, took up in the university studies in philosophy, mathematics, and natural science, philology and history, for the sake of his general culture; and at the same time studies in theology, jurisprudence, medicine, in preparation for his future profession. For the general studies, the *Initia Doctrinæ Solidioris*, by J. A. Ernesti, a manual which had been printed in numerous editions, was much used in schools and universities. It treated of mathematics, metaphysics (together with psychology, ontology, and natural theology), logic, ethics, and natural law, political science, physics, and rhetoric.

In the nineteenth century this development resulted in the transfer of the general scientific preparation in its essentials from the philosophical faculty to the gymnasium or preparatory school; however, with this peculiarity, which is worthy of note—that in this transfer philosophy, in its narrower sense, was almost wholly lost. Under the influence of the final examination (Abiturientenprüfung) and of the official school regulations the course of study for the gymnasium or preparatory school has been steadily broadened and extended. It is now completed, on an average, at 20 years of age, and it comprises a general scientific preparatory course in all branches, in ancient and modern languages and literatures, in mathematics and the natural sciences, in history and theology, only not in philosophy. When the student enters the university he is supposed to have given proof of his general culture in the closing examination of the gymnasium, and usually applies himself at once to his professional studies—anatomy, law (Pandekten), and only at best does he, now and then, attend a philosophical or historical lecture. Thus it has come about that the old philosophical instruction, with the exception of physics, has been eliminated. Indeed, logic and psychology, metaphysics and ethics

do not occur in the course of study of a very large number of our students.

A succession of causes has led to this exclusion of philosophy. We have, in the nineteenth century, no such school philosophy as the sixteenth and seventeenth possessed in the Aristotelian, and the eighteenth in the Wolfian, philosophy. Since the great Kantian revolution there is no universally recognized system of philosophy for schools. Through this philosophy has lost its adaptability to school purposes. It is true, the Hegelian philosophy served this purpose in so far that in Prussia it gained to a certain extent the position of an acknowledged school philosophy. But after the thirties there came the great defection, and with it the alienation of the public mind from philosophy in general and its inclination to special research. About the middle of the century it was the positive opinion in extensive circles that philologico-historical investigations and mathematical and scientific research lead to real knowledge, but that philosophy is twaddle and pseudo-knowledge. At the same time Neo-humanism had presented itself, and had been received at the classical high schools as a substitute for philosophy. The ancient languages and literatures, so it was maintained, afforded all that the pupil really had any use for. Logic and psychology, ethics and politics *in concreto*, abstract compendious instruction, in connection with this, was held to be unnecessary and in itself unfruitful. Moreover, to this dislike of philosophy on the part of the philologians was joined that of the theologians. The belief in the literal truth of Scripture (Buchstabengläubigkeit), which had come back with the Reformation, could see, in the study of Wolff, Kant, and Hegel, only danger—even ruin for the youthful soul.

That philosophical instruction should, under these circumstances, suffer, and finally yield entirely, is easily accounted for. I give a few data from the history of "philosophy as a school study" (Philosophical Propædeutics), under which name this instruction had a precarious existence in the course of study in the gymnasia during the nineteenth century.

The first official course of study of the Prussian gymnasium (Humboldt, Wolff, Süvern), newly constituted in the second decade, had no room for philosophy. Not before the decree of May 26, 1825, through the influence of Hegel, was (propædeutic) instruction in philosophy indicated for the gymnasia, and even then not positively obligatory, though really indispensable. The decree stated that the gymnasium should prepare the pupils of the two upper classes by means of elementary instruction in logic and psychology, in one or two lessons weekly, for the systematic study of philosophy with which the university instruction was to begin. In the Kantian categories and antinomies the schools might at least open up "a negative and formal outlook upon reason and ideas, and the higher satisfaction to be attained thereby," i. e., in the Hegelian system. (Vid.: The decree of

Neigebaur, Prussian Gymnasia, §121, etc.; Hegel's Report, Vol. XVII of his complete works.)

Herbart, too, is convinced of the necessity of philosophical instruction and of the danger of its complete abandonment. "Philology and mathematics," he says, in his report of 1821 (on Instruction in Philosophy in Gymnasia, Pedagogical works, edited by O. Willmann, Vol. II, pp. 121, etc.), "are industriously taught in our gymnasia, but they can not satisfy the soul. They leave a sensation of emptiness—a yearning for something else, which overcomes the enthusiast who pretends to himself and to others something greater and higher." Herbart would exclude from the schools all systems after Kant, including his own. He would have logic taught in the eighth high-school year, one quarter, four lessons a week; psychology in the ninth and tenth years, two quarters, four lessons a week, and a synopsis of the history of pedagogy (in 16–20 lessons), with Plato and Locke as the principal authors. Herbart gained permanent influence, especially in Austria. The Austrian plan of instruction of 1849 (Exner and Bonitz), with which the history of the modern gymnasium in Austria begins, provided two hours a week in the last two years for philosophical instruction; and this has been retained in the new regulations of 1884 for instruction at the gymnasium in Austria.

In Prussia, on the other hand, philosophical instruction dwindled more and more after the Hegelian philosophy had lost its influence, and the tendency for concentration had gained the ascendency. Trendelenburg, who exerted great influence by his counsel and writings, was inclined to exclude psychology as too difficult and to limit the philosophical course to logic, for which the material was afforded in his *Elementa Logices Aristoteleæ* (printed in frequent editions since 1836, together with the comments of 1842, etc.). The plan of instruction of 1856 (Wiese) gives the advice not to treat philosophical propædeutics as a separate study, but to combine logic with instruction in German. However, a decree of 1862 warns against excessive neglect, and orders the addition of a mark on acquisition in the elements of logic and psychology in the final certificate (Abiturientenzeugniss.) The plan of instruction of 1882 (Bonitz) emphasizes, it is true, the importance of this instruction, but at the same time also its difficulty and the rarity of success therein—the latter so much that it seems to have been abandoned. Lastly, the plan of instruction of 1891 has abandoned it wholly. The acquisition of concepts and ideas is relegated to the reading of prose, which may take the place of "philosophical propædeutics often carried on quite without results and out of date as a separate branch of instruction."

2. *The future.*—The decline has reached its limit—will there be a revival? I believe there will. The following facts point to that result:

In the world at large philosophy is on the upward trend. The time of depression that followed in the second third of this century upon

the speculation craze of the first third is gone. The sciences, which had retaliated for the unbearable arrogance of the disciples of Fichte, Schelling, and Hegel with contempt for philosophy altogether, have long since begun to be reconciled with her. Philosophic thinking everywhere grows out of the sciences themselves, out of physics and mathematics, out of physiology and biology, out of history and philology, out of law and political science. Fechner, Lotze, Wundt, to mention a few leading names, started with the natural sciences. General culture, also, which for a time seemed anxious to content itself with a purely physical view of things, begins now to feel that philosophy is indispensable. Increased production implies increased demand. But the school follows the movement of the outer world; that which has been established will eventually enter the school; school history can afford no surer generalization. In addition to this, humanistic philology, which in the beginning of the century assisted in crowding out philosophical instruction as superfluous, has suffered a decided deterioration in public esteem. When "classical culture" ceases to furnish an adequate view of the world, then the need of a substitute must make itself felt, and this need can be supplied only by philosophical instruction.

There is surely no doubt that the need of such instruction is practically, even now, felt in large circles. Its absence is followed by a lack of general culture which not unfrequently makes itself painfully felt in later life. For there are questions whose answers are not found in mathematics and natural science, nor in philology and history; and indeed questions of such importance and universality that no one is in a position to turn away from them. Every scientific and every practical discussion ultimately runs against the questions which we call philosophic—the relation of mind to matter, of thought to reality, of action to motives, of freedom to necessity, of the individual to humanity as a whole, of the finite to the infinite, of knowledge to belief, of morality to religion, etc. The person who has never thought out these questions in their mutual relation—that is, who has never paid earnest attention to philosophy—will, when confronted by them, be thrown into helpless confusion and become the victim of any idea that may occur to him. So it happens that debates in political bodies, which lead to universal problems of this kind, usually leave the impression that the participants have been engaged with them for the first time in their lives, and that they have no idea that others have considered them before them and that men of the greatest importance have publicly presented the results of this reflection. Not unfrequently do the writings of lawyers, physicians, scientists, and historians make the same impression when they tread upon the ground of philosophical questions. Here they act like one who had inadvertently stepped upon ice. A hundred years ago, I believe, authors of this kind moved with greater security, and they owed this to the study of philosophy, which, at that time, the schools and universities taught extensively.

At the same time, during the last decades, something like a generally accepted philosophical world-view has been forming which is not ill adapted to schools.

All of these things have a tendency to secure once more for philosophy the consideration due her in scientific preparation. In the university philosophical instruction is in the ascendency. It will likewise return to schools of learning. The new realistic high schools can less afford to do without it than could the old classical schools who still had, here and there, a substitute in the lectures of the ancients.

3. *Content and form.*—There are two branches which, after this revival, will stand first in the line for consideration as being suitable for philosophical instruction in schools, viz, logic and psychology. And rightly so. They are the most necessary and, for school purposes, the most accessible among the philosophical sciences.

Logic does not teach one to think any more than grammar teaches one to speak. But, as the latter clears up, corrects, and disciplines speech, so does logic with natural thought. It is the remedy for loose and careless thinking, for insincerity and sophistry. It shows how to define, classify, analyze, infer, judge, according to rule—that is, according to the nature of things—how to conduct investigations and arguments, inductive and deductive, and how fallacies and false inferences arise, and how error may be brought into evidence. All of these things are the daily tools of all sciences. The theologian, the jurist, the physician, the scientist, the historian, the philologist are daily engaged in the investigation of facts, the examination of propositions and demonstrations, in the coining and development of ideas, in the presentation of relationships in the actual. If this activity, by reflection upon its own form, gains in directness and reliability, then instruction in logic, which demands reflection upon the normal and fallacious in mental operations, must be regarded, in a universally scientific course of preparation for the learned professions, as no less essential than grammar.

And, similarly, like grammar it must be begun in a form suited to school purposes. Logic can not any more be taught through lecturing than can grammar. We should look upon it as a piece of foolishness for anyone to undertake to teach Greek grammar through the mere recitation of the definitions of the tenses and moods of the paradigms and rules of syntax. It is much the same with the explanations of definition and classification, of conclusions and fallacies. Through manifold practice with examples alone, can the pupil in both instances be rendered perfectly familiar with the subject and his knowledge become a living possession. Then, later on, he may be led to really scientific observation in another form, in which, of course, the old apparatus of the logical figures, *barbara*, *celarent*, etc., will not play an important part in either case.

Similar considerations obtain for psychology. It constitutes a necessary part of the universally scientific course of preparation. All sciences have constantly to do with psychological concepts. Neither the theo-

logian and jurist nor the philologist and historian can for a moment get along without them, and even the physician is by no means able to steer clear of them. The practice of most of the learned professions—of teacher and minister, of physician and judge—involves intelligent acceptation and influence upon human soul-life. If, then, there can be a science of this soul-life, and if he who has practiced this science is, other things being equal, superior to him who has heedlessly passed it by, then psychology must belong to the fundamental preparatory branches of every scientific study.

But, they say, it is too difficult for the pupil. In it, says Trendelenburg, all the ultimate and highest problems of metaphysics meet. Be it so. But the question would still remain, whether it would not be possible to avoid these difficulties beforehand. Physics quietly avoids metaphysical questions which arise for it also—questions of the nature of matter, motion, space, and time, etc., and confines itself to their phenomena.

Similarly, also, in psychology: description, classification, presentation of associations in the processes of the inner life, examination of the contents of their relative ideas as expressed in terms of speech—certainly all this is possible, without first solving the problem of the nature of the soul. And, on the other hand, these very things, while most unavoidable, are, in a certain sense, also the most accessible. They are the most unavoidable, for school instruction can by no means escape the use of psychological ideas. Every lesson in literature or history necessitates speaking of feeling and willing, of understanding and misunderstanding, of doubting and erring, of hoping and fearing, of loving and hating. And the pupil must use, in every exercise and every essay, ideas such as talent and character, condition, environment and development, inclination and duty, modesty and desire, pride and vanity, culture and rudeness. Would it not be consistent to consider these things in their relation to one another, and to grasp these ideas more closely and sharply than can be done through an occasional occurrence in the text? It may have escaped notice that the incommensurability of the words with which different languages indicate spiritual phenomena would frequently offer a satisfactory starting point for the fixing of ideas concerning these phenomena. And, with this, the other point is conceded: there are no facts in the world which more readily invite observation and investigation, and which are more accessible to them, than the facts of the inner life. The facts of physics and natural science must frequently be procured by means of apparatus and collections hard to obtain; the facts of history require a study of sources to which the school can have only very limited access. On the other hand, the facts of soul-life are the most familiar and always present. Simple experiments, too, are not hard to make, concerning association, apperception, illusions, etc. Here, too, however the form of instruction should, of course, not be that of the lecture, but

of mutual reflection and study. In the hands of one who understands the Socratic art of questioning, this instruction must become attractive to teacher and pupil.

As to metaphysics and ontology, there seems to be but one opinion—that they can find no place in school instruction. In fact, as a separate subject of instruction in systematic treatment, they can scarcely be accessible to the school—they presuppose too many things. However they may occur in some other form, indeed can scarcely be kept away. I do not see what should prevent the teacher, who might be so inclined, from touching, as occasion offered, upon metaphysical and ontological questions. In psychology and physiology the problem of the relation between spirit and matter presses so irresistibly that the pupil will come to it of his own accord. Everyone must form some idea concerning it—seniors not excepted.

I think certainly a better way than to leave him at the mercy of haphazard ideas, would be to consider the subject with him connectedly, to think out the possible presentations together, and to look into the respective arguments for each. In the same way one could lead through physics and cosmology into questions concerning the nature of space and time, the finite and infinite, if for no other reason than to give the pupil the feeling that the definiteness which characterizes ordinary ideas in the sensuous and finite, does not obtain in the world of thought. On the other hand, religious instruction touches necessarily upon metaphysics. Some may think that it is destined to step in and take the place of metaphysics. I do not think it is suitable for this; belief is not metaphysics. To be sure, much metaphysics has entered into the dogmas, but it is a metaphysics that has not grown out of such premises as are to-day offered, even urged, by science, and which for this reason has lost its convincing power. The traditional doctrines of belief, and the scientific conceptions to which the school leads the pupil, are to-day too far apart—indeed, in many ways opposed. The consequence is, one side is cast aside as incompatible with the truth. No one who keeps his eyes open to facts can question which side has most frequently met with this fate. Hence also arises the necessity of considering with the pupil, on the one hand, the significance and truth of natural science, and, on the other, the significance and truth of religious belief. In this, as a matter of course, only the most unprejudiced instruction, proceeding from the personal conviction of the teacher, can have good results. Nothing at all could be accomplished through the customary wretched suppression of particulars and furtive sidelong glances at authorities and inspired truths.

The premise ought to be: All truth is good; we will receive and concede without reserve everything to which we are led by honest research, correct investigation, earnest and sincere meditation, in the conviction that the belief in the absolute significance of the good in the human microcosm and macrocosm can not suffer thereby. Granting that a

broader and deeper cognition of the actual may injure transient conceptions, the actual itself, and truth, the cause of humanity and its belief in its own destiny and in the destiny of the actual can never lose thereby. I am not without some hope that an introduction to philosophy may afford useful hints to the teacher who desires to deal with these things. Ethics, too, is at present not in our plan of instruction. For it, too, religious instruction is regarded as a substitute. Now, however highly I esteem ethical instruction which may be found in the Holy Scriptures, nevertheless I do not believe that we do well to dispense entirely with the philosophic treatment of ethics. In the hands of an effective teacher in the higher grades it could do very valuable service, and this not in theoretical instruction alone. It could show plainly to the pupil that not the Bible and the church alone are concerned with good and evil. It is by no means of rare occurrence that things appear to a young man as follows: Good and evil are religious conceptions; they have their origin in an external authority; their sacredness and their binding power rest upon this authority. Now, if this authority is lost to him; if the belief in Moses and Mount Sinai, in God and future punishment are lost to him, the moral law goes the same way. Doubt in the authority of the Bible draws the moral world into the same doubt, and "free thought" leads to license. I am not of the opinion that philosophical instruction in ethics can in every instance prevent this, yet it might now and then enable someone to find his bearings in this region by showing him that the difference between good and evil, between right and wrong, is not, as new and old sophistry teaches, established by caprice and accident, but by the nature of things (not *thesei* but *physei*); it rests not upon the commands and prohibitions of an external authority, but it is laid and founded in one's own being; that which is wicked and low is against your own inner will; it lowers your worth; it destroys your inner self; it destroys at last your life. However, here, too, systematic instruction in ethics as a special subject would not be needed in the beginning; the occasional consideration of ethical principles might here, too, be more feasible and effective, especially if doubt and reflection among the pupils themselves lead to it; here, too, the opportunity to take it up is constantly afforded in the curriculum—in religious instruction, in classical and modern literature, in Plato, in the dramatists, in Schiller. And here, too, the contrast in the apprehension of morality between humanistic and supernaturalistic, between autonomous and authoritative ethics, lies so close that the pupil can not possibly overlook it. Will it always be advisable to pass it by and to leave the pupil to himself, where perhaps he is most in need of guidance; or does religious instruction afford here the necessary bearings? I doubt that it would often be the case. In the French schools they read with the pupils of the tenth course selections from the nicomachian ethics of Aristotle. Would this not be possible with us? A teacher who possessed the skill to lead to the

subject would find excellent starting points here. Moreover, it is also the great historical point of departure. I welcome, therefore, with pleasure a literary enterprise which purposes to furnish among us, for use in the highest grade, selections from the Greek philosophers with comments, in the editions of classical authors of Greek philosophy (Halle, Orphanage publication): I. Socrates, by K. Lincke; II. Plato's Phædon, by J. Stender; III. Selections from Plato's Politeia, by C. Nohle, to which a similar edition of the ethics of Aristotle will be added.

In conclusion, a word concerning the history of philosophy. A systemic and exhaustive presentation of this is, of course, not in place in the school. On the other hand, the neglect of philosophical literature, as compared with poetical literature, as is the case in our classical high schools, must surely be regarded as strange and unnatural. Men like Spinoza, Leibnitz, Kant, Hegel, Schopenhauer, are surely of such importance in the history of our mental life that no one who would have something to say, and who would count as a factor in the world of thought, can pass them by. It is true, the school can not present exhaustively what they were and what they signify; nor can it do this with Goethe and Lessing. Yet as, with the latter, it deems it a duty to place the great leading minds within the youthful horizon, and to aid as far as possible in their appreciation, it should do the same with the former. True, Kant, and Leibnitz, and Spinoza are not suitable for school literature—at most, only occasional fragments from their works—hence the acquaintance with them which the school can bring about will, of necessity, remain more or less distant and abstract. If, however, it should only result in the retaining of the names and of a few points of their systems it would still amount to something; and, connected with this, would be a feeling that beyond the ordinary range of ideas there are yet other thoughts in which remarkable men first found the solution of the great problems of the world and of life. Perhaps one might hope that this memory would at some later period be to some of them an impulse to seek closer acquaintanceship with these men. Others might find in it at least an admonition to modesty, so that when ultimate things are under consideration they would cultivate a praiseworthy reserve.

Literature.—For more advanced schools, I would refer to my Geschichte des gel. Unterr., second edition, 1895–96. An article by H. Kern, in Schmid's Encyclopedia, exhaustively treats of the literature of philosophical propædeutics in the nineteenth century. E. Laas treats of philosophical literature in the Gymnasium, in connection with German instruction (Deutscher Unterr., second edition, 1886), and especially R. Lehmann (Deutscher Unterr., 1890, p. 339, etc.). Fr. Kern shows conclusively how philosophical instruction grows out of the treatment of German literature (Lehrstoff für den Deutscher Unterr. in Prima, second edition, 1897). A Höfler (Zur Propädeutik-Frage,

Vienna, 1884) and A. Meinong (Über philosophische Wissenchaft und ihre Propädeutik, Vienna, 1885) treat of the subject with special reference to conditions in Austria. Among the numerous annual school reports on the subject I would mention Kränkel (Lahr, 1891) and Polle (Dresden, Vitzthumsches Gymnasium, 1894). A treatise of my own in the Zeitschrift für die Interessen des Realschulwesens, 1882. Also manuals by Mathiae, Beck, Rumpel, Hollenberg, Jonas, and others.

CHAPTER VII.

MEANS FOR SPREADING HYGIENIC KNOWLEDGE AMONG THE PEOPLE.[1]

By Leo Burgerstein, of Vienna.

Contents.—I. Means of hygienic instruction concerning children and instruction of children themselves: (1) By distribution of printed matter; (2) courses in normal schools and common schools; (3) secondary schools.

II. Means for the general spread of hygiene: (1) University extension; (2) associations, popular lectures, reading rooms, books; (3) the influence of the clergy; (4) itinerant teachers; (5) portable exhibits.

III. Means for spreading hygienic knowledge among the professions: (1) Special schools; (2) lectures to nurses; (3) technical schools; (4) administrative officers, physicians. *Theses.*

The following paper, though written with reference to European conditions and read in a European scientific convention, is here offered in translation on account of its numerous practical suggestions, many of which deserve attention in this country also. Prof. Leo Burgerstein has been a frequent contributor to the literature of the science of hygiene[2] and his suggestions toward popularizing it have everywhere been received with favor. He says:

My efforts with regard to the subject before us will be directed toward outlining the means practicable for the dissemination of hygienic knowledge among the masses of the people, as well as those applicable only to a restricted number. I shall amplify the text with appropriate examples from different states and nations.

A broad dissemination of knowledge is most quickly and easily effected among a population most of whom know how to read; where common schools are in the first stages of development it is difficult; the absence of these beneficial agencies makes it altogether impossible. The only immediately effectual means possible in the last case are the instructing and sending out of itinerant teachers with portable exhibits and the thorough education of those who enter the priesthood.

[1] A paper read before the members of the International Medical Congress, held in Moscow, Russia, August 19–26, 1897.

[2] See Annual Report of 1895–96, Part II, page 1175: "Mental Fatigue in School." where his publication on "Arbeitscurve" is mentioned.

I. Means of Spreading Hygienic Knowledge Concerning Children and the Instruction of Children Themselves.

1. distribution of brief tracts among parents.

With the supporting influence of State officials, the mutual cooperation of specially adapted societies and authorities can effect at a comparatively small expense the issue of brief tracts fitted to the comprehension of the masses. These may be distributed by authorized persons on suitable occasions, such as follows:

(*a*) *At marriages,* by the officiating parties, who should at the same time caution against their falling into the hands of children or minors.

(*b*) During the technical instruction of midwives, by those duly authorized and within specified periods of time limited by scientific progress.

(*c*) *At the registration of births,* instruction may be given in printed form by the acting clergyman or civil officer. Contents: Repetition in part of the hygiene of children during the first days of life, the dangers of eye and mouth diseases, their prevention, and the necessity of immediate medical treatment; significance and importance of vaccination; requirement of heat, temperature of baths, indispensability of cleanliness, care of the skin, and the organs of sense; nourishment by means of mother's milk or the milk of animals, time for the introduction of other food and its kind, caution against stimulants and narcotics; the treatment of weak children; exercise in the open air; dangerous playthings; protection of children against early study; the symptoms of the most frequent contagious diseases; the necessity of medical assistance. At the presentation of illegitimate children for registration, the printed matter mentioned under (*a*) should also be handed over.

(*d*) *At the entrance of children at school.*—Contents: Hygiene of children during the first years at school in respect to daily order, necessity of sleep, exercise, fresh air; hygiene of food; care of the skin, clothing; hygiene of study, position while reading and writing, carrying books, dangers of mental overexertion by other than school requirements; participation in pleasures deleterious to the child's organism; danger of employing children to earn money, both with regard to their age and the nature of the work required; increased danger of infection by attendance at school; duties pertaining to the prevention of the spread of infectious diseases; stoppage of the nasal canal; running of the ear, recommendations to caution children against such indulgences as tend to provoke thoughts, words, and actions which they would hesitate to make known to their parents. Dr. H. Cohn, among other subjects, specially agitates this one in printed instructions to parents.

As far as I know, France alone has taken measures toward distributing tracts among parents. In pursuance of a report of the advisory committee on public hygiene (the author of the report is Mr. H. Napias), the department of public instruction has ordered that in cases where children have contracted a contagious disease teachers must forward to the parents a pamphlet of instruction on the prevention of the spread of the disease.

As in most European countries statistics furnish the dates of marriages and births, as well as the number of children attending school, it is easy to determine the number of copies necessary for experimental proceedings in a single province. Expenses could be kept down by being partly defrayed by the individuals specially interested in the spread of hygienic knowledge. Everyone should be obliged to obtain the pamphlets, free of charge in most cases. If copies in more elegant finish and binding were offered for sale at a profit of 20 per cent, a considerable proportion would surely be sold. On such occasions as marriages and births, parents, if they could at all afford it, would willingly pay the prices asked for the booklets.

It is unquestionably true that children can be thus cared for in a great measure, from the day of their birth until they themselves are instructed in personal hygiene. Success will not attend every effort, of course, but considerable benefit may be

expected, since the instructive instinct of a mother for her child is thereby appealed to.

If similar pamphlets or booklets were sold by book dealers, the method proposed would lose much of its influence. It is, however, applicable in communities other than where the knowledge of reading is prevalent, as the acting official can inquire into cases where the ignorant may have the articles read to them by those informed. Beneficial societies, of which I shall speak later on, are capable of much good work in those lines.

2. DISSEMINATION OF HYGIENIC KNOWLEDGE BY MEANS OF SCHOOLS.

(*a*) *Elementary, or common, and normal schools.*—The subject of hygienic instruction in elementary schools should form a definite, systematically arranged series of important topics, discussed in such a way that children may be interested, and not taxed beyond their intellectual capacity. As instruction in elementary schools is conducted by one teacher, such an arrangement is easily made.

In the lower grades hygiene need not be introduced as a separate study; nor do the younger pupils require a special text-book. Talks on the subject may be best combined with reading exercises, proverbs and riddles, and with occurrences and observations, such as the cleaning of shoes before entering a room, ventilation, etc. Exercises of this kind have been introduced into Austrian readers; collections of lessons have been published also. The study of hygiene at this stage includes cleanliness of body and clothing, habitation, air, light, artificial light, and heat, together with attendant danger of food and eating (moderation), drink (water, its impurities, filtration, alcoholic mixtures), position, care of the organs of sense, and contagious and infectious diseases (preventives). A comprehensive but concise programme is desirable for the teacher.

In advanced grades the above-mentioned subjects may be treated more fully and supplemented by new topics, as: First help in cases of accident (lessons given in Austrian schools), hygiene as regards labor and workshops; instruction on the choice of a calling with reference to health and physical adaptation; even the first steps toward the understanding of social hygiene may be made. Pupils of the highest grades may be taught that the beneficial results of some public measures are felt by those not immediately affected by the regulations. Children from 12 to 14 years of age are able to understand that they incur personal risks by living near those who expose themselves to the danger of infectious diseases by dwelling under conditions unfavorable to health. They can also begin to appreciate the advantages of clean streets, pure water, and the like.

Teachers should not confine themselves to the lessons provided in the readers, but should make use of brief written exercises by the pupils on topics already discussed, compositions on their daily outdoor work and home surroundings, supplemented by discussions and final readings from their own compositions. A catechism of hygiene, with blank pages for remarks, may be given out. Charts of hygienic text (not anatomical pictures) may be hung up in schoolrooms, as has been done in Rome and Vienna. Finally, the course of study in outlines may be given to pupils, with brief explanations to be analyzed by topics. Household hygiene, and that of nursing children and the sick, are particularly significant subjects for girls in the higher grades of common schools.

Elementary schools are made use of, to greater or less degree, for the dissemination of hygienic knowledge in most civilized countries, as the Argentine Republic, Austria, Belgium, Denmark, England, France, Germany, Japan, Norway, Sweden, Switzerland, the United States of America, and others. As a matter of course, the results of efforts in large cities are more conspicuous than those in the States taken as a whole (notice Munich and the State of Bavaria). The thoroughness and the mode of instruction can not be conclusively judged from the reports, which claim to offer only the generally accepted regulations.

I shall say little of what has been done in the separate states, as *von Fodor, Kuborn, Layet,* and *Gauster* have discussed hygienic instruction before an international congress, and explained the conditions and progress in their native States—Hungary, Belgium, France, and Austria.

Much has been done in the United States for the study of hygiene, and especially for the prevention of the spread of alcoholism, by the Federal statute of May 20, 1886.[1] Mrs. *Mary H. Hunt,* who has published and edited works on this subject, was very prominent in the agitation against alcoholism, and gave a very strong impetus to it by incessant and indefatigable efforts. Vermont was the first State to require instruction in "physiological temperance" (1882); now all States and Territories of the Union, excepting Arkansas, Georgia, Utah, and Virginia,[2] have a temperance education law, which requires instruction in the danger of alcohol. In many States, among which Connecticut, Massachusetts, New York, Ohio, Pennsylvania, and others are specially conspicuous, this instruction is neither confined to elementary schools, nor limited to narcotics and stimulants.

Greater efforts in behalf of disseminating hygienic knowledge in elementary schools have lately been made in England, where, since 1896, a series of hygienic subjects has been inserted by law into the curriculum of the national or board schools. In a few selected schools for girls in London domestic economy, with accompanying hygiene, has lately received special attention.

France has recently begun to make use of schools as a factor in the suppression of alcoholism. In pursuance of the report of the commission specially appointed for this work, the minister of public instruction has published a detailed plan of study for elementary and higher elementary as well as for normal schools.

The decrease in the quantity of alcohol consumed per head and per year in Norway and Sweden shows encouraging results. The effect of temperance unions will be discussed later on.

A chief condition for the dissemination of hygienic knowledge in elementary schools is the corresponding preparation of young teachers, which should extend to the fundamental features of general and personal hygiene, school hygiene, and the first aid in cases of accident. With women teachers special attention should be paid to household hygiene, the hygiene of nursing children, the sick, etc. The teachers, in turn, should deliver similar tracts to mothers when their daughters leave school, or even earlier, if girls show unusual physical development. Finally, it is desirable that those in charge of kindergartens be likewise instructed.

Only teachers who have been thoroughly prepared—that is to say, who have themselves been properly taught at a normal school—are able to teach children hygiene. It is a well-known fact that, with a few notable exceptions, teachers who have not received this technical or professional instruction are ignorant of the simplest laws of either practical or theoretic school hygiene. Every country that exacts compulsory education is naturally bound to maintain the laws of school hygiene.

The opportunity of taking a special course—during vacation, for instance—should be offered to all teachers in office who have not studied hygiene. Great success, however, must not be anticipated, though anyone aspiring to the position of school principal ought, at least, to pass an examination in school hygiene. Self-instruction is commendable, even though it can not replace oral instruction accompanied by demonstrations. For this purpose a short, general treatise is to be recommended, not to mention the numerous compendiums published. Teachers should combine their forces against alcoholism, which has its own literature. Teachers, moreover, can exert a beneficial influence upon communities, since in countries of higher culture their profession is considered honorable, and they are oftentimes members of local boards of health.

Notwithstanding the long-recognized necessity, hygienic instruction of candidates for teachers' positions leaves much to be desired. It is seldom well regulated.

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[1] The Federal law applies only to the District of Columbia and the Territories.—Translator.

[2] The legislature of Virginia is now (February, 1898) discussing a bill to that effect.—Translator.

Some of the United States were probably the first to provide for this instruction. Pennsylvania, New York, and Massachusetts introduced it into the course of study of normal schools as early as 1844 or 1845–46.

Of the Swiss Cantons, Berne seems to have the best-developed course of study in hygiene. Professor Roth formerly delivered the normal course of lectures for teachers in Zurich. Professor Silberschmidt has taken his place.

In Belgium and Hungary physicians teach hygiene to candidates for teachers' places. In pursuance of the regulation of June 8, 1894, hygiene is included in the examination of elementary school teachers in Denmark. It does not seem, however, that physicians give the lectures.

Physicians do not teach hygiene in the normal schools of the German States. Local courses of lectures are, however, provided for, as those in Berlin for teachers of elementary and secondary schools. Prof. B. Fischer has delivered lectures on school hygiene in Kiel for elementary school teachers. Prof. A. Gaertner gained his reputation by regular vacation courses in hygiene in the University of Jena, combined with exercises in the first aid in cases of accident. Principals of secondary schools and teachers of gymnastics also attend these lectures.

The London school board requires male teachers to study physiology and hygiene and to receive the "advanced certificate" of the Government department of science and art. (J. R. Diggle.) A comprehensive programme is made out for this purpose. The lecturers need not be physicians. Domestic economy is required of female teachers.

In France, Germany, and Austria teachers have acted as the medium for enforcing the obligation of vaccination and revaccination.

In Austria hygienic instruction has been organized in normal schools for men and for women in an effectual and promising manner. For a number of years hygiene has been a special study, in which candidates have been also required to pass an examination. The school law of January 12, 1891, placed it on a new basis. During the second half of the first year of the normal school course two hours a week are devoted to anatomy, physiology, general and school hygiene, as well as first aid in cases of accident. During the first half of the fourth year one hour a week is given to a review of these subjects, supplemented by special consideration of the rules in force in the different crown lands concerning general and school hygiene. A special official decree refers to this subject and defines its scope; at present it is taught by medical lectures in 68 normal schools, including those for men and women.

Regular courses have been instituted in Vienna for teachers in office, of which hygiene is one of the subjects for a number of consecutive years.

(*b*) *Dissemination of hygienic knowledge in secondary schools. Teachers of such schools.*—The dissemination of hygienic knowledge by means of secondary educational institutions, such as "gymnasia," "lyceums," "Realschulen," and other high schools, is a knotty question.

In numerous states the programme of studies is already so crowded that, out of consideration for the health of pupils, a new subject, as necessary even as hygiene, to which special hours are to be devoted, is not introduced until another can be curtailed to gain time.

The omission of hygiene in these schools is the more deplorable since the pupils of the lower grades lack that instruction which pupils of the higher grades of elementary schools occasionally enjoy.[1] Moreover, pupils of the upper grades of high schools are sufficiently developed and well enough informed to be prepared by means of hygienic knowledge for the understanding of social questions that will intensively engage the attention of the coming century. It should not be forgotten that the younger generation now in secondary schools may in future be potent factors in society, and hence be able to effect much for the cause of hygiene.

[1] It should be remembered that German, Austrian, French, and other high schools (classical or modern) do not begin their course where the elementary school ends, but receive their students when they complete their tenth or eleventh year of age.

In secondary schools it would be necessary to arrange a series of hygienic subjects which probably would be best taught by *one* teacher who had been prepared for the purpose. That is to say, departmental teaching being the custom in the high school, hygiene should be treated as a branch of study like mathematics, or language and history, which subjects are in the hands of one teacher for several successive grades of the school.

So far few difficulties have been overcome. Hygiene in these schools figures mostly in connection with natural history (as in Norway, according to a law dated July 27, 1896). The effort to introduce hygiene as a separate study into secondary schools has been made in only a few isolated cases. In Hungary, since 1885, physicians, after having passed a special examination, teach hygiene in the two highest grades of classical and modern high schools. Attendance at these lessons is, however, optional; no action has ever been taken toward making the study obligatory in high schools.

As far as I know, hygiene is a compulsory study for secondary schools only in French lycées and colleges. Of late years the dangers of alcohol are treated under this head also. Even if the introduction of hygiene as a separate, compulsory study in the institutions mentioned is not to be expected, the possible substitutes need not therefore be neglected, nor should they be.

It would be a good thing if a governmental commission, a State legislature or a society were to offer a prize for the most influential book (not a mere extract from a handbook on hygiene) to be used by students between 15 and 18 years of age. If school and public libraries were furnished with several copies of such a volume pupils would probably often call for it and might be induced to read portions aloud in school and at home.

This suggestion is practicable and seems useful. A society would not be risking its money in the investment. If the prize manuscript came into its possession the subsequent sale of books would defray expenses, as the work would be recommended for schools and form a part of private libraries. And the author would lose nothing, since in the present condition of the literary market he could scarcely calculate upon a greater return than the sum offered as a prize. I dwell upon this point more particularly as I do not know of any such attempt in any language.

School principals could impart information on different subjects of personal hygiene to families by means of official communications. In the improvement of the pupils' mode of life, parents, teachers, and pupils should join hands. One of the means to this end is the distribution of printed blanks for insertion of such items as time spent in doing home work for school, amount of sleep, exercise, etc.

The introduction of this method into the Copenhagen high school by Professor Hertel led to the extensive later work of the Swedish commission (Axel Key), also to the improvement of Swedish secondary girls' schools (Goldkuhl), and the valuable investigations on the part of the Danish and Norwegian commissions.

Related to the same progressive measures are the improvements of the Russian institutions founded by *Empress Maria*, the local investigations of *Kotelmann* in Hamburg, *Strochmberg* in Dorpat, *Amalie Hansen* in Bergen, *Combe* in Lausanne, and those in Tiflis, the regular inquiries in the *Theresianum* at Vienna, the statistics of *Januschke* in Teschen, the labors of *Schmid-Monnard* in Halle, and other gratifying efforts.

In secondary institutions suitable tables may be displayed as a means of instruction. In all the class rooms of the "Johanneum" (a classical high school) in Hamburg the directions of Kotelmann for the care of the eyes have been used, as they have also been inserted in Austrian school readers with appropriate modifications. Instruction on sexual hygiene and its attendant dangers, optional and with the consent of parents, would also effect much good and might be given at the close of the last year's attendance.

The most important point for consideration in regard to secondary schools, however, is the preparation of teachers. All candidates for positions in high schools should

be required to attend a course of lectures on school hygiene for one semester and pass an examination at the close of the course. Those who intend to teach natural history, chemistry, or physics should be obliged to attend a one year's course of lectures on general, personal, and social hygiene, and likewise pass an examination on the subject. The latter course may be optional for other candidates. The lectures should be repeated once every three years in the high school by a teacher of hygiene.

In this way, school hygiene, on the one hand, would in the course of time be managed altogether differently from what it is now. On the other hand, teachers of different sciences would be enabled to discuss hygienic questions correlatively, and the more readily if text-books furnished the basis of the discussion. Hygienic subjects can be easily introduced into school books on science, as the authors are nearly always teachers of the different sciences. Any success worth mentioning, however, will be attained only by obligatory lectures or lessons, combined with compulsory examinations.

In point of fact, some steps have already been taken in this direction. Since 1878 lectures on hygiene have been delivered at the École normale supérieure des humanités in Liége, Belgium (Professor *Kuborn*). In Japan, since April, 1895, general hygiene and school hygiene have been taught two hours a week during the fourth school year (highest grade) of the superior normal schools, from the graduates of which alone teachers for high schools and lower normal schools are chosen (Professor *Mishima*). In Germany a similar course of lectures for candidates for high schools has been held at the universities of Giessen, Leipzig, and Greifswald. In Jena, since 1889, Professor *Gaertner* has conducted a course of lectures for teachers and candidates as well as for theologians; however, as it is not a compulsory course, the lectures are poorly attended. The University of Berne stands alone in having a special professor of school hygiene (Prof. Ch. Girard).

It is of paramount importance that teachers of secondary boarding schools for girls should know, besides school hygiene, something of general hygiene as applied to the bringing up of little children.

II. Means for the Spread of Hygienic Knowledge Among Adults.

1. University extension.

Information spread by means of so-called "people's universities" (university extension as it is called in America) is of incalculable importance to great cities as well as to the promotion of hygienic knowledge among the masses.

The efforts made by Austria are a good example of the development of university extension on the European continent. The "*Popular Education Society*" of Vienna instituted a course of lectures for 1890–91 to include 35 lectures on hygiene by A. Heider, and thus aroused interest in the subject. The first university course for the public was delivered in 1895. Up to 1897 there had been 118 lectures given, of which 30 were on medical and hygienic subjects.

The cities and more thickly populated rural districts of Sweden are covered with a network of scientific lectures, the most popular of which are those on hygiene by professors and physicians.

Among the subordinate agencies, though not of lesser merit, belong the voluntary lectures for university students of all the four faculties, delivered by university teachers for the spread of hygienic knowledge in general and the suppression of alcoholism and the elevation of morals in particular.

Such, for instance, are the lectures of Prof. *D. Wolffhügel*, of Göttingen, and Prof. *B. Fischer*, of Kiel, on selected topics of hygiene for students of all branches, and those of Prof. *Th. Ziehen* in Jena, Profs. *O. Bollinger*, *H. Buchner*, *M. Haushofer*, and *F. Moritz*, of Munich, on temperance.

In countries which have compulsory military service, and where the majority know

how to read, small tracts could be given to everyone on entering the army. This system would reach most young men and increase military strength, but it is open to criticism. As is the case with lectures of this kind, success depends very much upon the tone and style of the composition. Where the population is illiterate army physicians may lecture upon appropriate topics. Oral instruction well adapted is doubtless more convincing than printed information. In this case, however, the nonenlisted are deprived of the instruction which as a rule is most essential to them.

2. ASSOCIATIONS, POPULAR LECTURES, READING ROOMS, AND BOOKS.

Educational associations, with a general or a special object, as hygienic societies and temperance unions, play a great part in the spread of hygienic principles. Such associations are found in almost every civilized country.

Perhaps the oldest and greatest example of a union for special hygienic purposes is the *"Ladies' Sanitary Association"* in London, founded in 1857. Independent of other publications, it distributed up to 1897 in the neighborhood of two million copies of about one hundred different booklets and pamphlets which contain much knowledge relative to children, infancy, and childhood. The *"Austrian Association for the Promotion of Health"* is another splendid example of a society constituted for special hygienic purposes. Besides exerting an influence in other ways, it published appropriate works for general circulation. Another model association of this kind on the Continent is the *General Public Education Society of Lower Austria*, numbering fifty-one branch associations (one of these, the *Public Education Society of Vienna*, has become independent), which has founded over one hundred public libraries (some in hospitals and barracks) and issued nearly three million publications, besides publishing books, supporting schools for cooking and housekeeping, etc. Many of the nearly two thousand lectures on hygiene delivered in Vienna under its auspices have been published; to two hundred and fifty of these lectures the public were admitted.

The popular presentations intended for sale would be more widely circulated if a large number were distributed by charity, free of cost, or if an interesting lecture could be bought at once after delivery, or if the work were placed on the market during a time of intense interest in its subject, as, for instance, pamphlets on Samaritan help after a great accident or on infectious and contagious diseases at a time of their prevalence.

3. INFLUENCE OF THE CLERGY.

The instruction in hygiene of those who are preparing to become priests, through the insertion of that subject into the curriculum of theological seminaries, is of great importance for the dissemination of hygienic knowledge. The clergy, as confidential advisers on important questions, come in closest contact with the people; if well informed, they can exert a powerful influence on adults as well as on children. Priests can also bring their influence to bear on communities as well as on private individuals, since hygienic ameliorations of any kind tend to benefit all. In an ignorant or illiterate community the importance of priestly instruction is still greater, and the ritualistic regulations of ancient nations plainly show how much their influence was appreciated in olden times. Hygiene has been introduced as a study into several theological seminaries in Austria, i. e., in Budweis, Czernowitz, Klagenfurth, and Zara.

4. INSTRUCTION BY ITINERANT TEACHERS.

Popular lectures on hygienic topics are not of rare occurrence in large cities, and are undoubtedly productive of good results, but, like hygienic expositions, they only affect large cities, where the expositions suffer from the disadvantage of the ignorance of visitors who do not even know what benefit they may derive from seeing the objects displayed.

If young, well-informed physicians, equipped with material for demonstrations,

were annually to visit rural districts at a time when the inhabitants have little or no field work to do, for the purpose of lecturing on topics concerning the health (to children in the village school, too), they would undoubtedly find grateful audiences and effect much good. They could at once adapt their text to existing conditions in different communities, and discuss the good and the evil local hygienic conditions in their lectures.

Among ignorant people, a combination of the systems of itinerant teachers and portable exhibits, about to be discussed, would be effective. In states where military service is not compulsory, lectures on sexual hygiene should be held for men.

We shall mention, for illustration, what has been done for hygienic instruction in English schools by itinerant teachers. All the teachers sent out by the *Band of Hope Union* are permitted to speak in every grade of schools on hygiene, and especially on the dangers of alcohol. In the year 1896–97, 4,391 lectures were attended by 14,889 teachers and 439,464 children, of whom 208,066 wrote a review of what they had heard. The *Church of England Temperance Society* does similar work, while the *National Temperance League* applies its efforts to teachers solely.

5. INSTRUCTION BY MEANS OF PORTABLE EXHIBITS.

Portable exhibits, together with printed explanatory charts, as a means for spreading hygienic knowledge, may include the following items: Models of a healthy and an unhealthy dwelling with respect to local customs, building materials, and character of soil, location of walls to avoid dampness, flues, situation of outhouses, protection against fire, and the outlet drains into wells; models of a well, a dung-pit, and the drainage of marshes; demonstration of disease microbes; models of a well-constructed schoolhouse, and of a charitable institution.

The state may have the models manufactured, the provincial authorities buy the requisite number, as well as the necessary printed matter, and require communities in regular order to prepare a place of exhibit, to repack the objects in suitable cases and transport them to the place where the next exhibition is to be held. The mayor and other town officers, presupposedly men of intelligence, receive copies of the explanations gratis; copies are on sale during the exhibition In illiterate districts this system may be combined with that of itinerant teachers.

Occasionally a representative of rural districts might be delegated to visit hygienic exhibitions in large cities, in order to promote the distribution of explanatory illustrations. The delegate, a school-teacher, for instance, would incur the responsibility of reporting to his townspeople what he had seen. The most important objects of such exhibits should be explained in printed articles, to be sold at the very lowest figure.

III. MEANS FOR SPREADING HYGIENIC KNOWLEDGE AMONG PROFESSIONS—SPECIAL SCHOOLS.

1. INDUSTRIAL SCHOOLS AND TECHNICAL PURSUITS.

Hygienic instruction in industrial schools, mining academies, business colleges, etc., should be adapted to the character of the institution, and embrace hygiene as applied to factory life. It should include position at work, first aid in accidents, examination of articles of food, and particularly their deleterious adulterations.

It is advisable that the lectures in industrial schools on factory hygiene and first aid for laborers and foremen, and especially those in connection with pursuits exposed to loss of health and danger of accidents, should be free, and therefore held at convenient hours. Optional examinations, rewarded by prizes and certificates, would effect much good. It would be in the interest of employers to engage their emergency physicians to deliver lectures for their employees.

In regard to technical pursuits, placards of the laws made for the protection of workmen, as well as special individual instructions, should be posted at intervals throughout the factory. Finally, brief, popular articles on these pursuits should be

published. Mr. von Waltenhofen has written such an article for those engaged in electric works.

The following arrangements on the points in question are in existence in Austria. Lectures on first aid in accidents are delivered in Pilsen by Prof. *H. Hahn* at the mechanical engineering department of the polytechnic school, and during a four years' course of the State industrial school. In the mining academy at Loeben such lectures are given by Prof. *V. von Ortner*, and at a similar academy in Pribram by Prof. *J. Roscoe*. Prof. *S. Wotitzky* lectures on hygiene at the German agricultural academy in Budweis.

For years Profs. *A. Vogl* and *J. Nevinny* have lectured on the investigation of articles of food for the benefit of candidates for the position of market master. Prof. *J. Csokor* has given lessons in microscopic examination of meat. To be qualified architects, builders, inspectors of buildings and wells, it is necessary to pass an oral examination in hygiene as applied to buildings. Since 1851 the emergency physicians of railroads have given regular theoretical and practical instruction to conductors on first aid in cases of accidents. Examination and an annual review are required. In Austria a law is in operation requiring parish physicians to give instruction in first aid in cases of sudden illness and accidents. Throughout Austria we find volunteer fire companies, the members of which have been thus instructed.

2. LECTURES FOR MALE AND FEMALE NURSES.

These lectures should be attended by those educated at professional schools for nursing, since they can do much for the spread of hygienic knowledge on account of the students' contact with the sick.

Several States have made provision for this. In Austria occasional lectures on the care of the sick have been delivered in hospitals in all parts of the country. In some places regular courses of lectures have been established. These might be connected with introductory or suggestive lessons or summaries touching upon essential information for women or girls of all classes who do not intend to follow the profession of nursing, but who desire instruction for home nursing. As the experience of physicians attests the prevalence of great ignorance in this regard, much useful knowledge might be given out.

3. TECHNOLOGICAL UNIVERSITIES.

Hygiene is an important study in polytechnical schools, as the understanding of pertinent questions by architects and engineers places them in the position of imparting useful knowledge while following their practical pursuits. It is unnecessary to enter into detail respecting the broad fields of work that lie open to the practical technologist in that direction.

Hygienic studies are making encouraging progress in these institutions. In numerous polytechnica of Austria and Germany lectures on a long series of topics related to hygiene are delivered by professors of those schools, as *E. Lewy* in Vienna, *K. Linner* in Graz, *A. Vavra* in Prague, *O. Hammer* in Brünn, *A. Lieven* and *H. Storp* in Aachen, *K. Hartmann, Post*, and *Th. Weyl* in Berlin, *H. Beckurts* and *R. Blasius* in Brunswick, *Kraus* in Darmstadt, *F. Renk* in Dresden, *Ch. Nussbaum* in Hanover, *Baumeister, Klein, Migula*, and *Riffel* in Karlsruhe, *H. Buchner* in Munich, *H. Jäger* and *Zeman* in Stuttgart.

4. ADMINISTRATIVE OFFICERS, PHYSICIANS.

In view of the many and varied parts which administrative officers play in European States, their knowledge of general hygienic facts (if acquired by academic lectures illustrated by examples) can bring about great results not only for the cause of hygiene as a science, but for the practical preservation of the health of the public. This point has important economical bearings, for familiarizing the people with hygienic views is an important agent of national wealth; national health is national wealth.

For the application of the afore-mentioned means a greater number of physicians versed in social and personal hygiene is required.

As far as my knowledge goes, lectures attended by administrative officers not instructed in medicine, as State counselors, district attorneys, mayors, and inspectors of factories, are held only in Berlin. At some universities, on the other hand, illustrated lectures are held for medical officers and are attended chiefly by them. Such are those delivered by Prof. *M. Rubner* in Berlin, *C. Fraenkel* in Halle, *B. Fischer* in Kiel, *Erwin von Esmarch* in Königsberg, and *E. Wernicke* in Marburg. But the announcement of such lectures has not brought together an audience at all the universities. In Austria special courses have been occasionally held for official physicians (experts of health offices), as during the cholera epidemic. The attendance was large; the subjects were confined to the reduction of preparations and evidences of disease germs from ejections of cholera patients. Thus, for instance, in Graz, by Prof. *R. Klemensiewicz.*

The necessity of spreading hygienic knowledge among the people has long ceased to be a subject of discussion. To gain the end a considerable number of physicians is necessary. It is evident that they can not apply themselves to this branch of their profession unless they see their way clear for obtaining a livelihood.

Much has been done privately for the spread of hygienic knowledge among civilized nations; the results in some cases make a respectable showing. The influence of the Government, however, can in no case be dispensed with or replaced. If hygienic instruction is to produce fruit among the people the Government must decide upon a regular course of action and gradually carry well-defined plans into effect. To do this money is required; hence the insertion of Thesis V at the close of this article. Whoever has interested himself the least in the subject will grant that the allowances appropriated to hygienic instruction of the people are well expended. Ten years ago I spoke of our times as the age of traffic; perhaps, for all modern countries, the coming century will be one of general learning, and such learning as is necessary for the people.

In order to give the discussion a better start, I have taken the liberty of proposing Thesis VI. May the present opportunity be used to stimulate the progress of hygienic knowledge in many localities, as well as to pave the way for a permanent exchange of experiences and improvements in this direction. The latter is easily brought about and may prove a gratifying undertaking. To pave the way for the execution of these designs through consultation and choice of members from the various States represented in this international medical congress is a function of the provisory committee. Each committee member should then strive to organize in his own country a special committee, composed of interested, influential, well-informed men. Experience has taught us that it is worth the while to establish such international commissions for the promotion of culture at home.

Theses.

Submitted to the international medical congress at Moscow.

The following measures may be mentioned as means for spreading hygienic knowledge among the people:

I. *Instruction of parents on the hygiene of children,* from earliest infancy. This is best effected by the systematic distribution of brief, easily understood tracts by competent district officials on suitable occasions.

II. *Instruction of children in school,* elementary, secondary, and normal, but preeminently in elementary schools, the teachers of which have been prepared in normal schools, and the instruction in secondary schools, high schools, academies, and lyceums by teachers properly prepared at universities.

III. *Instruction of adults* by means of university extension, the clergy, itinerant teachers and portable exhibits; encouragement of societies, popular lectures, reading rooms, and books on hygiene of an educational tendency; also instruction in technical schools, industrial and agricultural schools, business colleges, etc.

IV. *The establishment of chairs of hygiene* and hygienic institutes for all departments of medicine in behalf of the preparation of physicians, who must take a more active part than heretofore in the dissemination of hygienic knowledge among the people.

V. *An annual appropriation* by the legislature of every State for so important and productive a measure as the hygienic information of the people is sure to prove.

VI. *Election of a provisory international committee* by the twelfth international medical congress in Moscow. This committee should meet during the session of the congress, elect a presiding officer, and make the initial preparation for future action. This committee would, by constant exchange of experiences, promote the science of hygiene, and aid materially in spreading valuable information among the people.

CHAPTER VIII.

REPORT ON THE EUROPEAN TEXTILE SCHOOLS.

By C. P. Brooks,
Director of the Textile School, Lowell, Mass.

The manufacturers of the leading European nations, and notably the German manufacturing communities, have for several years seen in the trade school a very valuable auxiliary if not a supreme necessity to their business. The textile manufacturers especially have seen that the system of training their workmen in the mill was inefficient and unsatisfactory, that the textile mill was an institution for the purpose of producing goods and not for training captains of industry, and consequently they have been the means of establishing textile schools in many European centers.

The young man who is trained in the mill assimilates the rule of thumb principles of his predecessors; even if he can overcome the prejudice of superintendents and overseers against training some one to succeed to their positions, he has not an opportunity of obtaining instruction in the latest applications of science to manufacturing, and thus systematic textile instruction is now considered necessary to provide brainy men to take charge of textile mills, to develop textile manufacturing to its highest degree of perfection, to improve the manufacture and encourage the production of those goods on which there is the greatest margin of profit in consequence of the great skill necessary for their manufacture, and to apply systematic methods, skill, and precision, to the textile industrial arts.

The most perfect system of training textile manufacturers, agents, superintendents, overseers of rooms, and so on, is undoubtedly a judicious combination of practical work in the mills and theoretical textile education by some convenient method available to all mill workers, so arranged that theory and practice can go hand in hand.

There are now textile educational institutions in England, France, Germany, Belgium, Italy, Switzerland, and Russia. Outside of the United States and Europe there are very few schools, one being located at Tokio, Japan, and another at Bombay in India. In this report, the expressson "Textile School" is used to denote an educational institution where instruction is given either in the day or evening in the spinning, weaving, dyeing, bleaching, and printing of textiles or textile fibres. Many large schools in Europe are almost wholly devoted to textile interests, and every year sees new schools opened or old ones enlarged.

The number of European schools in the first rank—that is, those giving courses of day instruction, and in such a manner as to qualify young men to become manufacturers—probably does not exceed 30. Those schools in which instruction is given in the evening classes for the benefit of artisans, or in which Sunday courses or intermittent lecture courses are given, probably number 100.

The mere teaching of spinning and weaving in some form or other must have been in existence for thousands of years, as is proved by Hindoo and Egyptian records. History gives many instances about the sixteenth and seventeenth centuries of spinners and weavers having been brought from one country to another to teach their arts.

The textile school movement first took definite shape in Germany, and textile schools are there found in the highest state of perfection, especially in Prussia. The Prussian textile schools are under the direct control of the government and are all managed on similar lines. In the course of this report several valuable tables of statistics of Prussian schools are given.

The school of Mülheim-on-the-Rhine is the oldest of existing schools, and its work was commenced in 1849. This school is doing good work now, although during the last twenty years many better equipped schools have been established. So excellent a reputation did this school enjoy up to twenty years ago that a deputation of Yorkshire (England) manufacturers, who visited the continent in 1876 to report on the state of textile education in Europe, styled it one of the most complete on the continent.

There have been erected during the last twenty years several better equipped schools which have now taken precedence of it. England has perhaps most examples of very modern schools, as the movement in that country has only been popularized during the last few years—that is, since about 1885—and there are now in England one hundred institutions of greater or less importance where textiles are systematically taught.

Textile schools are of various origin. On the continent of Europe many have originated through the guilds and weavers' societies, to which we have no parallel in this country. They were associations of weavers for mutual benefit established for the education of the younger members of the guilds and for their mutual production and advancement.

A large weaving school in Berlin originated in the first instance with the United Guild of Weavers of Berlin, and a notable example of a guild governing and managing a textile school is to be found in the textile department of the Yorkshire College, in Leeds, England, which has been equipped and supported throughout its history by the Cloth Workers' Company of London.

Sometimes a school springs from an association of workmen bent on their own higher education, as is to be found in Oldham, England, in what is known as the Oldham Mutual Technical School, which has developed in this manner.

The desire of the manufacturers of a town or city to improve the status of their assistants, to educate overseers and managers, has been another cause of the establishment of textile schools. An example of this is found in Mülhausen, in Alsace, where a school was established by local managers who controlled it, agreeing to make good any loss caused through its operation.

The schools of Crefeld and Roubaix originated in this manner. Many of the older English schools can show instances of large donations and subscriptions from manufacturers and private individuals, which have been almost sufficient to establish and equip the school. These subscriptions have ranged from $500,000 to $20,000 each.

Occasionally, it has been found that the owner or owners of very large works have built a school especially for the benefit of their employees. There are several examples of this, a notable one being that of Messrs. Howard & Bullough, of Accrington, England.

Many modern textile schools have been established jointly by the local authorities and by the Government at the instigation of local manufacturing interests.

The most recently erected English textile schools have been established in this manner. In the latter cases the schools are governed by a local authority, such as the city, town, or village council, and are administered by funds derived from the Government, augmented by local taxes.

When the Technical School in Chemnitz was established in 1857, it was a joint undertaking by the Saxon government and the Chemnitz council. On the other hand, the Reutlingen School was commenced in 1855, entirely at the instigation of the minister of trade and commerce of Würtemburg.

There has been a tendency by many of the continental governments, during recent years, to take control of the technical schools, and some of the most recent ones

have been built and equipped at the expense of the governments. In many cases local funds have been diverted to technical-school purposes. For instance, the proceeds of the hall marking of gold and silver are applied to watch-making schools, the proceeds from the administration of a conditioning house are applied to textile schools, and the proceeds from expositions are applied also to textile schools.

In schools established in such a variety of ways there are naturally many different systems of control and management, schedules of instruction, award of diplomas, and of equipment found in the same country, but there is being evolved a system in almost all countries to invest control in a central authority, usually the Government, and to arrange for all management of schools to be by local authorities, subject to the approval of the Government and other inspectors.

Even since my first visit to European schools in 1891, and on the occasion of subsequent visits, I have seen considerable change tending in this direction, especially in Germany.

All Prussian spinning, weaving, dyeing, and finishing schools are placed under the direct charge of the minister of commerce in Berlin, and are not placed under the minister of education, showing the recognition by the German Government that these schools are a necessity to the commercial well-being of the country, and not merely an educational agency.

The officials of the Prussian schools are Government officials. The school is placed under the charge of a director, who is in cooperation with a committee of local manufacturers, bankers, and superior educational officers. The directors of the schools share in the privileges of all Government service, and after a certain number of years of service, are pensioned off at two-thirds their salaries.

The following tables give the attendance at the Prussian textile schools, the annual fees both in the day, evening, and Sunday schools, and the expense of maintaining the Prussian textile schools for one school year:

Attendance of Prussian textile schools, winter term, 1894–95.

Name.	Day students.	Evening and Sunday students.	Name.	Day students.	Evening and Sunday students.
Aachen	51	87	Finsterwalde	.....	4
Berlin	35	219	Forst	4	46
Cottbus	7	50	Novawetz	2	70
Crefeld	137	152	Rummelsburg	1	11
Mülheim	62	.....	Sommerfeld	4	17
Sorau	17	30	Spremberg	5	31
Einbeck	7	18			
Falkenburg	12	15	Total	344	750

Annual fees at the Prussian textile schools, 1895–96.

Name.	Day students.			Evening and Sunday students.
	Natives.	Other Germans.	Foreigners.	
Aachen	$62.50	$75.00	$200.00	$7.50
Berlin	53.75	75.00	150.00	.....
Cottbus	25.00	25.00	25.00	7.50
Crefeld:				
First year	45.00	67.50	150.00	}
Second year	67.50	100.00	225.00	} 12.00
Special course	75.00	112.50	300.00	}
Einbeck	25.00	25.00	25.00	2.50
Falkenburg	25.00	50.00	50.00	7.50
Forst	20.00	20.00	20.00	7.50
Mülheim	75.00	75.00	105.00	.....
Novawetz	.....	.....	.....	.50
Rummelsburg	10.00	10.00	10.00	3.75
Sommerfeld	10.00	10.00	10.00	3.75
Sorau	25.00	25.00	60.00	7.50
Spremberg	37.50	50.00	50.00	5.00

Annual expense of maintenance, Prussian and other textile schools, 1895–96.

Name.	Total cost.	Apportioned to State.	City and local contributions.
Aachen	$8,325	$5,200	$3,125
Berlin	10,720	5,360	5,360
Cottbus	1,675	1,367	308
Crefeld	12,740	9,555	3,185
Mülheim	2,080	1,040	1,040
Sorau	2,055	1,500	555
Einbeck	1,624	1,082	542
Falkenburg	3,354	2,480	874
Finsterwalde	437	292	145
Forst	1,625	1,167	458
Novawetz	2,375	2,375	----------
Rummelsburg	1,200	800	400
Sommerfeld	1,880	1,336	544
Spremberg	1,621	1,300	321
Reichenbach	4,150	3,650	500
Mulhausen	2,475	1,650	825

The textile schools of Belgium are under somewhat similar supervision, and in that country they are placed under the ministry of agriculture and public works. Schools are managed by local committees of administration and are inspected from Brussels.

In England, as has been previously stated, the schools are almost entirely controlled by local authorities who administer the funds appropriated for technical instruction by the British Government. This fund is intrusted to the county councils (which mean in many cases the city councils), but where the operations of the county councils include the local government of small towns and villages the fund is intrusted to each local authority.

Technical schools are almost entirely run in connection with the department of science and art; the schools are also inspected by the South Kensington science and art inspectors and receive grants from the science and art department in addition to the appropriation by the county council for technical instruction.

In order to thoroughly understand the position of technical instruction in England, we must glance somewhat over the past history of science, art, and technical instruction in that country.

There is probably no country in the world which offers so many facilities for popular instruction in the sciences, pure and applied, as physics, chemistry, mathematics, astronomy, and also instruction in art in all its branches, by means of conveniently situated and almost free evening schools.

These schools are established by the local authorities and are supported and controlled by the Government, through the council on education, almost entirely by means of payments on the results of the annual examination. The examinations in art in connection with the science and art department originated in 1853, were amended and developed in 1857, while the science examinations were announced in 1859, and the first general examinations held in 1861. In the year 1857, 12,502 students were instructed in the local schools of art, entirely independent from the children who received instruction in drawing in ordinary elementary schools. In the year 1895 the number receiving instruction in the schools of art and science was 136,768, exclusive of over 2,200,000 children receiving the same instruction in the ordinary elementary schools, making a total of 2,443,153 persons receiving art instruction in 1895, as against 909,206 in the year 1882 and 56,117 in the year 1857. In science, in the year 1861, there were 38 classes, with 1,330 pupils. In the year 1882 there were 1,403 science schools, with 4,881 classes and 68,581 students. In the year 1895 there were 2,673 schools, with 9,445 classes and 190,386 students.

These figures show that for the last thirty, almost forty, years there has been building up gradually, but steadily, a system of science and art instruction in England which can be and has been taken advantage of by the workingmen and working women, and which has grown to be so great an organization that in the year 1895

337,000 individuals attended the classes of their own free will, mostly in the evening and at nominal cost to themselves, as their instructors are paid by the Government grants on the results of the examinations, in addition to 2,300,000 children from elementary schools.

The system is not a perfect one, though admirable in many respects. The system of payment on results tends too much to cramming for examinations and to inducements being offered for a number of subjects to be studied superficially, instead of one or two thoroughly.

The whole of the technical instruction in England has been practically tagged on to this system of science and art schools.

To the institution known as the City and Guilds of London Institute, and especially to Sir (then Mr.) Philip Magnus, its secretary, now the superintendent of technological examinations, must be given a very large share of the credit for the introduction of a system of technical instruction in England. About 1879 the Society of Arts, which had done something for two years previous toward establishing a voluntary technological examination without making any payment on results, turned over the conduct of these examinations to the above-named institute, which was established by the wealthy London guilds or city livery companies for the purpose of providing and encouraging education adapted to the requirements of all classes of persons engaged, or preparing to engage, in manufacturing and other industries.

This association voluntarily made contributions in sums of various amounts toward the building of suitable local schools and grants in aid of the establishment of technical schools, but their principal work was in organizing a system of examinations conducted in local centers, but in accordance with fixed standards and by recognized authorities; in making payments on the results of these examinations to the teachers of the classes, and in preparing syllabuses for the guidance of teachers and of organizers of technical institutions. This system was not only applied to Great Britain, but examinations were and are concurrently held in India, Australia, and other British colonies.

For over ten years, from 1879 to 1890, this institution built up the technical instruction system of England, and deserves all the credit that it is possible to give for the excellent work done voluntarily by the London guilds.

During the intervals above named, owing to very strong pressure brought to bear on the Government by advanced teachers, who had become aware of the immense strides made on the Continent of Europe, and especially in Germany, in the advancement of technical education, and by wide-awake merchants who could foresee the disastrous results that were likely to accrue to British trade if something was not done to foster technical instruction in England, a royal commission was appointed in the year 1881 and published various reports during the succeeding years. The effect of these reports was to open the eyes of the British manufacturers to some extent to the great progress that was being made by their continental competitors in the better trade education of the workman, the overseer, the superintendent, and the employer himself, and the Queen's jubilee, in 1887, was celebrated in England in many cases by the addition of technical schools to the existing science and art schools. A few years later, the technical instruction act was passed, which was the first instance of the Government officially recognizing technical education. A year later a windfall occurred which placed technical education in England on a permanent basis.

In the session of 1890, Parliament levied additional duty on the manufacture of beer, to the extent of 6 pence per barrel, which was estimated to yield an income of $3,750,000 per annum, and they found the money was not applicable for the purpose for which it was originally intended and a fresh use had to be found for it. Friends of technical education were wide-awake to the opportunity; they took the matter up and in a very few days the whole sum was appropriated for the advancement of technical education.

The amount was appropriated to each county or county borough in the country, which in turn made subappropriations to individual towns, villages, and institutes, and thus indirectly the brewers of the United Kingdom support the technical schools, which is a very judicious arrangement.

The immediate results of the distribution of this sum of money, and the knowledge that a similar sum would be distributed annually, resulted in the establishment of technical schools or technical classes wherever needed. Scarcely a town of any importance but has an organized class or technical school for systematic education in the local industry, and even large villages have schools. While the results of the bill appropriating this annual sum have on the whole been satisfactory, still the forced development of these technical schools is far from having been the healthiest growth.

The forced establishment of some kind of technical instruction has resulted in much ill-advised expenditure, in educational development in wrong directions, owing to the lack of knowledge as to what technical education really meant, and in, perhaps, the greatest evil of all, the establishment of classes without an adequate supply of trained teachers. On the other hand, the money came very opportunely to the assistance of many educational institutions, especially in the larger cities, where persistent attempts had previously been made to establish technical schools under the auspices of the City and Guilds of London Institute, supported or assisted by local contributions.

The result of this legislation has been, on the whole, beneficial. There are great possibilities in store for the English technical school. The errors in organization and in noncentralization will be corrected in the natural course of events, the supply of teachers will be created by the demand for them, and the certainty of a fixed and permanent income will materially help the movement.

These technical schools have been, in most cases, added on to the existing science and art schools, in many cases under the same roof, or a new building has been erected for the accommodation of all three branches. Every facility is now offered at a nominal cost for giving at least a superficial knowledge of science and art and technical education, and in many places very thorough instruction in science, art, and technology in all its branches, so far as it affects the local industry or industries.

In the technology branch the subjects taught are very varied, including brewing, slate quarrying, leather tanning, hat manufacture, photography, dressmaking, lace manufacture, railroad-car building, gas manufacture, bookbinding, every branch of textile manufactures—in fact, in all about 66 distinct trades. In many cases three or four of these subjects are taught in the same school, and owing to science and art classes being held in the same building students have an opportunity of studying those sciences and branches of art that apply to their own trade.

Instruction is almost entirely in the evenings, only a small percentage of the schools having day departments. The fees for evening classes are in most cases nominal, and for the day classes, although higher, still insufficient to cover the cost of instruction. Since the appropriation was made for technical education by the Government the grants from the City and Guilds of London Institute have been discontinued, but this Institute is still recognized as the controlling power over technical education in Great Britain. Its position is entirely unofficial, but it is tacitly recognized by all of the technical institutions of the country as the leading examining body. Its appointment of an examiner is accepted by all the institutions, and students from all the schools accept the decision of the Institute, in the matter of certificates or diplomas, as final and decisive.

Regarding Switzerland, practically the only textile school is the very excellent one at Zurich for instruction in silk weaving. In this case the school is governed by the local manufacturers, at whose instigation it was started. The town of Zurich provides the building, light, and power, and remits taxes. There is also a Government appropriation made for the school. In other places the schools are also

equipped and managed by the local manufacturers, with the assistance of small appropriations made by the communes.

In European schools the students catered for in day courses are usually sons of manufacturers, who are sent to the textile schools by their parents, as they get better instruction in the schools than in a mill. In the mill all people engaged have duties to perform which keep them busy without making the mill into an educational institution, and there is often considerable objection on the part of the overseers and manufacturers to giving instruction except when compelled. Another advantage in sending a young man to a textile school is that in the larger ones there is usually a very much more varied collection of machinery than is to be found in any one mill. In the European evening schools the attendance is mostly from artisans who are engaged in the mill or machine shops during the day, and arrangements are made by which they can obtain a thorough technical education at a low cost. In continental Europe there is a class of schools which is not found in England or America, and that is the Sunday textile school. On Sunday morning it is customary to have courses of lectures, and even practical work, for the benefit of artisans who are otherwise engaged on a week day. Some of these schools are attended by very large crowds of students and are very popular.

The fees for European schools are given under the description of the schools on succeeding pages; they vary in the day courses from the highest, namely, $300 per annum at the Crefeld Dyeing and Finishing School, and $360 per annum for the spinning and weaving course at the Mülhausen school, down to nothing; as, for example, at the Roubaix school, where the tuition is free. There are special reasons at the two schools just named why these high fees can be charged, and these are referred to in the description of the schools on later pages. In almost every case it may be assumed that the cost of tuition is higher than the average fee charged at each school.

To afford comparison, the following table is given of some of the leading technical schools of the world, where the gross cost of the student to the institution is given, and also the net cost, the difference being approximately the average amount received from fees:

Name.	Number of students.	Gross cost per student.	Net cost per student.	Fees.
Central Technical College	210	$270	$155	$115
England:				
Cooper's Hill	100	600	.....	600
Royal College of Science	300	335	285	50
America:				
Massachusetts Institute	1,200	300	100	200
Cornell University	1,503	315	215	100
Johns Hopkins University	600	305	125	180
McGill University (applied science only)	175	300	140	160
Germany: (Report of Royal Commission, 1884)	2,000	.....	500	.....
Switzerland: Polytechnic, Zurich	720	295	250	45

The fees at some of the European textile schools are as follows. These are in addition to those given on page 271.

Name.	Local residents.	Other natives.	Foreigners.
Zurich, silk weaving ..... francs	200	200	600
Second year ..... do	300	300	800
Roubaix, France	Free.	Free.	Free.
Elbeuf, France ..... francs	60	240	360
Second year ..... do	80	320	480
Third year ..... do	200	400	600
Fourth year ..... do	200	400	600
Manchester, England ..... dollars	78	78	156
Yorkshire College, Leeds, England ..... do	140	140	140

In evening schools it is the custom to make the fees as low as possible, being a small percentage of the cost of instruction in such schools, as at Roubaix, Verviers, and other centers where there are no fees for the evening classes; but this is not a good practice, as the instruction to adults is not appreciated by them when free, as it is when a sum, however small, is paid.

It is generally accepted by most of the European governments that the lower the fees can be made, and therefore the less self-supporting the school, the greater advantage the institution is to the community and the better it is for the industrial interests of the district.

It is customary in German and Belgian schools, and the practice is now being adopted in England, to charge a higher fee for a foreigner than for a native. This is done for two reasons—one is that the foreigner should not obtain the benefit of instruction at much less than cost, which is really intended only for the native, and another is to place an obstruction in the way of foreigners becoming acquainted with the local industries. A notable example to the contrary, which deserves widespread recognition, is that of the Polytechnic in Zurich, where the fees paid only amount to 15 per cent of the cost of instruction, and yet this benefit is offered to students from all parts of the world. The consequence is that three-sevenths of the students of the Federal Polytechnic School in Zurich are foreigners, the little State of Switzerland being burdened with five-sixths of the cost of their education. Many of the European textile schools remit the fees to needy native students, and in some centers, such as Chemnitz, the school committee assists in paying some of the students' board.

There is a widespread practice in England by which scholarships are offered for the benefit of poor but deserving students. This serves two objects—first, to help the needy students, and, secondly, it is a means by which wealthy societies and state and county authorities are enabled to support institutions to which they have not the power to make direct appro riations, or where from any reason it is undesirable to grant direct aid.

In some districts it is customary for manufacturers to send workmen to the schools, paying their fees and a small wage while at school, the idea being to qualify them to take positions as overseers and managers. This is especially the case in Switzerland, Austria, Germany, and Italy. In Italy I have seen girls in one of the schools who had been sent by their employers from the neighboring mills to learn the weaving of new or intricate patterns.

The education given by textile schools is so valued by many of the continental manufacturers that, after sending their sons through a full course in a school in their own country, they are frequently sent to another country to take another course. This is especially true in England, where a large number of French, German, and Austrian students are received, and it is found that many of them have previously been through a full course of instruction.

Male students usually are only found in the European textile schools, but female students are encouraged to attend, and in a few of the schools there are excellent ladies' classes in design. There are also female classes for burling and mending in some of the Belgian and German schools.

The textile school has certainly come to stay in Europe. There is no manufacturing district and there are few manufacturing cities of importance that are now without a textile school, either in the city or at some convenient town, from which the school can be utilized by the young men of the district.

The staffs of the schools are held in high esteem and their advice is sought by manufacturers in cases of difficulty, while the government draws on the officials of the schools for expert work, especially in judging exhibits at large expositions. This year the head of the textile department at the Manchester School is one of the judges of fabrics at the Brussels Exhibition. At the Columbian Exposition at Chicago several foreign governments delegated the directors of textile schools to take

charge of and report on exhibits. The same thing was done at the Paris Exposition in 1889.

A feature which is being now introduced in many of the best textile schools is a textile museum. There is no doubt that the museum at Crefeld is stimulating other schools to follow its example.

The museum at Crefeld, in Germany, is one of the best in Europe; in fact, I have only seen one other which is approximately equal to it, and that is the Museo Archeologico, at Florence, in Italy.

In the Crefeld school are 8,000 pieces of fabrics. The collection is of extreme historic value, including fabrics thousands of years old, from the tombs of the Egyptians down to the fashionable designs of the present year. The collections of the fifteenth, sixteenth, and seventeenth centuries are especially complete, and there is also an oriental section with many fine examples. The curator of this museum has a fund at his disposal, and is allowed to purchase fabrics wherever he goes. Some of the specimens have cost as much as $50 each for a square foot of cloth.

The Cloth Workers' Company, of London, have just placed at the disposal of the Yorkshire College textile school the sum of $5,000 with which to commence a textile museum. The Bradford, England, technical school is also commencing the arrangements for a textile museum, and other of the larger foreign schools are also engaged on the same work.

I shall now deal with some representative schools of England, and with one each of other countries.

ENGLISH TEXTILE SCHOOLS.

The textile schools in England are almost always associated with science and art schools, and also are frequently in a school where other technical departments are conducted. It has frequently occurred that a mechanics' institution has developed into a science, art, and technical school, the technical department in all cases being an addition of a recent date.

The technical departments deal with instruction in the technology of the staple trades of each district, and thus the textile school may be, in many cases, of equal importance with a mechanical engineering department, an electrical engineering department, a woodworking department, plumbing department, and so on.

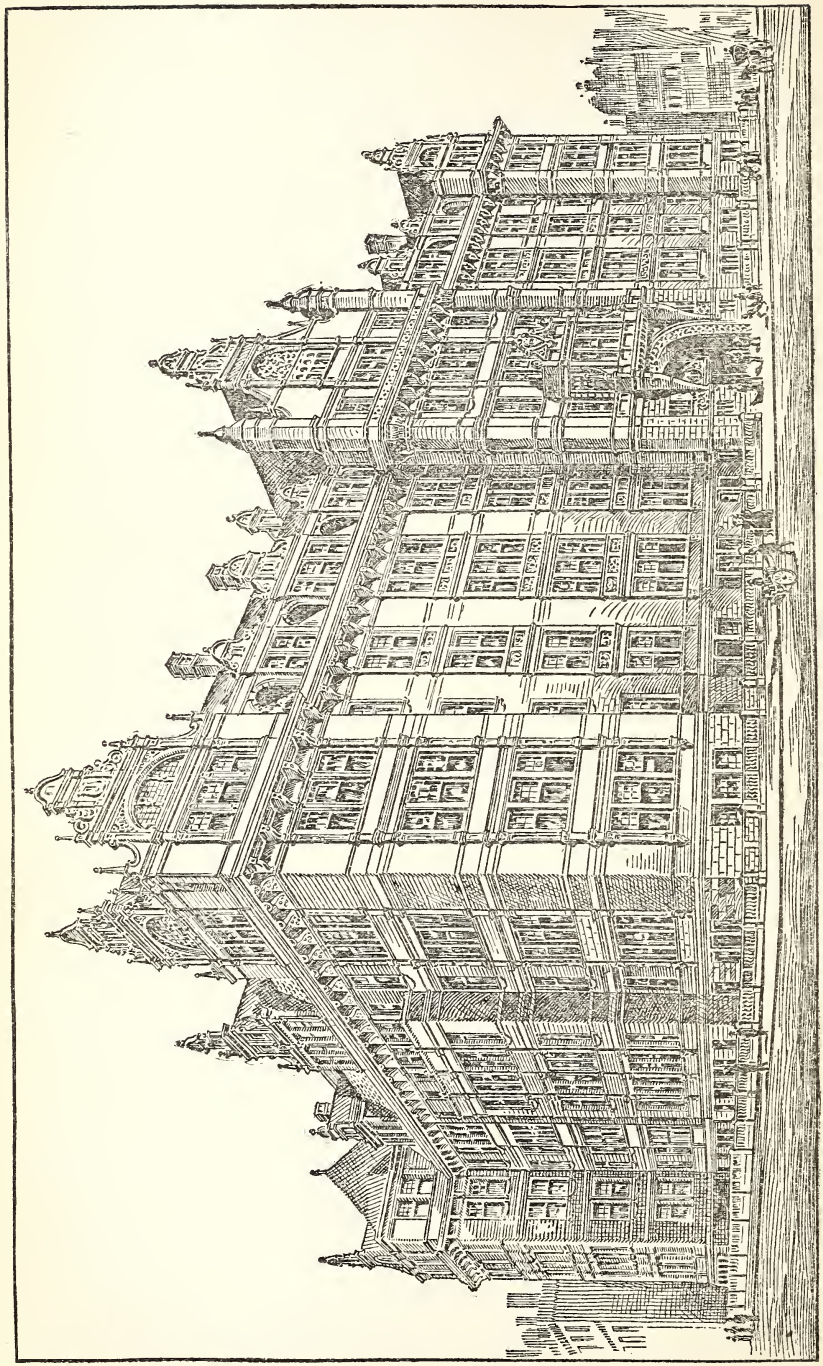
The Manchester Technical School forms a good example of this development. It is situated in what was formerly, and is still to a large extent, a great manufacturing city, although it is every year tending to become more of a distributing point for the manufacturers of Lancashire, rather than a manufacturing center. The production of at least half a million looms is handled in this city, so that it is an excellent center for a textile school.

The textile department of the Manchester school gives special prominence to the instruction in cotton spinning and weaving, the county of Lancashire being engaged largely in the manufacture of this fiber. Special efforts have also been made in the direction of teaching silk manufacture with a view to reviving what was formerly a large industry in the Manchester district.

The Manchester Municipal Technical School is a very large institution, or rather association of institutions, including the old Mechanics' Institute on Princess street, the Spinning and Weaving School on Peters street, the Electrical Engineering School on Whitworth street, the Painters' and Decorators' School on Nicholas street, with branch establishments at Newton Heath and Openshaw.

These schools were attended in 1895–96 by 3,434 individual students, while 554 students attended the Manchester School of Art, which is also in connection with the technical school.

The list of lecturers and other members of the staff is about 160 in number, and the director of the school is one of the best known educationists in Great Britain, Mr. J. H. Reynolds; the head master of the textile department is Mr. T. W. Fox;



THE NEW MUNICIPAL TECHNICAL SCHOOL, MANCHESTER, ENGLAND.

of the chemical technology department, Dr. E. Knecht, and of the art department, Mr. R. Glazier. All the previously named departments, with the exception of the school of art, will be assembled in a new building, which is now under course of erection, and which is shown on page 278, and a plan of the ground floor given on page 280. The estimated cost of the building alone is $650,000, and it is anticipated, with the cost of land and equipment, over $1,000,000 will be ultimately expended.

The building, which is from the design of Messrs. Spalding & Cross, architects, of London, is in the style of the French Renaissance of Francis I, freely treated, and will be a notable addition to Manchester architecture. It is being erected in Accrington brick and in terra cotta of an unusually pleasing tint and bold design. The main entrance, which is treated in gray Dalbeattie granite and terra cotta, flanked by designs characteristic of the union of science, art, and industry, by Mr. Walter Crane, is on Sackville street, and will be a specially fine feature of the main façade.

From the ground-floor plan, given on page 280, the general arrangement of the building on each floor can readily be seen. With the object of securing the effective lighting of all the rooms, it will be noted that the rooms are all placed in the four blocks which form the frontages of the building, and the corridors, which give ready and convenient access to each of them, are lighted from the large internal area which is divided by the large halls devoted to the museum, the great examination and assembly room, and the chemical laboratory.

The basement floor is devoted to workshops and laboratories for spinning, weaving, mechanical and electrical engineering, joinery, and plumbing. On the ground floor are placed the museum, the administrative offices, laboratories for physics, lecture rooms for spinning and weaving, joinery, and other textile workshops.

On the first floor will be found the scientific and technical library, the reading room, the lecture room for mathematics, physics, and engineering, workshops for letterpress and lithographic printing, book and stationery room, drawing room for building construction, and the large examination hall.

The second floor is devoted to rooms for machine construction and drawing and plumbing, to subjects pertaining to women's industries, to domestic economy, to advanced commercial teaching, and other subjects.

The third floor is entirely set apart for chemistry, in its application to the various chemical industries, while the fourth floor is given up to industrial art and to the gymnasium.

Provision is made for an astronomical and meteorological observatory at the extreme northeast corner of the building.

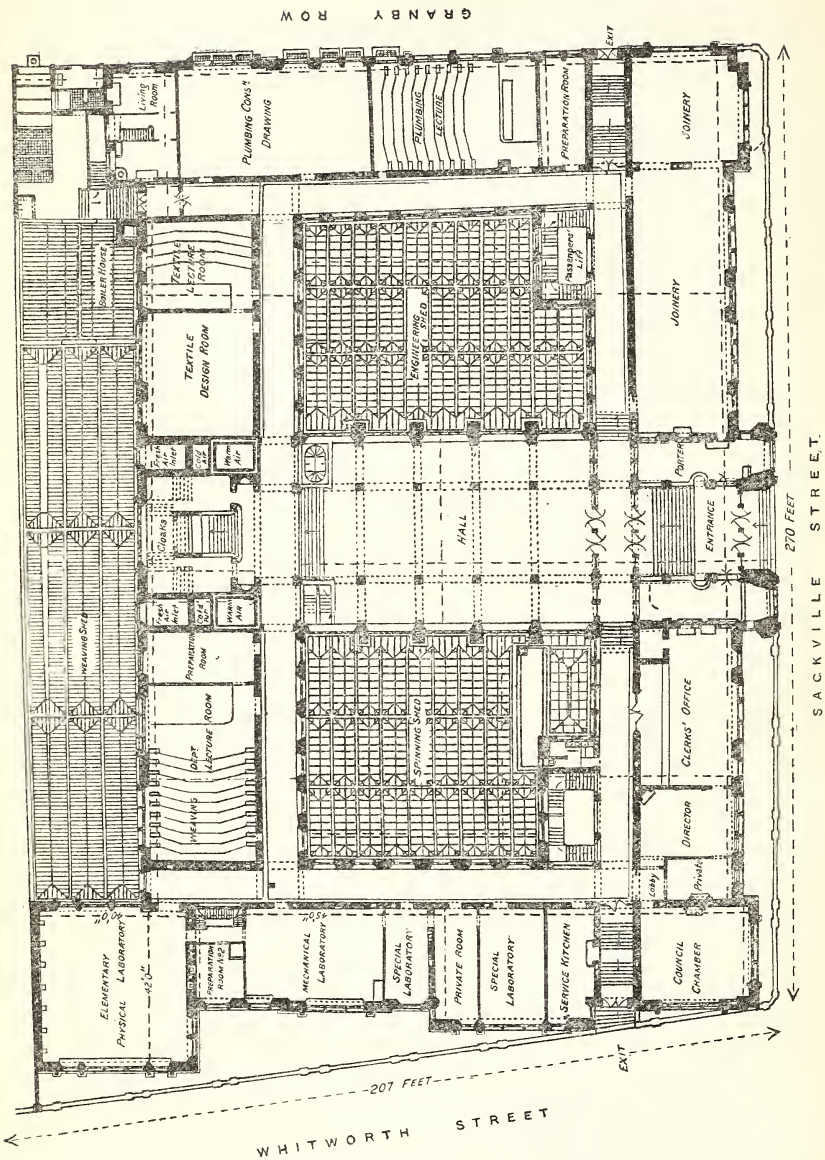
The lighting of the building will be by electricity, supplied from the city mains, from which source will also be derived the motive power for driving the various machines and appliances.

Special consideration has been given to the subject of ventilation and heating, which will be the Plenum system, and to the sanitary arrangements of the building. The fitting and equipment will be made in all respects complete and efficient for the purposes of technical training in the various industries of this great manufacturing district.

A textile department is at present conducted in the building on Peters street, Manchester, formerly used as a meeting house.

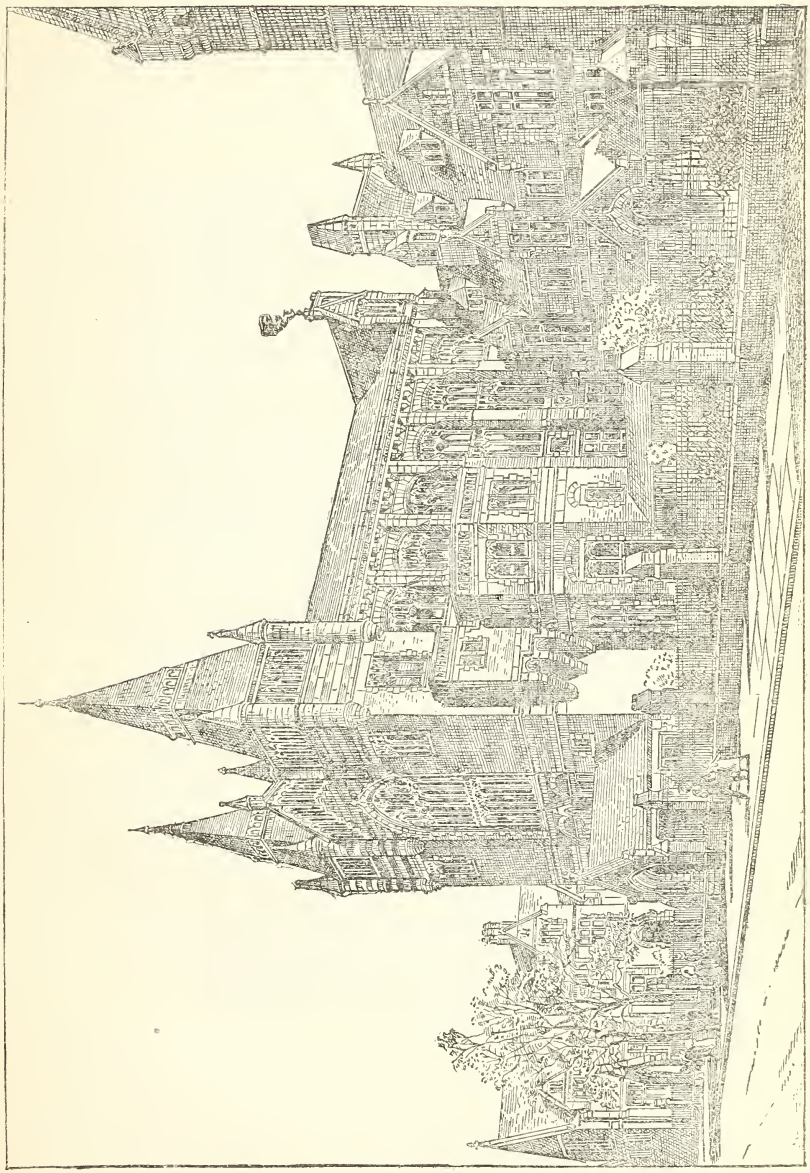
One room is devoted to cotton-spinning machinery, of which there is a large equipment of modern make, but not new. It comprises a cotton gin, picker, two cards, ribbon lap machine, comber, drawing frame, slubbing frame, intermediate frame, fine frame, mule, spinning frame, two twisters, and other machinery, mostly by Dobson & Barlow, of Bolton, England.

In the weaving department there is an excellent collection of 22 power looms, including representative looms from almost all English loom builders, with one or two of the American pattern. There are 16 power looms producing cotton fabrics, 4 producing silk fabrics, and 2 producing worsted fabrics. Six of the looms are



CITY OF MANCHESTER TECHNICAL SCHOOL—PLAN OF THE GROUND FLOOR (SPALDING & CROSS, ARCHITECTS, QUEEN STREET, E. C.).

Total area, 6,578 square yards.



YORKSHIRE COLLEGE, LEEDS, ENGLAND.

fitted with jacquards, 9 have dobbies, and 9 have drop or revolving boxes. There is also an equipment of spooling, warping, card punching and cutting, and silk-spooling machinery.

In addition to these power looms there are 28 hand looms constructed of iron. In addition to the spinning room and weave room, there is a lecture room, an excellent library, class rooms, power house, and so on.

The collection of modern charts, diagrams, and fabrics, is very considerable, and will form the nucleus of an excellent textile museum, the examples of the Bock collection, now in the possession of a Manchester city corporation, adding considerably to the value of the collection in the museum.

The school suffers considerably from lack of space, as the present buildings are too small for the operation of the school, but a magnificent building is being erected into which the textile department will be removed about the year 1900.

The course of instruction extends over two years, and includes the study, theoretical and practical, of spinning and weaving machinery, the study of fabric structure, cloth dissection, design, ornament, and coloring for fabrics, textile chemistry, engineering, and free-hand drawing for textile design.

The dyeing department is in the main building on Princess street, but is not at all well equipped for the purpose of a dyeing school, but will undoubtedly be put on a proper basis in the new technical school.

There is a separate course for dyeing, bleaching, and finishing, and these subjects are taken up in connection with a three-years' course of chemistry and technical technology, almost the whole of the three years being devoted to the technology of fabrics, coloring matters, and dyeing. In order to complete the courses of instruction in both spinning, weaving, dyeing, finishing, and subjects appertaining thereto, it would therefore be necessary for a student to spend five years in the Manchester school. As the different branches of the textile-manufacturing industry in England, such as spinning, weaving, dyeing, bleaching, and finishing, are generally conducted in separate establishments, instead of by one corporation, as frequently happens in this country, it is not considered necessary for the student to take the dyeing course in addition to the textile-manufacturing course.

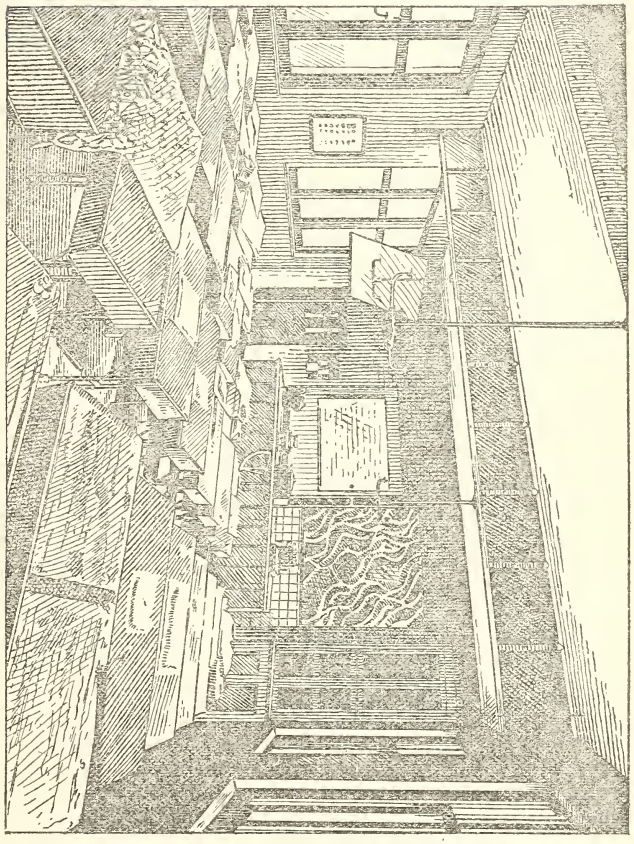
The tuition is $78 per year. Until this year foreign students have been received at the same fee as British students, and a large number of students in the textile department and dyeing department have been of foreign extraction, many of them having completed a course in a textile school in their own countries, and attend the Manchester school to get further experience. It has been decided by the textile instruction committee of the city of Manchester that after the session of 1896–97 all nonnaturalized foreign students seeking admission to the different departments of the school shall be charged twice the fees of British subjects. This is the first instance that has come under my notice of a British textile school making such a regulation, although it is an established custom with many of the German and French schools.

The land, building, and equipment of the spinning and weaving school is capitalized to the value of $82,435. This does not include the dyeing department, nor the art department.

The municipal School of Art is in Cavendish street, Manchester, and is one of the most successful schools of art in the country. It was attended in 1885–86 by 554 students. Very great attention is given to designing in its technical applications to historic ornament, and the application of art to textiles, special classes being conducted by the head master for the benefit of the students in the textile department. The number of students in the day school of the textile department is about 40. There are also well-attended evening classes.

The conditioning house of the Manchester Chamber of Commerce is operated in connection with the textile school.

The textile department of the Yorkshire College, of Leeds, England, bears the same relationship to the woolen manufacture as the school in Manchester does to cotton, or that in Bradford to worsted.



THE YORKSHIRE COLLEGE, LEEDS—TEXTILE INDUSTRIES LECTURE ROOM.

Leeds is a city of 390,000 inhabitants, and is the center of the manufacture of woolen fabrics for men's wear.

The Yorkshire College is one of the colleges of the Victoria University, and Principal Bodington is vice-chancellor of the university. The college originated in 1869, and is the largest institution of its kind in the county of Yorkshire; in it are departments for science, technology, and arts, and branches of mathematics, physics, chemistry, geology, biology, coal mining, civil and mechanical engineering, ancient and modern languages, textile industries, dyeing, carding, leather industries, agriculture; and others are taken.

The total number of day students in these departments in 1895–96 was 448, while there is also a largely equipped department of medicine, attended the same year by 207 students. There are 415 evening and occasional students, making a total of 1,110 students. About $900,000 has been expended on buildings, land, and equipment, and the college has about $250,000 invested and producing income. A very large proportion of the money expended on the college is the result of private donations. Twenty-five individuals or business firms have contributed sums from $5,000 to $40,000, and about 135 have contributed sums from $1,250 to $5,000. The annual income exceeds $100,000.

The textile, dyeing, and art departments were established by the Cloth Workers' Company of the city of London, and this company makes up all deficits in the working of these departments, subscribing from $10,000 to $15,000 per annum for this purpose. They had expended up to 1895 $162,500 on these departments. In 1895–96 the company made a further grant of $17,500 for the improvement of the art department, and have this year appropriated $50,000 for expenses in the textile department, and $25,000 for additional land for future extensions.

The textile department of the Yorkshire College is the pioneer textile school of Great Britain. Its work commenced with the appointment of the late Prof. John Beaumont in 1875. Prof. John Beaumont was the father of the present professor, and is said to have started with one loom in a small shed. Extensions were made in 1878, 1880, and in 1884, and very considerable extensions are now in contemplation for the purpose of establishing a carding and spinning establishment, and also a practical dyeing department as distinguished from the present experimental dyeing department.

The undertaking of the Cloth Workers' Company is managed by a local committee of manufacturers and others working in conjunction with nine of the cloth workers.

The textile department is under Prof. Roberts Beaumont; the dyeing department is under Prof. J. J. Hummel; and the head master of the art department is Mr. Frank Suddards.

The textile department occupies two large sheds; one of these is used entirely as as a power-loom weaving shed, and the other for warp preparation and weaving, with a small annex for cloth finishing. There is a boiler house, power plant, and textile lecture theater, of which a view is given on page 283, two hand loom rooms arranged as far as possible so that each individual student may have a loom; a common room for the use of the students is a chief feature, and there is a suite of offices for the use of the professor and his assistant. There is no carding or spinning machinery in the school, the instruction in these branches being theoretical. There are 24 power looms in the school, comprising representative machines from many English makers and from one or two American builders. In addition there are about 70 hand looms. The fabrics in the looms are mostly woolen and worsted, but include a few silk fabrics. The number of students in attendance at the day school is about 50, and there is a similar number in the evening classes.

The course of instruction in the school comprises the study of the construction of fabrics, designing fabrics, loom and hand-loom practice, cloth finishing, the application of art to textiles, including free-hand drawing and decorative design, French, German, mechanical drawing, and cloth finishing. These are arranged in three schemes of study, and the course of instruction occupies three years.

The fees vary according to the subjects taken, and for the full course amount to about $140 per annum.

The dyeing department of this school is one that has deservedly acquired an excellent reputation for the instruction given. There is on the ground floor a chemical lecture theater 32 feet 6 inches by 24 feet, with a preparation room adjoining. In addition to these there is a diagram and pattern room 32 by 22 feet, and on the same floor a chemical museum. On the first floor is a very fine experimental dyehouse, 54 by 33 feet and 30 feet high. In addition to the storeroom, the professor's private laboratory and private room, two additional rooms are set apart on the same floor for color mixing and printing, and have some machinery in, but are not now in use.

Day classes.—A junior and senior course of lectures are given. In the junior course the subjects treated are of textile fibers, bleaching and scouring, mordants, and natural coloring matters. In the senior course the lectures deal with the different artificial coloring matters.

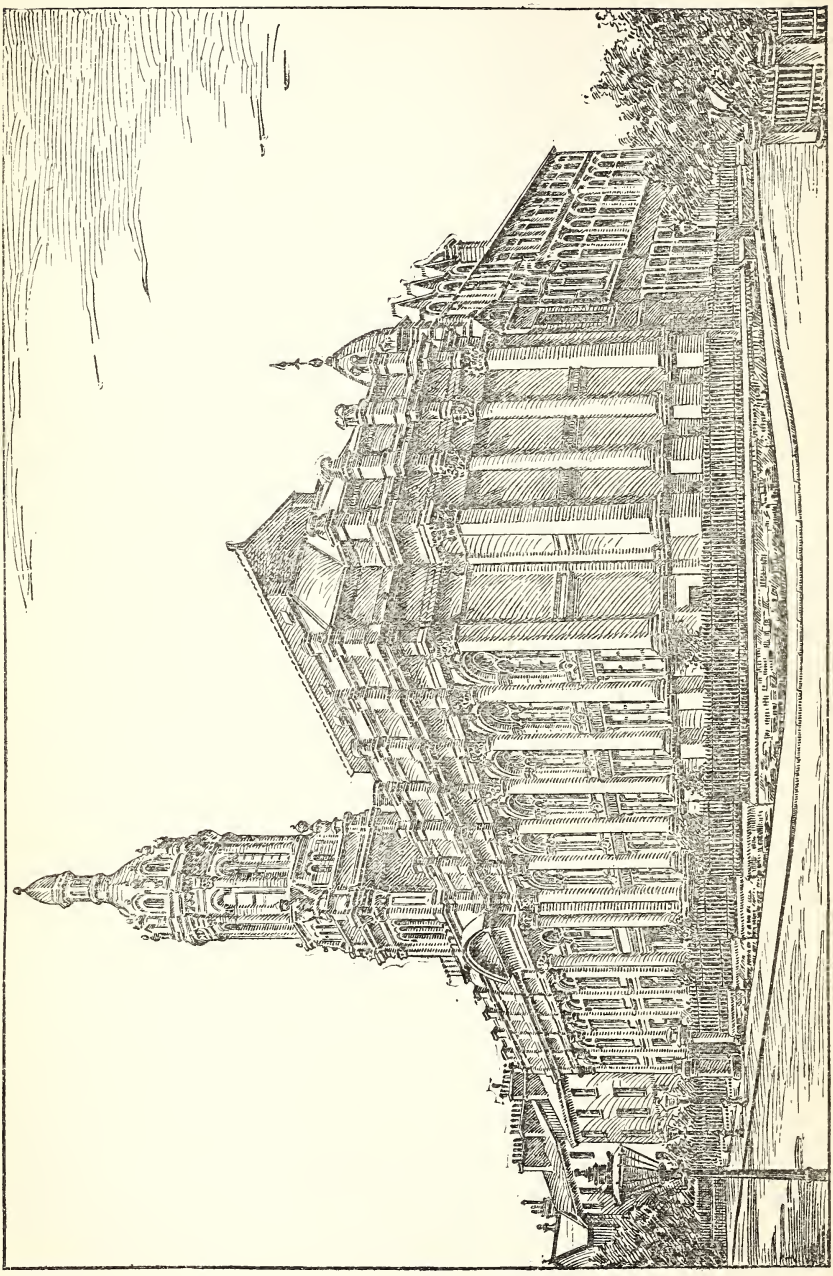
Practical work in the dyehouse.—The dyehouse is open for work daily, and students work at times convenient to themselves for periods varying from six hours to thirty-six hours per week. Each student works independently, having a working bench, apparatus, dye vessels, etc., under his own control. During the first year and part of the second year of study a definite course of work is adhered to. During the latter part of the second year, if time permits, a student can devote himself more particularly to the study of the special branch of dyeing which he intends eventually to pursue. The time spent in the first year in the experimental dyehouse is occupied in making dyeing trials on a small scale. The object is to determine, by means of accurate and systematic experiments, the dyeing properties of the various dyewoods employed in practice. The effect is studied of time, of temperature, and of the addition of various proportions of mordants or dyestuffs to the dye bath, etc., so as to arrive at the best method of applying each coloring matter to any given textile fiber. For these dyeing trials small pieces of woolen cashmere or calico are used; but, according to their proficiency, students are allowed from time to time, at the discretion of the professor, to dye larger quantities.

In the second year further experiments in dyeing are made. The subjects of study are the mode of applying the artificial coloring matter, the dyeing of compound shades, matching off, etc. Practice is also given in determining the commercial value of dye wares and in the detection of the nature of the coloring matter on dyed materials. Special instruction is given, when required, on the printing of woolen fabrics.

It is intended shortly to erect a new building as a practical dyeing department, in which work can be executed for local manufacturers. In the present experimental dyehouse there are several pieces of apparatus for experimental dyeing, which have been devised by Professor Hummel. In 1895–96 there were 34 students in the dyeing department. The fees in this department amount to about $150 per year. New buildings have recently been erected by the Cloth Workers' Company for the art department with special reference to the application of art to textiles, although in the third year's course general art forms a considerable portion of the instruction.

In the art department the course of instruction occupies three years and the fees are $16 per year. In 1895–96 there were 55 students. The authorities have recently decided to establish a textile museum, no doubt being stimulated to this by the splendid museum at the Crefeld school, in Germany. At the Yorkshire College $5,000 has been appropriated for the preliminary expenses of establishing a museum, and already a considerable number of specimens of textiles and of models of textile machinery, principally of French hand looms, have been obtained and are being placed in position.

The Yorkshire College textile department has been the favorite textile school for American students, but it is anticipated that with the textile schools now in operation in the United States the number of American students in European textile



BRADFORD, ENGLAND, TECHNICAL COLLEGE.

schools will be reduced. Views are shown of the exterior of the Yorkshire College and of the textile lecture room.

The Bradford Technical College is an institution which has been equipped by private enterprise by the citizens of Bradford. This town has a population of 230,000, and the leading industries are wool combing, worsted spinning and weaving. Ladies' dress goods in both worsted and mixed fabrics are very largely manufactured here. Bradford is an important market for Yorkshire manufactured products. The institution has been established fourteen years, and the cost was defrayed by a contribution of $17,500 by the Cloth Workers' Company of London, and by contributions from private individuals and business firms from $15,000 downward. The sum of $33,000 was raised by a fair for the benefit of the institution. The building is a handsome one, a view of which is shown on page 288. It is situated about half a mile from the city hall, and is of irregular shape, averaging 180 by 130 feet in length and breadth. The main front is a handsome stone elevation, with columns and other architectural adornments, and is flanked by a conically terminated tower. About one-third of the area of the building is occupied by a large one-story building, in which are the weaving sheds and engineering shops. The cost of the structure and equipment was upward of $175,000.

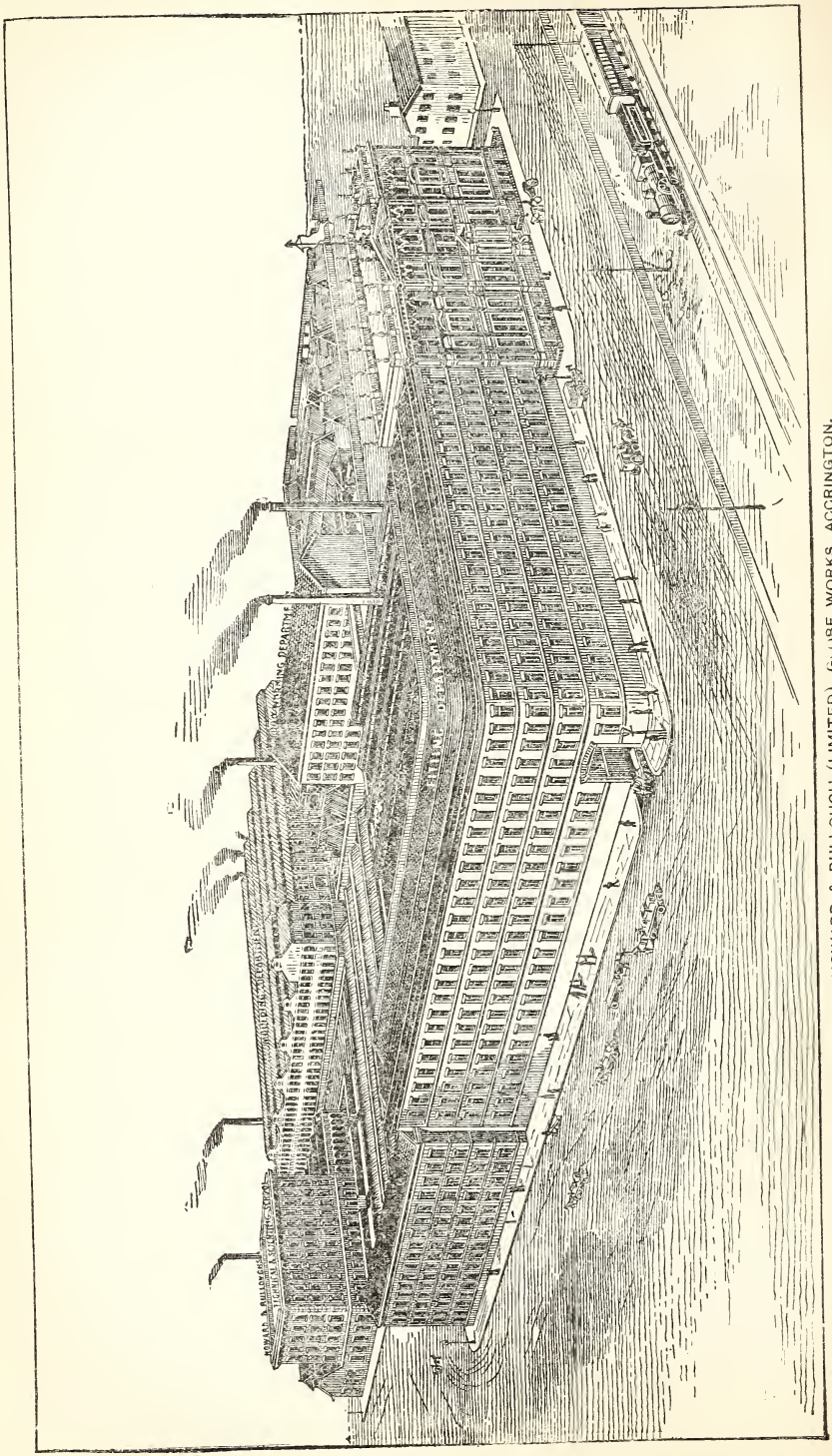
The Bradford College has not only an excellent textile branch, in which may be classed the art department and the chemistry and dyeing departments, but there is also an excellent mechanical engineering department and a department of plumbing.

The second branch of the school work is an important series of science classes, and there is also included in the operation of the school a male high school. In all these departments, with the exception of the high school, there are both day and evening classes, and the number of students registered for the year 1896–97 was 1,203.

The income of the school is derived from fees of the students, appropriations by the Bradford city council, and by the West Riding county council, augmented by private subscriptions.

The weaving department consists of several sheds, 1 power loom weave shed with 16 or 18 looms, both English and American types. There is an excellent collection of specially mounted Jacquard hand looms and a number of treadle and dobby hand looms. One section of the hand looms is set apart for experimental work of day students. The school has the usual equipment of card-cutting machinery, spooling, warping, and other machines. The course of instruction occupies three years, and includes mathematics, chemistry, machine drawing, cloth analysis, lectures on fabrics, figure designing, free-hand drawing, with the option of French, German, and dyeing, for those students requiring the same. The head master of the weaving department is Mr. A. F. Barker. There is no provision for the practical teaching of spinning in this school. The establishment of a carding and spinning department is under contemplation. There is a very successful evening textile school here. The full course which is recommended for the students occupies four years. There are over 100 students in the evening classes. Facilities are offered for instruction in special subjects, but in this school, like most of the other higher grade European schools, no diploma is given unless the student follows out the full course of instruction, passes with credit the examinations, and is able to show from pattern books and notebooks that he has carefully followed the lectures and other instruction throughout the three years' course. The dyeing department is under the charge of Mr. W. M. Gardner, and consists of a well-equipped experimental dyeing laboratory, chemical laboratory, chemical lecture room, and private laboratories. There are at present about 30 day students in the dyeing department and about 60 evening students. The department is somewhat cramped for room as is also the textile department, and a large extension at an early date is being contemplated to accommodate both departments.

Another important technical school is that at Bolton, England, which has developed from an institution in which formerly science and art subjects only were taught.



HOWARD & BULLOUGH (LIMITED), GLOBE WORKS, ACCRINGTON.

The Jubilee Technical School at Blackburn, England, is the development of the old science and art schools in that town. A class in cotton manufacturing was added, in 1884, to the existing science and art classes, with a primary attendance of 9 students. This developed into a department for cotton spinning and weaving, having, in 1888, 237 students, was devoted exclusively to evening students, and had very little machinery. The foundation stone of the present school was laid in 1887, the school being intended as a memorial of the 1887 jubilee, and it is a handsome structure, having an important weaving department. The spooling, warping, and weaving machinery is contained in a large shed, and comprises specimens of all the varieties of English cotton looms. There is a small day class in connection with this department, but the principal work of the school is in the evening classes. The headmaster of the textile department, Mr. Henry Neville, who is at present in China, is one of the three members of the British Commercial Mission, appointed to inquire into and report on the best means of increasing British textile trade with China, under the auspices of the English chambers of commerce. The Blackburn school has an extensive art department, a large number of science classes—principally evening—departments in cookery, dressmaking, embroidery, and some very large commercial classes, which take in England to some extent the place of business colleges in the United States.

The Technical School of Halifax, England, is quite a new institution, having been opened about two years. The school has the advantage of being transferred from the old Mechanics' Institute of Halifax to the new building.

Classes are held in the daytime in art, dressmaking, millinery and needlework, cookery, and laundry work; there is also a textile department. Evening classes are held in mathematics, physics, mechanical and electrical engineering, chemistry, building trades, physiography, botany, physiology, and hygiene, in addition to the evening repetition of the day classes.

In the first year of the school's work there were 1,052 students in the textile department. Instruction is largely given by means of lectures, as the equipment of machinery is not large. Instruction includes woolen and worsted carding and spinning, cotton carding and spinning, weaving, designing, calculations, cloth analysis, color in woven design, free-hand drawing, designing, etc.

In by far the larger number of the textile schools in England where textiles are taught instruction is exclusively in the evening classes, being formed for the benefit of the artisans at a nominal fee, in which the course of instruction extends for two, three, or four years, and is given almost exclusively in the form of lectures on spinning, weaving, dyeing, bleaching, etc. In almost all the schools facilities are provided for cloth dissection, for the study of art, of mechanical drawing, chemistry, applied and theoretical mechanics, steam, and other sciences appertaining to the textile industry.

There are probably 100 schools of this kind in operation. They are usually managed by the local authority (that is, the town or village council) and are supported by appropriations from the fund derived from the beer tax under the technical instruction act previously named.

In other than textile districts small schools exist, having for the subject of instruction in the technical department the staple trade of each district. So numerous are these schools, that in the year 1895 26,600 students attended registered classes in addition to those attending unregistered classes. Of these, 6,117 attended classes in spinning, weaving, bleaching, printing and dyeing, in classes registered under the City and Guilds of London Institute—regarding whose work see page 273.

Among some of the more important British textile schools may be mentioned those in Glasgow and in Dundee, Scotland, the Rochdale Technical School, the Huddersfield Technical School, the Morley Technical School, Stockport Technical School, the Wigan Mining School (which has a textile department), the Burnley Mechanics' Institute, and the Accrington Technical School.

GERMAN SCHOOLS.

The royal school of Mülheim-am-Rhein, the oldest school in Germany, having been in existence for forty-eight years, appears at the first instance to be much less satisfactory than such schools as those of Aachen and Crefeld, but on close inquiry the systems and methods of teaching are to be commended, especially in the theoretical work, which here, and elsewhere, appear to be thought much of. The excellence of the teaching is largely due to their able director (Director Ehrhardt), who proceeds next year to a town in Saxony to establish a new school for the Saxon Government.

The school under description is located at Mülheim, a few miles from Cologne, in the center of what was once a large handloom weaving district, and is still comparatively important as a manufacturing center. The school is under the supervision of the Prussion Government, and its rules of government follow the general lines of all the Prussian schools. The local management of the school is by a committee appointed by the town, the mayor presiding. As indicating the importance attributed to technical instruction, it is a fact worthy of note than an appointment on this committee can not be refused except by those holding a conflicting municipal office.

The building for the school is provided by the municipality, and the school is supported jointly by the State and municipality. The school is a large three-story building, having a large power weave room, containing 12 to 14 power looms, engaged on cotton, linen, and goods made from a combination of these yarns. Special attention is given to handloom work, perhaps more than in any other European school. There are some very excellent, though old, specimens of handlooms, about thirty in number. There are the usual arrangements for the spooling, warping, and twisting of yarns, several class rooms, and director's office; a private residence for the director is also in the school. There is a dyeing department attached to the school, which now appears very small and antiquated in comparison with the splendid dyeing establishments at some other schools, yet this dyeing department attracted the attention of an English trade commission reporting and inquiring into foreign textile schools in 1876. The school is open in the daytime only, and is intended largely for the sons of manufacturers, of whom from fifty to sixty are in attendance. There are occasionally as many as one-third foreigners attending this school, including Italians, French, Austrians, Belgians, and a few English. There are four teachers for practical weaving, one for chemistry, one for dyeing, two for power-loom construction, which, with the director, makes a total staff of ten. Their hours of attendance are from 8 till 12 and from 2 till 6. Not more than six students are allowed to one teacher in practical work. No student is allowed to enter who has not attained his 16th year. Lady students are taken in the design course.

Fees for native Prussians are $50 per annum, for other Germans, $75, and $200 for foreigners. All fees are payable in advance, and no return of fees is made unless the student leaves for some cause not under his own control. The course of instruction is a very complete one, and includes drawing and pattern designing, cloth analysis, instruction in cloth construction and in weaving, warp preparation, power weaving, finishing machinery, short courses in dyeing, and lectures on kindred subjects.

BELGIAN SCHOOLS.

The city of Verviers, in Belgium, possesses an institution which promises to be, when completed, one of the best textile schools in Belgium. It is beautifully situated on high land overlooking the town, and consists of a two-story main building, consisting of a center block with two wings; the wings are joined by a one-story building, the inclosure thus forming a courtyard. Behind the main building is a series of one-story sheds, occupied by spinning and weaving machinery, dyeing and chemical laboratories, engineering room, power house, etc. The spinning, weaving, and dyeing only form departments of what is really a large school of

technology or engineering school. The departments for instruction in physics, in mechanics, in mechanical, geometrical, and architectural drawing are unusually well equipped.

The chemical department includes a large laboratory for general chemistry, a smaller one for analytical chemistry, and a dyeing laboratory has been added this year. The rooms for instruction in drawing are three or four in number, each of which can accommodate 100 students. There is an excellent museum of fabrics and another of mechanics and the usual lecture halls for chemistry, textiles, etc.

The weaving shed contains 25 handlooms and 5 power looms, three of the latter being of English make and two of local make. The power looms are all arranged for the weaving of broad woolen goods. At the time of my visit the spinning department had not been equipped, but I was informed that arrangements have been made for the carding, combing, and spinning of wool, the principal machinery of which will be of Belgian make, with probably Swiss combs.

The course of instruction in the day school occupies four years, the first two years being applied to the study of sciences, especially of applied science, and the last two years being devoted to spinning, weaving, and dyeing. Languages form a portion of the instruction in all the four years. Instruction in the first year includes physics, elementary mechanics, organic and inorganic chemistry, pure and applied geometry, and botany. In the second year instruction is given in applied mechanics, industrial physics, industrial chemistry, mechanical analysis, principles of machinery, natural and artificial dyestuffs, and the study of textile fabrics, French and German languages, and laboratory work. In the third year the following subjects are taken up: The theory of dyeing, electro-technology, weaving, mill architecture, machinery construction, bookkeeping, French and German languages, drawing, practical work in the laboratories in dyeing, spinning, weaving, and in drawing. The programme of the fourth year is practically a repetition of that of the three years, the students, of course, being more advanced.

There is a very successful evening school in connection with this institution, the course of instruction occupying three years, in three different divisions.

The first is called the industrial division, which includes geometry, physics, mechanics, organic and inorganic chemistry, general and applied mechanics, architectural drawing, hygiene, etc. The second division is that of chemistry and dyeing, which includes the study of geometry, physics, political science, hygiene, mechanics, architectural designing, organic and inorganic chemistry, and the theory of dyeing, laboratory work in chemistry, and experimental dyeing. The third division, that of weaving, includes geometry, physics, the principles of designing, political economy and hygiene, practical weaving, lectures on weaving, and weaving calculations.

The evening school is practically free, a nominal charge of 40 cents being made for the entry of the student's name. The fees for the day school for native born or naturalized Belgians are $50 per annum, and for foreigners, $200.

ITALIAN SCHOOLS.

There is a very admirable little textile school at Como, which is arranged on a good system and does excellent work. It is situated in the silk manufacturing town of Como on the banks of the lake of that name and consists of a two-story straggling building, of which the principal rooms are the reception hall, the offices of the secretary, 2 power loom-weaving rooms and machine shop, gas-engine house, 2 chemical laboratories, physical laboratory, and an art studio. There is also a gymnasium and the usual class rooms. The school is equipped with 9 power looms and 13 hand looms, the power looms being all different and all made by continental loom builders.

The first year is devoted to the study of science, including chemistry and physics, the two succeeding years are devoted to the study of weaving and weaving machin-

ery, and two years are given to the study of designing, making a course of five years in all. The instruction is undoubtedly very thorough, and the work done, especially in the designing department, is excellent. The design rooms are very well equipped for the purpose. The director of the school is Prof. Luigi Ponci, and the professor of weaving is Peitro Pinchetti. There are 18 masters and professors, with a total staff of 25, and the number of students averages from 150 to 170.

FRENCH SCHOOLS.

Roubaix—The National School of Industrial Arts.—The French Government has recently erected in this textile manufacturing town a fine school for designing, weaving, and dyeing, on a scale to compare, and perhaps compete, with that of Crefeld. It is not yet completely fitted. The building is also designed to contain an industrial museum, picture gallery, and library. A splendid collection is already made of patterns of dyed, printed, and woven goods of all kinds, the productions of many years back. The samples in the cases are frequently changed from the stores, and the collection is freely accessible for study. The dyeing and weaving schools are in the rear of the building. They are fitted up much after the manner of Crefeld.

There are 700 to 800 individual students enrolled, 400 of whom come in the evenings and on Sunday mornings. Excellent courses of lessons in artistic design are given, and on the occasion of my visit the works of the students were on view. Workmen come, especially on Sundays, to consult books of patterns.

The buildings stand on a site of nearly 15,000 square yards, of which they occupy about one-half and have cost about $600,000. Most of the machines have been given. The school is supported by a subvention of $8,000 by the town and $12,000 by the State. It is a remarkable and noteworthy fact that the costly instruction in this school and the use of all materials are absolutely free.

One of the most important features of the school, and, indeed, the chief motive in its establishment, is to be found in the encouragement given to the art of design. Complaint is made that even in France there is a great want of originality, and that too little attention is paid to the appropriateness of the design to the purpose intended, and the hope is expressed that the creation of the school at Roubaix may be followed by the erection of similar schools in other manufacturing districts.

The school was established in 1883 and a department of spinning, weaving, and dyeing added in 1890. The school is controlled by the town authorities and has a staff of 18 professors and 4 assistant instructors together with machinists and other skilled officers. The course of instruction is carried out in full and occupies five years. At the time of my visit very considerable additions were being made in the spinning department, including cards, combs, and spinning frames, both for woolen and cotton. It was stated that the machines were all being given, and this is more remarkable, as the machines were mostly of English and German make. The spinning plant, when complete, will be an excellent one, but at the time of my visit there were quite a number of examples of cards and combs and very few of the machines used in later processes.

The French schools, like the Belgian schools, do not favorably impress the visitor by the thoroughness of instruction given. The course of instruction in the carding department in Roubaix includes, firstly, the combing of wool, the different qualities of wool, picking, oiling, carding, gill boxes, wool washing, the manufacture of soaps for wool washing and conditioning; secondly, the spinning of combed wool, the making of woolen mixtures, natural and dyed, drawing boxes, finishers, reducers and rovers, spinning frame, twisting, etc.; thirdly, the spinning of wool, burr pickers and mixing pickers and finisher cards, including condensers, spinning mule, and also spinning of yarn from waste and recovered wool; fourthly, the spinning of cotton, different qualities of cotton, opening picker, carding, combing, slubbing, intermediate, roving, spinning frames, mules, gassing and polishing yarns, twisting.

The method of treatment of the above subjects is: Firstly, to give instruction in

the calculations of speeds, treatment of power by pulleys and drums, friction, combs, belts, and ropes; secondly, to give lectures and instruction on the general principles as applied to all textiles, carding and combing, parallelizing the fibers by drawing, evening by doubling and further drawing, and strengthening by twisting and by doubling; thirdly, to give instruction of the peculiar conditions as applied to each industry, for example, cotton, wool, silk, linen, ramie, and jute, and also on the classification, principal markets producing machinery, sale of yarns, numbering of yarns, French and English systems, humidity, hygiene, etc.

It will be realized by any reader who has taken an interest in textile schools that the above is merely a suggestion of what can be said on the subject of such schools. In fact, this report is merely a summary of the more important points in connection with European technical education.

CHAPTER IX.

THE INTERNATIONAL CONGRESS ON TECHNICAL EDUCATION.

By C. P. Brooks, Director of Textile School, Lowell, Mass.

The International Congress on Technical Education, which met in London in June last, is an institution of French origin, having been first called to order at Bordeaux in 1886 as the Congrès International de l'Enseignement Technique. Since then there has been a meeting of the congress at Paris (in 1889) and another in Bordeaux (1895), but the attendance was not very large at either of these gatherings. The success of this year's meeting in London is one of the many indications of the increasing attention now bestowed on this important and too long neglected branch of education.

On the 23d of December, 1896, a proposition was submitted to the Council of the Society of Arts, of London, England, by Sir John Donnelly, the secretary of the science and art department, that the society should invite the Congrès International de l'Enseignement Technique to hold a meeting in London in June, 1897.

It had been proposed to hold the meeting for the present year at Madrid, but the arrangements for so doing had fallen through, and a desire had been expressed that the congress should meet in London. Sir John Donnelly further informed the council that he had reason to believe that the proposition for holding a meeting in London would be favorably regarded by the British education department, although it would be contrary to the usual practice that an official invitation for such a meeting should be issued by Her Majesty's Government. Sir John Donnelly further suggested that some of the city companies should be invited to cooperate with the society.

The council appointed a committee to consider and report on the subject.

The ancient guilds or livery companies of the city of London have for many years supported a system of technical education in Great Britain and now practically control the technical shools of that country through the association known as the City and Guilds of London Institute.

It was therefore appropriate that they should be asked to welcome the congress, which, it may be here remarked, they did in a hearty man-

ner, and they also defrayed all the expenses of the meeting. The committee above named extended an invitation to President Saignat, inviting the congress to hold their meeting in London from June 15 to June 18.

It was resolved that, as soon as the invitation had been accepted, an application should be addressed to the foreign office, asking that foreign governments might be invited to nominate delegates to the congress, and also that the invitation should be extended to the colonies and India.

On the invitation of the council, the Duke of Devonshire accepted the office of president of the congress, and Sir John Gorst that of vice-president. M. Saignat was also nominated as a vice-president. Maj. Gen. Sir Owen Tudor Burne, G. C. I. E., chairman of the council, was appointed chairman of the congress, and the masters of the contributing city companies vice-chairmen. The council also appointed a general, an executive, and a reception committee. Sir Henry Trueman Wood, secretary of the Society of Arts, was appointed general secretary of the congress.

The foreign office acceded to the application that foreign governments might be invited, and an application was sent to foreign governments requesting them to appoint such delegates. The shortness of the notice prevented many of the governments from accepting the invitation, but eventually the following delegates were nominated: M. Eugène Rombaut, Dr. O. Pyfferoen, and M. Paul Wauters, by Belgium; M. Felix Martel and M. P. Jacquemart, by France; M. Boris Ovsianikoff and M. Gregory Wilenskin, by Russia; C. P. Brooks, by the Bureau of Education of the United States of America.

Programmes of the congress (in English, French, and German) were issued to the principal technical institutions in several countries, to the county councils and county borough councils, to the science and art classes, etc.

The congress was opened at 11 o'clock on the 15th of June by an address from the president, the Duke of Devonshire, K. G., and from the president of the last congress, M. le Professeur Léo Saignat. It was found necessary to divide the Congress into two sections, A and B. The meetings of A were held in the Society of Arts' room and those of B in the lecture theater of the London School of Economics, which had kindly placed the theater at the disposal of the congress. The meetings were held from the 15th to the 18th of June, inclusive, a morning and afternoon sitting being held on each day. The meetings were presided over by the Duke of Devonshire, the Right Hon. Sir John Gorst, M. Léo Saignat, Major-General Sir Owen Tudor Burne, Major-General Sir John Donnelly, the late Right Hon. A. J. Mundella, Mr. John Walter Sugg, Mr. William Bousfield, Mr. William Woodall, M. P., Lord Belhaven and Stenton, Sir Steuart Colvin Bayley, and Sir Owen Roberts.

In all, fifty-six communications were laid before the congress. The subjects related to technical education and commercial education generally, technical education in its bearing on special trades, the technical education of women, technical education in India, and technical education in the colonies. The papers were all printed beforehand and distributed at the meeting for the purpose of facilitating discussion.

It was determined that the central office of the Congress should be in Paris.

The congress undoubtedly served a very useful purpose in the work of technical education. Perhaps never before has there been so large a gathering of those interested in that branch of education, some 600 being present at one or more of the meetings. Among the names of those attending were some of the foremost educators in Europe.

The attendance was to some extent augmented by the fact of so many taking the opportunity of attending the celebration of the sixtieth anniversary of Her Majesty Queen Victoria's accession to the throne, which began immediately after the last meeting of the congress.

The number of communications presented was very large, if anything too numerous, not admitting of sufficient time for discussion. The chief value of the congress will be in the publication of the printed report, thus giving an opportunity for perusal and assimilation of the matter in the papers that was not possible at the congress.

The success of the first attempt to conduct this congress on a large scale will encourage the society to repeat the experiment, and for this purpose a permanent bureau was elected at the close of the congress on June 18, 1897, as follows:

Permanent bureau of the congress.

The Duke of Devonshire, K. G., honorary president.
United States of America:
C. P. Brooks.
Belgium:
Eugène Rombaut.
Paul Wauters.
France:
Léo Saignat.
Felix Martel.
L. Jacquemart.
Jacques Siegfried.
J. Mesureur.
Julien Manès.
Russia:
Boris Ovsianikoff.
Gregory Wilenskin.
Great Britain:
Sir Owen Tudor Burne, G. C. I. E.
Sir John F. D. Donnelly, K. C. B.
Prof. William Garnett.
Sir Philip Magnus.
Gilbert R. Redgrave.
Sir Owen Roberts, M. A., D. C. L.
Sir Henry Trueman Wood.

This bureau will carry on the work of the congress in the interval between its meetings.

The following papers are reprinted here from the report of the proceedings:

The Relations Existing Between the Teaching of Pure Chemistry and Applied Chemistry.

By Otto N. Witt, Ph. D., Professor of Chemical Technology at the Royal Polytechnic School of Berlin.

It is a well-known and universally admitted fact that no branch of industrial enterprise has met during the latter half of our century with such signal and varied success as chemical industry. New manufactures, based on chemical principles, have been created and developed to colossal importance; branches of chemical science considered too intricate and special even to be mentioned in the ordinary text-books of chemistry have become the foundations of new manufactures; substances which in former times have been known as troublesome refuse have proved a more potent source of national welfare than even the richest gold mines.

It is more than probable that we are as yet only in the beginning of this wonderful development, and that the industrial chemistry of the future will yield a harvest even more magnificent than it has done in the past. Much that has been sown has not yet reached maturity, and new seed is constantly being intrusted to the fertile soil. The investigation of the natural resources of foreign countries has shown that the conditions of industrial chemical work are by no means everywhere the same as in the civilized countries of Europe, and that in some cases they are more favorable. The liquid and gaseous fuels of the United States and of Russia are ample proof of this assertion. Great continents overflowing with wealth are yet awaiting their development. All that we know of them is that they harbor treasures of enormous magnitude, and that these treasures can only be raised by methods different from those which we have adopted for developing the resources of Europe. Yet the technical chemistry of Europe will forever be the starting point for the development of the technical chemistry of the world.

With this bright prospect before us it is only natural that we should be very anxious about the proper education to be given to those who are destined to develop and enjoy what to us is but a brilliant vision. * * *

It is apparent that no definite view can be formed of the exact shape which the chemical industry of the future will take. Even in its original home, in central Europe, the chemical industry of to-day is totally different from what it might have been expected to become by the most experienced technologist fifteen or twenty years ago. The great secret of the success of applied chemistry lies in its versatility, which enables it to adopt ever new and varying means for a useful purpose. On the other hand, this very versatility prevents us from forming a definite idea of the exact nature of the road which will lead us to success.

The natural consequence of this uncertainty is the conclusion that our most important task in the education of young industrial chemists is to make them men of many resources. A special training, which may be useful enough in less changeable branches of manufacture, is little short of disastrous in all branches of chemical industry.

There is no objection to a special education, say, for engineers. For no matter how brilliant the success of the newly invented machines of the future may prove to be, the methods of working the parts of which they will be composed will remain essentially the same, and will only undergo modifications making them more effective and generally applicable. The methods, again, of estimating and calculating such machines will forever be based on general considerations of mathematics. If a young man has thoroughly mastered both the theory and the rational construction of a steam engine, he will not find great difficulty in the construction of a motor for compressed air.

The same conditions do not obtain for chemical manufacture. In our sphere it is not the methods of execution which undergo changes so much as the principles on which the manufacture is based. The consequence is that a young man specially trained for some branch of chemical industry would find his knowledge of but little use a few years after leaving the school in which he received his training. In order to remain efficient in his work he would have to acquire knowledge which has been considered unnecessary by his teachers, and in so doing he would have to undergo the weary task of becoming a self-made man.

This difference of industrial, mechanical, and chemical work is greater than perhaps it may seem at first. It is more of a qualitative than of a quantitative nature. The mechanical arts, dealing with the physical properties of matter, are comparatively simple in their theoretical foundations, but of almost unlimited variety in their practical resources. Applied chemistry, on the contrary, is comparatively simple in its practical aspect, but extremely varied and complicated from a theoretical point of view. From this it results that the only possible way to success in applied chemistry is the acquisition of sound theoretical knowledge. It is a complete scientific education which we must give to our young chemists in order to enable them to be successful in their industrial career.

Chemistry as a science is an organic whole, and its parts are inseparable. It is therefore a great mistake to think that the theoretical education of a young chemist may be limited to that part of chemistry which forms the basis of some given industry. Even the distinction, so often made, between inorganic and organic chemistry can not be upheld if we examine the subject logically and carefully. Organic chemistry is but the chemistry of carbon compounds, and there is no reason whatever for excluding one element from the theoretical education of a young chemist. The theoretical foundations of the chemistry of to-day are in a great measure derived from research in the domain of organic chemistry, and the information of a chemist who would strictly limit himself to inorganic chemistry would forever remain incomplete and undigested.

No matter, therefore, what the ultimate destination of a chemist may be, his education should be strictly scientific and theoretical, and it should embrace general, inorganic, and organic chemistry, without any preference for any or either of these separate subjects, but with constant reference to their various applications.

The success of the German chemical industry, so much commented upon of late, is in a great measure due to the fact that the men who founded it were the pupils of chemists like Liebig, Wöhler, Hofman, and others, who knew no higher ambition than the thoroughly universal and scientific instruction of those who had the privilege of working in their laboratories.

From the foregoing remarks it will be evident that I am no adherent of special technical education in applied chemistry, if by that term we imply a one-sided preparation of young men for a single branch of chemical industry, no matter what that branch may be. Dyeing, calico printing, and paper making are perhaps the only chemical industries which may rightly claim the necessity of some special instruction in the methods of their manipulation. But there is no reason why this instruction, which is comparatively simple, should of necessity be separated from the theoretical training of a chemist. Of course the great centers of these industries will always demand and have their special schools for the education of young chemists for their factories. But if these schools are to be really useful, if they intend to produce men who shall be the originators of progress in their manufacturing districts, they will have to make provisions for as complete and efficient an instruction in theoretical chemistry as may be obtained anywhere in a university.

If thus pure chemical science is to be the foundation stone of all chemical instruction, it becomes necessary to say a few words about the proper way of teaching chemistry as a science. Here I must say that I do not agree with the method adopted nowadays in many schools that I am acquainted with. There is a great

tendency to accentuate the hypothetical chapters of the science at the expense of its practical and experimental side.

As is natural, a science of so progressive a character as chemistry can not do without a good deal of hypothetical speculation. The theory of aromatic compounds, the considerations on the valency of the elements, the periodic law, even the atomistic theory itself are all nothing but hypotheses, though indispensable for the proper understanding of chemical reactions. So great has been their influence on the progress and development of chemistry, that slowly and gradually many chemists have got into the habit of considering them as the real essence and element of chemistry, whereas in reality they are nothing more nor less than general expressions of countless experimental observations. They are the great landmarks in that wonderful system which alone enables us to grasp and oversee the vast domain of chemical transformation. But they assume the nature of mere philosophical tricks, if we try to consider them apart from chemical facts in an abstract manner. That is what many chemists are now in danger of doing.

Almost all our chemical text-books begin with the explanation of this hypothetical part of our science, and many lecturers do the same, whereas the proper way would be to make the beginner acquainted with facts and to derive from them the laws which govern them. The consequences of such a mistake are almost ineradicable. The young chemist, once accustomed to consider theory as independent of its experimental origin, does not see the necessity of connecting it with his experimental work in the laboratory. The consequence is, that the majority of the young chemists of the day, instead of being imbued with one living science, are possessed of two things, both of doubtful value: theoretical knowledge, acquired by memory and soon forgotten in practical life, and practical rule of thumb, incapable of helping them in serious research.

Yet the highest object of all chemical instruction is to show the way to chemical research. No matter what the ultimate career of the young chemist may be, whether he devote his energy to pure or to applied science, patient research will always be his only way to success. Whether his object be to create a new industry, starting from a new raw material, or whether his task be to improve old processes or to find the causes of troublesome difficulties—the way to success in all these different tasks is always the same, it consists in a logical application of the old, well-known, and time-honored methods of experimental research, either analytical or synthetical.

Our young chemists of the day are not sufficiently indoctrinated with the view of an experiment, as a question addressed to Nature. Being accustomed to consider theories independently of facts, and facts independently of theories, they are incapable of drawing conclusions from one experiment, and making them the basis of the next following one. Consequently they are incapable of research, for research is nothing else than a succession of experiments, each forming the direct consequence of the preceding one.

It will no doubt be considered remarkable, that I, a teacher of chemistry in Germany, the home of research laboratories, complain of an insufficient capacity for research in the majority of our young chemists. Yet that complaint is by no means unjust, and the cause of the difficulty complained of is perhaps still more remarkable than the necessity for the complaint. This cause is nothing more or less than the fact that most young chemists devote themselves to research at too early a period of their studies.

To be successful in original research a chemist should be fully conversant with all the difficulties of chemical manipulation. This is but rarely the case with young chemists of the present day. Their manipulative skill is quite undeveloped. They are sadly inexperienced in the art of building up an apparatus for a complicated chemical experiment; they have an unjustified dread of somewhat complex analysis; they are totally innocent of the indispensable auxiliary arts of glass-blowing, grind-

ing, filing, etc., and, what is worst of all, they are insufficiently acquainted with the use of that instrument—which has created modern chemistry—the balance.

How are we to change all this? By a proper reorganization of the early stages of chemical instruction.

I have already indicated that lectures on chemistry should not begin with the explanation of chemical theories, but with the demonstration of facts, which should be chosen in such a manner that the theoretical conclusions may be deduced from them. In the same way instruction in the laboratory should begin with the observation of reactions, chosen in such a manner that by degrees some of the simpler methods of manipulation are acquired by the pupil. As soon as he is acquainted with these, he may begin to make preparations, starting with products of a simple composition, and transforming them into others by processes, the nature of which he is able to understand; but as soon as he begins this work he should also begin to use the balance. In every experiment he should use weighed quantities of raw material, and he should ascertain the weight of the intermediate, final, and by-products. The experiments should be chosen in such a manner that more and more complicated apparatus is required for them, and great care should be taken in insisting that every experimental plant constructed should be faultless in all its details.

Only after having acquired considerable skill in chemical manipulation should the student begin to do analytical work. After a short practice in qualitative analysis he should begin with quantitative work. Being acquainted with the necessity of ascertaining the weight of all matter taken into work, he would now easily become familiar with the use of the analytical balance, which would not remain (as it unfortunately does very often at present) an object of fearful veneration, but become an indispensable and well understood tool. This quantitative analytical work should be supplemented by a number of thermo-chemical and physico-chemical experiments.

Whilst this experimental work is carried on the student has become acquainted in his lectures with the subject of organic chemistry. Organic analysis may now be taken up in the laboratory. As soon as the young chemist shows some efficiency as an analyst of organic substances, it is time to begin with organic preparations; but here again an exact record should be kept of the quantitative conditions of every experiment. The use of weights and measures should become second nature to every chemist, and nothing is more important in the practical instruction of a chemical beginner than to imbue him with the conviction that merely qualitative work is imperfect by nature and only admissible as a preliminary preparation to the quantitative experiment, which, if properly carried out, is perfect and necessary as a supplement of the qualitative observation.

Another important point in chemical instruction is the constant reference to the practical application of facts and theories. If the teacher would take constant care to explain what are the conditions of an experiment, what alterations in the plant are necessary for its execution on a manufacturing scale, and why such alterations are necessary, then he would contribute more toward the formation and growth of industrial comprehension in his pupils than can be done by any special technical instruction.

I have no hesitation in saying that a young chemist who has followed with all necessary industry and intelligence a course of instruction such as I have sketched will be properly prepared for original research. This is equivalent to saying that he will be equally prepared to fill with advantage a position in a chemical factory in any branch whatever. His education will be complete and what he still lacks will be the experience and the rapidity of practical work, which can only be acquired by continued practice.

A few words remain to be said about the other subjects which, besides chemistry, should be taught to every young chemist. Of course he should receive a proper instruction in physics, the elements of mechanical engineering, technical drawing,

mineralogy, botany, etc. A certain knowledge of all the exact sciences is indispensable to every chemist, whether he intends to devote his work to industrial or to purely scientific research.

The essence of my investigation is, that I can not admit any fundamental difference in the methods of research of pure and applied chemistry. Consequently I can not admit the necessity of a difference of instruction for the two. A well organized instruction in pure chemical science would, in my opinion, be the best preparation for any young chemist for his future career. The method in use at present seems to be capable of improvement. Though much of what I have brought forward would not seem new to many of my colleagues, yet it can not be said to be generally admitted, and it is certainly worthy of the most serious consideration.

We want no school for producing specialists. Specialism comes as a matter of course in later life. But no matter how deep any chemist may involve himself in the intricacies of any given subject, he can still gather useful information for his own work from the contemplation of work accomplished in other branches of his science. If we want our schools to produce men fit to reap the great harvest before us, then let them produce chemists who enthusiastically embrace their science as a whole, and who are incapable both of separating practice from theory and theory from practice.

Remarks on the Teaching of Chemistry.

By George Lunge, Ph.D., Professor of Technological Chemistry in the Federal Polytechnic School, Zürich; Past-President of the German Society of Chemical Industry.

* * * In order to raise English chemical industry to the foremost rank which is deputed to it at present in several important branches, it is necessary that the technical management of chemical factories should not be left in the hands of "rule-of-thumb" men, but should be intrusted to real chemists. These men should have a much fuller education than the majority of chemists seem to obtain at present in Great Britain, which means that they must spend more time and money on their training than they generally do. Before entering on their proper professional study at college, they should receive a more suitable general education, in which the "classics" need not be entirely left out, but must take a secondary place in comparison with modern language, mathematics, drawing, and the elements of science. At college the student should receive a thorough training in scientific chemistry, taking this in its widest meaning, not merely as a "testing" business. Next to this, but not to the same extent, he should be taught physics, mineralogy, technology, mechanics, and the elements of engineering. Everything else is more ornamental than useful; but I am the very last to say that the student should confine himself only to the latter.

Nobody in these times of ours is likely to turn out a first-class chemist, worthy of being later on put in charge of a large factory, who has not tried his hand in original research. This has been pointed out with such cogency and emphasis by many authoritative voices in England (in Germany it has long been held as an article of faith) that I may abstain from dilating on that topic.

There is not quite so much agreement on the point whether technical chemists should be taught at college technology and the elements of engineering. Most people would take this as a matter of course; but there are influential voices to the contrary. We meet with such in the Report on the Teaching of Chemistry, made to the Technical Education Board of the London County Council in November, 1896. One gentleman declares the teaching of technological chemistry of no value whatever for chemical industries or for the pupils. Another declares that, although he had no preliminary technical training, and had been through theoretical courses only, he found himself able to cope with anything that cropped up when he entered manufacturing practice. Both gentlemen are eminently practical men for whom I,

like all the world, entertain the greatest respect, but in the present case I can not follow them, and I believe that their experience is too one-sided. I, for my part, trust that I shall not be judged arrogant for assuming my natural capability to be up to the average, but my experience has been as follows. Having gone through a complete course of scientific chemistry and allied subjects (I rejoice to have had Bunsen and Kirchhoff as teachers), and having afterwards entered upon a technical career, I did *not* find myself "able to cope with anything that cropped up in practice," but I had to spend immense trouble and time, and to pay serious "Lehrgeld" for acquiring those elements of mechanical and technological knowledge which students now obtain as a matter of course in a good technical college. And this experience of my own agrees with so much else which I have observed in later life that I feel bound to retain my view of this subject as before stated. Nor do I stand alone in that. Not to speak of the practice of all the continental Polytechnics, which, after all, have some results to point to, great efforts have recently been made to introduce those technological subjects even at the German universities, as it is felt that in that respect they are suffering under a drawback in comparison with the polytechnics. A very forcible speech was delivered on April 28 of this year [1897], in the Prussian House of Commons, by Dr. Böttinger, the head of one of the largest chemical manufactories in the world, with a staff of more than a hundred chemists (the Farbenfabriken at Elberfeld). Dr. Böttinger strongly demanded the establishment of more professorships of technological chemistry, also at the old universities, in order to maintain the prominent position of Germany in the chemical industry, and the Government made a very encouraging reply to this.

It is quite intelligible why some large chemical manufacturers do not care very much about a preliminary study of technological subjects on the part of their chemists. At their colossal works they need specialists for each branch, and they can not do without a staff of fully trained engineers, so that their chemists are not called upon to do any but strictly chemical work. Some owners of works may not even like their chemists to get too much insight into the practical and mechanical part of the manufacturing operations, for reasons which need not be dwelt upon here. But that can not be our standpoint, as teachers, nor, do I venture to say, is it in the interest of the nation as a whole that a trade should be monopolized in a few hands, as it is the object of "keeping everybody to his last." On the contrary, we aim at educating our pupils in such manner that they can turn their energies into practical channels at any opportunity which may offer itself; for this purpose they must be able to cope with mechanical and technical problems at the outset, and they must be taught to think technically, not merely as test-tube men. Of this I may be allowed to give an illustration from a huge industry which is after all quite as much a branch of applied chemistry as, say, alkali making, viz, the manufacture of iron and steel. Does anybody maintain that the enormous strides made in this industry in our own generation would have been possible if the ironmasters and their assistants had been brought up on a diet of pure chemistry and physics, leaving all the practical part and the engineering to be either performed by nonchemical engineers, or picked up at haphazard later on by themselves, instead of their going through a thorough training in the technology of metallurgy at mining schools or the like? This reductio ad absurdum is perhaps not quite so apparent and absolute in other branches of the industries built upon a chemical basis, but in my humble opinion it applies there as well. I can not consider it as an accidental coincidence that Germany, which had been one of the leaders in theoretical chemistry for a long time past, without developing a chemical industry commensurate with it, should have attained to such prominence in the same industry precisely in the period when the establishment of technical high schools had provided her with a number of chemists, trained in something else than pure science. It is really unnecessary for me to point out that such a training in pure science, and that of a most thorough kind, is the indispensable forerunner of the teaching of practical subjects, but, although speak-

ing pro domo, I can not help saying that technological chemistry has also amply proved its right of existence, and its great importance for the progress of chemical industry.

I have hitherto had only those in mind who aspire to filling the higher positions in chemical works, and ultimately hope to become themselves managers or owners of factories. Of course, only a few can ever reach that goal, and the great majority must content themselves with obtaining intermediate positions, but if they have honestly worked during their college time, they may trust not to be left always in the condition of "testing-slaves," but to be promoted to manage some part or other of the real manufacture. According to the way they perform that work, they will have a chance of getting on higher and higher. Such promotion is, on the Continent, now confined to trained chemists, and I believe it is also more common than formerly in England to make chemists managers of chemical works. So long as this is not a recognized principle, it is in vain to hope for retaining a foremost rank in chemical industry. It is another question whether it is necessary or useful for that purpose, as is sometimes claimed, that the foremen, or even the common workmen, should possess a certain knowledge of chemistry and technology, such as may be imparted at board schools or at night classes for adults. I am afraid that such knowledge is quite useless to ordinary workmen, who have simply to do as they are told, and who may do more harm than good by trying to apply a superficial idea of the nature of the operations which they have to perform, without possibly having a real insight into them. I do not even think that, apart from isolated exceptions, such knowledge is of much good to the foremen, whose duty it is to carry out instructions and to see that the men do their work as prescribed by the staff, but who are not to meddle with the chemical process itself. Both classes of men may have valuable suggestions to make concerning apparatus and other outwardly visible points, but even if they have learned as much chemistry as they have had a chance to do in the ordinary way, it is most unlikely that they will be able to find out any improvements in the chemistry of the process. At all events, in Germany, even in those factories where the work is carried on with the greatest chemical refinement, the foremen and ordinary workmen are neither required nor even desired to know anything of chemistry. Formerly, it happened sometimes that one of the men, after getting such a smattering of chemistry as he was able to obtain by evening schools and the like, was driven on by an irresistible impulse to rise from the ranks, to supplement his deficiencies by hard work, and to become a successful chemical inventor. But such a contingency has become more and more scarce with the widening of the area of science and the increasing difficulty of mastering it, and it really seems a great waste of time and means to give some superficial chemical teaching to tens of thousands of workmen on the remote chance that one of them may gain some real benefit from it, while at the same time many hundreds of educated men are receiving a really efficient training in the same direction, many of whom can not find properly remunerated places owing to a great extent to the cheap labor of "bottle-washers." * * *

Theory and Practice in Trade Teaching.

By Sir Philip Magnus, of the City and Guilds of London Technical Institute.

The experience acquired during the few years since technical instruction was first generally introduced and made supplemental to trade practice has enabled us to formulate certain principles applicable to the teaching of trade subjects. The material now exists for a new chapter in pedagogy, which, if not yet written, may at any time be added to the science of education. The difficulty of determining the true relation of theory and practice in teaching the technology of any trade is shown

by the regulations of the science and art department which apply to the teaching of science in its bearing upon trades and in the technical instruction act, which expressly forbids the teaching of the practice of a trade in any technical school. The words of the act are, technical instruction "shall not include teaching the practice of any trade or industry or employment."

It has become a recognized principle of technical training that a trade is best learned by actual practice in the factory or shop, and so strictly has this principle been adhered to that the establishment of schools similar to the apprenticeship schools of France and the Fachschulen of Austria and of other countries has been discouraged by the best authorities on the question of technical education. Nevertheless, it has been found necessary to approximate so closely to the teaching of a trade in some of our technical classes that local authorities have frequently been in doubt as to whether they have infringed the act, and the Government has been obliged to give a very broad and liberal interpretation to it to satisfy the just and proper demands of technical schools.

There is also considerable difficulty in indicating the kind of theory to be taught in a trade school. The courses of instruction prescribed by the department in the directory for science were intended to meet the requirements of students engaged in different sections of industry. But, although such courses of instruction have been largely followed by all kinds of artisans, a protest has been continuously heard that the syllabuses of instruction are ill adapted to the workmen's needs; and we know that the instruction has failed to reach thousands of workers in some of our largest and most important industries. This fact was brought prominently under my notice when I was asked, some time since, to ascertain what proportion of the candidates at the technological examinations succeeded in qualifying for the full certificate by having passed certain examinations in allied branches of science under the science and art department. The inquiry showed that less than 17 per cent of the successful candidates were so qualified, and in some industries, notably in the textile trades, the proportion was much smaller. It appears, therefore, that for the purposes of technical education, more particularly as adapted to workmen, special methods have to be considered even in the teaching of the theory or principles of science underlying the practice of any trade.

One of the most interesting papers it has been my privilege to read is an article contributed to the Edinburgh Review in 1824, which shows how clearly its distinguished author, the late Lord Brougham, foresaw many of the difficulties we now experience. Lord Brougham, in the article to which I refer, quotes with approval from the prospectus published in 1821 by the Edinburgh School of Arts the following passage:

> The great object of this institution is to supply, at such an expense as a working tradesman can afford, instruction in the various branches of science which are of practical application to mechanics in their several trades, so that they may the better comprehend the reason for each individual operation that passes through their hands and have more certain rules to follow than the mere imitation of what they may have seen done by another. It is not intended to teach the trade of the carpenter, the mason, the dyer, or any other particular business; but there is no trade which does not depend, more or less, upon scientific principles; and to teach what these are and to point out their practical application will form the business of this establishment. He who unites a thorough knowledge of the principles of his art with that dexterity which practice, and practice only, can give, will be the most complete, and probably the most successful, tradesman.

It would appear, however, that, more specialized instruction having been required, the students at the mechanical lectures of this school proposed to form themselves into separate classes, and they selected a working joiner, by name James Sale, and David Dewar, a working cabinetmaker, from among their fellow-students to give instruction. But even this arrangement was not free from difficulties, and Lord Brougham goes on to say: "The experience of the first year, and particularly the fact that the students were of no less than forty-eight different trades, convinced

the directors that the best plan was to limit the lectures to the general principles of those sciences which are of universal application to the arts and not to attempt, as had at first been intended, teaching the principle of the arts in detail."

Here the matter was left. The City and Guilds Institute has been trying during the last seventeen years, with, I hope, some success, to solve the problem which was left unsolved by Dr. Birkbeck, Lord Brougham, Mr. Galbraith, and other pioneers of technical education. At the Edinburgh School of Art it was finally arranged that the lectures should be "strictly confined to such objects of science" as would be "useful to workmen in the exercise of their trade," and if we adopt this principle we can not go far wrong.

I can not hope, in this short paper, to treat with any attempt at completeness what may be called the methodology of trade teaching. I can only throw out a few suggestions and indicate some of the difficulties it involves. The subject, however, is well worthy of the careful consideration of the educationalist as a problem full of interest and of great importance.

Let us consider, first of all, the extent to which practical work may legitimately enter into trade teaching. Now, there are certain branches of trade and certain circumstances and conditions in which, notwithstanding all that may have been said to the contrary, the apprenticeship school—that is, a school in which the practice of a trade is completely taught—is a useful and almost a necessary institution. In many art industries this is so. An apprentice will learn wood carving far better in a school than in a shop. The art requires no expensive tools, to be obtained only in the shop, and the supervision and suggestions of the school-teacher afford help which the young apprentice can not equally well obtain in the commercial shop. Of engraving and inlaying, of metal chasing and enameling, of china painting, basket making, embroidery, and artificial flower making, and of very many other "arts and crafts," as they are commonly called, the same may be said—that the practice of the trade may properly be taught in school. Then, too, an apprenticeship school often affords a very useful, if not the only, means of introducing a new or of recovering an old industry. In a country like Ireland, where trade has languished, the establishment of such schools for the teaching of carefully selected trades might, and probably would, prove most serviceable. In many rural districts, too, where the villagers earn a very scanty livelihood as agricultural laborers, new industries, requiring few tools and only cheap material, may be taught, thus increasing the prosperity of the district and improving the condition of the workers. In Cambridgeshire basket making is being now so taught, and an improving trade is likely to be localized in that county. In many parts of southern Germany similar trades are extensively taught, and the position of the agriculturist is thereby materially improved. But the instruction in such cases must go beyond the limitation imposed by the act; for unless the pupils are really taught the practice of the trades, so as to be able to produce saleable articles, the teaching would fail of its purpose. There are other cases in which, it seems to me, the practice of a trade may be legitimately taught in school. My attention has recently been drawn to the fact that the tailoring trade has for many years suffered from foreign competition. I mean the competition, not of imported goods but of imported workmen. This complaint does not apply so much to "cutters," who occupy a higher position in the trade, as to the rank and file of the work people who are engaged in sewing and putting together the garments that are cut out for them. There seems to be at present no way of training competent work people for this large industry. The conditions under which the work is done do not admit of anything approaching to the apprenticeship system, nor do the young people who want to learn the trade have any chance of acquiring the necessary proficiency and dexterity in the ordinary shop. The result is that foreigners are largely employed, many of whom have gained the necessary skill in a tailor's school. Now, I am told the want of such schools is much felt in this country, and it is believed that it is only in such schools that lads can be trained as competent and efficient workmen.

Yet, in accordance with the strict provisions of the act, a school of this kind would be unable to receive any grant in aid from a local authority.

The instances I have quoted are, I admit, of an exceptional character, and might be easily provided for by a clause giving discretionary powers to the central authority in the interpretation of the act—powers which, I am bound to say, have been already wisely stretched in the best interests of technical education by the science and art department.

To the great majority of industries, however, the rule unquestionably applies that the practice of the trade is best acquired in the factory and shop, and that the instruction of the technical school should be supplementary only to the experience obtained in commercial work. By this principle nearly all our technical classes are regulated. Nevertheless, in many of these classes something that approximates very closely to the teaching of a trade is recognized as necessary. The difference, more or less clearly defined, is, however, sufficiently marked to distinguish the practice of the shop from that of the trade school. Anyone going into a technical class for plumbers, printers, or bookbinders, or into the fitter's shop of a school for engineers, or into one of the well-equipped weaving sheds found in so many of our textile schools in Lancashire or Yorkshire, would be inclined at once to assert that the practice of a trade was being taught in such schools. Nevertheless it is not so, or is not necessarily so. The school is fitted with much of the same machinery and tools as is found in the factory or shop; and so indispensable is such equipment that a large part of the machinery is frequently supplied by local manufacturers, who are themselves interested in the training the school provides. In our weaving schools are found looms of various kinds with all the incidental machinery; in our printers' schools we have fonts of type; the best of our boot and shoe class are furnished with the different machines in use by those engaged in one or more of the ten or twelve sections into which the manufacture is split up; our plumbing classes are supplied with furnaces, and with the necessary tools for the joining of pipes and the bossing of lead, and so on with a large number of other trades and industries. To what end, then, are all these tools and appliances employed in the technical school, if the teaching of the practice of the trade or industry is forbidden by the act? The answer is that they are used and are required to show the student how certain processes are performed, and to enable him to perform those processes himself. The difference between the use of such tools in the shop and in the school is that in the shop the apprentice or young artisan acquires slowly, under considerable difficulty, and frequently without any explanation of the why or the wherefore, the knowledge how to use the particular machine or appliance; and once having learned it he is kept working at it, so as to gain skill and rapidity of execution in its use. In the school, on the other hand, he learns leisurely how the tool is used, the principles of its construction, the errors to avoid, and the means of rectifying them when they occur, the nature of the material to be wrought, and the means of distinguishing different qualities of such material; and having learned all this, and having acquired a certain degree of manipulative skill, he is not expected by constant repetition of the same process to aim at that rapidity of execution which is indispensable for trade purposes, but is allowed to pass on to the explanation of the use of some other machine and to the learning of some other process. It will be seen, therefore, that although a technical school may be equipped almost as completely as a trade shop, the equipment serves a very different purpose. Its object is the production of intelligent working people, and not the production of salable commodities. That goods may be produced is an incident only in the production of intelligent artisans. The practice a student obtains in a technical school is not intended to give him that complete mastery and rapidity of execution—the result of constant practice—which can be acquired only in the shop or factory, where work is done on commercial lines, but rather to enable him to understand the appliances of his trade, and to use them with care and judgment. Nor, indeed, can the technical school,

howsoever completely it may be equipped, afford that special training in adapting means to ends, in economic working, and in the appreciation of the commercial importance of detail, and of the true value of time which is acquired in the shop.

We see, therefore, the uses and the limitation of trade practice in technical instruction, and what the technical instruction act really requires is that while the school shall afford, by the completeness of its equipment, every facility, within such limitations, for trade practice, those limitations shall not be transgressed. It is in the apprenticeship school only, where efficient workers are produced—workers who on leaving the school can at once find employment, owing to the skill and dexterity there acquired—that the teaching of practice exceeds the limitations imposed by the act.

It will be seen that the equipment of a technical school for trade teaching is necessarily expensive, even although the object of the instruction is different from the training of workmen in the practice of a trade. A large number of our technical classes are still inadequately provided with the necessary apparatus, and the instruction is consequently too theoretical and the students lack the opportunity of applying in actual practice the principles they learn. Every year some improvement in this direction is noticed, and the requirements of our technological examinations, which are becoming more and more practical, are helping to make the teaching more practical also. In the early developments of trade teaching it was thought that the practice could be acquired in the shop, and that it was sufficient to teach the theory in the school. But it is now recognized that while what we may call trade practice may be best acquired in the shop, the application of the theory must be taught in school, and that a sufficiency of tools and appliances is needed for this purpose. The Germans, whose educational perfections are so frequently referred to, are still in the elementary stage of trade teaching. But they are beginning to recognize the value of practical work and the necessity of furnishing their schools with suitable appliances, and it is only the want of funds available for such purposes that prevents many of the German schools for artisans from being as well equipped as our own.

When we come to consider what we mean by theory in trade teaching we are also met by difficulties. It might have been thought, and indeed was thought, that ordinary instruction in physics, chemistry, and mechanics would form the best preliminary training for artisans engaged in different trades. But experience has shown that this is not so. Artisans require to be taught by special methods those principles of science which are directly applicable to the industry in which they are engaged. This requirement makes the teaching of science to artisans a very difficult problem, and necessitates a special training for those who are to give such instruction. For many years the city and guilds of London Institute have been brought face to face with the difficulty of this problem. They have tried to solve it in various ways. Latterly they have endeavored to induce apprentices or young artisans to take a preliminary course of instruction in which the principles of science are presented to them in relation to the practice of their trade. This experiment in trade teaching has proved fairly successful. Preliminary courses have been arranged in electrical engineering, in which the simpler problems connected with the fitting of electric bells, and with wiring for electric lighting, have been made to give examples illustrating some of the more important principles of electricity and magnetism. Similar courses have been arranged for apprentices engaged in certain branches of the building trade. In plumbing, for example, in which subject instruction, to be of any value in supplementing the practice, must deal with the principles of science applicable to the trade, young apprentices have been found to be particularly deficient in the knowledge of scientific method. The efforts of the institute to improve the instruction given in the numerous classes supported by local authorities and affiliated to the institute have been singularly successful. The preliminary courses of instruction, judging from the attendance of apprentices, appear to have supplied a distinct want, and the teaching has been of such a kind that the experiments illu3-

trating the principles of science with which the young plumber ought to be made familiar have been taken from the plumber's daily practice. It is only a well-trained and well-educated teacher who can give such instruction. In my address at the opening of the Finsbury Technical College, in 1883, I said:

The teacher who is to inspire confidence in his artisan students must address them in the language they understand. * * * Indeed, the technical teacher ought to be so constituted as to be able to keep one eye on the general principles of science and the other on the industry which his pupil intends to follow.

Where the teacher possesses this educational squint, so to speak, the instruction is found to be appreciated by the young apprentice, but teachers trained to give such instruction are not easily found.

The teaching of the theory of any particular trade will be more satisfactory and will be attended with less difficulty when the young apprentice leaves the elementary school with some knowledge of experimental method and some skill in applying it. The way might be much better prepared than it is for technical teaching. The school board for London has been doing excellent work in its science demonstrations, which will facilitate technical teaching in the future. Other school boards are, I believe, doing likewise. But the consideration of this question would take me too far from the immediate subject of my paper. I want to show only as regards the theory that enters into trade teaching that for the purposes of technical instruction in trade subjects the principles of science must be taught in their special application to the trade, and must be illustrated by examples with which the young apprentice is familiar, and by experiments which he would be likely to need in his ordinary work. You will see, therefore, that the teaching of the theory of any trade must be made to illustrate the practice, just as the teaching of the practice must be made to illustrate the theory. For such teaching a sufficient supply of apparatus and appliances is a first requisite, but the machinery and tools employed in a technical school are used with different objects and with a different intention from those of the factory or commercial workshop.

The technical education board of the London county council has appointed a committee of experts to inquire into the existing facilities for technical instruction in connection with the different branches of the building trades, and as these trades are essentially practical, I hope, as one of the results of the inquiry, that some additional light will be thrown on the problem I have been considering.

Many interesting facts and conclusions have been derived from a similar inquiry, undertaken by the same body, into the best methods of teaching chemistry for trade purposes. There is, indeed, a wide field still open for inquiry and investigation by educational authorities; and while it is evident that the preparation of schemes of instruction must be left to such authorities, or, to quote again Lord Brougham, while "it is conceived that persons of education are better able to determine what course of instruction is best fitted to attain the objects in view," valuable help may be obtained from those engaged in the trade in solving some of the problems that are still full of difficulty in trade teaching.

Some Limitations to Technical Instruction.

By Sir Joshua Fitch, LL. D.

In an assembly composed mainly of those who are firmly convinced of the importance of technical instruction, and who are met to concert measures with a view to make such instruction more accessible and more efficient, it may not, it is hoped, seem irrelevant to invite attention briefly to one or two considerations bearing on the relation of such special training to the larger subject of general education, of which, of course, technical instruction forms a part. We can never form a true estimate of the worth of any kind of instruction—manual or intellectual—unless we

see it in true perspective and proportion, and know the place it should occupy in a scheme of education which regards man in his totality, and not merely on his industrial or practical side.

We are all agreed that our schools have been for centuries too much absorbed in book-work, in verbal studies which sought to train memory and reasoning only, but which failed altogether to give adequate discipline for the eye and the hand, or to fit the scholar for skilled labor and for practical life. Parliament and public opinion have concurred in desiring to correct and supply this grave defect; and the technical instruction act and the local taxation (customs and excise) act are the national expression of a determination to do so. And these measures have already, as we all know, borne abundant fruit. No one can read, for example, the admirable and comprehensive report just presented to the London county council by its technical education board without seeing how completely the higher trades and the whole work of the skilled artisan in London will be transformed ere long by the well-devised efforts of that board to give a more scientific character to the instruction of apprentices and workmen, and so to improve the quality of the work done by them. "In the building, engineering, printing, furniture, silver working, and leather trades in particular, the London artisan has now within easy reach, at nominal fees, opportunities for thoroughly perfecting himself in his trade. * * * Drawing, modeling, and design, which are in many respects the most valuable form of technical instruction for all crafts, are taught in 47 centers, besides many day schools and evening continuation schools." And then in detail the report enumerates the various classes and the forms of trade work:

(*a*) *Building,* with special instruction in bricklaying, brick-cutting, carpentry and joinery, masonry and stone carving, plumbing, and plastering, besides practical and theoretical teaching in architecture and design for those who are aiming at the higher branches of the profession.

(*b*) *The metal trades,* including engineering, electrical fitting, lighting, and plating, the work of goldsmiths, jewelers, and workers in silver, iron and steel.

(*c*) *Book and printing trades,* including engraving, book-binding, lithography, classes for artistic design, photography, and the application of the several arts concerned in the production of books and illustrated papers.

(*d*) *The leather trades,* with the arts of tanning, dyeing, and dressing leather.

(*e*) *Furniture and carriage building.*

(*f*) *Clothing and upholstery,* which offer a very wide scope for skill, taste, and inventiveness.

The descriptions of the various classes engaged in these occupations, and the details of the various processes employed are full of suggestion and of interest, and inspire all of us with great hope. But every one of these manual employments has at its root some department of science. The nature of the material has to be studied, the laws of the various forces—chemical, mechanical, or biological—need to be investigated, and it is an essential part of an intelligent system of technical training that it should be from the first scientific in its character, and not empirical. In all these trades every rule employed which is worth adopting is founded on some principle or natural law which is worth investigating. But I cannot find in such experience as I have gained in technical institutions that attention enough is given to the scientific truths and principles which underlie the various forms of handicraft, and the knowledge of which makes all the difference between the mere mechanic and the intelligent artisan. I should not like to advocate the too early teaching of the science connected with a skilled trade. Still less does it seem to me to be well to encourage the desire on the part of the young student to accumulate certificates in a certain number of sciences—chemistry, electricity, sound, light and heat, and so forth. This practice has, unfortunately, been much encouraged in former times by the regulations of the science and art department. It has led to the result that the young scholar measures his success by the number of sciences in

which he is able to show a certain elementary knowledge, rather than by his thorough grasp of any one of those sciences, or even by his possession of the scientific temper and spirit at all. What we need is, that when the special *métier* of the student is found, and when he enters an appropriate department of the trade and technical school, he should unite the practice of the manual art and the knowledge of the rules of his craft with a thorough knowledge of the particular science which stands in the closest relation to that craft. All through the report of the London technical committee, and of similar authorities in other parts of the country, I find constant complaints of the imperfect grounding which the students have received, and of the need of more general and cultivated intelligence before technical studies can be entered upon to any good purpose. Thus the report on some of the London polytechnics calls attention to the importance of better training in workshop arithmetic. "Experience," says the report, "shows this to be a subject in which the young apprentice or artisan is usually very deficient, and this deficiency has been the greatest bar to the progress of the apprentice on entering the technical class." Again, in the tailoring and dressmaking departments, where cutting out is indispensable, the report points out the value of a previous knowledge of practical geometry, and deplores the fact that even an elementary acquaintance with this subject has to be gained after the pupils have begun the practical course itself. All this points to the conclusion that there should be greater soundness in elementary knowledge, and that what is wanted is more thoroughness in the ordinary disciplinal work and studies of a good school rather than any premature exercises, specially adapted to anticipate a particular form of technical study.

I should like to learn the opinion of experts and especially of the teachers in technical institutes, as to the expediency of providing by the education department a "leaving certificate," which at the age of fourteen might serve to attest that the holder had passed with credit the seventh standard and two at least of the optional subjects, and might also serve as a sort of matriculation or entrance examination into a technical or higher school. This plan will be found at work in France and Belgium and in Germany, where the *certificat d'études* or the *abiturienten-examen* appropriate to the conclusion of the primary school course is regarded as a necessary condition of admission to further educational privileges, and is also held in high estimation by employers of labor, many of whom require a youth to produce it before entering on employment. At present the practice of individual examination has fallen into disuse in our elementary schools chiefly because experience showed that it was an unsatisfactory way of assessing the money grant. But in the interests of the scholar, no less than in that of the thoroughness and accuracy of the school-work generally, I may suggest that a searching and authoritative individual examination should be instituted at the seventh standard; and that a certificate should be granted to those who had attended regularly, had borne a good character, had made a good use of their time, and reached the standard of proficiency appropriate to the end of the primary school course. This plan would, I believe, be very welcome to good teachers, to whom it would afford an opportunity of distinguishing themselves. It would certainly be very acceptable to parents. It would greatly facilitate the entrance of promising boys and girls into suitable employment and into the public service. It would have a useful influence on the whole of the school course, and serve as a check upon slovenly teaching, and even possibly—with reverence be it spoken—upon slovenly inspection. It would provide a new motive for regular attendance, and it would certainly give to the conductors of technical and evening schools a better guarantee than they now possess of the fitness of the young scholar to enter upon advanced technical study. I submit to this conference that its influence might be usefully directed to this point, and that the true coordination of elementary school work with the more developed industrial and scientific instruction in which the conference is most interested would be secured in some degree, at least, by the adoption, as an integral part of our elementary school system, of the

"leaving examination" at 14, and the award, by the education department, through its inspectors, of an appropriate certificate.

Nothing struck me so much in visiting the *apprentice schools*, the *technical schools*, he *écoles des arts et métiers* of the continent as the constant insistence on the pursuit of some of the humanizing or formative studies, concurrently with the special studies bearing on trade and industry. At the *École Diderot* for boys and at the *écoles professionelles* for girls, as I have elsewhere shown in an official report, one half of the day is devoted to the special teaching and discipline connected with the pupil's selected trade; but the morning of every day is spent in the study of literature, in drawing, in mathematics, in composition of themes, and in general scientific training. No one is admitted to the *atelier*, or work-room, in the afternoon who does not regularly attend the morning classes, and it is the testimony of the directors of these institutions that unless the cultivation of the intelligence and the general capacity of the pupil were attended to, *pari passu*, with the hand-work of the apprentice or the trade school, technical instruction would prove incomplete and of small value, and would fail to fulfill even its own highest purpose.

Many of you are familiar with the experience of Socrates, as it is recounted in the *Apologia*. "I betook myself," he says, "to the workshops of the artisans, for here methought, I shall certainly find some new and beautiful knowledge, such as the philosophers do not possess. And this was true, for the workmen could produce many useful and ingenious things." But he goes on to express his disappointment at the intellectual condition of the artisans; their bounded horizons, their incapacity for reasoning, their disdain for other knowledge than their own, and the lack among them of any general mental cultivation or of any strong love of truth for its own sake. He thought that mere skill in handicraft and mere acquaintance with the materials and with the physical forces employed in a trade could carry a man no great way in the cultivation of himself and might leave him a very ill-educated person; that, in fact, the man was more important even than the mechanic or the trader, and that in order to be qualified for any of the employments of life and to be prepared for all emergencies, mental training should go on side by side with the discipline needed for the bread-winning arts.

We have at hand some more recent experience illustrating the same truth. There has been for many years in our elementary schools one kind of manual and technical work specially subsidized by the State, and indeed enforced as an indispensable condition of receiving any aid or recognition from the education department, at all. I mean needlework in girls' schools. It fulfills for girls all the conditions which the advocates of technical instruction have in view for boys. It has unquestionable utility. It affords training for eye and hand. It demands attention, accuracy, and dexterity; and it has an economic value, as a means by which the home may be improved and money may be earned. It enlists a good deal of sympathy among managers, and the Lady Bountiful or the vicar's wife in a country village is often well content to see the half of every schoolday spent, not indeed in learning to sew, but in manufacturing garments for home use or for sale. It is thought by many good people to be the most appropriate of all school exercises for girls. It seems so domestic, so feminine, so practical. Perhaps it may seem ungracious to inquire too curiously into the effect of this kind of exercise upon the general capacity of the scholars and upon the formation of their characters. But as a matter of fact, the exercise is often dull and mechanical, it keeps children dawdling for hours over the production of results which, with more skillful and intelligent teaching, might be produced in one-fourth of the time. The place in which the work is done becomes rather a factory than a school, and measures its usefulness rather by the number of garments it can finish than by the number of bright, handy, and intelligent scholars it can turn out. In fact, it is found that proficiency in needlework may coexist with complete intellectual stagnation, and that the general cultivation of the children, their interest in reading and inquiring has been too often sacrificed to

the desire for visible and material results. Some of the sewing is designated with curious irony, fancy work. But there is little or no room in it for fancy or inventiveness, or even for the exercise of any originality or taste. So while fully conceding the importance of needlework as an integral part of the primary education of the girls in our schools, I think we are all interested in economizing the time devoted to this work, in seeking to employ better methods of obtaining results, and above all in remembering that the educational value of mere handiwork is in itself very limited, and that it ought to be supplemented by other discipline if we desire to make the best of our material and to send into the world capable and thoughtful women, ready for the varied duties of domestic and industrial life.

You will anticipate the inference, which from my own point of view, as an old inspector of schools and training colleges, I am inclined to deduce from these considerations. I entirely admit that our school instruction has long been too bookish, too little practical, and that the friends of technical instruction are fully justified in calling attention to the grave deficiencies in our system, especially to the want of sounder teaching in physical science, and of better training in the application of those sciences, to the enrichment of the community and to the practical business of life. And we are all agreed, too, in the belief that apart from the industrial and economic results of better manual instruction, there may be in such instruction a high educational purpose, that it may tell on character, awaken dormant faculty, teach the better use of the senses, and increase the power of the human instrument over matter and over the difficulties of life. Only do not let us exaggerate the educational value of manual instruction, or suppose that all our difficulties are to be solved by turning our schools into workshops. Without coordinate intellectual training and development, manual training will only accomplish a part, and not the highest part of the work which lies before the teachers of the future. Let us recognize its necessary limitations. And we can do this in at least two ways: First, by aiming at a higher standard of general intellectual culture in the schools from which technical schools are recruited, and thus securing a more solid groundwork for our special instruction. And the second expedient is to urge, whenever possible, upon each of the young people in our trade and evening classes, to take up one subject at least—it may be history or mathematics, or philosophy, or a foreign language—which has no direct or visible relation to his trade or to the means whereby he hopes to get a living, but is simply chosen because he likes it, because his own character is enriched and strengthened by it, because it helps to give him a wider outlook upon the world of nature, of books and of men, and because he may thus prepare himself better for the duties of a citizen and a parent, as well as for an honored place in the ranks of industry.

Reforms in the Organization of Technical Education.

By Prof. Silvanus P. Thompson, F. R. S.

* * * The next point in which reform is needed, and in which it is slowly but surely coming about, is the proper adaptation of the technical training to the needs of the various industries or groups of industries. The sort of training that is right and appropriate in one trade or group of trades may be quite wrong and inappropriate in another. Technical education means a different thing in every trade or group of trades. Take the following cases: In certain handicraft industries, such as that of the zinc worker, every man must be a skilled workman. He needs, besides a large amount of experience to be gained only in the craft itself, a certain knowledge of geometry of a particular kind. He must know something about the properties of metals, about soldering, about corrosion and its prevention. The acquisition of this knowledge does not necessitate many years of study nor compel attendance in any very expensive laboratory; but every man must get something of his training. Take by way of contrast the technical training required in one of the chemical

industries, such as that of the manufacture of dyestuffs. The work in this industry is carried out by a few highly trained chemists, an engineer or two, and a large number of unskilled laborers. The industry depends in no way upon the training of the laborers. It would not be benefited to any perceptible degree by opening evening classes in chemistry for them. On the other hand, its success is vitally bound up in the possession of a few properly trained chemists—men who have devoted three or four years at least of their lives to studying chemistry in properly equipped laboratories. Contrast these two cases—the most extreme that occur to me. In one industry the right and appropriate sort of technical education is the training of the many by a species of not very advanced instruction, which can readily be carried out in any evening continuation school where a room can be spared for a workshop and where a teacher can be found who is himself a skilled metal worker, well trained in geometrical drawing. In the other industry the right and appropriate sort of technical education is the high training of the few in an elaborate course of study, conducted in laboratories expensively equipped and provided with appliances for research, and to which several years are continuously devoted. Either kind of education would fail to meet the needs of the other industry. The man who had spent three years in the continuous study of the higher geometry would find no place in the zinc-working industry, while the chemical factory has no use for the smatterer who has only picked up the bare elements of chemistry in evening classes. The statistics sometimes paraded to show how many hundred or perhaps thousands of students are receiving evening class instruction in chemistry, gratifying as they may be in showing the progress of modern education in science, have really nothing to do with technical education or the development of the chemical industries of the country. One thoroughly highly trained research chemist is worth them all. What provision is made on the Continent for this higher training in chemistry may be seen from the fact that the entire establishment of the Regent street Polytechnic, chemical laboratory, gymnasium, swimming bath, theater, kinematograph, and all, might be accommodated within the space provided for the chemical laboratory alone in the Polytechnic at Munich. The chemical laboratory of the Polytechnic at Zürich exceeds in contents the whole of the technical schools at the People's Palace. The chemical laboratory of Berlin is larger than the whole building of the City of London College. The physics laboratory at Zürich is considerably larger than the whole building of the Finsbury Technical College, and the cost nearly twice as much. They do not play at teaching chemistry in Germany and Switzerland, and their laboratories are frequented by earnest students. Students will remain three, four, or five years in these laboratories to work at research.

And yet, with simple facts such as these staring them in the face, the builders of our technical schools and organizers of our schemes of technical instruction seem to have imagined that at every center of artisan education there must be a chemical laboratory, and that the chemical industries of England were to be regenerated by evening chemical classes for artisans. The first sign of reaction against this extraordinary blunder is to be seen in the recently published report of the special subcommittee of the technical education board of the London county council, who, after taking the evidence of a number of qualified experts, reported with regard to secondary and continuation schools that the teaching of chemistry "should be solely of an educational nature, and should have no reference to practical applications," but that "for the training of chemists who are to advance the industries of the country a prolonged course of study in the elements of physics and chemistry and in the methods of research is needed," while for certain localized industries, such as tanning, leather dyeing, waterproofing, etc., in which chemical processes are employed, they recommend that the teaching should be concentrated "in a small number of institutes which should be thoroughly equipped for the purpose and placed under the direction of technical experts." In other words, the subcommittee tells us that a complete reform is needed so far as the teaching of chemistry is con-

cerned in our technical institutes, that in the chemical industries only the most highly-trained chemists are wanted, and that in the allied industries, like tanning, special establishments or monotechnic institutes are preferable.

There are, of course, other industries which occupy places intermediate between these two extremes. In engineering there is wanted the kind of technical education which makes the skilled fitter, the skilled pattern maker, the skilled turner, and the skilled draftsman. But over and above this there is wanted the highest kind of training for those who are to manage and push forward the industry; and this training must necessarily be conducted in properly equipped establishments, requiring the devotion of two or more years of continuous study, and for which evening courses of instruction are, save in the case of most exceptional individuals, wholly inadequate. It is obvious that the highly specialized and highly equipped institutions suitable for the second of these purposes can only exist in a few places. Great municipal technical schools, like those of Manchester and Birmingham, and important local London technical institutes which, like that at Battersea, lie in an engineering center, must contemplate providing for both kinds of engineering education. In some other towns there is a university college which supplies the higher engineering work, and in such cases it is simply a waste of energy for a second institution to attempt to specialize in this branch. In the textile industries, again, a high degree of specialization is necessary; to train every mill hand in the mechanics of textile machinery or in the technique of textile design is simply useless. Here and there an individual of unusual capabilities may be found, and in a wisely organized system means will be provided to train and develop special talent. The greatest difficulty in the way of such development arises out of the too often imperfect general education of the individual who shows special technical abilities.

Another most important reform is that of so utilizing the facilities for instruction as to develop breadth of view and capacity in those who are trained. This is all the more vital to the future of this branch of education because of the extreme and in many cases disastrous degree to which the subdivision of labor has been pushed in many of the handicraft trades. Formerly the apprentice learned a whole trade; he journeyed about to pick up the outlying branches and widen his experience before he could become a master. Nowadays the apprentice commonly learns under a master who practices but a part of a trade, and he himself is taught only one portion of that part. In the cabinet-making industry and in many of the metal industries the result is deplorable. Men grow up capable of doing but one thing, and are dependent upon a wholly different set of men or upon several different sets to finish what they have begun or to begin the work that they receive from a subsequent stage in the process. The all-round competent hand grows rarer, and trade suffers and workmen suffer at every change of fashion. If judiciously directed, technical education may do much to alleviate this sad effect of the capitalistic tendencies of the past. It ought to be the incessant aim of the organizers of technical schools and classes to broaden the basis of the instruction and to fight against the narrowing tendencies abroad. But this must not be done without discrimination, otherwise it ends in absurdities. A little more than a year ago I listened to a speech on technical education by no less a person than the late chairman of the London county council, in which he advocated the teaching of chemistry to bricklayers on the ground that it would be an advantage to the bricklayer to know something about the chemical causes of the differences of color in his bricks. A grosser caricature of the aim and end of technical education could scarcely have been invented. What is wanted in the education of a bricklayer is not a pernicious smattering of chemistry, which is out of the range of his work, though germane possibly to the trade of a brickmaker, but a widening of the training of the bricklayer in his own craft. How few bricklayers know how to do tuck pointing! How few understand properly the different kinds of bonding! How few have ever learned the simplest elements even of brick cutting! These things they might with great gain

learn, as being things truly pertinent to the technique of their industry, and as such will be taught in every well-organized building trades school. Take, again, the case of the silversmith's craft. How rarely, in the modern ultra division of labor, can the all-round man be found! The chaser can chase but not engrave, the engraver can engrave but not chase; neither chaser nor engraver can do the simplest bit of enamel work, and neither chaser, engraver, nor enameler can do metal spinning or silver casting. Yet here, one would have thought, in an essentially artistic trade, was the chance for rearing good all-round craftsmen. It is cheering to learn from the recent report of the technical education board (1896-97, page 8) that at the Central School of Arts and Crafts, lately established, the subject of gold and silver smiths' work has been taken up "essentially as an artistic craft." "Every effort," they say, "is made to give students a broader view and practice of the craft in which they are engaged." These golden words might well be the motto of all technical instruction. It is to be hoped that it will soon be made compulsory for every technical student to take at least one accessory subject besides the immediate one concerned in his actual employment. Thus every silver chaser might be required to learn also either engraving or enameling; every bricklayer to learn either brick cutting or that part of plastering that is common to the two trades of plasterer and bricklayer; every plumber should also learn lead bossing and lead burning. I can not conceive of any more helpful thing to the prosperity of workmen than such a widening of their experience.

This, again, suggests another reform urgently needed in the organization of technical instruction, particularly in London, namely, the proper selection of subjects taught in the several technical institutes, so that they shall each be developed to the utmost without interfering in one another's work. Admirable as the idea of a polytechnic may be, as an idea, there is no question that good and sound technical instruction flourishes better in the school of monotechnic than in that of polytechnic type. Who attempts one thing well succeeds better than he who attempts everything and dabbles all round. Not one of the London polytechnics is to-day doing as much for any industry as the tanning school is doing for the tanning industry in Bermondsey, or the leather trades school is doing for the Bethnal-Green industry. Very wisely, the Borough road polytechnic has refused to attempt all sorts of so-called technical classes and has concentrated itself on certain groups of trades. So also the Bolt court school is doing an admirable monotechnic work for the printing and lithographic industry. The Shoreditch Municipal Technical School has wisely pushed its cabinet-making classes. The Battersea Institute excels in its engineering side. Without going further, one may hail this tendency as a most hopeful sign. Each institute must find its own appropriate work and do it, otherwise it will inevitably drivel away in the sensations of Pepper's ghosts and diving bells, or whatever may be their modern equivalent in scientific toys. All this points to proper adaptation to the local industries as a desirable line of reform. We shall need more schools than at present we have, but they will be schools where the work is better, more serious, more sincere. A technical institute for training reporters and journalists and a school of foreign tongues for teaching the spoken languages of the world might well be added to the monotechnic institutes of London.

Lastly, we have got to learn how to discriminate between education which is purely secondary on the one hand, and that which is purely "universitary" on the other hand, as against that which is truly technical. It will be an evil day if ever the technical institutes, whether monotechnic or polytechnic in type, neglect their proper work and take to "preparing" their students for university degrees. If they are giving a training that is really of technical value, then their certificate of that training will be more valuable to their students than any university degree. If technical institutes can not make their training of more use to their students than the holding of a B. A. degree, then that training stands self-condemned. As explained above, chemistry is almost the only subject in which the technical training and the

universitary training are really comparable, and the technical training in general goes far beyond anything required for a mere degree examination. In no other subject does the proper work of a technical institute run along the lines of a degree preparation. If it were made a rule in the day departments of our technical institutes to admit no student who had not already matriculated into the university, the case might be different. Yet this suggestion is hardly within practical range If such a rule were possible, how marvelously it would quicken the educational work of those institutes. In this connection it is well to remember that the *abiturient* examination required as a preliminary before entering a German polytechnic is vastly more severe than an English matriculation. How many students in a London polytechnic have, before entering, shown that they can pass an examination in differential and integral calculus? In Germany—and there is no mistake about it—the polytechnic schools are places for serious and responsible educational work. They do not, it is true, teach playing; neither do they play at teaching. If we wish our technical institutes to do as much for English industries as the Continental polytechnics have done for Continental industries, let us learn one thing from them. Let us make the serious instruction of the day classes accessible to all by its cheapness, while excluding the incompetent by entrance examinations suitable to the standard attained in our existing secondary schools.

Evening Schools.

By Swire Smith, Member of late Royal Commission on Technical Instruction.

At a conference of the mechanics' institutes of Yorkshire in 1886 I read a paper on the above subject, in which I made the following statement:

The magnitude of this question of evening schools expands illimitably the more it is considered, and yet if earnestly grappled with it offers the most practical and economical solution of the problem of the technical education of our artisans. There is no country in the world in which evening classes are so necessary, and can be so usefully and cheaply conducted, as in England. There is no country in which they can be so conveniently attended; in no country have young persons engaged in manufacturing pursuits so much leisure.

EDUCATIONAL CONDITIONS TEN YEARS AGO.

The ten years since 1886 have been years of great educational activity. The Royal Commission on Technical Instruction had presented its report to Parliament two years previously, and the recommendations contained in it were beginning to lay hold upon the public mind. In giving practical shape to the conclusions at which we had arrived after inspecting the schools of other countries and inquiring into their influence upon the manufacturing industries which they have been designed to promote, and after making ourselves thoroughly acquainted with the educational organizations of this country and their effect upon the occupations of the people, we made certain modest recommendations which at the time were considered by many educational enthusiasts to be altogether inadequate to meet the requirements of the times. We were of opinion, however, that it was better to ask for a little, with a chance of getting it, than to ask for much and have the favor refused. At that time the subject of drawing, which an education minister had graphically described as "the mainspring of the technical education of the artisan," was not taught to more than one in four of the scholars in elementary schools, and that often so badly as hardly to be worthy of the name of instruction. Elementary science fared even worse than drawing. Modeling was almost unknown; manual instruction had scarcely been heard of—the pen was the only industrial weapon that boys intended for skilled handicraftsmen were taught to use—and domestic subjects for girls, excepting needlework, had not come within the range of practical education. The local authorities, however much they might have desired it, had no power to appropriate any of the ratepayers' money toward the development of the brains of the ratepayers in the way of providing technical instruction or contributing to technical schools.

RECOMMENDATIONS OF TECHNICAL COMMISSION.

The recommendations of the commissioners dealt with the above and many other deficiencies, and it is very satisfactory that several of them have been adopted. Drawing is now taught to all boys, and usually with the aid of suitable casts and examples; modeling has been introduced in many localities; school museums have been established, and elementary science is now extensively taught with, in some instances, laboratory practice. Manual instruction is being given in the most progressive schools, and in agricultural districts the facts of agriculture are being taught, to which has been added the use of tools, with practical instruction in garden plats. In addition to drawing and needlework, the elements of cookery and household management are being taught extensively to girls. The above subjects influence the prospective life work of the scholars and prepare them on becoming apprentices to take up in the evening classes the special subjects of science and art which have a bearing on their daily occupation.

TECHNICAL INSTRUCTION ACT.

But the most memorable and effective impulse to technical education and evening schools has been given by the passing of the technical instruction act of 1889, which enables local authorities, to the extent of one pence in the pound sterling, to build and maintain technical schools and contribute to technical evening schools out of the rates. This was followed by the local taxation act of 1890, which practically handed over certain of the profits of the excise, amounting to about £750,000 a year, to the county councils and county boroughs of the country, empowering them to devote, if they were so disposed, the whole of the funds toward the promotion of technical instruction. The embodiment of these simple acts into practical legislation is silently working a revolution which is already most favorably affecting the civilization and industrial efficiency of all who have been brought under its influence. England is proverbially slow in the adoption of reforms, but it is satisfactory to state that already 172 municipalities and local authorities, including London and others of the largest cities, have adopted the technical instruction act, while of 126 county councils and county boroughs in England and Wales, 111 have devoted all their funds derived under the local taxation act, and 13 the larger part to that purpose, the amount last year being £724,000. The county councils of the agricultural as well as the manufacturing districts, where, in many instances, not the slightest interest had been taken in technical instruction, are devoting themselves to their new duties with conspicuous energy, and although, as was inevitable, some mistakes have been made, there are many instances of most gratifying success. The public authorities that are entering upon this business are "learning by doing," and among them there is an encouraging spirit of cooperation and of friendly rivalry. The county councils in many instances have followed their own methods, without any general organization, in allocating the funds at their disposal. The most advanced have organized their areas somewhat on the model of the science and art department of South Kensington, with responsible local committees, giving grants on buildings and apparatus, attendance, examinations, lectures, etc., and providing scholarships with maintenance, enabling painstaking students of the artisan class to pass from elementary day or night schools to the highest technical and university colleges. Others have distributed the grants according to population—leaving the administration of them to the various local authorities themselves—a more doubtful proceeding. Concurrently with the beneficial assistance of the county authorities, there has been an increased demand upon the education and the science and art departments, the latter of which has recently issued a new code of regulations for evening continuation schools, embracing literary subjects, languages, science, and commercial subjects, covering the whole field of preparation for those in search of useful or refining knowledge. The above agencies—cooperating with the school boards, voluntary school managers,

the Recreative Evening Schools Association, and the Society of Arts, guided in many instances by the National Association for the Promotion of Technical and Secondary Education—have put new life into the evening continuation schools of the country, enabling vast numbers of young people to rescue their school knowledge, which was in many instances rapidly disappearing, and to make it distinctly available as a help to the business and pleasures of life.

TEN YEARS OF PROGRESS.

The following figures from the report of the Recreative Evening Schools Association indicate the progress of evening schools during recent years:

Year.	Schools under inspection.	Scholars on register.
1886	841	42,423
1896	4,347	298,724
Drawing was taught in elementary day schools as follows:		
1886	4,446	870,491
1895	20,506	2,229,718

Under the science and art department the total number of students under instruction in science, art, elementary drawing, and manual instruction was, in—

1886	students	1,046,793
1895	do	2,641,388

These figures give evidence of great progress during the last ten years, amounting to a sevenfold increase in the scholars of ordinary continuation evening schools, and to more than two and a half times the number of students in science, drawing, and manual instruction under the science and art department.

There are 70 new technical schools which have recently been opened, involving an outlay of £768,000. There are in addition 67 schools in course of erection, or about to be erected, of which 55 are estimated to cost £756,000, the total being 137 schools, and representing an expenditure of £1,524,000. Another indication of the development and increasing popularity of this movement is to be found in the fact that the State expenditure on education, which amounted in 1872 to £1,077,894, in 1895 reached the sum of £7,644,885.

CITY AND GUILDS OF LONDON INSTITUTE.

A great impetus was given to technical instruction, especially in the manufacturing towns, beginning in 1876, by the organization of classes, and by practical examinations in the application of science to the industries of the country by the City and Guilds of London Institute, comprising the worshipful companies of mercers, drapers, fishmongers, goldsmiths, merchant tailors, vintners, cloth workers, leather sellers, carpenters, and others, which have taken such a generous and cordial interest in the promotion of this congress.

The technological classes of the institute are held in 63 subjects representing as many trades, in which practical instruction is being given. In 1886 there were 329 classes, with 7,669 students, and in 1896 there were 1,128 classes, with 26,609 students. The increase in the attendance is not more remarkable than the improved quality of the instruction and the higher standard of the examinations during the period.

By their organization of the above classes and by their splendid contributions to the People's Palace, and the polytechnic institutions of the metropolis, their erection and maintenance of the Finsbury Technical College, the South London School of Art, and, above all, of the Central Technical College for the training of engineers, industrial chemists, and technical teachers, these London livery companies have rendered invaluable service to thousands of students, and have thereby most favorably influenced the industries of the country.

CLOTH WORKERS' COMPANY AND TEXTILE SCHOOLS.

Nor can I, as coming from Yorkshire, abstain from acknowledging the great public services rendered by the Cloth Workers' Company to that county. It is now more than twenty years ago, at a time of great depression and suffering among the textile industries that the Cloth Workers' Company, of London, conceived the idea of rendering practical assistance to the wool industries of Yorkshire. Successive masters and leading spirits of the company, with the untiring assistance of their esteemed and public-spirited clerk, Sir Owen Roberts, made frequent visits to West Riding towns, where they were brought face to face with the difficulties of manufacturers and operatives in meeting the competition of their continental rivals. They recognized that the weakness of our position was not due to inferiority of machinery, or of manual skill, but rather to the scientific and artistic knowledge of the competing foreigner which could only be permanently overcome by "finer knowledge" on the part of the Englishman. They therefore boldly and generously challenged the public-spirited men of the various manufacturing centers with the offer in each instance that in proportion as they would help themselves in the erection of suitable buildings for technical instruction they would help them, not only by grants to the buildings, but by annual subsidies toward their maintenance. And what was the result? The challenge was accepted by every manufacturing center in the county, and it was to this practical initiative that the woolen and worsted manufacturing towns of Yorkshire owe their technical schools, and to the same cause the recent progress of the wool industry is largely due. But their wise and far-seeing generosity did not stop here. At their own cost they built and equipped a central textile college as a department of the Yorkshire College at Leeds, with all the practical, as well as the theoretical aids to the complete instruction of those intended for the textile industries. The new laboratory for dyeing research, which, without regard to cost, has been furnished with the most modern appliances for the prosecution of original research and for the conducting of experiments, bids fair to institute a new departure in the invention of colors and in their application to textile fabrics. In the necessary provision for the higher instruction of those engaged in the manufacture of textiles, in which this country has been so lamentably inferior to its continental neighbors and has temporarily lost some of its best business in consequence, the Textile College at Leeds stands forth as a noble institution, offering facilities for the highest technical training in the departments of weaving, dyeing, and finishing, which, so far as the wool industry is concerned, are not surpassed by those of any similar institution in the world. I am glad to be able to express the testimony of the best authorities to the fact that at the present time the wool industry of Yorkshire—both the woolen and worsted branches—is fairly able to hold its own against its competitors, and if it can not be said that this result may be credited entirely to the technical schools, so generously supported by the Cloth Workers' Company, it is certainly due to the improvements in designing, dyeing, and finishing of the goods, which it is the aim of the schools to promote, and to the greater skill, efficiency, and energy of those engaged in the trade.

SUPERIOR EQUIPMENT OF CONTINENTAL COUNTRIES.

The general provision for technical instruction in this country, especially in the higher branches, is as yet incomparably inferior to that of the leading continental countries. We have neither the buildings, nor until recently have we possessed the legislative means of obtaining the necessary financial aid, but perhaps at the present time our greatest inferiority is in the lack of preparedness on the part of the great bulk of the scholars when they leave the day schools.

The humiliating confession was recently made by the president of the National Union of Elementary Teachers that, with a register of 5,326,000 children last year, the average attendance was only 4,346,000, and that practically two-thirds of the

scholars (many by having passed the exemption standards of the local authorities, and many more by evasion of the school laws) leave the school at the age of 11, when their real education can scarcely have begun, and at a time when technical instruction, if offered, can hardly be understood by them.

All our efforts to bring the masses within reach of higher instruction, either in day or evening schools, will be seriously retarded while this state of things exists, and it should be the first duty of all patriots to combine in so strengthening the school laws that no scholar will be permitted to leave the day school under 13, unless there are exceptional and satisfactory reasons for exemption. It would appear that less than one-sixth of the children remain after 12, including the half-timers, who, on passing an easy examination at the age of 11, are allowed to work half-day in the factories till 13 or 14, on condition that they attend school on the other half. * * *

LEISURE OF ENGLISH OPERATIVES.

Although, as I have shown, the overwhelming proportion of children leave school and join the ranks of the workers at an earlier age in the United Kingdom than in some continental countries, there is no country where they have so much leisure after their daily labor. In the textile trades employing young persons and women the factory acts are rigidly enforced, limiting their hours of labor to fifty-six and one-half per week, while in the great mechanical industries the hours of the adult men, and boys above the age of 13, are more generally fifty-four per week. At from 5 to 5.30, and in fewer instances at 6 p. m., on five days per week, and on Saturdays at from 12 to 1, the workshops and factories are closed. In England the evening classes usually begin at from 7 to 7.30, and on Saturday the half holiday leaves all factory operatives free. In continental countries the operatives in similar industries work sixty-six or more hours per week, leaving the factories at from 6.30 to 7.30 in the evening, while there is no Saturday half holiday. I have frequently visited evening classes which did not open till 8.30 or 9, in order that apprentices might be able to attend after their work.

My colleagues on the technical commission will bear me out when I say that in every department of education in the more advanced continental countries that we visited, we were almost invariably drawn to the conclusion that the buildings, methods, apparatus, and organization of education were in advance of our own. When, however, we inspected workshops and factories, and learned the conditions of employment, and the wages and hours of work of the artisans, we were equally drawn to the conclusion that in these matters the advantages were on our side. Our industrial life has been founded on workshop practice, and it is in practical skill and efficiency that our workmen have excelled, and have thereby been enabled, in spite of educational deficiencies, to relax the harder conditions of long hours under which their rivals have labored. Since the time of our inquiry, 1882, I rejoice to be able to state that there has been considerable prosperity among all the nations, accompanied by a marked improvement in the lot of the toilers, but we still retain the lead in the splendid advantage of leisure possessed by our people. But this greater leisure which is enjoyed by British operatives is purchased at a sacrifice of at least a full working day per week, and the wages thereby represented as compared with other nations, and I regret to say that in many thousands of instances the time is absolutely wasted. We can only pay for our immense imports of food and raw materials by exporting the products of our labor and skill to the world's markets where we have to accept as low a price as our competitors who possess a higher educational equipment than ourselves, and whose industrial position is every day growing more formidable. Our extra leisure may confer upon us, as in most instances I believe it does, much compensation in a renewal of force and energy on the part of our workers, but unless it can be used for promoting their higher skill and knowledge so as to improve the quality or lessen the cost of our productions, it may become a penalty that we put upon ourselves for the benefit of our rivals.

GREAT IMPORTANCE OF EVENING SCHOOLS.

In giving our attention to the millions whose education on leaving the day schools must necessarily be incomplete, the organization of attractive evening schools in which their education may be appropriately and usefully continued should be our constant care. Experience shows that the better the preparation in the day school the greater will be the demand for, and the more effective the instruction obtained in, the evening school. It is when the boy enters upon his career as a wage-earner that he realizes the true meaning of education; it is only then that he begins to know what he wants, and the night school only can effectively supply the deficiency. What is absolutely necessary is that every boy in every elementary day school, in addition to drawing and elementary science suited to the needs of the locality, shall go through a course of manual instruction, and the girls through a similar practical course in cookery and domestic economy. Such training will furnish the basis of technical instruction for the artisan population. The establishment of public secondary schools, leading from the elementary to the higher science colleges and universities, can not much longer be delayed, and these, in conjunction with the secondary, technical, and commercial schools already existing, and equipped, where necessary, with laboratories and appliances for practical instruction, will furnish such theoretical training as will materially help those of higher ability who are preparing for the more important positions in the manufacturing, distributing, and commercial branches of business. In fact, the day schools, both elementary and secondary, may be compared to nurseries which prepare students, on becoming apprentices, to take up in the evening classes, and I hope in the same schools, the special subjects of science and art connected with their daily industries. Experience has already amply demonstrated that these young men, with nothing to unlearn, can return from the workshop to their familiar class rooms and pursue their technical studies with a measure of enthusiasm and success altogether unknown to students who have not had the same advantages of preliminary training.

It will be understood that, as practical men, we must make the most of the means at our disposal, in many instances limited, and of the material, often crude, that we have to deal with. Our organization must be as elastic as possible, not rigidly enforcing in all instances the prescribed courses. A youth often attends an evening school for specific instruction, and to compel him to go through any special curriculum would frequently drive him away. He had better learn something that has no bearing upon his daily employment than not attend the class at all; and, much as I believe in the instruction that will afford them bread and butter, I am at the same time always glad to see our young mechanics give their attention to literature or poetry or music. Indeed, in many instances, they may derive more intellectual benefit and enjoyment from the study of subjects that are remote from practical application than from those which bear more directly on the means of their existence.

Through the powers which are now possessed and are being so rapidly utilized by the public authorities, taken in conjunction with the leisure of our people, the facilities for instruction in evening classes in the United Kingdom will soon be unsurpassed by those of any country. The continuation schools to which I have alluded, the classes in science and art under the science and art department, the technological classes for every trade that are promoted by the City and Guilds Institute, the university-extension lectures, and courses of instruction supplied by the county colleges, such as those of the Victoria University at Manchester, Leeds, and in many other centers, are capable of untold extension and usefulness.

QUALIFICATIONS OF TEACHERS.

In some of the best schools on the Continent the technical commissioners found that the teachers were exceptionally conversant with the practical applications of the theories which they taught. The English teacher will have to give instruction to apprentices engaged in local industries of which he ought to know more than

they, and it is important that he should keep in touch with daily usages, adopting workshop terms and methods where he can thereby the better elucidate his subject. Beyond the occasional application of scientific principles to practice there is no great need for the extensive duplicating of the machinery employed by apprentices in their daily labor. In the varied applications of theory to practice in the textile industries a more extensive mechanical equipment may be necessary, but I think that experience shows that upon the whole the evening class should supply the maximum of theory with the minimum of practice, rather than the reverse.

VALUE OF SOUND PRINCIPLES.

In art matters, also, it is more important that the student should be instructed in principles of art than that his faculty should be immediately applied to industrial purposes. Our practical manufacturers protest that they want designers and not picture painters, forgetting that the power to paint the picture carries with it the power to design, and that to limit the artist in the cultivation of his faculties is to spoil and not to make the designer. I have observed that many manufacturers would have students taught to design textiles before they have learned to draw, or to receive instruction in dyeing before they have mastered the elementary principles of chemistry. There has been this inherent defect—this lack of artistic or scientific basis—in most of our technical instruction hitherto, which has left our students still behind many of their continental rivals. We shall, however, learn by experience that in the long run it is better that a student should be trained in art generally, and allowed to develop his imagination and taste by applying his knowledge to his particular industry, rather than, as is too often the case, he should skip the exercises and become a mere copyist of the designs of others. In visiting the continental schools that had exercised the most marked influence on manufacturing industries, the technical commissioners almost invariably found that the true province of the school was never subordinated to the mere teaching of a trade. In pottery, metal work, or textiles, the artistic basis of the instruction was ever kept strictly in view. The director of one of the most famous textile schools said to the commissioners, "Pray do not call this a weaving school; it is a school of art applied to weaving;" and surely the definition was a proper one. The practice of weaving can best be taught in the factory; but art or designing, applied to weaving, comes more distinctly within the province of the suitably equipped school with its examples of pure art and its canons of good taste; and what applies to textiles applies to all industries and handicrafts having an artistic basis. In the same way a dyeing or color-making school would be a school of chemistry applied to dyeing or chemical industries, and the students, trained in principles and in original research rather than in the working out of receipes dictated by a professor, would ever be ready for dealing with new agencies or inventions.

TRADE TEACHING NOT MOST ESSENTIAL.

I have given some prominence to these elementary truths because so many members of county councils and governing bodies, in their enthusiasm for rapid results, would actually make it their object to teach trades in schools rather than the underlying principles affecting our industries which it should be the aim of the schools to instill into the minds of the students. Besides, it is important that students should have some choice of subjects, so that they may give attention to those for which they may have the greatest natural faculty. To organize the technical instruction of a locality so as to develop its special industries has been found in many instances to be a good thing. On the other hand, to organize the instruction so as to develop the special faculties of the students has proved to be a still better thing. The former system tends to the concentration of a trade or a branch of a trade in a given locality, and where there is such concentration there is often exceptional energy thrown into it; but there may also be irregularity and fluctuation

in the employment of the people accompanied by alternating periods of inflation and corresponding depression. The latter system tends to the diversifying of the existing manufactures and to the introduction into a locality of new industries, and as it seldom happens that all are unduly busy or depressed at the same time, employment is often more regular and steady. It is idle to suppose that technical schools in small towns do not affect the industrial position of the nation. The fact is that the talent of the nation is so distributed that unless facilities for its development are provided in the smaller places much of it will be lost forever, but, on the other hand, when once trained it will be available for the world.

FACILITIES MUST BE OFFERED TO ALL.

It has been said by the critics and those candid friends who are ever ready to throw cold water on this movement, that the value of technical education first comes in with those "who emerge from the class of manual workers," the directors of labor, the foremen or those who work more with their brains than with their hands; and that while it may be prudent to spend public money on the training of the talented, it is a waste of money and of effort to attempt any widespread diffusion of technical education among the ordinary workmen. But our critics have never pointed to any method whereby the few may be selected from the mass. The sifting process must begin among the young, and it is not revealed to us when we see the children at the school, or even the apprentices at the workshop, how to distinguish those who will be the future brain workers or foremen. Professor Huxley said it was worth spending a million to discover a Faraday, and so to find the specially capable we must give facilities to all who will come. It must also be noted that it is not usual to find the foreman or even the adult workman in the class room. By the time that he has risen to a leading position he is no longer a student. In my own experience—going back many years—of the organization of evening classes in my own town that have been attended by thousands of artisans, I find that in the engineering shops, the building trades, factories, and large industrial establishments, the foremen, draughtsmen, brain-workers, and many employers now in middle life began their career as apprentices in the lower ranks of labor. But nearly the whole of these industrial leaders passed through the evening classes of the Keighley Institute 10, 20, or even more years ago, and if the technical classes in those days had only been open to foremen and brain-workers they would have been excluded. The students of to-day are youths and young men, most of whom are probably ordinary apprentices and workmen, but I have not the slightest hesitation in saying that from their ranks the future brain-workers, foremen, and employers in their various industries will rise, and those who may be destined to remain in the rank and file of the industrial army will be all the better as men for the wider cultivation and refinement which they obtained through their studies and reading. * * *

The True Basis of Technical Education.

By W. Slingo, Principal Telegraphists' School of Science.

The author of this paper first turned his attention to the question of technical education about twenty-three years ago, and it is hoped, therefore, that this congress will accept the few remarks which are now addressed to it as expressing the opinions of one who is largely interested in the question, and also as one who has had ample experience upon which to base such opinions.

The author is anxious that the managers of our technical schools and colleges should have some clear and definite course of action laid down for their guidance. At present the state of affairs is, as will be demonstrated in this paper, little short of chaos.

Initially, the real and ultimate aim of true technical education should be set forth. The air just now is full of wild ideas about the general elevation of mankind, the

approach of a sort of intellectual millennium, the appropriation of the commerce of the world, and numberless other topics of a similar character, but all of which are being paraded by so-called educationalists as coming within the scope of technical education. The proper test of technical education should be its commercial value, but there is considerable danger of that value being greatly overestimated. Attention is naturally directed to Germany, where such education has attained its, at present, highest development, and the prominent position which Germans have in recent years acquired in the commercial world has caused many to assume that that position is due entirely to the system of education. The equalizing effects of the telegraph, of railways, and generally of increased facilities for transport and correspondence are of course ignored. It is, however, more than questionable whether, if the German system of education had been applied in any other continental country, similar commercial progress would have resulted. The main causes of Germany's progress are to be found in the general industry of her sons, in the determination with which they pursue their objects, in the low rate of wages for which her workmen are content to labor, in the low profits which the masters are content to receive, in the general sense of discipline inspired by her military system, in the greater relative power of capital as compared with labor, in the influence of a fostering government, in their general business capabilities, and last, but not least, in the way in which they utilize their technically trained men.

In this country a vast amount of money is spent annually on what is termed technical education, and yet so injudiciously is this money spent that there are not wanting competent judges who insist that we should be better off without the results obtained thereby.

From the author's point of view, the first great aim of technical education should be to fit the student for a particular industry, and to give him such weapons as will enable him to prosper in that industry. The result of such education should be that he could perform his own particular work in a superior manner, in a shorter time, and with less expenditure of energy than he could in the absence of such education.

The necessity for the general adoption of some system of technical education has become more and more evident as the ancient system of apprenticeship has gradually died out. This ancient system of apprenticeship was one admirably adapted to the conditions of life, and to the requirements of the time. The apprentice lived with his master, learned the manual portion of his trade in the shop, and received from his master such instruction as he could or was disposed to give in the arts and mysteries (i. e., science) of the particular industry. The instruction was oral, nothing was committed to paper, and the secrets of the trade were handed down from generation to generation. This system tended to limit the number of entrants into any one trade, and thereby to prevent the overcrowding of any particular labor market. On the other hand, development was hampered by the system; the methods of one establishment did not become known at another; the apprentice had to assume a very humble and often menial position; his life was frequently very hard, the feeding often inadequate, and the flogging none too rare. Nevertheless, a highly skilled master had at all times many candidates for apprenticeship from whom he, as a matter of course, selected the most promising. Taking all the circumstances into consideration, it is scarcely to be wondered at that the system produced a greater proportion of first-class workmen than exists at the present time. One weak point consisted in the comparative narrowness of the education received, consequent upon the fact that the apprentice had no source of information other than his master or his master's shop.

At the present time it is too often the practice for a lad to enter some firm or establishment as a sort of odd boy; if he picks up sufficient knowledge of the business and does what he can to become proficient in the work, he in time blossoms out as an artisan; but if he neglects such opportunities as may fall in his way he remains a laborer to the end of his days. No attempt is made by the master to educate his

boys, and the natural result is a lowering of the standard of skilled labor and the flooding of our markets with shoddy work. In such circumstances, it is not to be wondered at that the public appreciation of good work has been degraded, and the consequence is that the price which has to be paid for good work is very often regarded as sheer extravagance.

It is to the remedying of this defect, to the recovery of the lost ground, that the attention of our educationalists should be directed, but the trouble is that there are generally three parties to be educated, viz, the artisan to turn out good work, the master to see that it is to his interest and credit to pay for good work, and the public (i. e., the purchaser) to recognize that it is to his advantage to have only good work, even though the cost be a little higher, for after all the difference between the cost of good work and shoddy is, in the great majority of cases, only a small percentage of the total outlay involved.

It is the purpose in this paper to deal mainly with the workman; let us call him the apprentice although he be little more than a boy doing odd jobs, and picking up such information as may fall in his way; or we may suppose him to be a young fellow who has just been raised to the dignity of a mechanic or an artisan. Whatever for the moment his exact position may be, he is in one respect in very much the same position as the apprentice of old. He has picked out for himself, or circumstances have placed him in, a particular trade, and he desires to prosper in that trade. He can only pick up the crumbs of knowledge and experience as they fall from the hands or lips of his older comrades, but the great fact remains that he is in a trade, he has a trade to follow, and he is anxious to learn all he can about that trade. We are not concerned with that type of youth whose only desire is to do as little as he can in return for his wages, and to ignore altogether the interests of his employer. Such a youth is soon recognized. But to return to the cardinal point. The lad has adopted a trade—the practical lessons he receives and which correspond to that part of the education of the old-time apprentice which was gained in his master's workshop, are the aforesaid crumbs which he picks up. Where is he to get the counterpart of the explanation of the arts and mysteries as imparted by the master of old time? Clearly this is the breach where our polytechnics and technical schools should step in, and they do step in, but only with one toe of one foot. The rest is left outside; the breach is not filled; the solitary toe soon gets trodden on and is withdrawn, and our poor apprentice is once more without an instructor. To make this important point clear is to demonstrate the inutility of much that is now being done in the name of technical education. Let us suppose that our apprentice has the incentive to avail himself of the facilities afforded by our polytechnics and technical schools. When he has selected his "institution" he attends for the first time with confidence, but he speedily finds that the men who should be prepared and able to teach him how to become more skilful at his work might, with advantage, take a few lessons from him. Frequently his would-be teachers are young men fresh from some other technical institution, and the workman discovers that they are merely prepared to coach him up for an examination or two, thus enabling him to obtain certificates but not skill. The examination papers are in too many cases set by some professor guileless of any real practical knowledge and absolutely incapable of coming down to the level of the workman. As both the professor and his assistants who prepare the examination papers for him base their work upon the same books as those from which the teachers derive their information there can be no doubt that such teachers are or should be well qualified to cram the student so that he can obtain his certificates. Indeed, a genuine and really capable teacher dare not waste much time in imparting really useful information to his students because, in a technical institution, the efficiency of a teacher is generally judged by the number of certificates gained by his pupils, and knowledge which is useful to a man in his work is not, as a rule, worth anything in an examination. In the course of a week or two, then, our apprentice sees through this and grasps the fact that

he can derive very little benefit from a course of lectures arranged to be acceptable to and comprehended by the majority of the students (mostly amateurs), and he loses at once any confidence he might have had in the lecturer when the latter essays to describe the fundamental principles of the underlying science in a language unknown to him, when the lecturer proves himself utterly ignorant of workshop practice and language, and when, as generally happens, he describes as current practice methods which have long since been abandoned. The immediate consequence is that our apprentice, for whom, or such as whom, the class ought primarily to be conducted, will, if he be a simple-minded man, desert the class by the end of the first month or so and will do his best to dissuade his fellow-workmen from making a similar attempt.

It might be imagined that such abortive efforts on the part of our apprentice would, if frequently repeated, have the effect of entirely depriving technical institutions of pupils, but, unfortunately, the very imperfections of the system enable it to survive. The exclusion of the artisan who can not write neatly and is unable readily to give evidence of his knowledge in an examination paper is not felt as a serious loss either by the teacher or by the institution. On the other hand, it is a distinct gain, because the field is now open to another class of students, many of whom would hesitate to mix too freely with the average artisan—a class consisting largely of youths who have recently been turned out as finished by the board schools; of school-teachers anxious to obtain certificates, no matter what the subject may be, providing that those certificates can be obtained with the minimum amount of work; of clerks in offices and factories, and of shopkeepers' assistants, with a sprinkling of unskilled laborers and a few craftsmen in other trades anxious to provide a second string to their bow. To such a class of amateurs the teacher, no matter how good or how earnest he may be, must now adapt his lectures, and in the event of a student like our apprentice remaining in the class he must be content to listen to a vast amount of talk meaningless to him and often bristling with inaccuracies. For the existing system of examination such pupils are exactly those required by the teacher to obtain good results, and he is assisted rather than otherwise by the distressing fact that few, if any, of his pupils ever have had, or ever will have, either the opportunity or the inclination to test his precepts by practice.

It may, perhaps, be asserted that this doleful picture is altogether overdrawn, but the recital of a few simple facts will suffice as a refutation. One city clerk was in his year the prize carpenter in the United Kingdom; another took the prize in electric lighting; another the prize in electrical instrument making; another in tools, and another, who had never been out of London for more than a week or two at a time, obtained a certificate qualifying him as a teacher of agriculture. A schoolmaster became a prize electrical engineer and an ironmonger's clerk a prize electrical instrument maker. Another teacher, who had in all probability never seen the inside of a telegraph station, blossomed forth as the first prizeman in telegraphy, and was inferentially the best trained telegraphist in the Kingdom.

Now, the principle of examinations is not to be blamed for these results. The fault lies entirely with the examiners, who too often base their examination papers solely on certain text-books, ignoring altogether the thousand and one points of detail and application which never get into text-books at all. The author has in mind one paper in an electrical subject, in which twelve of the fifteen questions were based entirely on theoretical electricity and could be answered by anyone who had gone through a moderate course of instruction in electricity, but who had never had any practical connection with the subject. * * * There is another source of trouble and waste in our present system, which may be called the overlapping or duplicating of classes. Owing to the present want of cohesion between the various schools, each school is worked as a separate entity and each school opens classes in as many subjects as it can find even a few pupils to attend, oblivious of the actual requirement of the vicinity and of the work which is being done by neighboring institu-

tions. This is particularly the case in London. To take only one subject, that of electrical engineering. There is already more than sufficient machinery in the many London schools to provide for the requirements of the whole industry throughout the entire Kingdom.

Enough, it is thought, has beeen said to show that, in so far as what is herein considered to be the true objective of technical education is concerned, by far the larger portion of the money which is being spent upon the so-called technical classes is absolutely wasted, and often with pernicious results. But the leaks do not end here, for in many cases, cases which frequently come under our notice, the lecture rooms and laboratories are provided with quantities of costly apparatus which neither the teacher nor the student knows how to handle, and which is therefore damaged and ultimately destroyed by being kicked along the floor or allowed to lie about until it falls to pieces.

What is the remedy for all this waste and mischief?

In the first place, the examiners should improve their papers and make them such that only students practically acquainted with the various industries could answer them. Certificates should be withheld unless such a practical acquaintance can be proved. The questions should be framed in simple, accurate, and unmistakable phraseology.

Secondly, schools should be grouped together, each to specialize in one or two branches of industry, according to the requirements of the locality.

Thirdly, the teachers should be men actually engaged in responsible positions in the several industries.

Fourthly, the instruction should be arranged exclusively for men engaged in the several industries. Amateurs or outsiders should only be admitted on payment of a decidedly remunerative fee. Every bona fide student should be required to take courses of instruction in the science subjects allied to his particular technical subject. Let the fee for these students be an inclusive one, to cover the allied subjects.

Fifthly, there should be an annual inspection and stock taking of apparatus and materials, as a check, not against the actual stock, but in reality against the use which has been made of it.

It is believed that if a scheme similar to that which is now suggested were carried out the various institutions would in a short time draw the right class of students, and in sufficient numbers to meet all requirements. The theoretical classes might be thrown open with certain restrictions to all comers. In this way the good that our technical institutions might accomplish is incalculable. The author would like to demonstrate this by showing what is being done in and by the school which he founded twenty-one years ago. None but telegraphists are admitted; nothing is taught but what is likely to be of service in the practice of telegraphy; every student is encouraged to take, in time, every class in the time-table. In the superior, or third year, classes no student is allowed to enter unless he has attended successfully all the classes prescribed for first and second year students. We started with 5 students and now number 350. All the instructors were trained in the school, all were telegraphists and are still actively employed in the service, and all are medalists. The Postal Telegraph authorities are convinced that a technically trained telegraphist is more valuable than a simple manipulative telegraphist, because he is able to detect faults and regulate his apparatus as required by the varying conditions of the lines and the fluctuations of the traffic. And by a recently issued order of the Postmaster-General every telegraphist of 24 years of age and upward who is not already receiving his maximum scale of pay, and who can produce a certificate from the Science and Art Department and the City and Guilds Institute in Electricity and Telegraphy, respectively, has £6 added to his salary every year until he attains his maximum. Last year no less than 19 of the students obtained superior appointments on account of their technical training, and such are a few of the results of technical education carried out on lines which this international congress is asked to indorse as the correct and only true basis of technical education.

Commercial Education in England and America.

By Bernard de Bear, Principal Pitman's Metropolitan School

In preparing this paper one of the main objects has been to endeavor, as far as possible, to remove the extraordinary misconception that exists in the public mind as to business training institutions and their methods in this country. Quite recently I was present at a debate on "Commercial education," which took place under the auspices of the London Chamber of Commerce. One of the principal speakers at that discussion was a prominent member of the London county council—one, indeed, whose special energies have been directed to the subject of education in various forms—and I was astounded to hear from his lips the utterance that "commercial business colleges were practically nonexistent in this country, or, in other words, that no gentleman would care to send his children to such as were established." It is with the object of combating such injurious and reckless statements as these that I have brought together a few facts in order to show what is being done for commercial education in this country by private enterprise and energy alone, and that despite the sneers of those who should be its wellwishers if not its supporters.

As to the statement I have quoted, I will content myself by saying that it is absolutely untrue. The institution with which I have the honor to be connected is the parent institution of the kind in this country and has been in existence for twenty-seven years, in the course of which it has received as pupils members of the highest families in the land, representatives of all the learned and honorable professions, and, in short, a patronage of as good status and social position as that bestowed upon any of the best public schools in the Kingdom.

In the spring of 1895, I paid a visit to the United States, with the object of inquiring into the methods of business training in America. I visited over twenty of the best business training colleges on the other side of the Atlantic, in such cities as New York, Philadelphia, Washington, St. Louis, Chicago, Detroit, Cleveland, Albany, and Boston. In the States, at any rate, I found that students at these colleges were drawn from the very best families in the country, and though it is inevitable that the class of student at a business college, whether in England or America, should be a mixed one, yet it is a fact that the large majority of the pupils represent what we call "the middle and upper classes." These institutions play an extremely important part in the business life of the United States, for not only is a finishing course in business considered a fitting termination to the young American's educational career, but the majority of the business houses in the different cities of the States depend upon these colleges for the supply of assistants to be engaged either as bookkeepers, stenographers, typists, or in any other capacity.

As a rule, the American business college insists upon its students taking up a complete course of study as mapped out in its prospectus; unlike the method adopted in this country, as I shall presently show. The fees for tuition average about $35 to $40 per term of ten weeks, or $100 per year; say £20 of English money.

The commercial course of study comprises bookkeeping—single and double entry—commercial arithmetic, penmanship, commercial law, business correspondence, business forms and methods, banking, insurance, commission, real estate, transportation, brokerage, wholesale, retail, importing, and jobbing. There is usually a separate course for shorthand and typewriting, which includes grammar, spelling, dictation, and practice in office routine; and another course, called the "English course," for those students whose elementary knowledge is not sufficiently sound to warrant their entry into the higher departments. This course comprises: Arithmetic, penmanship, English grammar, reading, spelling, United States history, geography, and letter-writing

I may best indicate the scope of the work of these institutions by quoting shortly from the prospectus of one of the soundest of these American colleges, as follows:

This college is devoted to the special training of young people who intend to devote themselves to mercantile or allied pursuits. Its course of study is arranged with the aim to develop the business capacity of the pupil, and to impart a knowledge that will lay the foundation for a successful business career. The essential feature of the system is individual teaching.

The great feature of these colleges is, however, the actual business practice. After having completed a certain amount of theoretical work, the student is advanced to the counting-house department, which is not a mere figure of speech, but an admirable and altogether realistic representation of a business house. Indeed, in the larger institutions one would find an entire floor of the college building fitted up with here a counting-house, there a bank, with its different divisions, and in other parts of the hall, offices representing firms of various descriptions. The student then actually performs in turn the duties of salesman, shipping clerk, cashier, receiving clerk, bill clerk, stenographer, bookkeeper, etc. In some places he actually carries on business with other cities by correspondence with students in similar colleges in, say, New York, Boston, Philadelphia, and Chicago. He orders or ships goods, draws drafts, makes and receives remittances, and, in fact, performs all the duties of a man of business. At the time of my visiting a college in Philadelphia there was actually a "public auction" going on, the instructor being mounted on a rostrum and the students in various parts of the room bidding against each other as to the manner born, paying with dummy checks, keeping practical accounts of the business and showing results. In another establishment in the same city I noted that from the first day of entry a student was set up in business, a cash capital was given and deposit slip made out. He went to the bank (an actuality) from time to time, presented his money and deposit slip and went through the regular banking routine. At a subsequent period he occupied a position in the bank, either as receiving cashier or paying clerk.

In the Gem City Business College in the town of Quincy (Illinois), I saw a most elaborate and perfect system of practical business training. An immense hall was fitted up with four banks, each bearing its title plainly over the front representing the four sections of the country. There were, in addition, two wholesale houses, two commission houses, one railroad express and freight company, one insurance and land office, and so on. Every description of document used in a house of business is brought into use in this department. There were also clearing houses, and, finally, an actual bank in the office of the college, where the actual deposits of students were received, and also occasionally of nonmembers of the school. In most of the colleges there was exhibited the market report for the day, just as it was received from the board of trade department of the State.

There can be no doubt that this elaborate and exhaustive system is attended by very good results, and that the young people of both sexes who have gone through such a course intelligently are fairly well qualified to take a place in any house of business without requiring that coaching and supervision which the raw youth fresh from the public school invariably needs, and which it is generally nobody's business to supply. But at the same time it is highly probable that the completed student—or "graduate," as he is termed in America—has in reality no sound knowledge of any particular commercial subject, but rather a general and often hazy idea of office routine, and in this respect it seems to me the American method falls far short of the English. If I might be permitted to crystallize into one sentence my criticism of American business training methods, I should say there was much to gratify the eye and to make an attractive display, but the great outlay involved in all this ornamentation and lavish expenditure on mahogany, plate glass, and gilding prevented the employment of a staff of teachers adequate to the purpose and able to carry out what is so desirable, but what in America is found to be but a mere figure of speech, namely, strictly individual instruction.

The chief difference between American and English methods lies in the importance they attach to what is called "business practice," as against our system of specialized teaching in individual commercial subjects, such as shorthand, bookkeeping, typewriting, French, German, and Spanish. My experience showed me that while there was something to learn, from an English point of view, in the American methods of training in office routine, the teaching of shorthand and other individual subjects was much inferior to that obtaining in England.

In the short time at my disposal it is impossible for me to give as exhaustive and clear an account of American methods as I should wish, but I trust I have indicated with sufficient plainness the lines on which American business training is conducted, and I must now pass on to consider for a few moments the methods of commercial education in England.

I will take as my type an institution which may well be said to represent commercial schools in Great Britain, inasmuch as it is not only the largest of the kind at the present time in any English-speaking country, but furthermore stands as the parent, the fountain and origin of them all.

Students entering these schools have as a rule the right to select the subjects, either singly or in groups, which they are to be taught. Thus, for instance, one may take shorthand, another shorthand and typewriting, a third these subjects plus bookkeeping, a fourth may add one or two modern languages to this course of study, while a fifth may take one or two odd subjects, such, for instance, as arithmetic, penmanship, and Spanish, and so on. The range covered by these institutions is a very wide one and comprises generally shorthand, typewriting, bookkeeping, office routine, arithmetic, penmanship, grammar and composition, French, German, Spanish, Italian, English to foreigners, and civil-service preparation. From such a comprehensive bill of fare it can not be a difficult matter for parents, guardians, or responsible students to choose items suitable to their requirements or their tastes. Each subject is taught in a separate department and has its own special staff of tutors; indeed, where the patronage given to a subject is exceptionally large, it may be split up into many divisions, as is usually found to be the case in shorthand teaching. In the modern language sections "native" masters only are engaged in each.

One of the great advantages offered by these schools is the facility given to men of business and others to take instruction at almost any reasonable hour of the day or evening. For instance, teaching is going on from 10 a. m. to 9 p. m daily, with short intervals at 1 and 4, and as there are no long vacations, the only blank days being those generally regarded as public holidays, such as the bank and other national holidays, it is conceivable that a student may take his lessons at any time suitable to himself. This is rendered the more easy by reason of the system of individual tuition which obtains throughout. Each student is taught personally in each department and is thus able to come and go entirely at pleasure, and without disturbing the studies of others present or the continuity of his own. This admirable arrangement is no doubt accountable for the fact that so many business men take advantage of the facilities offered in the subjects, for instance, of shorthand, bookkeeping, and modern languages.

It is scarcely possible, in the time at my disposal, to give anything like a clear idea of the fees charged at the English commercial schools. There is usually a separate fee for each subject, based on the length of time taken by a student of average capacity to complete the subject. For the fee of £20 (equal to the charge made by the American colleges for a year's instruction) the student can take up shorthand, bookkeeping, business training, penmanship, arithmetic, and typing, and be guaranteed completion in them without any time limit whatever.

Perhaps the chief point of distinction between the American and English methods is the relative difference in the importance attached to the study of shorthand. In the States shorthand is taught in a very perfunctory way, and as a proof of this I

may mention that while the principals of colleges there regard women as very much the inferior of men as teachers, the teaching of shorthand is, nevertheless, generally placed in feminine hands. In this country, on the other hand, shorthand is considered, and very rightly to my mind, as of paramount importance. It is one of the surest passports to employment which a young man or a young woman can possess, and while it is a great fallacy to depend on shorthand alone as a money-earning qualification, it does undoubtedly obtain recognition at the hands of thinking employers, and frequently gives one candidate a personal interview with the employer, while an otherwise equally efficient applicant is passed over on account of his want of acquaintance with this subject.

I spoke just now of the young woman seeking employment, and I am reminded of the immense part that shorthand, in conjunction with typewriting, has played in the opening up of a field of remunerative occupation for young women. It is but a few years ago, comparatively, that the typewriter made its appearance in this country. The suitability of typewriting to women as an occupation was very readily recognized and the influence which the advent of the typewriter has had, together with the twin art of shorthand, on the business life of this great city can not be lightly estimated. So far, women have proved themselves somewhat superior to men in the use of this ingenious machine, and in regard to shorthand it may be said that although they were slow to catch up to their brothers in the manual dexterity, they are now surely and unmistakably proving their right to be placed on an equality with their male competitors even in the matter of speed. Whether the sexes are equally suited to the work of a house of business is another question, and one which I do not propose to go into to-day. I may perhaps be allowed to say that although at first employers looked somewhat askance at the prospect of young women in the office, the number of houses of business employing ladies as clerks, bookkeepers, and so on, at the present time, is increasing enormously day by day. Ladies have shown an adaptability to office routine and an aptitude for commercial methods which have surprised their most hostile critics, and excepting only the few young girls who enter upon this work with no more serious idea than to earn a little pocket money, there is no valid reason why women should not be considered the equal of men as clerks, bookkeepers, or secretaries.

Great stress has been laid on the importance of a sound commercial knowledge of the French, German, and Spanish languages, all or any of them. I remember hearing the present attorney-general enforcing this point most eloquently and convincingly, and there can be no doubt that the addition of one or more of these languages to the business equipment of a youth is an immense help, not only in the obtaining of suitable employment, but in enabling him or her to rise to higher and better positions. The attorney-general, in the speech referred to, said: "In order to carry on the commercial business of the world it is absolutely necessary that the knowledge of foreign languages should extend, and particularly necessary in a country of such predominating commercial importance as England." I think we can all heartily coincide in that opinion. We know how much and how often the young German is paraded before us as an admirable linguist. It is true enough that those who come over to this country pick up a working knowledge of our language with a facility which is little short of marvelous, but in this connection we must not lose sight of the assistance rendered to the youths of continental countries by the money which is spent by the various governments in subsidizing their technical schools and commercial colleges. In Great Britain it is left entirely to private enterprise, and, as I have pointed out, often in the teeth of opposition from quarters where we should have most right to look for encouragement. But much is being quietly done in England at the present day to fit the youth of this country to take his place in the battle of life on equal terms with his continental rival.

In the institution to which I am particularly referring the main object kept in

sight is "practical training for commercial life," but, nevertheless, the advantages of a literary and conversational knowledge of French, German, etc., are by no means lost sight of. Each of the languages has a special department devoted to it for practice in conversation, and the student is thus enabled to get a stronger and more thorough grasp of the language than would be possible from book work alone.

One of the difficulties which has to be faced by the managers of these colleges is the question of the separation of the sexes in the classrooms. In America no attempt at this is made, the general opinion being that as girls are being taught to qualify themselves for business houses, where they will be unavoidably thrown into contact with the opposite sex, it is just as well to let them associate in the business college. I am quite prepared to hear expressions of dissent from this opinion, and I may add that in this country some attempt at any rate is made at the separation of the sexes, especially where the numbers are very great and will warrant a separate staff for each. Because, of course, these are all proprietary establishments, not run on philanthropic lines, not subsidized by Government or otherwise, and the working of the business on profitable lines has to be made a consideration. No doubt as time goes on, and more and more young women embark upon a business career, the need for any consideration of this aspect of the question will grow smaller still.

The question of the fitness of an intending student for a certain course of study is a most important one, and in the course of my American investigations I directed special attention to the question of entrance examinations, of which I had heard a good deal before my visit. Several of the proprietors of the colleges spoke very loftily of the rigid entrance examination which they imposed upon all prospective pupils. Some gravely assured me that they rejected on an average 50 to 75 per cent of the applicants on the ground of general unfitness. I was at first inclined to accept these statements as so much gospel truth, until I arrived at Brooklyn, where I had an interview with the principal of a very well known and important business college. This gentleman was spoken of with remarkable unanimity in the highest terms of praise by the principals of colleges in almost every city I visited. While they frequently abused one another heartily, they agreed in regarding this gentleman as able, conscientious, of good business abilities, and one whose opinion would always be entitled to great respect. When I put the question of the entrance examination to this gentleman, he replied with almost the suspicion of a wink, "You may take that as pure Yankee bluff. Business colleges here are run for profit, and their proprietors would no more reject an applicant, no matter what his mental attainments might be, than they would turn their backs on a fat political job." So much for American opinion on this subject. Frankly, I may say that the practice in this country is to take all comers, and to advise those who are deficient in subjects they have not arranged to take up to remedy the defects without delay. It must not be forgotten that English commercial colleges have great influence in placing their efficient students in business, and in this way it is possible to bring pressure to bear on those who are lacking in business handwriting, for instance, to make good the deficiency. But in my experience, which extends now over some sixteen years, I have found that the student who presents himself or herself at these colleges is usually one whose early training has not been neglected, one who is very well qualified, generally speaking, for the career he or she is endeavoring to follow. Besides, the teaching of a subject like shorthand, for instance, necessarily involves abundant instruction in grammar, spelling, composition, punctuation, etc., and inevitably imparts an all-round knowledge of men and things which in itself is a liberal education. It widens the horizon of these young people in a very marked degree.

Speaking of employment, I might add that the demand for capable stenographers, typists, bookkeepers, foreign correspondents, etc., is very healthy, and the general experience for some years past in these colleges has been that the difficulty is found rather in coping with the demand than in an oversupply of applicants. * * *

Systematic Commercial Education.

By T. A. Organ, B. A., L. C. C.

* * * I submit that to-day the educational necessity is a systematic course of commercial instruction. I use the term "systematic" as its omission would be met by the assertion that the opportunities for commercial instruction exist in the form of evening classes, etc. These I regard as worse than mere stop-gaps, for they have lulled us into security, as on these worthy, but ineffectual attempts to supply a want we have relied to the national loss.

It is not necessary to recall to your minds the skeleton which appeared at the commercial feast of last year in the shape of a book entitled "Made in Germany." The statistics given in that book, and the deductions therefrom, have been the subject of much controversy, but its author and all his critics agree that the lengthy commercial strides which Germany has made are undoubtedly due to her superior commercial education. A pessimistic attitude and a belief that we are beaten in the race for commercial supremacy are absurd. On the other hand, it is unwise to adopt the ostrich procedure, and to blind ourselves to the fact that other nations are pressing hard upon our heels in the commercial race.

The recent official report made to the Duke of Devonshire contains these remarkable words:

And while it is possible that the aggregate value of the foreign commerce of Germany in comparison to that of Great Britain has been overestimated, there can be no doubt that in certain industries our supremacy is seriously challenged. Germany is making enormous strides.

This is the testimony of Mr. Monaghan, the American consul:

That if his country and ours did not meet Germany more thoroughly and more practically in the school, each would in the course of a few years be compelled to yield to Germany the first place in all the higher and more profitable fields for manufacture and commerce.

Going from Germany, we find in the journal of the board of trade, issued last month, a foreign report which contains the following:

Entire countries, especially in the new world, which at one time might have been considered the "preserves" of the English merchant, are now overrun by the agents and travelers of the United States.

A perusal of the reports of our own consuls has convinced me that there is cause for grave alarm. The foreign workman can not produce a better and cheaper article than his English fellow, but the means taken by English houses to place that article on the market are of a character greatly inferior to the means employed by foreign houses.

Let me quote a concrete instance as given by our Egyptian consul. The incident occurred within the last few months. A foreign government asked for tenders for four portable engines, 12 horsepower effective, with a guaranteed coal consumption per horsepower. Many English tenders were received for engines, 12 horsepower nominal, equivalent to 30 horsepower effective; the price of course being higher than that of those who tendered an effective horsepower. This mistake lost the English firms the contract, and the work placed in an Austrian house.

And another, which is within my personal knowledge. An English firm tendered for a large quantity of machinery required for a Turkish manufacturer. The terms of the tender were in the English language and currency. Other tenders were received from German and Austrian firms, these being in Turkish language and currency. The natural result followed. The tender of the English firm was not even examined, but an investigation after the contract was made showed that the English price was the lowest, and that the work had gone to an Austrian house because the English terms were quoted in our comparatively unknown and complicated currency, and in our own language.

In both these cases, a loss accrued to English trade, a loss arising solely out of want of skill in "getting the article on the market."

WHERE WE FAIL.

It is agreed on all hands that in the matter of technical industrial education we are making up leeway, and on the other hand there is quite as decided a consensus of opinion that in technical commercial education we are drifting to leeward as helplessly as ever. Let me give a few of the many facts upon which I base this statement.

The commercial travelers who visited Palestine in 1896 were distributed among the nations as follows: English, 4; Germans, 29; Austrians, 18; French, 13; Swiss, 3; Italians, 2; Belgian, 1. These are exact figures as given by our own representative, and other foreign reports tell the same tale, but the figures are not given. It is agreed that although advertisement tends to promote trade, it can never have the same effect as traveling agents thoroughly acquainted with the views and wishes of their principals and possessing a knowledge of the language, customs, and currency of the land in which trade is sought.

As to advertising, we are far behind our rivals. Our Spanish representative says that the English catalogues are useless and absurd, showing not only crass ignorance of the language but also of the technical details of various trades, and that the larger number of them quote prices in the English currency. Contrast this with the "push" of the German. He takes care to catalogue and describe his goods in English when advertising in our own or any English speaking country. It is only within the last few weeks that Mr. F. H. Burford, our Victorian representative, reported that our bicycle trade in that colony was suffering severely owing to the inferior style of the catalogues which are being circulated. A number of these catalogues were submitted to good judges, and their unanimous award was: United States, best; Germany, second; British, worst.

In the foreign reports, complaint is rife as to the ignorance of the English merchant respecting foreign dues and customs. A glaring instance occurred only recently. On a certain textile fabric the import duty is 5s. 4d. per kilo if delivered untaped—if taped, three times as much. Our consul in that country reports that ignorance or negligence of this fact has done much to lose for England the trade in that article. The foreign houses are most careful to make themselves thoroughly acquainted with the various dues and customs, and in many cases they quote prices which cover these and represent the cost of the article delivered at the customer's own door. One can well understand the great inducement offered to the retailer by the firm which quotes "duty free" as compared with the one whose quotation is only part of the price, the other part not being ascertained without a large amount of trouble.

With more of these instances one can not deal in detail, but it may be taken as a commonplace in trade reports—not only by Englishmen but by foreigners—that the British traders and his representatives are wanting in resource and that they are not well equipped with the arms of their profession. For foreign trade especially, the English manufacturer has to rely largely on the foreign traveler, who learns his employers' trade secrets and his trade weaknesses and uses them as he pleases.

ONE OF THE CAUSES OF THIS FAILURE.

In all but the elementary branches of English education we have worked along old lines and traveled in the old ruts. The bells of our university leaders jingle, and with pack-horse constancy we have blindly followed, not caring whither. The results are disastrous, and I can not do better than call, as witnesses to uphold my statement, the London Chamber of Commerce, who say:

Business men have been galled by the constant proofs exhibited to them of youths seeking employment ill-equipped for their calling, ignorant of the elements of commercial life, and lacking the essentials of utility, so long as they as employers con-

fined their attention to the engagement of youths trained in British schools. These same employers have been equally concerned at learning that it was not possible to find in the labor market a British youth—or, if possible, then but rarely, and as an exception proving the rule—capable of competing with continental youths who have had the advantage of "practical" education, whose tuition has been guided by the career they had in prospect, and who to the commercial man of to-day are valuable. The employment of foreigners has hitherto been compulsory in English business houses.

That there is a lack in English schools of proper training for commercial life, and that as yet no successful systematic effort has been made to supply the gap in our system, is evidenced by the statistics given by the chamber of commerce of the examinations which they have conducted. Although 200 London firms have undertaken to give preference, in selecting assistants, to lads who possess the chamber of commerce certificate, yet after the scheme has been in existence for over six years, last year only 49 candidates presented themselves for examination, 40 sitting at London, 6 at Aberdeen, and 3 at Portsmouth. In 1890, 65 London candidates were examined; in 1891, 86 candidates; in 1892, 79 candidates; in 1893, 76 candidates. When it is remembered that in London alone there are 105,000 business men and women who style themselves clerks, the signal failure of the chamber to induce schools to train on commercial lines is apparent, especially when we see that in 1896 the candidates were half the number of those in 1891.

That the supply of English commercial assistants is less than the demand is patent, for the report of the chamber states:

> The most eloquent fact that the chamber can adduce as an encouragement to proceed with its work is that no holder of the junior certificate has yet endeavored unsuccessfully to obtain a situation through the chamber formerly, or latterly through its employment department.

"Commercial education" figures largely in the prospectus of many schools, but only a very few send up their lads for the chamber of commerce examinations, in spite of the manifest advantages accruing to a successful examinee.

FOREIGN PROGRESS V. ENGLISH CONSERVATISM.

Alertly progressive in commercial education are our foreign competitors, while we are blindly traditional. Our greatest competitor is Germany, and at the present moment she has 200 schools and institutions devoted solely to commercial training; these have 24,000 pupils, 19,000 being elementary and 5,000 being intermediate. France has 9,000 pupils in her commercial schools, and Italy has 8,500.

Russian progress.—The latest information from Russia is of an instructive character. Her first commercial school was established in Moscow in 1772, and its definite aim is shown by the words of the statute under which it works:

> To give to its pupils a general education, and to prepare them for commerce, and for taking the post of bookkeepers, controllers, and chief clerks to manufacturers.

In 1885 Russia had 36 of such schools, but in 1894 it was found that the number had been reduced to 25. The Russian Government, with a foresight which is lacking here, immediately placed the matter in the hands of its most powerful government department, the ministry of finance. This department is setting up new schools in which the pupils are to receive the necessary training for service in the capacity of clerks and small traders and in industrial banking and insurance methods. "One-class" schools are being established for those pupils whose lack of means prevent them from remaining for a long course, and "three-class" schools for the children of more well-to-do people; and finally, employers' classes for those who can attend in the day as well as in the evening for a long course. The programme of each school is adapted by the ministry to the local needs.

Austrian progress.—Mr. J. Goldschmidt, the United States consul-general in

Vienna, gives details with reference to the work carried on in that city. A full description is given in the Board of Trade Journal for August, 1892. He says:

In these special commercial schools pupils are actively brought into contact with practical life; they regularly visit the public collections of commercial and industrial art, industrial establishments and make "instruction journeys" to the great centers of commerce under the guidance of the professors. Despite a high fee—150 florins annually—the number of pupils has steadily increased, as it was found that those who had passed the academy could command their price in the market.

The instruction does not end in and around Vienna, for many of the students have been, and are now, in England, in order that—

as opportunity offers, they may return to their native State and put their newly acquired knowledge to use in the marts of the world.

At the risk of being tedious, I quote two other extracts from this valuable monograph:

I. England is thus (by training these young Austrians) raising up for herself in the near future a new, most intelligent, capable, and determined competitor.

For some years past the director of this special school has been applied to by foreign governments to give complete practical explanation of its organization and system, while banking and commercial houses in London and elsewhere, requiring specially trained and capable young men, have been applied to and supplied by him from the students under his charge.

German progress.—A correspondent of the Monde Economique says:

The Germans have shown themselves during the last few years to be on the way to become past masters in commercial matters. Their energy, patience, activity, and spirit of enterprise are remarkable, and at the pace they are going they will soon succeed in obtaining the commercial supremacy in the chief markets of the world.

The correspondent then deals with the means employed by the Germans with a view to developing and encouraging the native qualities of their race. He attributes much of their successes to their commercial education, and he especially calls attention to a society founded in Hamburg in 1858, with the object of procuring situations for young men desirous of entering trade, in which they may have facilities for learning the usages of international commerce. At the time of writing, the correspondent states that the society consisted of 34,000 members, and that it had 170 branches. Such a society formed in England would be a valuable adjunct to any system of commercial education which may be hereafter established. To pile up instances would avail little, but it would be easy to produce evidence of a most conclusive character, showing that the countries which are increasing their trade are also those which are giving the most attention to systematic commercial education.

"COMPETITION BECOMING MORE ACUTE."

Indeed, there are indications that in the immediate future our own countrymen will have to encounter a competition far more acute than anything they have had yet to grapple with.

So say Sir Philip Magnus and his colleagues in their report of last year, a report based on personal observation of the methods of trade adopted in the countries which they visited. This competition we are preparing to meet on the technical industrial side of our education, but on the technical commercial side we have done nothing worthy of a name.

There are encouraging signs, for the technical education board for London is alive to the necessity for immediate action. In their last report to the county council, referring to education, they say:

One of the subjects constantly kept in view by the board has been the importance of commercial education; there is no direction in which better technical instruction is likely to be more effective in promoting the industry and well-being of London.

A few weeks since the board appointed a special committee to bring up plans for effective work in this direction, and if London leads well in this matter the provinces will assuredly follow. At present in the higher branches of commercial life the foreigner holds the field, but there is no reason why he should continue to do so, provided we supply systematic training for our native talent.

In his "Expansion of England" when referring to our war with France in the two first decades of the eighteenth century, Seeley says:

England and France stood in direct competition for a prize of incalculable value. The prize was the control of the markets of the world.

The ethics of a war, based on such a motive, I am not prepared to defend, but the value of the prize for which both nations spent so much blood and treasure is beyond question. The commercial war is no less keen now, although the fighting men are clothed in fustian and broadcloth and the field of battle is the manufactory and the counting house.

Energy, brains, and physique we have, but in commercial education our methods are antiquated, our guides are not sympathetic, and we must decline to follow the latter and modernize the former if England is to remain in the forefront of the commercial world.

CHAPTER X.

EDUCATION IN INDIA.

By W. E. De Riemer, A. B., D. B., A. M.

I. Extent of Indian Literature.

"Knowledge is the best among all things, for it can neither be lost, nor sold, nor destroyed." (Hitopodesá, Hindoo Shástras.)

"Those who have believed and have received knowledge, God exalts in rank." (Koran of Mohammed.)

"Knowledge is a power causing man to be successful in every business." (Sár Uktávali, Sikh Scriptures.)

Contrary to the common thought of our day, India is a land where education of a high degree has prevailed for many centuries. Not that highly finished thing of which we moderns boast, but a culture so extensive and so varied that it is the surprise of the modern scholar. In India there are vast treasures of literature which have survived the destructive changes wrought by successive dynasties, and notwithstanding the fact that these writings were made upon perishable strips of palm leaves bound together by strings into huge volumes. The Hindoo mind is prolific in authorship. Many remarkable products of philosophic thought, retained only in memory to be thus transmitted to posterity, have perished in oblivion. Yet there remains a remarkable store of valued materials.

The Vethic[1] literature is the oldest literary product of the Aryan race, if not of the world. It is also extremely voluminous. The Rig-Vetha alone contains 10,580 slokes or double verses. Adding the Yajur and Sama Vethas we find 100,000 slokes. The famous epic poem "Mahabharata" is a veritable cyclopedia of its day. Its French translator hopes to complete it in sixteen octavo volumes of 600 pages each. Its related poem, the "Ramayana," translated, fills five similar octavo volumes.

Some idea of the extent of Indian literature may be gathered from the fact that in 1878 the registered number of vernacular publications was 3,783. Of these, 709 were religious treatises, 663 on poetry and the drama, 330 were linguistic, 195 dealt with sciences, 181 were fiction, 146 treated of law and 95 of medicine.[2]

At no period of its history has India been an altogether unenlightened country. Inscriptions on stone and copper and palm-leaf books, and the existence of paper of native manufacture, are all indications both of literary ability and of the widespread art of writing. The Brahminic literature of the Vethic period is admitted to be unrivaled in antiquity and intellectual subtlety.

In proof of the native love of literature in India Dr. G. W. Leitner[3] tells us:

As the wanderer through villages or unfrequented suburbs of towns * * * passes unperceived along the deserted streets or lanes, after the oil lamp has been lit

[1] I have preferred this spelling because it more nearly represents the sound of the Tamil word "Vatha."—D.

[2] Encyclopædia Britannica. Article "India."

[3] Doctor of Oriental Learning of the University of the Punjab, Lahore, in his work entitled History of Indigenous Education in the Punjab. Calcutta, 1882, page 1.

in the native household, he will hear snatches of songs or fragments of poems telling of departed grandeur, of duty to the Deity, of the fear of God which overcomes the fear of man. Love, which has inspired poetry in all ages and countries, will be celebrated in chaste and tender strains. * * * Here a minstrel will praise Ranjit Singh, or recount the glories of the "Dharm Raj," when God's law alone was king. There a boy will chant a chapter from the Koran, or a "sweet-voiced" reader recite portions of the "Ramayana." Elsewhere the sound of some saying of a Sikh sage or of the verses of a favorite Punjabi poet, unknown to print, but living in the mouths of the people, will strike the attentive ear. Indeed the taste for poetry, chiefly Punjabi, Persian, and now Urdu, is still the native resource for a prosaic life. Few are the shops, houses, or even huts in which there are not periodical gatherings to hear readings or recitations from religious books. Many there still are who have committed portions of the "Mahabharata" to memory in polyglot versions. In the humblest household will often be heard those charmingly compiled stories of prophets and saints which have been written for the use of girls. The driest grammatical or philosophical disquisition will collect and keep an audience in the village hall or shop whose owner wishes to become a public benefactor, and even the frivolities of the Holi [festival] are sobered at numerous places by the concourse of Pandits to discuss some subtle point in the Vedanta and of "Mastersingers" in Punjabi.

Besides this, thousands of pupils thronged the Arabic and Sanscrit colleges in which oriental law, logic, philosophy, and medicine were taught in the highest standards. At Nalanda, in Behar, during the reign of the Buddhistic Emperor Siláditya, there was a vast monastery—a seat of universal learning—where 10,000 monks and novices of 18 schools of thought studied theology, philosophy, law, and medical science.

II. Method of Inquiry.

A history of indigenous education in India prior to British occupancy must be identical with a history of its literature. The development of a people's language in its primitive life is a true index of that people's mental condition. I can only hope to touch it here and there.

It would be folly for us to insist on measuring the learning of primitive India by the intellectual standards of our day. Matthew Arnold defines education to be that course of training by which we come "to know ourselves and the world." "The sciences," says Mr. Thomas, "by which we are taught to know ourselves are the sciences of culture, such as anthropology, philology, history, mental and moral philosophy, while the whole range of physical sciences serves to inculcate the immutable laws of nature."[1]

Now, as a matter of fact, the Vethic Hindoo was utterly ignorant of all the sciences of Mr. Thomas's enumeration, save only that of philology. Yet it would be idle to assert that the Aryans were an ignorant race. No such comparison of standards with those of Greece and Rome at a similar period of their development can diminish the high regard which moderns cherish for the imperishable treasures of literary and philosophic art which those nations have bequeathed to posterity. We may well compare Vyasa with Cæsar, Valmiki with Virgil, and Manu with Justinian or Draco, though these Aryan prototypes anticipated the Latins by many centuries.

Neither is it possible to give a statistical report on educational matters covering the long, dim period which precedes British occupancy. Indeed no official figures are available for all India previous to this event. The Hindoo mind was not trained along statistical and precisely historic lines. Neither has there existed among them a philanthropy sufficiently broad to suggest any inquiry concerning educational matters outside their own caste or province.

My analysis of the situation suggests three important periods, each beginning with one of the three great religions which most have flourished in India, viz, the Vethic, the Buddhistic, and the Mohammedan. The real intellectual life of India has radiated from these religious forces.

[1] British Education in India, by F. W. Thomas, page 118.

1. THE VETHIC PERIOD.

The Vethic period lies far back of substantial history, in the realms of uncertain cosmogony, yet not so far remote as Job's or Abraham's day. There are relics of the past which point to a Bronze Age, and to a Stone Age of history antedating the Vethic period; but the people of those days have left no letters or hieroglyphics to show that they were possessors of even the rudiments of culture. But their conquerors—the fair-faced Aryans, emanating from the countries lying northwest of India—were people speaking a noble language, having distinct ideas of worship and a fondness for intellectual pursuits. Their language was the classic Sanscrit. Their poets, called the Rishis, composed that most ancient treatise known as the Rig-Vetha probably fourteen hundred years B. C. Its main purpose was to praise their gods, the presiding spirits of earth and air and light, of darkness, sea, and skies. Incidentally it helps us to trace the triumphant advance of the Aryan people.

The writing of these Vethas marks the starting point of culture for these conquerors of India. From that achievement to the sixth century B. C. defines the portion of time in which India's imperishable literature was born, as well as the dawn of true culture, and the awakening to self-conscious intelligence. The construction of that literature stamped their civilization and assured their mental and religious tendencies during the twenty-four succeeding centuries. After this it was not long before the poet became the priest, and priest became teacher, and teacher became philosopher, and philosopher became lawgiver and prophet. Out of this state of things the Brahminic system was evolved, and out of the Brahminic system was eventually developed the village system, one of whose features was to provide for a school in every village with a teacher as one of the village officers; another, an allotment of land whose title was irrevocable, known as the "schoolmaster's fields." Thus early in the centuries was developed the germ which ripened after ages into a distinct educational system; a system holding high rank as an essential feature of social life, since it exalted the the teacher to be an hereditary official in each cluster of people inhabiting the towns, and made a sort of government grant toward his support.

2. THE BUDDHISTIC PERIOD.

From about 600 B. C. to 900 A. D. a new religious force took possession of India. It was Buddhism. Buddhism, both civilly and religiously, was a protest against the exclusive Brahminical supremacy which had developed during the Vethic period. Priests had dominated the religious and social life; priests had monopolized the functions of teacher, statesman, lawyer, and judge.

Buddhism declared for freedom of mind, for exemption from priestly tyranny, and for freedom of worship. It was the Puritanism of the fifth century B. C. This new philosophy produced a tremendous mental awakening. Men were tired of the complications growing out of polytheism, and were glad to espouse a simple atheistic creed. If man by celibacy, asceticism, monasticism, meditation, and charity, could save himself, what need of being under the spiritual domination of a priest? It was a rebound to the freedom of self-direction for which the Aryan tribes had long been waiting. Great intellectual activity was the result. Buddha's direction to his ascetic followers was "mental culture, not mental death." All were to become teachers, and their rank was to be graded by the degree of their self-culture. Buddha's followers were resolved upon attempting to give education to the masses, and under their fostering learning became widespread.

One hundred years after Gautama Buddha's death (543 B. C.), a council of his disciples occurred at which time they attempted to formulate his doctrine. At the call of the Emperor Asoka (244 B. C.), who had become an ardent convert to Buddhism, the third great council convened at Patna (or Pátaliputra), his imperial city in Behar. It was an epoch-making council. It resolved upon a campaign of missionary effort to extend "to the utmost limits of the barbarian countries." It dis-

carded Sanscrit, and chose as its sacred language the Magadhi, which is the dialect of the central kingdom of Behar. The Emperor caused to be collected into this tongue the doctrines of Buddha as an authoritative version, and that version has stood for two thousand years. The Ceylon Buddhists, six hundred years later, selected as their sacred language the Páli, into which Asoka's version was translated, and in which all their historical documents have been written. Historical students have found in Páli manuscripts the clearest historical statements to be found anywhere concerning India's history five hundred years B. C.

But the first efforts ever made to disseminate education by royal edict seem to have originated with the Emperor Asoka about the middle of the third century B. C. He "founded a State department to watch over the purity and direct the spread of the faith." He appointed a minister of justice and religion to direct the effort. When many converts had been made, Asoka stood by them with material help, causing wells to be dug, and shade trees to be planted by the roadside and medical aid granted to all subjects of his dominion as far south as Ceylon. "Officers were appointed to watch over domestic life and public morality and promote education among the women as well as the youth." He set up in India 64,000 memorial tablets containing the principles of the faith as taught by the Saint. At least 30 of those tablets have survived the twenty centuries of corrosion—a monument to the zeal and intelligence of the great Emperor.

Notwithstanding Buddha's "renaissance" of learning, and that his religious triumph over the mixed races of western and southern India was such as, at one time, to endanger the existence of Brahminism in its native soil, after a thousand years of prosperity it began to relax its hold on the popular heart. It was finally absorbed into, or expelled by its adversary, and has now entirely disappeared from Hindostan.

3. THE MOHAMMEDAN PERIOD.

The third wave of intellectual awakening for India attached itself to another of the great religions which has found a home there. It came with Mohammedism in the tenth century, A. D. Like Buddhism, its successor Mohammedism is a great leveller. It abhors idolatry and caste and all social distinctions. Its best learning is freely open to its common people. Mohammed's stern command to all was to "read." Education was, in a sense, compulsory among them. The great Mogul Dynasty which held sway in western India for about eight hundred years, cruel though it was in bloody wars, was yet a deliverance to caste-enslaved Hindoos.

Under Mogul sway great reformers arose among the Hindoo thinkers, like Nanák, Kabir, and Chaitanya, all of whom preached intellectual and social equality. The great Emperor Aurangzeb established many schools and colleges and libraries. Both the Persian and Arabic languages were introduced as scholarly languages to offset the aristocratic Sanscrit. Yielding to the popular demand, the Puranas, which were composed about 600 A. D., and the sacred epic poems Ramayana and the Mahabharata of the Vethic period were translated into the vernaculars of India, a fact of incalculable advantage to both learning and literature, and to Brahminism. These Puranas, translated out of the Sanscrit, have practically become the Vedas of the common people, and are the Bible of modern Hindooism. Says a Mohammedan writer in the Calcutta Review (Vol. XCVII, page 326):

If the Hindoos lost their Kálidása and Bhababhuti, they gained such writers as Sridhar and Tukárám in Mahárashtra, and Munkundarám, Chakaravarti, and Rámprasád Sen in Bengal. * * * As in religion, the doctrines preached by Kabir, Chaitanya, and Nának were protests against Brahmin exclusiveness; as in literature, the works of such writers as Tukárám, Dádu, and Rámprasád Sen were protests against the predominance of Sanscrit, so in politics the Sikh and Mahratta powers were protests against Kshatriya ascendancy.

4. SIKH CONTRIBUTION TO LEARNING.

The influence of the Sikh religion on learning, while not so marked as to deserve an equal place with the three above mentioned, yet deserves notice.

When Buddhism rejected Sanscrit and attempted to develop a vernacular tongue as its medium of thought, the Brahmins attempted to withstand their effort by elaborating a new composite language formed of all the vernacular tongues of which they could learn. That composite was called Landé.

A few centuries later a new religious sect arose in northwestern India, a sect of warrior students, who were called Sikhs. As reformers, they also sought to do away with Brahministic literary and religious exclusiveness. They likewise attempted to form a new religious tongue called Granth, using all the vernaculars as a basis, that there might be a medium of communicating to all India the best learning of all the sacred or scholarly tongues of India.

The Sikh is the Protestant of Hindoo politics, society, and religion, says G. W. Leitner, LL. D., of the University of the Punjab. He is above all the worshiper of "the Book," of his Bible. * * * His great aim is to destroy the monopoly of learning, and of the social or religious ascendency of one class, and to make education the property of the masses of his community. Sikhism wishes to create a race of warriors and students. Hindooism aims at class monopoly. * * * All Sikhs are equal; Hindoos are unequal. Sikhs are conservative democrats in religion and politics, loyally subordinate to elected rule or office. * * * They consider their chiefs * * * merely as "primi inter pares," and as representative servants of the commonwealth. Above all, are the Sikhs, by name and history, a community of "learners" and "disciples." Their organization indicates a republicanism of letters, with liberty in all studies, the equality of all "Sikhs" or students, and the fraternity of "Bhais," as an excellence to which all can aspire. The crucial test of a good Sikh is good conduct; and the mass-education of that community is aimed at by its free access to every kind of learning within its reach, and by making the power of interpretation and explanation of the mysteries of Sanscrit and other philosophies and sciences the most important qualification of a "Gyani."[1]

Among the most noted Sikhs was Baba Amir Das, who left as his contribution to literature 200 books, chiefly Punjabi poetry of a religious character. He was also eminent authority on the Baidak system of medicine.

Still another was Guru Govind Singh, the warrior-poet and reformer. His court was composed of fifty-two "immortals," Gurmukhi poets of all denominations, who wrote on theology, moral philosophy, history, and state economy in verse. One of these manuscripts still exists at Anandpur, containing 4,000 pages.

III. CHARACTER OF INDIGENOUS SCHOOLS.

Having shown that India's intellectual development arose out of her religious life, let me call attention to the character of her schools. With so complex a population as exists in India there never was anything like uniformity of system in education. Indeed, each great religion, each ruling nabob, rajah, or emperor, each great central city, and each reformer and illustrious teacher prided himself on having a system of education which was personal, local, peculiar. This fact will make it necessary to consider each main system by itself.

1. VETHIC SCHOOLS.

We have seen that the Vethic system provided for a school in every village. Such schools were limited, restricted affairs, quite informal; an aggregation of boys or men of high caste who, at first, were selected by the Rishis to be their personal attendants and to commit to memory and recite the slokes composed by their literary superior. To know how to compose in Sanscrit, to commit to memory, to recite and to interpret an author's utterances was the sum of the pupil's attainments, and was an honor to which the best of the youth most eagerly aspired.

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[1] A History of Indigenous Education, Part I, pages 28 and 29.

As civilization advanced and men's minds expanded the range of subjects treated became greater, and rhetoric, logic, mathematics, philosophy, law, and medicine were successively treated by the scholar-priests. It was the system of the old Grecian philosophers, each of whom had his personal pupils who followed him, or made his house their home. In later times the teacher was not a peripatetic or a philosopher in his own right, but simply the village writer and schoolmaster. His pupils were but children, gathering under a shed or beneath a huge tree, or on the veranda of a temple. The average number of pupils in the remote village was not over ten, and the instruction was personal. Class instruction was unknown. Either the teacher or the monitor pupil taught each boy by himself. The students assemble at 6 or 7 o'clock and devote the morning to arithmetic or reading. After a morning of two hours or more (for the Hindoo having no clock or watch does not live by minutes) the afternoon is employed with penmanship and composition. In primary schools each one studies aloud. As each has a different lesson, and as earnestness is gauged by the noise each one makes and the number of repetitions of his lesson, the confusion is something indescribable. The school closes at 5 o'clock with a concert repetition of the multiplication table or a song.

In the higher grade of Landé schools, mental arithmetic is the distinguishing excellence. The multiplication table is recited from 1 to 10, and from 11 to 30; also the fractional table from 1 to 50 successively by the compound numbers $1\frac{1}{4}$, $1\frac{1}{2}$, $2\frac{1}{4}$, $3\frac{1}{2}$, $4\frac{1}{2}$, $5\frac{1}{2}$, etc.; also compounds by compounds, as $1\frac{1}{4}$ by $1\frac{1}{2}$, $1\frac{1}{2}$ by $2\frac{1}{4}$, etc. By this process surprising results are attained by even young pupils. In the use of such rules or "gurs" business men are trained to most marvelous accuracy and facility. College-bred men are amazed at the ease with which grain merchants compute results on a fluctuating price without the use of pencil and paper.

It is the practice in these schools for the teacher or his substitute to go to the homes of his pupils each morning and collect them for the day's duties, or learn the causes of their absence.

Another practice works well. To the padha or teacher is intrusted the responsibility of administering corporal punishment for delinquency or misconduct which occurs either in school or at home. Thus the parents cooperate with the teacher in securing faithful work and good behavior. The native maxim is this, "The child's bones belong to the parents; the child's skin belongs to the teacher." Public opinion justifies the teacher in any corporal punishment short of permanent bodily injury.

Says Dr. Leitner:

> The indigenous education of India was founded on the sanction of the *Shastras*, which [writings] elevated into religious duties and conferred dignity on the commonest transactions of everyday life. One may see the fruits of the indigenous system in the numberless "páthsálás," "chatsals," and "tols," which still overspread the country and which * * * prove by their continued existence, in spite of * * * adverse circumstances of a thousand years, the * * * stamina they acquired at their birth.

The highest schools of the Hindoo type are the real Sanscrit colleges where Brahmins are the teachers, Brahmins the pupils, Sanscrit the language, and Hindoo law, philosophy, and literature are the subjects considered. In such schools grammar is studied for about seven years; lexicology, two years; literature, ten years; law, ten years; logic, thirteen years, and mythology, four years.

The inferior castes may study these subjects with the exception of law, the six schools of philosophy, and the sacred mythologic poems, yet practically the Brahmins still monopolize nearly the whole of Sanscrit learning.

Prof. F. W. Thomas, in his volume entitled History and Prospects of British Education in India, pages 5–10, gives us this interesting account of Hindoo schools:

> Hindoo elementary schools, or as they would more properly be styled, classes, existed in most of the villages of India, a country of agriculture and villages. At about 7 o'clock in the morning from 6 to 12 nearly naked Hindoo boys would assemble

in a shed belonging either to the village or to some individual; where no hovel was available the schoolroom would be nothing more than the shade of some wide-spreading tree. All the teaching was oral, not only printed books but even manuscripts being entirely unknown. The boys commenced schooling at the age of 5 or 6, and the five years during which they attended were divided into four well-defined stages. For the first eight or ten days they were occupied in tracing the vowels and consonants, first with their fingers on a sand board, and afterwards with a pencil of steatite or white crayon on the floor. During the following year they were taught "to write on the palm leaf with a reed pen held in the fist, not with the fingers, and with ink made of charcoal which rubs out, joining vowels to the consonants, forming compound letters, syllables, and words, learning tables of numeration, money, weight, and measure, and the correct mode of writing the distinctive names of persons, castes, and places. Six months were next spent in studying the four rules of arithmetic, the elements of mensuration of land, and of commercial and agricultural accounts, in writing with ink made of lampblack on the palm leaf, and in learning the modes of address proper in writing to persons of different rank." The last period was devoted to advanced arithmetic, mensuration, and accounts, and the composition of letters written on paper. As even at the present day educated Hindoos are seldom able to write their vernaculars correctly, it is no surprise to hear that in very few cases was the orthography of the native languages acquired in the páthsálás, or elementary schools. Literary, moral, or religious instruction there was none.[1]

For the latter the people were dependent on regular and occasional readings and recitations concerning the gods, which formed part of the duty * * * of the Srotriya Brahmins * * *.

The schools were of four kinds, (1) Hindoo elementary, or páthsálás, (2) Hindoo schools of learning, or tols, (3) Mohammedan elementary [mahajani], (4) Mohammedan schools of learning, or muktabs. * * * The tols * * * were entirely unconnected with the páthsálás, or village schools. So complete, indeed, was the severance that even the slight vernacular instruction that necessarily preceded the entrance to the tols was generally obtained, not in the páthsálás, but at home. Inferior in numbers to the páthsálás—being in the proportion of about one to three in number of schools and one to ten in number of scholars—the tols bore a much higher reputation and possessed very different traditions. The course of study often lasted * * * twenty years, from the tenth to the thirtieth. But this period was much diminished by frequent and lengthy vacations. * * * At an early date special schools for literature, law, logic, Vedanta, mythology, ritual, and medicine had supplanted the primitive schools of wider range. * * * The curriculum of the schools of literature may be briefly outlined as grammar, lexicology, rhetoric, poetry, and the drama; that of law schools, the sacred text-books on law, with long disputations, commentaries; of the schools of logic, * * * metaphysics and religion; of the Vedantic [schools], the texts and commentaries of the Vedanta philosophy; of the Pauranic, the long mythological poems; of the Tantric, the works on ritual.

2. BUDDHISTIC SCHOOLS.

As before stated, Buddhism stood for the education of the masses, for democracy as opposed to aristocracy, for atheism as opposed to polytheism. But as Buddhism was finally vanquished in Hindostan, for models of their schools we need to go to Ceylon, Burmah, and China. The form and order of these schools differ very slightly from those of Hindoo schools. The subjects taught were also similar, except in religious lines. With reference to them Dr. L. J. Trotter in his History of India says:

The yellow-robed monks of Burmah still hold out to every Burman child such means of learning to read and write and cipher as the bulk of our English children are only just beginning to enjoy.

The report of the director of education for Burmah, covering the five years from 1892 to 1897, shows that in some of the principal provinces the percentage of pupils receiving instruction is as high as 41. It also gives the total number of primary schools in Burmah as 4,640 under government inspection, beside 10,585 private indigenous institutions, containing 105,827 pupils not subject to government inspec-

[1] We must differ with Mr. Thomas on the religious education being absent from the elementary schools. Personal knowledge of the country has convinced me that pupils were constantly taught religious formulas of worship, and the mythology which underlies their religious life.

tion. Of the 4,640 government-inspected schools 4,535 were original Burmese or Karen indigenous schools. These figures show that the instinct of Buddhism is still in the line of popular education. Says the director:

The difficulty of inducing monastic (Buddhistic) school managers to adopt more modern and conventional methods of instruction will disappear in time, and the prejudices of the "pôngyis" (monks) in favor of their own system must be combatted with tact.

3. SIKH OR GURMUKHI SCHOOLS.

Though Sikhism represents but a small sect of northwestern India, an account of its indigenous schools can not but interest us. We abridge from Dr. Leitner the following description of them:

The child should enter at five years—not after seven. Both boys and girls attend the same primary school. As fingers have been created before pens were invented, the pupil first writes upon the ground which is prepared by a layer of pandhu. He is taught to memorize alphabetically arranged moral maxims. He is then promoted to the dignity of a wooden slab or "pati"—a board first blackened over with soot and ground glass, then dried in the sun or near a fire. This can be written on with a pandhu, and the writing can easily be washed off. The pen is easily obtained from every hedge of sarkera.

The children then learn the forms of numerals and simple enumeration; also the signs for weights and measures. It is not considered necessary for the ordinary Sikh child to learn the pahara or multiplication table. If he wishes to he can afterward attend the Padha's school. The children now write down the names of God, of the people of the house in which they are assembled, of surrounding objects, of eatables, and of everything that can be pointed out to them. The child then learns in order the following books, viz: Japji, teaching the eternity of God; Rai ras, the true road; Arti Soila, an allegory to prevent idolatrous practices; Sidh Ghost, or no necessities for miracles; Unkar, skill in creation; Baibar, 22 stories illustrating God's work.

Next the child reads the whole Adi Granth and five chapters of Guru Govind Singh, both models of poetry; then follows Hanuman Natak, a drama by Hindoo Ram; Tulsi's Ramayana in classical Hindi; a chapter of Bhagwat Geeta, and other books; then a prose work, Janam Sakhi, is read at home; next the Gurbilas, or history of the first six gurus. Rhetoric (Sahitkab) is much studied, the text-book consisting of eight or nine volumes. These, with other subjects, include a complete guide to polite conversation, manners, and etiquette; prosody also, which forms the manners of all Hindoo people in strange contrast with rude-mannered Englishmen. The medical student reads Nigant (drugs), Saringdhar (prescriptions and pathology), and Nidan (causes of disease and diagnosis).[1]

4. MOHAMMEDAN SCHOOLS.

Undoubtedly the Mohammedans have done more to popularize education in India than any other religionists. They are admirers of knowledge for its own sake, and because its possession makes them equal and entitles them to Paradise.

Their primary teachers were called "mians," the advanced, "rawals." The vernacular language of the Mohammedans in northwestern India is Urdu or Hindoostanee, but their scholarly language is Persian. The latter had a financial value, because during Mohammedan ascendancy, and as late as 1835, Persian was the official or court language, hence the mahajani, or common schools, were thronged with Hindoo pupils. The education obtained in these Persian schools was called the education of a gentleman, while that of the Arabic colleges[2] was styled the education of the scholar. Learning is obligatory on every man and woman, but not to the same degree. Learning centers around the Koran, yet the scope of it is far greater than that of any religion preceding it. We must not forget that the Arabs, from whom Mohammed came, adopted all that was valuable of Greek philosophy, while rejecting Greek worship of art and the drama. In the realms of history, philosophy, logic, mathematics,

[1] History of Indigenous Education, Part I, page 33, et seq.

[2] By way of illustrating the thoroughness of the course of an Arabic college, see the table of the Deoband school, as given in Appendix B, p. 352.

astronomy, medicine, botany, zoology, and other physical sciences the Arabs were masters, originators, and teachers. Our numerals are Arabic and the word "algebra" is from the same source.

Great stress is placed upon the formal introduction of each young child to the mysteries of education. Again I quote:

When a child, whether a boy or girl, is four years four months and four days old, the friends of the family assemble, and the child is dressed in its best clothes, which, as well as the board, books, writing material, and the distributed sweetmeat, are provided by its maternal grandmother or maternal grandfather, or uncle. The child is then seated on a cushion, and the Arabic alphabet (sometimes also the Arabic numerals), the present Introduction to the Koran, the whole of the 96th Sûra, and the quoted verses of the 55th Sûra are placed before it and it is taught to repeat them after some relative or the respected tutor. Sometimes, also, the 87th Sûra is pronounced, which extols the teaching of the books of Abraham and Moses. If the child is self-willed and refuses to repeat, it is made to pronounce the Bismillah, "In the name of God, the all-compassionate, the Specially Merciful," which is accepted in place of the above desiderata, and from that day its education is deemed to have commenced. * * * Sometimes the child sits in state for a day or two before the ceremony, during which also the tutor coaxes it to repeat the above series by putting sweet "laddus" into its hands. Indeed, everything is done to make the initiation of the child as impressive as possible on its mind, as also to celebrate the event * * * by invitations and presents to friends and relatives.[1]

IV. Female Education.

We have noticed that among Hindoos of the Vethic and of all subsequent periods no provision was made for the education of girls. So base was the opinion held respecting them, so controlling the desire to retain women as chattels and instruments of lust, that the women themselves were made to believe they had no capacity for either mental or spiritual attainments. Among the practical hindrances to the education of women among the Vethic Hindoos were, viz, the practice of destroying female children; the custom of early marriage while the girl was but 6 years old; the burning of actual widows with their husbands' dead bodies, and the depraving and enslaving of betrothed widows. No woman of the Vethic period would consent to have it known that she could read and write. Such knowledge was reserved for the Nautch girls who were wedded to idols.

With the advent of each of the other religions a brighter day dawned for the women. Yet the day for their release from social and physical thraldom was yet far removed. Learning might be secured but it availed nothing. Few ever entered into the path of authorship; none were allowed to become teachers under any religious supremacy. The number of those whose writings survive is hardly a score. Says a writer in the Calcutta Review (Vol. XCVII. Critical notes, page i, xvii): "There are now about half a dozen Bengali poetesses whose productions posterity will not willingly let die, Girindra Mohini Dassi, Swarna Kumari Devi, Prasannamoyi Devi, and Miss Kamini Sein, * * * and we have no hesitation in adding to these names" that of Srimati Pramila Devi, author of the late volume of poems Tatini. Says another, Persian poetry and music have such an intoxicating effect upon the minds of young girls of India that it is sternly prohibited from being either read or heard by most respectable women. Nine-tenths of the educated natives are alleged to be averse to female education. Among Mohammedans very many widows considered it a sacred duty to teach girls of their own families to read the Koran. Nearly all girls in such families were taught to read, and no Sikh girl or woman could be called a learner who could not read the sacred Granth. But her education stopped with a knowledge of her sacred duties and her household duties, including sewing, cooking, embroidery, and keeping accounts.[2] It is refreshing to learn from the late report on Burmese education (1897) that during the past four years one young woman each year has passed the F. A. examination of the univer-

[1] See Child's Self-Dedication to Allah, Appendix A, p. 350.

[2] A History of Indigenous Education, Part I, p. 98.

sity and received her degree. Light comes at last from Buddhistic sources across the path of heathen women. In Burmah within five years just past indigenous vernacular girls' schools increased from 105 to 259, and pupils from 24,355 to 32,593.

V. Financial Support.

That the schools of India have not been more potent in elevating her people is due in part to the fact that they had no adequate financial support. Too much was intrusted to voluntary interest. The "schoolmaster's fields"[1] furnished too meager an income for the honorable padha. He was too often obliged to gratuitously entertain and clothe the pupils who came to seek his instruction. He was prohibited in every religion (except the Sikh) by inexorable custom from receiving stipulated wages, but must give his services "Lillah," for the love of God. Such a course was sufficient to impoverish any pundit, were it not for the custom of making presents to these respected men. Feast days and lunar observances formed the occasion for such gifts. Pundits are often supported by what is called "Jajmance" or "Katha," which is a subscription made by a number of families to whom they act as religious teachers.

Occasionally a wealthy man will employ a maulvi to teach his own son and the sons of relatives, allowing the maulvi to supplement his pay by private tutoring.

A few celebrated Banya padhas adopted the custom of migrating to neighboring villages, offering to teach children the multiplication tables, ciphering, bookkeeping, and drafting bills within a certain time.

Some illustrious padhas receive as high as 100 rupees per month, but the average teacher's wage is the despicable sum of 10 rupees, or $5, per month.

In some localities pupils have a custom of presenting each week to the teacher the sum of 2 pice (one thirty-second of a rupee), giving the same to his Hindoo padha on Sunday or to his Mohammedan rawal on Thursday. Presents of food are also made—seven loaves per month for the Mohammedan, and certain measures of flour, ghee, dal, salt, and vegetables (sida) for the Brahmin padha.

A cash present is also given at the commencement of each new book, on the occasion of a wedding, birth of a son, graduation, or important public festival.

In Landé schools the Brahmin padha gets flour, ghi, salt, vegetables, and pepper on the 11th of each lunar month and a large present on the 4th of the light fortnight (Bhadon). A curious custom prevails on this occasion. The teacher, accompanied by his pupils, visits all the parents. Before starting, each pupil places before the idol Ganésh, who is the patron of learning, offerings of flour and ghi, also two or four sticks suitable for fencing practice. The teacher appropriates the eatables and blesses the sticks.[2] The boys then, carrying the sticks, march in squads of four and go through the fencing drill at each house. The patrons feel obliged to treat the boys with sweetmeats and present the teacher with money, food, or a new turban.

In Koran schools presents to the teacher are always in order. The boys are expected, beside, to assist as pupil teachers and by any personal service which the teacher may require, such as bringing water for house uses, kindling fires, and collecting refuse wood, going to the bazaar or market for supplies, and caring for the teacher's small children.

When a boy finishes the Koran, wealthy parents are expected to present a padha a hundred rupees, or a field for rice culture, or a cart, with bullocks to draw it. The school observes a holiday. The pupils, with their respective teacher, meet at the graduate's house, the maulvi receives his present, and all unite to sing the "Amin" as a blessing upon the graduate. The refrain is caught up by the audience in Arabic, viz: "Praise be to God, who sees us," sing the students, and the chorus responds, "Amin, ilahi, Amin," Amen, O God, amen!

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[1] A History of Indigenous Education, Part I, p. 19.

[2] Ib., pages 43 et seq.

VI. Discipline in Schools.

As we have noticed on page 344, the teacher and parents are expected to cooperate in the effort to secure faithful study, proper deportment at school, and becoming conduct while at home. Much attention was given to manners, and rudeness, boorishness, incivility of every sort were promptly reproved. In this respect the better classes of native people far surpass the best of America's children.

Promptness of attendance upon school duties was secured by praising the first comer under the title "miri," or chief, and branding the tardy pupil "piddi," or laggard. Laziness and insubordination were variously treated, e. g., by standing the offender with his face to the wall; by causing him repeatedly to crouch down and rise to his feet; by pulling both his own ears with his hands, his arms being passed through his knees while crouching; by denying him his noon meal; by commanding a monitor teacher to box his ears; and, in desperate cases, by switching the boy upon his hands or upon the soles of his bare feet. The padha or guru with his switch of bamboo is the true representative of authority in India. When he lifts his rod a pin can be heard to drop in a school of 100 boys. In the relaxing climate of the East a rod seems to be the needed stimulus to exertion, though it is rarely applied. "The teacher's rod, whether under the form of tutorial, parental, Government, or religious 'hukm' [authority] is the moral regenerator of the East."[1]

VII. Statistics.

As stated above, we have no available statistics of an early date showing the number of indigenous schools and of pupils for even one province of the Indian dominion. The science of statistics and of generalization therefrom has never been apprehended by the Hindoo mind. We are entirely dependent upon English research for information in this matter. India became a political and geographical unit by the edict of Queen Elizabeth, signed December, 1600. But England paid no attention to the educational status of her dependency until in 1781 Warren Hastings, the Governor-General, founded the Calcutta Madrasa for the education of Mohammedans, and also gave aid to Hindoos and Europeans. During the next fifty years successive viceroys vied with each other in promoting educational works. The Sanscrit colleges at Benares and Calcutta, Agra College, the Hoogli Madrasa, and sundry medical colleges were then established. The present admirable system of Government aid to schools and colleges was started by Sir C. Wood, afterward Lord Halifax, in 1854.[2]

From the census of 1813 it was discovered that on the average in British territory one person in 39, including women, could read. In the native States of northwestern India in 1849, before England annexed those provinces, one in 41 males could read.

In the year 1822 Sir T. Munro, then governor of Madras Presidency, distressed at the rapid decline of literature and the arts, began a series of investigations in his province on educational lines. From his report, made in 1826, we give this summary: The number of schools and colleges, so called, in the Presidency is 12,498 and the population is 12,850,941, which supplies a school for every 1,000 people. But the governor argues that half the people are women, who are not regarded by the Hindoos as proper subjects of education, so that existing schools are in the ratio of one to every 500 of the people.[3]

The board of revenue, commenting on this matter, concluded that only one in 67 of the population is receiving any education whatever. It then proceeds to halve the population, enumerating only males, then it reckons only those boys between the ages of five and ten years, or school age, then it adds the number of private pupils discovered by the census, and thus makes as its final results that one boy out of

[1] A History of Indigenous Education, Part I, p. 42.

[2] Encyclopædia Britannica, pages 774, 775.

[3] History and Prospects of British Education in India, by F. W. Thomas, pp. 3, 4.

three of school age is receiving instruction.[1] Naturally we demur at such juggling with figures.

Later investigations were made by Lords Bentinck and Elphinstone in the Calcutta and Bombay Presidencies. The general result arrived at by these worthy investigators was that on the average about one boy out of every ten of the proper age was, in 1820–1840, receiving some kind of indigenous education.[1] Such results show the impotency of all voluntary and local Indian effort at securing anything that approaches to universal education.

VIII. Nature of Indigenous Education.

Glancing at the long centuries of India history which my review has attempted to cover, one must conclude that, though the sages and reformers—the intellectual giants of India—have devoted themselves assiduously to India's enlightenment, the standard of intellectual attainment for the masses has been very low. Even in the best schools nothing which we call a liberal education has ever been reached by purely indigenous effort. In the realms of literature and of philosophy alone has India achieved any supremacy. The excessive cultivation of philology has been her pride. Grammar and prosody, rhetoric and logic, philosophy and mathematics, law and medicine, poetry and the drama, these are the only lines where her best genius has been displayed. Memory, that "Mother of the muses," was abnormally cultivated, and the great stress laid upon the cultivation of manners has developed a nation as polite as any of our day. With reference to the higher education of the best ages of Vethic or Brahminic culture, Dr. F. W. Thomas (British Education in India, p. 10) has well said:

The general characteristics of the instruction given were impracticality and thoroughness. The pandit is ignorant of the proportion among things and careless of the flight of time. To him nothing is so distasteful as incomplete enumeration of heads or imperfect treatment of the matter thus scientifically divided. Commentaries on commentaries are committed to memory. The minutest questions evoke discussion lasting for days. All the resources of an eminently philosophic language are one day exhausted in building up arguments on one side of a question; the next day, when the pupils have been thoroughly convinced, the master will say "tad asat"—"all that is fallacious"—and proceed to give a complete refutation of all he has before advanced.[2] This kind of training produced its characteristic results—an unworldliness and a devotion to knowledge [intellectuality?], a want of practical sagacity, an intellectual isolation and class feeling more intensified than has been witnessed by any other country.

The facts can be summarized in a few words. The lower orders were entirely uninstructed, the castes of middle rank, including the landholding and trading classes, receiving a scanty, and, in the case of the Hindoos, a strictly commercial training. Every Brahmin was able to read and write, and there was a considerable body of men of this class who had partaken of what may be styled a liberal education, while not a few had further obtained eminence in such special studies as grammar, logic, rhetoric, mathematics, and metaphysics. It is true that in these branches real progress had ceased for centuries. But what was taught was well taught, and the attainments of the Hindoos were not inferior to those of any ancient nation or to those of European scholars prior to the Renaissance.

Appendix A.

The Mohammedan boy's contract with his Creator.

O God, Creator of the heavens and of earth, Thou who knowest all that is secret or manifest, Thou who art all-compassionate and specially merciful, I contract myself unto Thee in this sublunary life; with that I testify that there is no God but

[1] History and Prospects of British Education in India, by F. W. Thomas, pages 3, 4.

[2] The Hindoos might well adopt the Latin prayer of A'Kempis, "Da mihi, Domine, scire quod sciendum est" (Grant me, O Lord, that I may know what is worth knowing).

Thou, who art ONE; and there is no partner with Thee. And I testify that Mohammed is Your servant and prophet. Do not give me over to my own sinful self, for if Thou abandon me to myself I shall be caused to be near evil and be made far from good; for, indeed, I do not trust in aught but Thy mercy. Then place Thou to me a contract from before Thee which Thou wilt fulfill unto the day of judgment, because Thou never ignorest Thy promise.

Now may God, whose name be exalted, bless the best of His creatures, Mohammed, and his posterity and companions, and all Mohammedan men and women, all of them. This I supplicate from Thy mercy, Thou who are the most merciful of those who have mercy.[1]

This consecration is the usual ceremony of the occasion when the pupil graduates in his Koran study.

[1] A History of Indigenous Education, Part I, page 70.

Appendix B.

Scheme of study in the Arabic department of Deoband School.[1]

Year.	First daily lesson.			Second daily lesson.			Third daily lesson.		
	Name of the text-book.	Pages.	Daily lesson.	Time for completing the book.	Name of the text-book.	Pages.	Daily lesson.	Name of the text-book.	Pages.	Daily lesson.	Time for completing the book.
			Pages.	*Mos.*			*Pages.*	*Mos.*			*Pages.*	*Mos.*
First	Mizan Ussarf (Etymology)	14	.....	$\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	.....
	Munshaib (Etymology)	18	.....	1	Panj Gung (Etymology)	44	2	1	.....	.....	.....	.....
	Sarf Mir (Etymology)	48	1	2	Zubdá (Etymology)	16	$1\frac{1}{4}$	$\frac{1}{2}$	.....	.....	.....	.....
	Shara Miat (Etymology)	51	1	2	Dasturulmub tadi (Etymology).	23	1	1	.....	.....	.....	.....
	Nahvi Mir (Syntax)	48	$\frac{5}{6}$	3	Zarradi (Etymology)	23	1	1	.....	.....	.....	.....
	Hidayetunnahv (Syntax)	101	2	2	Mia Amil (Etymology)	4	$\frac{1}{2}$	$\frac{1}{8}$	Isagoge (Logic)	16	1	$\frac{3}{4}$
					Sharah Mete Amil of Jami (Etymology).	10	$\frac{3}{4}$	$\frac{1}{2}$	Qála Aqúlo (Logic)	60	$1\frac{1}{2}$	$1\frac{3}{4}$
					Zariri (Etymology)	30	1	$1\frac{1}{4}$	Mirqat (Logic)	32	$\frac{3}{4}$	$1\frac{3}{4}$
					Misbah (Etymology)	32	2	$\frac{3}{4}$	Mizan i Mantiq (Logic)	28	1	1
					Maralularwah	64	2	$1\frac{1}{4}$	Tahzib (Logic)	20	1	1
Second	Shafya (Etymology)	164	2	$3\frac{1}{2}$	Fasúl i Akbari	93	2	2	Sharah Tahzib (Logic)	85	$1\frac{1}{2}$	$2\frac{1}{4}$
	Káfya (Syntax)	100	2	2	Munyatuh Musali (Law)	120	2	$2\frac{1}{4}$	Qutbi (Logic)	172	3	$3\frac{1}{4}$
	Sharah Mulla Jami (Syntax)	400	2	$8\frac{1}{4}$	Kadusi (Law)	234	3	$3\frac{1}{2}$	Mir Qutbi (Logic)	108	2	$2\frac{1}{4}$
					Kanzud Daq ay eq. (Law)	420	4	$4\frac{1}{2}$	Maibuzi (Mental science)	180	2	$3\frac{3}{4}$
									Sullumululúm	15	$\frac{1}{2}$	1
Third	Mukhtasar Maani (Rhetoric).	340	3	$4\frac{3}{4}$	Asul Shashi (Theology and philosophy).	56	1	$2\frac{1}{4}$	Mulla Hasan (Logic)	251	3	$3\frac{1}{2}$
					Sharah Waqnaya (Law)	227	2	$4\frac{3}{4}$	Mir Zahid (Logic)	42	1	$1\frac{3}{4}$
					Nur Ulanwar (Jurisprudence)	254	4	$2\frac{3}{4}$	Ghulam Yahya (Logic)	52	2	$1\frac{1}{2}$
									Abdulali (Logic)	66	2	$1\frac{1}{2}$
Fourth	Sharah Aqayed	128	3	2	Husami (Jurisprudence)	184	4	2	Mir Zahid Jalalya (Logic)	129	2	$5\frac{1}{2}$
	Khayali (Theology)	104	2	$2\frac{1}{2}$	Tanzih Talwih (Jurisprudence.	211	$1\frac{1}{2}$	$5\frac{3}{4}$	Mulla Jalal (Logic)	133		
	Nafhatul Yaman (Literature)	403	3	5	Musallam Ussabút (Jurisprudence).	66	.....	2	Abdalali (Logic)	188	3	$2\frac{3}{4}$
									Hamdulla (Logic)	232	3	3
									Qazi Mubarak	128	2	$2\frac{3}{4}$
Fifth	Muqamat i Hariri (Literature)	412	$2\frac{1}{2}$	7	Mishkat (Tradition)	576	3	8	Khulasatulhisáb (Arithmetic)	84	.....	2
					Jami Tirmazi (Tradition)	654	6	$4\frac{1}{2}$	Siráji (Law)	66	2	$1\frac{1}{4}$
									Euclid	422	.....	5

Sixth	Divan i Mutanabibi (Literature).	400	2	8¼	Sahih Muslim (Tradition)	917	6	6½	Sadrá (Natural philosophy)	249	4	2¾
	Tarikh i Yamini (Literature).	263	2	5½					Shamse Bazigha	164	2	3½
									Sharah Mawagif (Theology and philosophy).	69	2	1¼
Seventh	Divan i Hamásá (Literature).	219	2	4½	Sahih Bukhari (Tradition)	1,128	6	7¾	Mirzahid (Amur Amá) (Logic)	104	2	2¼
	Tafsir Jalalain (Kororis Exegesis).	510	4	5¾	Nisái (Tradition)	545	7	3	Abdulali (Amur Amá) (Logic)	362	4	3¾
									Tshrih ul aflak (Astronomy)	36	.....	1½
									Saba Shadad (Astronomy)	.....	.....	1¼
Eighth	Baizawi (Kororis Exegesis)	120	1½	3¼	Abu Dáúd (Tradition)	718	7	4	Sharah Chaghmini (Astronomy).	138	1	5¾
	Hidaya (Law)	578	3	8	Ibn i Maja (Tradition)	576	6	4	Jabr o Muqabila (Algebra)	372	.....	3
					Muwatta (Tradition)	392	6	2¾	Masahat (Mensuration)	74	.....	3

[1] A History of Indigenous Education, page 76.

Appendix C.

A list of books taught in Arabic indigenous schools.

I. ARABIC GRAMMAR.[1]

Mizan ussarf.
Munshaib.
Sarf Mir.
Sarfi Bahái.
Panj Gunj.
Zubdá.
Dasturulmubtadi.
Zarradi.
Zariri.
Sháfya.
Marah ul arwah.
Naho. Mir.
Mete Ámil.
Sharah Meite Amil.
Mete Amil (in verse) by Jami.
Hidayetunnaho.
Káfya.
Sharah Mullá.
Alfia of Ibni Hajib.
Razi.
Abdulghafúr.

II. LITERATURE.

Alif Laila.
Akhwanussafá.
Napfatulyaman.
Muqamat i Hariri.
Mutnabbi.
Tarikh Yamini.
Tarikh Timuri by Arabshah.
Tarikh Khulfá by Saúti.
Qualiúbi.
Saba' mua' llaqa.
Diwan i Hamasá.
Diwan Hassán.
Diwan i Hazrat Ali.
Ajab ul Ajayeb (letter writer).
Munabbehat i Ibn Hajar.

III. LOGIC AND PHILOSOPHY.

Isagoge of Porphry.
Qála Agúlo.
Mizan i Mantiq.
Tahzib.
Sharah Tahzib.
Qutbi.
Mir Qutbi.
Sullam.
Mulla Hasan.
Mulla Jalál.
Mir Zahid.
Hamdulla.
Qazi Mubarak.
Hidayetulhikmat.
Maibuzi.
Rashidia (rules of argument).
Sadra.
Shams i Bazigha.
Sharah Isharát.
Amuri Amma.
Shifa of Avicenna.

IV. MOHAMMEDAN LAW. (FIKAH.)

Munyatul musalli.
Kaduri.
Kanzuddaqayeq.
Sharah Woqáyá.
Hidáya.
Sharifiá.
Sirájia.
Fatawa Alaurgiri.
Fatavi Kazi Khan.
Durre Mukhtár.
Mukhtasir Vaqáya.
Multaq ul abhár.
Tanvir-ul-absár.
Ashbahwan-Nazáyer.

V. JURISPRUDENCE.

Asul i Shashi.
Núr ulanwár.
Husami.
Tauzih Talwih.
Musallam.

VI. RHETORIC.

Mukhtasar Maani.
Mutawwal.

VII. THEOLOGICAL PHILOSOPHY.

Sharah Aqáyed.
Khayáli.
Sharah Muaqif.

VIII. HADÎS (TRADITIONS OF THE PROPHET).

Mishkat.
Tirmazi.
Sahih Muslim.
Sahih Bukhári.
Nisái.
Abú Dáúd.
Ibn i Mája.
Muwatta.

IX. EXEGESIS AND COMMENTARIES OF THE KORAN.

Jalálain.
Baidáwi.

X. ASTRONOMY.

Tashrihulaflak.
Sabá Shidád.
Sharah Chaghmini.

XI. ARITHMETIC.

Khulasatul hisáb.

XII. GEOMETRY.

Euclid.
Almajesta.

XIII. ALGEBRA.

By Ibn Musa.

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[1] A History of Indigenous Education, page 77.

CHAPTER XI.

THE ORGANIZATION AND RECONSTRUCTION OF STATE SYSTEMS OF COMMON-SCHOOL EDUCATION IN THE NORTH ATLANTIC STATES FROM 1830 TO 1865.

By Rev. A. D. Mayo, A. M., LL. D.

The first great revival of the American common school during the present century included the full generation from 1830 to the close of the great civil war in 1865. In the present essay it has been thought most instructive to deal with this period under two separate aspects.

First, an account has been given of the life and services of Horace Mann and Henry Barnard, with brief sketches of others of the group of celebrated educators who labored in cooperation with these leaders. While the more complete reference to the large number of these excellent workers in all portions of the Union has been reserved as a part of the educational record of their several States, it has been deemed important to present the biography of these two chief leaders of the revival at greater length, not only on account of their acknowledged superiority, but as a valuable object lesson of the characteristic methods by which a general educational reform in our country encounters and overcomes the peculiar obstacles attending an enterprise so full of difficulties. Especially as the epoch beginning at the close of the civil war has been distinguished by a second revival of popular education no less vital and far more extended than the movement from 1830 to 1865, it will be an interesting study for the educators of those portions of the country still in the heat of the battle to review the course of their predecessors at an earlier day.

But the history of this important period in the educational progress of the country would be incomplete were not this account of conspicuous personages supplemented by a record of the organization and reconstruction of the State systems of public education that accompanied and followed this remarkable awakening of the public mind. It was only to be expected that the two foremost leaders in this revival should have come up and performed their most influential work in the States of Massachusetts and Connecticut, which led the colonies in the organization of the common school. Indeed, it could hardly be otherwise than

that the New England States, which alone during the entire colonial life had supported the people's school, should first have yielded to an awakened and educated public opinion demanding this radical reform. But hard on the track of these States was the movement in New York and the Northwest, especially where the New England element of population for half a century had been a powerful factor, always proposing increased facilities for the schooling of the children.

In Pennsylvania and New Jersey and the border States, Maryland, Delaware, North Carolina, Kentucky, and Missouri, the results of the great upheaval had been less evident, while in the proper Southern Commonwealths it was confined to a few cities, and to a decided stirring up of the more thoughtful class of educators and public men who had not forgotten the teachings of Jefferson and the fathers on this inspiring theme.

It is the purpose of this essay to trace somewhat in detail the results of this great revival of the common school, especially through the States of the North, in the reconstruction in the older and the organization in the later Commonwealths of the common-school system under the powerful influence of the first appearance of the new education as a conspicuous feature in the school life of the Republic. This movement was gradual, extending through the entire generation from 1830, when it appeared in Massachusetts, to 1865, including the disturbed period of the civil war from 1861. After this date, or rather about the year 1870, the movement was submerged in the rising waves of a second revival, which has overflowed the entire Union and, after thirty years of remarkable progress, has left the American common school as an established institution in every State and Territory, and now offers to every child in the land at least something that can be called an elementary education.

NEW ENGLAND IN THE RECONSTRUCTION OF ITS STATE SYSTEMS OF THE COMMON SCHOOL.

MASSACHUSETTS.

In Massachusetts the pending reform in the organization of the common school had not long been anticipated, when Hon. Robert C. Winthrop, chairman of the joint legislative committee on education, on April 14, 1837, reported the memorable statute establishing the Massachusetts State board of education, with the provision for the appointment of a secretary, who should become the proper superintendent of public instruction. As early as 1642 the general court of the Colony of Massachusetts Bay had "ordained and decreed" that the chosen men appointed for managing the prudential affairs of the towns should see to it that all parents and masters of children should see that they should be able to read and understand the principles of religion and the capital laws of the country, on pain of fine to the disobedient and even the removal of children from their own families.

The statute of 1647 went further and compelled every township of 50 families to establish a public school for all children and every town of 100 families to set up a grammar school where youth might be fitted for Harvard College. This was the first law ever passed by which a self-governing community was authorized to offer the elements of knowledge to all children and youth. In 1683 every town of 500 families was required to sustain two grammar and two writing (or elementary) schools. On this broad foundation the original people's common school of the Colony of Massachusetts Bay stood during the one hundred and thirty-eight years of colonial life, until the organization of the Commonwealth of Massachusetts in 1780.

The support of the common school through all its grades, including the university at Cambridge, was incorporated in the constitution of 1780. By a constitutional amendment, in 1855, it was ordered that no public money should be used for the support of the schools of any religious sect.

By a law of 1789 every town was required to maintain a school for six months in the year, or two or more schools for an equivalent time, in which the elements of learning should be taught, with "decent behavior." By the same act the towns were divided into school districts for the convenience of attendance, although the town remained the guardian of education. It was also provided that 200 families should be the minimum for the support of a grammar school, and that all teachers should bring a certificate of good intellectual and moral character. In 1800 the selectmen of the towns were authorized to call district meetings in which the voters might raise money for building schoolhouses. In 1817 the school districts into which the towns were divided were made corporations and empowered to hold property for the support of the schools. This act completed what Horace Mann declared "the most disastrous educational law ever passed by the Massachusetts legislature," for isolating the school districts of a New England town and practically removing the system from general supervision. But so obstinate was this habit that it held on for nearly one hundred years, and the schools were only restored to the complete supervision of the towns by the act of 1882. In 1826 every town of 500 families was required to support a free English, and of 4,000 inhabitants to establish an English and classical free high school. By the same law the towns were required to elect a general school committee intrusted with the complete control of educational affairs. In 1827 the districts were required to take care of schoolhouses and contract with teachers. The general school fund of Massachusetts was established in 1834.

It is plain from this brief record that the American common school was as practically organized in all essential respects in 1837 as to-day, when the State assumed additional responsibility by establishing the first board of education, of which Horace Mann became the first secretary. This fact disposes of the statement, somewhat industriously

propagated, that Horace Mann virtually created the present common-school system of the country by his administration of twelve years as secretary of the Massachusetts board of education, from 1837 to 1849. There was doubtless ample need that Mann and his illustrious group of coworkers should accomplish the reformation of the public schools of that day. But the foundation had been laid, and there was no call for the destruction of anything; only for the return to the original habit of town supervision, additional legal authorization of all that then existed, and especially the waking of the people to the call of the new time for the more vital and generous support of their own system of public education, reorganized according to the improved methods of a progressive age.

In nothing was the educational statesmanship of Horace Mann more evident than in his immediate grasp of the situation, his estimate of the points of attack, and his commanding influence over the foremost public men, and wise manipulation of the legislature of the Commonwealth during his entire administration. Already an eminent lawyer and rising statesman, a man of mark, who had risen from humble estate by his own energy, well informed concerning the New England life of the period, he needed little of pedagogic preparation for his new work. He well understood the art of the popular reformer, at once to magnify the dangers of the situation and the corresponding importance of his own office and measures. His tremendous arraignment of the condition of popular education in the State was rather the thundering of a great educational revolutionist than a strictly accurate account of what really existed. It underestimated, as he always did underrate, the force of the private, secondary, and higher education that made the Massachusetts of sixty years ago in some respects the foremost of American Commonwealths, and emphasized the support of popular education as the soul of a people's civilization. But while in discussion he wielded without apology all the weapons of the educational agitator, he was in public policy conservative, cautious, careful to preserve what was already worth the saving, and only to add new features, according to the ability and disposition of people to accept and the probability of their permanent support. He understood, as few educational officials do, the art of dealing with legislative bodies and organizing that "lobby" for wisdom and righteousness in public life that stands behind the enactment of every valuable statute in an American State.

The few statutes passed during his administration of twelve years were chiefly additions and amendments to existing laws and nearly all "came to stay." Although there was always an opposition that required vigorous watching, and more than one formidable combination threatened the destruction of the entire fabric of his work, so powerful and tactful was his policy that no hair of his head was harmed, and he left his office in 1849 with such a record of complete success as has

attended the labors of few American publicists of positive and large ability in any department of public activity.

The most important act of the legislature was the establishment of three State normal schools. This was made possible by the generous gift, by Edmund Dwight, esq., of Boston, of $10,000 on condition of the duplication of the sum by the State. These schools were established at first at Lexington, now at Framingham; Barre, now at Westfield; and Bridgewater, as early as 1840. Teachers' institutes were organized in 1846. All these agencies for the training of teachers were made possible through the supplementing of public appropriations by private gifts. Mr. Mann always kept himself on the verge of financial bankruptcy by his personal contributions to this end.

The State board of education, created in 1837, consisted of the governor, lieutenant-governor, and eight persons appointed by the governor, "with the advice and consent of the council," each appointed member to hold office for eight years. This body was intrusted with the management of all educational matters that directly emanated from the State. Its most important function was the annual appointment of the secretary, as chief executive educational official of the Commonwealth. How this office, apparently requiring little beyond the duties of a faithful clerk, was magnified by its first great occupant, through twelve tremendous years, has already been told.[1] In 1850 the board was required to appoint a group of agents to visit the schools of the Commonwealth, and, without administrative authority, do all that a body of eminent educators could accomplish for their improvement. The law of 1846 decreed that the teachers' institutes should be controlled by the board of education, through its secretaries and agents, and supported at public expense. County and State teachers' associations were also taken under the protection of the law to the extent of a moderate subsidy.

These, with several acts for enlarging the duties and the compensation of school committees, were all that then seemed possible and expedient to complete the organization of the system. Indeed, it was not so much a new system of public education that was needed in Massachusetts, in 1837, as a great awakening of the people to the possibilities of that already on the ground for the more complete training of all children and youth for good citizenship. Rarely have the two essential qualities of high statesmanship, the overpowering enthusiasm and magnetic power of the popular leader, and wisdom and caution in handling legislators, been so happily blended as in Horace Mann.

On the final retirement of Horace Mann from his twelve years' service as secretary of the State board of education, Rev. Barnas Sears, president of the Newton Theological Institute (Baptist), was appointed as his successor. The wisdom displayed by the board of

[1] Rep. Com. Ed. 1896–97, Vol. 1, pp. 715–767.

education in the choice of its first was in full measure sustained by the appointment of its second secretary. Indeed, Dr. Sears seems to have been, of all others, the man to succeed the great leader of the educational revival.

Barnas Sears was born in 1802, at Sandisfield, Mass. Like Horace Mann, he was educated at Brown University, Rhode Island. He studied theology at the Newton (Mass.) Theological Seminary, became pastor of the First Baptist Church of Hartford, Conn., served during five years at the Hamilton Literary and Theological Institute (now Colgate University), New York, as professor of classical learning, and was called first to a professorship and finally to the presidency of the Newton Theological Institute in 1839. In 1848, at the age of 46, he was summoned to the vacant chair of the secretaryship of the State board of education of Massachusetts. By temperament, culture, a rare habit of mental fidelity and comprehension, a persuasive and reconciling method of dealing with people, and especially the faculty of looking a situation into shape which exalts the scholar and teacher to the educational statesman, Dr. Sears was the happy complement of his great predecessor. His administration of six years, till 1855, when he was called to the presidency of Brown University, was one of the most fruitful in the annals of New England educational history. It was made doubly interesting as the training school of the future general agent of the Peabody education fund, who was universally beloved and honored as an educator, a patriot, and the spiritual father of a generation of children and youth through twelve States of the South.

Dr. Sears entered on his administration with the advantage of a double title—secretary of the board of education and State librarian. This entitled him to an official home under the Statehouse dome and to the comfort of a skilled assistant, who held the twofold office of clerk of the secretary and chief of the library at the capitol.

For twelve years Horace Mann had toiled in his own private office, generally with no official aid, indifferent to the outward dignity of his honorable position, intent only on getting his work done "while it was called day." His successor was now installed in a convenient and conspicuous place, recognized by all the superior officials of the Commonwealth, accessible to all comers, at the ear of the governor, board of education, and general court. In the Rev. Samuel C. Jackson, D. D., of Andover, Mass., he found an assistant fully competent to attend to the details of the secretary's office, with the additional qualification of a good librarian. Here, for the first time, was found the combination of elements that has made the State Library of Massachusetts one of the few reliable depositories of educational literature in the country. It was also an advantage that the secretary could be relieved from the slavery to minor details for frequent absences on the more important work of general tour of inspection, which occupied him during the first year of his administration.

With his characteristic habit of looking a situation into shape and the rare combination of an all-round comprehension of its outlines and a minute study of details, Dr. Sears at once entered on the administration that made his six years of service one of the most truly notable in the educational affairs of the Commonwealth. In half a dozen pages of his first report he strikes the keynote of which his subsequent career was but the development. He says:

> Impressed by the consideration that my predecessor had nearly completed the preparatory and fundamental work which he had undertaken, you have instructed me to direct my efforts chiefly to the practical application of the common-school system in its details.
>
> A correct theory of popular education and an organization of proper agencies for applying it are indeed indispensable. But they are only preliminary. The work itself on which the whole value of the arrangement depends is yet to be performed.
>
> At the outset the danger most to be feared and avoided was that of going to work without due preparation. Now the danger lies in the opposite direction of leaving the work undone until every part of the preparation shall be completed. * * * Improvement in the administration of a system is often a surer mark of progress than improvement of the system itself. * * * It is the spirit of a whole people feeling out its path and manifesting itself in different degrees in many minds and finding some one agency or man to give it utterance; it is this that produces true progress in society. Our system of education is essentially the product of the character, past history, and present necessities of the people. The germ of it was brought from the mother country by the pilgrim fathers. It has become what it is by a natural growth. It may receive aliment from various sources, but the laws of its original development must be left to their free action. It ought never to be conformed to any foreign standard, but to remain wholly American in its character, the offspring of a pure but free government, as of a pure but free Christianity. Changes, therefore, should be admitted as they spring from the necessities of the people and are in harmony with the genius of its institutions.

It is evident to every student of this period that the administrations of Horace Mann and Henry Barnard in the New England and Western States were largely national rather than local in their character. While grappling with heroic courage and tireless energy with the serious difficulties of the local situation, their great literary and controversial power had exhausted itself in elaborate discussions on the fundamental principles of the common school. While the real creators of the first national educational literature of the country, they hardly realized how limited at that date was the reading public of documents like those with which they literally bombarded the people. As Dr. Sears well said:

> The people at large do not read what is published on the subject of education. Reports, books, and pamphlets will sooner reach certain circles in other States and even in other countries than these particular towns, neighborhoods, and individuals where their influence is most needed. The press can never take the place of the living agent in carrying home to men's doors the particular hints and suggestions which the interests of the public schools demand.

With these views in mind as the guide of his administration, Secretary Sears laid out a course of operation to bring what had been so nobly gained and so eloquently set forth by his great predecessor, "whose

eminent ability, untiring efforts, fervid eloquence, and long period of service have given luster to the State," into vital contact with the hearts and minds of the teachers and thoughtful people of the Commonwealth. His plan, in which from the first he was religiously supported by the board of education, which contained several of the foremost men of the State, was first to ascertain, by careful inspection, the actual condition of the schools; second, to strengthen and enlarge to their utmost possible influence the normal schools and institutes for the training and improvement of the teaching force; third, to add to these a new force in the appointment of a group of agents of the board who should traverse the State with the double intent of instructing teachers and school committees and inspecting schools, and of waking up the masses of intelligent people by a continuance of the important function of popular address in which Horace Mann was unparalleled; fourth, in laboring with the general court, not for radical changes, but for such legislation as would confirm the best and remove the unsatisfactory conditions then on the ground. It was a fortunate circumstance that Dr. Sears himself represented the best culture and most progressive sentiment of that important body, the evangelical clergy and college faculties, with which Horace Mann had never been in full sympathy, and whose cooperation and confidence were so essential in a civilization like that of the New England of half a century ago, to the full appreciation and best use of the people's common school.

The first report of the secretary, the thirteenth of the series, presented at the close of his opening year, is full of valuable information and practical suggestions. Dr. Sears had selected a group of schools, fully representing all grades in different portions of the State, and given to their careful examination that wonderful faculty of observation which was so conspicuous during his administration as agent of the Peabody education fund in the South. His mind seemed to work like an animated phonograph endowed with a soul, receiving a perfect report even to its minute details of every school and community visited, while all came forth not as a dead mechanical reproduction, but instinct with the life of a broad, humane, generous, practical, and patriotic educational statesman and true father of souls.

The pages in his first report describing his method of school inspection might be copied as a guide to similar work to-day with untold advantage. From the humblest sanitary concern of the schoolhouse up to the highest function of organization, discipline, and instruction, his eye scanned all things with the calm and comprehensive glance of a master and the generous appreciation of a man conversant with all the limitations and characteristics of American life. He took in at once the fundamental weakness of the average district school in the irregularity of attendance, especially among the children of the increasing throng of immigrant population, now crowding the manufacturing districts of the State. Nine-tenths of the twenty thousand illiterate

adults of Massachusetts, as early as 1848, were of this class, and the habit of evading the labor laws passed for the protection of childhood and youth was too common. He realized, however, that in a civilization like ours regularity of school attendance will depend far more on the attractive excellence of the teacher and the intelligence and fidelity of the parents than on the enforcement of the most stringent legislation.

The emphasis of the report is upon the vicious habit of appointing teachers by the prudential committees of the rural districts into which the State was divided by the school law of 1797. By this and subsequent legislation the original power of the towns to examine and appoint teachers, appropriate funds, and practically supervise the schools through a general committee, elected by the whole people, had been largely transferred to one official, chosen by a district. By a steady habit of encroachment, this functionary had come to be almost the chief administrator of the entire system of schools, often in excess of the letter and in flat contradiction of the spirit of the law.

Dr. Sears opened fire at once on this pernicious habit, and attributes to it in large measure the inefficiency of the teaching force of the State. But so commended to the people had this practice become by its subtle appeal to the obstinate spirit of personal and local independence, that it was not till several years later that the movement began which, after thirty years, resulted in the introduction of the present form of supervision. The teachers' institutes, organized by Horace Mann, were a connecting link between the normal schools and the associations of instructors.

The beginning of Dr. Sears's administration was signalized by the first appearance of Dr. Eben S. Stearns, in the position of principal of the original normal school of the State, removed to West Newton, as the successor of Dr. Pierce. This eminent educator was a successful director of this important school, and later was summoned to Nashville, Tenn., by Dr. Sears, as chancellor of the University of Nashville and president of the Peabody Normal College. The donation of Edmund Dwight, esq., whose timely conditional gift of $10,000 had rendered the first group of State normal schools in America a possibility in Massachusetts, was followed by a gift of $10,000 for general use by Mr. Henry Todd, one of the munificent merchants of that early day. The legislature appropriated $6,500, $1,500 in excess of the $5,000 given to Amherst College, for the annual support of the three normal schools at West Newton, Westfield, and Bridgewater. In 1849 the appropriation was increased to $7,000. The salary of the secretary of the board was $1,308.33, with $1,000 additional for the assistant and librarian, Dr. Jackson. The valuable annex of an abstract of the reports of the local school committees, introduced by Horace Mann, accompanies this and all the subsequent reports of Dr. Sears. The school committee of Boston set forth the great need of a general superintendent for the city. Boston, in the person of Mr. S. S. Greene, the most distinguished critic

of Horace Mann among its thirty-one schoolmasters, furnished the first city superintendent of schools in New England, at Providence, R. I. In 1848–49 the State appropriated $836,069 for the education in common schools of 215,926 children and youth, an average of $3.87 per capita; of this sum, $830,000 was raised by direct taxation.

In 1849–50 the board of education entered on a most important and practical device for the improvement of the public schools—the appointment of a group of agents to represent it in all portions of the Commonwealth. An appropriation of $2,000 was invested in the services of six gentlemen, all of well-known reputation as educators and public men, who, for periods more or less extended, were ordered to "spend their time in kindling or increasing by means of lectures, addresses, conversations, visits to the schools, and in other ways, the interest of the inhabitants in what relates to the welfare and improvement of the common schools."

The experiment resulted in the establishment of that most important annex to the State board of education, a body of permanent agents, whose labors cover the entire area of the Commonwealth, though especially confined to the rural districts and towns below the grade of city population—12,000 people. Two of the original six who were employed in 1850–51 were Mr. S. S. Greene, afterwards superintendent of the schools of Providence, R. I., and professor of didactics in Brown University, and Mr. N. P. Banks, then a young public man, thereafter known as governor of Massachusetts, first Republican Speaker of the National House of Representatives, and a distinguished general of the Union Army. While Dr. Greene attended chiefly to the inspection of schools and improvement of teachers, Mr. Banks appeared before the people in his strong and practical method of popular address.

The great improvement in the country district school affairs of the State within the past generation has been largely due to the exertions of this "flying corps" of educators, the agents of the board of education. They have often been men of national reputation, and have not let the people sleep over their one essential interest—the better training of the children for good citizenship.

Twelve teachers' institutes were held during the first year of Dr. Sears's administration, attended by 1,750 teachers, and large numbers of lectures were delivered to the popular audiences which have always been a prominent feature of these gatherings.

The terms of admission to the normal schools were made more stringent and important changes made in their curriculum. A movement was inaugurated for the permanent increase of a State school fund. Secretary Sears devoted an important portion of his report to an elaborate discussion of the gradation of schools, in which the weakness of the prevailing habit of massing children in the isolated country district schools with little regard to classification was exposed, and practical suggestions made for the proper grading of the pupils, even in

towns of small population. The assault on the separate district system was kept up. The growth of public interest in education was noted by the steady increase of the appropriations for the public schools. Since 1834, the date of the establishment of a State school fund, the amount had doubled in 1850, reaching the sum of $1,277,187.35, with an annual school term of seven months and twelve days, and an average daily attendance of 150,000 on an enrollment of 194,000.

The report for 1850–51 takes on an even more encouraging tone. During the fourteen years since the establishment of the board of education, in 1837, the appropriations for public education had increased threefold. A thousand had been added to the list of schools; an additional month had increased the term, a gain of 202 years of school attendance in one single year; the number of teachers had been doubled, 2,671 of the additions women; the wages of teachers had risen one-third; the per capita investment was twice the original amount. An additional building had been given by Hon. Josiah Quincy, jr., to the normal school at West Newton and a large public school had been set apart by the town of West Newton for the practice of the normal students. Two thousand and sixty-eight graduates from the three normal schools had gone forth, not only to enrich the teaching, but even more to become a power for the improvement of the profession in the State. A popular feature of these early normal schools in Massachusetts was the attendance of a large group of remarkable young women who here, for the first time, found the opportunity of a superior method in education. Many of these afterwards became known through the Union by their admirable service in superior positions. The Hon. Charles Upham had been employed as a lecturing agent by the board of education. Professor Agassiz was appearing before the institutes and teachers' associations in his interesting discussions on methods of study in natural history, and Professor Guyot revolutionized the popular ideas and methods in geography. The legislature increased the limit of the State fund to $1,500,000. The bulk of the secretary's report is occupied by a most interesting dissertation on "Methods of instruction." It will be found that forty years ago Dr. Sears in this essay outlined the substance of what has now become the commonplace of superior methods of instruction and discipline in the schools of all portions of the country. That a scholar, clergyman, college professor, author, and president of a theological seminary should have been found an expert in the details of common school organization, instruction, and management in 1850 was a prophecy of the national fame enjoyed fifteen years later by Barnas Sears as the great right hand of the Peabody education fund for the South. During this year the board of education furnished Webster's and Worcester's dictionaries to 4,000 public schools, at an expense of $12,000.

In the report for 1851–52, the secretary returns to the assault on the district systems of schools which he exposes, if not according to the

"heroic method of Horace Mann," yet with a wealth of information and a relentless common sense no less effective. So extreme had become this habit of isolation that there were in the State 25 schools with but 5 pupils each; 205 under 10; 546 with 15; 1,456 not exceeding 25; and 1,009 not over 20; while the corresponding overcrowding gave 334 with more than 70 and 188 with more than 120 under 1 teacher. Thirty-six recitations in a day were not an unusual diet for the distracted school master or mistress in many of these "temples of science." George S. Boutwell, afterwards secretary of the board, on his way to a public career that included almost every eminent position below the Presidency of the United States, now appeared as a lecturing agent.

Master S. S. Greene became the first superintendent of city schools in New England, at Providence, R. I. A series of important institutes was held in a dozen leading cities in the State with good results, and Professors Agassiz and Guyot, with the not less valuable aid of the secretary, himself one of the most accomplished educational lecturers in the country, were enlisted for the improvement of the teachers. The president and faculty of Amherst College cooperated by offering their college buildings and their own assistants in instruction at the largest teachers' institute yet held in Massachusetts.

The report of Dr. Sears for 1852–53 opens with the announcement that 20,000 adult people in Massachusetts can neither read nor write, 1,800 of whom are "native Americans," with a serious homily on the possible results of a growing illiteracy from the drift of foreign immigration to New England. The legislature established 48 annual scholarships of $100 each for male college students, with a view of preparing teachers for the increasing number of free high schools in the State. A system of student aid for normal schools was also adopted. Several city normal schools, including one at Boston, had been added to the State group. It was proposed to raise the State school fund to $2,000,000. The new normal school building at Framingham was finished at a cost of $15,000 to receive the original school in its second remove from Lexington. A committee of the board of education was appointed to cooperate with the secretary in presenting proper measures for action to the general court. Mr. Lowell Mason now appeared as a pioneer leader in the introduction of music to the schools. Richard Edwards, first as a teacher at the Bridgewater Normal, afterwards professor in the Salem High School, and later as an agent of the board of education, here began his remarkable career, which left him one of the most useful and deservedly celebrated educators of the new Northwest.

This report of the secretary closes with a "Remark on the department of public instruction in its various ramifications," a valuable review of the operations of the board of education and its State and local agencies for the instruction of the children. The publication of an address at the dedication of the Framingham normal schoolhouse, by George B. Emerson, is a valuable addition to the report.

The report of 1853–54 is crowded with interesting matter. The Bridgewater and Westfield Normal schools had new principals. Mr. Tillinghast, of Bridgewater, one of the most valuable of the original masters, had finally retired, from broken health. A new State Normal School for Girls was established at Salem, a building erected at a cost of $18,500, and Prof. Richard Edwards appointed as principal. Professor Agassiz delivered a course of nine lectures before the institute on natural history, and Professor Krusi appeared in a lecture on drawing. This report of the secretary ends with a résumé of the great movement inaugurated by Horace Mann in 1837. It is not inspiring to read that "half the State had remained unaffected by the prodigious labors of this great apostle of education during the twelve years of his administration." But the general results were full of encouragement. Sixty towns had voluntarily abandoned the district system, and other States had been moved by the cooperation of New England. The legislature declared that hereafter public money should be appropriated only to free schools under public supervision. Before 1848 there had not been a dozen free high schools in Massachusetts, but now the general court moved to enforce the law of 1827, compelling all towns of a certain population to establish English and classical schools of this order. Professor Crosby, of Salem, had become a valuable agent of the board. Fifty thousand dollars additional were appropriated for education in the State, making a total, for wages of teachers, board, and fuel, of $1,013,472 in 1853–54, a gain of 85 per cent in ten years. Since 1848, $203,000 had been invested in schoolhouses. The entire cost of education in the State was $2,283,500.

A most interesting annex of this report is the publication of several pages of extracts from a pamphlet edited by Hon. Edward Twistleton, late chief commissioner of poor laws in Ireland, published in London, 1854, entitled, Evidence as to the Religious Working of the Common Schools in the State of Massachusetts. It had been presented in 1852 to the committee of the House of Commons on the Manchester and Salford education bill. The author traveled in the United States in 1849–50, and was impressed by the high standard of intelligence and the general mental superiority of the inhabitants of New England. He could not then account for this on the theory of race, or the locality of the 21,000 emigrants from England to the New England colonies between 1620 and 1643. Eight counties then made large contributions, and not a county in England failed to send its quota. Neither the religious belief nor the political characteristics of the people were an explanation. He notes that "with the exception of Washington Irving, every leading American author whose literary works are well known in England is by birth a New Englander." He finally decided that this superiority was due to the system of popular education which for two hundred years had flourished in this State. But at home he was confronted by the popular impression that the American common-school system could only be sectarian or irreligious.

In 1851 Mr. Twistleton returned to New England with the view of settling this important point. Under the advice of Secretary Sears he examined the schools, and for public use drew up a circular concerning the point of the religious policy and influence of the common-school system, addressed to a number of the most eminent gentlemen of the State, including Daniel Webster, Edward Everett, Right Rev. Bishop Eastburn, William Appleton, Robert C. Winthrop, F. C. Gray, George S. Hillard, William H. Prescott, George Bancroft, George Ticknor, Jared Sparks, president of Harvard University, and Henry W. Longfellow. He also requested Dr. Sears to ascertain, if possible, the extent to which the pupils of the common schools of Massachusetts attended Sunday schools or were instructed in religion by their parents or churches. Six cities were selected for this inquiry and a table of results prepared. All the distinguished gentlemen addressed by the circular responded, and their replies were so interesting and characteristic of the estimate of the American common-school system and its moral and religious influence on the children of the Republic that this part of the document is quoted in full, with the entire preface of Dr. Sears.

EVIDENCE.

Answers of Mr. Webster respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

I believe that the system of instruction in the common schools of New England does not "interfere with the special tenets of any denomination of Christians," and from the state of opinion on which that system rests, no less than from the laws that regulate it, I am persuaded that such interference, if attempted by an individual teacher, would cause him to be removed from his place. In fact, the teachers of the public schools are paid by assessments upon the property of all denominations alike, and care being taken by law that what is to be taught in the schools shall be unobjectionable to all denominations, the different denominations are equally careful to see that the law is entirely respected.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

I think that children in New England are, to a remarkable extent, practically instructed in the tenets of Christianity entertained by their respective families, but not in the public schools.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Direct religious instruction is given to children in New England by their parents, by the clergymen, and by Sunday schools, which collect together the children of all classes and conditions in life, according to the religious tenets of their families, and which employ a great many more teachers than are employed in the week-day schools. In these Sunday schools and also in private families catechisms and other manuals are often used, such as conform to the religious opinions of the parents of the children. It is perhaps important to be added that in New England everybody, or almost everybody, is capable of reading, and young persons read books of religious

instruction as early as they read other books. I do not know how religious instruction could be made more general or more effectual than it is in New England by these several means.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I have no doubt that the system of instruction in the free or common schools of New England promotes religious sentiments, encourages a reverence for the Scriptures, and tends always indirectly, and sometimes directly, to the formation of a religious character in the pupils. The morals of the children are always carefully watched by their teachers.

5. Generally, do you approve or do you disapprove of that system, and what are the main grounds on which your approbation or disapprobation of it is founded?

I have been familiar with the New England system of free schools for above fifty years, and I heartily approve of it. I owe to it my own early training. In my own recollection of these schools there exists, to this moment, a fresh feeling of the sobriety of the teachers, the good order of the school, the reverence with which the Scriptures were read, and the strictness with which all moral duties were enjoined and enforced. In these schools, or it may be partly by my mother's care, I was taught the elements of letters so early that I never have been able to remember a time when I could not read the New Testament and did not read it. Many moral tales and instructive and well-contrived fables, always so alluring to childhood, learned by heart in these schools, are still perfectly preserved in my memory. And, in my own case, I can say that without these early means of instruction ordained by law, and brought home to the small villages and hamlets for the use of all their children equally, I do not now see how I should have been able to become so far instructed in the elements of knoweldge as to be fit for higher schools.

In my opinion, the instruction communicated in the free schools of New England has a direct effect for good on the morals of youth. It represses vicious inclinations, it inspires love of character, and it awakens honorable aspirations. In short, I have no conception of any manner in which the popular republican institutions under which we live could possibly be preserved if early education were not freely furnished to all, by public law, in such forms that all shall gladly avail themselves of it. Although a little beside the immediate object of these inquiries, I may be permitted to add that, in my judgment, as the present tendency of things almost everywhere is to extend popular power, the peace and well-being of society require, at the same time, a corresponding extension of popular knowledge.

DANIEL WEBSTER.

OCTOBER 11, 1851.

Answers of Mr. Everett respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

There is, and from the nature of the case can be, no such interference. The schools are supported by a tax laid upon the whole people of the cities and towns in which they are situated. They are under the immediate control of school committees, chosen by popular election. If any one sect, having a preponderance among the people, should attempt to exercise it by giving a sectarian character to the school committee, and through them to the instructors of the schools, the other sects, though in a minority, would take the alarm. In a word, it is a fundamental principle of the whole community that the schools shall not be sectarian, and what all agree in is of course sure to take place in a popular government. A portion of Scripture is daily read in most schools, and some kind of devotional exercise generally performed

by the instructor. This is done in such a manner as not to offend any serious person, and in this there is no practical difficulty where people act in good faith; and there is no temptation to act otherwise in this respect.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

In nearly all the religious societies of New England there are (as far as I am aware) Sunday schools, taught by the young men and women of the society, under the general direction of the pastor. These schools are not charity schools for the poor who get no instruction in the course of the week, but religious schools for all classes. The instruction is, of course, in conformity with the tenets of the denomination to which the school belongs. It is usually kept in the church, or in some vestry or other apartment connected with it.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

This question is answered in the reply to the second question.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I answer this question decidedly in the affirmative. Public opinion requires of all persons connected with the schools a constant observance of all the practical duties of religion and morality. A schoolmaster decidedly failing in either would instantly lose his place. A considerable portion, often a majority, of the school committee are clergymen. With respect to the actual condition of individual schools, much, of course, must depend upon the force of character of the teacher and upon the state of society from which the children who attend the school are gathered; but the religious and moral tendency of the system is uniformly good.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I think our school system, in theory, perfect; in practice it varies, of course, with local circumstances. I do not know much personally of the schools except in this neighborhood, where they are excellent. The great merit of the system is that it is a public provision for the education of all the children. The schools are so good that the children of the wealthy are sent to them from choice; hence there is nothing eleemosynary in their character. They are free and gratuitous, without being in reality or appearance charitable. As the burden of taxation falls on the rich, the children of the poor get a good education gratuitously, and all classes mingle together in the schoolroom. This would be good, I think, in any country; in ours it is an essential part of our general social system. I send my child to the public school in Cambridge because it is the best within my reach. If there were a private school where he would be better taught, I might think it my duty to send him to it, but I should regard this as an evil.

EDWARD EVERETT.

CAMBRIDGE, *September 30, 1851.*

Answers of Mr. Bancroft respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

Every New England town has inhabitants attached to different denominations of Christians; they all unite cordially in support of the common-school system. Everybody takes an interest in common schools, and Calvinists and members of the Protestant Episcopal Church and Unitarians and Baptists and Methodists and Catholics (where there are Catholics) give them their support, and have no reason to appre-

hend any interference with the special religious tenets of their respective denominations.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

Children educated in common schools practically receive instruction in the tenets of the religious denomination to which they respectively belong, and receive it apart from the common schools.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Such instruction is communicated at home, under the direction of, or by, their parents; at the Sunday schools, by the respective ministers of the different denominations, and generally by such agencies as the parent or the church of which he is a member may adopt.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

The common-school system of instruction in New England has been of incalculable service to the promotion of morality, and makes the whole population susceptible of a higher degree of knowledge on subjects connected with religion. I could hardly use language strong enough to express my sense of the benefit done by the common-school system to the character, vigor of enterprise, morality, industry, general self-respect, love of liberty, respect for law, and attainments in religious knowledge of the people of New England.

GEORGE BANCROFT.

Answers of Bishop Eastburn respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

As far as I know, there is no interference by any of those who have charge of them with the religious tenets or predilections of the pupils, and I do not believe that such interference is practiced.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Although in these schools the only religious instruction conveyed is that afforded through the reading of the Holy Scriptures at the opening of the school, and that which is incorporated necessarily, more or less, with the studies pursued by the pupils, yet this deficiency is elsewhere made up to a very great extent, not only by the teaching of the clergy in their churches, but by the powerful instrumentality of our Sunday schools. The pupils of these Sunday schools, it is important to bear in mind, are not confined to the poorer classes, but consist of the children of the parishioners of our various congregations, without distinction as to their position in life.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I think so. A general respect for religion and its institutions would be promoted by that system. It is a fact that no one suspected of entertaining irreligious sentiments would be employed as a teacher in the common schools.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

Although I individually should prefer arrangements under which the tenets of my own church were directly taught in the common schools, yet on the whole I approve of the present system, because it insures the means of providing a more efficient system of instruction than could permanently be maintained for all the children of the Commonwealth in any other way.

MANTON EASTBURN,
Bishop of Massachusetts.

Answers of Mr. Appleton respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

I do not believe the system adopted in our common schools interferes with the special religious tenets of any particular sect of Christians. Such is the zeal of our various religious denominations that if any religious instruction other than the reading of the Bible was introduced by the teachers, complaint would be made, such as would compel the masters or teachers to resign their situation.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

To this question I answer in the affirmative.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Formerly, in New England, it was generally the custom for parents, after the church service on Sunday, to instruct their children by hearing them repeat the Lord's Prayer, the Ten Commandments, the Creed, and to read to them from the Bible and other religious works. This custom is, I am led to believe, to a great extent discontinued; and, as a substitute, it is almost uniformly the case that the various denominations have connected with their society and place of worship Sunday schools. But to speak more within my own particular knowledge (I belong to the Episcopal Church, and for more than thirty years have taken an active interest in the Sunday school of our parish and others), the children of parents the most favored as to property, those of mechanics, and those of the most humble in the community meet together on Sundays, and are instructed according to their age and understanding. They are taught the Creed, the Lord's Prayer, and instructed in the church catechism and such books as are approved by our bishops and other clergy, by religious young men and women, under the general superintendence of the rector. Children are admitted as soon as they can read, and continue until they are at a mature age, when such as are inclined are formed into Bible classes, and there remain until they are at a suitable age, in their turn, to become teachers.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

No teachers would be approved or continued unless of a moral and religious character. Their example would be followed to some extent by their pupils, and I can not doubt that the more education is advanced the more morality is increased and vice lessened.

5. Generally, do you approve or do you disapprove of that system, and what are the main grounds on which your approbation or disapprobation of it is founded?

Generally, I do approve of the system, believing it to be better than any other within my knowledge; and the main grounds on which my approbation is founded may be found in the foregoing replies.

W. APPLETON.

BOSTON, MASS., *October 11, 1851.*

Answers of Mr. Winthrop respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

Not the slightest; on the contrary, I believe that the system of common-school instruction in Massachusetts is in perfect harmony with the express provision of our State constitution that "all religious sects and denominations demeaning themselves peaceably and as good citizens of the Commonwealth shall be equally under the protection of the law, and no subordination of any one sect or denomination to another shall ever be established by law." I may add that there is an express prohibition in our statutes of the purchase or use in any of the town schools of "any schoolbooks which are calculated to favor the tenets of any particular sect of Christians," and at least one instance has occurred of a teacher being dismissed from his office for persisting in efforts to give sectarian instruction.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

It is. I speak, of course, in regard to such children as have fallen under my own observation; but what is true of them is undoubtedly true of almost all. Parents are not accustomed to look to the week-day schools for the religious instruction of their children. They look at most for that general religious influence which may result from the recognition of God and of his Word, in the daily prayer or reading of the Scriptures with which our schools are commonly opened. To suppose, then, that the children do not practically receive instruction in the tenets of the religious denomination to which they belong is to suppose that they are either abandoned without any religious instruction whatever or that their parents and pastors are indifferent to the tenets of their own denomination. Neither of these ideas could be entertained for a moment by those who know anything of New England clergymen or of New England fathers and mothers.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

The pulpit, the Sunday school, and the fireside. There is no lack, certainly, of doctrinal discourse and instruction in the pulpits of the Protestant Episcopal Church, with which I am associated, while the catechisms of the church and the tenets of the liturgy are diligently taught in the Sunday school of the parish. It is not to be doubted that in most families there is a greater or less degree of attention paid to the religious education of the children. The Bible, the prayer book, the hymn book are the familiar manuals of parental teaching, and the influences of home are thus brought in aid of the instructions of the Sunday school and the pulpit.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

In the highest degree. The mere influences of the order, the discipline, the obedience, and the "good behavior" which belong to a well-kept school, and which it is made the duty of our teachers to enforce, are, I need not say, of the utmost importance in establishing moral habits and inculcating moral principles. Indeed, were our schools to do nothing more than to supply a stated and innocent occupation to our children, keeping them from idleness and from the temptation to mischief, of which it is the parent, for six days out of seven, their importance to the prevention of immorality and vice could hardly be overrated. It is, however, among the positive duties which our law imposes on all instructors and teachers "to exert their best endeavors to impress on the minds of children and youth committed to their care and instruction the principles of piety and justice and a sacred regard to truth;" and the pupils of our normal schools, who are afterwards to become the

teachers of our common schools, are expressly required to be educated "in the principles of piety and morality common to all sects of Christians."

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I should find it almost as difficult to state the main grounds for my unqualified approbation of our common-school system as I should to state the reasons for cherishing the common bounties and blessings of Providence—the light, the air, the seasons. I can not conceive of our getting along without them under a political system like ours. They are a vital part of our Government; they are our most efficient police; our institutions would not enable us to provide any substitute for them. But apart from any consideration connected with the character of our Government they seem to me the only effective means for promoting the intelligence, developing the energies, and elevating the character of a whole people. Any voluntary system of education must leave great numbers of children untaught. It may be that among these neglected children are the persons whose natural capacities would have enabled them to do most for their fellow-men, who, if their faculties could have been cultivated and developed, might have been foremost in art or science, in invention or enterprise, in literary, civil, or military pursuits. It is certain that our American common schools have given their earliest, and sometimes their only, education, to not a few of our most distinguished men in all conditions of life. Universal education, freely offered to all, and of which all are, in a manner, constrained to partake, secures to society the benefit of all the powers which God has bestowed upon all its members, and thus gives the strongest impulse to the progress of human civilization and improvement. If New England has made rapid strides in anything good, or great, or valuable since its settlement, I think it has been primarily owing to her common-school system.

ROBERT C. WINTHROP.

BOSTON, *October 20, 1851.*

Answers of Mr. Gray respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

Certainly not. The system admits the use of the Bible without note or comment, and a simple prayer, morning and evening, which ought to contain nothing offensive to any denomination of Christians. If anything thus offensive is introduced there or elsewhere, it is not in conformity with the system, but an abuse of it; and one which, though it may no doubt exist, must be rare, since I know no instance of it being made a matter of public discussion in the newspapers or elsewhere, though in this country everything is so discussed on which there can be two opinions. A single instance of a marked abuse of this kind would certainly attract public attention, and even those parents of the same peculiar tenets as the teacher would join with all others in censuring him for introducing those tenets into a common school.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

Undoubtedly they do so.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

That of domestic instruction and that of Sunday schools, which last have become very general of late years and seem constantly becoming more so. In these some of the most respectable young persons in the parish of both sexes, who have finished their own education but are not yet charged with the care of families, teach the children in small classes in different parts of the church.

4. In your opinion, is the system of instruction pursued in the common schools of

New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

It is so, by affording special securities that the teachers shall be exemplary as moral and religious men. In consequence of the provision of law that the masters shall be appointed and the schools governed by committees chosen by the inhabitants of the school districts themselves and shall be supported by taxes assessed upon themselves, they of course take a lively interest in the government of the schools and in the due application of the funds. Moreover, parents entertaining different religious sentiments are careful to see that the teacher introduces into the school no tenets adverse to their own. Watchful for these purposes, they are naturally watchful in all respects, and no one can be a teacher here who does not, under this close scrutiny, maintain an unimpeachable character for morals and piety; for no parents, whatever they may be themselves, would let any other instruct their children. It is thus favorable in many other respects, but in none that I now think of peculiar to it as a system.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I do approve of it, and for these reasons, among others: Because it is highly important for the security of society in all free countries, and most so in the freest, that the children of all sects, classes, and conditions, since they must mingle together subsequently in the conflicts of life, should from their earliest years be intimately associated in similar pursuits (as they are in school) on terms of perfect equality; because I believe that religion, like almost everything else, is best taught in a school devoted to that single object, and see no more reason why it should be taught in connection with reading, writing, arithmetic, and the other branches of a common school education than with any accomplishment, trade, or profession, its alliance with the former having probably originated in times when even the mere rudiments of learning were taught only by ecclesiastics; because if taught it by those who are not associated in their minds with the daily drudgery and discipline of the schoolroom, and whom, though young, they look on with respect, and especially if thus taught in the church and on Sunday, children will be likely to regard this study as something apart from their week-day tasks, and more sacred; because the Sunday-school teachers are themselves benefited by the lessons they give no less than their pupils are, since the best mode of acquiring a thorough knowledge of any subject and a strong interest in it is to teach it; and religious education, as it should begin earlier, will thus be continued also later than any other, as it should be; because while the use of the Bible and daily prayer, in which all may join without tasking their minds or their memories, tend to excite veneration for the Scriptures and for the Deity thus invoked, it does not seem to me that to omit the teaching of the tenets of any one religious sect, however true, in the common school, if they are properly taught elsewhere, has any more tendency to create indifference to them than the omission to teach them in the same schools with drawing, music, or dancing. It is only on the assumption that they ought to be taught in common schools and that children should be made to believe so that their omission could be deemed by them or by anybody an evidence of neglect, and thus countenance indifference, which amounts to no more than this: That, assuming they ought to be taught, they ought not to be omitted.

F. C. GRAY.

BOSTON, *October 14, 1851.*

Answers of Mr. Hillard respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

My means of knowledge as to the results of the system of instruction adopted in the common schools of New England are derived exclusively from observation of the public schools of Boston. So far as they are concerned, I can say with confidence that the system does not interfere with the special religious tenets of any particular denomination of Christians. If by chance any such interference does happen in a particular case, it can be only incidentally or indirectly, and probably unintentionally; and even to that extent it is a perversion and abuse of the system. The teachers of the public schools in Boston are annually elected; and, having been for many years a member of the school committee, I can say positively that any teacher who should manifest, by acts or words, an intention to interfere with the religious tenets of any pupil would certainly lose his situation as soon as the fact became known to the members of the school committee. I have no doubt that the above observations apply with equal force to the other cities and towns of New England.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

It is within my knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong. This is the general rule, though there may be, and doubtless are, occasional exceptions.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

The system of Sunday schools, which is universal in New England, is intended to give, and does give, instruction in the tenets of the various religious denominations to which the children respectively belong. These schools are not confined to the children of the poor and do not give secular instruction. A very large number of intelligent men and women in New England are engaged as voluntary teachers in these schools and spend much time, not only in the discharge of their duties on Sundays, but also in preparation for them. Besides these schools, I believe it is the custom in many religious congregations in New England for the clergyman to devote a portion of his time to the special religious instruction of the elder children, at least, of his flock. The above is, of course, exclusive of the domestic religious instruction given by heads of families to their children—a duty never neglected by religious households in New England.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

The system of instruction pursued in the common schools of New England is, in my opinion, indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality. I could not believe otherwise without believing ignorance to be the natural ally of religion and morality—a proposition which seems to me opposed alike to the wisdom and goodness of God. Whatever expands and enriches the mind appears to me favorable rather than unfavorable to the growth of the religious sentiments and the promotion of morality. There have been many instances in the world of the combination of great powers and attainments with irreligion and immorality, but they form the exception rather than the rule.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

Our system of public schools is the natural growth of our soil and the necessary complement of our system of self-government. I can not conceive of the permanence of our institutions without a system of popular instruction. When, therefore, I am asked if I approve of the system it is as if I were asked whether I approve of laws and magistrates, of marriage, and of property. The system itself seems to me nearly perfect, but in its practical application much will depend upon the character of the teachers themselves, and many degrees of excellence will be the result.

In a country like ours, with no established religion and a multitude of sects watching each other with jealous solicitude, it is quite impossible that the system itself should provide for distinct religious training, for religious training must mean training in what the teacher himself calls religion. And this watchful supervision of one sect over another also renders it impossible that a teacher should successfully attempt to imbue the pupils intrusted to him with his own peculiar views.

There is one good and not very obvious result of our system of public schools which has always struck me as of some importance. In democratic communities, where all men are equal before the law, there is always a sense of heartburning likely to be engendered from an observation of the inequality of fortune and condition among men. The remedy to this state of feeling is to be sought in the cultivation of a genuine sympathy on the part of the more favored toward the less favored classes; and nothing will more tend to produce this sympathy than that the children of each should attend for a time the same schools. A man can not but feel a lifelong kindliness of heart toward one with whom, when both were boys, he sat upon the same bench and learned the same lessons. That this good result should be obtained it is requisite that the schools should be of such excellence that the more favored classes should be willing to send their children to them, which in many, probably most, places is the case.

GEO. S. HILLARD.

BOSTON, *October 9, 1851.*

Answers of Mr. Prescott respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

I have not, nor do I well see how it can well be so. The members of the school committees are chosen by the votes of all the inhabitants of the respective towns, comprehending every variety of religious denomination. The committee representing them would, of course, allow no system of instruction which favored one denomination at the expense of the others.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

It may be as well to answer the second and third questions together.

There can be no doubt that while the school education gives no direction toward any particular sect, the child must receive this direction from its parents at home or from the teachers in the Sunday schools, which are to be found, I believe, among every denomination of Christians. There is hardly any child, I should imagine, in such abject circumstances as not to come under the influence of one or the other, and usually of both of these causes, by which he is maintained in the religious tenets of his parents.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I should say directly favorable to both. The morning exercises are usually preceded by the reading of a portion of the Scriptures, and thus a reverence is inculcated in the child for the sacred volume and the teachings it contains as the guide of his life.

It is hardly necessary to add that the regular course of the school discipline is favorable to moral culture.

5. Generally, do you approve, or do you disapprove, of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I believe no other system of instruction would be so favorable to the education of the great body of the people; and such an education is of the last importance to a republican government like ours. If the system were made to comprehend religious instruction, this instruction must necessarily be accommodated more or less to the doctrines of some particular sect. This would render the school inaccessible to those children whose parents were unwilling to expose them to the risk of imbibing such doctrines. On the present plan all of every denomination may receive an education fitting them for the dutie of this life; and while no one is taught any special religious tenets, all are taught that reverence for religion which is a good basis for those particular tenets which may be inculcated elsewhere.

W. H. PRESCOTT.

OCTOBER 7, 1851.

Answers of Mr. Sparks respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

From the nature of our political institutions, it would seem impossible that there should be any such interference. The constitutions of the several States, as well as that of the United States, allow entire freedom of opinion and worship to every citizen. Schools are required by law in every township, and local taxation is authorized for their support. The taxes are levied upon a uniform principle, without reference to religious opinions; and there is probably not a public school in New England in which the parents of the pupils are not of different denominations. It would be obviously impossible, therefore, under these circumstances, for such a school to exist, if the teacher were to attempt to inculcate the tenets of any one particular sect, or to interfere with those of any other.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

They certainly do; but the amount of instruction must of course depend on the zeal with which the parents of the children maintain their religious faith, and their devotedness to the denomination to which they belong. Experience has shown that the existence of a variety of sects constituting one community, enjoying equal rights and privileges under the laws, and acting upon each other by example, rather tends to increase than diminish their zeal, and prompts them to communicate to their children religious instruction according to the views they entertain.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Sunday schools may be regarded as among the principal agents. These schools are found in almost all the parishes in New England, and are designed expressly for religious instruction. Suitable books are provided for the purpose. Clergymen and other persons properly qualified are the teachers. Several of the denominations also distribute large numbers of religious tracts, suited to children and young persons. Moreover, the parents themselves naturally exercise an important agency, either by direct instruction, or by putting into the hands of their children such books as will enlighten or establish their religious sentiments.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I can not but think so. The books used in the schools, although they do not inculcate the dogmas of any particular sect, nor any special form of worship, are, never-

theless, of a moral and religious tendency. No others would be tolerated; nor would a teacher of known immorality or of skeptical views in religion be allowed to have charge of a school.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

A system may fairly be judged by its results. In this respect, the system of common schools in New England claims unqualified approbation. It has existed two hundred years, and I am not aware that the people of any country or community have exhibited the fruits of moral and religious culture in a more eminent degree than the inhabitants of New England.

JARED SPARKS.

HARVARD UNIVERSITY, CAMBRIDGE, *October 13, 1851.*

Answers of Mr. Ticknor respecting the common schools of New England:

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

I have been familiar for above forty years with the practical working of the New England common or free schools, in which the children of all conditions in life and all sects in religion are educated together, from about the age of four to about the age of sixteen, and I am satisfied that these schools in no way interfere with the special religious tenets of any denomination of Christians. The simple fact, which, I think, will be questioned by nobody among us, that children, until several years at least after the period when they leave the common schools, follow, with extraordinary uniformity, the religious tenets of their respective families, seems to me to render this point certain. It seems to me, also, to be rendered certain by another well-known fact, viz: that each separate religious sect in the State of Massachusetts, and perhaps in each of the towns and cities into which the State is divided, is in a minority; and, therefore, if any one sect were, through the teachers of the free schools, to influence the religious tenets of the children committed to their care, or even attempt to influence them, the other sects, constituting a great majority of the people, would unite in correcting the evil; or, if that could not be done, would overthrow the whole system, which is completely and always in their power, and which would certainly not be sustained by them if it interfered with the religious opinions of their children.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

The instruction of children in the special tenets of religion was, until Sunday schools became common among us, chiefly given in weekly catechetical exercises and familiar explanations of Scripture by the minister of the congregation to which the children belonged. But for the last thirty years Sunday schools, in which children of all conditions in life are taught together, have been increasing in numbers, until now hardly a congregation in New England is without one, in which the special religious tenets of the families of the children are inculcated on the children themselves, under the immediate direction of their clergyman, by such teachers as he selects from among his own people. Nearly all the children continue in these Sunday schools as long as they continue in the free common schools, often longer, and not unfrequently till, in their turn, they become teachers of a generation younger than themselves. I say nothing of domestic instruction in religion, which has always been common in New England from the first settlement of the country, and is so still. It may be well, however, to add that there are a few children in our free schools who do not attend Sunday schools. These children, with rare exceptions, belong to one of the three following classes: First, they are the children of Irish

immigrants, who penetrate everywhere, and are therefore not infrequently found in localities where they have no church, priest, or Sunday school; second, they are the children of Quakers or other persons who disapprove either of all Sunday schools or of those to which they can have access and teach their children at home; or, third, they are too young and have not learned to read or become otherwise fitted for Sunday schools; these last being more numerous than either of the two other classes, but coming to the Sunday schools when they are old enough. Still, the entire number of children who are taught in our free or common schools and who do not go to our Sunday schools is small in New England, and will, I think, always be inconsiderable wherever the different sects in religion are made to feel that they alone are responsible for the religious education of the mass of children growing up in the families belonging to their respective faith, because this responsibility awakens their zeal and makes them provide means to educate religiously not only the children of their own congregations, but also all other children whom they can draw within their influence, establishing, as they often do in New England, Sunday schools merely to gather in, from all quarters, children who, from the low condition of their families, or any other cause, are left without proper religious training.

On the separation of doctrinal teaching in religion from the teaching of the common schools, I will say a single word on the New England system, regarded as one that separates all teaching in the free schools from all teaching of religious doctrines. I deem it to be a system favorable to the cause of religion, and for this, among other reasons: Our free-school teachers must everywhere be selected mainly from a regard to their skill in teaching on common subjects; and though no teacher believed to be an irreligious person would be appointed in New England any more than in Great Britain, or could keep his place after he was known to be such, still the main qualifications for which he would be chosen would be, in their nature, connected with elementary knowledge on common subjects and a power of communicating it. But the Sunday-school teachers, who are at least three times more numerous in New England than the teachers of the free schools, are selected for their known interests in religion, and, serving without pay, can be prompted by hardly any motives but those arising from zeal for religion, from love of the occupation, and from a sense of duty. Moreover, nothing is taught in the New England Sunday schools but Christian morals, natural theology, the evidences of Christianity, and its practical and doctrinal claims, the free schools on week days being so abundant, and of such a character, as to render all teaching of secular subjects on Sundays unnecessary and unbecoming. Religious teaching, therefore, is, I think, by this very separation from other teaching, made more thorough, earnest, and effectual. The children feel that their unpaid teachers can have no interest in the matter different from their own, and an attachment, founded on religious sympathy, often grows up between the Sunday-school instructors and the Sunday-school scholars, as well as among the scholars themselves, which lasts many years, sometimes through life. In this way Sunday schools and the religious training of children have become as well settled a part of the New England system of instruction as the free schools on week days, and quite as successful, each, as I believe, being made more effectual by its separation from the other. Religion, however, gains, I think, the most by their separation.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

Special religious instruction is communicated in different ways; oftenest and most systematically by Sunday schools, the aggregate number of whose teachers throughout New England is very much greater than the aggregate number of teachers in the common schools; but besides the Sunday schools, which generally use manuals, the children often receive oral instruction from their clergymen and from persons selected for the purpose in Bible classes and in other ways. Regular meetings of the Sunday-school teachers of each school are also held by their clergyman, in order to advise and direct the teachers in the management of the children, and in some denomina-

tions catechetical exercises with the children are still used more or less—a mode preferred, I believe, by the Roman Catholics. But, as a general remark, each denomination of Christians feels it to be its duty to provide in some way or other for the careful religious training of the children whose families belong to it, and is not only able and desirous to do so, but really does it faithfully. Any teacher of a free school who should interfere with this recognized system of things would, I think, find it impossible to retain his position as a teacher; but I never heard of one that attempted it.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I have no doubt that the system of instruction pursued in the free schools of New England tends greatly to the preservation of social order, to the diffusion of a spirit of inquiry for the truth, and to the cultivation of religious sentiments and of a sense of duty to man and to God; and I think it would be difficult to find a sensible man born in New England, of any religious persuasion, who would give a different opinion.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I believe the system of the free schools of New England to be a wise system of moral police, to support which the property of all is rightfully taxed; and I will add—having lived two or three years in Germany and longer in other parts of Europe—that I believe this New England system to be more effectual than any system of teaching has yet been made elsewhere to secure the well-being of a State. And further, that such a persuasion of the inherent benefits of our free schools is the settled conviction of a vast majority of our people is, I conceive, made certain by the fact that while the laws of Massachusetts require the several towns, in proportion to the number of children they may contain, to provide to a certain extent for the education of all the children within their limits, hardly a town in Massachusetts—perhaps not one of above 300 into which the State is divided—fails annually, by a popular vote, based on universal suffrage, to provide for such education to a greater extent, and at a greater cost, generally much greater, than is required by law. This spontaneous, uniform, and, so to speak, universal assent of the voters, in a population of nearly a million, annually asked for and annually given afresh in the shape of a somewhat burdensome tax laid by themselves upon themselves, seems to me, considering the general intelligence of these voters and the thorough trial of two centuries to which the free schools among us have been subjected, to be a proof of the excellence and efficacy of the system as decisive as can be asked.

My remarks have generally been limited to Massachusetts, my native State, but they may be applied to all New England with little or no modification—certainly with none as to the instruction of children in the special religious tenets of any particular denomination of Christians.

GEORGE TICKNOR.

BOSTON, *October 10, 1851.*

Answers of Mr. Longfellow respecting the common schools of New England.

1. Have you reason to believe that the system of instruction adopted in the common schools of New England interferes with the special religious tenets of any particular denomination of Christians?

I have no reason to think this to be the case. It is certainly possible that an overzealous instructor may think it his duty to inculcate particular doctrines in his prayers, or in the schoolbooks used. This, however, could hardly be called a defect of the system, but rather a defect in its application, and can always be guarded against.

2. Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

To the best of my knowledge, the children of the common schools are thus instructed. I suppose there are not many families in New England the younger members of which do not receive this kind of instruction. By families in New England, I mean New England families.

3. If they do receive such instruction, what are the agencies by which it is communicated to them?

The chief agencies are the education of the fireside and the Sunday schools.

4. In your opinion, is the system of instruction pursued in the common schools of New England indirectly favorable to the cultivation of the religious sentiments and to the promotion of morality?

I give an affirmative answer to this question, and have no doubt that such is the result. Were it otherwise, the common schools must long ago have been abandoned as worse than useless.

5. Generally, do you approve or do you disapprove of that system; and what are the main grounds on which your approbation or disapprobation of it is founded?

I very heartily approve of the system, on the ground that by it the means of education are given freely to everyone, and, however poor a man may be, he feels that the education of his children, to a certain point, is secured to them, and that good morals will be taught them, and their religious sentiments cherished and cultivated.

HENRY W. LONGFELLOW.

Evidence of the Rev. Dr. Barnas Sears, secretary of the Massachusetts board of education.

Are you secretary of the Massachusetts board of education?

I am and have been so since November 24, 1848.

Had you any previous connection with the public schools?

I was educated in them till I was about 15 years of age, and I afterwards taught in them six winters. For the last twenty years I have been engaged chiefly as an instructor in literary and theological seminaries, and was member of the Board of Education from 1842 to the time of my appointment as secretary.

Does your official position necessarily make you acquainted with the working of the Massachusetts system of common schools in its principles and in its details?

It does, necessarily. I am in direct communication with the common schools of all the towns of the State; not only do all school committees make their annual reports to me, but I visit all parts of the State, aided by two assistants, besides the clerk, who is always at the office.

Will you be so good as to explain the precise form and extent of the religious instruction which is given in the common schools?

One of most striking features in our institutions is the existence of our towns (which are equivalent to townships in the north of England) as free corporations; and, as in other matters, so also in the management of schools, the greatest degree of freedom is left to these towns or their committees that is consistent with the general unity of the government; consequently a great diversity exists in regard to the form in which religious instruction is given the schools. Religion is not taught as a matter of theology, according to the forms of the catechism, but is generally inculcated as a matter of devotion and of Christian morals. The Scriptures are almost universally used in some way in the public schools.

In the Eighth Annual Report of the Secretary of the Board of Education, printed in 1845, it was stated that out of 308 cities and towns in the Commonwealth, the Bible was then used in the schools of 258 towns as a regular reading book prescribed by the school committee, and that in the schools of 38 towns it was used either as a reading book or in the exercises of devotion. Have you reason to believe that the

proportion of schools in which the Bible is so read is at the present time nearly the same as in 1845?

It is my belief that it is read decidedly more than it was at that time; but less as a reading book, and more in connection with religious exercises.

Is there any difference of opinion prevalent as to the extent to which the Bible should be used as a text-book in the schools?

There is; but this difference does not arise from sectarian or irreligious considerations, but is solely connected with the different views which are entertained upon the different processes of instruction. Very many persons of deeply religious sentiments are of opinion that it is more favorable to the religious character of the young that the Scriptures be used for devotional purposes rather than as a text-book.

When the Bible is used for devotional purposes, what is the precise manner in which it is so used?

Select portions are read, sometimes by the teacher, sometimes by the first class, sometimes by a pupil selected by the principal for the purpose, and sometimes by all the members of the school who are able to read fluently.

Is the Bible read at the commencement of the school?

Usually, at the opening of the morning session; in some schools the morning exercises begin with the reading of select portions of Scripture, the singing of school hymns, and a brief prayer, extemporaneous or written, or sometimes a psalm, or the Lord's Prayer. This, with a few practical remarks, sometimes constitutes the whole of the religious exercise, but it is left optional with the teacher.

Upon whom does the selection of prayers, psalms, and hymns depend?

Upon the teacher; the use of the Bible as a text-book would depend upon the committee, but the committee would leave entirely to the teacher the precise manner in which he would perform the devotional exercises of the day. The committees are required by law to prescribe text-books, but they do not prescribe the precise mode of teaching and discipline, or of religious exercises, though they often make friendly suggestions; only when obvious abuses exist do they interfere with their authority; they must, at the outset, be satisfied with the moral as well as intellectual and literary qualifications of the teacher.

Can you tell me the precise number of schools in which the Bible is now read as a regular reading book prescribed by school committees?

The State collects statistics, which are presented to the public by the secretary; since 1845 that precise question has not been deemed necessary, and therefore has not been put to the teachers or committees. But, as I said before, I have reason to believe that there is an increased use of the Bible. We have frequent discussions on these subjects before the associations of teachers, and having attended these, I am satisfied that the fact is as I have just stated.

Do the Roman Catholics raise any objection to the presence of their children in the schools when the Bible is read?

Very rarely. I have known an instance where Roman Catholic parents preferred that their children should enter the school at the close of the morning devotions. In one of our manufacturing towns the school committee allow the children of the Roman Catholics to use the Douay version, if they prefer, when their turn comes to read, in the same school where others read in the common version. In one of the schools of the city of Lowell I saw a Roman Catholic teacher who had been regularly chosen by the school committee; the children of that school were from Roman Catholic families.

Do the Roman Catholics ever maintain separate schools for the education of their children?

I have known but a single instance of the kind since entering upon the duties of my office, and that was in Fall River. I was recently informed, however, by the school committee of that town, that the children were leaving those schools and returning to public schools.

What has led to the change?

The parents see that those children who attend the public schools make better progress in their studies, approximate more to the character of the natives, and have better prospects for success in life than those who attend the separate schools; that they lose their brogue at the public schools; that their manners are decidedly improved, while at the same time their religious opinions are not in any way interfered with by the teacher.

In the several districts have the Roman Catholics raised any objections to the presence of their children in the schools?

Not to my knowledge. There are very few Roman Catholics in the rural districts. They are mostly in the cities and manufacturing towns. I mean by the phrase "manufacturing towns" not only the large towns where cotton and woolen cloths and the like are manufactured, but the numerous towns where boots, shoes, and other articles are made.

Have you heard any complaints made to you by any Roman Catholic that his religion has been interfered with in the schools?

Not in a single instance, either from a Roman Catholic or by any other person, have any such complaints come to my ears, either directly or indirectly.

And should you have been likely to have heard of such complaints if they had been raised?

Certainly, if they have existed to any considerable extent. There might have been single instances and I not have heard of them.

Have you any reason to doubt that a boy who goes through a regular course of instruction in the common schools would leave them with the same religious opinions as when he entered?

Not the least, whether he be a Roman Catholic or a Protestant.

What are the checks on the appointment of improper persons as teachers?

In the first place, as you are aware, the law provides that only such persons as, upon nomination, are found to have suitable qualifications, both literary and moral, shall be appointed as teachers. In the next place, committees of superintendence are chosen by the people with reference to their being suitable persons to execute these laws. In the third place, it depends upon the discretion of these committees, who are themselves responsible to their constituents. In the very nature of the case these committees will pay attention to the moral demands of the community, and if they permitted any sectarian influences to creep into the school the constituents would take care to prevent the continuance of such abuses by the appointment of a new committee at the annual election.

Would a teacher who attempted to propagate his own sectarian opinions be removed from his situation?

Undoubtedly he would be removed by the school committee, in whom alone the authority is vested by law. I wish you to understand that I deem this an essential part of our system, that the control is not exercised by State authorities, but by the authority of the local committee; not even the board of education have the power of removal or any direct control over the schools.

Should you make any representation to the school committee if it came to your knowledge that there was an improper teacher in the schools under its superintendence?

I should, as any other individual in the Commonwealth would be likely to do. If, however, you mean to inquire whether that is one of the duties of my office, I answer no. We may give advice, to be sure, but we regard those as local affairs, and the committees are expected to attend to their own business.

Is it within your knowledge that, apart from the common schools, the children educated in them do practically receive instruction in the tenets of the religious denomination to which they respectively belong?

They do. In the first place, each family has, or may have, its own religious instruc-

tion; in the next place, most of the children attend some Sabbath school, and, in the third place, they are generally connected with some religious society or church. For the most part parents see to it that all these three modes of religious instruction are faithfully employed; in other instances, benevolent individuals and societies endeavor to bring all the children of the ignorant and vicious under the influence of Sunday schools and of religious worship in some one or other of the religious denominations. In some cases parents prefer either to give or to superintend the religious instruction of their children, and for that reason keep them from the Sunday schools rather than from any indifference to their religious education. All these parties, instead of looking with jealousy upon the common schools, regard them as rendering most important aid by preparing the minds of the young to receive intelligent views and hold intelligent opinions on the subject of religion.

Do you think that the system of instruction pursued in the common schools of New England is indirectly favorable to the cultivation of the religious sentiment?

I have no doubt of it whatever; and I will add, further, that I believe that it is directly so, and in a very high degree. It is a general sentiment among committees and teachers that moral education founded on the religious sentiment is indispensable to the highest success of the schools; that all the other ends, both of discipline and instruction, are better answered where there is a high moral and religious tone of feeling. At the teachers' conventions, associations, and institutes, both in public lectures and discussions, the importance of religious instruction is generally made very prominent. Everybody that writes on the subject or speaks on the subject, no matter to what party or sect he may belong, presents it in the same light.

The result of the examination of six cities and towns of Massachusetts in regard to the religious instruction in free Sunday schools of public-school children made by Dr. Sears, at the request of the Hon. Mr. Twistleton, is as follows: In the cities of Boston, Fall River, and Lowell and the towns of Andover, Boxford, and Wayland there were found actually present when their public schools were visited 13,496 pupils. Of these 12,026 were regularly attending a free Sunday school; 1,008 not attending at present but had been members of a Sunday school; 462 were "unaccounted for." As this investigation included children from the age of 4 to youth of 16, it is easily understood that at both extremes there would be ordinarily the number here indicated, 1,470, as not yet connected with or having ceased attendance on Sunday schools. Probably to-day the proportion of common-school children in Massachusetts attending Sunday schools or in some way brought under the influence of public religious instruction is larger than ever before. The pamphlet from which these extracts are made is one of the most forcible ever addressed to the British public and the Parliamentary committees on education, and contains much valuable information concerning the condition of popular education in England and Wales in 1850–1854. At that period there were in England and Wales (1851), with 17,922,768 inhabitants, 968,557 children between 5 and 12 years of age entirely without schooling. In Massachusetts the same year, with a population of 994,655, there were in school 199,429 scholars, slightly over a fifth of the entire population. Up to the year 1853, during fourteen years, the average annual grant of Parliament for subsidizing public education in England and Wales was

slightly in excess of $500,000, and in 1854 had been raised to nearly $1,000,000, the same amount that the people of Massachusetts raised for their own public-school system. At the same time 30 per cent of the men in England and Wales who married in 1851 signed the marriage register with marks only. Well might the eloquent Englishman, in view of these appalling facts, address the educational committee of the House of Commons in words like these:

> We can scarcely, indeed, regain the precedence which Milton once claimed for England of teaching nations how to live. That wreath of glory, "despised and flung aside" by ourselves, has been nobly earned by the State of Massachusetts, and now blooms on the brow of this our younger brother.

In 1854 the city of Boston appropriated $330,000, one-fourth the entire tax of the municipality, for the 23,000 pupils of the common schools—$15 for each child. The population of the city was 150,000 and the property valuation $188,022,500, thus represented by $14 each appropriated for education, a tax of 2 mills on the entire property of the city. There were 175 girls in the city normal school, the only opportunity given for the secondary education of the sex above the grammar schools. The disturbing influence of foreign immigration was already manifested. The Germans, though not a numerous body, had already petitioned for separate schools taught in their own language, and the religious movement, since expanded to the establishment of the Catholic parochial schools, had begun to agitate the educational public.

In 1854–55 Secretary Sears appears in his final report. Dr. Sears had declared his intention to accept the presidency of Brown University, Rhode Island. He remained there until "called up higher" to occupy the influential position of general agent of the Peabody Education Fund for the South, in 1867. Ex-Governor George S. Boutwell was chosen as secretary of the State board of education on September 7, 1855. The board, in its report, says of the retiring secretary:

> By the resignation of Dr. Sears the cause of popular education has lost a zealous, faithful, and highly cultivated supporter and friend. His administration was eminently calculated to conciliate public sentiment in favor of education, to consolidate the system, and to bring it into harmony with the wants of the people and the policy of the legislature. During Dr. Sears's administration great progress has been made. The appropriations have been increased, schoolhouses and apparatus have been improved, and the professional character of teachers has been elevated and their influence extended. We are sensible that these changes are in a high degree owing to the labors and wise counsels of the late secretary.

The appropriations for education this year reached $1,137,407, a gain of 12 per cent—the highest in the history of the Commonwealth. There were now 100 high schools in the State. Two classes of 12 young men each had been sent to the colleges of the State under the arrangement for educating high-school teachers by State scholarships. Dr. Eben S. Stearns had resigned the principalship of the Framingham State Normal School to accept the important post of principal of the Albany

(New York) Female Academy, which, under his charge, became one of the most notable seminaries of the country, largely taught by graduates from the normal schools of Massachusetts, and Mr. George H. Bigelow was elected to the chair thus vacated.

The retiring secretary, in his final report, dwells on the limitations and perils that beset the American system of common schools: (1) Extravagant expectations of their patrons; (2) the limitations of the teacher's power; (3) the schoolroom covers only a portion of the education of the child; (4) effects of foreign immigration on the classes of children in cities; (5) adverse social influences; (6) improper reading and public amusements; (7) danger from crude legislation on education in the formative condition of American society; (8 and 9) difficulties of school government and slow growth of the superior teacher's power.

The reader has been called to linger over the six years of the office of secretary of the board of education by Dr. Barnas Sears because it would seem that a gracious Providence had permitted the people of Massachusetts to harvest the crop from the good seed sown by Horace Mann. After the twelve years of thunderstorm that everywhere accompanied the public career of the great secretary, it was indeed an indescribable relief to abide during six years in a calm such as follows the advent of spring at the end of a season of clouds and storms. During these eventful years all the practicable schemes of Horace Mann had been tested, the great excitement awakened by his eloquence somewhat abated, the hostile class developed by his positive and controversial type of manhood conciliated, and the highest influences of the Commonwealth finally enlisted in behalf of the common school.

This period was also very fruitful in bringing to the front a corps of educators like Dr. Stearns, Crosby, Green, Hillard, Agassiz, Guyot, Edwards, and "noble women not a few," who, at home and in other States, afterwards were honorably connected with education in all its departments.

The Twentieth Report of Education contains the first communication of George S. Boutwell, who, on the retirement of Dr. Sears, in 1855, had been elected secretary, which position he administered with distinguished ability until December, 1860. Mr. Boutwell is perhaps the only person who after holding the office of governor of a State for three years was called to serve the Commonwealth five years more as superintendent of public schools, and the only secretary of the Massachusetts board of education who obtained all his own education in the country district school. Born in 1819 in Brookline, Mass., his youth until the age of 13 was spent on his father's farm in one of the remote towns of Worcester County. There he also began his occupation as a clerk in a village store. Having removed to Groton, Mass., at 17, for twenty years he worked as clerk and partner in a mercantile house in that place. His leisure was given to books, and at 21 he was qualified for the practice of law. At 32 he was elected to the State legisla-

ture, where in three years he became the leader of the minority party and its candidate for governor. In 1851, on a third trial, he was elected governor, and served for three years with distinguished ability. Harvard University answered the jibe of his political opponents that the new governor "was only a country trader" by conferring upon him the honorary degree of LL. D. and appointing him a trustee of that institution.

With this valuable experience, in which, as governor and member of the State board of education, he had become thoroughly acquainted with the public school system, he was appointed secretary of the board in 1855. He returned to political life through his connection with the Republican party in 1860 as a member of the convention that nominated Abraham Lincoln for the Presidency; was a member of the "peace congress" which met in Washington January, 1861, and received from President Lincoln the office of Commissioner of War Claims and First Commissioner of the Internal Revenue. In 1862 he was elected a Representative in Congress, where he served four terms, and became a notable figure in the important legislation of that critical period. He was appointed Secretary of the United States Treasury by President Grant, and in 1870 was elected to the Senate of the United States as the successor of Henry Wilson, then Vice-President—a signal coincidence of two wholly self-educated men sent to that body by the then most cultivated of American States; while Governor N. P. Banks, another statesman of remarkable ability, had risen from the same obscure estate. His last public employment was as the counsel of the United States before the French and American Claims Commission. Declining a second call to the Secretaryship of the Treasury by President Arthur, Mr. Boutwell established himself in 1880 in Washington in the practice of the law, where he still lives at the age of 79.

In the administration of the office of secretary of the board of education of Massachusetts from 1855 to 1860, Mr. Boutwell displayed the same distinguished executive ability and rare common sense that made him perhaps the most conspicuous American statesman of the Benjamin Franklin type in the past generation. His first report, issued December, 1856, is a powerful and statesmanlike presentation of the condition of the common school system of the State during the past twenty years. In that period the population of the State had almost and the property valuation quite doubled, in 1855 amounting to $260 for each of the 1,132,000 inhabitants of the Commonwealth.

The secretary declares that the high schools of Massachusetts in 1855 gave, without charge, a better education than could have been obtained at any price from any institution of learning in the State thirty years before. Labor, "from a menial had become an intellectual occupation; from imitative had become creative." The increase of school appropriations in these twenty years had exceeded the increase of property valuation by 9 per cent—109 per cent since the advent of Horace

Mann. The annual expenditure on schoolhouses was greater than the entire amount of school property in 1837. He speaks of the teachers of the State as the equals of any professional class in fidelity, a progressive spirit, and public estimation. The proportion of men to women teachers, 4 to 6 in 1837, had fallen to 4 to 15 in 1855. He also notes the beginning of that drift of pupils from neighboring States to the secondary and high schools of Massachusetts which to-day brings to the State an annual income fourfold the sum expended on its own high and normal schools.

Still, according to the report, a great work remained to be done. Only 64 per cent of the children between 5 and 15 were in the public schools, leaving 36 in every 100 to be accounted for. In 1855 the legislature passed the important statute securing to every child under the age of 15 at least eleven weeks' instruction in a school approved by the school committee of the place of its residence. The secretary emphasizes the idea of personal effort among the people for the further waking up of educational interest.

"Not one-twentieth of the people read the reports of the board of education or any school literature." The secretary himself had made more than fifty public addresses during the year, and urged the reappointment of the agency of the board that had lapsed by the neglect of the legislature to make the appropriation. There were 320 students in the four State normal schools, and the appointment of Mr. John W. Dickinson as principal of the Westfield school, then the largest of the four, inaugurated a new era in that department of public education. Thirty-six young men had been appointed to scholarships in the colleges of the State, but there was an evident disappointment in this experiment of training high-school teachers. Eighty of the 90 towns legally required to establish high schools had complied with the law, a gain of 70 during the past twenty years. There were then 125 towns in Massachusetts with a population exceeding 2,500. Boston had established the office of superintendent of city schools, and Mr. Nathan Bishop was the first appointee.

During the successive years of the administration of Secretary Boutwell educational affairs in Massachusetts moved on at a gradual pace of reform, varied by occasional lapses into the old ways so dear to the New England temperament. In 1857 the school appropriations exceeded those of 1856 by 6 per cent, $1,283,000 being raised by public taxation. Teachers' wages were slowly rising. Sixty new schools had been established, making 4,360 in the State. Mr. Richard Edwards had left Salem, Mass., to enter on a distinguished educational career in the West—first as principal of the City Normal School of St. Louis, Mo.—and Dr. Alpheus Crosby was appointed to the vacant chair in the State Normal. But the original academical type of the New England normal school keeping obstinately held on against the protests of the State board of education and its secretary, and pre-

vailed to the extent that the model and practice school departments were discountenanced in all save one, and the feeble substitute of a pupil conducting the regular class recitations was adopted. Mr. Birdseye Grant Northrop first appeared as one of the agents of the board, the beginning of a long life of amazing industry and great influence in public education, relieved by his interesting labors in Japan and a subsequent ministry in the cause of public village improvement and ornamentation through nearly all the United States. Three hundred and seventy lectures and lessons were given to the teachers of the State—another testimonial to the great importance of this agency in developing the educational spirit of Massachusetts.

Secretary Boutwell visited several of the Western and Central States and reported that the agricultural districts of the West appeared to be educationally behind the rural districts in Massachusetts, while the school systems in their cities were of remarkable merit. He says "the general interest of the West in education is a more promising fact to the country than even its untold agricultural wealth." In Cincinnati, Ohio, he found a high school of 75 students in successful operation without a master, the pupils generally reciting to the superintendent and other teachers.

The school appropriations of Massachusetts for the year 1858 exceeded those of the previous year by $66,000, $5.83 for each pupil, with an average school term of seven months and fifteen days.

The secretary enlarges on the value of the annual reports of the school committees, almost every one of the towns now printing this document, and declares this "one of the most efficient agencies in the cause of education."

The stubborn independence of the New England character was still intrenched in the isolated district system, only 18 towns having discarded it since 1850. The secretary declares: "The neglect of elementary training is the cardinal defect of our whole educational system."

In 1858 the legislature appropriated $4,250 for teachers' institutes, of which 10 were held, each through five days, under an excellent teaching force, and $50 a year was given to each county teachers' association. The school appropriations still mounted upward—$57,000 increase. Mr. N. P. Banks was now governor of the State. The report of Secretary Boutwell for 1858 contains a complete history of the State school fund, and urges its increase by an additional $1,500,000. He says: "The people themselves are more generous in the use of the taxing power than their representatives." "Previous to 1834 there had been no trustworthy information concerning the common schools of the State." A distinguished English educator praised the reports of the school committees which appeared in the "Abstract," prepared by Dr. Jackson, with a special admiration of their literary style. These reports were often written by the ablest men of the Commonwealth, acting on these local boards.

The income of the State school fund was less than $100,000; one-half appropriated to the towns and cities, according to their school population, and the remainder expended by the board at its discretion. Still, 22 towns received only $2.50 from the State and 52 towns less than $3 per capita for their school population. Dr. John D. Philbrick was this year elected superintendent of the public schools of Boston, a notable event in the development of the system of city schools in New England and the entire country. He reports that "the primary schools had been comparatively little affected by the various improvements, which for the past ten or fifteen years had operated powerfully for the advancement of schools of the higher grades." He reports the primary city schools of New York greatly superior to those of Boston in general organization, gradation, and forcible administration.

Secretary Boutwell offered his resignation in 1858, but was reelected and persuaded to serve the State another year, during which he delivered 62 lectures to the people. Mr. B. G. Northrop made himself almost omnipresent as agent of the board, having given 481 popular addresses during the year and traveled 10,000 miles within the narrow compass of a State containing but 8,000 square miles. An interesting portion of the secretary's report is a number of replies to a circular addressed to leading manufacturers concerning the influence of popular education on the rapidly growing interest in Massachusetts. The legislature, as if stung to a spasm of reform, abolished the local district school system, but only to reinstate it at the following session.

In 1859 Mr. Albert G. Boyden entered on his long and valuable career as principal of the Bridgewater (Mass.) Normal School.

Secretary Boutwell was practically relieved of active public duties, although he completed his series of excellent reports by the preparation of A Manual of the School Legislation of the State, with copious notes for the use of teachers and school officials. He prefaces this work with the statement: "Massachusetts, first of all, established a system of public instruction and supported it by the essential and distinctive characteristics of a State—the right and duty of taxation." The school system of Scotland, established in 1696, "was not public in its foundations nor public in its influence. It was controlled by the clergy; fees were charged to those who had the ability to pay, and hence it was not in any true sense a system of free schools." The secretary meets the claim which came up from the city of New York that the American system of common schools was inaugurated on Manhattan Island by the original Dutch settlers in 1633, by showing that "the school system of Holland, established in 1656 was essentially an ecclesiastical institution, and the school referred to was simply a parochial school of the Dutch Reformed Church in New Amsterdam, subsidized by the commercial corporation, which was virtually the government during the entire history of New York previous to its occupation by the British power."

The secretary declares that "in no State or country have the facilities

for public education been so good during the past generation as in Massachusetts." Whatever truth there may have been in this statement, it is certain that the people of the old Commonwealth had profound cause of gratitude to God and satisfaction with themselves for the progress of the common school since the memorable day when Horace Mann was appointed first secretary of the board of education in 1837. In 1861 Hon. Joseph White was chosen as the successor of Mr. Boutwell, and through a long period of about 14 years served the Commonwealth with conspicuous ability.

Here the proper limit of the present essay is reached. It has been the intention of the writer here to record the organization of the State systems of public education during the period extending from 1830 to 1860, distinguished as the great revival of the American common school.

CONNECTICUT.

In the year 1849 the office of superintendent of the common schools of Connecticut was combined with the presidency of the State Normal School and Henry Barnard recalled to the leadership of the reformed system of popular education inaugurated by him in 1838. During a portion of his administration, Mr. John D. Philbrick, of Connecticut, had been the acting head of the normal school at New Britain, and on the resignation of Dr. Barnard was appointed to the State superintendency of public schools.

In his first report, May 10, 1855, the new superintendent "regrets that the imperfection of the existing system of returns and reports from school officials to this department renders it impossible for me at this time to present full and accurate statistical information as to the progress and present condition of our common schools." He attributes the failure to "the absence of the requisite legal provisions for a proper system of returns and reports." This chronic shiftlessness of the "business side" of the common school affairs of New England at this period, so opposed to the careful and correct methods prevailing in the pecuniary transactions of ordinary life, emphasizes the fact (1) that the old-time isolated district school, even in its home in Massachusetts and Connecticut, had become the refuge of that spirit of personal and local independence characteristic of the New England people, and (2) that the statement of Dr. Sears and Superintendent Boutwell that the reports, documents, and literature of the new educational movement, even in the States where it originated and was led by its two most eminent champions, Mann and Barnard, were not read by the people. Certainly if a Commonwealth could be lifted up to the perfection of educational organization and method by an awakening presentation of startling facts, unanswerable logic, and inspiring eloquence, the State of Connecticut should have responded to the deluge of information in which she had been engulfed during the past eighteen years. But when the great practical schoolman, Dr. Philbrick, came up to the statehouse

in 1855 as superintendent of schools he discovered that great masses of the people remained practically unmoved. Probably many of the school visitors and local committeemen had never read enough of this overabundant literature, which had exalted the name of Henry Barnard to national and even international renown, to clearly understand what their great educator was about.

But from such records as he found in the office of the superintendent, and from other sources of information, Dr. Philbrick was able to gather a considerable amount of information, and could honestly declare that—

> On the whole, the aspect of our common school system is encouraging and hopeful. The gladsome light which for years has been lingering upon the mountain summits has descended into the valleys. Since the last report from this office was made probably more has been done by way of reducing into practice the plans and suggestions for the improvement of the schools which had been previously urged upon the people than during the same length of time since the system was established. Never was there a time when so many capable and faithful teachers were in the field; so many citizens earnestly engaged in the work of reforming our schools; when the people were so well prepared for liberal action upon the subject.

Indeed, the fact that the double office of superintendent of public education and president of the State normal school was in existence and Dr. Philbrick in the post of authority, representing the reality of an improving school system and a successful attempt to exalt the teacher's profession, was a decisive testimony that the wheels of progress, so long embedded in the muddy ruts of a stolid conservatism, had begun to revolve. But there were other signs of motion enumerated by the superintendent that cast a cheerful light on a situation still clouded by uncertainty. Several of the larger towns and cities of the State had made a radical change and a marked improvement in their educational arrangements, and, to a certain extent, the rural districts were looking in the right direction. The legislature of 1853 had required the towns to lay a tax of 1 per cent on their valuation for the schools; the teachers' institutes and associations were better sustained and more worthy of support; acts for the condemnation of land for schoolhouse sites and for the consolidation of districts had been passed by the legislature; still it must be acknowledged that, in the words of the report—

> A majority of the districts have made little or no progress for many years; the majority of the schoolhouses are utterly unfit for school purposes; a majority of the teachers are incompetent for the discharge of the responsible duties which devolve upon them; the majority of the schools are kept open for too short a period; in a majority of the districts great difficulties are experienced from want of uniformity in the text-books and the most essential apparatus; in a majority of the districts the attendance of pupils is very deficient; the great majority of the children of the State enjoy no means of pursuing any but the elementary branches; and a vast number of children among us are growing up without that intellectual and moral culture necessary to make them industrious, intelligent, respectable, law-abiding citizens.

Of course, this tremendous impeachment of a State, confessedly from the beginning of colonial life among the foremost of American communities, must be understood, like all similar statements of American

affairs, as the estimate of the pedagogic reformer, which leaves out the formative agencies of private and public character beyond the schoolhouse. The great Commonwealth of Connecticut a generation ago was in no such desperate plight as is here posted on the blackboard of the earnest schoolmaster and high-toned citizen called to the head of its educational department. All this is but another way of saying that forty years ago even New England, then the most progressive portion of the Republic, was still educationally lingering in the good old British aristocratic habit of largely depending on a superior educational class to do the thinking and save the people according to some vicarious scheme of public salvation. Never had there been a more abundant supply of eminent scholars, eloquent and devoted ministers, able public men, enterprising and executive leaders in business, even superior teachers and leaders in education, both at home and in other States and round the world, than when the new Superintendent of the Common Schools of Connecticut gave this doleful picture to the world.

A free American Commonwealth, like a man, is never absolutely compelled to depend on any single institution or agency, however valuable and in the long run indispensable, for its existence or progress. In the absence of a suitable provision for the schooling of the masses of the people, the superior class of Connecticut, in a variety of indirect ways, had educated the people, at least sufficiently to avoid the extreme perils that filled the horizon of Barnard and Philbrick with threatening omens of impending ruin. The entire life of an American Commonwealth even in the crude condition inevitable to a new and heterogeneous population getting itself together after the fashion of a republican State, is the most powerful and many-sided university yet set up on this planet, containing within itself vast and varied resources of power to educate and train the people for emergencies that would overwhelm a State otherwise constituted.

And the good doctor confirms all this by the way he applies himself in this, the first of a series of remarkable reports which hold a distinguished place in the educational literature of the country, to a practical and elaborate discussion of the most important needs of the schools; evidently with a lively faith that the people would "read, ponder, and digest," and in the fullness of time act upon his lines of reform.

Through the remaining 175 pages of his report he treats of, (1) Schoolhouses, (2) Attendance, (3) Rate bills, (4) The distribution of public money, (5) Small districts, (6) Length of school terms, (7) Support of schools, (8) The Connecticut Common School Journal, (9) The State Normal School, (10) School visitors' reports, (11) Lectures on Common Schools, (12) Teachers' institutes, (13) Common school apparatus, (14) The school laws, (15) District school libraries. The last item was especially emphasized. An elaborate appendix contained a mass of valuable information under the heads of, (1) Plans and descriptions of schoolhouses with cuts, (2) Reports of visitors and educational addresses in

school societies, (3) Extracts from school visitors' reports, (4) A circular to school visitors, accompanying a copy of the school laws, by the Superintendent, (5) A list of teachers' conventions and institutes held in Connecticut since 1839, (6) Rules and regulations prescribed by school visitors, (7) A long extract from the 16th Annual Report of Secretary Sears of Massachusetts on the district system of schools, (8) Circular to school visitors, (9) The returns, as far as received, from the different portions of the State, (10) A list of 40 districts, each containing less than twelve children between 4 and 16 years of age.

A general estimate shows 153 towns in the Commonwealth, 221 school societies, 1,644 school districts, 100,294 children and youth between the ages of 4 and 16; capital of State school fund, $2,049,953.65, with an income of $144,137.73—a dividend of $1.25 annually to each pupil in the schools. The superintendent regards the rate-bill, the hardship of which is especially felt by the poorer class, as one of the most serious obstacles to good schooling in the State. The method of distributing school moneys is severely criticised. The schools are in session, on an average, but four months in the year. Some $200,000 from all sources of revenue were appropriated to public education in 1852—$2 to each person of school age. While the law permitted an unlimited local taxation, the privilege was rarely exercised. The secretary cites the example of the new western State of Ohio, which levies a tax of 1½ mills on the dollar for the schools. Connecticut, he says, is perhaps the wealthiest State of the Union in proportion to population, with probably a valuation of $300,000,000, and a school tax like that of Ohio would produce $450,000—$4.50 to each child.

The State Normal School is one of the bright features of the situation. During the five years of its operation 867 students have been connected with it; only 20 of the school societies of the State have not been represented, the number during the first year being 294. But the majority of these have only remained through one term, and the school has scarcely reached the height of a proper training seminary for teachers. Two lecturers have been employed among the people and 655 teachers have been instructed at institutes. The State of New Hampshire is praised for raising $5,200 annually by the voluntary taxation of its different counties for institutes. Under an arrangement with the State prison, the convicts have been employed in manufacturing the Holbrook's school apparatus, and the articles have been offered at 25 per cent discount on their cost to all the school districts. But few have been sold, and it was only after a still farther reduction, almost amounting to a free distribution of this valuable material, that the accumulated supply could be disposed of. A pamphlet compiled by legislative direction containing the school laws had been distributed to all the districts in the State—2,500 copies in connection with an edition of the Common School Journal. The importance of common school libraries is urged in the longest item of the report.

This summary of the first report of one of the most prominent edu-

cators of New England, following the lead of Mann and Barnard, gives a fair picture of the method of all the New England superintendents, commissioners, and secretaries of school boards during the period covered by this essay. The copy was set by the splendid reports of Horace Mann, followed by the even more discriminating essays of Henry Barnard, and has been adopted in all the States of the Union. One of the most valuable features of these State documents is the Abstract of the Reports of Local School Officials. Under the handling of Horace Mann this became an instrument of prodigious power, bringing the reader face to face with the actual situation of affairs as could no presentation from the office of a State superintendent, however eminent. In the subsequent record of educational progress in Connecticut and elsewhere it will be easy to mark the facts of the steady advancement that year by year came to the front until, by 1860, the eve of the civil war, every New England Commonwealth had placed itself in line with the high ideal of popular education lifted up to the whole country and the world, a generation before, in the great revival of the common school.

This revival during this notable period of the educational history of the republic is a pathetic commentary on the fact that the higher service of the noblest educators and leaders of that time was a daily sacrifice. The majority of them were either killed outright or kept on the edge of periodical, physical collapse by the preternatural strain of fighting the good fight without a reliable support against the hosts of ignorance, indifference, and prejudice.

Dr. Philbrick's career in Connecticut, perhaps fortunately for himself and the future of the country, ended at the close of his first year of double administration as State superintendent of education and president of the State normal school, with the added responsibility of preparing a revised code of school laws. Happily for himself and the cause of education, on recovering from a long and dangerous illness, he was called to the position he occupied with such eminent usefulness and reputation during the remainder of his professional life, the superintendency of the public schools of the city of Boston. The record of the remainder of his short term of service in Connecticut contains little to indicate any marked improvement outside a few towns that had long since become the educational centers of the State.

About this time appeared Mr. Charles Northend as an agent of the State of Connecticut, visiting schools, lecturing to the people, and generally "spying out the land." During the year he inspected 100 schools and addressed several thousand pupils, with constant appearances before popular audiences. His reports emphasized the facts of the "shady side" of common-school affairs as exposed by Barnard, Beers, and Philbrick, though perhaps oftener than in their representation lighted up with the cheerful realities of progress and hope that keep the genuine reformer from despair. We shall meet this faithful servant

of the people for many a year to come, always on an errand of mercy to the children. His educational writings were for many years largely distributed, 20,000 copies of one publication being called for in New England.

Dr. Philbrick was succeeded in 1857 by Mr. Daniel N. Camp, who from the first had been associated with the superintendent of education as chief assistant in the State normal school. He retained the position of State superintendent of public instruction and president of the State normal school from 1857 through the entire period of the civil war. His first report, in 1857, contains little save a reiteration of the somewhat monotonous record of the very moderate response of rural Connecticut to the prodigious expenditure of effort by its foremost educators, now protracted through twenty years. A somewhat more cheerful compliance with the persistent demand of the State superintendents for statistical information, a few more graded schools in the larger towns, and a growing attention to the essential conditions of good school keeping, summed up in what is called by the new secretary "a general interest manifested in educational matters," tell the story of another year. Of the seven cities of the State four are still divided into independent districts, each under the management of a local board, and in only two were the schools administered as one municipal interest. Until 1838 there had been no free high school in Connecticut except the county grammar schools of colonial days. Half a dozen cities and towns supported a high school in 1857. The normal school and teachers' institutes continued their usual good work. The general assembly succeeded in distributing 250 sets of Holbrook's school apparatus among the districts at the nominal cost of $3 each. The new school law, prepared by the legislative commission of 1855, with some alterations, was enacted in 1856. Its most valuable feature, of great importance to the educational interests of the people, was the final abolition of the system of school societies, which for more than half a century had hung like a millstone about the neck of the Commonwealth. Thereafter the management of educational affairs was intrusted to the towns, like all public affairs, to be debated and voted upon in open town meeting.

Another important feature was the demand from the local school authorities of every town of a report as a condition of receiving its quota of the State school fund. Mr. Northend was still engaged in his good work among the teachers, children, and people. The appendix to the report of the superintendent contained an interesting account of the establishment of the Norwich Free Academy, which had been dedicated during the past year, and has become one of the celebrated academical secondary schools of the country. Among the provisions of the new school law was the offer of $10 and a continuation of $5 annually to any district appropriating a similar amount for establishing and maintaining a free library. Attention is called to the fact that the States of Ohio and Indiana have followed the lead of New York

and Massachusetts, and have expended nearly $500,000 during the past two years for this purpose. Mr. Albert Sedgwick, commissioner of the State school fund, reports that it now amounts to $2,046,397.32, has distributed during the past fifty-nine years $4,660,042.48, and in 1857 will divide among the districts an income of $143,190, which, with the addition of other taxes and collections, amounts to an expenditure of more than $300,000 for the public schools. This year, 1857, may be accounted as one of the most important in the upward movement of popular education in Connecticut.

In 1858, 570 schoolhouses are reported "in good condition," an increase of 330 in five years. "A uniformity of text-books has been secured in the principal towns and cities of the State." The new law compelled each district to submit plans of schoolhouses to school visitors and building committees, and assigned to the board of visitors the duty of distributing the school tax. The law also fixed a six months' school term as a condition of receiving the quota of the State school fund. An increasing number of towns were dispensing with the vexatious rate bill and making the schools free, and the law placed a severe limit to its imposition. Under the vigorous administration of Mr. Northend the eight school institutes contained nearly 800 teachers. One hundred and fifty-six districts had established school libraries. The State Teachers' Association had been in operation ten years, with an attendance of 300 teachers at its last session. The Rev. Warren Burton, afterwards widely known as a charming author and promoter of home education, appears here as the active representative of an association for the promotion of home and social life.

By 1859 the chronic difficulty of obtaining valuable statistics had been well-nigh overcome by the operation of the law making such reports essential to the participation in the State school fund. Seventy-four new schoolhouses had been erected and a good deal of repairing done, at an expense of more than $60,000; the possession of a decent schoolhouse and outbuildings now being an essential condition of sharing in the State money. During the four years ending in 1858, $475,000 had been expended in schoolhouses, and the superintendent predicts that "the dingy, uncomfortable schoolhouse, peculiar in its architecture, with slab seats and unwashed walls, and no decent outbuildings, will be known in Connecticut only in history." The superintendent dilates at length on the necessity of a more liberal supply of graded and free high schools. For the schooling of the 75,000 children enrolled the sum of $347,000 was expended. Mr. D. C. Gilman, now the honored president of Johns Hopkins University, Maryland, here appears as an active school visitor in New Haven, in an essay on graded schools.

The report for 1860 contains the gratifying statement that, whereas in 1838 there were but 85 professional teachers in Connecticut, there were now, in 1860, more than 700. Fifty-two new schoolhouses had been built during the year, most of them in the rural districts, at an expense

of $10,000. It is noted that the rate of wages for teachers is less than that for the superior sort out of the State; so that the Connecticut school teacher is "more in evidence" abroad than at home. The nuisance of irregular school attendance continues aggravated by the steady growth of a foreign-born population in the manufacturing districts of the Commonwealth. A connected history of the State Normal School is given in the report, with reference to the growth of the normal school in other States. Although "the schools of the State had never advanced so rapidly as under the school law of 1856," there were still defects that required additional legislation.

Thus, by the gradual, persistent working at a good cause, so characteristic of an Anglo-American people, the common schools of Connecticut, in a period of twenty years from 1838, had been lifted from a condition which was regarded by their own superior educators as a disgrace to the Commonwealth, to a state of fair respectability, with progress over the entire field of operation. The rate-bill was gradually abolished, with a hope for the consolidation of school districts, and constant improvement in school attendance; the condition of schoolhouses was improved and the teachers better trained. While the great civil war was upon the country, in which no State was more distinguished by patriotic sacrifice than Connecticut, the schools went on with no greater abatement of their vigor than in any other of the higher interests of the Commonwealth. In 1860–61 there were 44 new schoolhouses built, and others repaired, at a cost of $84,000. The health of pupils had never been so much regarded, and uniformity of text-books and the more severe examination of teachers were being secured.

The educational institutions of the State are presented in the report of these years, as follows:

1. The public and common schools.
   5 high schools.
   148 graded schools, with several high-school departments.
   1,632 mixed district schools.
2. Incorporated institutions and private schools.
   3 colleges.
   The Norwich Free Academy.
   12 incorporated academies.
   288 private schools and seminaries.
3. Professional schools.
   3 theological institutions or departments.
   1 State normal school for teachers.
   1 polytechnic or scientific school.
   1 law school.
   1 medical school.
4. Eleemosynary and charitable institutions.
   (1) The Asylum for the Deaf and Dumb.
   (2) The State Pauper School.
   (3) The School for Incompetents.

Yale College, in all its departments, had 649 students, 234 from Connecticut. The endowment of the Yale Scientific School by Joseph E.

Sheffield, of New Haven, was an important event. Trinity College, of the Episcopal, and the Wesleyan University, of the Methodist denomination, had each 200 students. A female college at Stonington, and the Connecticut Literary Institute at Sheffield, with the Norwich Free Academy, were an addition to the higher educational opportunities of the State, all containing some 500 students. The academies had largely been supplemented by the growth of the common schools. Eight thousand pupils were instructed in 262 private schools, at an expense of $100,000. The entire expenditure upon the common schools is estimated at $388,000, the rate-bill still being retained. Every town in the State in 1860 collected a State tax of three-tenths of a mill on a dollar, and 250 districts added a local assessment; so that the avails of local taxation exceeded the school moneys distributed by the State. In 1860 a compilation of the school laws, with all recent legislation, was made, and 3,000 copies mailed and distributed among the people.

Such is the record of the organization of the great revival of the common schools of Connecticut, begun under the lead of Henry Barnard in 1838, continued "through evil report and good report" for more than twenty years, until the great central interest of the common school was so far advanced that the State, at the close of the great conflict for national union and freedom in 1865, was found ready to go on in the good work inaugurated two hundred and fifty years before and never dearer to the heart of the sons and daughters of the "land of steady habits" than to-day.

RHODE ISLAND.

The connection of Dr. Henry Barnard with the public school system of the State of Rhode Island, virtually his own work during a laborious administration of five years, was followed, in 1848, by one of those periods of complete physical prostration which so often left his work incomplete. His successor, Judge E. R. Potter, in 1850, in his first brief report covering the year 1849, throws light on the chronic independence of the little communities in the State of Roger Williams when he informs us that, notwithstanding the splendid success of Dr. Barnard, which had attracted the attention of the whole country, "it is to be regretted that the abstract of school returns, herewith presented, is so imperfect; but it is necessarily so, because a considerable portion of the town returns themselves are so very imperfect. Few people seem to be aware of the value of correct statistical tables, and the information to be derived from them." The historian of the American common school at every step of his progress is baffled and left entirely in the dark by the absence of reliable data of the national school keeping, and a correct science of educational statistics, which would seem to be the first matter of concern, is still, after two hundred and fifty years of the common school, yet to be hoped for.

From the materials at hand the new commissioner of public schools in Rhode Island collects a few items of radical importance. "In all the towns of the State except Providence, Newport, Bristol, and Warren the schools are managed under the district system." Here was the citadel of the idea of local independence in New England society, which bravely withstood the assaults of Mann and Barnard, and was only starved out after a siege of nearly half a century, even surviving in some of its features to the present day. Says the commissioner: "Of the 332 districts in the State, 231 are the owners of schoolhouses. In others, the schoolhouses belong to private individuals." This was a survival from the period when the schooling of the children of Rhode Island in the rural districts and smaller towns was almost entirely in private schools, being the property of such enterprising citizens as were moved by local needs to make this investment. But, within the past six years covered by Dr. Barnard's administration, the large sum of $360,000 had been expended in the State for building and repairing schoolhouses. Every town, save two, in 1849, raised the amount of school money necessary to enable it to receive the State's appropriation. Fifty-four thousand eight hundred dollars was raised by local taxation. The number of children and youth of school age was 27,000, of whom 22,477 had been registered during the past year, with an average daily attendance of 16,590. From these facts the commissioner draws the perhaps too hasty conclusion that "there is still a large number who do not participate in the opportunity of our schools, and who are left to grow up in ignorance, vice, and crime."

The commissioner believes that the rate bill, still a feature of the Rhode Island system, "is one great obstacle in the way of a more general attendance on the schools." While, in some of the larger towns, education is wholly free, the majority of them still depend on this method of supporting the schools. But the benevolent exception of the poorer class from the small tuition fee drives away the sensitive people it was intended to favor. The State of New York had finally rid itself of this incubus on the system of popular education. Despite the great work undoubtedly done by Dr. Barnard, his successor declares that the present school system "is but a feeble commencement and approximation," and calls for a common school that will "unite moral and religious with intellectual training." Time and patience are invoked to place a system like this on the ground. In many parts of the State, he declares, "the people have not had the opportunity to know the difference between a good and a poor teacher. Send a good teacher among them, and the people have the good sense and shrewdness to appreciate his value and be willing to pay for his services." In describing the proper arrangement for training teachers the commissioner inclines to the attempt to organize a department of didactics in Brown University, a system afterwards for a short period carried into effect under the direction of Prof. S. S. Greene.

There were some 85,000 volumes in the libraries of the leading institutions of the higher education in Rhode Island in 1849, and by the generosity of Mr. Aaron Marston, of Providence, many of the towns in the State had been able to obtain a collection of books, so that "nearly every town has a town or village library."

Judge Potter held the office of school commissioner in Rhode Island until 1855, and although in his annual reports we miss the elaborate discussion of principles, powerful massing of statistics, and sometimes tedious republication of valuable material that characterized the public documents of Dr. Barnard, giving to them a high literary and historical interest apart from their local application, yet under his practical administration the schools moved forward in the very moderate way by which any important public interest could advance in such a civilization as that of New England fifty years ago. The report of 1850 announces that every town in the State has raised by tax the sum necessary to receive State aid, and that during the past year $10,000 had been added to the State appropriations. The teachers' institutes had been held. The subject of a State normal school constantly returns and is further debated, and reference is made to a work in preparation by Dr. Barnard on normal schools. The formation of union school districts is vigorously urged, also of evening schools in the manufacturing towns, not only for children but for a large number of illiterate foreigners recently come to the country.

In 1851 the number of pupils enrolled in the schools does not appear to have increased. The sum of $125,000 was expended for all purposes connected with public education. Only four of the cities of Rhode Island had come out from the district system. There were 569 common-school teachers, 313 of whom were women. The old New England prejudice against woman teachers was passing away. "If school officers and parents support the schools as they ought, female teachers would find no difficulty in governing them." The State was supporting institutions for the deaf and dumb, the blind, the imbecile, and the idiotic.

The commissioner congratulates the State on the great advance in popular education during the past few years, but returns to the vital point of the improvement of the teaching force. He urges self-improvement on teachers in a forcible way that might well be considered by the educators of the present time, some of whom appear to have lost sight of the individual scholar and teacher, as in themselves the source of the greatest results, with further discussion of normal schools, lyceum lectures, union districts, school attendance, children in factories, relation of education, poverty, and crime, etc. The commissioner was appointed by the legislature to examine and report upon the subject of child labor in the mills.

The appendix to this report contains an interesting letter from Prof. S. S. Greene, of Brown University, dated February 12, 1852, in which this eminent educator outlines the plan of the department of

didactics recently added to the university. The first class nad been formed during the past year.

The department is established to fit teachers for the practical duties of the schoolroom. These things are contemplated in the plan: 1. The professional training of the student. 2. The opportunity of an elaborate course of study which shall be a proper literary basis for professional culture, especially for those who are preparing for teaching in superior schools. 3. A large class, including only those of the women teachers of the city who receive courses of lectures in the high-school hall. This is a strictly professional exercise. The students are instructed in the principles and duties of school organization, government, and instruction, tested by exercises in teaching, and the public schools of the city are open for constant inspection. More than 80 persons have been collected in these classes.

The professor further remarks that in this organization of professional work "a wider range for culture and mental improvement is afforded than in any normal school in the country." It escaped the radical weakness of the State normal schools and the crudeness of the material sent to them in numbers of young people who had received only the very narrow and often misleading instruction of the country district school. This arrangement, as pictured by the professor, was almost ideal, and although it was suspended by the experiments that finally resulted in the establishment of a State normal school, it seems to have been the model on which the school of professional normal training has recently been put in operation in Harvard University, Massachusetts, under the direction of Prof. Paul Hanus.

Rev. E. M. Stone, of Providence, had already been doing good work in evening schools, and a valuable document by Professor Hart, of Philadelphia, is printed in the appendix of the commissioner's report. This feature of the common-school system had already been in practical operation for eighteen years, strongly indorsed at a national convention of the friends of education held in Philadelphia in 1849 and 1850. An important paper on "Ignorance and vice in cities and towns," by the American Sunday School Union, is also reproduced in the appendix, with a list of libraries and an "account of the system of education in Rhode Island." The population of the State in 1850 was 147,549, of which a few cities and a score of manufacturing villages contained the far greater proportion.

There were 5 cities and 31 townships, in all of which save 4 cities the schools were organized by separate districts, every city and town choosing annually a school committee of not less than 3 persons. Providence and several other towns had superintendents. The school committee examined teachers and had a general oversight of the schools. In 27 towns each district chose annually 1 or 3 trustees who elected the teachers and visited and supervised the schools. A State commissioner of public schools, annually appointed by the governor and senate, was the head and high court of appeal for the public schools of the entire State. County inspectors might be appointed by the commissioner to examine teachers and visit schools in the county.

The State had a permanent school fund of $51,000, from the interest of which and the surplus revenue fund and a direct tax $35,000 was appropriated to the townships in proportion to their population under 15 years of age. Every town received its quota on condition of raising by tax one-third the sum received from the State. Each town was required to support a school for four months, although the larger towns had longer terms. School libraries might be established by a local tax.

Apart from a somewhat extended discussion of several questions connected with public education the commissioner, in his report of 1852, made the announcement that a private normal school had been established by Professors Greene, Russell, Collins, and Guyot. Valuable essays by Professors Andrews, of Marietta College, Ohio, and Tayler Lewis, of Union College, New York, were also printed and an extended paper on "Religious education in schools," including quotations from eminent educational authorities, was placed in the appendix.

The report of 1854, including 1853, urged legislation concerning the distribution of the school fund for the special favor of the feebler towns, and called attention again to the private normal school in Providence. An unsuccessful attempt to carry a bill for the suppression of vagrancy and truancy through the legislature awoke a discussion of this important subject. A crowded appendix of nearly one hundred pages furnished a valuable discourse on "Public schools and religious education," emphasized by the fact that one of the great American Protestant churches, through its annual convention, had declared in favor of the church parochial school system. There can nowhere be found a more elaborate treatment of this delicate subject, the relation of the common school to moral and religious teaching, than in the numerous treatises appended to the reports of the various State and city school officials of the United States beginning at this period, often a review of the most important declarations on the subject by the celebrated educators of our own and other countries. In this report, for the first time, we believe, in New England we come upon the subject of education in the arts of design, called forth by the formation of an association for promoting this important branch of popular education in Providence. An elaborate catalogue of books suitable for public and school libraries was prepared and published by Commissioner Potter as an appendix to this report.

In 1854 the State of Rhode Island finally established a normal school, and Mr. Dana P. Colburn, of the Bridgewater, Mass., Normal School, was appointed principal. On May 29, 1854, it was appropriately opened with addresses from the governor and commissioner of education. Professor Greene, just appointed superintendent of the schools of Providence, was also secured as lecturer and instructor. The vexed question of Bible reading and religion in the schools had again come up, and a good part of the superintendent's report for 1854 was devoted to an extended treatment of this topic, his decision

being on the line now generally accepted in the different States of the Union. The right of Scripture reading was vindicated with provision against any needless infringement on the rights of conscience and the general disclaimer of sectarian intent in the moral and religious instruction and discipline in the schools. This question has been greatly confused by the assumption that moral and religious instruction and character training can only be conducted by the formal methods prevailing in the church. But this great work of character training in public schools is carried on most effectively through the entire organization, discipline, methods of instruction, and general arrangements of school life, all inspired and directed by the spirit of love to God and man, which is always the decisive element in molding the character of children and youth. And all this is powerful or powerless, according as the teacher is personally the object lesson of what is expected in the pupil. It is remarkable to what an extent this practical, central, and truly religious view of the fundamental obligation of school life, character training, has been ignored by so many of the great educators of every period, and to what a lamentable extent the whole subject has been confused and misunderstood thereby.

Meanwhile a series of important laws "to regulate the employment of children in factories," "to enlarge the powers of school committees," "to limit the hours of labor and regulate the employment of children in factories," and to establish a State normal school had been placed on the statute books from 1851 to 1854. The directions relating to the enforcement of the school laws were published, with another extended paper of 200 pages on religious instruction in public schools containing the opinions of educators in Europe, extended addresses by American educators, etc.

On the retirement of Judge Potter, in 1854, the office of commissioner of public schools was filled by Mr. Robert Allyn until 1859, when Mr. John Kingsbury, widely known as the very successful principal of a school for young ladies in Providence and a firm and influential friend of the common school revival, was appointed to the position. In 1854–55 the cost of the common school system in Rhode Island had risen to $153,431.10, while the attendance on the schools was but little increased. Of the 39,000 children of school age in the State, only 19,000 were found in daily attendance. The per capita amount expended was $7 on the estimate of average attendance and $5 on the enrollment. Male teachers were receiving $33 and females $17 per month, including board. There were 384 districts and 398 schoolhouses in the State. The State Normal School had already vindicated its establishment. The appearance of a new school commissioner was shown by a fresh discussion in his report of the ordinary topics included in public education, but there appears little to indicate that the people had any disposition to be hurried in their very moderate pace in the enlargement and improvement of the appliances for the

training of the children and youth. The city of Providence had lost the valuable services of Professor Greene as city superintendent, and we find in the appendix to his report the introductory address of Supt. Daniel Leach, who for many years occupied this position. State Superintendent Allyn made a valuable report on "Truancy and absenteeism in Rhode Island," by appointment of the State legislature, with an annex of information and tables of statistics.

On the retirement of Superintendent Allyn in 1857 Mr. John Kingsbury was appointed his successor. His one report, September, 1858, was a general survey of the steady improvement of the school system in Rhode Island, with no suggestions of important changes. Mr. Kingsbury retired in 1859 and was succeeded in 1860 by Mr. J. B. Chapin. The most important event of the year 1859–60 was the death of Principal Colburn of the State Normal School. The coming of the new superintendent brought on anew a general discussion of the general topics of education. The second report of Superintendent Chapin, January, 1861, contained the record of the State school keeping for 1860. It showed an increased expenditure, $168,365.21, with nearly $100,000 pledged for schoolhouse building in the year to come.

In this record of the organization of the State public-school system during the sixteen years since the advent of Superintendent Henry Barnard, in 1845, we have, perhaps, the most notable example of the change from a condition of great educational neglect and inefficiency to comparative success to be found in the history of common schools during the entire period now under consideration. In all the New England States there had been from the first in their original population a substratum of respect for intelligence, reverence for high scholastic attainments, and a profound sense of the religious obligation to "train up a child in the way he should go." Thus, while sometimes halting and apparently indifferent to the improved arrangements and methods of the public schools, the idea of universal education was never out of the mind of one of the colonies and a deep sense of the value of the higher education prevailed at an early period in all. In Rhode Island, where from the peculiar composition of the original population and other causes action was longest delayed, when "the time was ripe" the reform came with remarkable vigor and the experiment was persisted in with a more determined purpose than elsewhere. We linger over the educational history of these New England States because at the period from 1830 to the outbreak of the civil war, 1860, they undeniably held the leadership in the cause of popular education for the entire Republic. In many of these New England towns and cities were the reforms that have so changed our American system of universal education wrought out with patience, persistence, and careful study of all the conditions of success. Hence the establishment and reconstruction of public schools in the new States of the West were greatly aided by the experience in the old home of popular education. Great

numbers of these new communities rightly ascribed their success during their early years to the presence of teachers and educators trained in New England in the great art and science of "keeping school," the science of sciences, the art of arts.

VERMONT.

The Report of the School Commissioners of the State of Vermont, Governor Hall, chairman, in 1828, is a convenient guidepost not only for the understanding of the conditions of the popular mind in that State, the firstborn child of the Union, but very interesting for the realization of the peculiar embarrassments that confronted the reformer of the American common school of that period. The report is included in a pamphlet of twelve pages, printed in a primitive style, with a cover of coarse blue wrapping paper, perhaps to better serve its mission, to be sent to each of the school districts of the Commonwealth, and is signed by five commissioners for common schools, one of them the notable name of Jacob Collamer.

The new school law of 1827, the result of the educational revival experienced in the moderate way in which such matters were taken in the Green Mountain State, had been in operation only a year. But there is no indication in this document that the habit of reporting to a central body had been considered by the local school committees, and the information respecting the condition of public education is of the most meager description. Through the entire report runs the evidence of the jealous, even "touchy," personal independence of the people in the little school districts, in whose hands the entire administration of educational affairs seems to be.

The commissioners had been empowered by the late statute to take into consideration the several subjects within the scope of their powers and duties. The first presentation is a list of text-books recommended for use in the schools, accompanied with the almost humble protestation that "the duty of the commissioners in this respect is merely advisory;" it forms a record of what was considered a good average selection of American text-books seventy years ago. A partial list is here given:

For young pupils.—Franklin Primer, Worcester's Primer. Spelling books: Marshall's Spelling Book, Emerson's National Spelling Book, Hazen's Spelling Book. Reading books: Leavitt's Easy Lessons, Boston Reading Lessons, Pierpont's National Reader, Murray's English Reader, New Testament, without note or comment. Geography: Goodrich's Outlines of Modern Geography. English grammar: Murray's Grammar, Greenleaf's Grammar Simplified. History: Goodrich's History of the United States, Hale's History of the United States, Whelpley's Compendium, Tytler's Elements of History, Worcester's Elements of History. Arithmetic: Smith's Mental and Practical Arithmetic, Adams's New Arithmetic.

This is certainly a creditable selection for the day, containing several works of permanent worth and enduring reputation. But the board of commissioners evidently remembered the repeal of a clause in the

new law authorizing the superintending committees (the school committees of Massachusetts) of each town to select the text-books used in the schools. So, although defending their own selection in a manner little short of absolute command, the commissioners announce that this feature of the law is "peculiarly obnoxious and unacceptable to the people." Their statement of this malady of exaggerated personal independence is so illuminating that we quote it as a valuable guide to the understanding of the conditions of educational progress in New England during this period of revival and readjustment in common school affairs:

No system of common-school education can be of lasting or essential benefit to the State unless it receives the cordial cooperation and support of parents and instructors. But so generally diffused through the great mass of the community is the sense of personal as well as political independence, and so sleepless is the jealousy of arbitrary power, which is almost instinctive in the popular mind, that the attempt, however well intentioned, to dictate the books to be used in our common schools is regarded by many an invasion of the right of private judgment, and consequently as incompatible with the genius of our free institutions. And though an accurate classification of scholars according to their attainments and studies and a uniformity of at least elementary books seem to be indispensably necessary to the complete success of any method or system of instruction, yet, under existing conditions, the commissioners are unanimous in the belief that the interests of our common schools will be promoted by the repeal of the section under consideration.

The full appreciation of this paragraph, especially in its application to common-school keeping in a city district school, can only be had by one who, like the writer of this essay, through five successive winters labored as schoolmaster in a series of schools of this type, where every family exercised the "glorious liberty" of sending their children to school not only with the text-books most convenient at hand, but of naming in peremptory style the class in which each child of the household should be instructed. In the latter case the compliance of the teacher with the home demand did not include a great amount of exertion, since more than half the lessons in the crowded six hours of school time were given to one or two scholars.

Indeed, an apology is made by the commissioners for the entire school law of 1827 as, "in its most important provisions, an experiment." A careful argument is entered upon to prove that a committee of competent examiners of teachers is the best arrangement for securing good instruction.

It is very obvious that the majority of the parents and friends can not without great perplexity and delay be enabled by personal examination to decide upon the fitness and capability of applicants. Hence the necessity of a committee for this purpose, for nothing can be more absurd than the idea that the only point to be ascertained is, at how cheap a rate can his services, or rather his time, be engaged.

The remainder of this remarkable report, more remarkable as suggesting the mental and social condition of the constituency to which it is addressed as judge and jury in the whole matter of common school education than for the excellent sentiments of the commissioners, is made up of exhortations equally valuable and commonplace. The com-

missioners announce that "a school fund has been established which promises within a few years to support a school for some part of the year in every district."

No better evidence of the fact that moral courage rather than a gift for graceful apology is after all respected in a public official by his constituents can be offered than a later report of popular education in Vermont made by the State superintendent of common schools eighteen years later, in 1846. Its author, Hiram Eaton, superintendent, takes the field in true Green Mountain style, and in a closely printed document of sixty-four pages moves upon the concentrated force of timidity, indifference, and ignorant opposition to universal education after the manner of Ethan Allen summoning the British commander to surrender Ticonderoga "in the name of the Great Jehovah and the Continental Congress." The attempt at the rehabilitation of the common-school system was so recent that it was not yet time to look for the great results reasonably expected therefrom. The superintendent writes: "Perhaps no single act that has ever passed its legislature was fraught with such benefit to the best interests of our beloved Commonwealth." Vermont, by its early connection with Connecticut, had from the first been distinguished for popular intelligence. Only two of the early settlers of Bennington "made their mark," and all the 1,006 petitioners to King George wrote their names.

The History of Vermont, by Ira Allen, a younger brother of the famous Ethan Allen, and a public man of large influence in the State, published in London, 1798, states that—

> There is scarcely a man in the State that can not read and write in English and keep accounts, or a female that can not read or write. In the townships granted by the governor of New Hampshire, one-eighth of the land, containing about 340 acres, was reserved for the use of schools in each township; one-eighth was reserved for the propagation of the gospel in foreign parts, which, by act of the legislature in October, 1794, was also appropriated to the use of the town schools. In the township grant by Vermont there was one-eighth reserved for town schools, which would make two-eighths in each township through the State for the schools. From the avails of these lands and other measures a sufficient number of schools will be erected to give early instruction to the youth of Vermont. Several academies are established in different parts of the State, with funds for their support, by benefactions of their founders. From the funds appropriated to schools, academies, and colleges in and contiguous to Vermont, from the disposition of the people to contribute further to support these institutions and their desire to extend knowledge amongst all orders, great benefit may be expected to this generation.

In 1792 the population of the State was 85,589. In 1831 some $125,000 was raised by State and local effort for the support of common schools. There were 104,850 people in the State and 2,400 school districts, containing 43 scholars each, with an average attendance of less than 30. About 35 academies and high schools were reported. The State fund established in 1825, and referred to in the report of the commissioners in 1828, at a later date was abolished and the amount, $250,000, applied to the building of a statehouse. But the people had come to

the rescue and the schools were sustained to the point that Vermont in 1840 was within one of the head of States in the Union in exemption from illiteracy. In 1837 the share of the United States surplus revenue deposited with Vermont was distributed among the towns and the interest, $40,000, divided.

Thus, although the office of commissioner had been abolished and the law of 1827 repealed a few years later, the growing educational sentiment had prepared for what the first State superintendent of schools, Eaton, declares an "important and interesting era in the history of the State, calling for the warm and hearty congratulations of the friends of common-school improvement in our sister States." Here, after a century of experiments in the old-time local and almost indescribable style of early New England, Vermont, the most isolated of all these States, trained in a school more severe than any, and not till the naval battle of Lake Champlain, during the war of 1812–14, really out of the woods of its early contentions, finally joined the great educational revival procession and moved forward along the common highway of progress. The recent enactment of the revised school law rendered the first report of Superintendent Eaton deficient in statistical information. Nearly one-half of the districts omitted to furnish a reliable account of the condition of the schools.

The recent appointment of the county superintendents had delayed their reports. Superintendent Eaton was therefore driven to the regulation method of making up his report by a lecture on the general and special topics included in the idea of popular education. As far as information could be obtained it appeared that in the fourteen counties of the State, including 240 organized towns, there were, in 1846, 227 school districts, containing 100,000 children and youth between the ages of 4 and 18—from 33 to 34 per cent of the entire population in the Commonwealth. The average number of children in a district was 37; the average population, 110; the average extent of territory, about $1\frac{3}{4}$ square miles; the whole area of the Commonwealth, 9,565 square miles. The superintendent urges the consolidation of school districts as far as possible, remarking with a grim humor:

> Small districts are said, and truly so, to be the paradise of ignorant teachers. But this class of beings is not so valuable and useful that we need feel any compunction in breaking up their haunts and desolating their "pleasant places."

A very large proportion of the schoolhouses through the State are declared to be "in a miserable condition, altogether unsuited to their high purposes." The arraignment of the Vermont schoolhouse of 1846 by Superintendent Eaton falls little short of the exposure of those of Massachusetts and Connecticut at an earlier date by Mann and Barnard. The Vermont superintendent attributes to the exposure of health therein a vast amount of the "consumption" that at this period was the scourge of New England. The schools were "not generally furnished even with so cheap and simple, though vastly important, an

article as the blackboard," and he urges every teacher to procure "a piece of pine board 2 feet wide and 5 long, planed, and painted black." The majority of the blackboards now in the schools had been placed there within the past year, and many were "not very large, nor very black." "One or two globes and no charts," etc., are all that were reported under the head of "illustrative apparatus." Of text-books there is no deficiency in number and variety. Fifty different books are reported. The sentiment of the people concerning the sending of their children to school with such books as might be "on hand," as reported sixteen years before, still continues. The system or no system of districts was rather an obstinate popular caprice than a system. Twenty classes in little district schools of less than 30 pupils were the rule rather than the exception. The foolish ambition of teachers and parents to force the children to use text-books above their comprehension was a great calamity.

The general deficiency in the qualifications of teachers in the schools was "painfully apparent." "Ordinarily our teachers are found to be individuals of good intellectual capacity, of fair morals, and of respectable attainments in the common sense of the term. And in regard to our female teachers, it might be said not only that many of them are drawn from the best ranks of society in the State, but as a class they pursue the employment of teaching a longer period of time [than men teachers], so as to acquire a good degree of experience. The great and prevailing deficiency consists in the want of a specific qualification for their peculiar duties. They have never had the requisite training, nor have the means of securing it been within their reach."

"The want of good teachers is emphatically *the evil* of our schools." The failure of parents to realize the importance of school life is at the foundation of all these defects. The majority of the teachers are young; the average age 24, 22, and even younger. "'Few,' if not 'evil,' are the days of teachers in Vermont." The schools remained in session a fraction over three months. Seventy-seven per cent of the children and youth of the State were enrolled, while only 51 per cent were found in daily attendance. Twenty-two thousand eight hundred and forty-two persons of school age were in no schools, while the irregularity of attendance robbed the children of one-third of the time offered them.

Some $200,000 were expended annually on the public schools of the State, a large proportion of which, owing to the defects in the schools already noticed, was practically squandered. The wages of teachers were $12 per month for men and $4.75 for women, including board.

"Not one-hundredth of the children of the State are enjoying the benefits of instruction in academies, high schools, and all other institutions classed as select schools." A number of interesting quotations from the reports of several county superintendents, with a few important letters, close this, one of the most effective reports of a series well deserving to be republished and read throughout the entire country.

Four years later, 1850, Superintendent Eaton returns to the charge in a report of 41 pages, describing anew the chronic deficiencies of the schools and throwing in an occasional flash of sunshine in the way of several hopeful features of the situation. He believes that not only are the schools the cause, but also the result, of improving material conditions, and ascribes the latest movement in the interest of reform to the action of the agricultural associations of the State. Indeed, these associations in New York had always been an important agency on the side of intelligence and reputable living. Their frequent meetings, almost a great family gathering of a whole county, where all things of interest were discussed, and some distinguished visitor was often expected to deliver an address with a choice of subjects as broad as American civilization, have originated more than one movement of permanent importance to society. The ex-governor and superintendent sums up a valuable train of suggestions in his report:

> The position which a State maintains in regard to the interests of education not only forms a standard by which the general prosperity of its people may be safely estimated, as well as by which their character may be weighed, but it really constitutes the paramount and determining influence by which that prosperity is advanced on the one hand or retarded on the other. * * * Yet all this [the superintendent continues] is subordinate to the higher needs of the moral and social exaltation of the people— * * * the wise and true system of education, whose great and prominent purpose is not to produce wealth, but to nurture men.

In the important matter of full and reliable returns there had been a decided gain, less than 2 per cent of the whole number of districts having failed, and the returns in 1850 being the most complete that had ever been obtained. There were 2,594 school districts in the State and a beginning of a healthy consolidation of districts, with an average of 39 scholars to each. There were 100,000 children and youth entitled to schooling. The superintendent suggests that the legislature provide for the condemnation of land for schoolhouse sites. The county superintendents had the power to recommend text-books, but the districts seem yet to be determined not to yield this test of local independence. There was no law in force to compel returns to be made concerning school attendance. The superintendent asks how long the State will remain indifferent to the fact "whether all, three-fourths, or less than one-half the children of the Commonwealth are to be found at the place of instruction." Twenty-four weeks is reported as the average length of the schools, while many districts maintain them for eight or ten months, and the wages of teachers are steadily rising. The women teachers are 70 per cent of the entire number, the men receiving $13.55 and the women $5.63 per month, with board. The last legislature made provisions for teachers' institutes, which the superintendent regards a highly auspicious omen, and the experiment of conducting them has not been discouraging. The superintendent lingers over this new feature of the school system with a great expecta-

tion. The schools for 1849 had cost $230,000. He argues that a third of the State subsidy be distributed on the basis of school attendance. An advancement in the matter of supporting the schools by raising all the money for teachers' wages by the tax-list is hailed as an approach to a wholly free school, the tax for board and fuel still being a burden on the parents of the humbler sort of people. At the close of this report Superintendent Eaton announces his intention of retiring from the position of State superintendent of common schools in October, 1850.

It may be that the vigorous prodding of the people by their interested and even obstinate superintendent of common schools for five years caused them to fall back on the "good old way" of management—each district for itself. From the close of the next year till 1856, after one successor to Superintendent Eaton, the legislature failed to make the appropriation for this office. In 1856 a rising wave of a popular educational revival lifted the fathers of the State to the establishment of a board of education, fashioned after the plan of Massachusetts, with a secretary as the virtual superintendent, and Mr. J. S. Adams was appointed to that office with a series of wise and conservative suggestions in the letter of instructions concerning the policy of his administration.

The new secretary expresses the belief that the complete indifference of the people during the interregnum of supervising authority has been from the loss of faith in the efficiency of school laws and the "dread of all radical innovations." A circular containing accounts of superiority in this direction sent broadcast through the Commonwealth seems to have won a hopeful welcome to the new administration. This was followed by a 6-month's tour through 46 towns by the new secretary, not only visiting the schools by day, but addressing the people at night. Several hundred schools of every grade in every county were thus inspected and many influential people consulted on the subject of education. The secretary deprecates the habit for the past sixty years of relying on—

> Elegant essays, outward displays, stated preaching, and complacent self-congratulation, as exhibited by educational addresses and annual State papers for the support of educational institutions. Upon a people like that of Vermont, whose prominent trait of character is a shrewd, dry, hard common sense, there is a force in the array of facts that will arrest attention and incite to action where mere oratory would fail to move; had the board of education been in existence for the past five years with the ability to have presented to the people every year the mere ordinary statistics of the schools, the present torpidity of the popular mind would have disappeared long since.

With this view an unusual effort had been made for gathering careful statistics of the actual state of affairs, apparently with less of satisfaction than was hoped. A recent enactment of the legislature had directed the holding at least one teachers' institute in each county during each of the autumn and spring school terms.

For more than five years the schools had existed or been supposed to exist without any State superintendent, consequently the public mind seemed to have sunk into a state of torpor and indifference, the legitimate and usual consequence of State inaction.

Only one-half the towns in the State (136) made returns to the board of education in 1856. It is evident from such as had reported, that education had suffered through five years of neglect. Of the 2,719 school districts, 104 were without schoolhouses, 101 were without schools, 2,021 reported as supporting schools by taxation, and 222 had no school apparatus or blackboard. Of 1,800 schoolhouses, but 1,000 were reported "good." The schools averaged twenty-two and three-fifths weeks in duration. The wages of teachers were $16.92 per month for men and $7.64 for women, excluding board.

The Vermont girl who can earn $1.25 to $1.75 a week at home work, or making butter and cheese, or $2 to $3 per week in fine sewing, or $3 to $6 in a Massachusetts or New Hampshire factory, will not be eager to assume the toils, responsibilities, and grinding cares of the schoolmistress for $1 to $1.50 per week with board picked up at a distance of a mile or two by traveling here and there like a mendicant from door to door, though there be a teachers' institute in every church vestry in the State.

The young Vermonter would not go into school keeping "for less wages than farmers are willing to pay a smart teamster or active wood chopper, though a normal school were in session under every shade tree in the land." During the past six years the town superintendents had virtually subsided to an advisory position and the executive head of the schools had become the district prudential committeeman. Hence the election of inferior men to these positions and the schools delivered to an easy "go-as-you-please" sort of life.

The secretary enlarges on the lack of faith in the system of popular education by the influential people of the State, and writes, "the Vermont system of schools is a good one, far better than was supposed by many of those who claim to be its most especial friends." The select schools of every sort cost the people $102,514 a year, one-third the expense of all the public schools in the State, with a greatly inferior attendance. He offers the discarded system of New York, whereby the private academies were utilized and subsidized for normal schools, as a good expedient for Vermont. All the usual details of the State school keeping are elaborately discussed in the report.

In 1858 the difficulty of obtaining reports from the towns seems to have increased, as only 75 reported—less than one-third the whole number; hence no statistical report was presented for the year 1857. A bill presented to the legislature containing the ideas of Secretary Adams concerning a revision of school laws "was dismissed without discussion." With a courage not to be daunted, the secretary sent his rejected bill as a circular through the State, with the request for an expression of an opinion. A large number of approving notices having been received, the bill was subjected to a thorough revision and

sent again to more than a thousand individuals. A copy of the circular including the bill, with the accompanying superintendent's remarks, appears as a part of the secretary's report for 1858.

The result was that on November 28, 1858, the legislature passed an act respecting the common schools which was a very decided improvement upon the laws so forcibly criticised by the practical and able secretary. It made the furnishing of reports the condition of receiving the State funds by the town superintendents, and the superintendents the sole judges of the qualifications and responsible for the fidelity of the teachers. It provided that the public school moneys should be distributed on the basis of actual attendance on the schools, that the teachers could attend the institutes at public expense, and required the appropriate authorities to make reports to the board of education. A most important feature was the selection of school books by the State board of education which should be similar in all the schools. The act was a great triumph, the result of a persistent presentation of the needs of a school system upon a careless and reluctant legislature.

In 1859 the State board of education reported in a very cheerful manner on the effect of a new school legislation. The capital of the State, Montpelier, had established a graded school of 400 pupils in a building costing $20,000, and, with seven of the larger towns in the State, was testifying to the need of the graded system of education. The name of Governor Hiland Hall appears at the head of the board of education, accompanied by five eminent citizens of the State. A large space in the secretary's report for 1859 is devoted to a defense and explanation of the new legislation and the publication of numerous testimonials from the local school authorities to its favorable reception. The symptoms of a new vitality are everywhere appearing. An edition of the school statutes is included in this report. In 1861 the secretary thus testifies to the steady improvement of the schools:

> Good fruits are already beginning to appear in the condition of the schools and a more general attendance. The schools are more valued and respected. Better teachers are therefore employed; higher wages are paid; school houses are repaired and better furnished; new houses are built, and better models used in better places. Districts could be named where select schools have been discontinued and the children of the rich and poor attend together the same school, under teachers fully competent to teach and train them all, with the disposition to have better schools and better teachers and to pay higher wages. We find also the demand and effort to avoid a frequent change of teachers. There is an increasing number of instances where it is made the interest of good teachers to continue their schools.

The secretary's report contains an appendix of 75 pages of closely printed matter, including the returns of many school superintendents of towns, presenting a vivid picture of the situation, on the whole a great encouragement:

> The first effort in a State to obtain accurate information on the condition of our schools has resulted in a body of statistical returns that testify to a general and growing interest. The entire expenditure in 1859 has been $400,000. The entire expendi-

ture for education absolutely dwarfs in comparison all other expenditures. The damage which the State has sustained in past years from a failure to present to the public mind the importance of the school in a financial and practical as well as a moral and social light is incalculable. But still the stubborn fact remained that 49 per cent of the children of the State between 4 and 18 are yet absent from the public schools.

The report of the board in 1861, of which Governor Erastus Fuller was chairman, though issued under the shadow of the opening civil war, is a cheerful and even inspiring document. The secretary devotes a large space to the discussion of the religious question in the schools, which had been forced upon the board by the attitude of certain extremists of several denominations. He defends the American policy of Christian training through the organization of genuine religious morality, founded on love to God, into the discipline, methods of instruction, and entire atmosphere of the schoolroom, and from this and the "daily walk and conversation" brings practical testimony to that watchful, parental control that far better than formal catechising builds up the true manhood and womanhood of the child.

Here we may well pause in the record of the common school in Vermont during a period of more than a century of its history as colony and Commonwealth. In no member of the New England group of States had the people's school to contend against such odds for a favorable recognition. Without commerce or manufactures, with no populous cities, for one hundred years a border land of hardship and peril, coming up to the full enjoyment of statehood through perpetual conflict, sparsely populated, with a severe climate, the State could only grope its way toward the establishment of an effective system of education by slow and cautious steps. But at last the battle was won. In 1862, it was by the persistent effort of the United States Senator from Vermont, Hon. Justin S. Morrill, that the beneficent law for the establishment of agricultural and mechanical colleges in all the States, subsidized by the gift of public lands from the National Government, emphasized by important additional legislation in 1890, was passed, the former statute during the existence of the civil war, and the lands appropriated for the seceding States religiously held by the United States Government until their acceptance after the peace of 1865.

NEW HAMPSHIRE.

During the first generation of its colonial life New Hampshire, like Maine, was an outlying district of Massachusetts, and shared in the earliest movements of the Bay State colony for the education of all the children. "Brother Philemon Purmont," who was appointed the first public schoolmaster of Boston, and Mr. Maud, who actually held the position, both at a later date emigrated to New Hampshire and were known as influential clergymen and educators in the new plantations. But the educational movement lingered as through all the northern

outlying realm of New England, and it was ten years from the inauguration of the great revival, through the appointment of Horace Mann as the first secretary of the Massachusetts board of education, that the legislature of New Hampshire, after an agitation begun in 1844, under the lead of the governor, on July 10, 1846, passed a revised school law, including the appointment of Mr. Charles B. Haddock as the commissioner of common schools. Mr. Haddock was a professor of Dartmouth College and a nephew of Daniel Webster. He traveled 300 miles in his own carriage during the year of his service.

The first report of the commissioner at the session of the legislature in 1847 bore ample testimony to the fact that this forward movement in education was regarded even by its responsible friends as an "experiment." Commissioner Haddock introduces himself in his new capacity with profuse explanations and warnings against the danger of great expectations from the new departure. He pleads for at least a five years' trial before the popular verdict is made up, and he reminds his constituents of the profound truth that, after all, commissioners and committees are only agents.

> The work is the work of the people themselves. This is one of its most beautiful features. It makes our education an education for the fathers and mothers as well as the children. The teacher learns as fast as the pupil; the parent is elevated by every effort to raise his children in the world. A community engaged in improving their schools improves with them. There is nothing so liberalizing and ennobling, nothing so likely to purify the morals and enlarge the intelligence of the men and women of the State as a general, hearty, enlightened interest in the mental and moral culture of the young. * * * It is [he continues] a remarkable fact that after more than two hundred years of experience the legislatures of the New England States should be engaged in experiments for improving the schools.

The spirit of the great revival was abroad, and the "Granite State," after its own deliberate and persistent style of doing good things, had joined the procession. At this period, in the organization of the common school, New Hampshire did not essentially differ from the other New England States.

> Each town is divided into districts. Each district, with a distinct organization and appropriate officers, has within certain limits an independent jurisdiction. In this way the immediate care of the young, even while they are under the instruction of the State, is committed to their natural advisers and guardians, their own parents and friends. * * * In any district having fifty scholars the school may be divided into two or more divisions, thus securing the beginning of a system of gradation. Two or more contiguous districts may unite to maintain a common high school which may even prepare youth for the university.

A hundred dollars for every equal sum of the public taxes apportioned to a town was to be assessed upon it annually for the support of the schools. Additional sums might be raised without limit. Five per cent of its school money might be appropriated by each town for the support of a teachers' institute at some convenient place within the county to continue from ten days to four weeks with practice in a daily model school.

The public officials required were a district prudential committee not exceeding three persons, a town superintending committee of not less than three nor more than five, and a State commissioner, the two former elected by the district and the town, and the last appointed by the governor and council. The commissioner was required to spend at least twenty weeks in the different counties of the State each year in general school work. No teacher could receive pay unless he had reported the statistics of his school to the supervising committee of the town, who must make a general report in town meeting, which was to be forwarded to the State commissioner before April 1 each year. No town could receive its portion of the State literary fund that had not complied with this requirement.

For some of the most important features of this law the State was indebted to Daniel Oliver, the chairman of the committee on education, by which the school law of 1827 was reported to the house; to Joel Piper,(?) Samuel D. Bill, and Charles James Fox, who drafted the revised school law of 1842, and especially to Hon. Salma Hale, chairman of the legislative committee of education in 1844 and the father of the new law of 1846. In the opinion of the commissioner:

> A board of education like that of Massachusetts would, not improbably, interfere too much with those notions of freedom in such matters which have prevailed in New Hampshire from the first, and which, whatever inconveniences may sometimes result from them, we should not willingly see abridged or offended.

He refers also to the "moral and Christian tone of the constitution and the law, evidenced by the adoption by the constitution of New Hampshire of the clause concerning the moral and religious training of children and youth in the common schools.

With these preliminaries the new commissioner launches out into a report substantially like all similar documents presented to the legislature and the public in the New England States during the first twenty years of the great movement for school reform. We read the same description of poor schoolhouses, incompetent teachers, a bewildering variety of text-books, popular independence, etc., as everywhere during this period. There was probably little difference in the condition of communities similarly situated through New England in this respect during these years of the reorganization of the school system. The southern counties of New Hampshire, by far the most populous, and half a dozen cities of the State were, of course, farther along than the great mountain world in the north, buried in snows and vexed with storms during the long winter, still with a sparse population hardly raised from the conflicts and hardships of the pioneer life of Daniel Webster's boyhood.

Here, as everywhere, the commissioner reports that the best results have been obtained by the personal visits of himself and distinguished public men to the people assembled in convention, where an American community can exercise its dearest prerogative in "talking back" and

"talking the thing over" till it is finally talked into shape. A circular was also directed to many teachers of the State, generally republished in the newspapers, and in some cases given to every pupil in the schools. The most potent educational influence to-day, as fifty years ago, in any American community is a man or woman fitted by genius, culture, and of self-sacrificing spirit, for a true ministry of education, set agoing through the length and breadth of the land.

In 1848 there were about 2,300 school districts in New Hampshire and 75,000 pupils enrolled in the schools, 55,000 only in regular attendance. The average length of the winter schools was nine weeks, and the average wages of male teachers, exclusive of board, $13.50 and of females $5.65 per month. The entire annual cost of popular education was $120,000. The inevitable appendix contains an abstract of the most notable reports from local authorities, and as usual contains the most important portion of the entire document.

By 1849 the change of administration, everywhere noticeable outside of Massachusetts and Connecticut, had occurred and the State report for two years was made by the Rev. Richard S. Rust. But it is only "the old, old story," told by another preacher according to his special power of calling public attention to defects in an educational system so deeply rooted in the habits and ideas of the people that any reasonable expectation of reform seemed to include the work of a generation. The new commissioner dilates especially on, 1. The branches of education adapted to the present conditions of our district schools, and the order of their introduction. 2. The preparation of the teachers for their work, and the instrumentalities for its accomplishment. The whole amount received for the schools for the year 1849 was $174,517.66, a gain upon the previous year of $15,000.

The year 1851 introduces us to still another State official in the person of John Q. Woods, secretary of the board of education. A State board of education had been established, consisting of the county commissioners of education. The change was doubtless a surrender to the spirit of independence which revolted at the idea of power concentrated in a State superintendent of common schools acting without the "advice and consent" of a body near the county and township committees. The careful way in which the new board approaches the sensitive topic of recommending a uniform course of text-books is a proof of its probable inefficiency. It writes, "a pretty general uniformity of books was considered very desirable, and at the same time it was thought very undesirable to recommend any book that might prove unsatisfactory. A medium course was adopted, to recommend now to the common schools of the State only those books upon which all could agree and of whose superior excellence there could be no doubt." A committee of five on methods of instruction, school government, and discipline, through their chairman, the secretary of the board, favors us with a few pages of eloquent generalities, the pith of which

may be found in the suggestion that the way to govern the schools and especially to "abate whispering, with its frightful train of evils," is "by the people of the district, acting in their collective capacity of a corporation!"

The democratic idea of "rotation in office" was adopted by the new double-barreled board of county commissioners acting as a State board of education. The report for 1851 was signed by the ten county commissioners, with Mr. Hall Roberts as secretary. This was a very successful method of showing "how not to do it," since no county commissioner could be expected during his brief term of office to obtain any very complete impression of the general situation or to acquire any general power to influence the legislature or the people. With the exception of a small increase in the wages of teachers and a gain of $10,000 in the general school appropriations, there seems to have been no perceptible improvement in the situation.

In 1853 Mr. Hall Roberts again received the office of secretary of the State board. The usual discussion of educational affairs appears in the report for this year, with the statement that "statistics show that the scholars in the public schools of the State are absent, on an average, one-fourth of the time." The "average time" was nine and one-half to nine and three-fourths weeks for summer and winter, nineteen weeks in the year. The general expenditure was slowly increasing—$205,402.60, a gain of $15,476 for one year.

No more impressive commentary on the noted saying of Washington concerning the old-time confederation of States, "Influence is not government," could be made than the doings of this New Hampshire board of education, consisting of a group of ten gentlemen who, if faithful and competent, must have been so occupied by the duties of their local county commissionership that their knowledge and ability to impress the people of the whole Commonwealth would have been of little account. A well-written annual report, dealing with general propositions and, at best, containing their observations and performances in their local spheres, would represent "influence" reduced to its lowest terms. Mr. Hall Roberts was retained for another year as general secretary of the board, as his position representing the capital city and county made it convenient. But nothing occurred in school legislation in this year to greatly encourage the friends of education. Of course, in a State like New Hampshire, whose people could hardly by any public abuse or neglect fall into the "barbarism of ignorance," there would be inevitably a gradual improvement. For in every locality enterprising and self-sacrificing friends of better schooling would more or less impress themselves upon the people. But the principal gain through all these years seems to have been a growing sense of the inefficiency of the extreme local type of school administration, which virtually placed the educational affairs of an American Commonwealth in the power of 2,000 district debating societies, whose perpetual

discussions, which rarely came to a decisive vote, attracted more public attention than the going on of the schools. In 1854 the expenditure for public education in New Hampshire amounted to $212,324, and the average wages of male teachers rose to $16.42 and female to $7.18 per month, evidently the result of the increasing number of women in the service and the employment of men chiefly in the higher department of the schools.

Mr. King S. Hall, secretary of the board of education for 1855, somewhat moved the placid waters by advocating the introduction of drawing and music in the schools. The attendance on the schools, length of term, and wages of teachers showed no sign of increase, although the general expenditure was slowly rising, a gain of nearly $20,000 in a year—$231,435.

In 1856 Jonathan Tenney, secretary, appears as the author of the annual report. The teachers' institutes of New Hampshire had for several years been relatively a more important factor in the school system than in other States. As a logical result, the topic of a State normal school now first appears. A bill for its establishment was passed unanimously by the house of representatives of the State legislature in the session of 1855 and postponed to the following session by the senate. In 1854 a State association of teachers was formed and held regular sessions twice a year, with local associations in each county. The reports of the county commissioners and abstracts of local returns are especially full and interesting.

Mr. Tenney in 1857 remained in the office of secretary of the board. This year a new educational worker appears in New Hampshire in the person of Mr. Warren Burton, afterwards widely known as the author of two charming books, The District School as It Was, and The Scenery Shower, and numbers of essays especially devoted to the union of home education with the upbuilding and improvement of the schools. Mr. Burton was born in Wilton, N. H., a town then of 1,161 people, which had sent from thirty to forty young men to college, many of them afterwards men of mark. He graduated at college in 1821 and for thirty years was a clergyman, never "settled" in a parish, but always working in a home mission among the people; for a time city missionary in Boston and Worcester, Mass. In 1850 he entered on the great ministry of his life, the importance of home education as the source and soul of all successful schooling. He went about the country as a "revivalist" of the genuine stamp; a most efficient worker also in the great revival upon which the people of New Hampshire were entering in a way all too moderate to satisfy the ardent friends of popular education. He faces the people of the State of New Hampshire with a series of twenty-six questions, which might well set every family not "dead in trespasses and sins" reflecting on its obligations to its children and the community.

In 1858 the school system of New Hampshire received a powerful

impetus by the appointment of Mr. J. W. Patterson as secretary of the State board of education. Mr. Patterson represented Hanover and was already in connection with Dartmouth College, in which he was afterwards a professor. He left his professorship to serve for a term in the Senate of the United States, returned to the college at a later date, and closed his public career with perhaps the most important educational service ever rendered to the Commonwealth. During this administration of the office of State superintendent of education, entered upon in 1858, he inaugurated reforms of great importance. In his report for 1858 he boldly enters the lists as the out and out apostle of popular education. He compares the pitiful wages of the teachers with those of the military officials of the United States Army. "The salary of a common foot soldier in the United States Army is greater than the salary of the best female teacher in the public schools of New Hampshire, and we pay a bookkeeper more than the president of a college." He rightly says that the fundamental work is "to awaken a deep general interest in education." He recommends the appointment of county commissioners for a term of five years, urges the importance of school training in good manners, and through several forcible pages of the report discusses the general needs of the schools. The amount appropriated for the schools was $233,581—$2.86 for each scholar. The wages of the men had risen to $26.31 and of women teachers to $14.74 per month, including board. One-fifth of the schoolhouses in the State are reported "unfit for their purpose."

In his report for 1859 Secretary Patterson boldly faces the actual situation. He gives a brief and forcible history of popular education in New Hampshire from the first union of the colony with Massachusetts in 1641. In 1638 Philemon Purmont, first invited to the mastership of the original common school of Boston, settled in Exeter, and in 1642 Mr. Daniel Maud, first master of the new school, was called to Dover, N. H., both as clergymen. In 1682 there were 71 households in Portsmouth, 61 in Dover, 57 in Hampton, and 20 in Exeter—the largest towns in the colony. From this early period the secretary traces with pride the efforts of the people, under great stress of poverty and hardship, to support a school in every township supported by a local tax. We commend this forcible and illuminating statement of the progress of common-school education by Secretary Patterson as a model of similar compositions, and refer to it for more detailed information than the limits of the present essay permit.

But all this, in the opinion of the secretary, is preliminary to the final decision of the real question of the hour, Should the inefficient system of the present State board of education, composed of ten county commissioners, each in turn a secretary, be continued, or should the State honestly meet the demand for a more thorough supervision and a great awakening of the people by returning to the method of a State school superintendency? The question is argued with great

force and tact, and its presentation evidently marks a new departure in the public-school keeping of the State.

Professor Patterson held the post of secretary of the board for two years longer, an entire period of four years. His final report, in 1861, is a continuation of his powerful and wise discussion of the entire subject of educational reform. He sums up the educational problem in the State in the following paragraph:

> We believe the schools of the State should be reorganized on the principle of gradation and a high school established in all except a few of the smaller towns, as the head of the general system, and so connected with it as to awaken aspiration and stimulate study in the departments below it. The high school should be made the connecting link between the common school and the college.

In his report to the county of Grafton, of which he was local school commissioner, he says:

> When our whole population come to perceive that it is the first duty of a State and of Governments to educate, in the broadest import of that term, the rising generation, and manifest a corresponding interest in the work; when our towns have been redistricted, the schools reorganized and graded, and a uniform course of study adopted; when we are willing to pay for a more skillful and thoroughly educated class of teachers, we may begin to hope for good schools, and not till then.

These inspiring words read like a prophecy of the work this eminent educator was called to perform thirty years later on the other side of the great civil war, which had so powerfully stirred the oldest and most conservative States of New England. He died with the satisfaction afforded to few men of having the system of education advocated in his earlier years adopted and organized into the common practice of his native State. In 1860 the sum appropriated in New Hampshire for popular education was $296,000, and the average attendance on the schools, 54,550. The investment in school property was $814,387, with 55,000 volumes in district, town, and school libraries.

MAINE.

Until the year 1820 the public-school system of Maine was that of Massachusetts, of which State it was the great "down-east" outlying section, in itself more extensive in area than the remainder of New England, with one county, Aroostook, as large as Connecticut and Rhode Island. A fair supply of district schools, several well-established academies, and two colleges, celebrated by graduates like Hawthorne, Longfellow, and other notable characters, had laid a solid foundation for future educational growth. The State had also retained a portion of its own public lands, sufficient to warrant the establishment of 20 townships, still under State ownership, valued at $100,000.

The second legislature of the new Commonwealth in 1821 enacted a general school law differing from that of Massachusetts in the one feature that, whereas the town in the Bay State was required to support a common school or schools for a given time, the town in Maine was

required to raise and expend a certain sum of money. Each town was required to raise by tax a sum equivalent to not less than 40 cents for each inhabitant, to be appropriated among the several districts for schools free to all children and youth between the ages of 4 and 21. The inhabitants of the several districts were empowered to build and repair schoolhouses. The town elected annually a general superintending committee of not less than three nor more than seven persons, and an agent for each district, whose duty it was to hire the teacher and generally oversee the "prudential" affairs of his beat. The school committee examined teachers, selected text-books, and visited the schools. At the next session of the legislature the election of the local agent was given to the district by consent of the town, and the city of Portland was allowed a special organization of its system of schools.

In 1825 various changes were made in the school laws, chiefly with a view of defining the powers of the officials and making the machinery more effective for the control alike of unwilling school boards and disobedient towns refusing or neglecting to conform to the statute. One clause compelled the selectmen of the town to make returns to the secretary of state once in three years, the secretary of state being the one official who represented the Commonwealth in educational administration.

A subsequent revision of the school statutes in 1827 contains the earliest general provision for a gradation of schools, the only exception being the special act for Portland in 1820. In 1828 the State school fund was finally established by setting apart 20 townships of land and appropriating certain moneys due the State from the General Government. By 1832 Bath and Bangor were added to Portland as special school districts, and the first grant of authority for the payment of salaries to school committees was by the city of Bangor. In 1833 the bank tax, levied by requiring every bank in the State to pay into the State treasury semiannually one-half of 1 per cent on the capital stock invested, was appropriated among the towns for the benefit of the schools, and stringent measures were devised for securing more frequent and correct returns of school statistics. Under a general revision of the school laws and their consolidation in a general statute in 1834 the power to organize as a special district confined to the three principal cities of the State was made general. In 1835 the clause appropriating moneys due from the United States to the school fund was repealed.

By 1839 there was a general feeling that the system of public education was defective and the schools inefficient. But the only movement was the order to the secretary of state to make an abstract of such statistics as were in his possession, with comparisons and deductions that might be regarded useful, and to send a copy to each school district in the State. This was, in fact, the first public manifestation of sympathy in the State with the great revival of the common school that

was now sweeping over New England and invading every portion of the country. Here, as elsewhere, it began in the demand for accurate information on the condition of popular education. In another general revision of the school laws in 1841 the power to compensate school committees, heretofore restricted to one city, Bangor, was made general. After a three-years distribution of the abstracts of statistics in the office of the secretary of state the law was repealed, it being evident that the returns were so defective as to be of no considerable value.

It was not till 1843 that the long-suppressed disapprobation of the public-school system found expression in the legislature. Under the vigorous leadership of Mr. E. M. Thurston, chairman of the committee on education in the house of representatives, a strong effort was made toward State supervision. A bill was introduced and debated to establish a board of thirteen commissioners, one from each county, appointed by the governor and council. The wording of the bill reminds us of the grim satire of old English Dr. Johnson, of dictionary fame, concerning the demand of the average housekeeper on her woman servant for "all the Christian graces at three and sixpence a week." In this bill the work assigned to the county commissioner would overtask the most energetic expert during three hundred and sixty-five days and six hours of the year, for which he was to be paid $2 a day and $1 in addition for expenses—"*Provided, however*, That no commissioner shall be paid for a greater number of days than the number of towns he actually visits in the discharge of the duties of his commission." Although it was confessed on all hands that as at present administered the tendency of the school system was downward, yet, after a thorough discussion in the lower house, the bill was sent to the senate, the regulation legislative "cooler" of exuberant lawmaking, and without examination was "indefinitely postponed."

But enough had been revealed to convince the thoughtful people of Maine that their common-school system was a failure—at least the partial failure of local government "run mad." In more than 4,000 separate school districts the business of separate school keeping was carried on in almost absolute indifference to similar work anywhere else in the State, under local authorities from whom there was no appeal, by 7,000 teachers without previous training, in whom the State was practically taking no interest, beside 500 towns and plantations absolutely independent of each other, and the reports of this work were so defective that the people of the State had no reliable knowledge of the use made of the public-school moneys or the result of the working of the system apart from a general conviction that things were steadily "going to the bad." The only legislation that immediately resulted from this beginning of agitation was the passage of the first permissive law to establish school libraries. At the session of 1845 the subject came again to the front, and a new bill was introduced which provided for a State school board of education, appointed by the governor, whose

duties corresponded with those of the board of education of Massachusetts. The office of secretary of the board was, however, omitted, and the secretary of state was made the executive arm of the department. The motive power to move this machinery was $2,500 a year. This bill was rejected.

In the winter of 1846 the friends of educational reform met in convention at Augusta, the capital city. An efficient committee drafted a memorial, which was presented to the legislature in the following May, with an earnest recommendation from the governor in his message, and referred to the committee on education, of which the indefatigable Mr. Thurston was chairman. In the report which followed attention was called to the fact that all of the northern States of the Union were following the example of Massachusetts and New York in establishing an effective system of general supervision of common schools, and unless Maine consented she might find herself at the foot of the educational procession. A bill prepared by the committee, in which a State board of thirteen members should be elected by the supervising school committees of the towns, the secretary to be appointed by the board, was passed, and in 1846 the State of Maine formally took the decisive step which replaced the rule of chaos by the semblance of orderly administration and a general efficiency of operations.

Subsequent amendments to the school laws in 1848–49 culminated in a general revision of the statutes in 1850. The most notable feature of the new law was the establishment of teachers' institutes by the State and the distribution of the State fund, which had now been formed for the use of the schools.

The first report of the new board of education was made by its secretary, Mr. W. G. Crosby, in May, 1847. The board, Hon. Stephen Emery, chairman, declared that the late movement in behalf of school supervision, represented by itself, was a response to the public conviction that the common-school system of the State "had been suffered to fall into decay, and had ceased to exert that happy influence on the minds and hearts of the people which of right belonged to it." While by the academies and colleges the education of the more favored was well provided for, "the children of the people were suffered to grow up, if not in absolute ignorance, yet with such slender means of improving the mind and heart that prudent men might well tremble when they thought our destinies might be committed to their hands." The State school fund now amounted to $86,000, and for many years the State had failed to give account of the interest. The report suggested that this sum be applied to the general improvement of the schools. The board made an appropriation of $200 to every county for teachers' institutes; $2,600 for the entire State. A report containing plans for schoolhouses, with explanations, had been prepared by the secretary; also a system of registration and returns. Attention was called to the condition of the people in the new settlements of the State,

and two additional academies or high schools were recommended for the express purpose of preparing teachers for the districts. Other topics, including moral instruction, were treated. The board congratulated the people that this work of reform, so much needed, had at last been undertaken, and invoked in its behalf the zeal, patience, persistence, and discretion to insure its final success.

At this date, 1847, the population of the State was 583,235, of whom 240,000 were counted of school age, all between 4 and 21. There were 13 counties, containing 7 cities, 370 towns, and 84 plantations, divided into about 4,500 school districts, with 500 others scattered through the great northern wilderness outside of incorporated settlements. The plantations were not obliged to raise a school tax, while all towns and cities were under this compulsion.

Secretary Crosby reports that about one-half the towns have made school returns, including one-half the population of the State. The first impression from the statistics is that the isolated district system had "run wild." The absolute power of the towns to divide their own area into school districts has been exercised with such caprice that the number ranges from 1 to 29, one town with 1,400 people containing 27, and another with 8,600 but 5 districts. The idea of "bringing a schoolhouse to every man's door" had wrought the mischief that every individual or collection of influential people had managed to get a district arrangement suited to personal or neighborhood convenience, while the less-favored class had been left unprovided for. Legislative authority is invoked for a general policy of district consolidation. The teachers were receiving about $15 per month for men and $1.20 per week for women. The result of the policy was that for many years the superior teachers of Maine were dispersed all over the country in search of suitable positions and support, doubtless greatly to the advantage of the Republic, but to the humiliation and shame of the State.

The length of the schools varied from seventeen to twenty-four weeks, in two terms. Of the 240,000 children and youth between 4 and 21, 122,000 in summer and 95,000 in winter "did not darken the schoolhouse door." After all explanations and apologies, the fact remained that "there are yet thousands who are unaccounted for, whose interest, future happiness, and welfare demand their presence in the schoolhouse, but who are sought for there in vain." Complaint is made that few towns receive by tax more than the minimum required of them by law, and many fail even of this. The annual battle over the tax bills goes on. The establishment of teachers' institutes is urged on the legislature, with favorable action. A codification and revision of the school laws is enforced, which came three years later, in 1850. A series of reports by different committees adds to the value of this, the first common-school report of the State. From this we learn that the county of Aroostook contains an area of 6,000 square miles, larger

than the States of Connecticut and Rhode Island. In the great wilderness of the north there were 10,000 people, and within 300 square miles only four common schools could be found, less than 4,000 of the 10,000 enjoying their benefit.

Here was begun the reformation in the neglected and inefficient public-school system of the State of Maine, which has since gone on in the characteristic gait, "growing with the growth," of this enterprising and ambitious Commonwealth. At present it is reported that a larger proportion of children between the ages of 6 and 14, the actual American school age, are found in average school attendance than in any other State of the Union.

Secretary Crosby remained in office another year. In his report for 1848 he treated the important subject of the single school-district system. Established by the Massachusetts law of 1789, it had, in Maine, intrenched itself so powerfully that in many quarters the schools were well-nigh useless. The immediate attention of the State board of education is directed to this abuse. The most hopeful sign of promise during the year was the attendance of more than 1,600 teachers on the first year's institutes.

The year 1849 terminated the connection of Secretary Crosby with the State board of education. His report for this year reveals the fact that he was retiring from the office with a sense that its importance and the difficulties attending its administration had not been surmised at its creation. As the man who attempts to repair an old house generally finds himself involved in an experiment that far exceeds his estimates—indeed, is often more expensive than the erection of a new mansion—so the first board of State officials which faced the work of an educational uplift during this period of common-school development was appalled by the demand for the highest qualities of statesmanship, added to a training in the details of school organization, discipline, and instruction not possessed by one in a thousand of the "eminent educators" of the day. All that could be expected at first was the forming of a proper educational public among the superior teachers, school men and women, and the interested professional and active class of the people. And only by the constant enlargement of this constituency, and its persistent activity everywhere, from the little district schoolhouse up to the halls of legislation, could any great change be accomplished.

It was a great good fortune that the State, on the retirement of Secretary Crosby, should have been able to obtain the services of that intelligent and enthusiastic educator and publicist who, as chairman of the committee on education in the legislature in 1846, drafted the bill establishing the State board, Hon. E. M. Thurston. For four years under his leadership the people of Maine certainly had no reason for complaint that the greatness of the cause and the needs of the Commonwealth were not advocated at the State house. The board declared that "within the past four years the public-school system has under-

gone particular and material improvement." The subject of a State normal school, or in place of it an arrangement for three terms of normal instruction of three months each in the three divisions of the State, was presented by the board and argued in the secretary's report.

The secretary refers to a feeling of hostility to the existence of the board of education as one cause of the resignation of his predecessor, and appeals to the uniform verdict of distinguished educational people, in all the States where a similar experiment has been tried, in its vindication. He keeps before the people a vivid picture of the loose, inefficient, and even shiftless condition of school affairs in the State—376 towns and numerous plantations, 6,844 school districts, as many little district schools going on for not exceeding five months in the year, in two terms; "every man for himself," almost every child "paddling its own canoe" among the dangerous rapids with which such an educational torrent must abound. The school fund will probably become $200,000 from the avails of 20 townships of public land. The income from the bank tax for the sixteen years past has amounted to $535,694, with an interest of $31,500 annually. Even this small sum is in a state of siege from that class of statesmen who value government according to its cheapness and forget that the most wasteful policy in public affairs is knocking out the brains of a State to save money.

The entire appropriation for 1849 was $290,000. Nearly 5,000 school districts were served by 6,000 teachers, men working for $16.66 and women for $5.84 per month, with board.

The average length of the school term was 19.2 weeks. Only a third of the 3,064 schoolhouses reported were in good condition. The irregularity of school attendance is pronounced by the secretary "one of the most fruitful sources of evil." "The common-school library is unknown in our State. One hundred and twenty-one schools during the past year have been broken up by the incompetency of the teachers. An institute was held in each of the thirteen counties of the State during the past year." The manner in which the secretary discourses on a variety of topics, especially the relation of public education to the welfare of the State, suggests a resurrection of the spirit of Horace Mann.

The most notable event of the year 1851 was a revision of the school laws of the State and their publication in connection with the report of Secretary Thurston. From this we gather that in legislation the Pine Tree State was among the foremost of the Northern Commonwealths, its defects being largely from the neglect of the half century preceding 1846. The condition of the various benevolent institutions of the State is referred to in the report of the board. The appointment of agents similar to those in Massachusetts and Connecticut for personal visiting among the people in the school districts is strongly urged.

This year all but 16 towns in the State made school returns. An addition was made to the State school fund by the legislature in 1850, by the setting apart of 24 additional half townships of public lands.

From these sources the State distributed $33,485 among the school districts. The entire expense of the schools was about $350,000. Ninety-seven charters of incorporation had been granted for educational institutions, including 2 colleges, 1 medical and 2 theological schools, and 97 academies. In many cases one-half of a township, 11,500 acres of public land, had thus been given. Of the 97 chartered institutions, 26 had failed to keep a school alive, 64 academies were in session some part of the year, 37.5 weeks, with 3,678 pupils, at a cost of $141,500. 576,955 acres of land and $20,800 in money had been granted to these schools by Massachusetts and Maine, representing a gift of nearly $200,000. The value of academical school property in 1851 was $291,447.

The secretary writes:

> The school fund accruing from the proceeds of the lands granted to the academies of the State is nearly twice as large as that received from the lands set apart for the public schools. In the former case the money is applied to the education of 3,678 scholars; in the latter to the education of 240,000.

In 1852 the legislature followed the advice of the board of education by providing for a group of agents to visit the people in the school districts, but accompanied the act with the abolition of the present board of education. For six years this board, composed of a member from each of the thirteen counties of the State, elected by the supervising school committees, had served without compensation. "Their labor has been chiefly performed through the secretary, their executive officer." The board enumerates the services of the agent to the State and retires with dignity, leaving the impression that its abolition was a mistaken policy. A valuable part of the report of Secretary Thurston for 1852 was a historical sketch of school legislation in Maine and a synopsis of the school statistics and operations in the State as existing April 13, 1852. The record closes with a brief general sketch by the retiring secretary. He had held office two years eight months and sixteen days. During that period he had devoted himself exclusively to his public duties, with no other occupation, the entire compensation for his services being $809.67, representing an annual salary of $298.65. During this time he had visited 26 States and 3 British Provinces in pursuit of information, having traveled during the first year of his administration by steamboat, 3,643; by railroad, 3,664; by stagecoach, 1,598; by private conveyance, 829, and by canal boat, 250; in all, 10,000 miles, and this at a time when traveling was a labor rather than a luxury. He closes his report with a stirring appeal for general education that rises to the dignity of a solemn warning and an inspiring prophecy.

By the act of April 26, 1852, the State abolished the board of education, with its secretary, and the teachers' institutes, and in their place provided for 13 school commissioners, appointed by the governor and council for one year, at a compensation of $200 each, to cover all services and expenses. The commissioners were required to spend at least fifty

days in each year during the winter in visiting the towns of their own county and generally supervising the schools and informing the people. The power of supervising school keeping is transferred to the local supervising committees, and for any sufficient cause a commissioner will forfeit his office.

But in 1854 the people of Maine had already repented of their reactionary policy of 1852, and by an act passed April 17 of that year provided for the appointment of a superintendent of common schools, clothed with such powers as are only granted to that functionary in an American Commonwealth. Under the lapse of the past two years the returns from the local committees had fallen away, and the facts and statistics collected in the office of the secretary of state "furnished no reliable data for any general conclusions." Mr. Charles A. Lord, of Portland, was appointed superintendent, and had spent the remainder of the year in visits to the different portions of the State, including even the remote Northern wilderness. Everywhere he reports a welcome, and evidently had sincerely exerted himself in the interest of an educational awakening and improvement through his tour of 2,000 miles.

He reports a widespread want of proper discipline in the country schools. The schoolhouses are crowded to repletion, the rooms being like "a kind of educational cars, in which as many children as can be crowded within a narrow space will be borne along to the desired goal." "Rational methods of elementary education are receiving less attention than formerly," and the prevailing idea seems to be, getting over the ground at all hazards. The 6,000 teachers, "substantially the class in our private and public seminaries, the engineers of our education," have no local habitation and name. "Probably not a score of common school teachers in Maine have made their work the business of a life." After a report of thirty pages, crowded with the exposure of the defects of the public-school system, mingled with elaborate reflections on general culture, etc., we read, with no little astonishment, the statement, "Maine has a larger proportion of children at school than any other State of the Union—than any kingdom or nation in the world. We have one scholar for every 3.1 persons; the average for the United States is one for every 4.6 persons. We are in advance of the world."

It was, perhaps, not remarkable that after this exalted climax, following such a melancholy screed, the people of Maine "had no further use for their superintendent of schools." At any rate, the year 1855 found Mr. Mark H. Dunnell in his place, appointed near the close of March in that year. The statistics of education reveal an average school attendance of 96,227 in a school population of 238,248, and an expenditure of $491,060.29. More than one-half of the schoolhouses are reported "poor." In 1853 the sum of money obtained by a local tax was raised to 50 cents for each inhabitant of the State. Sixty-two

thousand dollars had been expended in 1853 on new schools, and the public school property of the State in 1854 was valued at $870,000. The law of 1850, providing for the setting apart of one-half of 24 townships of land as an addition to the State school fund, had not been enforced. Twelve conventions had been held in 12 counties of the State, five days and evenings each, and 69 public lectures delivered to large and attentive audiences, with an attendance of 1,700. Among other recommendations to the legislature by the superintendent is one for an appropriation of $3,000 for the support of a State normal school.

The year 1856 introduces us to still another superintendent of common schools, Mr. J. P. Craig. He writes, in his report, December 29, 1856, "No facts minute or extensive enough to show any improvement in attendance, deportment, or scholarship have been recorded by teachers or returned by committees." He declares, "Unless this obstruction (the want of well-qualified teachers) can be removed, it is utterly impossible to elevate the chararcter or improve the condition of our common schools." The superintendent devotes a large section of his report to a history of normal schools, which had been established in seven States of the Union, with interesting letters from their superintendents and principals.

In six years, from 1850, there has been an additional attendance of 10,000 pupils in the summer and 20,000 in the winter schools, and 205 male and 705 female teachers; a gain of $5.30 per month for the wages of men, and $2.50 per month for women instructors; 0.64 of a week additional time; a decrease of schoolhouses in "good repair," and $245,708.24 increase of appropriation for public education. Nearly one-twentieth of the whole number of the public schools are located in cities and large towns. These are generally graded and accommodated in good buildings, comparing favorably with similar places in New England. The superintendent bewails the low estate of the country schools and ascribes much of it to

> the frenzy of the people, who, in spite of reason, appear determined to compute their educational advantages, not from the high character of their schools, but from the proximity of the schoolhouse. Nine-tenths of the country has been compelled to submit to poor schools, that lest the remaining one-tenth should be subjected to some little inconvenience in attending schools at a greater distance. A central school for scholars between 12 and 20 years of age could be established in every country village throughout the State.

A valuable appendix to the report contains a résumé of the school laws.

Mr. Mark H. Dunnell returned to the office of State superintendent of common schools in 1857. The legislature of 1854 raised the amount to be raised by local tax to 60 cents for every inhabitant of the State. The entire amount expended for schools was $536,667, an average of $2.064 to each scholar. A valuable summary of colleges and other incorporated institutions of learning in the State, arranged in chrono-

logical order, accompanies this report, with a long list of those incorporated that never went into operation. Six thousand five hundred copies of a pamphlet containing the school laws, with index and marginal references prepared by the State superintendent, had been circulated. An appropriation of $4,000 is recommended for a State normal school. The influence of public lectures, the circulation of educational tracts, and an educational journal are urged. The abstract of information is unusually full and interesting.

In 1858 Superintendent Dunnell opens his report by the statement:

> The extreme reluctance too frequently discovered in a legislature of Maine to adopt measures which have been incorporated into the educational systems of other States, and with results far more emphatic than their most sanguine friends had claimed, is well calculated to dishearten those who clearly see the pressing wants of our own and impatiently strive for their remedy.

The report of this year is largely given to reiteration of the sayings of former documents.

In 1859 the expenditure for public education amounted to $617,889.48, and the value of school property had risen $1,116,766. Some 70,000 children and youth between 4 and 21 attended no school. "Forty thousand were neglecting the only means within their reach of acquiring a good school education, and another 40,000, who partially attend in summer and winter, are so irregular in their attendance that they receive but little discipline or knowledge." A teachers' convention of one week had been held in each county of the State, with an attendance of 1,700. A State convention of teachers called by the State superintendent was held at Waterville for three days, with lectures and profitable discussions by eminent men heard by large audiences. A State association of teachers was organized, from which much good was anticipated. The superintendent returns to his plea for a State normal school, and for the first time in a report of the legislstive committee the subject of a scheme of instruction for teachers is broached.

An important feature of the report is the history of school supervision in the State. Great importance is attached to the labors of teachers assembled in convention.

Hon. Mr. Crosby in 1853 became governor of the State. His appointments under the law of 1853 for county commissioners of schools were not confirmed by the council, and the law was repealed in 1854, and the statute providing for a State superintendent of schools and county conventions of teachers was passed. The Maine Teacher had been published meanwhile, with a circulation of 1,000 copies. In 1859 22 States of the Union had a superintendent of common schools and but two a State board of education. "Every State of the Union and two or three of the Territories, in which the common schools have any real character or prestige, provide for their general supervision by a State officer."

Superintendent Dunnell announces that within the next month his

official connection with the public schools of the State will terminate. His second appointment was made by Hon. Hannibal Hamlin, afterwards Vice-President of the United States.

In the three years and ten months of his term of service the superintendent had traveled more than 17,000 miles, nearly all within the State, with an average absence from his place of residence of eight months in the year, the remaining months being spent in office work. He had held 60 teachers' conventions.

In December, 1860, Mr. Edward P. Weston reports as State superintendent of common schools. The principal subject of interest that year was the adoption by the legislature of a scheme of subsidized academies for normal instruction. Eighteen academies in various parts of the State were offered a subsidy for establishing a normal department of eleven weeks in the spring and autumn in which the professional training of teachers should be attempted. The State superintendent was required to visit these schools and make rules and regulations for their conduct. The salary of the State superintendent was limited to $1,000 a year.

Superintendent Weston reports that this law was passed without consultation with one competent educator and "met the approval of very few well-informed friends of education and was regarded by all as a measure of very doubtful utility." The superintendent faithfully attempted to work this unworkable arrangement and 560 pupils were gathered in 15 of these institutions. The conclusion of the whole matter was that "it fails to meet the demands of those who have most carefully and earnestly studied the educational wants of the State." In lieu of this the superintendent proposes a scheme by which from 2 to 5 of the most important academies of the State, which have received the bounty of the Commonwealth in times past, shall be reorganized as normal schools and for a series of years be entirely under State control, each considered a normal school. He suggests that a committee be appointed by the legislature to make such an arrangement.

During the ten years, from 1850 to 1860, the population of Maine had increased but 8 per cent, the property valuation 65 per cent, and the money raised by voluntary taxation for education 80 per cent. Only three towns in the State in 1860 failed to make school returns. The sum invested in school property was $1,164,000. In 1860 $616,879.41 was expended for the public schools. The population of the State in 1860 was 628,300, and the number of children and youth between 4 and 21, 243,376, with a mean average attendance of 110,679 through a school term of 21 weeks. Male teachers received $21.31 and females $8 per month, including board.

The experiment of subsidizing the 13 academies as normal schools held on for another year and died a natural death after two years' experience. The proposition of Superintendent Weston that certain of the leading academies should be reorganized under State control as normal schools was not met at first by a corresponding interest in

these institutions, the majority of which had been established or largely aided by the bounty of the State.

Here we leave the record of the common school in New England from the years 1830–1835 up to 1860, the verge of the great civil war, which through four momentous years arrested the development of education in every portion of the Union. We have given an unusual space to this record of the response of these six New England Commonwealths to the great awakening call of Horace Mann, Henry Barnard, and their only less known and honored coworkers, because in their effort to reconstruct and place the State systems of public education on a permanent basis, conformed to the enlarged ideas and ideals of the time, they furnish a complete object lesson of the characteristic method by which an Anglo-Saxon American Commonwealth moves toward a great reform in an interest of overwhelming importance to the life of a republic

Nowhere so well as in such a record can we realize the unswerving faith and implacable determination with which this portion of the American people has clung to the conviction that only in the training of the youthful element of the population in the people's common school is there an assurance that the coming generation will be educated into the supreme art of living together according to the demands of a true American citizenship. But in the working out of this fundamental faith we see how hesitating and slow, often with dangerous lapses into apparent reaction, was their indorsement of the inspiring gospel of the new education preached by their own great educators. They clung to some of the most unreasonable features of the old organization, like the division of responsibility by the district system, for two generations after it was repudiated by the most competent schoolmen of the country. It has been very hard for the people of the rural districts to realize that in clinging with almost the fondness of idolatry to outgrown habits and methods of schooling they have virtually condemned their children to assume the heavier responsibilities of mature citizenship amid an environment a full half century behind that of the village and city born and bred youth. But when we compare the condition of all the public schools of New England in 1860 with their status at the beginning of the great revival thirty years before, even in the foremost of these States, we are greatly encouraged. For by 1860 every New England Commonwealth, though in different degrees, had placed itself on the reorganized common school, the foundation that henceforth was not to be moved. This revival until 1860 in New England was largely a work of school reorganization, the securing for the public schools that environment amid which they might be developed hereafter into any desirable improved condition. The question of reformed methods of instruction, although to some extent attracting the attention of the more thoughtful leaders, yet awaited the coming of the second great revival from the close of the civil war, in the midst of which we now abide.

Perhaps one reason for the apparently inefficient educational policy,

which is often a matter of surprise in a people so efficient in all practical affairs as the New England populations of that period, may be found in the fact that outside of Massachusetts this work of reform was largely in the hands of educators and schoolmen many of whom were not especially connected with public school life. The characteristic of the eminent teacher is seldom that of the politician or statesman. His interest is centered on the individual pupil or at farthest on the group of youth that marks the limit of the school, college, or community over which he presides. Unless a person of unusual breadth of mind and generosity of temperament, he falls into the habit of dealing with people which of all others disqualifies for American statesmanship of the higher or more complex type. His theories too often make little account of the actual state of mind of his constituents and his plans go to wreck on the reef of details he is tempted to ridicule or entirely overlook. Only in this way can we account for the apparently stolid temper in which the legislatures of several of these States seem to have received the admirable educational literature that like a gospel cried aloud to the people during the entire generation from 1830 to 1860. With all grateful acknowledgment for the labors of the recent European schoolmen in seeking to lay broad and deep in our human nature the foundations of the new education, we must still believe that in no language has so vast an amount of eloquent presentation of the relations of education to personal and public welfare, of wise and practical discrimination, of workable theories, of ingenious plans for the adaptation of educational systems to present needs, and especially in the adjustment of the entire work of the schools to the influence of that marvelous university, the new American life, been found as in the literature of common-school reports, in which the period now under consideration was especially rich.

Only in Horace Mann in any eminent degree was the office of chief educational executive in any of these New England States held during this period by a man of great administrative faculty, a veritable statesman, although several of the men who, for a brief period, served in educational supervision afterwards rose to high political station. Mr. Mann at once recognized the fact, as by instinct accepted in New York, that any important reform in popular education must be understood, organized, and engineered by great public men in whom the masses of the people had confidence. The average American citizen has a lurking suspicion that a clergyman of pronounced sectarian associations, a college or academical president or professor, especially a literary man or popular journalist, is no man to follow in a matter so vital and delicate as the organization of a public-school system for all the children of the State. He seems to find in this sort of man a want of roundabout common sense in theory and a lack of adaptability to present conditions that forces him into a corner and compels him to act without the full consideration of what should be done. Acting upon this well-

known state of the public mind, Mr. Mann at once secured the cooperation of the most distinguished public men of his own State—Daniel Webster, Edward Everett, George N. Briggs, George S. Hillard, Robert C. Winthrop, John Quincy Adams, Governor Boutwell. Rising young men like Nathaniel P. Banks and Charles Sumner in turn appeared at his conventions and added their powerful encouragement to his great enterprise. Indeed, there is no record that his own efforts were seriously opposed by any distinguished public man in the State, although himself the most positive and at times one of the most exasperating of men and almost a failure as a successful statesman in political life. For this reason the work of Horace Mann bore fruit at a much earlier period than that of many of his educational colleagues in other New England States.

All these and other important facts concerning the organization of public education and its gradual uplift to its present condition can be studied at great advantage in the history of these years in the States where the common school had its birth and has moved on with the strong and steady impetus of fate to its present condition of eminent success. And especially is this record of value in the half of our Republic where the common school to-day is virtually, in the great open country, in the condition of New England sixty years ago, and where the great leaders are yet to appear who shall guide the people through the wilderness of fruitless experiment and irritating opposition safe over the forty years' wandering in the desert into the promised land.

NEW YORK.

No State in the Union in 1837 was in a more favorable condition to follow the lead of the revival of the American common school than New York. For twenty-five years its public-school system had been under the direction of competent supervision—first by Gideon Hawley, a State superintendent from 1813 to 1820, working an improved code of school legislation, and afterwards under the able direction of a series of distinguished statesmen, who combined the honorable post of secretary of state with the superintendency of public education. During this period, while the common schools of New England, including Massachusetts and Connecticut, were under a partial eclipse, the common school was largely introduced and fostered by New England influence in the State of New York, and gradually improved and became more deserving the confidence of the people. As early as 1835 the chairman of the committee of education in the New York assembly, in an able report, urged the establishment of a department of education with a secretary of public instruction, anticipating by two years the first action of an American legislature in Massachusetts in 1837. In the same year was passed the first law for the establishment of district-school libraries, whereby $20 might be appropriated the first year and $10 during successive years by any school district, to be supplemented

by State aid, for the establishment of a district-school library. By the enthusiastic cooperation of Hon. Samuel Young, James Wadsworth, and others, the law at once became a reality, and this important annex to the country district school was introduced as a permanent feature of the institution.

Governor William L. Marcy, in his message of 1833, speaks of increasing interest in public education. In 1836 there were in New York 10,000 school districts, in which 541,000 children and youth received more or less instruction during eight months of the year. This estimate did not include the city of New York, where the only system subsidized by public funds was still "the public-school society," with many thousand children under private and parochial instruction and 15,000 entirely outside the schoolhouse. Under the loose method of reporting attendance, which only dealt with the enrollment, it was estimated that 2,000 children in excess of the whole number from 5 to 15 were at school. This neglect of an accurate enumeration of the numbers in average daily attendance for years to come was a source of perpetual delusion to the people—even to the school authorities of the Commonwealth.

In 1837 Governor Marcy recommended that a portion of the United States deposit fund distributed among all the States should be added to the State school fund, and the legislature applied $160,000 from this source; $55,000 to the library fund, and the remainder for general distribution. The secretary of state during the administration of Governor Marcy was John A. Dix, then at the beginning of a long and illustrious career of statesmanship, and at no time during his crowded life were his services of more value than in his persistent devotion to and vigorous administration of the educational interests of the State. But with all this public effort there was a chronic weakness in the system, centered at the points of public indifference, incompetent teachers, and careless or neglected supervision. The attendance was steadily falling behind at the rate of 8,000 to 10,000 a year, and the public dissatisfaction was plainly on the increase.

The administration of Secretary Dix overlapped the advent of William H. Seward as the first Whig governor of New York by several months, and his final report contained much to awaken the interest of all friends of education. He wrote:

> No plan of education can now be considered as complete which does not embrace a full development of the intellectual faculties, a systematic and careful discipline of the moral feelings, and a preparation of the pupil for the social and political relations which he is destined to sustain in manhood.

The great reform so imperatively demanded would only be accomplished "by furnishing each school district with a competent teacher." Secretary Dix also urged the passage of a law for the protection of children in manufacturing establishments, founded on the statute of Massachusetts.

At the advent of Governor Seward there was an investment of $2,000,000 in school property, and $1,000,000 was annually expended

for the instruction of more than 500,000 children. The secretary's remarks on moral and religious instruction were broad, excluding all sectarian bias, but approving the use of the Bible, which was still retained as a reading book in more than one hundred towns of the State.

If it was a providential event that Edward Everett was governor of Massachusetts in 1837, in the opening year of the great revival of the common school, it was no less a happy circumstance that, in 1839, William H. Seward was elected governor of New York, and during four of the most important years of the educational reformation in that State was its chief executive. During the first two years his educational right hand as secretary of state and superintendent of schools was Hon. John C. Spencer, and after this distinguished statesman was called to a Cabinet ministry at Washington his place was supplied, first, by Mr. S. S. Randall as deputy (his first appearance in educational affairs), and subsequently by Hon. Samuel Young. A more powerful combination in favor of public education could hardly have been made in the capitol, supported and advised during the entire administration of Governor Seward by Dr. Eliphalet Nott, president of Union College, a most reliable expert in all things pertaining to this department of public affairs.

William H. Seward did not come to the great post of governor of the Empire State without a long previous training in this as in other departments of public life. He was born in 1801 in the little village of Florida, Orange County, N. Y., one of the old counties of the valley of the Hudson. His ancestry represented a blending of Welsh, Irish, and English stock. His grandfather was a colonel in the Revolutionary war, and his father was well educated and by profession a physician as well as farmer, merchant, county politician, magistrate, judge, and a member of the State legislature—a good citizen of moderate wealth and high respectability. William was the fourth of a family of six children, none of whom ever seem to have arrived at any considerable distinction save himself. From his childhood he was a lover of learning. He says: "I remember only one short period when the schoolroom and the class ambitions were not quite as attractive to me as the hours of recess and vacation." And this when the schools were so imperfect that at an early age he saw through its numerous shams, and learned to gather out of its ash heap of pedantic and mechanical fumbling with childhood the golden gems of a rare culture.

It may encourage the despondency of the boy of to-day to learn that this man, himself one of the most convincing speakers and writers of his period, began his first school composition on "Virtue" with the important announcement, "Virtue is the best of all the vices," having taken his cue from an older boy who had stated in his own "original composition," "Drunkenness is the worst of all the vices." It is also encouraging that the future statesman, who, of all others, prophesied

the magnificent destiny of the Republic, invoked all the great latent powers of the General Government and added to its area the Territory of Alaska, a region as extensive as the original American colonies, protested in his college club in an elaborate essay against the building of the Erie Canal by the State of New York as the precursor of financial ruin. His schooling in two or three country academies prepared him for the junior class of Union College at the age of 15.

Here he met the most important human influence in the formation of his character—as Thomas Jefferson in Professor Small at the college of William and Mary, Virginia—in Dr. Eliphalet Nott, then president of Union College. His admiration of President Nott as a great educational statesman never waned. But he had little faith in the fragmentary style of instruction, which, even to the student of 15, was seen to be rather "a beating of the bush" of knowledge than a training of the mind and character of the scholar. His teacher in the classics was Francis Wayland, afterwards the celebrated president of Brown University, but then, by his account, an absent-minded and somewhat repellent young man. In good time Seward became a member of the Phi Beta Kappa Society, and always regarded the training in composition and debating in that association the best mental result of his college course.

He fell out with a portion of the college faculty in his senior year and left college, traveling as far as Georgia, where he spent six months as teacher of a private school in the new hamlet of Edenton, Washington County. Here he was first introduced to the great world he was to know in future as his proper university, for he had unusual opportunities for observing good society in this new Commonwealth claiming the proud title "the Empire State of the South." Here, also, he first saw the institution of negro slavery and came to those profound conclusions regarding it which were the great motive power of his future career in national affairs. He carried on a friendly correspondence upon this subject with the gentleman who entertained him as a beloved guest during his Georgia experience until the outbreak of the civil war. Returning to college at the entreaty of his mother and the hearty invitation of Dr. Nott, he graduated with high class honors at the age of 18, having spent six months meanwhile in the study of the law at home. His college debts were paid by a strict personal economy. The history of his residence at Schenectady was a prophecy of his future. In 1820 the violent agitation stirred up through the entire country by the Missouri Compromise legislation in Congress had divided the two literary societies of Union College into hostile clans so embittered that for many years the members of the one refused to speak to their old classmates in the other.

From this period through the twenty years when at the age of 38 William H. Seward was elected first of the Whig governors of New York his entire personal, social, and political life was largely influenced

by his western New York environment. With an almost prophetic intimation of the future, he left the old conservative valley of the Hudson and took up his abode in the new village of Auburn, almost on the verge of the new New York. Here, surrounded by a great multitude of the superior people of New England origin who at the close of the Revolutionary war had struck Utica, N. Y., in the favorite Yankee enterprise of "spreading themselves" toward the "great West," he developed that matchless capacity for high political leadership which made him chief of the modern American philosophic statesmen, a sort of Northern Thomas Jefferson, in the hour of the nation's supreme peril one of the most eminent of the illustrious group of the fathers of the new Republic. In 1837, at the age of 36, in an elaborate address delivered at Westfield, Chautauqua County, N. Y., he presented a view of the future possibilities of public education, broad, profound, and practical beyond anything then in actual operation in the country, prophetic of all that the great Chautauqua Assembly and university movement stands for in our day. Like Henry Barnard, he lived to see all that he there emphasized with his own grave and persuasive eloquence incorporated in the educational system of his own State and every Northern Commonwealth of the Union.

With such a training in opinions and ideals of public education Mr. Seward, after a course of eight years in public life as a member of the State senate, entered upon the high office of governor of New York, in 1839, at the age of 38. His secretary of state was Hon. John C. Spencer, a statesman of marvelous energy and untiring industry, of whom the shrewd new governor said: "He wants to do his own work and the work of everybody else." His first message, in 1839, contains an admirably condensed and suggestive statement of the ideas previously set forth in his Westfield address. His constitutional optimism here shines forth in its full radiance. He says:

> If these reflections seem extravagant and the results they contemplate unattainable, it need only be answered that the improvement of our race is without limit, and that all that is proposed is less wonderful than what has already been accomplished. I do not hesitate to invite efforts to establish the standard I have described. Postponed, omitted, and forgotten, as it too often is, amid the excitements of other subjects and the pressure of other duties, education is nevertheless the chief of our responsibilities. The consequences of the most partial improvement in our system of education will be wider and more enduring than the effects of any change in public policy, the benefits of any new principle of jurisprudence, or the victories any enterprise of physical improvement can ever accomplish.

After a luminous exposure of the defects of the present condition of educational affairs, the governor says:

> For this evil of our school system there is a remedy, simple, economical, and effectual—the establishment of a department of education, to be constituted by a superintendent, appointed by the legislature, and a board to be composed of delegates from subordinates of boards of education to be established in the several counties.

These officials, he suggests, should serve without compensation, and he is assured that—

> the State abounds with competent individuals who would assume this direction without other remuneration than the consciousness of rendering enlightened and patriotic service in the cause of education.

The suggestion that the public service for the children should be "a ministry," a labor of love, was in full accord with the practice of Governor Seward through his entire political life, for he always expended for public uses far more than the salary of any and every office he occupied. His idea of public education included the entire course of industrial training now inaugurated in every State, and his first message contains a strong passage urging the industrial training of the farming population and the formation of a State board of agriculture. It was an auspicious time for educational reform when the great governor of the Empire State made his first appeal for the common-school system. For the revival of the common school, by a logic as rigid as the laws of the human mind, appeared on the advent of the splendid system of internal improvements, the new methods of rapid transportation, and the incoming immigration from Europe. During the four years of Governor Seward's administration in New York the first railroad married the capital city to the city of New York, the Atlantic, and the Great Lakes.

The young governor spent twenty-one hours by a stagecoach coming from Auburn to his inauguration at the capital. The huge building rented as executive mansion, a fine specimen of the old time "palatial residence" in aristocratic Albany, had no arrangements for heating save the antiquated open fireplace and grate, with the addition of two anthracite coal burning stoves of the pattern invented by President Eliphalet Nott. A cloud of dim sperm candles lighted up the generous board always spread for a crowd of transient visitors in the big dining-room, and occupants of the huge and homely establishments up in the sacred precincts of "Quality Row" shivered through the tremendous winters of the stimulating Albany climate. The extreme limits of the Empire State were then farther apart than the ocean boundaries of the vaster Republic of to-day. At the celebration of the completion of the Boston and Albany Railroad, in 1842, Mr. Thurlow Weed offered the toast, "Massachusetts, the cradle of philanthropists, statesmen, heroes, and historians. Keep it rocking." The intimate acquaintance of the young Governor Seward with men like John Quincy Adams, Thaddeus Stevens, and President Eliphalet Nott, and the influence of his wise and accomplished wife, a pupil of Emma Willard, with his, for the time, large experience of American and European travel reenforcing that marvelous genius for progressive American statesmanship in which he has never been excelled, were all prophetic to him of the new education, that mighty lurch of the human mind during the memorable period from the beginning of the second half century

of the Republic, 1830, to the conclusion of the Civil War and the final reconstruction of the Union.

The broad views of Governor Seward were not inconsistent with a careful inspection of the field of operation and a practical estimate of what could actually be accomplished. At this end of the great enterprise of a contemplated educational reformation, the State was again favored in the election of Hon. John C. Spencer as secretary of state and superintendent of common schools. Mr. Spencer at this time had been for many years a public man of commanding influence, with a large experience in practical administration. The son of the chief justice of New York, by descent connected with the family of De Witt Clinton, he had already held the office of Member of Congress in 1817, with an unsuccessful campaign for the position of United States Senator. In 1820, he was chosen speaker of the New York Assembly. In 1825, he was elected a member of the New York State senate, where, as chairman of the literature committee, he contributed largely through his able reports, and as the educational leader of the higher legislative house, to the progress of the common schools. Again in 1831–1833 he became a member of the assembly. For twenty years he was engaged in a revision of the State laws. Now a veteran in public service, he was fitly placed as the executive right arm of the new governor, and during his brief term of service, until summoned to national honors, he inaugurated a preliminary movement for a radical reconstruction of the all-outdoors educational policy of the Commonwealth.

Up to this date it would seem that the State of New York had no reliable method of knowing what was going on in the public schoolhouse, on which $1,000,000 was annually spent, with half a million children reported as in attendance. The only responsible officials between the schools and the educational department of the State were the local supervisors, the majority of whom seemed to have been of that description who do not supervise and whose careless and incorrect reports did much to nourish that complacent view of school affairs according to Governor Seward largely responsible for the present unsatisfactory condition. The first official act of Secretary Spencer was to secure the passage of a law establishing a board of school visitors, appointed by himself, to inspect the common schools of their respective localities and make a correct report at the statehouse. Among these visitors were men like Professor (afterwards Bishop) Potter, of Union College; Hon. Jabez D. Hammond, the political historian of the State; Francis Dwight, editor of the District School Journal; James Wadsworth, the wealthy and enthusiastic friend of the district school library, and others, each of commanding influence in his own district.

For the first time in the history of the Commonwealth, the legislature and people were permitted to know the fact about their system of public education. The report of this body of experts was an eye-

opener to the educational public. It was revealed that one-half of the schools of the State were not visited at all by the inspectors. The examination of teachers was slight and superficial—well nigh worthless. There was a strong popular demand for the abolition of the office of examiner. The secretary and visitors recommended the appointment of deputy superintendents of common schools from each county and the establishment of public normal schools in each county, while the secretary still held on to his faith in the competency of the subsidized academies to do this work. The publication of a district school journal was urged, uniformity of text-books, the introduction of vocal music, the extension of the term of office of school officials, and the formation of teachers' associations, with a union of graded schools in charge of local superintendents in all the considerable villages of the State.

The demand for a county superintendency was heeded, and by an act of the legislature this first great step of reform was taken. In 1839 the State was spending $1,924,381 on common schools, of which $476,443 was from rate bills paid by the parents for children in attendance. The average wages of male teachers were $18 and the females $6 per month, exclusive of board.

The indefatigable superintendent also commissioned Prof. Alonzo Potter and D. H. Little to examine the academies receiving a subsidy as training schools for teachers.

Professor Potter urged as an additional agency the establishment at Albany of a proper normal school, under the eye of the State superintendent. There were then 442,000 volumes in the school district libraries, on which $95,000 had been expended. In comparison with the state of educational affairs in 1815, about the time of the first attempt at State supervision of common schools, the statistics were certainly encouraging—10,387 districts, 573,000 children, and a corresponding gain by the people of $1,188,000, contributed by a population of 2,422,000, of whom probably not one-sixth were either taxed or in any way called to share these expenses. It was also a favorable indication that 30,000 school trustees in the State were giving gratuitous service in the interest of education.

But from all these excursions into the upper realm of public optimism the practical secretary comes back to the old story. "The first requisite is the employment of teachers who can impart a greater amount and a higher degree of instruction." The act providing for the annual appointment of a county superintendent of schools by the board of county supervisors was passed May 26, 1842. The number of town inspectors was reduced to two; provision made for the instruction of colored children, and a subscription made to Mr. Dwight's District School Journal for a number of copies sufficient to supply every school district in the State. It is believed that this was the first instance of the subsidizing of a school journal by any State. One of the most important features of the new school law was the provision of a deputy

State superintendent of common schools who should serve as superintendent in the case of a vacancy. This office was filled by the appointment of Mr. S. S. Randall, who for many years occupied a very prominent place in the administration of the common school system of New York and became its historian. Eight additional academies were subsidized for normal instruction.

In October, 1841, Hon. John C. Spencer was called to a cabinet position at Washington, first as Secretary of War and afterwards Secretary of the Treasury. Mr. Randall was left for a season in charge of the office of the secretary. The first fruits of the good work already done appeared in the addition of 30,000 children in attendance on the schools, the general increase of appropriations, and the success of the experiment of county superintendents. Six of the important cities of the State had reorganized their schools on the graded system, with superintendents, and many of the larger villages were adopting the union and high schools.

During the last term of the administration of Governor Seward, Hon. Samuel Young was appointed secretary of state and superintendent of common schools. Mr. Young was also a well-known public character in the State, a Democrat of the old type, violently opposed to the system of internal improvements by the Government and distinguished among a group of strong and positive political leaders for an unusual gift of personal assertion and unswerving fidelity to his convictions. He had served since 1814 in the State legislature; in 1824 was a candidate for governor against De Witt Clinton; from 1816 to 1840 a canal commissioner; in 1834 a member of the State senate, and in 1842 secretary of state and superintendent of common schools. His political career was terminated by an additional term in the State senate, after which he retired to the life of a farmer in Saratoga. He was met on his first acceptance of the office of state superintendent of education by a strong movement for the abolition of county superintendency and his own prejudices were strongly in favor of this petition.

But an able adverse report by the chairman of the educational committee in the assembly confirmed the legislature in the retention of this valuable feature of the school system. In May, 1843, a State convention of county superintendents representing 42 of the 59 counties of the State was held at Utica. It remained in session three days and was presided over by Hon. Jabez D. Hammond and attended by Horace Mann and George B. Emerson, of Massachusetts; Dr. Gallaudet, of Connecticut; Francis Dwight, Professor Potter, and various other notabilities. The new superintendent, Young, was persuaded to be present and came away a thorough convert to county superintendency. The whole subject of common school instruction was discussed by the eminent educators present with unusual thoroughness and force.

Horace Mann appeared in every important discussion and lectured to a great assembly on one of the evenings. At its close he declared

that this convention was one of the most important ever held in the country. His most eloquent farewell address stirred the distinguished audience to its depths. The conventions of county superintendents held afterwards at Rochester, Albany, and Syracuse were a powerful stimulant to the educational revival already "in full tide of successful experiment" in the Commonwealth.

The number of children and youth reported as under instruction in 1843 was 600,000, and a million books were in the district school libraries, on which $100,000 had been expended. After a fair experiment extending over many years, including a large expenditure of money, Superintendent Young at last confessed to an abatement of faith in the subsidizing of academies for the training of teachers. He recommended the concentrating of the effort on four of the most efficient of these institutions and a central State normal school at the capital city. In addition, in his report, he treats the legislature and people to a criticism on the defects of the public-school system worthy of Horace Mann in his best days. He especially shows the amazing wastefulness and inefficiency displayed in the distribution of school funds, and urges for the improvement of the lower schools a proper supervision required by the incompetency of the teachers. While the schools of a State remain in this condition, he declares, all additional appropriations and all superficial reforms, however valuable in themselves, are but thrown into a bottomless slough which swallows up with insatiable appetite all that passes into its hopeless depths. He recommends the substitution of the office of town superintendent for that of commissioner and inspector, and the location of authority in county and State superintendents. The majority of his suggestions were incorporated in a new school law passed April 16, 1843. Hon. Henry S. Randall, superintendent of Cortlandt County, afterwards biographer of Thomas Jefferson, supplemented this report by a valuable document on the selection of books for district school libraries.

At the opening of the administration of Governor Seward there were 147 incorporated academies in New York, 118 of which were subject to inspection by the regents of the university and deriving an income from the State literature fund. One hundred and six reported to the regents in 1837 as containing 17,233 students, of whom 7,122 were pursuing classical studies. Their school property was valued at $1,050,000, and their endowments at $151,892. Their united actual revenue was $160,000, and the value of their libraries and apparatus $58,000. The Albany Female Academy received $19,000 per year in tuition fees and the Troy Female Seminary $9,000. Although receiving a subsidy from the State, both refused to comply with a provision for a normal department and were sustained in their denial by Superintendent Spencer. Several colleges, Hamilton, Columbia, New York University, Genesee, and the College of Physicians and Surgeons, New York, were also under the direction of the regents of the univer-

sity and subsidized to the extent of $15,000. Besides this, the legislature, with a free and open hand, had distributed material aid to many private schools and charitable institutions whose center was a denominational school. There were a thousand students in all of these colleges, with 70 professors, and a property of over $1,400,000, an annual increase of $80,000. Besides this, the State was expending large sums for the instruction of the deaf, dumb, and blind.

In the Common School Journal of Massachusetts of March 15, 1839, Horace Mann, after a visit to Albany and an examination of the common-school system of New York, reports that "owing to the fact that the common-school system of the State is of late origin, established as late as 1812, it is worthy of remark that the people of the State have enjoyed one great advantage over the people of Massachusetts, in being exempted from the immense labor of forever boasting of their ancestors, and have had more time to devote to their posterity." Mr. Mann condemns the academical system of training teachers and mentions with surprise the fact that of the 384 normal students in these academies only 19 are young women. He asserts that the Normal School at Lexington, Mass., is "the first normal school, properly so considered, in the world exclusively devoted to the female sex." He also compares the absolutely free school system of Massachusetts favorably with the schools of New York, still partially supported by a rate bill. But his admiration is unstinted at the great liberality of the State, even in 1837 appropriating so large a sum for education. We can understand the growing interest and respect in which the great educational leaders of New England held the New York system, both Mr. Mann and Dr. Barnard declaring that the New York organization of public education was the best in existence. At the advent of Governor Seward the Lancasterian system of schools still held on in several of the larger cities of the State. More than one of these important communities had given their meager school funds to this one school, with the result that large numbers of children seem to have been living without instruction. These cities however, were among the first to reorganize under the efficient administration of Secretary Spencer.

Had the administration of Governor Seward, through the executive agency of his three able superintendents of education, Spencer, Randall, and Young, only achieved the results already described, it would have deserved high commemoration in the educational history of the Commonwealth. For surely to have revealed through a competent board of visitors the weakness of the public-school system then in operation and by one legislative act struck at its most mischievous infirmity by adopting a system of county superintendents, to have placed more fully than ever before the people as in the first message of the governor the necessity of the proper organization of a State educational department with a State superintendent as its executive and head, to have developed the district school library as never before or since in our

country, to have brought the legislature nearer to the decisive point of the establishment of a State normal school, with the steady increase of the means of support, the growing attendance of pupils, the organization of union and high schools in many villages and of a complete graded system in several important cities, was a service of incomparable value. And not least in significance was the spectacle of a governor of the State and a rising man in public affairs standing forth as the earnest advocate of an enlarged ideal of universal education which logically would dispense with much that still "cumbered the ground."

But the State of New York and beyond her limits the whole country has abundant reason to be grateful to the Seward administration of four years for its services in finally placing the public-school system of the greatest and most influential State of the Union on its present basis as far as concerns its relation to a vexed question that for years had threatened the peace of the common school. And this is a matter which has been for so long a period and even is to-day involved in the mists of sectarian misconception and misapprehension that there could be no good excuse for omitting a truthful notice of it.

The public-school system of New England at its inauguration during the earliest colonial period escaped the embarrassment of what is popularly called the "religious question" by the fact of the practical unanimity of the entire population on the subject of religion. The ultra-calvinistic faith and the Congregational Church, one of the most characteristic features of the early New England civilization, were for one hundred and fifty years virtually the accepted belief and ecclesiastical polity of the two most powerful New England colonies—Massachusetts and Connecticut. The colony and State of Rhode Island escaped the embarrassment of this controversy by postponing its organization of the common school till a period two hundred years from the banishment of Roger Williams from Massachusetts Bay. New Hampshire and Maine were originally a portion of Massachusetts, and in this respect followed her lead. Vermont was declared by President Dwight, of Yale College, Connecticut, "a colony of Universalists and infidels," but its development of public education followed the later and permanent idea announced and so ably advocated by Horace Mann, Barnard, and the great leaders of the educational revival of 1830–1860. From this cause for more than a century the clergy of New England were greatly interested in the public schools, were often their best teachers, and much of the popular theology, as well as the moral temper and habits of good society, was a part of the everyday schoolhouse life.

But below all this the real motive power of New England society was all the time working, the radical Puritan idea that under God the people are the source of all earthly power; that neither priest nor Government was superior to the individual man as related to Almighty God, and that church, state, and school in their outward organization are only

arrangements by a flexible majority always open to new ideas for the promotion of civil order, religion, and public and private morality. As the views of these communities expanded under the experiences of the colonial, revolutionary, and national life, the schools emerged upon their present high and practical ground, to wit: that while the duty of teaching according to the declarations of the universal religion and morality set forth and illustrated in the word and life of the Great Teacher is the fundamental obligation of public education, this shall be confined in the common school to the inculcation of the universal principles of character and conduct in which all good people unite and to the overpowering influence of the object lesson of a righteous man or woman "keeping school." This idea stands firm in the approbation of the national judgment concerning the relations of an American State to religion and the church, and is to-day the rule of practice throughout the Republic.

But the character of the early population of New York was of such a nature as to absolutely forbid the establishment of a public-school system during its colonial days. The early conquest of the Dutch country, itself little more than the temporary occupation of a vast territory by a commercial company establishing trading posts, by the British power, the great variety of race, language, religious and social cultivation, that made the island of Manhattan the receptacle of a population representing all nationalities, creeds, tribes, and tongues, for two centuries, absolutely prevented the establishment of anything like a public-school system of the New England type. During the opening years of the nineteenth century, when the city of New York had a population of 60,489 (in 1800), there were none but private and parochial schools in the place, and large numbers of children were found growing up in ignorance.

Moved by this social peril of a growing illiteracy and the benevolent spirit of offering the inestimable blessing of knowledge to the humblest, a body of the foremost people of the city of New York, including Governor De Witt Clinton and others of like reputation, established a plan of free education for the neglected children and youth of the city. In 1813, when the first general system of public instruction was adopted by the State, the legislature enacted that the public-school moneys for the city of New York should be distributed to such benevolent institutions and religious and educational associations as hereafter would support charity schools. For, notwithstanding the provision in the State constitution for religious liberty and the separation of church and state, New York began its public-school system by a scheme of subsidizing different sectarian and private organizations of superior schools through its board of regents and the distribution of public lands and moneys among corporate and church organizations. This practice, though under the form of law, was evidently in contradiction to the letter and spirit of the constitution, although a benevolent pro-

vision for the schooling of the vagrant and neglected classes of children in the city. Under its operation the schools of some eight or ten different religious associations were subsidized until 1824.

At this time the act was repealed and "the common council empowered to designate the societies or schools which should be entitled to a share of the school moneys, and prescribe the rules and restrictions under which such moneys should be received." By this time the Public School Society (for under this name, on its change of title, the charitable agency formed in 1805 had become known) had, by its superiority in general school advantages and the backing of a powerful leading class of the people, become the chief educational power in the city. Naturally the common council designated the schools of this Society, with a few others, as the recipients of the public funds, and so continued from 1826 to the period now under consideration. During the thirty years there had been distributed in public funds supplied by the State and raised by public tax $1,000,000 to these schools, and $125,000 to other institutions.

Thus, by the gradual operation of this habit of subsidizing the schools of all denominations and descriptions by public funds, it had come to pass that Governor Seward, on his elevation to the executive chair of the State, in 1839, was compelled to report that "the control of the public education of the great city of New York, with a population of 300,000 people, and the distribution of nine-tenths of the public-school money, is vested in a private corporation." And this corporation was self-perpetuating, with no direct power anywhere to repeal or modify its charter. The Public School Society consisted of people who contributed to its funds the payment of $10, making a member for life. The members annually chose 50 trustees, and these were empowered to add 50 more, making a private school board of 100.

By a report of the commissioner for the school moneys of the city of New York in 1839 it appeared that of the 115 schools receiving public aid in the district 98 were under the absolute control of the Public School Society. There were on the rolls of the society 22,955 children and youth, with only an average attendance of 13,189. At the request of the State superintendent a body of eminent gentlemen in the city conducted a laborious investigation into the working of these schools. The result was that while on the whole they were pronounced the best schools of the city, absolutely free to all who came, and every reasonable effort was made to draw the poorer class of pupils under their influence, yet there was a broader spirit and a feeling of dissatisfaction growing up in the city in connection with the whole subject of public instruction, and educational affairs were getting dangerously involved with sectarian animosities growing out of the present system. On the one hand came up strongly the objection that here was a private and close corporation empowered to receive and distribute nine-tenths of the public-school funds of the greatest city on the continent and appropriate them to a system of schools over which the

people who paid the taxes had no control, not even the influence of a growing and enlightened public opinion. The system was also a dangerous anomaly in the general scheme of the public-school administration of the Commonwealth, where the people had full control in their local capacity, these schools being only bound by a loose obligation to report progress as a condition of sharing the public school funds.

On the other hand came up a loud protest from the several religious denominations and churches not included in the ordinary Protestant fraternity, especially from the growing Catholic Church, which was educating several thousand children in its own parochial schools, that here was a palpable injustice in the public preference of one class of citizens above another. For although the Public School Society was not on its face an ecclesiastical corporation, and probably less under sectarian influence in the conduct of its schools than any others in the city, yet its managers and supporters were largely from the great Protestant churches, and its ideas and ideals of educational training were those of the day—a day when religious bigotry and sharp distinctions of society on theological and ecclesiastical lines were far more marked than at present.

The result was a vigorous and renewed protest from the managers of these various schools, first to the common council and afterwards to the legislature, for justice. The situation was further complicated by the disgraceful fact that between the contentious forces of these great Christian bodies the children went to the wall, 20,000 being reported as growing up in ignorance, attending no school whatever. In fact, in the city of New York, containing in 1839 63,000 children of proper school age (6 to 16), there were only school accommodations for 35,000, and only 30,000 were reported as actually at school, leaving 33,000 in the streets.

This was the situation which confronted the young statesman, philanthropist, and educator who as the leader of a rising political party had been lifted at an early age to the great office of governor of the foremost State in the Union. At the first realization of these appalling facts, the governor, in his second message, had recommended that these neglected children, largely of foreign descent, should be instructed in schools taught by people speaking their own language and of their own religious faith. This declaration, as explained by the governor in a subsequent message, did not signify that the children were to be taught in a foreign language or instructed in any special religious creed. But it was at once seized upon by his political opponents as well as by a section of the popular religionists as a movement to subsidize the parochial schools for the Catholic faith. Whatever may have been the original idea in the mind of the governor, which he seems to have arrived at after a consultation with President Nott and other clergymen of different denominations, including the Catholic archbishop Hughes, he soon placed himself fairly on the American educational platform, that the only cure for the present condition of affairs in New

York City was the bringing of the schools under the public school arrangement of the State, thus placing the educational system of the great metropolitan city in line with that of the Commonwealth. Secretary Spencer on his retirement from the office of State superintendent of schools left behind an elaborate report on the situation, which in its general policy was eminently wise and practical. But in the controversy concerning the subject of religious instruction in public schools the plan advocated by him was not only repugnant to the fundamental idea of the American common school, but grossly unjust to every party involved.

This elaborate project for avoiding the war of the sects was to leave the controversy to be fought out in every one of the school districts of the State, in each one of which by "local option" the majority of the people should have the right by vote to adopt any system of religious and moral instruction and enforce it upon the minority. But it was discovered to the surprise of great educators, ecclesiastics, and statesmen that the people of New York had in mind a far more just and practical idea of the question. They proposed in the spirit of plain common sense and Christian charity to teach and train the children of the State in the universal religion and morality of the New Testament, the love of God and man through the entire organization, discipline, and methods of instruction of a school taught by the precept and example of good teachers, enforced by the reading of the Bible "without note or comment," having no use for sectarian theology or partisan ecclesiastical polity in the public schoolhouse.

The importance of the controversy that sprung up around this corporation in the city of New York can hardly be overrated. The inquirer who seeks for its details will find it so expanded in the admirable volume, the History of the Public School Society of New York, by William Oland Bourne, that it is only necessary to direct attention thereto. Suffice to say that never, save possibly thirty years later in Cincinnati, Ohio, has the subject of religion in the American common school been so thoroughly discussed by disputants so able, with such practical reference to its relations to the education of American children and youth, as then and there.

The result of all was that the recommendation of Superintendent Spencer, as far as related to the local question, was indorsed by the governor and embodied in an act of the legislature, by which the public-school affairs of the city of New York were to be placed in charge of a board of commissioners elected by the people, who should distribute all funds and supervise and manage all educational affairs, with a general direction of the schools of the Public School Society, which were to be regarded as a portion of the public school system, while still, in the management of details, under the control of the corporation. By the act of April 11, 1842, a board of education consisting of a representative of each ward of the city of New York, elected by the people, was organized, upon whom was devolved the general administration of

the system, including the schools of the Public School Society, reserving to that body the economic supervision and direction of the schools under its charge, and confiding the immediate administration of all others to local trustees elected in each ward for this purpose. This was all that could then be accomplished, but it was a radical settlement of the question. From this time forth the common schools under the public sanction came more and more to the front, taking the place of those of the Public School Society, which steadily declined in means, attendance, and public estimation, until in 1853, by common consent, the large property of the society in school buildings and funds was merged in the common-school system.

Henceforth the metropolis of the American continent was irreversibly committed to the American system of universal education. This was an achievement of educational statesmanship never exceeded, even by William H. Seward. The crisis had come when the religious question must definitely and fully be settled through the entire area of the Republic outside of New England, not blindly copied from the Eastern States, but settled in populous commonwealths built up by immigration from all nations and all peoples, a common citizenship in a common republican nationality. The illogical and vacillating policy of the State hitherto was a constant and imminent peril to American popular education everywhere. By the irresistible logic of the situation Archbishop Hughes and his party proved their own right to the bounty of the State along with that of an educational corporation representing an opposite religious faith and in every way irresponsible to the people of New York. Had this state of affairs continued the great city of New York, with its present enormous wealth and population, would have been to-day the headquarters of the most powerful opposition to the American system of universal education, composed as its population is so largely of people of foreign birth or recent descent. But this peril was averted then and there by the patriotic policy of the great philosophic statesman of the old and one of the most powerful makers of the new Republic.

It is not too much to say that by these great measures of educational policy, the ascertaining and exposure of the actual condition of common-school affairs in the State of New York in 1839, the enactment of the law for county superintendency, the influence of the annual conventions of county superintendents on the public mind, and the final settlement of the religious question on a basis from which it has not been moved by fifty years of subsequent sectarian agitation, the system of American school education was assured of its permanence in the Empire State and all subsequent expansion and reform made possible.

The memorable law that settled this great contention was substantially as follows:

No school shall be entitled to or receive any portion of the school moneys in which the religious doctrines or tenets of any Christian or other religious sect shall be taught, inculcated, or practiced; or in which any book or books containing com-

positions favorable or prejudicial to the particular doctrines or polity of any particular Christian or other religious sect is used, or which shall teach the doctrines or tenets of any religious sect. But nothing herein contained shall authorize the board of education to exclude the Holy Scriptures, without note or comment, or any selection therefrom; but it shall not be permitted to the board of education to decide what version, if any, of the Holy Scriptures, without note or comment, shall be used in any of the schools; provided, that nothing here contained shall be so construed as to violate the rights of conscience as secured by the constitution of this State and of the United States.

Governor Seward, at the close of his four years' administration of the office of governor of New York, in 1843, might have announced, "the battle of the common school in the Empire State of the Union is won," for, by the revelation of the condition of public education, the establishment of a more efficient method of supervision and a general advance in the popular support and improvement in the extent and quality of the schools, especially in the adjustment of the public-school system of the city of New York to that of the State, the most formidable obstacles to educational progress had been removed. Indeed, the reorganization of the New York city schools assured the great popular majority of votes in that city in favor of an absolutely free school system for the State, which carried the point. And by the united efforts of Governor Seward and Superintendent Young, the normal-school idea had been presented to the educational public as never before.

But there was still a period of twenty troubled years to be lived through before all this could be realized. The greatest obstacle to the American system of universal education in New York from the first was the diversity in the origin of its population, which for many years remained a serious obstacle to the New England and American idea of free common schooling for the entire population of the Commonwealth. To this must be added the fact that New York is probably, even to day, politically an uncertain State, there always being a large body of its population waiting to be moved to active political action by some local crisis or special appeal. The change of one vote in each school district of the State will give a larger than the average majority in any important election to the political party in whose favor it occurs. Even at this period the old antagonisms between race and class and sect inherited from the colonial days had not been laid to rest.

But much had been accomplished during the four memorable years of Governor Seward's administration, 1839–1843. The broad ideas and ideals of the young chief magistrate, though somewhat modified, had largely prevailed. In President Eliphalet Nott and his son-in-law, Professor (afterwards bishop) Alonzo Potter, of Pennsylvania, the governor had a power at his right hand, always wise and progressive in the cause of education so much at heart. The historian of the common schools of New York, Mr. S. S. Randall, acting State superintendent and one of the early superintendents of public schools in the city of New York, declares "never before or since has so much been done in so

short a period of time for the advancement and improvement of our common schools." Hon. Samuel Young still held on for a period into the administration of Governor Bouck. The subject of a State normal school at length came up before the legislature in a remarkable report by the chairman of the assemblies committee on education, Hon. Mr. Hulburd. This gentleman had visited the new normal schools of Massachusetts and informed himself concerning the European seminaries of this sort. His report, and in May, 1844, his bill for the establishment of a State normal school at Albany, became a law. The institution was pledged $10,000 a year by the State, and the city of Albany for four years undertook to provide it with a shelter, until the gift of $12,000 supplied a permanent building. The regents of the university were authorized to make all needful rules and regulations for its management and government and for the appointment of five professors to whom, with the superintendent of common schools, its internal control should be committed. Mr. David P. Page, of Newburyport, Mass., was appointed president, with George R. Perkins as assistant, who, on the death of President Page succeeded to his place, and other instructors. On December 18, 1844, the institution was formally opened by an address from the superintendent of common schools. Twenty-nine pupils at once appeared, but 100 were soon under instruction, and an experimental or model school became an important annex.

Along with this came up an agency of almost equal importance, the organization of the teachers' institute. The experiment with the academies seems to have delayed this method of training the masses of teachers. The first institute in the State was held in the city of Ithaca, now the seat of Cornell University, in 1843, with 28 teachers in attendance, for two weeks. The success was contagious, and several of the counties at an early period followed the example of Tompkins.

The office of governor, in 1845, was held by Silas Wright, one of the ablest statesmen of his day, afterwards United States Senator from New York. He declared in his first message:

> Our school fund is not instituted to make our children and youth either partisans in politics or sectarians in religion, but to give them education, intelligence, sound principles, and moral habits, and a free and independent spirit; in short, to make them American freemen, and American citizens, and to qualify them to judge and choose for themselves in matters of politics, religion, and government.

The administration of Hon. Samuel Young terminated in 1845. By common consent of the leading educators and public men of the day he was regarded one of the most efficient of the common-school superintendents of the State. Great credit is awarded him for outgrowing several violent prejudices against the most prominent features of public education and becoming the firm, wise, and progressive friend of the common schools.

In 1845 Mr. Nathaniel S. Baker was elected to the post of secretary of state and superintendent of education. He had been a county judge

and a State senator, and his administration, though cast in troubled times, was creditable to the State and friendly to the best advancement of the schools. It would seem that at first many of the best men of the State had been appointed to the office of county superintendent of schools. But this, like all openings to office holding, came to be used by the county supervisors for political and personal ends. A small compensation, $500 a year, was a weight upon its efficiency. Popular dissatisfaction was aroused, and in many of the rural counties came to a violent head. Meanwhile the conventions of the county superintendents continued a powerful influence through their able discussions. Of all the men in the home field in this, as in all good works, Professor Alonzo Potter, of Union College, son-in-law of President Nott, afterwards called to the high position of bishop of the Protestant Episcopal Church of Pennsylvania, was foremost. During his years of service at Union College he was always a minuteman in the cause of the children. Always ready to give aid by word or deed, conservative by temperament, but ever found liberal in his dealing with educational affairs, he was a most effectual helper of the superintendents and workers in this campaign of reform.

A recent controversy had sprung up respecting the use of the Bible in the schools of the city of New York. By the special law establishing the common-school system of that city, the use of the Bible had been permitted, although this was not a general law of the State. But a portion of the trustees of the ward schools rejected the use of the Bible as a sectarian book. The State superintendent overruled this action by declaring the Bible not sectarian and holding the schools to the letter of the law. The city council also refused the usual allowance from the State school moneys to the districts then in rebellion. The question was debated with great ability at the superintendents' convention at Syracuse and a resolution recommending the use adopted.

At the same gathering came up a discussion of the question of county superintendency. The abolition of the system had been demanded by memorials to the legislature from 14 counties on many grounds, chiefly economic and sectarian. And here for the first time the assembled educators of the State faced the obstinate demand for wholly free schools that held on as an educational storm center till 1867. Hon. Henry Barnard attended this convention and warmly praised the administration of Superintendent Samuel Young. His services were not altogether lost to the State, as he afterwards became a member of the executive committee of the State Normal School.

This year, 1844, the first State convention of teachers assembled at Syracuse. The meeting of this association for half a century has been an annual event in the educational life of the State; and, although sometimes not supported as it should be, it has remained an undeniable influence for good in the State.

At the State convention of county superintendents held at Albany in 1845, the whole subject of free schools was ventilated. In 1844 the

Onondaga County Teachers' Association, through the efforts of Mr. William Barnes, a rising young man, had moved in this direction.

An important testimonial in behalf of this movement, often quoted in the discussion on this theme, was the declaration of Horace Mann in his great address in advocacy of the free school, that "it had been so long a part of the educational life of Massachusetts that the memory of man runs not to the contrary."

The State constitutional convention, at its session in 1845, debated the subject of free schools, and finally referred the following section of the revised constitution to a popular vote:

> The legislature shall provide for the free education and instruction of the State in the common schools now established, or which shall hereafter be established therein.

Mr. S. S. Randall was compelled to resign his place as State deputy superintendent of schools by reason of illness.

According to the belief of the foremost educators of the State and all competent observers, the system of county superintendence of schools was working in the main with excellent effect. Owing to the occasional failure of the county supervisors to appoint the right men to the right place, a storm was brewing in the rural districts where the greatest opposition on the smallest pretext was always encountered. At a special session of the legislature in 1845, the act establishing county superintendency was repealed. In vain did committee after committee in subsequent legislatures report adversely to this conclusion, and the opinions of the most celebrated educators at home and abroad were quoted in favor of their plea. The "contrary fit" that now and then comes over every American legislature to abolish some approved agency for promoting the general welfare was now on in New York. The average rural representative "had no use for" the views of great educators, and the spirit of reaction ruled the hour. The immediate and remote effect of this action was so disastrous to the school system that the subject came up eight years later in perhaps a more practical form, as a system of district supervision under elected commissioners well paid for their services. The State Normal School had also moved up to its full success through a storm of opposition. The death of its first president, David P. Page, was a great loss to it, and even a greater disaster to the cause of educational reform in the State. The presidency was filled in succession by Prof. George R. Perkins for four years; Hon. S. S. Woolworth for three years; and Mr. David Cochrane, who remained in the position till 1860. During these years it had matriculated 1,000 students, with an annual attendance approaching 300, and had been established in its own spacious school building and become one of the honored educational institutions of the State. In the same year the free academy of the city of New York was established under the presidency of Dr. Webster, who, for many years, was the head of this, one of the most celebrated of the great free high schools of the country.

Under the administration of Superintendent Christopher Morgan, from 1848 to 1852, Hon. Hamilton Fish, governor, the reestablishment of the county superintendency was urged and the subject of the free schooling of all the children of the State kept well at the front. The district library system, for some inexplicable reason, seemed to be falling into disrepute. Four hundred school districts were clamoring for relief from the law concerning the library tax. It may be that the character of the original books prepared for these libraries, with perhaps the selection of too high a type of literature for the children and youth, was at the bottom of this. Indeed, the same result had been experienced in Massachusetts and Ohio, the two States that were first to follow the experiment in New York. Under a recent inspiration in Massachusetts the district-school library seems to be emerging into a new life.

The teachers' institute was assuming large proportions in the State, 16 counties with 1,000 teachers having used it with advantage. The new State superintendent entered heartily into the movement for free schooling and showed himself from the first in opposition to the system of distributing the school funds. It was estimated that 50,000 children of the poorer sort were deprived of education by the unwillingness of their parents to be published virtually as paupers because unable to pay rate bills. In 1849 the legislature rose to the occasion in a moderate way and passed "An act establishing free schools throughout this State." A somewhat complicated system of raising the money previously realized from the rate bills encumbered the law. But the bill was submitted to a vote of the people and approved by a majority of 157,000 in a vote of 350,000. Mr. S. S. Randall returned to his position of deputy superintendent in 1849.

But this final vote of the noble army of educators was met from the first by an almost furious opposition. It presented a cause against which could be rallied all the diverse elements hostile to the common school in the State. And these elements were not to be despised as an opposition. The legislature was flooded with motions and protests for the repeal of the statute. It was debated in a great convention where the opponents of the whole system of common schools rallied, and were met by one of its supporters in a powerful document addressed to the people of the State, and heard by a convention representing some of the most eminent men of the Commonwealth. The result was that the legislature again submitted the law to public indorsement, and it was again sustained, though by a small majority. The rural districts, by a majority of 47,000 in 42 of the 59 counties, rejected the law. But the larger cities of the State, which had already enjoyed the blessing of free schools for several years, overcame this by a counter majority of 72,000, leaving an aggregate majority of 25,000 for free schools. The cause of free schooling through the State was saved by the voters of the city of New York, giving 39,000 majority against the repeal of the

law. In the long list of eminent people who were efficient in securing the adoption of the free-school idea were Deputy State Superintendent S. S. Randall and Horace Greeley and Henry J. Raymond, pioneers of the new journalism of the city of New York.

But the legislature either mistook or deliberately misinterpreted public opinion by giving a practical negative to the decision of this question by the popular vote. It passed an act directing that the sum of $800,000 should be annually levied as a State tax, one-third of the avails of the entire school revenue from all sources to be divided equally among all the school districts and the residue appropriated according to the number of children of school age residing in each, any balance remaining due to be raised by a rate bill levied on all save the indigent parents of the children in attendance. There was still a conflict of nearly twenty years impending before the powerful and wealthy State of New York could bring the mind of its rural population to the idea of the education of the children of the State by the property of the State. Fifteen cities had already adopted the free-school system, and it was the inevitable jealousy of country versus city that so long hindered the coming of this great reform.

Mr. Henry S. Randall, afterwards the biographer of Thomas Jefferson and a lifelong worker in the cause of good education, was employed in 1851 to report a common-school code to the coming legislature. In 1852 his report was made, including, among other things, the provision, first, for separating the State superintendency of schools from the office of the secretary of state; second, substitution of a permanent tax of 1 mill on the dollar of the real and personal property of the State for the present tax of $800,000; third, the restoration in a different form of the system of county superintendence of common schools. In 1854 the first of these propositions was adopted, and Mr. Victor M. Rice, superintendent of public schools in Buffalo, N. Y., was appointed State superintendent of common schools by the election of the legislature. In 1856 the system of local superintendence was adopted in an improved form as a district superintendency elected by the people for three years and supported by a moderate salary. The rate bill, the last refuge of the resistance to educational reform, remained till the close of the civil war and only succumbed to the rising tide of a second great revival of the common school in 1867. During the long agitation produced by the adoption and final indorsement of the free-school bill the school returns had received a great uplift. The educational taxation necessary to sustain the rural schools for seven or eight months in the year had been raised, but even this failed to meet the demand, and 200,000 children of the State were reported as having very slight advantages, with other thousands not at school at all.

Hon. Henry S. Randall in 1852 came to the office of secretary of state and superintendent of education. The school fund of the Commonwealth was now increased to $6,500,000. One million five hundred

thousand dollars was expended on the schools and 700,000 pupils were in attendance. Hon. Washington Hunt, as governor, proved himself, like the majority of his predecessors, a friend of popular education by indorsing the cause of free schools. Superintendent Randall urged the placing of a tax of 1 mill on the dollar on the entire valuation of the State, now $1,000,000,000, and urged the establishment of an additional State normal school. In one of his reports he refers to the fact that every member of President Monroe's Cabinet entered life as a poor boy—Calhoun, Crawford, Thompson, Crowningshield, and Flint. He urged the final separation of the office of superintendent of schools from that of secretary of state. His decision that religious services in the schools should be held outside the time devoted to instruction introduced a new element of confusion into the chronic dispute over the question of religion in the common schools in the great States so rent by the sectarian and political hostilities of their cosmopolitan peoples. It was not true that "the whole religious public or the common-school public acquiesced in the decision that all religious services, even Bible reading and prayer, should be held outside school hours." The decision itself was only another instance of an overzealous public official injecting his own political theory into the administration of a great public department.

In 1853 Hon. Elias W. Leavenworth succeeded Mr. Randall as secretary of state and superintendent of public instruction. Mr. Leavenworth then and afterwards was a distinguished man in the public affairs of the State. At last the half-century career of the Public School Society of the city of New York came to an end by the abolition of the organization and the passing over to the public-school system of its property to the amount of $500,000. Never was there a clearer case of an institution established for the noblest ends and administered by a body of eminent people in an almost faultless way at last becoming a practical hindrance to education. But the death of this outgrown arrangement was the cause of deep regret to a considerable class of educators and excellent people in the city and elsewhere. Even as late as ten years ago a distinguished literary man of New York, Mr. Richard Grant White, declared its abolition the cause of all the woes afflicting the people of New York in their educational affairs.

Meanwhile the cities of the State were rapidly engaging in the establishment of union schools with the high-school attachment, supported by special local taxation. Poughkeepsie, Schenectady, Troy, Rochester, and even Albany (one of the last of the important cities of the State to reform its system of public education), Auburn, Oswego, and Syracuse one by one adopted this the most characteristic feature of the great educational revival.

In 1854 Mr. Victor M. Rice, superintendent of schools in Buffalo, N. Y., was elected by the legislature State superintendent of common schools, the new law separating the office of secretary of state from

that of the superintendent of schools having finally passed. Mr. S. S. Randall was called from his former position, so long held with distinguished fidelity and ability, the State deputy superintendency of education, to the city superintendency of the public schools of the city of New York. The administration of State Superintendent Rice was a step forward and a positive addition to the cause of educational reform in the State. He recommended the establishment of school commissioners for city and village supervision, with additional compensation, the appropriation of one-third the public-school money to districts in charge of qualified teachers, the empowering of the district elementary schools to raise a tax for their maintenance, with other suggestions of importance. The war against the rate bill, more and more vigorous, was renewed by the proposition to impose a tax of three-fourths of a mill upon the entire valuation of the State. In 1856 the legislature adopted the advice of the superintendent and established the office of school commissioners in districts formed by the boards of county supervisors corresponding to the legislative assembly districts. One hundred and twelve commissioners of public schools were then elected and entered on their positions, heretofore occupied by their predecessors, the county commissioners of schools, appointed by the county supervisors, drawing their salaries of $500. The tax of three-fourths of a mill on the dollar was substituted for the $800,000 previously raised. The one-third added to the school schedule was divided into two parts, one to be distributed according to the number of scholars and one according to the average daily attendance. The interest of the school fund now reached the sum of $867,000, and the annual expenditure for schools was more than $1,000,000.

The administration of Hon. Henry Van Dyke extended from 1857 to 1862, when he was promoted to the important office of assistant treasurer of the United States at the city of New York. His assistant secretary, Mr. Emerson W. Keyes, held the position during the remainder of the term and prepared the report. His exposure of the decline of the famous district-school library system of New York is a melancholy picture of the unaccountable popular indifference to a magnificent public privilege. One million two hundred and sixty-five thousand dollars had been appropriated to this purpose during the past twenty-four years; but Superintendent Keyes finds as the result "a motley collection of books, 1,500,000 in number, distributed among families, neglected, torn, and soiled."

> He is constrained to believe that no plunder-burdened contractor or bribe-stained official ever yielded to the State so poor return for his spoil as have the people of this State derived from their liberal and beneficent appropriation through their own reckless and improvident care of it.

Mr. Keyes was one of the most accomplished and energetic of the younger school men of the State, and his report was one of the most valuable in its common-school literature. His failure to reach the posi-

tion of State superintendent, by the reelection of Hon. Victor M. Rice, was mitigated by his immediate reappointment to his original post of deputy superintendent.

In 1860 the population of New York was 3,880,735. There were 49,000 free colored persons in the State for whose children provision was made in separate schools. Not until a period subsequent to the civil war were colored children and youth admitted to the full privilege of the common schools.

The period included in this essay closes during the second administration of Superintendent Rice. The six years 1862–1868 were not a period of educational decline. The condition of the district-school teachers was improved. A more just arrangement for the disbursement of public school funds had been adopted. In the country the schools held on seven months in the year. Eight-tenths of the towns made returns. In 1865 upward of $4,500,000 were expended on the schools in a time of great public financial stringency. Eighty-six academies had under instruction 1,500 pupils four months in the year in preparation for teaching. The conclusion of all things recorded in this essay during the thirty years from 1837 to 1867 was reached by the abolition of the rate bill in 1867, which declared the common schools of the Empire State free to every person of school age. The one-mill tax for education had also been increased to one and one-fourth mills on every dollar of the enormous property valuation of the Commonwealth.

The limitations of the present essay have confined it to the presentation of the gradual development of the common school in New York during the period of the great educational revival from 1830 to 1867 as a system. During this period it had expanded from a condition of the most extreme isolation in 10,000 independent school districts up to that powerful and well-ordered organization of district, county, and State supervision declared by Horace Mann and Henry Barnard the most complete at that time existing in any country. It would have been a grateful task to enliven this somewhat formal sketch by a local coloring of the actual school-keeping of the Empire State during this momentous period, not only in the history of education, but of the country; for it is impossible to understand the real significance of the American common school in any State without some adequate comprehension of its environment in the intellectual, social, religious, literary, artistic, and political conditions cooperating therewith.

The period from 1830 to 1867 in New York was especially significant in all these directions. It was the era of the first physical consolidation of the different portions of this great State with each other, and its even more important communication with the East and West by the completion of the extended railroad system reaching from the Atlantic coast to the Great Lakes and the Mississippi Valley. With this came in the era, through rapid transit at home and steam navigation abroad, of an immense immigration from Europe and the movement which relieved

the rural districts of multitudes of their ablest young people to build up the wealthy cities and flourishing villages which now contain so large a proportion of the population of our Eastern and Central States. The city of New York and its immediate suburbs forged ahead from the somewhat moderate burg it was found at the Revolutionary war, in the rear of half a dozen larger towns in all forms of industrial enterprise, to the metropolis of the Western Continent.

Never in the history of the Republic has any Commonwealth been served by a more eminent body of public men than has New York during these thirty years. The settlement of the western portion of the State, the real beginning of the new Northwest during the past half century of the national life, had trained a group of statesmen of whom Mr. Seward was the most eminent, who, through the entire generation before the civil war, had lifted the Empire State to the most conspicuous position in the public affairs of the country.

And by one of those providential political blunders that often open the door to a great public opportunity, the act of the "council of appointments" in 1820 removing Gideon Hawley from the office of first State superintendent of common schools resulted in the practical elevation of the office through the transfer of its increasing interests to the charge of the secretary of state. And as the men who filled this honorable and influential department of state were among the most distinguished and broad-minded statesmen of the Commonwealth, it happened that their supervision of popular education was such as probably no American State outside of Massachusetts has enjoyed. During this period appeared on the field a new and mighty agency, the metropolitan journalism of New York, inaugurated by Horace Greeley, Henry J. Raymond, William Cullen Bryant, and others. The corresponding establishment of the district school library gave a new impulse to popular intelligence, and both wrought mightily in behalf of the new education. The beginnings of the later American literature in the group of authors clustered about Washington Irving, and the appearance of the first and so far the most eminent school of native artists, especially in the delineation of American scenery in church, the Harts, Page, Durant, Kensett, and others only less celebrated, were characteristic of the time. And the new democratic organization of social life begun in western New York, so largely settled and molded by the best New England immigration with a broader social ideal and a more generous patriotic cultivation, greatly modified the intensely aristocratic type of the old Hudson River country, the capital city, and the metropolis.

This rapid elevation of New York to its present eminence as the Empire State carried along with it and was greatly reacted upon by the common school. Here was indeed, as Governor Seward so forcibly declared, the vital center of the Commonwealth. While there was all the time in the old collegiate, academic, sectarian, and more conservative educational and social circles an evident jealousy of, sometimes hos-

tility to, the common school, yet it was a great support that the two most celebrated institutions of learning then in the State, Union College and the Troy Female Seminary, under the presidency of Dr. Eliphalet Nott and Mrs. Emma Willard, were established at first on the threshold of the new New York, and were the firm and powerful friends of popular education. In Dr. Nott, Mrs. Willard, Prof. Alonzo Potter, and the group of admirable educators that hailed from these and schools of similar spirit farther west, the pioneers and supporters of the common school found their most efficient backing and their most persistent support. So, when the most respectable corporation that ever ruled the city of New York, the Public School Society, was sidetracked by the final organization of the metropolitan school system, in accordance with the remainder of the State, the last bulwark of opposition was surmounted.

That this great work did not proceed with the speed and decision which characterized it in Massachusetts, Rhode Island, and Connecticut, under the leadership of Mann and Barnard, was due largely to the fact that in New York meanwhile was being wrought out in the common-school policy of the State the most difficult educational problem of the new Republic, the fusing of a cosmopolitan people, representing all the political hostilities and obstinate religious differences of the past thousand years of European life, in one homogeneous civilization. In this respect, until the outbreak of the civil war, New York was the great school-teacher of the young West and the civic object lesson of the North. And by no achievement of masterly statesmanship did this Commonwealth so contribute to the solution of this vital and almost impossible national problem as by the final success in 1867 in placing the American common school, not only in her rural districts but especially in all the great cities of the State, so thoroughly on its present basis that several of these cities and of the more important villages had established the free graded system of education, with the high school and effective supervision, and were looking toward the improved methods of the new education. And meanwhile the country district school had been, first in its history, placed under an effective local and county administration and relieved from the incubus of the tuition fee.

If there is a spectacle in modern history more inspiring and more encouraging to the believer in the American order of society than this record of the Empire State of the Union during this period of its development, we have not been permitted to find it in the studies of a lifetime. And this great achievement of a cosmopolitan people, representing the various political systems, churches and creeds, and industrial habits that had dominated Europe for centuries, by their own effort lifting a Commonwealth to the uplands of American life by educating their children together for a common citizenship, can only be understood by one who also understands that the keynote of American nationality was sounded in the American idea of universal education.

NEW JERSEY.

In New Jersey, as in all the States of the North, there had been a gradual preparation for the revival of the common school. As early as 1825 Philip Lindsley, acting president of the College of New Jersey (Princeton), afterwards the father of the important movement in Tennessee, the founding of the University of Nashville, now best known by its connection with the Peabody Normal College, had spoken out plainly in favor of State normal schools. In 1828 the first convention in behalf of popular education was held in Trenton, and the able report from its committee greatly influenced the effort of the people at the founding of something like a general system of popular education in the State. The school law of 1828, referred to in a previous essay, was the first effective demonstration in New Jersey in favor of universal education. But it was at best a permissive statute, and after being twice emasculated it was finally repealed in 1831 and the State fell back into its former unsatisfactory condition. A group of associations, the Literary and Scientific Society in 1825, the New Jersey Lyceum in 1828, with other similar movements, however, kept the spirit alive. Several of the foremost men of the State, now of national historical reputation, were conspicuous in this movement. Chief Justice Hornblower, Hon. Theodore Frelinghuysen, Hon. William L. Dayton, Prof. John McLane, of Princeton, and Prof. E. C. Wines, of Brunswick College, with numbers of others, were indefatigable in the good work.

It was by their efforts, with the hearty cooperation of some of the leading educators and public men of New England and New York, who by lectures, letters, and their personal presence greatly encouraged the home educational public, that the common school law of 1838 was passed. At that time New Jersey had a population of 372,000. In the year 1828 the school fund of the State amounted to $222,000, and there was a great desire for its appropriation for the establishment of a system of common schools. By the law of that year $20,000 was appropriated by the State, with a request that each township should duplicate the amount received by its distribution. There were then 15,000 children between the ages of 5 and 15 for whom there was no provision for schooling, and another 15,000 unable to read, with 5,000 illiterate voters. But the ten years before 1838 had not been encouraging to the friends of popular education. Indeed, under the loose administration of what was adopted, there was a growing indisposition among the people to support the common schools. Dr. Wayland, of Brown University, in a letter to the friends of popular education in New Jersey about this time, had written, "In devising a system of instruction, I should proceed on the principle that all of our present teaching is nearly as bad as it can be." It was mechanical to the last degree, and the president of Brown University also declared that the best teaching could be found in the schools for infants, then being

established. During the eight years following the reform school law of New Jersey, passed in 1838, the trustees of the State school fund made an annual report to the legislature. This body consisted of the governor, one member of the council, the speaker of the legislative house of the assembly, the secretary of state, and the attorney-general. Hon. William Pennington was governor during four years. That a public board of such authority of public standing and character could only obtain a report from 89 of the 139 townships of the State was, in itself, the best testimony of the condition of the schools. Only one-half of the children between 5 and 16 were enrolled in the schools then in session, and no account is given of the daily attendance of the 34,000 children who looked in at the common schoolhouse door. The whole number of school age in the State was 64,000. After an allowance for all reasonable hindrances it is too evident, say the trustees, that "there are thousands of children in New Jersey who never go to school." The schools were in session about eight months on an average, ranging from two to eleven months. Tuition was rated at $2, and teachers received some $80 a quarter.

The school law of 1838 was declared the best ever enacted in the State, and the omens were somewhat brightening for an awakening in favor of the children. Although the townships were not under obligation to raise anything, and not permitted to raise more than twice the amount received from the State, some $26,000 had been contributed by 89 townships. But the spending of the money was irresponsible and often wasteful. Sometimes it was not used at all. Four-fifths of the entire expense of the schools was paid by individuals in the form of rate bills. The trustees suggest: 1. An obligation providing that every township should raise as much as its share of the public money as a condition of receiving anything. 2. A record of all estimates of townships as to the amount to be received. 3. The establishment of schools of instruction for teachers. 4. The establishment of school libraries, apparatus, etc. 5. The general enlargement of the entire scheme of instruction. Reference is made to the educational awakening in Massachusetts and New York.

The succeeding reports of the board of trustees for the following eight years, till 1846, are generally in the same dispiriting vein. It was well-nigh impossible to obtain reliable accounts from a majority of the townships of the State.

Certain localities were well known as models for the rest of the Commonwealth, but the other end of affairs is declared "a nebulous spectacle." Private schools were a great hindrance to public education and often were not superior. "If the system has not been productive of any perfect results, it has, at least, not utterly failed of success," say the trustees in 1839–40. "The moneys paid to the township corporations appear to have been expended by the trustees of the school districts on no fixed or uniform plan." They recommend the little N. J. School District Library, published by Harper Brothers, New York, a

collection of 50 volumes for $20, as the beginning of this movement in the State. Several absolutely indispensable corrections of the law of 1838 are recommended. In 1840–41 not half of the districts reported. The number of children and youth in the State from 5 to 16 was 100,000, about half of whom were reported as enrolled, leaving 46,000 out of school. Tried by any severe educational test there would seem to have been even a less satisfactory record.

In 1842 the trustees confess that "the effort to make anything like a clear and satisfactory record from the reports received only increases the difficulty." The worst feature in the administration of the system was the want of proper inspection of schools, "the laws providing for it 'being more honored in the breach than in the observance.' The whole system of public instruction, as now administered, lacks vitality. It is almost paralyzed by inefficiency and want of interest in all its departments." Indolent officers, incompetent teachers, poor school-houses, imperfect instruction, "a deep and all pervading apathy on the part of the parents, is a frequent, although not an uniformly correct, picture." The trustees appeal to the women of the State to come to the rescue. They recommend the Bible as a text-book. Never were the standing arguments for the complete educational system more forcibly urged than by this body of men during these eight years of apathy and comparative failure.

In 1845 an attempt was made to obtain the opinions of the common school authorities on the subject of free schools, with very little result. By 1846 there were 120,000 children and youth in the State between the ages of 5 and 16, of whom nearly two-thirds were in school a portion of the year. The trustees report that there are no means of ascertaining the educational status of those that attend. The schools were kept open about nine weeks in the year, generally four supported by the payment of $2 per quarter. The conclusion of the trustees is that "the children have attended the schools an average of only eight weeks." Of course, the high-rate bill must have left a large number of the children of the poorer classes, as late as 1846, in a state of educational destitution.

But a brighter day was at hand. Certain portions of the State for several years had been a marked exception to the average condition. The counties of Essex and Passaic, in which the leading cities of the State, Newark and Paterson, were situated, had provided for the appointment of a superintendent and required him to furnish a written report to the State trustees. Under this act of the legislature, Mr. H. F. King, one of the most conspicuous of the county superintendents of New York, was appointed superintendent of these counties and the State trustees commended him to the people.

From this time a new life seems to have animated the common school organization of New Jersey. It is evident that for the past decade the difficulty had not been so much the lack of a general desire for better things as the want of a leader of the badly demoralized and disheart-

ened party of the friends of public education in the old Commonwealth. The administration of Superintendent King in the two counties that confessedly led the State was followed by a permissive law authorizing all the counties to "come in out of the cold" of their present cheerless estate into the warmth and good cheer of what was to be. For the six coming years, until 1852, the enterprising superintendent so pushed the good fight that when he left the position the State had already come up out of its long and dreary educational past and was well on the way toward the splendid achievements of the present generation.

In the first years of Superintendent King's administration 200 additional districts sent in reports. From all sides came the good news of "a favorable change in the condition of the schools and in public opinion with regard to a public school system." From everywhere came the complaint of "the want of properly qualified teachers." Little attention was paid to the law making it the duty of the people to appoint examiners and visitors, and there was yet no general habit of examining teachers. The new superintendent hesitated to propose radical changes in the present school situation on the ground that "in the present awakened and excited state of public opinion upon this subject, it is better to 'bear the ills we have than fly to others that we know not of.'" A pamphlet containing forms and regulations for making school returns had been sent to the districts, the people had everywhere treated the superintendent with hospitality on his visits, and the famous Camden and Amboy Railroad had given him a free pass.

In 1847 200 more districts fell into line and reported. Much of the improvement already noticed had come from the action of the town superintendents. In twelve counties conventions of teachers and friends of education had been held, and associations and teachers' institutes had been established. The emphasis of the superintendent's report for this year was on the training of teachers and the advocacy of normal schools, in which the example of the State of New York was urged. The action of the Society of Friends, here as in Pennsylvania, had been a disturbing element, and their claims to recognition by the public system were discussed in the light of the common school idea.

In the report for 1850 the subject of free schools was earnestly pushed. Many of the townships had already tried the experiment under special acts of the legislature with perfect success. The people looked to the legislature to consider the subject by a general law. It was recommended that a permissive statute be passed authorizing all townships by a vote of two-thirds to establish free schools supported by a local tax. The State still made no provision for building or repairing schoolhouses by general tax. The superintendent reminded the legislature that—

> the people of New Jersey, since their attention has been devoted to public instruction, have made rapid strides, and they seem ready and anxious to press upward to as high an eminence as that occupied by any of their sister States.

An interesting letter from Mr. S. S. Randall, of New York, was published with the report stating the reasons for the falling off of the vote on the second trial for a free school system in that State. It was charged, first, to an error in the details of the law, which was prepared without a careful regard to the condition of the districts and the work especially therein needed, and second, to a rally of all the clerical enemies of the public schools with the support of many who were unfortunately disappointed by the defects revealed by the statute. An appropriation of money to each county for a teachers' institute was urged. The public press of the State was complimented on its unanimous support. Indeed, this period of the common school reform was simply education waking up and marking time with the grand march of the railroad and all other agencies of the higher civilization that were moving upon the works of the old-time order of society during the momentous years from 1830 to 1860. Much use was made in the report of the returns of the local committees, and the greater part of the document was made up of these quotations.

The year 1851 was the last of Mr. King's superintendency of six years. His report was a vindication of his administration and an encouraging statement of the increasing interest in the State. One thousand five hundred and thirty-eight of the 1,612 school districts in the Commonwealth had made returns. There were 145,529 persons of school age, 5 to 18, in the State, of whom 88,600, an increase of 13,365, had attended school during the previous year. The attempt had not yet been made to ascertain the average attendance in the schools. Two hundred and fifty thousand dollars had been expended on public education, an increase of nearly $100,000 on the preceding year. The superintendent said:

> Whatever may have been true of the past, it can no longer be said that the people of New Jersey are negligent of the education of their children.

There had been a forward movement along the whole line. The governor and other State officials were commended for important influence and aid. The superintendent again referred to the question of sectarian religion in public schools, urged upon the people by the schools for the Friends. The first institute for teachers had been held in Somerville, Somerset County, conducted by Professor Camp, of Connecticut, and Mr. James B. Fowle, of Boston, with success, where work was warmly commended. The subject of normal schools was again urged with great earnestness.

In 1852 Mr. John H. Phillips was appointed State superintendent and held the office for eight years, until 1860. During his administration the improvement of the schools went on from year to year with accelerated velocity. Two hundred and seventy-two thousand dollars was expended in 1852. A statement of public school legislation was given in the first report of the new superintendent. In 1853 the amount expended for the schools was $325,219. Of 97,000 pupils enrolled in

the common schools only 12,771 attended during the whole year; 36,000, nine months; 39,000, six months; 41,400, three months; this being the result of the first attempt to inform the people of the actual school attendance. The first meeting of the State teachers' convention was held in Trenton; afterwards a meeting was held in New Brunswick and a permanent organization effected. The school fund of the State amounted to $394,000. The salaries of teachers averaged $284 for a year for men and $205 for women. In 1854 Superintendent Phillips reported that "in no past year has been seen such a special interest in the subject of education in New Jersey; at no former period has so great an interest been exhibited in the subject." Three hundred and eighty-eight thousand dollars had been appropriated, of which $221,000 had been raised by tax, "six times the amount appropriated eight years ago." The schools had improved in quality in proportion to the increasing public interest. An act to establish teachers' institutes had passed the legislature, and nine counties had availed themselves of its provisions, 365 teachers attending. The establishment of normal schools and a wholly free school system were now needed to complete the good work so well begun.

The counties still neglected to appoint proper examiners for schools. The superintendent (in 1854) recommends that their appointment be given to the teachers' associations, and, where no county association exists, to the State Teachers' Association. Professor Camp, of the Connecticut State Normal School, afterwards State superintendent of schools in Connecticut, was a welcome worker in these institutes. In 1855 the superintendent reports that the school returns of the past year "wake the emotions of great joy" at the advancement of the State in the reformation of the public schools. Only 26 of 193 cities and townships had failed to make returns. One hundred and fourteen thousand children had gone in at the schoolhouse door; $475,000 had been expended—$90,000 for schoolhouses.

The last legislature had established the State Normal School. A series of able addresses, resolutions, and public meetings had placed the subject before the legislature. Hon. D. D. Barnard had repeatedly urged it upon the institutes and at the sessions of the State teachers' associations, and in the same year on the attention of the legislature. Ten thousand dollars was voted for annual expenditure. The city of Trenton had provided a temporary home for the new school, and later it was housed in spacious buildings favorably placed by the State. A benevolent person had built a schoolhouse and endowed a school as an annex to the State Normal at an expense of $75,000, on condition that $12,000 a year should be appropriated for insuring its maintenance, and 250 pupils were educated there, with reference to the normal school department. The 15 pupils at the opening increased to 280. Dr. W. F. Phelps, one of the ablest of the progressive educators of the time, became its president and held the position until 1864 with eminent success.

A board of commissioners had been appointed to codify, revise, and extend the school laws of the State. In 13 of the 17 counties teachers' institutes had been attended by 560 teachers. The State had distributed 700 copies of Webster's Dictionaries among the schools. The State school educational fund had been increased to $413,000.

In 1859 131,000 children were enrolled, and nearly half of this number—65,400—were in average daily attendance on the schools. Free schools had been held in 48 cities and townships, and in 18 no money had been raised. $539,000 was expended. Of 2,116 teachers 933 were women. Since its opening in 1855 the State normal school had graduated 356 pupils, and in 1859 140 were in attendance. The model school and also the annex, already mentioned, were well spoken of. All the counties of the State had received the benefit of the teachers' institutes. The local district organization, as in other States, had been so pushed that the object of the school laws had been frustrated, and it had become a hindrance to the progress of popular education. Free schools had been established through one-fourth of the State, and a township board of education was urged as a cure for the great evil of isolated district organization. There was the same deep chasm between the country and cities of the State as everywhere, and the perpetual insisting on the necessity of the examination of teachers and better supervision is the main theme of the report.

We have now traced the record of the proper inauguration of popular education in New Jersey, under the stimulant of the great revival of the common school from 1830 to 1860, to a successful close. A new superintendent, Mr. F. W. Record, appears in the report of 1860, made January 1, 1861. The work of his administration properly comes within the period of the second revival of popular education that followed the close of the civil war.

An examination of this eventful history of the development of the common school system of New Jersey shows that after the great revival of 1831 there was no reaction similar to that which occurred in Connecticut and New York. The long experience of the existence of an incomplete system seems to have been ground into the soul of the people, and when once the reform movement began, although the progress was slow, the results achieved were never lost. In 1851 the three colleges and 231 academies of the State contained 10,500 students and possessed an income of $300,000, while there was only $25,000 more—$325,000—given to the 96,000 children who received all of their education in the public schools. This fact throws a strong light on the slow progress of the public school system in New Jersey. In no Northern State of the Union had the idea of a sharp distinction of social classes, the college and academy developed for the training of the children of the more favored, while the masses of the people were left with such a schooling as they could procure—so strong a hold as in New Jersey. But as in the educational record of our American States it has been seen that no Commonwealth can permanently remain unfriendly

to the cause of popular education, the States that have longest resisted it have been found in the end foremost in its support. And of these States New Jersey is perhaps one of the foremost in the Republic to-day.

PENNSYLVANIA.

The school law of 1834–35 was the result of an agitation that had never let the State of Pennsylvania sleep during the entire previous generation. The spirit of William Penn, Franklin, and Rush was still alive in the land. The reasons why the people did not sooner respond to this first victory for popular education, but even then waited ten years for a second, and still another decade for the final step that carried the Keystone Commonwealth well over the threshold of the American common school, are well set forth in the closing address of Hon. Thomas H. Burrowes on his retirement from the office of secretary of state and superintendent of public instruction in 1862.

Dr. Burrowes above all others deserves the reverence of the educational public of Pennsylvania. For although the energy, courage, and tact of Breck and Stevens in the legislature and the righteous obstinacy of Governors Wolf and Ritner in 1834–35 in a dire emergency lifted and held the Commonwealth to a higher level, it was the wise and persistent administration of Superintendent Burrowes, who during the three years 1836, 1837, and 1838 was secretary of state and ex officio superintendent of the new system of public schools, which clothed the skeleton system with flesh and breathed into it a breath of life that never was lost during the many years of partial success and reaction to come.

He began in 1836, in a day of small things. Only 156 of the school districts in the State had organized under the new permissive law. There were 700 public schools in operation, with 808 teachers employed and 32,544 pupils in attendance three months and twelve days in the year. Forty thousand nine hundred and fifty-two dollars was paid to teachers, and the average expense for tuition was $1.125 per capita.

As the whole number of school districts in the State was 907, of which a little more than one-half (536) had accepted the law, and the number of children of school age in the State 301,000, there appeared no great cause for jubilation. Still, under what the superintendent often calls "the old pauper system," only 23,000 children had been gathered into the schoolhouse, such as it was, and the expense of the arrangement was only $112,000. In one year the number of pupils had risen to 132,000, with a corresponding expansion of funds, and there was good reason for a mighty hope that the labors of the friends of education during the past century had not been in vain.

While thoroughly sound on the fundamental idea of the common-school system, that it contemplated the training of the entire youthful population of the State together for good citizenship, the superintendent threw out more than one anchor to the windward, possibly through

an underestimate of the educational spirit of the people. He advised that each district should have an opportunity once in three years to decide on retaining or rejecting the system, that the schools should only admit children between the ages of 5 and 15, and not attempt to cover the proper ground of the secondary education. But he clearly saw that nothing can permanently commend the schools to the favor of any reliable class of people save the increasing competency of the teachers. Here is the fatal defect that will finally destroy any system of public instruction, however liberally supported. He urges the establishment of *two* seminaries for teachers—one in each end of the State—or, if this can not be, the subsidizing of a number of colleges to this end. He believes "in three years from the passage of a proper act on this subject the whole business of common-school teaching might be rejuvenated in Pennsylvania."

But the apprehensions of the cautious superintendent were not shared by the more progressive and hopeful friends of education in the State. In the same year that this report appeared a meeting was held in Philadelphia, at which a valuable document was read by Mr. Philip Maguire, late president of the Western University. No paper read before any assembly of Pennsylvania educators previous to 1836 more thoroughly exposes the fatal weakness of the old or more heartily indorses the nobler ideals of the new time in Pennsylvania than this.

The speaker shows how the State has been led into a wasteful and inefficient habit of subsidizing educational institutions generally on the "ragged edge" of financial despair and rarely doing the work of a respectable academy. Under the loosely worded clause in the State constitution, the "arts and sciences shall be promoted in one or more seminaries," colleges had been multiplied until twenty, with not students enough for two, and sixty academies had obtained not less than 60,000 or 70,000 acres of valuable land and $300,000 "from an empty treasury." Some 200 laws, chiefly for the chartering of local schools, encumbered the statute books, the mere cost of executing which represented $200,000. The remedy suggested was a State board of education authorized to reform the whole system of appropriations and confine the bounty of the State within practical and moderate limits, composed of the chief public officials and leading educators of the Commonwealth. All public gifts should be dispensed on the principle of "helping those who help themselves." The elevation of one of these institutions to the rank and title of a proper university was urged. The plan of a normal school there presented has not yet been accepted by the State of Pennsylvania. It included a proper seminary of the broadest character with a model school. The fate of the deplorable folly of the system of a costly development of pedagogues from the academical and collegiate graduates of the State is forcibly explained.

The indorsement of such an out-and-out demonstration by a prominent assembly of distinguished people was evidently a great encourage-

ment to the State superintendent. His second report, 1837, is one of the most illuminating of all the public educational documents of the State, in that it sets clearly forth the real obstacles to the rapid development of the common schools. He shows that the resistance to the new system does not come from the ignorant, but rather from the more substantial and well-informed classes.

The city of Philadelphia and the four adjacent counties were largely, in their influential classes, still dominated by the religious sect of the Friends or Quakers. This body, from the first, had been strongly attached to a special parochial system of education, and had built up, not only for the higher but largely for the poorer classes, including the neglected colored people, an educational system satisfactory to itself. In this, still the most influential, wealthy, and cultivated section of the State, after a three-years experiment, little more than one-half of the districts in these counties had accepted the common schools. To meet this condition the law had been modified in the interest of the prevailing system to subsidize all schools willing to come under a merely nominal control of the State, retaining the power of appointing their own teachers.

Next in order came the 14 German counties in the center of the State. We have seen how the effort of Dr. Benjamin Franklin, seventy-five years before, to establish a general system of education among these people, had been frustrated by the jealousy of the German clergy and the indisposition of the population to use the English language. But the permission to conduct the schools in the German language had modified this spirit of opposition, and in the third year of the experiment 135 of the 255 districts had fallen into line.

In a third division of the 24 counties, stretching from the middle mountain to the western and southwestern portion of the State, inhabited by a cosmopolitan population, a more favorable state of affairs was found. The new system was gaining favor as a compromise between the captious opponents who hitherto had rendered any practical agreement hopeless. Three hundred and seventy-seven of the 431 districts in 1838 were in the field. These counties contained a large element of the Scotch and north Irish peoples, whose zeal for education we have had occasion to notice from their earliest appearance in the States along the vast Appalachian mountain range. In a group of ten counties found on the northern border of the State, settled largely from New England and New York, there was not found a single hostile district. It was in this region that the first settlement in the beautiful Wyoming Valley by a Connecticut colony had established the New England system of common schools before the Revolutionary war. These counties were not only intensely patriotic, but they also forced the brief acknowledgment of universal education into the constitutions of 1779 and 1790. And here had been found the solid column of support for the gallant leadership of Thaddeus Stevens, which had upheld the new school law during the assault that followed its enactment.

Twenty-five years later Dr. Burrowes, called in his old age to preside over the reformed public school system during the years of the civil war, closed his connection with the schools by an interesting statement of the peculiar conditions which had compelled the State of Pennsylvania to adopt a system of public education at first radically different from that of New England and New York. He ascribes the early founding and steady progress of the common school system of New England to the homogeneity of this people and the radical ideas of government that possessed the Puritan mind, according to which the people were acknowledged as the source of authority in church, state, and school, all the creation of a responsible majority and only existing by the permission and under the absolute control of their creator, the sovereign people. Here the entire scheme of education, from the elementary country district through the free grammar school, came up substantially at first and never received a serious check during the two hundred and fifty years of its existence.

But Pennsylvania was colonized by a variety of people, the majority of whom were from the European classes that held fully to the right and duty of the Christian church as the exclusive educator of the generations, separated by obstinate differences of nationality, language, and class, and scattered over a new country of vast extent, which by its native fertility and abundant resources enabled the colonists from the first to live in the enjoyment of a rude comfort without the influence of universal education. No American State was so disposed to cherish the educational department of its religious organizations as Pennsylvania, but so powerful is the centripetal force of the American school idea that despite almost insurmountable obstacles the Commonwealth is found to-day among the first in its provisions for universal education; indeed in all, save its habit of subsidizing academies for normal instruction, is it in no essential way out of line with the entire Union.

Superintendent Burrowes ascribes the apparent reaction from the first movement that established the common school system to defects of legislation, the influence of the general public apathy against a vigorous start to the schools, and the conservative habit of looking askance on any public movement that proposed a change so radical. Of the general scheme he says:

> Yet through the toil of clearing away the rubbish for the rock-foundation of the future edifice the labor of the friends of common schools in Pennsylvania has heretofore provided for it little else than a firm basis. We have now a system, an admitted, permanent, and well-understood starting point, a class of men set apart to watch over the cause of education in every neighborhood. Security is fixed upon the qualifications of teachers. The former carelessness with regard to the business of bringing together and the methods of instruction employed in primary schools has been overcome. The inconvenient localities and abnormal construction of schoolhouses have been in a great measure remedied and will hereafter be prevented.
>
> Here we have the first fruits of the common school. The possession of the spirit which accomplished this is well worth the half million dollars expended in the attempt.

Seven hundred and forty-two of the 987 districts had accepted the system. Three thousand three hundred and eighty-four common schools, with 3,394 teachers, had in charge 150,838 pupils, an increase of 118,294 in one year. Male teachers received $18.38 and female $11.96 per month, and the schools were kept open four months and eighteen days. Three hundred thousand dollars were expended in 1838 against $110,000 under the old system. With an increase of the State appropriation from $200,000 to $500,000 the schools could be kept up nine months in the year. "The chief defect of the system is undeniably the want of good teachers. It must be provided for, if the common school method of instruction is to be continued." The superintendent urges the normal school idea with a force and versatility of illustration that would seem to be convincing. Thirty thousand dollars a year would support two such schools, and by their training of a large number of students even for a short period a steady increase of teaching power would be secured. The reports from the academies and colleges subsidized for normal purposes by the State showed that not 100 young men in them all were preparing to teach. As a return for the munificent gifts of public lands and $500,000 in money to these institutions the superintendent concludes that this method of State aid to the secondary and higher education "will never produce an adequate amount of support to these institutions or of benefit to the public." The great evil is the multiplication of collegiate and academic schools. He recommends a separation of the State fund into a proper literary fund for the higher institutions and a common school fund for the elementary education of the masses.

In 1838 Superintendent Burrowes made his final report. In 1837 the question of the support of the new system of common schools had been submitted to the people and decided in the affirmative. The mental scope and moral courage of the superintendent gathers strength from these facts and he now boldly advocates a system of common school education reaching from the country district through the secondary up to the collegiate department. In his enthusiastic outlining of the school system of the future he includes much that is clearly ideal and some things that are not yet realized in the State. Especially does he advocate a scheme of practical institutions to educate for the business of life, reaching the higher department of a great industrial college, similar to the present Drexel and other great endowed seminaries in the State. But this broad system he finds still encumbered by the mistake of subsidizing a large class of secondary and collegiate schools which are not under the absolute charge of the State. Through this open side door any American system of public schools will eventually run dry of resources and be stranded on the reef of the perpetual jealousies and contentions of the numerous institutions claiming State aid. The superintendent argues at great length in favor of his system, evidently believing that the disintegrating influences that so long pre-

vented the coming together on the basis thus secured would be a permanent factor in the educational life of the country. He represents the view of the general system in vogue. But it is largely due to his influence that the present normal school system of the State, with some other features that will eventually be eliminated, are still retained.

In bidding farewell to his office, the superintendent notes the fact that "from a small incident to the office he has the honor to hold [that of secretary of state], the common school department of its business has grown up so as to occupy more than one-half his time and nearly all his thoughts. It was a mere experiment; it is now a settled system."

The State of Pennsylvania in 1838 was largely interested in an important system of public improvements for the development of her vast material resources. Dr. Burrowes urges a corresponding interest in the care of public education, predicting that "if this be secured Pennsylvania in a very few years will be less celebrated for her coals and railroads than for her schools and colleges." He bears hearty testimony to the services of Governors Wolf and Ritner and the members of the legislature for 1835–36, 1836–37, who, "opposed as they were on all other points, agreed on the common ground of education and only vied in the degree of benefit to be conferred." A valuable annex to this admirable document was the republication by the State of the report of Prof. Calvin Stowe, of Ohio, on the school systems of Europe.

This remarkable man and great friend of the children and youth of Pennsylvania, Dr. Burrowes, was born in Strasburg, Lancaster County, in 1805, of Irish parentage. His youth was passed in Ireland, Canada, and Pennsylvania, for a time in connection with the University of Dublin, his law studies being completed at this department of Yale College, New Haven, Conn. He began his professional life as a lawyer, but like Henry Barnard, soon drifted into public activity. For several years he was a member of the legislature of Pennsylvania, and at the age of 30, by the favor of Governor Ritner in 1835, was appointed secretary of state. By the school law of 1834 this official, as in New York, had charge of the department of common schools. During the following three years Dr. Burrowes managed this department with such energy, skill, and tact, that he may in an important sense be called the father of the common school system of the old Keystone State. His official duties as secretary of state occupied his daily office hours, and the great work connected with the schools was usually done at night in his own home. His suggestion that the school districts should have the power every three years to vote on the retention or rejection of the public school system was incorporated into the amended statute of 1834–35, and doubtless saved the entire system until in 1848, twelve years later, the law extended it over the entire State without consultation with or the consent of the local districts. Another suggestion, that $500,000 should be appropriated for the repairing and rebuilding

of public schoolhouses, was also adopted, and Dr. Burrowes prepared one of the first treatises on school architecture in the country. A change in the political administration of the State sent him out of office in 1839. Previous to his retirement he had made an extended tour through the Commonwealth, visiting all but eight of the county towns and holding familiar consultations with the school authorities and other friends of education. The legislature voted him an additional $500 to his salary of $1,000 as a recognition of this service. Five thousand copies of his last and greatest report printed in English, and 2,000 in German, with the 5,000 copies of Professor Stowe's report of European schools, made for the day a formidable mass of educational literature cast upon the waters. He also left in the office a draft of a revised school law with a special plan for instruction in normal schools, neither of which received attention from the legislature. At his retirement he left 840 of the 1,033 school districts in the acceptance of the new system, 5,260 schools, 6,733 teachers, and 174,000 pupils, with nearly $700,000 appropriated by public and local effort to popular education.

For the next seven years, Dr. Burrowes lived as a farmer in Lancaster County, making an unsuccessful effort to open a school of agriculture. Returning to the practice of the law in 1845, he reentered the educational field as a voluminous writer in the State press on practical school affairs, urging the establishment of county school supervision. As a local school director he served for many years in Lancaster, which was becoming the center of the common school reform spirit in the State, among other things placing the high school of the city on an equality with the best of the academies of the time. In 1850 a convention from 56 counties of the friends of education was held at Harrisburg, by which Dr. Burrowes was appointed chairman of the committee to draw up a report on the present condition of the public schools.

In this report he urges the establishment of a separate department of education by the State as essential to the continuance of the system. Besides this, a State and county supervision is insisted on; the establishment of normal schools and teachers' institutes, the formation of school libraries and public night schools in the towns. In 1851 the teachers of Lancaster County formed a permanent association, and Dr. Burrowes was elected president. Soon after a monthly journal was established at the suggestion of the association and Dr. Burrowes became the first editor of what has been known so many years as the Pennsylvania School Journal.

In 1852 a State teachers' association was formed, of which Dr. Burrowes was also elected president. He labored with great zeal to extend the teachers' institutes, which, beginning in Crawford County, northwest Pennsylvania, was then first introduced to the older part of the State. From 1852 to 1856 he entered largely into the public agitation for the improvement of the school system by addresses and written

essays. The result of this movement was the revised school law of 1854, which really inaugurated a new revival of educational interest in the Commonwealth. It created the office of deputy superintendent of schools, with additional clerical force, established county superintendency, improved examination of teachers, grading of schools, and uniformity of text-books. Dr. Burrowes was an efficient and leading member of the first convention of county school superintendents. By the act of 1854 the nuisance of small school districts was somewhat abated. The limit of the district was changed, and by subsequent legislation a district in Pennsylvania is a township or a similar portion of its territory including several schools under a board of six directors.

Dr. Burrowes prepared a volume on schoolhouse architecture, which was largely circulated through the State. His conservative temperament, intensified perhaps by his early education abroad, and the persistent refusal of the State to establish a system of normal schools, although no body of educators in the Union had more persistently urged it upon the public mind than the leading schoolmen of Pennsylvania, resulted in his final change of opinion on this subject, announced in 1854. He now maintained that the training of teachers should be placed on the same ground as the education of other professional classes in private seminaries. By his influence, largely exerted, the State finally adopted what is now known as the Pennsylvania system of normal schools, a group of a dozen private seminaries subsidized and to a limited extent managed by the State educational authorities. He afterwards served as mayor of Lancaster.

In 1860, at the breaking out of the civil war, he was again appointed, by general consent, State superintendent of schools—the office having meanwhile been separated from that of secretary of state—and served during half of that exciting period. He was favored during this term of office by the aid of Dr. Samuel P. Bates, a gentleman of great ability, a native of Massachusetts, school superintendent of Crawford County, Pa., historian of the Pennsylvania contingent of the Union Army, and afterwards superintendent of the Meadville, Pa., public schools. Superintendent Burrowes rendered valuable aid toward a general digest of the school laws. He was greatly interested in labors in behalf of the soldiers during the war, and died at the age of 66, in 1870, as first president of the State agricultural college. Whatever may be thought of some of his educational opinions, no man in Pennsylvania should be more honored for the persistent and intelligent support and advocacy of the common school system through its most critical period, the thirty-six years from 1834 to 1870, than this admirable friend of the children and father of the Commonwealth, Dr. Thomas H. Burrowes.

The history of the common school of Pennsylvania through the fourteen years from 1838 to 1852 has little to interest the reader of the edu-

cational record of the State. The hand of the great superintendent was no longer on the helm, and the high spirit of the two German governors did not animate their successors. These governors filled out the political record of these years. But although a few pages of impressive educational rhetoric can be gleaned from the State reports, wherein the superintendent reiterated New England ideas in his own way, nothing essential disturbed the monotony of public school affairs. In 1840 school directors were authorized to examine and give certificates to all teachers, either themselves or by deputy. In 1843 the board of directors of any county and of boroughs comprising a school district were authorized to appoint an inspector of the schools, with suitable compensation. In 1854 this law was superseded by county supervision.

In 1843 the State appropriations for schools were cut down from $350,000 to $250,000, and the appropriations to colleges and academies were reduced one-half preliminary to discontinuing this appropriation altogether. Up to 1843 these institutions had been generally subsidized. At that period 9 colleges, 64 academies, and 37 female seminaries, contained in all some 6,000 students, with only 350 proposing to become normal students. In 1848 the law concerning the voluntary acceptance of the common school system by the districts was repealed, and the American system was extended over the entire State. At this time there were still 200 school districts, one-fifth of the entire number, that refused to operate schools under the common school laws. As late as 1868 there were still 23 districts of this sort. In 1849 the school laws were codified, and 5 years was established as the minimum school age. The minimum school term was lengthened from three to four months, although the appeals of the opponents of this action caused the repeal of this clause in 1851. Before the year 1854 public high schools were established only by special act of the legislature, although it is noted that only by favorable legislators to such departments have they been set up.

Meanwhile the school system of 1834–1838 went on by its own momentum and the general diffusion of the common school spirit through the State. A great deal was due to the teachers' associations and the public efforts of the leading educators in waking up the public opinion to the point that no decided reaction occurred. In these fourteen years the number of schools had increased from 3,913 in 1838 to 9,699 in 1852; the number of pupils from 174,000 to 480,000; the number of teachers from 5,000 to 11,000; the tax levied from $385,000 to $982,000, and the general expenditure of $709,797 to $1,116,919. The principal element in this movement was the growing interest of the masses of the people, for the State appropriations were steadily falling behind in proportion to the increase of population. In 1838 the cost of public schooling was $1, and in 1852 40 cents for each taxpayer in the State.

The schooling of teachers had not advanced nor the length of the

school term materially increased during this period. The history of these years is another conclusive proof of the necessity for the cooperation of a vigorous central and a local administration to the success of any scheme of public education. The task of a State superintendent of education, whose functions are only the lower half of a secretaryship of state, located in an office in the State house, with the directors, trustees, and prudential committees of 1,000 little school districts, clothed with almost absolute administrative authority in their little domains, is too formidable for any save the most eminent genius, and such a one is only capable of a spasmodic influence.

Such was the case for the time after the strong hand of Secretary Burrowes was removed, until the increasing downward tendency of the discredited common school forced the whole subject to the front in the revival of 1854.

The three years from 1854 to 1857 are known in Pennsylvania as a "revival season" that placed the common school of the State well in advance and prepared it to resist the disintegrating influence of the coming ten years of agitation, from 1858 to 1868, dominated by the great civil war. Dr. Burrowes, in an address in 1851, puts the case in this strong way:

> When the people examine the surface of a school system they behold a rude, though well-compacted, skeleton, still wanting the rounded proportions and the fit lining of its muscles and the moving power of "the breath of life."

Nowhere was the obstinate power of resistance located in rival ecclesiastical organizations and difference of nationalities more powerful than in Pennsylvania, and while the common school in its irresistible progress somewhat overcame the active opposition of such agencies, they still held back the Commonwealth from that universal hearty and practical indorsement of the schools, for the absence of which there is no substitute.

An initial movement toward an awakening of the educational public was made in Harrisburg, the capital city, in 1850, in an important convention of the friends of education. Dr. Burrowes as usual was in at the beginning as temporary chairman. Many of the foremost educators of the State and members of the legislature were in attendance during the three days of its session. The State superintendent was present, but Dr. Burrowes, as chairman of the principal committees, was recognized as the moving spirit of the assembly. The convention indorsed the plan of two State normal schools, the establishment of a department of education separate from the department of state, the publication of a common school journal and the selection of an editor, and the necessity of county superintendency. The proceedings of the convention were published by aid of the legislature and widely circulated. Educational associations and teachers' institutes had already been formed in different portions of the State. In 1852 the first volumes of the Penn-

sylvania School Journal were issued, owned and edited by Dr. Burrowes. The State Teachers' Association was organized in 1852.

In 1852 Governor William Bigler, like Governors Woolf and Ritner, a representative of the progressive German population of the Commonwealth, appeared as a powerful advocate of a "movement along the whole line" of public education. In 1853 he "spoke out in meeting" in his message. He assisted at the drafting of the school law of 1854 and signed it, declaring that "he would sign the bill, even though it would sink him in political oblivion." His two secretaries of state, F. W. Hughes and Charles A. Breck, especially the latter, stood by him. But the greatest credit for this advantage was due to deputy State superintendent of schools, Henry L. Diffenbach, who, like the three great common-school governors, represented the upper story of the German contingent of the State in the long battle which resulted in the triumph of the new education. In the preparation of an improved school law Superintendent Hughes had the aid of the governor, his own deputy, Dr. Burrowes, and Bishop Alonzo Potter, who as bishop of the Episcopal Church in Pennsylvania, rendered the same powerful service to the sacred cause of popular education as when Professor Potter, of Union College in New York.

This bill was not considered, but formed the basis of the new statute enacted in 1854. The important provision relating to normal schools was struck out, but the provision for county superintendency, though fought at every step, happily came out alive and with other features of the statute gave a new impetus to the common schools. One of the most important provisions of the law abolished the small school district, which had been the evil spirit of the old New England common school, and made the township the unit of the system. The minimum length of the school term was thereby fixed at four months. Colored children, who hitherto had been admitted to the common schools, or gathered together for private instruction, were now to be educated separated from the whites.

A volume on school architecture was to be published and distributed. "Orthography, reading, writing, grammar, geography, and arithmetic, as well as such other branches as the board of directors might determine every year," were to be taught in every district; this was the first attempt to devise a public school course of study. The general guardianship of schools and the provision for the secondary education were vital parts of the system. Thirty-six counties sent up their school superintendents in response to a call from Superintendent Black to meet in convention at Harrisburg. Among those attending we first meet Mr. James Pyle Wickersham, afterwards the distinguished State superintendent of public instruction, and the fit successor of Dr. Burrowes in the great good work of the final establishment of the American common school in the central State of the old Republic. The reports of the county superintendents were published as an annex to the report of the State secretary, as in New England and New York.

The passage of this law created another uproar from the hostile element that was still a power in the State. It especially antagonized the new county superintendency, and the coming administration at the capital was shaken with anxiety by its passage. But, happily, the increasing momentum of the common schools had drifted into power such men as the governor and the secretary of state and superintendent of education, who were not inferior in energetic advocacy for the common schools to any of their predecessors. The governor, Pollock, and his secretary and deputy, Curtin, who were to be hereafter widely known in State and national affairs, boldly faced the opposition and declared in advance their determination to give the new statute a fair trial, demanded normal schools and teachers' institutes, and favored an advance of the State appropriations.

The result was that in 1855, 1856, and 1857 laws were passed for increasing the salaries of county superintendents, giving to the county the power to create independent school districts, making the Pennsylvania School Journal the organ of the school department, separating the school department from the department of state, and establishing normal schools. The important step of creating a separate State school department with a State superintendent of public instruction met with little opposition. The act for the establishment of normal schools had come as the result of the agitation of a generation in behalf of some better method of improving the teaching force of the day. The county superintendents had begun the good work of weeding out the sheep from the goats in the district schools. The teachers' institutes had done much to meet the rising demand for qualified instructors to take the place of the discarded incompetents. One of these permanent institutes at Millersville, Lancaster County, became the first State Normal School of Pennsylvania, and its first president was Mr. J. P. Wickersham, who there laid the solid foundation for his long and invaluable service to the common schools of the State.

To meet the protracted assault on county superintendency, a convention of superintendents was called at Harrisburg, in 1855, during the session of the legislature, by Superintendent Curtin, who opened it with an address. A powerful body of educators, including the ever-present Dr. Burrowes, made the subject so clear and the appeal so convincing that the friends of reform took heart. And when the chairman of the legislative committee on education appeared and in terms most positive pledged himself to resist this backward step by every legal method, the announcement brought courage to the hearts of all present. After a fierce and protracted struggle this important measure was sustained, and remains a permanent feature of the Pennsylvania system of common schools.

The bill for establishing the normal schools as a vital part of the system of common schools in Pennsylvania was prepared by Dr. Burrowes as his revised opinion. It divided the State into twelve normal

school districts. The schools were to be established by private enterprise within a time hereafter to be decided. A building, with accommodations for 300 students, with a hall that could seat 1,000 persons, six professors, with the qualification of a "liberal education," each to have charge of a department under proper regulations, and a model school of at least 100 children were the essential conditions; the course of study for each department to be fixed by the several professors. A student was to be admitted coming from each common-school district at a cost of $20 a year; practical teachers for a limited time on other terms. Examinations were to be conducted by a board of principals. The State superintendent was to approve the regulations for the conduct of the school and the course of study. At first the State assumed no obligation on the subject of subsidy, but trusted to the public interest for the support of the system. Subsequent legislation granted the power of the State and brought forward the essential fact of subsidy.

Under this act normal schools were established in ten counties before the year 1877. From the first the school at Millersville, Lancaster County, was under the presidency of Dr. Wickersham, then and always foremost in the development of the Pennsylvania system. In 1860 this school had an attendance of nearly 400 pupils.

In 1857 there were 1,688 school districts in the State, 10,950 schools, 12,474 teachers, with salaries of $24 per month for men and $16.60 for women, 541,247 scholars, a State appropriation of $164,723, and an entire expenditure of $1,754,215. Here we may well pause. In this brief and necessarily almost formal narrative we have traced the history of the common-school system from its emergence from the "pauper school" of the early period to 1832 through its tempest-tossed career of twenty-five years to its final triumph in 1857. By the law of 1854 the essential features of county superintendency, the establishment of a separate State department of public instruction, and the founding of the system of State normal schools had been implanted in the school legislation of the Commonwealth, never to be repealed.

The good Providence which seems to have watched over the critical periods in the educational affairs of Pennsylvania was never more conspicuous than in the appointment of Henry C. Hickock and Thomas H. Burrowes as the first two occupants of the new chair of State superintendency of schools. The reform movement that placed on the statute book such a number of important acts as were included in the law of 1854 and the fiercely contested battle over the establishment of county superintendency left the educational affairs of the Commonwealth in just that condition of popular uncertainty that its maintenance and effective administration depended largely on the wisdom, firmness, tact, and general reputation of the chief official at the statehouse. Mr. Henry C. Hickock had served during a portion of the term of Governor Pollock as deputy superintendent under Secretary Curtin, and to his untiring and progressive labors was the Pollock

administration greatly indebted for its success in the maintenance of the legislation of 1854.

Henry C. Hickock was born in New York in 1818 of a Connecticut family, both his father and mother being teachers. His youth was passed in Pennsylvania, where his parents were first engaged in a private and afterwards in an academic school. After his preliminary and professional studies he entered the profession of the law at Harrisburg and soon became conspicuous as a rising man in general practice, an official of common schools, and a forcible writer and speaker on educational topics. His appointment to the State deputy superintendency of common schools in 1855 at the age of 37 brought upon the stage one of the most intelligent, active, and aggressive of the group of reformers that brought in the revival period of 1854. During the administration of Superintendent Curtin the details and to a large extent the direction of the educational department came upon his shoulders.

It was, therefore, a logical result that in 1857, when the educational was finally separated from the department of state, Mr. Hickock should be appointed as the first occupant of this important office. He held the position until 1860, and during these three years he laid the Commonwealth under great obligation for his vigorous and successful administration of the new department, entangled in the mazes of a radical change of school laws administered in the face of an excitable and still divided constituency, amid the disturbance of a series of popular financial embarrassments in the State and nation.

The first reports of Superintendent Hickock contain an important review of the situation, and a wise correction of extravagant expectations and overheated zeal in the friends of educational reform. There were still great defects in the working of the public-school system. A majority of the teachers entirely neglected the duty of keeping registers, and more than half of them had not served three years in the schoolroom. The State was yearly losing large numbers of superior teachers by removal to other portions of the country in search of better positions and more generous salaries. Only 3,000 of the 10,000 public schoolhouses were reported as up to a reasonable demand for a good structure. Too many of the new county superintendents were officials of mere routine, and the administration of the best was greatly restricted by the obstinate resistance or indifference of their constituents, or discouraged by the meager salaries awarded for a work so perplexing and responsible. But the superintendent, after a journey through 53 of the 64 counties of the State, was greatly encouraged by the new spirit that everywhere seemed to animate common-school affairs, like the new birth of a soul from a paralysis of transgression or moral indifference. He predicted the most complete success, and believed that the people's common school, with fair opportunity and popular support, would finally override all obstacles and prevail.

In his first report Superintendent Hickock gives his readers such an outlook over the past twenty years of school life in Pennsylvania as a mountain climber, after a laborious tramp through a varied country, may attain while resting on the first eminence of the vast and mysterious range that soars and retreats peak above peak toward a distant horizon. "The school system for many years had lost the prestige and hopes of its earlier years, and has failed as yet to fulfill the expectations of its friends." He attributes this unsatisfactory condition to organic defects in the structure of the system, and consequent blundering and maladministration, a pervading apathy of prejudice of the public mind, represented by legislative unwillingness to make needed changes in the school laws, the lack of any suitable agency for the examination and inspection of teachers and the proper supervision or grading of schools, no adequate power to lay taxes or build schoolhouses and other indispensable needs, no school architecture, no legal place for the transaction of business in the districts, no connecting links between the extremes of the system, and no efficient control anywhere. All these negative evils were greatly exasperated by a habit of dividing the territory of the State into small and isolated districts. The school law of 1854 was the result of twenty years of steady agitation against the defects that would have wrought the complete destruction of the common school, and being this, the deliberate conclusions of this period had "come to stay."

The act for the establishment of normal schools passed subsequent to the legislation of 1854 had also the clause for the establishment of a separate school department in 1857. The plan for the normal schools at first omitted all provision for a State subsidy, but after repeated amendment, as suggested by experience, steadily gained upon the public confidence. It had the merit of probably supplying to Pennsylvania a larger number of teachers who had enjoyed the opportunity of even a short term in a school known as professional than any other State. This, with the later development of the institute system, has made this feature one of especial pride to many of the educators of the State. Of one thing the schoolmen are justly proud—that from the first the system was one of free schools, it having at no time been burdened with the rate bill of New York or the tuition fee of some of the New England States.

The close of the active and successful administration of Superintendent Hickock in 1860 brought the schools and the State to the verge of the civil war. It was then that the Commonwealth turned again to Dr. Burrowes and ordered, as one of the closing acts of his long and faithful educational career, that he should resume the superintendency held by himself twenty-five years before.

CHAPTER XII.

ON PHYSICAL TRAINING.

By Edward Mussey Hartwell, Ph. D., M. D., late director of physical training in the public schools of Boston and sometime associate in physical training in the Johns Hopkins University.

Physical training may be defined in general terms as the development by use and wont of the motor powers of the human body, either for the sake of health or discipline, or for the sake of both.

Abraham Lincoln once characterized the slavery question as "a durable question." In the history of education the question as to the legitimate place and standing of physical training has assuredly proved itself a durable question, since, in a certain sense, the history of education may be regarded as the history of a series of attempts on the part of thinkers and teachers to reconcile the claims of bodily and mental training in the upbringing of children and youth. In times past and in our own time physical training has been exalted, tolerated, neglected, or contemned according to the character of the conceptions concerning the nature of the human body and of its relations to the human mind which have exerted a dominant influence upon those charged with the shaping of educational policy and the administration of educational affairs.

TYPICAL IDEALS OF MANLINESS.

There appear to be four principal ideals of manly excellence which, singly or in combination, have dominated the minds of the promoters or governors of educational foundations. Those ideals may be broadly characterized as the Greek or æsthetic, the monkish or ascetic, the military or knightly, and the medical or scientific. The first three have been influential in varying degrees from very early times. The fourth, although compounded to some extent of ancient elements, is so strongly tinged with utilitarian and psycho-physical ideas that it is best described as modern. All of these ideals are traceable to conceptions of human nature and destiny which may be roughly classed under the two heads of lugubrious and cheerful.

The Greek ideal was not lugubrious. "Everything that is good," says Plato in the Timæus, "is fair, and the fair is not without measure, and the animal who is fair may be supposed to have measure. Now, we perceive lesser symmetries and comprehend them, but about the highest and greatest we have no understanding, for there is no symmetry greater than that of the soul to the body. This, however, we do not perceive, nor do we allow ourselves to reflect that when a weaker or lesser frame is the vehicle of a great and mighty soul, or, conversely, when a little soul is incased in a large body, then the whole animal is not fair, for it is defective in the most important of all symmetries; but the fair mind in the fair body will be the fairest and loveliest of all sights to Him who has the seeing eye."

In an article on "The genius of Plato," by the late Walter Pater, it is well said that "not to be 'pure from the body,' but to identify it, in its utmost fairness, with the fair soul by a gymnastic 'fused in music' became from first to last the aim of education as he [Plato] conceived it. * * * Platonism has contributed largely, has been an immense encouragement, toward the redemption of matter, of the world of sense, by art, by all right education, by the creeds and worships of the Christian church, toward the vindication of the human body."

The antithesis between the Greek and the ascetic ideals is clearly indicated in a remark of Apuleius concerning Egyptian and Greek modes of worship. "The Egyptian deities," he says, "were chiefly honored by lamentations, and the Greek divinities by dances."

The ideal of the monk, which, after the first few centuries of the Christian church, exercised such a profound influence upon European thought and life, was of Asiatic and, to a considerable extent, of Egyptian origin. "The duty of a monk," said St. Jerome, "is not to teach, but to weep." Weeping and self-torture might well absorb the energies of men who conceived that all flesh was the creation of satan and championed the belief that soul and body are independent and mutually antagonistic entities.

When it was held that "the greatest of all evils was pleasure, because by it the soul is nailed or riveted to the body," and that mental and spiritual health was best subserved by bodily weakness, we can not wonder that "a hideous, sordid, and emaciated maniac," to borrow the words of Lecky, "without knowledge, without patriotism, without natural affection, passing his life in a long routine of useless and atrocious self-torture, and quailing before the ghastly phantoms of his delirious brain, became the ideal of the nations which had known the writings of Plato and Cicero and the lives of Socrates and Cato."

The military ideal of manliness, now existing side by side with the monkish ideal, now confronting and challenging it, has played a most important and conspicuous part in the education of the sons of noblemen and of gentlefolk. Herodotus tells us that the sons of the Persians, from their fifth year to their twentieth, were carefully taught three things only—to ride, to draw the bow, and to speak the truth. Physical training was predominant in the education of free-born youth among the Spartans, Romans, and ancient Germans. It consisted chiefly of martial exercises and the chase, and its aim was the formation of an agile and enduring soldiery. "Plaienge att weapons" formed a necessary part of every gentleman's education in Britain as well as on the Continent, even later than the sixteenth century.

"I swear I d rather that my son should hang than learn letters. For it becómes the sons of gentlemen to blow a horn nicely, to hunt skillfully, and elegantly carry and train a hawk. But the study of letters should be left to the sons of rustics." These are the words of an English gentleman of the time of Henry VIII, who, on hearing letters praised, "was roused to sudden anger and burst out furiously."

The ideal of the Greeks sprang from a passion for beauty and harmony and a joyous sense of well-being; that of the theologian and the monk was conditioned too often on and determined by a profound ignorance of, and a bitter contempt for, the body, while that of the soldier and the knight owed its peculiar features to a rude appreciation of bodily force and skill gained from experience in camp and field.

It is not to the generative vigor of any or all of these ideals that we owe our modern doctrine of the interdependence of body and mind, which doctrine is but vaguely, if at all, apprehended by the majority of those who quote with generous unction the time-worn *mens sana in corpore sano* line of Juvenal, who exhorts men not only to "pray for a healthy mind in a healthy body," but also to "ask for a brave soul unscared by death." No; the belief "that to work the mind is also to work a number of the bodily organs, that not a feeling can arise, not a thought pass, without a set of concurring bodily processes," is the child of the scientific spirit embodied in the new physiology and the new psychology.

SCIENCE AND EXPERIENCE WARRANT RECOGNITION OF PHYSICAL TRAINING.

My main contention is that both the teachings of modern science and the lessons of experience warrant the demand that physical training should be recognized and provided for as an integral and necessary branch of instruction in the elementary and secondary education of both sexes.

Medicine and the biological sciences, e. g., physiology, psychology, zoology, and embryology, which are the offspring of medicine, are the sciences which throw most light upon the structure and powers of the human body.

Before noting the characteristics of the principal national systems of physical training, or attempting to trace their history or to estimate their value, it will be well to consider the nature of physical training and its relation to education in the light of the modern doctrine of the human body.

SCIENTIFIC BASIS OF MODERN DOCTRINE OF HUMAN BODY.

The doctrine of the human body current among scientific men is one of the most notable and significant achievements of the modern spirit. It has been wrought out and developed during the past two centuries and a half, and owes its characteristics of comprehensiveness, suggestiveness, and illuminative power to the improvement and consolidation of the physical sciences, particularly of that group which we term the biological sciences. Mr. Huxley has called attention to the essential solidarity and kinship of these sciences, and to the genetic relation between them and medicine, which till within very recent times included "what little physical science could be seen to bear directly upon human life."

"It is a peculiarity of the physical sciences," he says in his address on "The connection of the biological sciences and medicine," "that they are independent in proportion as they are imperfect; and it is only as they advance that the bonds which really unite them all become apparent."

Through the advance alluded to by Mr. Huxley man's knowledge of himself has been immensely increased and his conception of nature and his place in nature radically changed. The human mind has been thereby both uplifted and enlarged. Considered simply as a member of the animal kingdom man is a much more intelligible and interesting creature than ever before, since so many new and commanding points of view have been established from which his structure and powers and the laws governing the development and use of his powers may be studied profitably.

In the modern doctrine of the individual human body are mirrored the results of man's observations and reflections touching: (1) Nature, including the characteristics of its animate and inanimate divisions and their relations to each other; (2) the structural and functional characteristics of the living beings which inhabit our globe and their relations to the living beings which have become extinct; and (3) the evolution of living beings, past and present, the term evolution being employed "as a general name for the history of the steps by which any living being has acquired the morphological and physiological characters which distinguish it."

All nature is in a state of flux owing to the ceaseless dance of atoms and molecules, whereby matter is metamorphosed and energy transformed. In the little corner of the universe which we call the solar system the sun is the driving power as well as the source of energy. Our planet, with its continents and oceans, its realm of living organisms, and its all-encompassing atmosphere, floats and rolls in a determined path in the great ocean of energy furnished and ruled by the sun. It is never the same world for long. Its ocean is continually shifting its bed and boundaries and constantly agitated over all its surface and throughout its deeps. Its continents are continually wrought and sculptured into new shapes and contours by its streams of air and water. But the most changeful and varied realm beneath the sun is the realm of living things, which embraces the aggregate sum, in all its countless forms, of organized material, which is at once the culminating and most transitory and unstable stage in the metamorphosis of matter.

RELATION OF ANIMATE TO INANIMATE NATURE.

If we confine our attention to a single organism, e. g., protococcus, amœba, or the human body, we discover that by reason of its possession of protoplasm it is related in a peculiar way to the world's stock of inorganic, energy-yielding substances contained in its soil, air, and water, and to the streams of energy which encompass the earth and its atmosphere as a part of the solar system. The world's stock of material and the world's stores of energy are continually modified in character through the agency of the world's fund of living substance, which is apportioned among the individuals that make up the two great kingdoms of animated nature. Every living organism, whether simple or complex, continually draws, directly or indirectly, from the ocean of energy derived from the sun, and contributes to the ceaseless round of transformations whereby potential energy is converted into active energy, and vice versa; and at the same time, and pari passu, every such organism is drawing energy-yielding materials from the earth's stock of air, soil, and water, metamorphosing these materials into living substance and returning material drained of its energy to the world's stream of temporary waste substances.

Taken together and viewed as a whole, the sum total of plants and animals constitutes a vast system of intermediate stations of exchange in the world's circulation of interchangeable material and circulation of interconvertible energy. Every aggregation of primitive or derived protoplasm is such a station, but for a time only, since every individual organism is strictly limited in respect both of the duration and field of its activity. But so many individual organisms fulfill their life purpose by the transmission of life to new individuals that the species and the sum of the species persist, and new series of stations for the metamorphosis of material and the transformation of energy continually arise in place of abandoned stations and worn-out organisms. As the surface of a full flowing stream presents a constant and shifting succession of eddies and transient currents of varying degrees of complexity, so the restless, ever-flowing oceanic stream of animate nature bears on its surface a constant, though ever varying succession of living organisms, which may be likened to bubbles, eddies, and currents that play upon every sea-bound stream of water.

The ocean, though divisible into drops of water, is one, however much teachers of geography may subdivide it in thought and multiply names for its parts. It is fed by mighty river systems made up of innumerable tributaries ranging in volume from mere trickles of moisture down the face of a mountain cliff to the resistless floods which sweep through a river plain into the sea. It is the seat of complicated systems of tides and currents dependent upon the agency of atmospheric and lunar forces swayed by the energy of the sun. It is continually losing water to the air through the lifting power of the sun's rays. It is continually receiving condensed watery vapor, either directly as rain and snow, or indirectly as river water laden with earthy matter in suspension and earthy salts in solution. Its rivers and their rivulets have eroded and sculptured the earth's surface from the mountains to the sea, and continue to do so. The earth and air contribute of their substance and the sun of its energy to enable the ocean to play its part as a receptacle and reservoir of material and a source of energy for the support of the myriad forms of life that inhabit our globe. No wonder the earth has been considered by some to be a vast organism on which plants and animals lead a parasitic life. No wonder the magnitude of this goodly frame the earth, the interplay of the forces having their seat and theater in and around it, and man's relations to inorganic nature on the one hand and to organic nature on the other should challenge and stimulate the speculations of philosophers and stir and quicken the imagination of poets.

THE HUMAN BODY AS A MACHINE.

In general terms the modern doctrine of the human body is based upon two leading ideas, viz: First, that that organism is an aggregation of matter which, by reason of the arrangement of its parts and the qualities of the living substance compos-

ing those parts, is capable of transforming and utilizing energy, i. e., it is a living machine for doing work; and second, that the adult body is the product of organic evolution, to the outworking of whose laws it owes its rank among organisms and its efficiency as an individual organism. Of machines in general it may be said that they are aggregations of matter designed to facilitate the utilization of energy. Energy may be utilized either by inanimate or by living machines, each of which is divisible into simple and complex machines. Simple machines generally have but few parts and the parts which they have do not differ much from one another in form or office. The combination of parts in a simple machine is not intricate, that is, they do not present a high degree of coordination between subordinate and leading parts for a common end. Summarily stated, simple machines whether designed for thermal, chemical, or mechanical work, are characterized by slight differentiation of parts, by little subdivision of labor among their parts, and by a low degree of specialization and coordination in the office or function of their parts.

Simplicity and complexity are determined and estimated by quite the same general tests and criteria in living as in inanimate machines. Plant and animal mechanisms differ most essentially from inanimate machines in respect to the substance of which they are composed and out of which their parts are wrought. Owing to their composition out of living matter, they are the seat of continuous inner activities which are necessary for their maintenance as structures, for their growth and development as organisms, and for the fulfillment of their destiny as members of a species. These attributes plant and animal mechanisms owe to the qualities of their protoplasm or living substance. Out of protoplasmic units or cells, variously modified during their life cycle, all the tissues and organs of all animals and plants are built up; and protoplasm may be characterized as the universal, generalized building material of living things. It is formed living material endowed with the remarkable property of building itself either out of nonliving substance, as in the case of plant protoplasm, or out of organized food stuffs, as in the case of animal protoplasm. Living matter is the highest term in a series of constructive chemical changes whereby simple atoms and elements, such as carbon, hydrogen, nitrogen, and oxygen, are united through the intervention of heat into more complex and unstable compounds, e. g., into water, carbon-dioxide, and ammonium compounds. These relatively simple compounds are built up into compounds termed organic, e. g., proteids, fats, and starches, which represent, by reason of their complexity and instability and the number of their unsatisfied bonds, a greater amount of potential energy than would be contained in an equal amount of their uncombined constituents, and at last as proximate principles they are loosely but intricately combined into the larger and still more unstable molecules of living matter.

To put it in another way, the atoms of simple elements under the influence of heat and chemical action are subjected to a series of lifts, the effect of each lift being to render them more complex and unstable and representative of a greater amount of potential energy. Simple atoms are lifted to the plane of simple compounds. Simple compounds are lifted to the plane of proximate principles, which may be called formative material, and proximate principles are lifted from the plane of formative material to the plane of formed material, or of living protoplasm. By a series of changes which may be likened to falls, mainly oxidative in their nature, living protoplasm is tumbled downward to the plane of dead protoplasm, dead protoplasm to the plane of decomposed protoplasm, decomposed protoplasm to the plane of inorganic compounds, and inorganic compounds to the plane of simple inorganic elements. By each uplift kinetic is converted into potential energy, chiefly in the form of chemical affinity. By each downfall potential energy is converted into kinetic energy, chiefly into heat, sometimes into mechanical work. Formed or living substance is, then, the last term in a series of constructive energy-storing processes, and the starting point, or first term, in a series of destructive energy-expending processes. These constructive and destructive, these storing and expending processes, taken together, constitute a cycle of give-and-take changes between living and nonliving substances.

INTERCHANGE OF MATERIAL AND CONVERSION OF ENERGY BY LIVING SUBSTANCES.

This cycle of interchange of material (or "Stoff-wechsel," as the Germans call it) is termed metabolism. The manifestation of metabolic activity is one of the most characteristic signs of life. The series of changes during and by means of which the atoms of simple nonliving elements are built up and recombined until they form a part of living protoplasm are designated by the inclusive term, anabolism. The series of changes during and by means of which protoplasm is torn down, reduced to simpler and more stable substances, until its final decomposition into stable and nonliving elements is reached, are designated by the inclusive term katabolism. Broadly speaking, anabolic processes are characterized by the consumption of carbon, hydrogen, and nitrogen found in carbon dioxide, water, and ammonium compounds and the setting free of oxygen, while katabolic processes are characterized by the consumption of oxygen and the setting free of carbon dioxide, water, and ammonium compounds. The main work accomplished by one of the simplest of plant mechanisms, e. g., the single-celled protococcus, is chemical work. Its protoplasm is a magazine of stored-up energy, derived from the kinetic energy of sunlight through the agency of its contained chlorophyll in changing heat into chemical action, and the chemical action of its protoplasm in building up new protoplasm out of nonliving substances by the anabolic processes to which attention has been called. The energy derived from sunlight and the stock of inorganic food stuffs or raw material derived from the water in which it lives constitutes the income fund of the living protococcus.

It spends its income chiefly in replenishing and increasing its stored-up energy, in repairing its wasted substance, in making new organs—if it can properly be said to have any—and in forming new individuals. Though the protococcus expends energy in the form of heat and motion, and performs katabolic or destructive chemical work in so doing, its main and characteristic work is of the constructive, anabolic, chemical sort. Broadly speaking, its life is passed in pulling relatively simple oxygen-containing compounds to pieces, setting free the oxygen—i. e., in reducing oxygen compounds, and in rearranging and fixing the derived carbon, hydrogen, and nitrogen in new compounds, and in building such compounds up into protoplasm. It is, therefore, more of an oxygen-reducing machine than an oxygen-consuming machine—that is, deoxidizing processes predominate in it over oxidizing processes.

ANIMALS AS WORKING MECHANISMS.

In animal machines, on the contrary, oxidizing processes, accompanied by the development of kinetic energy, predominate over deoxidizing processes. The food stuffs and protoplasm built up by green-plant machines, whether they are simple, like the protococcus, or complicated and highly developed, like the bean plant or the oak, serve as fuel or stores of energy-yielding substance for the nutrition of animal organisms which require oxidizable food stuffs for maintaining life and developing kinetic energy, but are unable, even by the aid of sunlight, to manufacture proximate principles out of simple inorganic compounds or atoms. The vegetable kingdom, therefore, serves the animal kingdom with prepared energy-yielding food or fuel. The animal kingdom utilizes the food furnished it by plants, developing kinetic energy and producing waste, both gaseous and solid, that again serves as plant food. In the case of even the simplest living mechanisms, whether vegetable or animal, there is a circulation of food material and a circulation of energy derived from this food material. There is an ingoing stream containing soluble and gaseous food material, which the simple mechanism (for instance, the protococcus or amœba) is capable of absorbing at any or all parts of its surface, and an outgoing stream of waste material, which may issue from any or all parts of the cell wall. The absorbed material is diffused more or less throughout the whole protoplasmic lump, each and every part of which is capable of effecting general chemical changes of the construc-

tive, assimilative sort, and is or may be the seat of destructive, katabolic energy-liberating changes—i. e., each part of the protoplasmic lump takes from the stream of nutritive material, develops energy, and contributes to the outgoing stream of waste and to the inner circulation of liberated energy.

As a type of the simplest animal mechanisms, we may take the amœba, because in it problems of animal structure and function are reduced to their lowest terms. The amœba may be characterized as a single, one-walled, free, nucleated cell composed of slightly differentiated protoplasm. Under favorable conditions of warmth and moisture the amœba feeds and grows upon minute plant organisms. It is contractile and spontaneously motile, as well as metabolic. It is contractile and irritable—i. e., it can move—and its movements are modified by stimuli, such as mechanical or electrical shocks. It is respiratory, since it consumes oxygen and gives out carbon dioxide. It can secrete and assimilate nutriment and excrete waste, and it is reproductive, since by self-division it gives rise to new individuals like itself. Its parts are so little differentiated and specialized that each of them shares with all the rest the power of reacting to stimuli, of assimilating food, of developing kinetic out of potential energy, of consuming oxygen, of excreting gaseous and other waste, and of reproduction. It manifests in a generalized and rudimentary way all the forms of activity of which any of the animal mechanisms which are found higher in the scale of organization are capable.

All the forms of activity that go on in the adult human body, numerous and varied and elaborate as they seem to be, are capable, when broadly viewed, of being arranged under the same categories as the fundamental activities presented by the amœba.

Locomotion, movements of the hands, the eyes, the breathing and vocal organs, the propulsion of the blood and lymph, the expulsion of liquid, gaseous, and solid waste are all forms of molar motion effected by structures endowed with the power of contractility. The contractile structures—that is, the muscular tissues—are irritable and contractile, and therefore influenced by stimuli received from irritable structures situated in the nervous system. In other words, the expenditure of energy in mechanical or thermal work by the contractile part of the body is modified and regulated by the sensitive irritable nervous tissues which mediate between them and objects outside the body. The working units of the body are single, living cells, containing more or less of protoplasm, which cells, at least at the outset of their career, are comparable to simple, single-celled organisms, of which the amœba is the type; but whether they be bone cells, gland cells, muscle cells, lung cells, or nerve cells, they all require to be provided with a mixture of organic food stuffs and oxygen for the renewal of their substance and replenishment of their store of energy. In other words, the metabolic activity of the cells and cell aggregates of the body depends upon the character and amount of their blood supply. A whole series of organs for grinding, mixing, dissolving, and absorbing food stuffs are concerned in elaborating a nutritive, oxygen-charged fluid, the blood, out of raw starches, fats, and proteids. Another series of organs is engaged in carrying blood to and from the cellular units having their fixed stations, with like cellular units, in the cell aggregates or tissues which make up the skin, muscles, bones, nerves, and brain and other organs of the body. Still another series of organs made up of cell aggregates is engaged in gathering, separating, and expelling waste matters from the body, and another set of organs is set apart for the production of new individuals and the continuance of the species.

DEVELOPMENT OF CELLS AND CELL AGGREGATES.

The structural and physiological unit of living mechanisms, then, is the cell, since th organs of the higher organisms in their last analysis consist of cells and cell products. "In the course of its development," says Mr. Huxley, "every cell proceeds from a condition in which it closely resembles every other cell, through a series of stages of gradually increasing cycles, until it reaches that condition in which it presents the characteristic features of the elements of a special tissue. The devel-

opment of the cell is, therefore, a gradual progress from the general to a special state.

"The like holds good of the development of the body as a whole. However complicated one of the higher animals or plants may be, it begins its separate existence under the form of a nucleated cell. This, by division, becomes converted into an aggregate of nucleated cells; the parts of this aggregate, following out laws of growth and multiplication, give rise to the rudiments of the organs, and the parts of these rudiments again take on those modes of growth, multiplication, and metamorphosis which are needful to convert the rudimentary into the perfect structure.

"The development of the organisms as a whole, therefore, repeats in principle the development of the cell."

The individual human being begins as one of the simplest of animal mechanisms. Microscopic in size, its parts are indistinguishable or few at the most; its functions are reduced to lowest terms; its habitat is restricted to a particular seat in a single organ of its mother; and its condition is that of a dependent parasite, without intelligence, responsibility, or recognized legal status. It evolves gradually and surely by duly ordered and progressive stages into a bulky organism, goodly in size and fair in symmetry, having parts beyond counting, whose arrangement is bewildering in its marvelous complexity; with functions so varied and specialized and co-ordinated that it is enabled to play the part of an intelligent, self-sufficing, individual member of society, free to range throughout the world as an independent citizen of the same, having legal rights and moral responsibilities as an heir of all the ages, and as such entitled to an indefeasible share in mankind's hope of immortality.

It begins its career at the level of the amœba and the wandering white blood corpuscle; when it emerges from immaturity at the summit of a long series of spiral changes and enters upon its inheritance and is made free of the world as a matured and perfected human being, it has become man, and well deserves to be characterized, in the words which Shakespeare puts into Hamlet's mouth, as "the paragon of animals, the wonder of the world."

THE EVOLUTION OF THE HUMAN BODY.

The following affirmations of the modern doctrine of evolution in respect to the human body may be cited here because of their more or less direct bearing on our subject:

(1) The human body is the highest term in the series of animal mechanisms found in the world to-day, since in it we find the most elaborate and perfectly coordinated subdivision of labor associated with the greatest differentiation of structure and the highest specialization of function, together with the greatest capability of adaptation to its environment.

(2) The human body is the highest term in the whole series of living mechanisms produced by organic evolution in the vast stretch of time since the first and simplest of living things appeared upon the earth.

(3) Every adult human body is the highest term in a long series of orderly, progressive developmental phases, which taken together constitute the period of its immaturity. This period may be divided for convenience into stages, viz, (1) Embryonic, (2) Fœtal, (3) Infantile, (4) Childhood, and (5) Adolescence.

(4) At the culmination of each of its developmental stages the body of the human being more or less resembles the highest stage of zoological development attained by certain of its lowlier, less intelligent and responsible animal kindred.

(5) As in the zoological series of developed organisms each well-marked advance is characterized by greater differentiation of parts, higher specialization of function, and more elaborate subdivision of labor, so in the embryological series of developmental stages through which the body is transformed from a unicellular ovum into a communal mechanism, made up of somatic or general and minor or special mechanisms, each stage of development is signalized by the acquisition of more numerous and more perfectly adapted and coordinated parts; by an increased efficiency of general functions and the addition of special aptitudes and powers; and by the attainment of larger and more varied capacity for improvement and training in the exercise of its distinctively human endowments.

(6) In acquiring structural completeness and functional perfection the human body

recapitulates in a condensed or schematic way the development of its ancestral forms—first of its simplest, lowliest, and most ancient; last of its most highly developed, most gifted, and recent. Its period of immaturity, during which it may be molded and educated, is more prolonged and diversified, and therefore more fateful and important, than the period of immaturity either of its ancestors or its nearest kindred in the animal series.

EVOLUTION OF HUMAN MIND AND INSTITUTIONS.

The jurisdiction of the laws of evolution over mental as well as bodily development is pretty generally conceded, even in strongholds of orthodoxy, so called. The following extract from Drummond's Ascent of Man, which consists of lectures originally delivered before the Lowell Institute in Boston, is highly significant, considering its source:

Mind, in man, does not start into being fully ripe. It dawns; it grows; it mellows; it decays. This growing is a gradual growing, an infinitely gentle, never abrupt unfolding—the kind of growing which in every other department of nature we are taught by nature to associate with an evolution. If the mind of an infant has been evolved, and that not from primeval man, but from some more ancient animal, it could not to more perfection have simulated the appearance of having so come. But this is not all; the mind of a child not only grows, but grows in a certain order. And the astonishing fact about that order is that it is the probable order of evolution of mental faculty as a whole. The mind of a child is to be treated as an unfolding embryo; and just as the embryo of the body recapitulates the life history of all the bodies that led up to it, so this subtler embryo in running its course through the swift years of early infancy runs up the psychic scale through which mind probably evolved. We have seen also that in the case of the body each step of progress in the embryo has its equivalent either in the bodies or in the embryos of lower forms of life. Now each phase of mental development in the child is also permanently represented by some species among the lower animals, by idiots, or by the mind of some existing savage.

It has been well said of biology that it has been "raised in our own time from a mere record of isolated facts to a majestic study of orderly progress." So fascinating and convincing is that story in relation to man and the institutions through which the life of man is reflected that we find its teachings adopted and applied in most unexpected quarters. For instance, we find an eminent English judge, the late Lord Bowen, in an address before a society of law students, urging that "national life, national business, like every other product of human intelligence and culture, is a growth, begins far away in a dim past, advances slowly, shaping and forming itself by the operation of purely natural causes."

And again, Kidd, in his Social Evolution, declares that "social systems and civilizations resemble individuals in one respect; they are organic growths, apparently possessing definite laws of health and development. Such laws science has already defined for the individual; it should also be her duty to endeavor to define them for society."

EVOLUTION AND EDUCATION.

If we admit the declaration of modern science that the laws which determine the orderly progress of the cells, tissues, and organs of the human body from a general and simple to a differentiated and special state, also bear sway, *pari passu*, throughout the realm of the human mind and over all the products of human intelligence and culture, can we avoid the conclusion that education, which avowedly aims at enabling the ungrown human being to make the ultimate utmost of himself, should conform its measures and methods to nature's laws of growth and development?

Pedagogical oratory and literature teem with assertions that education means educing, unfolding—evolution. But no very searching investigation is needed to discover that educationists hold very largely to the very doctrine of evolution that has been discrowned and displaced by modern science.

What we call cramming, as an educational procedure, is merely a short-sighted deduction from the principles of what used to be termed "evolution," as opposed to the doctrine of epigenesis. Education by "conveying information" resembles the

process by which a gardener develops a small onion into a plump, marketable onion. Both processes are in harmony with the idea that the immature organism is a perfect edition in miniature of the adult, and that evolution consists in the growth of small parts, originally created perfect, into larger and finally full-sized parts through the intussusception of aliment.

This view of evolution, which was dominant till microscopical research showed it to be incorrect, was summed up by Haller, the great authority of the last century in biological science, as follows: "There is no becoming; no part of the body is made from another; all are created at once."

William Harvey's statement in the seventeenth century of the doctrine of epigenesis is as follows: "The first concrement of the future body grows, gradually divides, and is distinguished into parts; not all at once, but some are produced after others, each emerging in its order." This view, which was rejected by the evolutionists of the eighteenth century, has been accepted as a corner headstone by the evolutionists of the nineteenth.

CLASSIFICATION OF COMPONENT BODILY MECHANISMS.

Regarded as a structure the human body is an aggregation of a vast number of living individual cells, which may be classified according to their pedigree, form, or function. These individuals are so grouped and joined together in our various organs that the body as a whole forms a communal structure, a sort of federal union of tissues and organs. Among machines it resembles an army or a city rather than such mechanisms as an eight-day clock or a windmill. "Of this army," says Huxley, "each cell is a soldier, an organ a brigade, the central nervous system the headquarters and field telegraph, the alimentary and circulatory system the commissariat."

In classifying the cell aggregates of the body, that is, its tissues and organs, we may arrange them in three great classes: (1) Those which subserve the metamorphosis of material to be employed in the construction, maintenance, and repair of the individual and in the continuance of the species. They include what may be broadly characterized as the digestive and reproductive organs. (2) Those which are chiefly instrumental in the transformation and expenditure of energy. (3) Indifferent and supportive tissues and organs as, for instance, connective, cartilaginous, and bony tissues, found in the organs classed under one and two.

Leaving supportive and reproductive tissues out of account, we may characterize the tissues and organs under (1) as being concerned in renewing the substance of the body, of the body's fund of energy, and (2) those concerned in setting energy free in special ways. Under (1) we may place (A) the tissues of digestion or the "purveyor tissues," whose office it is to so prepare raw food or energy-yielding substance as to bring it to the energy-expending tissues, the muscular and nervous tissues, that they may build the prepared food into their own substance as easily as possible, and (B) the tissues of excretion or "scavenger tissues," whose office it is to receive the waste matters which arise in the nervous and muscular tissues and prepare those substances for rapid and easy ejection from the body.

Under (2) are placed the matter tissues, viz, the nervous and muscular tissues and organs by means of which energy is liberated and turned to account. The nervous tissue is the "masterful tissue" par excellence and is served in one way or another by all the other tissues we have just mentioned. Again, the bodily organs are divisible into (1) somatic or primary, whose effectual working is requisite for the more general needs of the body as a whole, e. g., the digestive, circulatory, excretory organs, the skeleton and skeleton muscles, and the bulk of the brain and nervous system, and (2) minor or secondary organs, as the organs of speech and the hands, or organs of manipulation, and the most highly specialized parts of the brain and nervous system. Again considering the body of the individual in its relation to the species and the continuance of the life of the species, the soma or

body, with its primary and secondary mechanisms, is merely the home and vehicle of the reproductive elements which constitute the essential link between the individual and its ancestors on the one hand and the individual and its descendants on the other. Viewing the matter in this way it may be shown that the life of the soma is incidental, determinate, fleeting, and subservient to the wider, continuous, perennial life of the species resurrected by the reproductive elements.

Man in contradistinction to the brute—thanks to his more complicated structure and more highly specialized functions—has a relatively larger "live capital" of free energy that can be turned into special forms of mechanical work. In comparison with savages and barbarians, civilized men have a larger fund of such capital at command, together with greater aptitude for expending it wisely and economically; while among civilized men, the educated man, by reason of his superior training, is able to do more and harder and better work than the ignorant man. From our present standpoint the main end of education appears to be to develop as fully as possible the power of making the most of the fund of energy which is available in the individual organism after the maintenance and repair of that organism have been provided for.

We have likened the body to an army. Broadly speaking, an army is organized, equipped, fed, drilled, and led, in order that its executive machinery—which in the last analysis consists of the skeletal muscles of its soldiers—may be enabled to transform the largest possible amount of accumulated energy into the mechanical work of marching and fighting. So, in general terms, it may be said that the principal minor mechanisms found in the human body largely subserve the interests of the organs devoted to the performance of voluntary, purposive mechanical work, viz, the muscles.

EXECUTIVE MACHINERY OF THE BODY AND ITS WORK.

It is the skeletal muscles and the skeleton, then, which constitute the executive working machinery of the body. But it is important to remember that no skeletal muscle is a simple organ. Every skeletal muscle is made up of two conjoined mechanisms: a contractile, executive mechanism, the muscle proper, and a stimulating, regulative mechanism consisting of nerve fibers and gray-matter nerve cells; that is to say, "a muscle" is fundamentally a muscle and a nerve besides; or, to put it in another way, muscles are the slaves of the nerve centers. So close and necessary are the bonds existing between the muscular and nervous systems that, so far as our movements are concerned, the separate disjoined action of either system under ordinary circumstances is practically unthinkable. Muscles without their exciting nerves become inactive and inert, and nerves deprived of muscles to do their bidding are impotent.

What may be termed the gross income of the bodily community is derived chiefly from the productive activity of its purveyor and scavenger members, though the master tissues, whose leading function is the regulation of expenditures, by reason of the active copartnership existing between them and their servants, materially assist toward the accumulation of the gross-income fund. It is preeminently the function of the master tissues to turn the net income of the body to the fullest and best account, which net income is what remains from the gross income after the fixed charges for construction, maintenance, and repair have been met. To secure the wise expenditure of net income, therefore, it is needful to prevent the master tissues from developing aimless, blundering, or spendthrift habits of action. Prevention, in this instance, can only be secured through the intelligent and adequate training of the neuro-muscular system. If the development of ability to make intelligent and adequate use of the net income of man's free energy be the main end of his education, it is tolerably clear that neuro-muscular education or physical training must constitute a considerable part of the measures directed to that end.

NATURE AND EFFECTS OF MUSCULAR EXERCISE.

The primary, essential, universal factor in all forms of physical training is neuro-muscular exercise. The effects of exercise upon a single muscle are chiefly two. On the one hand there results a general condition which may be termed the heightened health of the neuro-muscular machine, which state of health involves the attainment and maintenance of a normal degree of size, strength, and working power in its structural parts; and, on the other hand, a more complex and special effect, viz, the acquisition or organization by its neural parts of advantageous habits as regards the origination, transmission, and regulation of stimuli. The effects of exercise upon the muscular system as a whole differ in degree but not in kind from the effects of exercise upon a single muscle. The habitual movements having their seat in the various groups of muscles are said to be represented by the central masses of nervous tissue through whose stimulative action the muscles are animated or innervated.

The functional improvement, i. e., the *development* of the nervous mechanisms which represent our bodily movements is the most important effect of muscular exercise or, to speak more accurately, neuro-muscular exercise. It is not altogether clear just how it comes about that through trial and repetition, i. e., through training an action which is at first a difficult feat becomes a pleasurable accomplishment, then a routine performance, and at last an almost instinctive act. But it seems reasonable to suppose that the frequent or habitual passage of stimuli from a given group of cells through definite fibers to the muscles concerned in a given movement leads to some kind of a rearrangement of the molecules composing the irritable protoplasm of fibers and cells so that less and less resistance is offered to the passage of subsequent stimuli from the same source. Somehow or other the memory of past actions and of the stimuli which evoked them becomes embedded or organized in the motor centers of the spinal cord and brain.

"The word 'training,'" says Michael Foster, the eminent English physiologist, "suggests the reflection that the physiological interpretation of becoming easy by practice is that new paths are made, or the material of old paths more mobile by effort and use. . . . We must suppose that training promotes the growth and molecular ability of the motor area and of all its connections. There are doubtless limits to the changes which can be effected, but within these limits the will, blundering at first in the maze of the nervous network, gradually establishes easy paths."

THE NEURAL AND MENTAL FACTORS IN MUSCULAR MOVEMENTS.

In this connection the following extract from "Sanity and Insanity," written by Charles Mercier, an English alienist, is introduced because of its suggestiveness with regard both to the effects of exercise upon the nervous system and to the mental accompaniments of exercise:

When a new mode of action is originated, when a novel adjustment is made to circumstances, when the organism reacts in a new manner to impressions made upon it, there must occur some new combination of nerve elements to produce the new combination of movements. The new combination of nerve elements is effected in the way already indicated when treating of the matrix or brain substance of the gray matter. Either a new set of circumstances impresses the organism, in which case a new combination of nerve currents sets inward, or an old set of circumstances impress the organism a new way, in which case the old combination of nerve currents receives a new addition on its way inward, which alters its arrangement and direction. In either case the higher centers are impressed in a way that is new, and the consequence is that instead of the usual centers being discharged in the usual ways the currents are drafted off into new directions. But it has already been shown that the channels in which currents frequently pass are channels which have become, from the effect of this frequent passage, scoured out to an appropriate caliber and able to carry the accustomed currents without leakage; while the irruption of a voluminous current into bypaths and unaccustomed channels results in its escape from the formed channels into the ground substance and the excavation of new passages therein. When, therefore, new circumstances impress us, or when old circumstances impress us in new ways, there is a tendency for the nerve currents in the

higher centers to break their bounds and to escape in new directions. Whether the tendency becomes an actuality or no will depend on whether the new element in the incoming current is of sufficient intensity and whether the brain substance is easily enough permeable. Supposing, however, that these conditions are favorable and that the current does overflow, it will find its way in some new direction to a center that has not hitherto been in the habit of acting with the center from whence the discharge comes. The consequence will be that these two centers, not hitherto associated in action, will act together—in other words, a new combination of nerve centers will be formed and their combined action will result in a new form of reaction—in new movements or a new course of conduct.

The repetition of the impression will bring about a repetition of the action, and with each such repetition of the passage of the current in the new direction the new channel which conveys the current from one center to the other will be enlarged and rendered more patent and definite in the way already described until the connection between the two centers becomes thoroughly organized and the course of action habitual. The more and more often the combined action is repeated, the more thorough and complete becomes the union between the two centers and the less and less readily does the combination of their action admit of interference from centers outside of them. By the mere force of repetition and of the definite organization which repetition brings about novel acts become habitual, habitual acts become automatic, and automatic acts become reflex.

ORGANIZATION OF NERVE CENTERS THROUGH EXERCISE.

The differences between the several degrees of consolidation are thus marked. An act is habitual when it occurs with perfect facility, but yet requires the guidance and direction of higher centers for its performance. An act is automatic when it has become so far organized that the mechanism which actuates it is complete in itself and, given the necessary impression, the action occurs without any guidance or regulation from higher centers. Such are the acts of walking, the fingering of musical instruments, the manipulation in many handicrafts, the movement of the lips and tongue in speaking. All these movements occur with a celerity and an accuracy which indicate thorough organization; all of them can be performed without direct guidance from the higher centers or while the higher centers are otherwise employed—while as we say we are "thinking of something else;" and any direct interference of the higher centers, any undue attention to the movements, tends to spoil their facility and accuracy. Lastly, when organization is complete movements become reflex; that is to say, not only do they occur on the occurrence of their appropriate stimulus, but they occur necessarily. A nerve channel is so completely formed in itself and the neighboring currents are so built out that when once the process is started it goes on to completion as a matter of necessity and no action of the higher centers can interfere to prevent or alter it. Such movements are those of blinking, of swallowing, of coughing, and the like.

Since states of mind are but the obverse side, or, as I have termed them, the shadows of nervous processes, it was to be expected that repetition, which has so great an effect on nervous processes, should have an effect equally great on the mental states; and this we find to be the fact. The law is that a new nervous process is attended by the most vivid mental state; and that the more unlike the nervous process is to previous processes the more vivid is the mental state that accompanies it. With nervous processes we have seen that continual repetition brings about complete organization—organization so complete that a very small incentive is required to start the process, and by starting the process to set the movement going. We have seen how new acts become habitual, habitual acts become automatic, and automatic acts reflex. We have now to notice that as the nervous mechanism subsides through these several stages from the nascent to the complete stage of organization, so the mental accompaniment, at first vivid, becomes fainter and fainter until when the latter stages are reached it altogether disappears. When an act has become habitual it has so little mental accompaniment that, as we put our watch down on the dressing table, we are uncertain whether the instant before we wound it up or not. It has so little mental accompaniment that on meeting a carriage in the road we draw the near rein to the required extent with scarcely a consciousness—a thought—of what we are doing. When the act becomes automatic, and still more when it becomes reflex, there is no appreciable mental accompaniment to the discharge of the center that actuates the movement, though there may be a mental accompaniment to the act itself, obtained in other ways. For instance, the fixed mechanism which actuates such movements as sneezing or swallowing is not only completely cut off from the influence of the highest centers, so that no amount of focusing or concentration of energy there—no effort, as we say, of will—can produce them; but the action of these mechanisms is attended by no mental manifestation. We know that we are sneezing and that we have sneezed by intelligence arriving from the periphery, but the instant before the

sneeze happens we can not say when it will happen or even that it will take place at all.

Hence it appears, since the most fixedly and completely organized centers are the lowest and the most recent and the least organized are the highest, that the mental accompaniment of the nervous discharge gradually increases in vividness from the lowest centers to the highest. Quite at the bottom are the mechanisms actuating directly the movements of the heart and other viscera, which are in health absolutely void of mental accompaniment; above these are the mechanisms for breathing, swallowing, and other reflex actions, and with their activity a faint glimmering of consciousness is occasionally perceptible. Above this again are layer upon layer of mechanisms actuating automatic and habitual acts of every degree of fixity, and with their action appears a certain amount of consciousness, broadening from a mere glimmer at the bottom through an ever-lightening daylight to full dawn at the top. The action of the highest centers is accompanied by the broad daylight of wakeful consciousness and occasional concentration of energy in particular tracts, and the vigorous and energetic discharge of these tracts from time to time are accompanied by mental states of exceptional vividness, which, in comparison with the usually more quiescent condition of consciousness, may be likened to bursts of sunshine on a cloudy day.

PHYSICAL BASIS OF MEMORY.

Memory is the recurrence of a mental state that has occurred before. It is, on the bodily side, the revivescence of a nervous process that has previously been active. It is obvious that this physical process may occur both in centers and channels, and so we can remember both feelings and thoughts. It has already been shown how repetition of a nervous process acts in rendering the process more facile and more rapid, and how, as facility and rapidity of the nervous process increase, the mental accompaniment diminishes; and thus we are prepared to find not only that the more often a thing has been repeated the better we remember it, but the more perfectly it is remembered the less effort, the less consciousness, we have of its remembrance; until, when memory becomes perfect it ceases to become conscious, we cease to consider it memory. Thus, I remember with effort the name of the person to whom I was introduced yesterday; I remember without difficulty the name of my friend of a year's standing; but it would be inappropriate to say I remembered that the name of this thing on the plate before me is bread. Similarly, I remember with effort the way to tie a turk's head; I remember more readily how to make a clove hitch; but it would be inappropriate to say that I remember how to tie a knot. Thus conscious memory fades and merges into unconscious memory, and the more perfect the memory is, the less of consciousness accompanies it. When memory is looked at from this point of view, as, on the physical side, the repetition of a nervous process that has occurred before, and, on the mental side, the conscious accompaniment of this process where it is a conscious accompaniment, the scope and meaning of the term become considerably extended, and a community of origin and of nature is found to exist between processes that are at first sight widely different. All automatic actions—the movements of the legs in walking, of the fingers in writing, of the lips and tongue in speaking—are actions whose memory has become perfect and therefore unconscious. The movement of the newly-hatched chick in pecking at food a few hours after birth has been called a remembrance. It is said that the chick remembers how its parents pecked; and this statement, at first sight fanciful, is, if we adopt this view of memory, almost accurate. For the chick inherits a fully formed nervous structure, which when set in action produces the movement of pecking. Such a structure can have been formed in the ancestral fowls only by continual repetitions of the act, repetitions that were at first accompanied by conscious memories and subsequently became automatic. In the newly-hatched chick the movement is evidently preceded by hesitation. It is at first tentative and imperfect, and only after repetition attains its perfect precision. Every one of the acts is, however, actuated by the repetition or revivescence or recurrence of a nervous process, and is therefore on the physical side a case of remembrance; and no one can doubt who has seen the hesitation, the deliberation, and the manifest tentativeness of the first few pecks that they are accompanied by consciousness, by conscious states, which are in such a case memories. In the same way the vast bulk of the content of our consciousness at any time consists of memories. The judgments that we continually and subconsciously form of the distances of all objects that we see around us are made up of the memories of the amount of stretching or reaching, or of the number of steps, or of the time taken to traverse the intermediate distance between us and objects similarly related to us, on innumerable previous occasions. Our ideas of the solidity, of the hardness and softness, the roughness and smoothness of bodies are similarly made up of memories of the sensations that we have had in handling objects of similar appearence and surface. It is the same with more complex judgments. Our decision as to the probable qualities of a horse is made up of memories of the qualities of horses having similar points. We decide as to the healthfulness

of a house by memories of the salubrity of other houses similarly situated, and as to the prudence of a line of conduct by means of the consequence of other lines of conduct previously pursued.

Similarly, again, on the bodily side, the skill with which we perform any operation depends upon the accuracy with which we remember the amount of previous efforts and their results and on the precision with which we reproduce them. But to reproduce an action is to have over again an activity of the same nervous process which produced it before—that is, to remember the action. From every point of view, then, we see the importance of memory, of fully conscious memory; which is the early repetition of a newly-formed nervous process, accompanied by vivid consciousness; of subconscious memory, which is the repetition, after very many times, of a well-organized nervous process, accompanied by faint consciousness, and of unconscious memory, which is the repetition, after innumerable times, of a completely organized nervous process, unaccompanied by any consciousness.

MOTOR TRAINING IN EDUCATION.

The ends of exercise may be characterized, in a general way, as first the promotion of health, and second the formation of proper habits of action. The one is a hygienic end, while the other is a distinctively educational end. It matters not whether we consider a single muscle which admits of only a single limited motion, or a group of muscles, or a complicated system of muscular organs like the organs of speech, or the communal structure we call the body, or a class of school children, or a football team, or a regiment of soldiers—the ends of exercise are practically identical in each case, and can only be attained through a combination of hygienic and educational measures.

The main field of education is the nervous system, and the principles of all forms of education into which physical training enters as a factor are based upon the power of the nervous system to receive impressions and to register them or their effects; in other words, upon its ability to memorize the part it has played in acquired movements, and on occasion to revive and repeat such movements. The student of nervous disorders notes carefully the peculiarities of his patient's movements in order to determine the seat of his injury or weakness and the nature and extent of his disease. It is equally necessary that the practical teacher should apprehend the significance of the spontaneous and acquired muscular movements of his pupils, be those movements coarse or fine; since those movements constitute an index of the action of the brain which it is the teacher's business to develop and train, and also serve to measure the success and test the character of the teacher's efforts at instruction. This is true not only of instruction in football, military drill, gymnastics, sloyd, shoemaking, and sewing, but of instruction in drawing, singing, and the three R's as well. Genuine success in any of the departments of instruction mentioned above is conditioned on the intelligence and skill of the instructor in selecting and teaching such forms of neuro-muscular action as are adapted to the sex, age, and capacity of the pupil.

The motor element in education is so large and of such vital importance that we hazard little in predicting that the systematic study of movements is destined to play a much more prominent part than has been accorded it hitherto, in the professional training of all classes of teachers. "It can scarcely be too often reiterated," says Mercier, "that the study of movements is the only means by which we can gain any insight whatever into the working of the nervous system."

As Mercier's work, The Nervous System and the Mind, contains the latest and most satisfactory study of movements that has come to my notice, I am content to follow him in developing that part of my subject which relates to the classification of movement and the hierarchical arrangement of the nerve centers which represent them.

CLASSIFICATION OF MOVEMENTS.

As regards their regional relations, our bodily movements may be characterized as central or peripheral. "By a central movement," says Mercier, "is meant, generally, a movement of the trunk. By a peripheral movement is meant, generally, a

movement of the digits, mouth, or eyes; and the remaining parts of the body are classed in an intermediate position, and in one which approximates to the central or to the peripheral, according, generally, to the size of the part moved, and the size and individuality of the muscles concerned in the movement. . . . . The movements here called central are continuous in duration, vague in limitation, few in number, same in character, and form a general, approximate or coarse adjustment. Progress toward the periphery brings us to movements that are more intermittent in duration, more precisely defined, more numerous, more diversified, and more specially adapted to particular ends; and when at the eyes, the articulatory apparatus, and the digits, we reach the extreme periphery, all these characters reach their highest degree of development."

Movements may be classified, also, as simultaneous or successive, the former being mainly central and the latter mainly peripheral in character. "Coordination in simultaneity affects the central movements first and most, spreads toward the periphery and affects the most peripheral movements last and least. Coordination in succession involves the most peripheral movements most often and in the most prolonged and complex sequences; and when, as often happens, the succession of movements begins centrally and spreads to the periphery it is the most peripheral movements to which all the others are subservient and act as aids and adjustments." As an example of successive movements beginning centrally, those concerned in vocal utterance may serve as an example. Vocal utterance is the resultant effect of the combined—i. e., coordinated—action of the organs of breathing, phonation, and articulation, which are situated in the chest, throat, and mouth, respectively. Breathing movements are central, voice movements intermediate, and articulatory movements are peripheral. The most central movements in this series present two phases—viz, inspiration and expiration. In each phase the movements of abdominal wall, diaphragm, ribs, and glottis start simultaneously, but the enunciation of consonant and vowel sounds results from rapid successive movements of the vocal cords and of the tongue and lips—results, that is, from peripheral movements coordinated in succession.

The nervous mechanisms which innervate and represent our various movements have been divided according to their situation into lower, higher, and highest level centers; and again they have been classed as fundamental or accessory according to the order of their development. In general we may say that the coarser, more central movements, are represented in lower level centers, i. e., in the more central or basal regions of the brain and spinal cord; that the centers representing intermediate movements are found at higher places in the hierarchy than those which represent central movements; and that the highest level centers, in the cortex of the brain, represent the most special, precise, elaborate, and varied of our peripheral movements.

EDUCATIONAL SIGNIFICANCE OF LAW OF EDUCATION OF NERVOUS SYSTEM.

In the evolution of the race and of the individual, the more general functions and organs are formed and developed earlier than the special functions and their organs; e. g., the circulatory and alimentary organs develop earlier than the vocal organs and the hands and feet. The same law obtains likewise in the growth and development of the nervous system, in respect both to its massive and its minute parts. The nervous mechanisms concerned in central movements are at once older and more lowly placed than the mechanisms concerned in peripheral movements. To those parts of the nervous system, in man, which are formed earliest and are practically completed and fully organized at birth, the late Dr. Ross, a leading English neurologist, gave the name "fundamental," while he designated as "accessory" those parts which are rudimentary at birth and comparatively late in their growth and development. Broadly speaking, central movements are represented by low-level, fundamental centers, and peripheral movements by high-level, accessory centers. If, as has been stated, the nervous system is the field of education, education to be natural, safe,

and effectual should defer the training of the accessory parts of the nervous system until the development of its fundamental portions has been secured by appropriate forms of general training.

As is well known, city children as a class present more cases of nervous instability than do country children as a class. I therefore venture to quote at length Dr. Ross's views as to the part which physical training should play in the education of children with tendencies to nervous instability.

The children of parents who manifest a predisposition to severe nervous disease, as hysteria and epilepsy, are frequently not merely quick in their perceptive faculties but are also often possessed of great intellectual powers, and much of their future happiness depends upon judicious mental training in youth. The children of such families ought not to be subjected to any severe mental strain during the period of bodily development, or be allowed to enter into competition with other children in the mental gymnastics which are so fashionable in our public schools. On the other hand, regular graduated and systematic exercise in the form of walking, riding, gymnastics, and calisthenics does a great deal of good by strengthening both the muscular and nervous systems. Everything which tends to develop the muscles of the lower extremities and trunk, and indeed all muscles engaged in executing the movements common to both man and the lower animals, tends also to develop the fundamental part of the nervous system, and a good sound development of the fundamental is the first prerequisite to a well-balanced development of the accessory portion.

The order of the development of the nervous system in the race has been from the fundamental to the accessory portions; and no one can reverse this process with impunity in that further development of the individual which constitutes education in its widest sense. Yet until a few years ago the natural order of development was reversed in the education of youth, and especially in female education, so far as this could be accomplished by human contrivance and ingenuity. The natural order of development was indeed observed so far as to allow the child to acquire the power of walking prior to that of other accomplishments; but the care of the infant had not yet been transferred to the professional trainer. No sooner, however, had what is technically called education begun, than the professional trainer began to exercise the small muscles of vocalization and articulation so as to acquire the art of reading, the muscles of the hand so as to acquire the art of writing, and in the case of young ladies the still more complicated movements necessary in running over the keyboard of a piano; while little attention was paid to the development of the larger muscles of the trunk and lower extremities, upon the full development of which the future comfort of the individual depends.

In the education of youth in the present day the laws of development and physiology are not so openly violated and defied as they were a few years ago; but much remains to be done in this respect, and especially in the education of children of families who manifest a neuropathic tendency. In the children of such families the greatest possible care should be taken to develop carefully the fundamental actions, inasmuch as a sound development of these involves a stable construction of the fundamental part of the nervous system; a process which makes the latter to offer a greater specific resistance to the paroxysmal discharges from the later evolved centers of the accessory portions which underlie hysteria, epilepsy, and even many of the psychoses. The process of educating the accessory system, and especially the higher centers of that system, should be regular and systematic; habits of mental scrutiny and self-examination—which, unfortunately, too many religious teachers deem necessary for the welfare of the soul—ought to be discouraged. In one word, education should be made as concrete and objective as possible.

If this be true, and who shall gainsay it, is it not evident that educational measures of every kind should be selected and coordinated so as to conform to the order and rate of growth and development of the fundamental and accessory neuro-muscular mechanisms of the child and the adolescent?

The law of the evolution of the nervous system seems to me a sure and serviceable criterion of the worth and propriety of educational procedures of every kind, since it affords a means of comparing our conventional methods of educating the individual with nature's method of educating the race.

Is it too much to ask that educationists should recognize, ponder upon, and be guided by the laws of development which determine the health and power of the brain centers, and the health and efficiency of the servants and ministers of those centers, namely, the skeletal muscles? It is true, doubtless, that the laws of devel-

opment are recognized, in a way, in the conventional division of schools into elementary, secondary, and superior; but it is no less true that the bodily and mental characteristics which differentiate children from youth, and both from adults, are deserving of more careful study and much fuller recognition than they have received hitherto from teachers as a class, or from those charged with the appointment and control of teachers.

GROWTH AND DEVELOPMENT DURING IMMATURITY.

Our "earthly pilgrimage" embraces three stages, viz, (1) that of evolution or immaturity, which is par excellence the period of growth or increase in size, of development or improvement and increase of functional powers, and of storage of energy; (2) that of maturity or completed development, in which growth and development proceed more and more slowly till they cease, a period of productive activity, of balanced income and expenditures of energy, and (3) that of dissolution or decline, marked by excess of expenditure of energy, by weakened and decaying functions, and by wasting and degeneration of organs and tissues.

Growth and development characterize the stage of immaturity, as has been said, but since development waits upon growth, the two processes vary in amount and rate in different parts of that stage, considering the body as a whole. Nor should it be forgotten that the several somatic and special mechanisms of the body differ in respect to the order and rates of their growth and development. If the education of children and youth shall ever become thoroughly natural and rational, it will be because the significance of that order and rate, and their relations to life and death, is recognized and heeded to an extent that is nowhere common as yet.

The leading somatic organs emerge from the rudimentary chaos of early fœtal life in the following order, practically speaking: The brain and nervous system; the alimentary system; the circulatory and respiratory systems; the muscles and the skeleton. And after birth the brain maintains its lead both in growth and development over the muscles, until the period of second dentition, at 7 to 8 years of age, when the brain weighs, within a narrow margin, as much as it ever will. "The difference between what the brain of the child of 8 and the brain of the man of 25 can do and can resist is quite indescribable. The organ of these two periods might belong to two different species of animals so far as its essential qualities go," says Dr. Clouston in his Neuroses of Development.

In the brain the parts which preside over the sense organs appear sooner and develop earlier than do the parts which control the motor organs. Complete development of motor ability does not and can not take place until the muscular instruments or end organs of the motor brain centers have attained full growth, which is not accomplished till puberty. The skeleton is not fully consolidated until the twenty-fifth year.

Increase in height is chiefly an increase of length in the skeleton, and growth in weight consists mostly of increase in the weight of the muscles. The adult body is about three times as tall and twenty times as heavy as that of the infant at birth. Certain facts relating to the growth rate of some of the leading somatic organs may be cited here. The following figures, showing the changes brought about by growth, during the stage of evolution, in the ratios of the weight of the brain, the muscles, and the skeleton to the total body weight, are taken from Foster's Text-Book of Physiology:

Weight of—

Brain in new-born babe equals 14.34 per cent, in adult equals 2.37, of body weight.

Skeleton in new-born babe equals 16.70 per cent, in adult equals 15.35, of body weight.

Muscles in new-born babe equals 23.40 per cent, in adult equals 43.10, of body weight.

In other words, in the adult the brain is 3.7 times, the skeleton 26 times, and the

muscles 48 times heavier than at birth. It is obvious that if the musculature fails to attain its normal size and weight, the body can not attain its full size and weight. It is scarcely necessary to urge in the face of such facts that well-directed muscular exercise may powerfully promote normal bodily growth.

PERIODS OF IMMATURITY AND THE CHARACTERISTICS.

The stage of evolution or immaturity is of paramount importance, since the formal education of the vast majority of the pupils in our elementary and secondary schools ceases long before maturity is reached. This stage may be roughly divided into three equal periods of eight years. Both growth and development proceed during each period, but growth preponderates in the first and second and development in the third period. The salient features of each period may be grouped as follows:

First period, from birth to the close of the eighth year.—The whole body grows rapidly in the first two years of life, more particularly in the first year, but it is the "immense" growth of the brain, which attains its full weight within a few ounces in the eighth year, that signalizes this period most markedly. In the domain of development the sensory organs take the lead and reach a high degree of perfection, though certain of the most essential neuro-muscular mechanisms concerned in the coordination of relatively central movements also undergo active development, e. g., those concerned in equilibration, locomotion, and vocal utterance. The child is imitative, inquisitive, and acquisitive; but his perceptive powers and his memory develop faster than his powers of discrimination and expression. During this period sensory education may safely be diversified and somewhat specially emphasized; but motor education should be of a more general and elementary character.

Strenuous and exacting "drill," especially of the intermediate and accessory mechanisms, is contra-indicated for the child. Both games and gymnastics yield valuable results if they are intelligently selected and conducted; but the first should be easy and simple and the second elementary in their character.

Second period, from the beginning of the ninth to the end of the sixteenth year.—This is distinctively the period of most rapid growth in height and weight. In increase of weight the muscles play the leading part. Motor coordinations reach a higher degree of development than was possible during the preceding period, though they are not fully perfected till adolescence is nearly completed. "The process of perfecting motor coordinations can not be said to be complete," says Dr. Clouston, "while the awkward, ungraceful motions of hobbledehoyhood last, and until we reach the grace and poetry of body motion of the maiden of 23 and the dexterity, force, and swiftness of coordination of eye, hand, and body seen in the male cricketer or lawn-tennis player of 25." As Dr. Clouston has pointed out, one of the most marked features of this period is the coordination of motion and emotion.

In this period the individual diverges from the neutral condition of childhood and takes on the distinctive characteristics of youth or maiden. The changes in body, mind, and character which result from the establishment of puberty are profound and lasting in both sexes, though in this period they transpire more rapidly and proceed further in the gentler sex—i. e., females in comparison with males are precocious in their growth and development.

Self-consciousness is awakened, self-confidence is quickened, and new impulses, appetencies, and ambitions arise which prompt the adolescent to try all things and everybody. The child yields to authority and accepts dicta with comparatively good grace; but the youth demands reasons and must be convinced, or at least persuaded, by his teachers and governors; he may be led, but he resists being driven. Educational methods, therefore, particularly during the second half of this period, should savor more of incitement than compulsion. The formal education of the great majority of public-school pupils terminates in this period, since so soon as they are fairly well-grown their services become marketable. Those who are destined to the ruder forms of labor or the humbler crafts and occupations enter the lowest ranks of wage-

earners, while as yet the privileged youth selected by their parents or by circumstances to engage in pursuits which demand special aptitudes or technical training are too undeveloped, in most instances, to make rational choice of a vocation, and much less to engage in professional pursuits or the higher crafts.

On the whole, since the period of most active growth appears to be followed by one of comparative exhaustion, when the organism is peculiarly susceptible to disturbing and deterrent influences, the second may be considered, from the hygienic standpoint, as the most critical of our three periods. Exhausting constitutional disease, excessive mental or bodily exertion, underfeeding, ill-judged deprivation of muscular exercise, may readily lead to irremediable stunting or enfeeblement, especially in those who are city born and city bred. If physical education be neglected or misdirected during this period, if it be deferred to a more convenient season, it can not accomplish its perfect work, either as regards the promotion of health or the development of the motor powers of the brain.

The main general departments of physical education should be systematically availed of, i. e., both gymnastic training and athletic pastimes should be given a prominent place in the school curriculum, and the forms of exercise selected should be more varied, complicated, and difficult than those employed in the previous period. But the time for engaging in feats or contests that demand extraordinary strength, endurance, or skill is not yet.

Third period, from the beginning of the seventeenth to the close of the twenty-fourth year.—This, the period of established adolescence, is distinctively a period of development—of development of character as well as of bodily and mental faculty. The life of the race begins to be reflected in the life of the individual, to whom a higher and wider range of activities is opened through the development and perfecting of his higher fundamental and accessory neuro-muscular mechanisms. Emotion is coordinated with self-chosen aims and ideals; self-directed actions increase in number and effectiveness, and the individual is prepared by special forms of technical training to enter upon his life work as an adult, independent member of society.

The muscles, which are to serve as the executive instrument of the brain, do not attain full growth till toward the end of the second period. Then, when both brain and muscles are fully grown, neuro-muscular development enters upon its most active and important stage, i. e., in the third period. Measures that directly promote growth are mainly hygienic measures, and measures that directly promote development are mainly educative. An intelligent combination of hygienic and educative measures is called for, both in the sensory and motor education of the individual, during each and all of the three periods; but as regards physical education during the whole of the first and the first half of the second period, hygienic forms of exercise should preponderate, while during the last half of the second and the whole of the third period educative forms of exercise should be assigned the leading part—provided that practically normal growth and sound health have been secured to start with.

Attempts at tours de force, trophy winning, and record breaking, which would be ill-judged at an earlier stage, may now be profitably encouraged—within reasonable limits—in the case of well-developed and well-trained gymnasts and athletes. Doubtless there are valid objections to be urged against rampant athleticism. Nevertheless, the predilection of collegiate youth for athletic sports and contests may be justified as natural and fitting by the teachings of neurology and psychology, if once it be admitted that the development of mind and character, as well as that of the brain and muscles, is subject to the laws of evolution. The average collegian, if a healthy animal, is apter at expressing himself fully in terms of muscularity than in terms of mentality. Intellectual maturity comes later, unless arrested development supervenes. It can hardly be considered a misfortune that, in the heyday of youth, the sons of civilized men tend to exhibit in their games something of the hardihood, daring, and contentiousness which characterized the principal pursuits of their primitive, beast-hunting, war-making ancestors.

PHYSICAL TRAINING VERSUS PHYSICAL CULTURE.

Elementary education is naturally assigned to the first and second periods. Secondary education usually begins in the second, and either terminates in the third or merges into superior or technical education. According to the statistical tables contained in Superintendent Seaver's last report, the elementary public schools of Boston on January 31, 1897, included upward of 93 per cent of all the pupils in the day schools, while less than 7 per cent were found in the secondary schools. Classifying the 71,949 pupils in question in accordance with the age scale used above, it appears that 27.9 per cent of them are in the first, 66.2 per cent in the second, and only 5.7 per cent in the third period of immaturity. It is plainly obvious, then, that the main work of our schools is elementary and general, and that training and not culture should be their end and aim. Culture presupposes and is based upon fully developed and disciplined powers, which are precisely the powers that the pupils in elementary and secondary schools lack. It is, therefore, a misleading use of language to apply the term "physical culture" to school gynastics and school sports. Physical training is what our school children need, but have never had in the measure adequate to their needs. It may be that the day will come when our colleges and universities will undertake the "physical culture" of their students; but their efforts will be barren and fruitless unless they shall first induce the secondary schools to do what comparatively few of them even pretend to undertake at present, viz, provide intelligently and adequately for the physical training of the youth they profess to educate.

It seems to me that, as it is generally employed, the term "physical culture" is a misnomer, and that it had better be eschewed when one undertakes to discuss the forms of muscular exercise that are best adapted to meet the needs of pupils in elementary and secondary schools, since it is not properly synonymous with the terms "physical training" and "physical education," which are interchangeable according to the best usage. Moreover, as usage varies not a little with regard to the two terms last mentioned, it may be well to consider their significance before proceeding further. The term "physical education" has been frequently employed to signify all such measures as are classed by the best writers, along with exercise, under the head of personal hygiene, e. g., dress, diet, bathing, etc. When employed in this sense, the term manifestly means too much, whereas when physical training is made to include only such particular forms of exercise as respiratory gymnastics, elocutionary drill, Delsarte exercises, massage, posturing, the manual of arms, cudgel or sword play, or the inchoate games that serve for the recreation of school children at recess time, the term means too little.. For our present purpose physical training may be defined as "the regulated practice of some form of muscular exercise under such conditions as serve to promote the health of the organism or to develop and discipline its motor functions, either in a general or special way."

MEANING AND IMPORTANCE OF PHYSICAL TRAINING NOT GENERALLY APPREHENDED.

If it be true, as I have endeavored to show in the preceding pages, that the neural element is a necessary and dominant factor in muscular exercise, so called; that muscular movements serve as an index of the constitution and condition of motor brain centers, and may be made to serve as a means of securing the orderly and natural growth and development of those centers; that there is a definite order of evolution in the neuro-muscular mechanisms, as in the other somatic organs, and that the ages of more than two-thirds of the pupils in the public schools fall within the period just mentioned, it will hardly be gainsaid that the principles underlying systematized muscular exercise—which is physical training—are worthy of serious and careful consideration from all who are intrusted with the responsibility of determining the policy or of administering the practical affairs of elementary and secondary schools.

It is implicitly and explicitly denied by many that education is a science as well as an art. American educationists, as a class, have been rather disinclined to accept and apply the plain teachings of modern physiology and psychology with regard to the natural history of man and the mutual interdependence of his bodily and mental parts. It is perforce a slow and difficult matter for a class, many of whose leaders are not fully emancipated from the thraldom of an arrogant and overweening humanism, to readjust their aims and methods so that they shall harmonize with the results of proven science. It is vastly easier for them to regard the rising generation as mere adults in miniature, and to judge, admonish, and instruct children and youth in accordance with the standards of mental and moral excellence that obtain among men and women than it is to ascertain the essential characteristics which differentiate the child from the youth and both from adults, and to employ only such methods as are natural and appropriate to the age, sex, and individual peculiarities of their pupils. Moreover, "practical educators" have been loth to admit the legitimate claims of physical education, either as a branch of practical hygiene, or as a pedagogic discipline, for the reason that the subject has been ridiculously exploited at times by doctrinaires and dabblers as a safe, sure, and speedy means of hastening the millennium.

The motor element in all forms of instruction and practice is so large and vital; physical education has so many points of contact and such numerous and intricate relations with mental and moral training; the range in which its principles are applicable is so wide and diversified; and critical, comprehensive views regarding its nature and limitations are so little in demand that the larger and more weighty claims of physical training to the dignity and privileges of a coordinate department of education easily fail of recognition in the confusion due to the conflicting and often preposterous claims of the partisans of one or another "system" on the one hand and of self-elected "professors" and practioners of one or more of the thousand and one minor subdivisions of physical training on the other.

GENERAL AND SPECIAL FORMS OF PHYSICAL TRAINING.

Inasmuch as muscular exercise is resorted to for a variety of purposes, its aims may be classified as recreative, hygienic, educative, and remedial. In its wider sense physical training, therefore, includes childish games, athletic sports, gymnastics, manual training, and all forms of exercise that are employed, of set purpose, to develop motor ability of a special or professional sort. Success in language training, or in military, manual, and industrial training, is conditioned on the intelligence and skill with which the principles of physical training are applied by the teachers of those arts; since it is only through the assiduous drilling of their neuromuscular mechanisms that actors, elocutionists, musicians, marksmen, draftsmen, and penmen, as well as plowmen, boatmen, soldiers, and craftsmen are enabled to acquire their technique.

The great majority of the pupils in our schools are too unripe to profit from such mental training as is mainly technical; accordingly our schools are wisely organized for general and preparatory training. In the domain of physical education it is equally important not to confound general and special training either in thought or practice. Reason and experience forbid the substitution of military drill, sloyd, manual or elocutionary training for gymnastic and athletic training, or vice versa. It is unfortunate, to say the least, that the ardent advocates and promoters of specialized forms of motor education so often fail to appreciate the necessity of conforming their measures and methods to the laws of nature. The introduction of sloyd and manual training and of military drill into the curriculum of urban schools enhances and intensifies the need of school gymnastics and athletics, since it is demonstrable that sloyd, manual training, and the manual of arms, unless they are based upon and accompanied by sound bodily training of a more general nature, tend to produce awkwardness and deformity. Competent experts in surgery,

ophthalmology, and hygiene have shown that the customary systems of school seating and the conventional methods of teaching penmanship are largely responsible for much of the impaired vision and spinal curvature found among school children. It is devoutly to be hoped that such intrinsically valuable branches of physical education as sloyd and manual training shall not, through haste and heedlessness, be rendered liable to similar criticism and attack.

Physical training, though an ancient art, is so new a science that even its most zealous advocates must admit that very much remains to be done before an exhaustive and absolutely satisfactory statement as to the hygienic and educational values of its leading general and special forms can be drawn up; but this condition of affairs does not justify indifference or aversion to efforts already initiated in various parts of the world for making good the losses which accrue to city children, as a class, from the deprivation of adequate facilities for play and exercise in the open air. Enough is known and has been proved by experience with regard to the nature and effects of muscular exercise, to warrant much more vigorous and comprehensive measures than have been taken as yet in any American city to secure the benefit of appropriate forms of physical training to the pupils in all grades of the public schools. To this end all efforts to add to the number of baths and of swimming schools, of playgrounds and gymnasia, or to enhance the efficiency of those we have, should be heartily seconded and promoted. If it were more generally the custom in American, as in many foreign cities, to provide the public schools with spacious grounds, well adapted to serve as play and gymnastic grounds, our school yards could be made much more serviceable than is at present possible in the interests both of formal and informal physical education.

Experience shows that out-of-door games, athletic sports, and systematic gymnastics are the forms of exercise which yield the best results in the physical training of school children. The plays of the kindergarten, the athletic sports to which British and American youth are so devoted, and the systematized gymnastics of the Swedes and Germans have all developed from one germ—from healthful play; the vital energy of that germ is found in the universal and ineradicable impulse of all healthy children to play.

CHARACTERISTIC FEATURES OF ATHLETICS AND GYMNASTICS.

In the athletic sports of young men we see the highest and fullest expression of the play instinct. The most essential difference between athletics and gymnastics is one of aim. The aim of athletics, unless they are of the illegitimate professional sort, is pleasurable activity for the sake of recreation; that of gymnastics is discipline or training for the sake of pleasure, health, or skill. We have but to compare the aims, methods, and results of each, and to call to mind the characteristics of the peoples that have most affected athletics on the one hand and gymnastics on the other, to perceive that gymnastics are more highly developed and present more features of educational value where large numbers are concerned. Gymnastics as compared with athletics are more comprehensive in their aims, more formal, elaborate, and systematic in their methods, and are productive of more solid and considerable results under the artificial and restrictive conditions of city life. I have no disposition to disparage athletic sports. I would that they were more general and better regulated than they are in our country. I believe that they are valuable as a means of recreation, that they conduce to bodily growth and improvement, and that their moral effects may be of great value, since they call for self-subordination, public spirit, and cooperative effort, and serve to reveal the dominant characteristics and tendencies as regards temper, disposition, and force of will of those who engage in them. But athletics bear so indelibly the marks of their childish origin, and are so crude and unspecialized and expensive in their methods, as to render them inadequate to meet the requirements of a thorough-going and comprehensive system of bodily education. The requirements of such a system demand a judicious admixture of

sports and gymnastics, of free play and formal guidance, to the end that each may help and reinforce the other.

No comprehensive system of physical training can be considered safe or rational whose exercises are not chosen and ordered so as to meet the varied and changing needs in respect to their sex, age, health, strength, and mental capacity of the individuals to be trained. The results which should be secured by such a system are briefly these: Easy and graceful carriage of the head and limbs; a broad, deep, and capacious chest, in which the heart and lungs, developed to their normal size and strength, shall have free, full, and regular play; square shoulders; a straight back; fully developed and well-rounded limbs, and the power to execute with ease, precision, and economy of force such movements as are involved in habitual actions, in the simpler exercises calling for strength and skill, and in the performance of ordinary gymnastic and athletic feats.

IMPORTANCE OF EDUCATIVE ENDS OF PHYSICAL TRAINING.

It is well to emphasize the beneficial effects of muscular exercise upon the nutrition of the body and its component parts, since in the last analysis health is very largely a matter of nutrition. I am not disposed to deny that ample justification for making physical training a coordinate branch of instruction in city schools is to be found in the undoubted efficacy of muscular exercise to promote general bodily health; but equally weighty arguments for the efficient organization and generous support of physical training may be derived from the educational value of systematized muscular exercise. Indeed, I am convinced, both from reflection and observation, that the hygienic ends of physical education can not be attained in full measure by instructors and trainers who do not recognize and strive to realize its educative ends as well.

Most teachers, unfortunately, derive their notions of exercise from text-books on physiology, since hitherto the normal schools have failed, for the most part, to furnish their pupils with sound and thorough instruction in either the theory or the art of physical training.

Says the late Du Bois-Reymond, for many years the professor of physiology in the University of Berlin:

> We seek in vain in most physiological text-books for instruction respecting exercise. If it is given, only the so-called bodily exercises are generally considered and they are represented as merely exercises of the muscular system; therefore it is not strange that laymen in medicine, teachers of gymnastics, and school-teachers believe this. Yet it is easy to show the error of this view, and to demonstrate that such bodily exercises as gymnastics, fencing, swimming, riding, dancing, and skating are much more exercises of the nervous system, of the brain, and spinal marrow. It is true that their movements involve a certain degree of muscular power; but we can conceive of a man with muscles like those of the Farnesian Hercules who would yet be incompetent to stand or walk, to say nothing of his executing more complicated movements. For that we have only to add to our conception the power of arranging the motions suitably, and of causing them to work harmoniously. . . . All the bodily exercises we have mentioned above are not mere muscle gymnastics, but also, and that preeminently, nerve gymnastics, if, for brevity, we may apply the term nerves to the whole nervous system. . . . Man is adapted to self improvement by means of exercise. It makes his muscles stronger and more enduring; his skin becomes fortified against all injury; through exercise his limbs become more flexible, his glands more productive; it fits his central nervous system for the most complicated functions; it sharpens his senses; and by it his mind, reacting upon itself, is enabled to augment its own elasticity and versatility.

If we once admit, as we must, that thought and feeling, judgment and volition, are inexpressible and ineffectual except through motor acts, and that motor acts are animated and controlled by the central nervous system, the inference is clear that physical training is an essential element in the development of mental health and power. Since motor acts, like mental acts, vary greatly in their nature and effects, equal educational value is no more to be ascribed to all forms of physical training than to all forms of mental training. This is tacitly recognized in practical life.

Thus the technique of the plowman or the wood chopper is more readily acquired and commands a lower wage than that of the violinist or the surgeon, just as the habitual mental operations of the bookkeeper are of a lower order and less highly prized than those of the engineer or the astronomer. The principles of physical training are applicable throughout a wide and varied field, since those who aim at intellectual pursuits, no less than those who are destined to become day laborers or mechanics, stand in need of physical training of a general nature, to the end that they may have vigorous health and serviceable muscular powers; and both classes also require instruction and practice in such forms of technical motor drill as pertain to their several callings. Broadly speaking, though the various general and special forms of physical education may differ much in respect to the manner in which certain customary forms of procedure are combined and accentuated, still the leading principles of physical training are essentially the same in kind in all its branches. If teachers of reading and of foreign tongues, as well as those of writing, drawing, and of manual training, were more apt at recognizing and turning to account the principles of physical training which are demonstrably applicable in their respective subjects, there would be less insensitiveness and indifference, both among the leaders and the rank and file of the educational armies of the United States, to the just claims of gymnastic and athletic forms of physical education to a dignified and influential place in the scientific order of our times.

PLACE AND SCOPE OF PHYSICAL TRAINING IN EDUCATION.

Moral, mental, and physical training, each and all, aim at developing the faculty or power of action—of acting in accordance with a rule of right and wrong, of acting intelligently, so that action and the ends of action shall be adapted to each other; of acting easily or with the greatest economy of force; *i. e.*, so that energy shall not be wasted in purposeless, irrelevant, roundabout, or self-defeating movements. This suggests closer relations and interrelations between physical, mental, and moral training than are usually recognized by teachers, or the trainers and governors of teachers. Since physical training aims at perfecting the body as an instrument and at rendering it the willing, prompt, and efficient servant of an intelligent mind and a sensitive and enlightened soul, it can not be gainsaid that physical training lies at the foundation of mental and moral training, or that it enters and must enter as a more or less prominent and necessary factor into a great number of our educational procedures. The full success or failure of physical training, therefore, does not relate simply to the size or strength of the red meat we call muscles, but is measured in part by our achievements in the domain of mind and the domain of conduct. In other words, we judge of the mental and moral worth of a man by the purpose, number, consecutiveness, and skillfulness of his ordinary and extraordinary acts, which acts, when viewed objectively and concretely, are reducible to the contractions of muscular fibers.

Modern education presents many vestigial features that bear witness to its descent from mediæval and ancient origins. Of old, when the learned class was made up chiefly of readers to whom was given the name of clergymen, the church enjoyed a natural monopoly of education in its technical sense. The church's claims to authority were based on written documents. Most of the world's books belonged to churchmen, or had been written by churchmen. Naturally enough, the clergy became the recognized teachers of the literary arts of expression and interpretation, and were inclined unduly to exalt those arts at the expense of the painful, objective study of nature and of man.

Though the control and conduct of educational affairs has been secularized in a large measure, the inner purpose and guiding principles of elementary and secondary education are still strongly tinctured by antiquated conceptions and scholastic dogmas regarding human nature and the means of influencing and developing it. The unwillingness of many educationists to accord science a coordinate place in the scheme of liberal education, and the general indifference, not to say aversion, of the

responsible managers of popular education to the just claims of bodily training, are forcible reminders of the strength and vitality of traditional views and conventional methods.

The medical profession, by its revolt against the tyranny of speculative philosophy and theological dogmatism, has succeeded in securing freedom of thought and teaching within its own domain. It has thereby rendered important service to the cause of superior education. It would seem that the opportunity for the medical profession to exercise a wise and helpful influence upon popular and secondary education, particularly in respect to school hygiene and physical training, grows constantly larger and more inviting. Educationists, as a class, apprehend but feebly the teachings of modern science with regard to the interdependence of mind and body. To whom should they more appropriately turn for light and leading than to the leaders in medicine, who have done so much for the enlightenment and improvement of mankind?

EDUCATIONAL BEARINGS OF MODERN VIEWS OF THE NERVOUS SYSTEM.

Among the medical sciences neurology, by reason of its teachings concerning the nature and functions of the neural and neuro-muscular mechanisms, bears most directly upon educational theory and practice. Laurie, a well known Scotch writer on education, has put forth a serviceable statement of the modern ideal of education. "By education," he says, "we mean the training of a man with a view to make him all that he can become. * * * The education of a child is the bringing of him up in such a way as to secure that when he is a man he will fulfill his true life; not merely his life as an industrial worker, not merely his life as a citizen, but his own personal life as a citizen through his work and his citizenship." And he goes on to say that the attainment of the ethical end of education must be considered "from the point of view not only of the growth of mind, but of the growth of body; for we have not to train up a soul, says Montaigne, nor yet a body, but a man, and we can not divide him."

How inadequate and ill-adapted the old neurology was to serve as a rational basis for the modern civic ideal of education may be guessed from the following extract from Prochaska's De Functionibus Systematis Nervosi, written more than a century ago:

> We have disputed strictly enough whether the soul be matter or brain, whether thought be an electric fire or a movement of the vital spirits; whether souls form their bodies; whether they are diffused through them or dwell only in the head; whether souls and bodies exercise a real or ideal influence on each other; whether an instinctive impulse or a passion belongs to the body or the soul; or whether the vital spirits be elastic or inflexible, electrical or etherial, etc. All these inquiries will remain forever inscrutable mysteries, and do not belong to our subject. They can remain altogether uninvestigated without any disadvantage to the real usefulness of theoretical medicine, but we have pursued them with profitless diligence, and have done our best to confuse them more and more.
>
> How much have we effected in resolving questions useful to our art, as, for example, in determining by what laws the mind moves the machinery of the animal organism? Under what circumstances the nerves excite sensation? Under what the sensation becomes an animal, moving force, so as to move this or that limb in such a manner and not otherwise? After what laws the imaginations, the conceptions of the understanding, pleasure, pain, the instincts, the passions, and the will impel various portions of the animal to perform the actions intended by the Creator in uniting the machine with a thinking force?

Contrast with the above the following statements of modern neurological doctrine taken by way of illustration and almost at random:

> While the physical function of the nervous system is the redistribution of force, mainly by the production and regulation of muscular action, the psychological function of this system is mainly the production of muscular movements. * * * The physiological function of the nervous system is to adjust the processes that occur in the organism to one another. But the psychological function of the nervous system is to adjust the processes that occur within the organism to the conditions that exist

outside of it. * * * Briefly, the study of the psychological functions of the nervous system is the study of conduct. (Mercier, The Nervous System and the Mind.)

The "nerve-center" of mammalia and of man is a collection of nerve centers, with more or less diverse special offices under their control, communicating each with the other upon occasion, yet separately active upon other occasions—variously organized through past excitations, yet still variously organizable by excitations to come. To-day the state and disposition of organs and of the organism are the product of the past, immediate and remote, individual and ancestral. To-morrow and in the distant future they will become what they may be made to become by training, by education, and by new conditions of life. (Waller's Physiology.)

The order of the development of the nervous system in the race has been from the fundamental to the accessory portions, and no one can reverse this process with impunity in that further development of the individual which constitutes education in its widest sense. (Ross, Diseases of the Nervous System.)

Now, the flower of the human organism is the highest portion of the nervous system. It is the region in which development attains its supremest height. All the rest of the body is but, as it were, the foundation of and preparation for the highest nervous regions. The body is but a house for them to live in, an apparatus for them to act through, an organization for them to control. They are the culmination and climax of the process of development. Hence, if development is not carried far enough, if it fails to reach its latest stages, if its forces are spent ere its full course is run, the part whose development will fail to be attained will be the highest nervous regions. And what is the evidence? The evidence is that in close inbreeding, not only do the late offspring of such inbreeding fail to reach the full size and stature of their race, but the highest nervous regions fail to attain the development normal to that class of organisms. They are idiotic. Inbred fighting cocks stand to be cut up without making any resistance. The inbred pigs have not sense even to suck. (Mercier, Sanity and Insanity.)

All human education aims at the control of inherited and acquired reflexes through intelligent and reasonable motives. (Kussmaul, Störungen der Sprache.)

Education consists in modifications of the central nervous system. In its size and development the central system is precocious. Long before birth all the cells destined to compose it are already formed, though by no means all are developed, in the sense that they have acquired the form and connections characteristic of those at maturity. . . . In the development of the central system it is found that an anatomical framework is first formed. In this framework are represented in outline the nerve structures whose functions are most fundamental. These with later growth are locally strengthened and organized, and by the establishment of associative paths gain both a wider influence and a greater complexity of reaction. . . . Since the special senses first become useful the various reactions of the individual are customarily associated with one or another of them. . . . With the refinement in sense perception and the accompanying central changes comes a corresponding increase in the control of the motor elements, and in these latter an increase in the strength, accuracy, and readiness with which they respond. . . . Education must fail to produce fundamental changes in the nervous organization, but to some extent it can strengthen formed structure by exercise, and in part waken into activity the unorganized remnant of the dormant cells. No amount of cultivation will give good growth where the nerve cells are few and ill-nourished, but careful culture can do much where there are those with strong inherent impulses toward development. On neurological grounds, therefore, nurture is to be considered of much less importance than nature. (Donaldson, The Growth of the Brain.)

The body of the accomplished man becomes by training different from what it once was, and different from that of the rude man; it is charged with stored virtue and acquired faculty which came away from it unceasingly. . . . The special laws of inheritance are, indeed, as yet unknown. All which is clear is that there is a tendency, a probability, greater or less according to circumstances, but always considerable, that the descendants of cultivated parents will have, by born nervous organization, a greater aptitude for cultivation than the descendants of such as are not cultivated, and that this tendency augments, in some enhanced ratio, for many generations.

I do not think that any who do not acquire this notion of a transmitted nerve-element will ever understand the "connective tissue" of civilization. We have here the continuous force which binds age to age, which enables each to begin with some improvement on the last, if the last did itself improve, which makes civilization not a set of detached dots, but a line of color, surely enhancing shade by shade. (Bagehot, Physics and Politics.)

It were idle to assert that the modern doctrine of the human body admits of final and complete statement. It is equally idle to deny that the salient teachings which are embodied in that doctrine are too little heeded in the nurture and admonition of the rising generation. The teachings and implications of modern neurology are, I submit, sufficiently clear and definite to warrant the claim that physical training, by reason of its neuro-muscular element, lies at the basis of human education, and of necessity enters into and interlocks with what for convenience is customarily termed mental and moral training. By physical training I mean, as I have said, the more or less regulated practice of some form of "muscular exercise," under such conditions as serve to promote the health of the organism or to develop and discipline its motor functions, either in a general or a special way.

Viewed in the light of the modern doctrine of the human body, the office of the teacher of youth, be he a teacher of morals, of literature, or of gymnastics, possesses a new and heightened significance. Though education as at present organized is largely traditional in its aims and mechanical in its methods, there is increasing reason to hope that it will be transformed by the modern spirit till it shall become a science based upon the science of human nature, and shall cease to be an empiric art, mainly shaped and ruled to accord with the dreams of speculative thinkers, the precepts of priestcraft, and the maxims of the market and the caucus.

The problems of education are mainly problems of evolution, problems concerning growth and development. The new education will be conceived and ordered as a biological science—as the quintessential of the biological sciences. Then will the teacher strive to play the part of an intelligent, loyal, efficient coworker with nature in so shaping and ordering nurture that the child shall develop naturally and fully into a healthy, vigorous, intelligent, active, God-fearing citizen of the world.

Lord Bacon closes the announcement of his Instauratio Magna with the following invocation: "When Thou hadst surveyed the works which Thy hands had wrought all seemed good in Thy sight, and Thou restedst. But when man turned to the works of his hands, he found all vanity and vexation of spirit, and experienced no rest. If, however, we labor in Thy works, Thou wilt make us to partake of Thy vision and Sabbath; we therefore humbly beseech Thee to strengthen our purpose, that Thou mayest be willing to endow Thy family of mankind with new gifts through our hands and the hands of those in whom Thou shalt implant the same spirit."

What higher privilege or reward can the student or teacher seek than to be enabled "to endow the family of mankind with new gifts?"

TYPICAL FORMS OF PHYSICAL TRAINING AND THEIR CHARACTERISTICS.

The most representative and typical forms of physical training are five in number, and may be styled, (1) the Grecian, (2) the mediæval or knightly, (3) the British, (4) the German; and (5) the Ling or Swedish.

In comparison with the five main types or national systems of exercise, mentioned above, all other schemes and so-called systems of physical education seem to me to be fragmentary, anomalous, and insufficient. Provided we apprehend the lessons of experience and the teachings of science with regard to the essential character and comparative worth of the results attained by each of these national systems of bodily education, we shall be able to classify and criticise, with approximate justness, the numerous varied, and often fantastic, new and local schemes of exercise, whose inventors and partisans are on every hand clamoring loudly and insistently for recognition and support.

It will be convenient to use the terms agonistic, gymnastic, and athletic in speaking of the most general features of the five types of physical training under review, these terms being derived from Grecian usage. An ἀγών meant originally an assembly, then an assembly to witness a contest of some sort. For instance, the Olympic games were gymnic agones, being so called because the contestants in them were naked; then there were musical and hippic agones also. The prizes given to

victors in an ἀγών were termed ἆθλα, and an athlete was a winner or contestant in an agone simply; later, in its worse sense, an athlete was a prize-fighter, governed by professional and mercenary ends. A gymnast was a trainer primarily, especially after the agonistic games had become systematized and regulated, and were practiced as a necessary part of the education of every freeborn youth.

Greek physical training was, then, agonistic during the period of its growth, when its main purpose was to afford sport or pastime; it was gymnastic during the period of its best estate, about the time of Pericles, when its aims were distinctly educational and ethical; and it became athletic, in the worse sense of the word, during the decadence of the institutions and independent life of the Greeks when a spirit of mercenary self-seeking and professionalism dominated both gymnasts and athletes.

Using these terms, in the sense above indicated, we should call the martial exercise of the ancient Gauls and Teutons agonistic. Out of these sports and exercises were developed the physical training of the young page and squire and the chivalric tournaments and jousts to which the knights of Italy, France, Germany, England, and Scandinavia were so devoted in feudal times. That training and those contests were partly agonistic and partly athletic in their nature. The same terms may be applied to British sports. They were agonistic and have become chiefly athletic within the last seventy-five or one hundred years. Athleticism is the dominant note in all British physical training, which has but little of pedagogical aim or method in it, and is less deserving of being called gymnastic than was the mediæval kind of physical training. German turning is somewhat agonistic in its nature, though its aims and methods are in the main gymnastic. No system of physical training, ancient or modern, so well deserves the name of gymnastic as the Swedish system, which has, perhaps, too little of the athletic element in it. In the Swedish gymnastics, moreover, we find medical gymnastics more highly developed and accorded a higher place than in any other system of physical training. Indeed, excepting the Grecian, there is, properly speaking, no system of medical gymnastics worthy of the name to be found outside of the Swedish gymnastics.

Taine has well said, in his English Notes: "In every age, under every civilization, a people is always itself. Whatever be its dress, goatskin, blouse, gold-laced doublet, black dresscoat, the five or six great instincts which it possesses in its forests follow it in its palaces and offices." Of these great instincts, the play instinct is one of the most ineradicable. To this instinct of the barbarian and the child, as to a primitive germ, we may trace more or less directly every national or tribal system of bodily training. Ball games, contests in running, jumping, lifting and casting of weights, hurling a tree trunk or a beam and wrestling, are sports which have never ceased to be practiced in one form or another, as popular pastimes and means of exercise, from Homer's time to our own.

In many an out-of-the-way corner of Europe, especially in remote islands and secluded mountain districts, you may find to-day one or another of the ancient pastimes still popular and played according to immemorial usage, often on the anniversaries of ancient heathen festivals, which the church has never been able to render wholly Christian, although most of them have been duly christened. The ancient sports have undergone least change in such regions as the Scottish highlands, the lake country of England, outlying districts such as Friesland and Gottland, and the valleys of the Alps, Tyrol, and Pyrenees.

If we attempt to trace our typical systems of physical exercise to their original forms, we find them beginning either in childish plays, or in games which are akin to such plays. The Grecian gymnastics and athletics developed directly out of such pastimes as Ulysses and Ajax engaged in around the funeral pyre of Patroclus, which Achilles instituted in honor of his playmate and comrade. Jahn adopted several of the ancient German games in his turning system; and Ling wrote about

the sports of the ancient Norsemen, though he gave them no very prominent place in his gymnastic system. British sports are the most highly developed modern expression of the play instinct.

BRITISH ATHLETIC SPORTS.

It is a significant fact that many French, Swedish, and German educators are now endeavoring to domesticate British sports, in order to incorporate an athletic element in their more systematic and refined forms of physical training, though it has been truly pointed out by foreigners that "English schoolboys play at their work, and work at their play," when judged by continental standards.

The words "play" and "exercise" were quite synonymous in the early days of our English speech, the ancient Teutonic word "plega," play, being applied to all sorts of warlike exercises. For instance, we find it in such forms as "linden-plega," play of shields, "sweardu-plega," sword-play. The Anglo-Saxon translated the Latin "gladiator" into "plegere" or "plegeman," meaning player. In Bede's Ecclesiastical History one finds that the priest was forbidden to hunt, hawk, or dice, but was charged "to play with his book, as became his condition." In the time of Henry VIII, "plaienge att weapons" was still a necessary branch of the education of young noblemen. Sword-play and cudgel-play still retain their ancient meaning of practice as well as of amusement.

Hodgetts, in his The English in the Middle Ages, recounts the story, given in the "Edda," of the death of Baldur, the sun-god, by means of an arrow made of mistletoe, on which the traitorous Loki was sitting in the shape of a white crow, at the time Nanna, the bride of Baldur, obtained the promise of all nature but the mistletoe not to injure her spouse. So, when the gods of Valhalla instituted a game which consisted in throwing their spears, javelins, and arrows at Baldur, who was placed with his back against the holy tree—that is, the holly tree—Loki managed to have Höder, the blind twin-brother of the shining one, shoot the arrow of mistletoe at Baldur, who was unscathed by the missiles of the other gods. Baldur was killed by the arrow of mistletoe, which had first transfixed the cock, which flew up to intercept the arrow, and has been sacred to Baldur ever since.

"I only refer to this myth," said Hodgetts, "to show you where to look for the origin of the early English or Anglo-Saxon archery games, their casting the bar and javelin at a figure armed as a warrior, and the custom of shooting at the cock at Easter." Cock-throwing was, till rather recent times, I may add, a customary game among British schoolboys at Shrovetide.

The old English custom of playing certain games in the churchyard, and even the church itself, had doubtless a pagan origin. Among certain Instructions for Parish Priests, dating from the middle of the fifteenth century, we find one with regard to profanation "wyth-ynne chyrche seyntwary" which runs as follows:

"Songe and cry and suche fare,
For to stynte thow schalt not spare;
Castynge of axtre and eke of ston,
Sofere hem ther to vse non;
Bal and bares and suche play,
Out of chyrcheyorde put a-way;
Courte holdynge and suche maner chost,
Out of seyntwary put thow most."

Archery, under the name of artillery, was for many centuries a common exercise in England, being particularly protected by statute, even as late as the time of Henry VIII, when every village and many schools had butts for archery practice. In a law of Richard II, passed in 1388, it is enacted that "Servants and Labourers shall have Bows and Arrows, and use the same the Sundays and Holydays, and leave all playing at Tennis or Football and other games called Coits, Dice, Casting of the Stone, Skittles, and other such importune Games." Though the above contains no mention of churchyard games as such, it was held, long after the reign of Richard II,

that "The Lord of the Manor may not, by custom, plough or break up two acres of land lying near the church, because it was anciently granted for the recreation of the youth, after evening service on every Lord's Day." King James I, being a hater of Puritanism and its kill-joy tendencies, in 1618 issued a proclamation known as The King's Book of Sports, in which he declared his pleasure to be, "that after the end of Divine Service our good people be not disturbed, letted or discouraged from any lawfull recreation, such as dancing, either of men or women, archery for men, leaping, vaulting, or any other such harmless Recreation, nor from having May Games, Whitson-ales, and Morris-dances, and the setting up of Maypoles, and other sports therewith used, so as the same be had in due and convenient time, without impediment or neglect of Divine Service." In 1633 Charles I reissued the Book of Sports. All this seems to indicate that old English sports, at least in pagan times, had a relation to public worship, somewhat similar to that of the Greek games to funeral sacrifices and other acts of worship.

Although differing widely in most respects, the Grecian and British types of bodily education are alike in being devoid of any admixture of elements acquired through conscious imitation or borrowing. British sports reflect more fully, perhaps, than any modern system of physical training the national spirit of their devotees. In them we find clearly mirrored certain traits of British character, such as marked individualism, ruled by tradition and ancient custom; a dislike of theoretical and ideal aims; a liking for strenuous exertion and violent methods; a marked tendency to contentiousness, and a preference for what is concrete and resistant. They are the necessary, inherited pastimes of a manly, vigorous, self-sufficient folk, and have never fully outgrown or lost their primitive, not to say pagan, characteristics. They have been followed largely for their own sake, and have suffered but slight modification through the efforts of innovating educators and thinkers; in this respect presenting a marked contrast to German turning and Swedish gymnastics, which, though they bear the impress of national feeling, have been developed chiefly of set purpose, on the part of their promoters, either as a means of national regeneration or as a remedy for overrefinement and the deteriorating effects of sedentary and urban life. Such modifications as are inevitable in British sports are due mostly to efforts to make them more social and general—in short, more truly popular. Then, too, the English climate is singularly favorable for the pursuit of athletic sports. The summer is so cool and the winter usually so mild in England that there are comparatively few days in the year when one may not, if he will, engage in out-of-door games of some sort. Indeed the climate, more than most climates, acts as an incentive or provocative to active exercise. Muscular activity is more conducive to comfort than is quiescence or loafing, in most varieties of English weather. Riding is always in season. Football is practicable not only throughout the autumn and winter of ordinary winters, but far into the spring. Rowing may be practiced more than three-quarters of the year. Cricket, being dependent on the state of the turf, is little played but in the spring and summer.

INFLUENCE OF PUBLIC SCHOOLS ON SPORTS.

The English public schools are peculiarly adapted to serve as the nurseries of national pastimes. The oldest of them, Winchester and Eton, were originally ecclesiastical foundations, and have served, in a measure, as models for most of the later foundation schools, which, as a class, have departed less widely from their mediæval prototypes than have the secondary schools on the Continent. In England the public schools, which are boarding schools for boys from 10 or 12 to 19 years of age, enjoy a practical monopoly of secondary education. On the Continent, if we except the French lycées, high-class boarding schools are the exception. Moreover, the standard of intellectual training is higher and the course of instruction more exacting and severe on the Continent, so that pupils in a German, Swiss, or Scandinavian gymnasium or in a French lycée have much less freedom and leisure than boys at

Eton, Rugby, or Winchester, where the half-holidays average three a week. Force of public opinion generally, and often the rules of the school, oblige the English boy to take part in the school games. Owing to the combined influence of tradition, public opinion, and the peculiar organization and government of the schools and universities which set the tone in the athletic world, British interest in British sports, by reason of its universality, intensity, and intelligence, stands alone. Though teachers and governing boards are sympathetic and helpful, as a rule, British athletics, as an institution, have been shaped chiefly by successive generations of boys and "old boys," as public-school graduates are wont to be called. The British boy has forced his masters to give him time and space for his games, often at the expense of the course of study. It is doubtful if school and college athletics will ever be properly managed in this country before a generation of teachers, presidents, and trustees shall arise who have enjoyed the advantages of athletic training in their youth.

Not a few of the English public schools, e. g., Rugby and Winchester, are provided with gymnasia, in which systematic instruction in gymnastics is given to the younger boys. "Physical exercises" constitute part of the curriculum in many board schools; so that school gymnastics may be said to be on the increase in Great Britain, particularly in the great cities. Out-of-door gymnasia are to be found in many public parks, e. g., London and Manchester. Nevertheless, the dominant note in British physical training in athletic and gymnastic instruction is relatively less highly developed and absolutely less highly appreciated in the British Islands than is the case in Germany, Sweden, or France.

The scope of all forms of modern physical training is wider and more truly popular than was the case in either feudal or ancient times, inasmuch as members of the privileged classes only were allowed to take part in the Grecian games or the brilliant mimic warfare of the mediæval tournaments. The sports of the Roman arena, in which the contestants were mostly slaves or prisoners of war, do not constitute a real exception to this statement, since the Roman gladiators and athletes were, like our baseball players and circus acrobats, mere professionals whose function was to amuse the populace.

Team matches and class exercises are distinctively modern inventions, the prizes in most forms of ante-modern contests being adjudged to individual victors. There were, to be sure, certain games among Grecian youth in which "sides" strove with each other, and in the knightly tournaments squadron charged squadron in the lists; but these, like the ancient football and hockey games, in which parish fought against parish, were rather mass than team contests, since the sides were at best only rudely organized and there was little or no division of labor among the contestants. Team athletics, I repeat, have reached their highest development in cricket, baseball, football, and rowing, in comparison with which the class exercises of the Swedes and Germans, which oftentimes involve the simultaneous action of large numbers of persons, are unspecialized.

As regards length of days, British sports come next to the Grecian games, even if we do not venture, as does Hodgetts, to date them from the games of the Æsir in Valhalla. The tournaments and jousts of the Middle Ages lasted scarcely four hundred years; German turning took its rise in the last quarter of the last century; Swedish gymnastics have not reached their hundredth birthday; but the history of the Grecian games extends over nearly one thousand four hundred years, from the days of Homer, if there were a Homer, till 394 A. D., the date assigned to the last celebration of the Olympic games.

GRECIAN ATHLETICS AND GYMNASTICS.

In the breadth and sanity of its aims; in the magnitude of its proportions and the completeness of its development as a national institution; in the perfection of its organization; in the splendor and solemnity of its festivals; in its many-sided and abiding influence, as well as in the length of its history and the brilliancy of its record, the physical training of the Greeks has no parallel. Its history forms a

coherent whole, presenting well-marked phases of growth, culmination, and decay, and reflects at every stage the spirit of the nation. Athletic contests entered into the worship of Greek gods and heroes; and the lapse of time was reckoned in Olympiads to mark the recurrence of the principal sacred games. Gymnastics were assigned an enlarged and honorable place in the training, for peace and war, of every freeborn boy and youth. The codes of Lycurgus and Solon provided for the organization and regulation of bodily training; and the management of it, during its best estate, afforded positions of honor and emolument to distinguished and ambitious men. It furnished themes for poets, philosophers, and historians; sculptors and painters sought the palæstra and gymnasium for their fairest models, and even the greatest of Greek physicians thought it no condescension to study and adopt exercises and procedures which had been originated by paidotribes and gymnasts.

In Guhl and Koner's "The Life of the Greeks and Romans," we find the gymnasia mentioned first among the public buildings of Greece, because they were "center points of Greek life." The authors go on to say:

Games and competitions formed a chief feature of their religious festivals. This circumstance reacted both on sculpture and architecture, in supplying the former with models of ideal beauty and in setting the task to the latter of providing suitable places for these games to be celebrated. For purposes of this kind the palæstræ and gymnasia served. In earlier times these two must be distinguished. In the palæstra young men practiced wrestling and boxing. As these arts were gradually developed, larger establishments, with separate compartments, became necessary. Originally, such places were kept by private persons. Sometimes they consisted only of open spaces, near a brook, if possible, and surrounded by trees. Soon, however, regular buildings, gymnasia, became necessary. At first they consisted of an uncovered court surrounded by colonnades, adjoining which lay covered spaces, the former being used for running and jumping, the latter for wrestling. In the same degree as these exercises became more developed these institutions grew in size and splendor.

Minute descriptions of these establishments, by Greek authors, we do not possess, but the important facts are known to us from occasional remarks, particularly in the Platonic dialogues. There we find mentioned the *ephebeion*, where the youth used to practice; further, the bath, to which belonged a dry sweating bath, for the use of both wrestlers and visitors. The *apoduterion* was the room for undressing. In another room, the *elaiothesion*, the oil was kept for rubbing the wrestlers, and there possibly this rubbing itself took place. In the *konisterion* the wrestlers were sprinkled with sand, so as to give them a firmer hold on each other. The *sphairisterion* was destined for games of ball, while other passages, open or covered, were used for practice in running, or simply for walking. A particular kind of covered passage were the *xustoi*, which had raised platforms on both sides for the walkers, the lower space being used by the wrestlers.

At Athens the gymnasia were public institutions, supported by public or private means, at which *epheboi*, youths old enough for military service, and men spent a part of the day in athletic exercise and in instructive and social intercourse. There were the *Lukeion* (Lyceum), the *Kunosarges*, the *Akademia* (Academy), the *Ptolemaion*, the splendid gymnasium of Hadrianus, and the small gymnasium of Hermes. The number of palæstræ at Athens was still greater. They were all private institutions, kept by single *paidotribai* and destined for the athletic education of boys only. In smaller cities the joint practice of youths and men was frequently inevitable.

The teachers of gymnastics among the Athenians were known as *gumnastai* and *paidotribai*, the former having to superintend the general development and training of the body, while the latter directed the single exercises. The *sophronistai* were responsible for the good behavior of the boys. The whole *gumnasion*, and all its teachers, was under the charge of a superintendent, termed the *gumnasiarchos*. The principal exercises taught in the palæstra and the gymnasium were running, leaping, wrestling, throwing the discus, throwing the spear, boxing, and the pancration, a combination of boxing and wrestling.

Various games of ball were in vogue, and much attention was paid to swimming and bathing. It is held by some that the Greeks at times engaged in boat racing. If so, the sport formed no part of the athletic canon. The Greek training was severe, that of candidates for the Olympic games lasting for ten months. It was mostly conducted in the open air, often under a blazing sun. In their practice exercise and in their matches the athletes were naked. They were oiled and sanded

before their exercise, and scraped with a strigil, shampooed, and bathed after it. Their dietary was also carefully regulated. So, too, were their hours of sleep and practice. In none of our five national systems of exercise has "training" been carried to so high a pitch, or been so well ordered, as it was among the Greeks. So far as I know, no attention was paid to dietetic rules by the contestants in either knightly or popular games in the Middle Ages; and "training," in the sense in which it is employed by those who are addicted to British sports, has practically no followers in Germany or Scandinavia outside the ranks of professional acrobats and a few anglomaniacs.

The Greeks used but little apparatus, either in their preparatory exercises, which were made in the palæstræ and gymnasia, or in their match games, which usually, as at Olympia, took place in the *stadion*, or some other uncovered place; and such apparatus as was used was of the simplest kind. The spear, the discus, possibly the vaulting pole, the *halteres*, and *himantes*, which are the prototypes, respectively, of our dumb-bells and boxing gloves, pretty nearly exhaust the list of Greek gymnastic machines. The Grecian *halteres*, somewhat resembling our dumb-bells, were used by jumpers, who carried one in each hand when in the act of leaping. The Romans used *halteres* much as we use dumb-bells, for building up the muscles of the arms.

Machine or apparatus gymnastics are mostly of modern origin. Jahn invented the parallel bars and the horizontal bar. The stall bar, the swinging ladder, and the "Bom" are Swedish devices. Most of the ropes, ladders, and poles used in gymnastic climbing have been adapted to modern uses, and can not be classed, generically, as distinctively Swedish or German. Boucicaut, a famous French mediæval champion, could, we are told, ascend and descend ladders, using his hands alone, while in full armor. The physical training of page and squire was chiefly directed to making him a good horseman and to rendering him skillful in the use of sword, lance, and maule while in the saddle, and the newly dubbed knight must be able to leap into the saddle while in full armor. The aspirant to knighthood practiced with his sword at posts and the Saracen's head, and learned lancemanship by tilting at the ring and the quintain; beyond these he had little need for fixed apparatus. The gymnastic horse of wood, so popular every where among heavy gymnasts to-day, is clearly of chivalric origin. I am not able to say when it was first used to supplement or to supersede exercises upon the living animal, but mention is made of it in the sixteenth century. As might be expected, we shall find more "mediæval survivals" in the exercises and tactics of the modern cavalryman than in those of the infantryman.

But the Greek gymnasium was much more than an aggregation of wrestling pits, running tracks, exercise halls, and bathing establishments, surrounded by colonnades and shady walks. The Athenian gymnasia were clubs and schools as well, provided with lecture halls and quiet nooks to which the elders of the city resorted for instruction and social intercourse. It is noteworthy that even among the Greeks the word palæstra came to mean a school, and that the most highly educated of modern peoples, the Germans, designate the highest of their secondary schools by the term gymnasium. The French word lycée, derived from Lyceum, the name of the gymnasium in which Socrates and Aristotle taught philosophy, is used in the same sense as the German gymnasium. Antisthenes, the founder of the Cynic school of philosophy, taught in the Kynosarges gymnasium. The masters in art and science the world over are content to be styled Academicians in memory of the Academy of Plato, which was one of the public gymnasia of Athens.

The most notable athletic and gymnastic gatherings of our own day are, in a sense, more truly popular than were any of their forerunners, since the masses take part in them, not only as spectators, but as contestants. The chivalric tourneys were often signalized by gorgeous pageants, elaborate merry-makings, and stately ceremonials, and were graced by throngs of on-lookers, both gentle and simple. But the sacred games of the Greeks surpassed them all as regards significance and splendor.

THE OLYMPIC GAMES.

Olympia, in Elis, where the most famous of the Grecian contests were held for five days every fifth year, at the time of the first full moon after the summer solstice, was a festival city. It not only included a stadion (or race course), two gymnasia, and a hipprodome, but was adorned with temples and other public buildings, with monuments to kings and heroes, with treasure-houses, and with hundreds of statues erected to the memory of victors in the games. Here assembled, not only the flower of Greek manhood, but also delegates of empires and cities, and throngs of spectators from distant shores, to witness the athletic contests, the chariot races, and the competition between poets, dramatists, and artists, and to participate in the sacrifices and processions in honor of Zeus, to whom the place and festival were sacred.

Athletics and gymnastics have never played so large and dignified and prominent a part in the life and affairs of any nation as they did among the Greeks. We may not hope that any modern people will ever reproduce, on a large scale, the essential features of Grecian physical training, for the same reasons that forbid us to look for the rise of a new Sparta or a second Athens.

Grecian physical training was of an empirical nature, for the Greeks, even the best of them, had next to no scientific knowledge of the human body. Plato's physiology is clotted nonsense. Aristotle looked upon the muscles as mere padding for the bones, not suspecting them of being the organs of motion, and held that the chief function of the brain was to cool the heart. But the Greeks were rare empiricists, and saw with wonderful clearness what lay within the range of their unaided vision. Having insight and experience, loving beauty of form, being favored of heaven as to climate and leisure, their gymnasiarchs and athletic trainers produced types of manly beauty and health which have never been surpassed.

MEDIÆVAL OR KNIGHTLY FORMS OF PHYSICAL TRAINING.

The dominant note in the history of the middle ages is one of warfare. Education, accordingly, was conceived and carried out with a view to what may be called the technical preparation of the young ecclesiastic or noble for the post of under-officer, either in the cohort of a lord spiritual or of a lord temporal. Though very much has been done in the last hundred years toward making exact sciences out of the art of war and the art of healing, the art of teaching is still, in the main, characterized by empirical methods, especially among English-speaking peoples. This is particularly true of bodily education.

The mediæval and British types of physical training resemble the Grecian in being natural growths, which smack of their native soil, rather than manufactured productions, bearing the tool marks of their designers and artificers. It is characteristic of modern systems of gymnastics that they have been devised chiefly for remedial or pedagogical ends, and furthermore that we have comparatively full and trustworthy accounts of the men and measures whereby their rise and development have been determined.

Enthusiastic worshipers of classical antiquity and writers on education, especially at such times as the Renaissance, the Reformation, and the revolt of the realists against merely humanistic training in the last quarter of the eighteenth century, have shown a marked tendency to laud and magnify the physical training of the Greeks. Still the fact remains that no general or very considerable revival of Greek athletics and gymnastics has occurred within five hundred years. Though mailed knights, and the martial exercises which they most affected have been "knocked out" so to speak, by the anathemas of the church and other more modern explosives, the code of the soldier and the gentleman is still colored by the traditions of chivalry which favor such bodily accomplishments as riding, hunting, fencing, and dancing. The "fagging" of British schoolboys is a survival from the period when the training of the young noblemen in "courtesy" included the performance of many tasks

that we hold to be menial. Many of the customs of German university students, especially those which regulate their dueling, are reminders of the times when swordsmanship formed a necessary part of every gentleman's education. In the sixteenth and seventeenth centuries, and late into the eighteenth, a class of special schools termed "Ritterschulen" or "Adels-Akademien," were maintained in various parts of Europe, but particularly in Germany, for the education of the sons of the nobility. In such schools instruction in riding, swordplay, dancing, and leaping was regularly given; swimming was much practiced, and sometimes wrestling.

It may be well to consider at this point some of the more characteristic features of the general movement for educational reform of which the movement for the advancement of physical education forms a part. Physical training is at most a province in the realm of human training, and the struggle for its advancement is but an episode in a general campaign. The main issues of that campaign were joined in the conflict that arose from the revolt of the realists and philanthropists against the humanists in the revolutionary decades of the last century.

The political, social, and industrial revolutions that have been wrought within the last hundred years have done much to spread and popularize the ideals and methods of the philanthropists, and have contributed not a little toward forcing the humanists to abate their somewhat arrogant and exclusive claims with regard to superiority of "discipline studies" over "information studies;" in other words, scientific training has won, or is fast winning, a secure place for itself beside its present rival and former overlord and master, "classical culture." It is not probable that permanent or absolute victory will be achieved in America either by the devotees of humanism or realism; a much more desirable result is likely to be brought about, viz, that the parties shall become so far united and reconciled as to work side by side for a complete human training.

RISE OF PHYSICAL TRAINING IN MODERN EUROPE.

In reviewing the history of the rise of physical training as a distinct department of modern education in Europe, five distinct periods are recognizable. They are: (1) The period beginning with the Renaissance and the Reformation, and extending to the year 1774, a period in which bodily training aroused the theoretical and critical approval of various humanistic writers and reformers; (2) the period extending from 1774 to 1820, which was characterized by innovation and experiment on the part of the philanthropists and their followers; (3) a period of comparative quiescence and neglect, as regards physical education, covered by the interval between 1820 and 1840; (4) the period 1840 to 1860, which was a period of revival and expansion; (5) 1860 to the present time, a period of active growth and development on the whole, though a tendency to reorganization and reform has declared itself within the last twenty years.

The humanists of the Renaissance and the Reformation were inclined, owing to their reverence for the example set in ancient times by the Greeks and Romans, to recognize in a general and literary way the worth of bodily exercises and accomplishments, but they made no strenuous attempt to engraft physical training upon their reformed schemes of education. We might multiply citations from such writers as Rabelais and Montaigne in France, Martin Luther, Melanchthon, and Comenius in Germany, Milton and John Locke in England, to show their enlightened opinions with regard to the fundamental importance of bodily training. But it would be difficult to show that their writings led to any thoroughgoing attempt to realize their generous ideals prior to the last three decades of the last century.

To Basedow, the first of the philanthropists, belongs the honor of making the first hopeful modern experiment in combining physical and mental education in the general training of youth. In 1774, he was instrumental in founding an institution at Dessau, which was called the Philanthropinum, for the purpose of realizing Rousseau's "method of nature," or in other words, to conduct education "so that the training

of the mind and body shall serve to assist each other." Twelve years before, Basedow had attempted to adapt to general educational purposes certain physical exercises that were peculiar to institutions set apart for the education of young men of gentle blood. These schools, which bore the name of schools for the nobility, or "Ritterakademien," furnished instruction in riding, fencing, vaulting, and dancing. Basedow endeavored to make use of these knightly exercises in his scheme for educating the sons of the burghers. He also introduced certain forms of exercise derived from popular German sports. Simon, one of Basedow's assistants, induced him to make trial of certain exercises copied from the gymnastics of the ancient Greeks; thus arose the so-called Dessau pentathlon, which consisted of running, jumping, climbing, balancing, and carrying of heavy weights. Basedow's immediate disciples and imitators were Campe, Salzmann, and Guts Muths, who labored to extend and perfect the Dessau system of physical training, in which manual training was also given a place. As regards their efforts to promote physical training, Pestalozzi and Fellenberg in Switzerland, Nachtegall in Denmark, Ling in Sweden, and "Father Jahn" and Spiess in Germany may fairly be classed with the men above mentioned as followers of Basedow among the philanthropists.

Pestalozzi has been called the father of education for the people. He attempted to devise a system of school gymnastics based upon the nature of the human body, and endeavored to combine industrial as well as general bodily training with mental and moral education in his experiments for the amelioration of the condition of the common people. Pestalozzi's attempts in the period 1780 to 1810 were practically failures. What he was unable to accomplish was largely realized by Fellenberg and his successors in the schools at Hofwyl near Berne between the years 1807 and 1848. Not a few of those who were engaged in educational reform, as marked out and attempted by Pestalozzi, became identified with the physical education movement. Among these we may mention Colonel Amoros, who in 1817 opened the first gymnastic institute in Paris. He had formerly been at the head of a Pestalozzian institute in Madrid, and it is noteworthy that Father Jahn and two of his nearest friends and helpers in the gymnastic movement, viz, Fredrich Friesen and Ernst Eiselen, were teachers in a Pestalozzian institute in Berlin.

GUTS MUTHS—HIS WORK AND INFLUENCE.

In 1784 Salzmann, who had been one of Basedow's assistants at Dessau, established a Philanthropinum at Schnepfenthal, near Gotha. Schnepfenthal has been termed "the cradle of German turning." Guts Muths labored here as teacher from 1785 till his death. "In the year 1785," says Guts Muths, "I entered, when still a youth, the school of Schnepfenthal, near Gotha, and thereupon Salzmann, its head, conducted me to a place saying, 'Here are our gymnastics; within this little space we amuse ourselves daily with five exercises, though they are still only in their rudiments.' These exercises had been first tried at Dessau, where Salzmann had been previously. All that I found out from ancient usage from the historical remains of earlier and later antiquity—all that reflection and sometimes chance offered to me—was brought forward for the sake of amusing experiments. Thus, the chief exercises increased, were subdivided into new forms and tasks, and were subjected to rules often laid down with great difficulty. Thus originated, after seven years' experiment, the first edition of my 'Gymnastics for the Young' (1793), my first attempt to call attention to a subject that had been quite forgotten." His Gymnastik für die Jugend was the first German manual of gymnastics. Guts Muths wrote a work on plays and games entitled Spiele zur Übung und Erholung des Körpers und Geistes, which appeared first in 1796. This work, which reached its eighth edition in 1893, is still a classic, both on account of its exposition of the educational value of play and by reason of its richness as a collection of games. It is also a noteworthy fact that Guts Muths wrote a book on certain branches of manual training and their adaptation to recreative ends.

Inspired by the example of Guts Muths, many private and a few public teachers introduced gymnastics into their schools. In 1799 Nachtegall, a follower of Guts Muths, established a private gymnastic institute in Copenhagen. The Danes were the first people in Europe formally to adopt the new gymnastics for use in schools and the army. Ling, the founder of Swedish gymnastics, while a student in the University of Copenhagen (1799–1804), had his first lessons in gymnastics from Nachtegall.

Guts Muths, whose aim was distinctively pedagogical, at first defined "gymnastik," a term which was rejected by Jahn but retained by Ling, as "work in the garb of youthful pleasure or merriment." Later he defined gymnastics as "a system of exercises having bodily perfection for their aim." Jahn, though his main purpose was to produce patriotic and able defenders of hearth and home, worked largely in the spirit of Guts Muths's first definition, Ling in the spirit of the second. It is quite possible, too, that Ling received some impulse toward his laborious studies of the laws of bodily movements from the following utterance of Guts Muths: "I know well enough," says the latter, "that a genuine theory of gymnastics should be based on physiological principles, and that the practice of every single movement should be governed by a consideration of the individual peculiarities of the body." Guts Muths divided "pedagogical physical exercises" into three departments: (1) Gymnastic exercises; (2) manual training, and (3) youthful plays. His distinctively gymnastic exercises were free and pole jumping, short and long distance running, casting the stone, wrestling, climbing, "balance movements," lifting and carrying of weights, dancing and marching movements.

English and American writers on education have very generally either entirely neglected or largely failed to apprehend the lessons which German experience teaches in regard to physical education.

The German for gymnastics is "turnkunst," or "turnen," though the term "gymnastik" occurs not infrequently, especially in the earlier writings. "Turnplatz" and "turnhalle" correspond, respectively, to our terms out-door gymnasium and gymnasium, which latter ordinarily signifies a building for gymnastic exercises. A gymnasium, in the German sense, is the highest of secondary schools and leads directly to the university. The uniform use of this term to designate such schools dates in Prussia from the year 1812.

German gymnastics embrace three well-marked fields or departments, viz: "Volksturnen," or popular gymnastics; "schulturnen," or school gymnastics, and "militärturnen," or military gymnastics. The organization of the last two departments is maintained and controlled by the Government for strictly educational purposes; whereas the "turnvereine," as the societies of the turners are called, are voluntary associations of a social and semieducational but wholly popular and patriotic nature. The fondness of the German people for gymnastic exercises is as marked a national trait as is the liking of the British for athletic sports. The germ of the turning system is to be found in the martial games and exercises of the ancient Teutons.

Considered from an educational point of view British athletics are rude and primitive when compared with German gymnastics, which in many of their features are almost Grecian. The two systems are as widely different in their aims and methods as are the British schoolboy and the German schoolmaster, and for the same reasons.

The reform whereby mental and physical training have been made conjoint factors in the compulsory education of every German has been worked out during the last hundred years. At every stage of its course the quickening and shaping influence of innovating educators has been felt. The three most eminent names in the list of men identified with the revival and upbuilding of German gymnastics are those of Guts Muths, Jahn, and Spiess. Each was a teacher and writer. Jahn was an agitator and popular leader in addition. Guts Muths lived from 1759 till 1839, Jahn from 1778 till 1852, and Spiess from 1810 till 1858.

Guts Muths did much by his writings and labors to prepare the way for Jahn, the "father of turning," and Spiess, the "founder of German school gymnastics and the creator of gymnastics for girls." Guts Muths's success at Schnepfenthal led many private and a few public teachers to attempt to give their pupils some gymnastic training.

Prussia's commanding position in science and politics is owing in large measure to the efficiency of her educational and military systems. Their present excellence and efficiency are, in a large degree, the outcome of reforms begun by the sagacious and energetic ministers of the father of Kaiser Wilhelm I in the period between 1806 and 1813. This was the darkest period in the history of Prussia. Subjugated by Napoleon, as the result of the battle of Jena in 1806, Prussia was despoiled of half her territory, and the remaining half was scarcely more than "a field for French taxgatherers and a parade ground for French troops." Yet it was during this period of her greatest humiliation and direst poverty that the seeds of reform and reconstruction were sown whose marvelous development has resulted in a united Germany. Bismarck and his coadjutors but cultivated the seed and reaped the fruits of the reforms instituted or marked out by Stein and Scharnhorst and Wilhelm von Humboldt.

Stein emancipated the peasants from serfdom, broke down the barriers between them and the middle classes, and gave enlarged freedom to trade. His name is also associated with radical and successful reforms in the constitution and administration of the State. Scharnhorst reorganized the army in accordance with the principle that all the inhabitants of a country should be trained to defend it. "In the field of educational reform the providential man," says Professor Seeley, "appeared in Humboldt, as great a master of the science and art of education as Scharnhorst was of war."

As early as 1804 Guts Muths urged upon the Prussian minister, Massow, the importance of introducing physical education into the schools as a means of promoting the military efficiency of the people. The minister replied that he proposed to make bodily training an essential part of his plan for national education. The war with Napoleon prevented this reform from being more than projected. In 1808 Scharnhorst's provisional scheme for the reorganization of the army was submitted to Stein for criticism and suggestions. Scharnhorst urged that fencing, swimming, leaping, etc., should be taught in the town and city schools. Stein approved the views of Scharnhorst in regard to bodily exercises, called attention to the success of Guts Muths at Schnepfenthal, and suggested the desirability of securing his cooperation in bringing about the general introduction of gymnastics into the schools. Humboldt likewise favored the scheme, but no efficient measures were taken at this time to carry it out. The first public gymnastic ground (turnplatz) was established in the summer of 1809 at Braunsberg, in Prussia, under the auspices of a secret association formed under the name of "The Moral and Scientific Union," the so-called "Tugendbund," for the purpose of arousing national feeling and throwing off the French yoke. The gymnastics adopted at Braunsberg seem to have been based on the principles of Guts Muths.

GERMAN TURNING AND FATHER JAHN.

That gymnastics, under the name of "turnen," became a popular institution and a potent factor in national development was due to Jahn, a man of much more aggressive spirit than the quiet teacher of gymnastics at Schnepfenthal. Friedriech Ludwig Jahn, the founder of German turnen, was born August 11, 1778, in the village of Lanz (where his father was a clergyman), in the Prussian district of West Priegnitz. Jahn received his elementary education from his mother and father. In 1791 he entered the gymnasium at Salzwedel. Neither there nor at the Gymnasium zum Grauen Kloster, in Berlin, whither he went in 1794, did he submit cheerfully to school discipline and instruction. His restless, self-sufficient disposition declared itself while he was still a youth, and in 1795 he ran away from school

and left Berlin. After a short stay at home he repaired to the University of Halle, in 1796, to study theology, a subject which he soon abandoned. Though gifted with quick wit and a good memory he was desultory and capricious in his reading. His career as a student was wild and irregular. During a portion of his stay at Halle he lived by himself in a cave near the town. He was turbulent and quarrelsome, and had to leave Halle, where he was on bad terms with the members of the student societies. He became a wanderer from university to university, but he seems to have been more at home and better appreciated among the common people (whose customs and forms of speech interested him deeply) than in academic circles.

From Halle Jahn went to Jena, and thence in 1802 to Greifswald, where he studied under an assumed name. Forced to leave the university because of his insubordination and contentiousness, he became a private tutor in a Mecklenburg family in 1803. In this capacity he achieved some success, being a participant in the sports and exercises of his pupils as well as the director of their studies.

Jahn's tendency to engage in popular agitation asserted itself during his years of roving. His first publication, on the Promotion of Patriotism in the Kingdom of Prussia, appeared in 1800. In 1805 he repaired to Göttingen, in order to complete and publish a pamphlet, entitled Bezeichenung des hochdeutschen Sprachschatzes, which appeared in 1806. In the same year he was at Jena, whence he rushed to join the Prussian army just before its overthrow by Napoleon, but in time to take part in its flight. Jahn's grief and despair so affected him that during the night after the battle of Jena his hair turned white.

For the next three years he lived in various places, studying in his way, consorting with men who vainly sought to rouse the people to rise against the French, and working on his book on German Nationality, which was published in 1810. German unity was the keynote of this work. Late in 1809 he repaired to Berlin, hoping to secure a teacher's post in its newly established university. Failing in this, as well as in his attempt to secure regular employment as a gymnasial teacher in Königsberg, he engaged in private teaching in Berlin, where in the course of the years 1810 and 1811 he also taught in the very school from which he had eloped fifteen years before, and also in Dr. Plamann's Pestalozzian Institute. In Friedrich Friesen, who taught fencing and shooting in the institute, Jahn found an enthusiastic and helpful fellow laborer in the promotion of bodily exercises as a means for uniting the youth of Prussia and preparing them for willing and effective military service. Already in his German Nationality Jahn had urged the value of bodily exercises for such a purpose. He seized upon the idea of making bodily training a force in national regeneration and education, and dreamed and wrote and labored, not to say plotted, for a free and united Germany.

In the spring of 1811 Jahn opened his first turnplatz, in the Hasenheide (Harewood), a pine forest on the outskirts of Berlin, toward the south. Friesen and others of his admirers and pupils aided Jahn in its management. From the first vigorous and contentious games were assigned a leading rôle. Various devices were adopted to awaken community of interest and national feeling. A special costume or uniform was adopted, ancient Teutonic forms of speech were cultivated, and those who took part in the exercises were given turnmarken, a sort of badge or token bearing the word turnkunst and the figures 9, 919, 1519, and 1811—these figures serving, respectively, as reminders of Hermann's rout of the Roman legions under Varus in 9 A. D., the introduction of tournaments into Germany in 919 A. D., the last of German tournaments in 1519 A. D., and the revival of turnen (which word was supposed to be akin to "tourney") in 1811. In the summer of 1812 the original gymnastic ground in the Hasenheide was given up for one that was better situated and fitted up, and the number of turners rose to 500. Meanwhile Jahn and Friesen had established a "German union" hostile to their foreign rulers, and had established connections with the students of various German universities.

When the war of liberation broke out, early in 1813, Friesen and Jahn were the first men enrolled in the famous Free Corps of cavalry, organized and commanded

by Major Lützow. Jahn commanded a company which he had recruited, and Friesen became adjutant of the corps. Jahn was ill adapted to military command, and after some months of service, during which he bore his part in several engagements, retired from the corps in November, 1813. Friesen continued in the corps and lost his life in France in March, 1814.

As an example of Jahn's gift of expression, his tribute to Friesen may appropriately be cited here:

Friesen was a man in the bloom of youth and of youthful beauty, without blemish in body or soul, full of innocence and wisdom. His eloquence was as persuasive as that of a seer; a Siegfried in figure, with manifold gifts and graces that won the love of young and old alike; a master of the sword, in cut and thrust quick, sudden, firm, elegant, irresistible, and tireless once his hand gripped the iron; a keen swimmer, for whom no German stream was too broad or violent; an heroic rider, at home in any saddle; an adept in the art of turning, which owed much to him. It was not his lot to return to his freed fatherland, for which his soul yearned. He fell through foreign knavery, on a dismal winter night, by an assassin's shot in the Ardennes—he whom no mortal could have touched with the sword in battle! Favor none, disparage none; but as Scharnhorst among the elders, so Friesen among the youth—was the greatest.

In the interval which elapsed between 1810 and 1816, the date of Die Deutsche Turnkunst, his other most important work, Jahn accomplished the main labor of his life. The nature of his work, the ideas by which he was animated, and the circumstances of the time which favored his success, are indicated in the following extracts from Die Deutsche Turnkunst:

Like many other things in this world, the German turning system had a small and insignificant beginning. In the end of the year 1809 I went to Berlin to see the entry of the King. Love to my fatherland and my own inclinations now made me a teacher of youth, as I had often been before. During the beautiful spring of 1810 a few of my pupils began to go out with me into the woods and fields on the holiday afternoons of Wednesday and Saturday, and the habit became confirmed. Their number increased, and we had various youthful sports and exercises. Thus we went on until the dog days, when the number was very large, but very soon fell off again. But there was left a select number, a nucleus, who held together even during the winter, with whom the first turning ground was opened in the spring of 1811, in the Hasenheide.

At the present time many exercises are practiced in company and before the eyes of all, under the name of turning. But then the names turning system, turning, turner, turning ground, and the like came up all at once, and gave occasion for much excitement, scandal, and authorship. The subject was discussed even in the French daily papers, and even here in our own country it was at first said that the ancient German ways have brought forth a new folly.

During the winter we studied whatever could be got on the subject, and we reflected with gratitude upon our predecessors, Vieth and Guts Muths. The stronger and more experienced of my pupils made a very skillful use of their writings, and were able during the next summer to labor as instructors in turning. In the summer of 1812 both the turning ground and system of exercises were enlarged. They became more varied from turning day to turning day, and were mutually developed by the pupils in their friendly contests of youthful emulation. It is impossible to say in detail who first discovered, tried, investigated, proved, and completed one or another exercise. From the very beginning the turning system has shown great community of spirit, patriotic feeling, perseverance, and self-denial. Every extension or development of it was used for the common good, and such is still the case.

Toward the end of the summer exercises of 1812, a sort of association of turners was formed for the purpose of the scientific investigation and artistic organization of the turning system in the most useful and generally applicable manner. On the King's proclamation of February 3, 1813, all the turners capable of bearing arms entered the field. After long persuasion I succeeded at Breslau in inducing Ernst Eiselen, one of my oldest pupils, to take charge of the turning institution during the war. I myself accompanied Eiselen from Breslau to Berlin, and introduced him to the authorities and to the principals of schools, who promised him all manner of cooperation, and who have ever since shown confidence in him. Since that time Eiselen has been at the head of the turning institution during the summers of 1813 and 1814, and the intervening winter, and has conducted the exercises of those who were too young to carry arms.

At the end of July, 1814, I returned to Berlin. In the winter, when the volunteers returned, bringing many turners with them, the associated discussions were renewed.

On the escape of Napoleon all the turners able to bear arms volunteered again for the field, only two who had fought during the campaigns of 1813 and 1814 remaining at home from the consequences of those campaigns.

The younger ones who remained behind now took hold of the work again with renewed zeal. During the spring and summer of 1815 the turning ground received still further improvements and enlargements. In the following autumn and early part of winter the turning system was again made the object of associated investigation. After the subject had been ripely considered and investigated in the turning council and opinions had been compared, experience cited, and views corrected, a beginning was made in collecting into one whole all the results of earlier and later labors on the subject and all the separate fragments and contributions relative to it, a labor which has lastly been revised by my own pen. Although it was only one architect who at first drew the plan, yet master, associates, pupils, and workmen have all labored faithfully and honestly upon the structure, and all have contributed their share to it.

This is a brief account of my work, my words, and my book. Neither of the three is perfect, but the book may serve to promote a recognition of its ideal. It is put forth only by way of rendering an account to the fatherland of what we have done and endeavored.

The turning system would reestablish the lost symmetry of human development; would connect a proper bodily training with mere exclusive intellectual cultivation; would supply the proper counteracting influence to the prevailing over-refinement, and would comprehend and influence the whole man by means of a social mode of living for the young. Every turning institution is a place for exercising the bodily powers, a school of industry in manly activity, a place of chivalrous contest, an aid to education, a protection to the health, and a public benefit. It is constantly and interchangeably a place of teaching and of learning. In an unbroken circle follow constantly after each other direction, exemplification, instruction, independent investigation, practice, emulation, and further instruction. Thus the turners do not learn their occupation from hearsay. They have lived in and with their work, investigated it, proved it, and perfected it. It awakens all the dormant powers and secures a self-confidence and readiness which are never found at a loss.

The director of a turning institution undertakes a high duty. He must cherish and protect the simplicity of the young, that it may not be injured by untimely precocity. He who is not thoroughly penetrated with a childlike spirit and national feelings should never take charge of a turning institution. It is a holy work and life.

But all education is useless and idle which leaves the pupil to disappear, like a will-o'-the-wisp, in the waste folly of a fancied cosmopolitanism, and does not confirm him in patriotic feeling; and thus, even in the worst period of the French domination, love of king and fatherland were preached to and impressed upon the youth of the turning association. No one ought to enter a turning association who is knowingly a perverter of German nationality, and praises, loves, promotes, or defends foreign manners.

With such principles did the turning societies strengthen, train, arm, encourage, and man themselves for the fatherland in the sultry times of the devil. Nor did faith, love, or hope desert them for a moment. "God deserts no German" has always been their motto. In war none of them staid at home, except those too young or too weak, and they were not idle.

"The turning system," says Von Raumer, "soon spread from Berlin throughout Germany and a large part of southern Germany. Next to Berlin, Breslau had the largest number of turners, some 800. In that city students, Catholic and Protestant, seminary pupils, the pupils of four gymnasien, officers, and professors frequented the turning ground. Singing flourished. On Wednesday and Saturday afternoons, after exercising from 3 to 7, the whole company returned singing to the city.

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"Together with this first natural development of the turning system there came up also a reaction against many received and universal customs and manners. This necessarily aroused enemies, and the more because the turners frequently overpassed the bounds of moderation and made turning identical with a warfare against all ancient errors. This was particularly the case after the war of freedom."

The state authorities, especially those at the head of the department of education, seem to have manifested a lively and, on the whole, friendly interest in Jahn and his work. In 1813, during Jahn's absence in the field, 670 thalers were appropriated to enable Eiselen to conduct an eight weeks' normal course of instruction for teachers of turning, but it was impracticable to carry out the plan at that time. Several reports of a favorable nature were made to the Government on the pedagogical and hygienic worth of turning, and turning grounds were established in various parts of the Kingdom under governmental auspices. In 1814 the Prussian chancellor, Prince

Hardenberg, bestowed a pension of 500 thalers upon Jahn in recognition of his services to the state. In September, 1815, Jahn's pension was increased to 800 thalers, and Eiselen was granted a salary of 400 thalers. This was due to a report made to Hardenberg in April, 1815, by Minister Von Schuckmann, to whom Hardenberg had referred a plan of Jahn's for enlarging the turnplatz, purchasing certain buildings, and bringing the turning institution into close connection with the Berlin school system. Von Schuckmann was averse, by reason of the low state of the treasury, to incurring the large expenditures suggested by Jahn and deemed it inadvisable to introduce turning formally into the schools, lest it should lose its spontaneous popular character.

In 1818 Altenstein, the minister of education, caused an official investigation to be made into the nature, extent, and effects of turning throughout Prussia. During the period 1816–1819 the department of education elaborated a provisional scheme for a general education law, which, however, was never enacted in its entirety. In this scheme a place was assigned to gymnastics, and it was proposed to introduce them into the rural schools, as well as into the middle schools, normal schools, and Gymnasien.

At last, in 1819, a plan was perfected by the educational authorities for the establishment of turning grounds throughout Prussia in connection with the schools. On March 23, 1819, the very day that this plan was laid before the King for his approval and signature, the news of Kotzebue's murder by Sand, who was a student and a turner, reached Berlin, and the King refused his approval. Sand's deed of crazy violence had, as it appears now, no political significance; but the Prussian Government feared revolution and looked upon the spread of liberal ideas among the rising generation with alarm. The Burschenschaften, or students' societies, and the Turnvereine were put under the ban as being hotbeds of liberalism. Jahn was arrested in July, 1819, on the charge of engaging in revolutionary practices and conspiring to assassinate a privy councilor, Von Kamptz by name. Francis Lieber, then a youth of 19, one of Jahn's oldest and favorite pupils, was also arrested on suspicion. Lieber regained his freedom in a few months, but was forbidden to study at a Prussian university. Francis Lieber came to the United States in 1827, with a recommendation from Jahn, for the express purpose of taking charge of the then recently founded gymnasium, in Boston, Mass., where he also established a swimming school on his own account.

Jahn's case dragged along for nearly six years, during which he remained under police surveillance and restraint, though, strictly speaking, he was not imprisoned. Finally, in 1825, he was acquitted, and allowed to retain his pension, but only on condition that he should not reside in Berlin or within 10 miles of it or in any town where there was a university or gymnasium, and should furthermore remain under police surveillance. He took up his residence at Freiburg on the Unstrut, in Saxony, where he died October 15, 1852. In 1840, when King Frederick William IV ascended the Prussian throne, Jahn was released from special accountability to the police and was awarded the Iron Cross in recognition of his services in the war of liberation. Though he issued various pamphlets and maintained his interest in turning, his declining years were passed in poverty and obscurity. In 1848 he was a member of the German National Assembly at Frankfort, but incurred the hatred of the revolutionary party, owing to his relative conservatism. His last publication appeared in September, 1848. It was entitled "Schwanenrede" (Swan Song), and closed with these words: "Germany's unity was the dream of my awakening life, the morning glow of my youth, the sunshine of my manhood, and is now the evening star which guides me to eternal rest."

THE RISE OF SCHOOL GYMNASTICS IN PRUSSIA.

In January, 1820, the Government abolished turning in Prussia by closing the turning grounds, some ninety in number. Volksturnen was not again allowed until 1842. Gradually gymnastics found a place in the instruction of a few schools. In

1836 Dr. Lorinser, of Oppeln, published in a medical journal an article entitled "The protection of health in schools." Dr. Lorinser was very severe in his strictures on the management of the schools, especially of the Gymnasien. He declared that bodily and mental weakness were on the increase among school children, and especially the gymnasium pupils, by reason of the overburdening due to multiplicity of studies, too many school hours, and an undue amount of home work. This paper gave rise to a wide and somewhat heated discussion, and indirectly brought about a renewed interest in school gymnastics.

In 1840 the department of education recommended the introduction of bodily training into all the higher schools for boys. In April, 1842, the ministers of war, the interior, and education united in recommending to the King the reintroduction of turning. In June following the King gave his sanction to the proposal of his ministers that "*bodily exercises should be acknowledged formally as a necessary and indispensable integral part of male education, and should be adopted as an agency in the education of the people.*" The King also authorized the establishment of "gymnastic institutes," in connection with "the Gymnasien, the higher middle schools, the training schools for teachers, and the division and brigade schools in the army."

POPULAR GYMNASTICS AND THE TURNERSCHAFT.

Volksturnen revived after the promulgation of the above-cited cabinet order of King Frederick William IV; but its aims and usages were too strongly colored by political views for the turning societies to pass unscathed through the troublous years 1848-1850. It was not until 1860 that the turning movement began to regain its lost momentum. Great enthusiasm for turning was awakened by the first German turning festival, held at Coburg in 1860, in which some thousand or more turners took part in celebrating the victory of Waterloo. In August, 1861, came the second general Turnfest, when the turners celebrated at Berlin the fiftieth anniversary of the establishment by Jahn of the original turnplatz in the Hasenheide. Nearly 6,000 turners, representing more than 260 districts, took part in this festival, which is also notable for the laying of the corner stone of the national monument to Jahn. The completed monument, consisting of a bronze statue of Jahn upon a pedestal of stones contributed by turning societies in every quarter of the world, was dedicated in August, 1872.

Between 1859 and 1862 the number of German turnvereine increased from 241 to 1,279. In 1863 20,000 turners took part at Leipsic in the celebration of the fiftieth anniversary of Napoleon's defeat near that city by the allies. A year later the societies numbered nearly 2,000, and their members nearly 168,000. The great majority of German turnvereine have, since 1860, belonged to the organization known as the Deutsche Turnerschaft.

The Turnerschaft comprises 15 circuits, or geographical divisions, within the German Empire and Austria. Each circuit (Kreis) is subdivided into districts (Gaue), and each district into societies (Vereine). On January 1, 1896, there were 252 turngaue within the Turnerschaft. In 1896, out of 6,251 turnvereine in Germany and Austria, 5,547, in 4,744 municipalities and villages, with a total membership of 554,757, belonged to the Turnerschaft; of the total membership 50.44 per cent were active turners, or, to express it differently, in 4,744 localities there was an active turner, over 14 years of age, for every 108 of the population in those localities. The number of "foreturners," or class leaders, was 28,061; the number of zöglinge, i. e., boys under 14 who took part in turning, was 84,319. All but 7.5 per cent of the societies belonging to the Turnerschaft practiced turning in winter as well as summer; 863 of these societies owned a turnplatz and 509 a turnhalle (an increase of 137 over the previous year), while 1,022 other societies used a public school turnhalle.

In 1876 the Turnerschaft had 69,872 active members out of a total of 156,590. The corresponding figures for 1890 are 195,375 and 388,513, respectively, and for 1896, 279,828 and 554,757, respectively. Such large and steady growth denotes the strong hold of the Turnerschaft upon the affection of the German folk, in whose minds turning and the turning societies are associated with the part played by the common

people in the struggle for German freedom and unity. Jahn's instinct in appealing to the common people was a true one, and has been amply justified by the event. No wonder his name is honored and cherished as that of a popular hero. His place among apostles of physical training is unique.

It is almost as common to find turnvereine among Germans in foreign lands as to find cricket and baseball clubs among British colonists. Turning societies flourish in the United States, Brazil, Chile, and Australia, as well as in every country in Europe. In the United States the principal association of the turners is the North American Turnerbund, which embraces more than 300 vereine with a membership of more than 40,000.

The nature and working of the spirit which animates the German folk are reflected to a highly interesting degree in the organization and the management of the Deutsche Turnerschaft, which is, in a sense, the one most genuinely popular of German institutions. In their Volksturnen we find the people acting with more freedom and spontaneity than in almost any other field. It is one of the few fields in which the folk has been left comparatively untrammeled by the Government. While its aims are broadly national and social, and tinged with sentimental idealism, the Turnerschaft reflects in its democratic organization and government, its systematic methods, and its economical administration, the severely practical German spirit, with all its love of order, discipline, and minute division of labor. The Turnvereine are in their way as much center points of the popular life of Germany as the gymnasia were center points in Greek life. It is to be noted, however, that the Turnerschaft is largely recruited from such classes as were enslaved by the Greeks.

Volksturnen of the present day differs somewhat from that which flourished in the time of Jahn and Eiselen. Individualism is less rampant for one thing, and certain styles of exercise first made prominent by Spiess, whose method and work we shall consider under Schulturnen, have been adopted by the turners. Then, too, the Turnvereine have ceased to resemble political clubs. The committee of the Turnvereine declared at Gotha in 1861 that turning could only yield abundant fruit when it should be considered a means for training strong men for the entire fatherland. The Turnvereine should hold themselves entirely aloof from the consideration of party questions as such. The formation of definite political opinions was the affair and duty of the individual turners. The general adoption of military exercises by the turners was deprecated. A genuine normal training to render the body equal to the performance of all manly exercises should remain the principal concern and business of the Turnvereine.

The aim of the Turnerschaft is to promote the interests of turning, as a means to bodily and moral strength. Its members (any German of good moral character who is 14 years old, may join it) are urged to render turning attractive to boys and apprentices who have passed the school age; to cultivate simple German customs and manners; to cultivate national exercises and games, such as free and class exercises, running, leaping, climbing, casting the weight, hurling the spear, wrestling, fencing, and sword play; to promote sociability through the singing of folk-songs, and those having freedom and the fatherland for their themes—such songs should be thoroughly known by every turner, and not merely their first lines; to participate in all popular festivals, especially those commemorative of national events, such as the Kaiser's birthday, Sedan day, and the like; to manifest an active interest in useful public enterprises and associations, such as fire and salvage companies, and sanitary corps for the care and transportation of the sick and injured.

The turners are divided into two main sections, viz, boys from 14 to 17 years of age, and men. These divisions are subdivided according to their gymnastic ability into squads, or classes (Riegen), each class being under the lead and guidance of a "foreturner" (Vorturner), chosen on account of fitness. The chief foreturner is the turnwarden (Turnwart). Strength alone is not enough. It is the foreturner's business to make his squad as expert as possible, and above all to secure to each of its members an erect, firm, and graceful carriage of the body.

The times most favored for turning are Sundays, holidays, and certain appointed evenings during the week. The order recommended for the ordinary evening turning is as follows: A brief Kurturnen, i. e., gymnastic exercise, in which each individual follows his own taste and inclination as to apparatus and movement. Then comes the formation of the classes, which fall into line at a signal from the Turnwart, and at a second signal march to the machines, the bars, horse, horizontal bar, etc., to which each has been assigned. The exercise on each piece of apparatus is set by the foreturner at the head of the class. Usually, after exercising for a quarter of an hour, the lines are re-formed and each class marches to a machine of a different character. After this second period of fifteen minutes of heavy gymnastic exercise (Gerätturnen) the ranks are re-formed, and "free movements" are made by the assembled classes. No apparatus is used in the free movements, which are made in unison and according to commands given by the Turnwart. The evening closes with a second Kurturnen. The affairs of the Verein are regulated by officers elected by its members. The programme of exercises, i. e., the amount and nature of the Gerätturnen, or heavy gymnastics, is determined by the officers and is duly bulletined. The foreturners are bound to practice together at appointed times. The order of exercises on the gymnastic machines is changed from evening to evening, and variety and interest are further secured, when the weather is favorable, by engaging in out-of-door games (Turnspiele) on the Turnplatz. The cultivation of gymnastic specialties and of one-sided dexterity is discouraged.

From time to time the societies comprised in a district, and the districts included in a circuit, hold festivals, when both individuals and squads compete for prizes. The intervals between these festivals vary greatly in the different circuits and districts. The General German Turning Festival (Das Allgemeine Deutsche Turnfest), as the grand festival of the entire Turnerschaft is termed, occurs at intervals of at least four years. It continues for at least three days, one of which must be Sunday. Eight such festivals have been held in different German cities since the first was celebrated at Coburg in 1860.

THE INFLUENCE OF SPIESS ON SCHOOL GYMNASTICS IN GERMANY.

We pass to a consideration of the salient facts regarding the development and present organization of school gymnastics (Schulturnen) in Germany, particularly in Prussia. The essential differences between Volksturnen and Schulturnen are based on the fact that the former is a free art, originating with and maintained by the common people and the latter is a discipline imposed by authority upon persons in a state of a pupilage. The ends of training and education are not lost sight of in Volksturnen, but in Schluturnen they occupy the foreground.

Although Volksturnen has lost many of the extravagant and marked peculiarities of its assertive and aggressive youth, and has become better regulated and systematized with the lapse of years, it still bears the impress set upon it by Jahn and the times which produced him. The democratic organization of the Turnvereine; the voluntary submission of the turners to taxation, drill, and discipline, for common and patriotic ends, and the predilection for heavy gymnastics under foreturners, all survive. The turners are men and youths who devote a portion of their spare time, particularly during the evening hours, and on holidays, to the exercises of the Turnplatz and the Turnhalle for the sake of social entertainment and the promotion of health. Schulturnen, on the other hand, is a department of instruction in the educational system ordained by the State. As such, it is administered by officers of the State, who aim, by means of a graded, progressive series of bodily exercises, to bring about the symmetrical and normal development of pupils of both sexes, ranging between the ages of 6 and 20.

School turning works in the interest of folk turning by preparing promising recruits for the Turvereine, and the turners have ever been its zealous friends, doing much to secure its spread and to enhance its usefulness.

It is chiefly to Adolf Spiess and his followers that German Schulturnen owes its

most distinctive and valuable peculiarities. Spiess was a Hessian, born in 1810. Like Jahn, he was a pastor's son and a teacher. In his father's private school, which was conducted according to the principle of Pestalozzi, he was trained in gymnastics, partly after the methods of Guts Muths and partly after those of Jahn. While a student of theology at the universities of Giessen and Halle, he was an active turner and duelist. In 1829 he became acquainted with Jahn. In the following year, while still a student, he formed a class of boys at Giessen, and made a beginning in teaching what came to be known as "common exercises" (Gemeinübungen), or class drill "in standing, walking, running, and jumping." "Class turning," consisting in the simultaneous performance by a number of persons, either with or without the aid of apparatus, of given exercises at the word of command, was introduced by Spiess, and lies at the foundation of his system of physical training; whereas in the Jahn-Eiselen system the members of the class followed in succession the example set them by their foreturner.

In 1833 Spiess became a teacher of history, singing, drawing, and turning in the public schools of Burgdorf, a town in the Canton of Bern, in Switzerland, where he became intimate with Froebel. Spiess is sometimes called the "creator of gymnastics for girls" (Mädchenturnen). The exercises for girls which he introduced at Burgdorf were chiefly of his own devising. They included free gymnastics, dumb-bell exercises, and exercises on the suspended ladder and the seesaw, besides a variety of exercises in running, jumping, and swinging. In 1844 he removed to Basel to take charge of the gymnastic instruction in the higher schools of that city.

In 1848 Spiess returned to Germany, having been appointed to a high office in the department of education of the Grand Duchy of Hesse, and took up his residence in the city of Darmstadt. It devolved upon Spiess to organize and supervise school turning throughout that State. In 1849 and 1850 he conducted special normal classes for the purpose of preparing trained assistants for his work. At Darmstadt, as at Basel and Burgdorf, Spiess was highly successful in introducing gymnastics into schools for girls. He died in 1858.

Spiess based his theory of bodily training on the laws of anatomy and physiology, and grouped and ordered his exercises in compliance with his understanding of those laws. He applied his principle of common exercises to the Jahn heavy gymnastics as well as to the free movements, which latter were often made to music. It was his distinctive work to render German gymnastics systematic and scientific, and to adapt them to pedagogical purposes and methods. As a teacher, organizer, and writer his influence has been wide and weighty. His principal books were Lehre der Turnkunst, Basel, 1840–1846, and Turnbuch für Schulen, Basel, 1846–1851.

Allusion has already been made to the cabinet order of June, 1842, in which Frederick William IV formally recommended the adoption of "bodily exercise as an indispensable integral part of male education" throughout the Kingdom of Prussia. Eichorn, the minister of education, by an ordinance issued in February, 1844, undertook to carry the King's recommendations into effect. This ordinance directed that a sufficient number of turnplätze and turnhallen should be established to furnish all the gymnasien, higher burgher schools, and normal schools for males, with accommodations for winter and summer turning. Those in charge of school affairs were charged to do their utmost for the promotion of the new department of instruction. When it was feasible, pupils were to exercise daily for an hour after school. At least the afternoons of Wednesdays and Saturdays should be devoted to gymnastics, on which days no home study was to be exacted. In the "certificate of ripeness," given at the "leaving examination," the examiner must indicate the degree of gymnastic ability attained by the candidate.

Spiess had an interview with Eichorn in Berlin, in the summer of 1842, in relation to the proper mode of organizing school gymnastics, and there seems to have been a somewhat general expectation that he would be called from Burgdorf to Berlin. Spiess was, however, passed by, and Massmann, who had since 1827 been engaged in teaching gymnastics in Munich, where the sons of Ludwig I, King of Bavaria, and

the royal corps of cadets were numbered among his pupils, was in 1843 called to Berlin to aid Eichorn's department in carrying into effect the views expressed in the King's cabinet order.

Massmann had been a Berlin turner in the palmy days of 1811–1813, and was strongly wedded to the methods of Jahn and Eiselen. He looked with disfavor upon the new methods of Spiess, and, not being endowed with sufficient skill or energy to adapt Volksturnen to school needs, his administration, which lasted until 1850, was, on the whole, a failure.

THE TRAINING OF TEACHERS OF GYMNASTICS IN PRUSSIA.

A serious obstacle to the success of gymnastics in the schools was the lack of competent teachers. To meet this want the Central Normal School for Training Teachers of Bodily Exercises was opened in Berlin, under Massmann's direction, in 1848. The school died in 1849. In 1851 the Royal Central Gymnastic Institute, with parallel courses of instruction for officers of the army and school teachers, was established in Berlin under the conjoint control of the ministers of war and education, and Capt. H. Rothstein, of the Prussian army, who had studied Swedish gymnastics in Stockholm, was placed at its head. This institute has exercised a powerful influence upon the rise of military and school turning in Prussia. Its dual constitution remained unchanged until the year 1877; since then two separate training schools have been in operation; the one for army officers is entitled the Königliche Militärturnanstalt; the other, for teachers of turning in the schools is termed the Königliche Turnlehrerbildungsanstalt.

Rothstein was a warm partisan of the Swedish system of gymnastics as developed by Ling and his followers, while the civilian teachers of the Central Institute either favored the Jahn-Eiselen system or a compromise between it and that of Spiess. Rothstein made the capital mistake of antagonizing the turners; he banished the horizontal and parallel bars from the institute, thereby giving rise to a long and bitter controversy, in which he was finally worsted. The turners and their champions attacked the Swedish gymnastics on the ground that they were too formal, one-sided, and uninteresting, as well as un-German and outlandish. Medical men and university professors took an active part in the discussion over the merits and faults of the "bar exercises." Professors Virchow and Du Bois-Raymond, of the Berlin University, stood up for German gymnastics and the "bars." Finally, in December, 1862, a commission composed of the most eminent medical men in Prussia declared that "the bar exercises might, from a medical point of view, be improved, but ought not to be done away with." The triumph of the "bar exercises" involved the defeat of the Ling-Rothstein system of school turning. In 1863 Rothstein left the Central Institute; in 1865 he died.

In 1860 Lehnert, then minister of education, issued an order for the gradual introduction of gymnastic instruction into the elementary schools (Volksschulen) for boys. In 1862 attendance upon such instruction was made obligatory. In recent years turning has become quite general in girls' schools of all grades. It is obligatory in female normal schools, and also in all the girls' schools of many cities, e. g., Berlin, Frankfort on the Main, and Hanover.

The teachers of gymnastics in Prussia, indeed throughout Germany, are specially trained for their duties. They are not, as is too often the case in England and America, retired drill sergeants, broken-down athletes, or merely enthusiastic gymnasts. There are, it is said, more than 1,500 teachers in Berlin alone who are competent to give instruction in turning. According to the regulations now in force, in order to be installed as a teacher of turning in a Prussian school, one must first pass a satisfactory examination and secure a certificate of fitness. Such certificates must be obtained from one of two sources, viz, the Königliche Turnlehrerbildungsanstalt, or a Turnlehrer Prüfungs Kommission. The latter is simply an examining board, which holds examinations for candidates for turning teachers' posts at stated intervals. Besides the Berlin Commission, which was originally established in 1867, there are commissions at Bonn, Breslau, Halle, Königsberg, and Magdeburg.

The Turnlehrerbildungsanstalt holds two examinations yearly, one at the end of its winter course of instruction for male teachers, the other at the end of its spring and summer course for female teachers. Those who take the examinations set by the Kommission are mostly teachers who have attended courses in turning at a normal school, or have received special training in classes formed for the purpose by educational authorities of one of the provincial cities; some are university students who look forward to a teacher's career.

The candidates are of three classes before a commission: (*a*) Those who have already been found competent to be installed as teachers in the schools; (*b*) students who have completed five semesters at a university; (*c*) persons of sufficient age (twenty years in the case of men, eighteen years in that of women), not teachers, who have had a good school education.

The examinations are both theoretical and practical. The theoretical examinations are both written and oral. The written examination consists in the preparation, within a limited time and without the assistance of books or persons, of a thesis on such questions relating to school gymnastics as the examiners may select. The candidate is examined orally on his knowledge in relation to the most important points in the history of turning, particularly of school turning; in the literature and technical language of turning; on the kinds of exercise adapted to pupils of different ages and states of proficiency; on the principles involved in the construction and use of the various gymnastic appliances; on human anatomy, physiology, and hygiene, and their relation to gymnastics; and on the means of rendering first aid to the injured. In the practical examination the candidate is required to show what degree of expertness he possesses in the exercises made use of in school turning.

The principal normal school of gymnastics in Prussia is the Royal Institute for training teachers of turning in Berlin. This institution, known as the civil section of the Centralturnanstalt till 1877, dates from 1851. Since the separation of the military and civil sections in 1877, the latter has been known as the Königliche Turnlehrerbildungsanstalt. Prof. Dr. Carl Euler, who, though not the titular "director" of the Bildungsanstalt, actually directed its daily affairs till 1891, is a highly accomplished teacher, and one of the best known German writers on turning. He has occupied his present position as the chief normal teacher of turning in Prussia since the year 1860, when he was called from Schulpforta to take charge of the civil section of the Centralturnanstalt, of which Rothstein was then the head. The faculty consists of Professors Euler and Eckler, Dr. Küppers (Director of Instruction since 1891), and Dr. Brösike. The number of assistant teachers in the Bildungsanstalt varies with the number of pupils from year to year—there are usually 5 in each course. The winter course for men begins in October of each year, and lasts six months; the course for women begins at the close of the Easter vacation and continues for three months.

Courses of lectures are given in anatomy, physiology, and dietetics; on first aid to the injured; on the history of bodily exercises and the science and methods of turning, and on the construction and use of apparatus. The practical instruction comprises lessons and practice in free gymnastics; exercises with "hand apparatus"—dumb-bells, wands, and the like; exercises on the heavy gymnastic appliances; fencing and swordplay, games, and swimming. The pupils of the institute are required to conduct classes in gymnastics, under the supervision of their instructors, in several of the city schools.

The systems of school turning in the other States of the German Empire do not differ very widely or essentially from that in vogue in Prussia. Each of the principal States, too, maintains a Turnlehrerbildungsanstalt. There is one at Dresden, for the Kingdom of Saxony, which dates from 1850; that at Stuttgart, for the Kingdom of Würtemberg, was founded in 1862; that for the Grand Duchy of Baden, at Carlsruhe, was established in 1869, and the one at Munich, for the Kingdom of Bavaria, was opened in 1872.

PRUSSIAN SCHOOL GYMNASTICS OF THE PRESENT DAY.

In general terms it may be said that turning is obligatory for unexcused pupils in all but the lower classes of most public schools in Prussia. In the higher schools for boys three hours weekly are assigned to turning. Prior to 1891 the time given was two hours weekly. In the common schools and the schools for girls the time assigned to turning is usually two hours a week. The provision of special opportunity for gymnastic plays, in addition to the instruction in turning, is not uncommon. As a rule each school has its own turnhalle and in very many cases its own turnplatz, furnished with appropriate gymnastic apparatus. Not a few cities provide special playgrounds either apart by themselves or in the public parks—e. g., Berlin has several such playgrounds, Frankfort has three, and Brunswick four. Brunswick and Dresden maintain skating ponds in winter for the special use of pupils in the public schools, while in Dresden and Frankfort, not to mention other German cities, the school authorities provide free instruction in swimming for certain classes of school children.

As might be expected, gymnastic instruction is rather more common as well as better provided for in city than in country schools. In 1882 only 10 per cent of the pupils in the higher schools for boys in Prussia were excused from turning, and they were excused on the certificates of physicians that the exercise would be prejudicial to their health; only 18 per cent of this class of schools were obliged to discontinue turning in winter through having no proper turnhalle; 60 per cent of them possessed a turnhalle of their own.

In the course of study each class has its special time for gymnastics, just as it has special hours set for arithmetic and reading, and in the majority of cases the instruction is given by one of the ordinary class teachers and not by a special teacher of turning.

The exercises are carefully adapted to the age and sex of the pupils. The youngest pupils, from 6 to 10 years old, engage in a great variety of simple games, easy, free movements, marching, jumping, and climbing exercises, and the fundamental exercises on the easier gymnastic machines. In free, "light," and heavy gymnastics the exercises grow more complicated and difficult with the advancing age of the pupil. The expertness of the boys in the upper classes is often quite astonishing. In the gymnasien and realgymnasien fencing is taught in the upper classes. Pedestrian tours, skating parties, and excursions into the woods are frequently made under the lead of those who teach turning. The gymnastic course for girls comprises the ordinary free gymnastics; class gymnastics with "hand apparatus," such as dumbbells, wands, and skipping ropes; marching, dancing, and balancing exercises; various games of ball, easy jumping, swinging, and climbing, and a few of the simplest exercises on the parallel and horizontal bars. Singing, especially during the march and minuet, is frequently engaged in during the hour given to gymnastic instruction.

In nearly every university voluntary associations of students are formed to practice turning. The university masters of swordplay and riding are survivals from feudal times.

In 1892 there were 522 institutes of higher instruction for males in Prussia, leaving universities out of account. The number of pupils in these schools was 140,285, of whom only 6.5 per cent were excused from turning, and of the total number excused 6,891 were excused on physicians' certificates. The 522 institutes in question embraced 5,479 classes and 2,923 gymnastic sections, and in 364 schools the prescribed course of three hours weekly in turning was carried out. In 309 cases the school had a turnhalle of its own, while in 163 cases an outside turnhalle was made use of. The yards of 207 schools were furnished with gymnastic apparatus, while 289 other schools had special turnplätze. In 325 schools outdoor games (jugendspiele) were cultivated. In 457 schools the pupils were afforded an opportunity to learn to swim. Instruction in turning was given by 1,246 teachers, of whom 674

had university and 390 normal school training. Of the 1,246 teachers, 858 held special certificates as "Turnlehrer." Connected with the schools were 78 gymnastic clubs, 17 football clubs, 12 rowing clubs, and 2 bicycle clubs.

THE SCHOOL-GAMES MOVEMENT IN GERMANY.

Outdoor games and popular sports have been accorded a place in German training from the days of Guts Muths and Jahn, but interest in them and zeal for promoting them has increased to an extraordinary degree in Germany during the past ten years. The movement seems to have started in Görlitz in the years 1885–1889 under the leadership of Dr. Gustav Eitner, director of the Görlitz Gymnasium, whose success in reviving interest in certain forms of outdoor sports, notably various kinds of ball games, challenged public attention and awakened imitation and emulation among the managers of schools of the same grade elsewhere. It is only fair to say, however, that Dr. Eitner was ably seconded by Oberturnlehrer Jordan. In 1890 the Prussian minister of education called the attention of the educational authorities in the several provinces of Prussia to the Görlitz games and recommended them to send teachers of turning to Görlitz in order that they might familiarize themselves with the methods there in vogue. Some 190 attended the "games courses" at Görlitz in 1890–91. Dr. Eitner's Jugendspiele, published in 1890, ran through six editions in its first year.

In 1891 the "Central committee for the promotion of youthful and popular sports in Germany" was organized under the presidency of Representative E. Von Schenkendorff, of the Prussian Landtag. The committee has done much for the rehabilitation of outdoor sports, which are very generally conducted under the supervision of the teachers of turning. The committee numbers many men of prominence in public affairs; it includes the former minister of education in Prussia, the directors of several secondary schools, a number of high municipal officials, including several school councilors, as well as the most prominent representatives of the Turnerschaft. The committee has been active and successful in arousing public and official interest in its objects, through its publications, the holding of congresses, and the organization of normal courses for teachers and leaders in outdoor games. Its yearbook—that for 1895 being the fourth in the series—is an interesting and inspiring publication.

Spielkurse for male teachers were held in 1894 in Bonn, Brunswick, Frankfort, Görlitz, Hadersleben, Magdeburg, Munich, Osnabrück, Posen-Rendsburg, Sonderburg, and Stuttgart, and 357 teachers took part in one or another of the courses. Similar courses for female teachers were held in 1894 at Berlin, Bonn, Brunswick, Breslau, Hanover, Magdeburg, Osnabrück, and Stuttgart, the total number in attendance being 340. In the period 1890–1894 no less than 2,509 persons (1,588 men and 921 women) received instruction in 63 games-courses.

The following facts taken from a report published in 1895 by the central committee in its yearbook may serve to show the extent of the games movement in Germany. The report is based on replies from 1,455 out of 1,629 "higher institutions of instruction" in the German Empire in 1894, including secondary schools, normal schools, preparatory institutes, etc. Of the 1,455 institutions 768 were Prussian. Of these 452 had what were termed "sufficient playgrounds;" 49 had playgrounds which served for all usual games, with the exception of ball games; 101 had playgrounds, characterized as more or less inadequate; only 59 reported having no playgrounds whatever. In the other States of Germany 428 "higher institutions" were credited with adequate playgrounds; 27 with playgrounds sufficient for all games, with the exception of ball games; 82 with inadequate playgrounds, and 45 were reported as having no playgrounds whatever, making the total of adequate playgrounds in Germany 880; adequate for all games, with the exception of ball games, 76; inadequate, 183, and 104 having no playgrounds whatever. Of the 1,352 institutes which had playgrounds of one kind or another in Germany, 100 were possessed of a special playground; 53 made use of the school yard; 90 made use of the gymnastic ground; 970 had other playgrounds; 23 used a military parade ground. In Germany the num-

ber of institutes of the class in question in which plays and games were cultivated, in addition to compulsory instruction in gymnastics, was 923; in 784 of these participation in such games was voluntary; in 139 it was required; in 298 the games were carried on throughout the entire year; in 625 only during the warmer months. Of the 1,455 institutes making reports, 63 carried on their games during recess; 461 during the time set apart for physical training. In 380 cases the time devoted weekly to games was from one to two hours; in 78, from two to three hours; in 69, three to four hours; in 96, more than four hours; in 213, the time was not limited; in 56, games took place only occasionally, and in 39, not at all. In 166 schools the games were conducted by the director of the institution; in 310, the games were conducted by the teacher of gymnastics (the turnlehrer) alone. In 924 cases the faculty of the school took no part in the promotion of games; in 227 cases they took an immediate and personal part in conducting games; in 135 cases they exercised oversight; in 49 cases they merely visited the playgrounds; in 77 they only took part in walks and promenades, and in 43 cases they showed interest in other ways.

Eleven hundred and ninety-eight of the higher schools of Germany reported that they possessed good opportunities for swimming, 109 had fair facilities, and 148 had none; 1,254 were well provided with means for skating in its season, 110 poorly provided, and 91 were with no opportunity for it.

In 1892-93 Berlin had six special playgrounds set apart for school children, and in addition many school yards were utilized as playgrounds out of school hours. The appropriation for school plays amounted to 7,940 marks, viz, 2,580 marks for sixteen leaders in six playgrounds, 360 marks for maintenance of apparatus in the same, and 5,000 marks for oversight of school yards used as playgrounds.

Facilities for school games have been provided for in certain public schools of Frankfort since 1884. Much doubt and hesitation was felt among many parents and teachers and directors of schools when the experiment was initiated, but the school deputation has been friendly to the movement and has done much to promote it through special appropriations and in other ways. At first the yearly appropriations for games was 3,000 marks, later 3,500 marks; in 1893 the appropriation was 4,200 marks. In addition, 11,000 marks annually are appropriated for the purpose of providing instruction in swimming for children belonging to the Frankfort schools. Frankfort owns three special, well-turfed fields devoted to the use of its school children for play purposes. School yards in several of the schools for younger scholars are also made use of. Participation in the games is voluntary. In the summer of 1892, in 175 classes in 20 schools, with 6,684 boys, 2,970, or 44 per cent, took part in the games. In general, the squads of players number about 100 boys, each squad being under the oversight of a teacher. Special leaders and helpers are chosen from among their own number by the boys.

The school playgrounds of Frankfort are not furnished with fixed apparatus, but they are well supplied with hand apparatus of one sort and another, such as balls, bats, etc. The number taking part in the games in 1892 has been mentioned as 2,970, or 44 per cent of the totals in the boys' schools. These were divided into 40 squads, each under the oversight of a special teacher, the general management of the games being under the charge of the director of gymnastics in the schools of the city. Of the number of players inscribed the average attendance was 79 per cent. Eight schools showed an average attendance of 85 to 91 per cent and one an attendance of 97 per cent. This is considered a good attendance, particularly as on half holidays—Wednesdays and Saturdays—many of the boys are in the habit of going to the swimming baths on the river or of taking walks or excursions into the country with their parents. In September, 1896, I was so fortunate as to witness the annual games contest of the boys of the lower schools in Frankfort. Not far from 300 boys took part, and perhaps 50 teachers were present, who acted as judges and umpires. The prizes had no value but as marks of distinction and honorable mention. Their award was determined by the total number of marks gained in four events: (1) running 100 meters; (2) broad jumping; (3) throwing a light ball, and (4) throwing a heavy ball.

The competitions occupied the entire afternoon, and though they were interrupted by showers of rain they were put through to the end. The boys who took part in the competition had been selected as the result of preliminary trials at their respective schools. In the higher schools of Frankfort there are competitions in "the Pentathlon," similar to the pentathlon of the Greeks, and also in football and other games. The German practice of placing skillful and sympathetic teachers of gymnastics in charge of the public playgrounds is to be warmly commended. The presence of a mere custodian, school janitor, or park policeman does not answer the same purpose, even though "regulated play" sounds strange and un-American.

The population of Berlin in 1890 was 1,578,000. In 1895, out of a total population of over 1,600,000, over 233,000, or nearly 14 per cent, were attending school, of whom 185,000 received free tuition. On November 1, 1895, Berlin had 211 gemeindeschulen, or free common schools, with more than 90 turnhallen belonging to them. In 1892, when there were about 90,000 boys and rather more than 90,000 girls in these schools, the boys were taught turning by some 600 male teachers and the girls had similar instruction from upward of 700 female teachers. In 1892 there were 29 higher schools for boys maintained by the city, and 5 schools of the same grade for girls. In the 29 schools specified about 20,000 pupils received gymnastic instruction, and 21 of them had their own special turnhallen. Of the 7 royal gymnasien, with 500 boys maintained by the State, 6 were provided with turnhallen of their own. In the fiscal year 1892–93 the appropriation for turning in the higher schools supported by the city of Berlin amounted to 172,158 marks, of which 108,000 marks were for the salaries of instructors, and the residue for janitors' service, maintenance, repairs, etc.

The population of Breslau in 1890 was 335,186; in 1895 it was 373,140. In 1894–95 there were 5,501 pupils in the secondary schools for both sexes in Breslau, of which number 4,655 (3,231 boys and 1,434 girls) received gymnastic instruction during the winter. Of 40,000 pupils in the common schools 10,739 were reported as receiving similar systematic instruction in one or another of the 15 turnhallen maintained by the city. For gymnastic instruction in the volksschulen 26,280 marks was paid to 109 teachers (69 men and 40 women), and not far from 1,000 marks was appropriated for games, for which nine playgrounds were provided. During the school year 24,207 children resorted to these playgrounds and 7,346 during the long vacation.

LING THE FOUNDER OF SWEDISH GYMNASTICS.

The Swedish system of physical education now demands our attention.

Peter Henry Ling, the founder of Swedish gymnastics, was born November 15, 1776, near Wexiö, in Smaland, one of the southern provinces of Sweden, and died in his sixty-third year, on May 3, 1839, at Annalund, near Stockholm. His father, a poor country parson, died when Peter Henry, who was the youngest of six children, was only 2 years old. Ling's mother married the new parson, but did not live long. Ling's stepfather seems to have treated the dreamy, imaginative boy kindly, but to have aroused his antagonism by designing him for the pastor's calling. In due time young Ling entered upon a course of classical training in the gymnasium or Latin school of Wexiö, where he distinguished himself by reason of his mental ability, strong individuality, firm, unyielding will, and reckless enterprise. Naturally impetuous, restless, and impressionable, he was also good-hearted, patient, and forbearing.

His course as a preparatory student was abruptly terminated by his suspension, or possibly expulsion, from the school on account of his refusal to give the name of the ringleader of some schoolboy pranks in which he was concerned. He left Wexiö on foot, avoided his home, and appealed to one of his brothers, who gave him some small change and much good advice. But the boy replied, when advised to go home, "There is a blot on my fair name, but I shall wash it off," and then set out to seek his fortune, friendless and alone.

He is usually credited with being a wanderer for many years in Sweden, Denmark, Germany, France, and even England. In after years he was averse to talking about

this period of his life. It is certain that he acquired a practical knowledge of the principal languages spoken in the north of Europe, including French. He is reputed to have made his living at times as a waiter, at times as an interpreter and translator, and again as a house tutor. It is even said that he served for a time in the army of Prince Condé. It is quite certain that in 1801 he was enrolled as a volunteer for service in the naval defense of Copenhagen against the British fleet under Nelson.

In 1793 Ling was a student in the Swedish University of Lund; but not for long, as in May of that year his name was inscribed as a student of the University of Upsala, where in 1797 he passed his examination in theology. One Weilauff, a Danish official, writing in 1847, professes to have been a fellow-student of Ling's in the University of Copenhagen from July, 1799, till September or October, 1804. Weilauff says that Ling left Upsala in June, 1799, for Copenhagen, and began his studies in philology in July of that year, devoting himself zealously to modern tongues and Scandinavian mythology. If Weilauff's statements are to be credited—and they are most circumstantial—the stories of Ling's adventurous wanderings in Germany, France, England, and Russia may be regarded as somewhat mythical.

Ling's five years' stay in Copenhagen [says Weilauff], had an altogether decisive influence upon all his later education and activity. It was here that he came first to know the Edda and the Scandinavian mythology. He began to study German belles-lettres, especially the works of Goethe and Schiller, among which Goethe's Werther exercised a strong influence upon the sometimes fanatical and melancholy youth. He also attended the lectures of Steffens, who made his debut in Copenhagen in 1802 as a lecturer on philosophy and on Goethe.

It was also in Copenhagen that Ling began his poetical activity. He composed several short poems in French, German, and Danish, and made a free rhymed translation into Swedish of Ewald's Death of Baldur. His translation of a Danish comedy entitled The Jealous Man, which was published in Copenhagen in 1804, is without doubt his first printed work.

As Ling first struck in Copenhagen the path along which in his riper years he was to gather his laurels, so was it also here that he first became acquainted with that art which he later transplanted to his fatherland, and by means of which he won for himself recognition and place. At first he began to learn fencing from two French émigrés (Montrichard and Beurnier), who had set up a fencing school here. Ling attributed the cure of a gouty affection in one of his arms to the fencing. On this account he was induced to take up gymnastics in their proper sense.

The creator of this art in Denmark was Commissary-General Nachtegall, recently deceased (i. e., when Weilauff wrote, in 1847), who in 1799 had established a private "turnanstalt" in Copenhagen, to which many university students resorted. Among them was Ling. He took up gymnastics with all his might, as he did any subject that particularly interested him. He was not content to practice gymnastic dexterity simply as a means of strengthening his health, but looked upon it at the same time as an art of great importance, and strove to give it a scientific basis and to make use of it according to mathematical and anatomical rules.

In the autumn of 1804 Ling left Copenhagen and repaired to Lund, in Sweden, where he was soon appointed university fencing master (on December 28, 1804). A few months after his departure from Copenhagen we find Ling writing to his friend as follows:

Above all, procure me a good vaulting horse, which is no end needful for me. I do not intend, as you may think, to fit up a gymnastic institute here in Lund, but it devolves on a *fechtmeister* in a Swedish academy to be able to give instruction in vaulting with the horse. At the same time they wish instruction in riding, since it is proposed to establish a riding school here, as in Upsala. Alas! I have lost almost all my skill in riding. Still, practice will soon restore it.

Thus it was that Ling entered upon his work at the age of 28. He remained in Lund till 1812, when he was called to the post of teacher of gymnastics at the Royal Military Academy in Karlberg, near Stockholm. He accepted the call the more gladly for the reason that he had formed the plan of establishing a central institute at Stockholm for the further development of gymnastics, more particularly through the training of skillful gymnasts, who should be well grounded in the theory and practice of their art. On first proposing to the Government his scheme for a normal

school of gymnastics he met with a rebuff. "We have," replied the minister, "jugglers, acrobats, and rope dancers enough already, without burdening the treasury of the State on their account." Nothing daunted, Ling continued to urge his views, and in 1813 the Government consented to the establishment of a Royal Central Institute of Gymnastics, and made a grant of money for its maintenance. In 1814 the institute was opened, with Ling as its director, on the site which has been devoted to the purposes of the institute from that day to this, I believe.

Ling's ideal, formed apparently while still a student in Copenhagen, was to awaken, strengthen, and confirm patriotic and national feeling among his countrymen; to promote not only the full and rational education of the people, but also to develop a love for the stirring sagas and myths in which were recounted the valiant and heroic deeds of the ancient Norsemen. He belonged for a time to the Gothic party in literature, as it was called, to which belonged also Sweden's most famous and popular poet, Bishop Tegner, author of the "Frithiof Saga." The aim of the Gothic party, whose antagonists were the representatives of the romantic and French party, was to counteract the demoralizing influences due to the imitation and exaltation of foreign culture and literature, especially the French. Ling was too individual and self-sufficient a man to work well within the lines of any party. He strove to write a Norse epic which should occupy a place in Scandinavian literature similar to that held by Homer's epics in Grecian literature. Finding its leaders somewhat antipathetic, Ling left the Gothic association and went his own way.

Ling was a voluminous poet—a veritable scald cast in the ancient mold. His poems, which include epic, dramatic, and lyrical productions, constitute by far the greater portion of his published works. Ling's complete works consist of four goodly volumes, amounting to more than 2,500 octavo pages. Of these less than 400 pages are devoted to gymnastics.

Though Ling is hardly to be classed among distinctively popular poets, his poems have exercised a considerable influence upon Swedish scholarship, literature, and art, especially sculpture. The Royal Swedish Academy of Arts and Sciences was founded nearly a century and a half ago. Its eighteen members, named by the Crown, are chosen by the most representative men of their day. In 1835 the founder of the present dynasty, King Charles John XIV, known also as General Bernadotte, made Ling a member of the Swedish Academy in recognition of his position as a national poet. The same King also conferred on Ling the honorary title of professor, and the decoration of the Order of the North Star. It is also to be noted that Ling's success in the domain of gymnastics was due in no small measure to the friendship and influence of Charles John XIV, both as Crown Prince and as King, and of his son, Oscar I.

Ling's work, as the founder and representative of Swedish gymnastics, falls naturally into the Lund and Stockholm periods, the first of which is covered by the years 1805–1812, and the second by the years 1812–1839 (when he died).

While at Lund, Ling not only taught fencing and gymnastics, and devoted much time to the study of anatomy and physiology, with a view to basing his system and teachings upon rational and scientific foundations, but also lectured in the university on Old Norse mythology, poetry, and history. He published some poems and gave instruction in modern languages.

In Stockholm Ling was teacher of gymnastics in the Cadet School at Karlberg from 1812 to 1825, and was fencing master there from 1817 to 1825, when he withdrew from the institution. He was director of the Central Gymnastic Institute, from its establishment in 1813, for more than twenty-five years.

It can hardly be doubted that Ling gained his first knowledge of gymnastics at Nachtegall's institute in Copenhagen. Nachtegall was a follower of Guts Muths, and there is every reason to believe that Ling—such was his thoroughgoing nature—was acquainted with Guts Muths's writings, as well as practiced in the Guts Muths-Nachtegall gymnastics.

Guts Muths in 1793 dedicated his first book on gymnastics to Prince Frederick of

Denmark, who was then Regent, but became King in 1808. He did so because he believed that Prince Frederick, "who had broken the shackles of serfdom and slavery in his Kingdom, would be inclined to favor a more vigorous sort of education than had hitherto obtained." The Prince, who was a pupil of Nachtegall's in gymnastics, became an influential patron of the institute, and was active in introducing instruction in gymnastics and swimming into the army and the cadet schools of Denmark. Three hours of gymnastics weekly was the amount prescribed, and the schools were required to provide themselves with suitably furnished out-of-door gymnasia.

It is possible that Ling received some impulse toward his studies of the laws of bodily movements from the following utterance of Guts Muths: "I know well enough," says the latter, "that a genuine theory of gymnastics should be based on physiological principles, and that the practice of every single movement should be governed by a consideration of the individual peculiarities of the body."

It matters little whence or from whom Ling derived his first impulse. He was soon able to make free and original use of the material which lay nearest his hand, and finally evolved a system of gymnastics unlike any that had been devised in any country. It is as idle to deny Ling's originality as it would be to attempt to mimimize Harvey's claim as discoverer of the circular motion of the blood, because Harvey was led to make his epoch-making experiments through knowledge of the anatomical discoveries of his Italian teacher, Fabricius of Acquapendente, who proved that the venous blood flowed toward the heart. Harvey died without having demonstrated to the eye the flow of blood through the capillaries; but having proved the main facts upon which the doctrine which bears his name is based, nobody thinks of attributing Harvey's discovery to Malphighi, who furnished the last link in proving it true. Similarly, though the Swedish system of gymnastics has been considerably modified by Ling's successors, and particularly by his son, Hjalmar Ling, its development has followed so closely the lines marked out by Ling that his name is still rightly given to the system.

It is clear from accounts given of a military gymnasium planned and fitted according to Ling's views in 1819, that he did not for some years discard the Guts Muths-Nachtegall gymnastic machines; and it is equally clear that he was recognized as an innovator, and the originator of a new method, even before he was called to Stockholm.

One Molbech, probably a Dane, writing from Lund in 1812, noted that the old university building had been turned into a fencing school and gymnasium. Of Ling he says: "He performs his duties with great zeal, and has introduced into his instruction a systematic method, in which he differs somewhat from the forms of instruction common elsewhere. I had," says Molbech, "the pleasure to witness these exercises, in which some of his pupils, from seven to eighteen years old, had attained a truly astonishing dexterity in a comparatively short time. It is indeed a pity that this arrangement is, properly speaking, only for the young gentry who have means, and resort to the university with their attendants more for the sake of these exercises and to learn living languages than on account of the teaching of the professors. The gymnastic instruction is a private matter and is paid for as such. The fencing master receives only an inconsiderable sum from the university, in return for which he gives free instruction to a few poor students and to a few town children, whom he admits gratis. So far Lund has the advantage over Upsala in this matter. I leave it to others to determine to what extent gymnastic teaching belongs to the proper work of a university. For my own part I am not one of those who set a low estimate on the gymnastic art. I look upon it rather, though it is now in its infancy, as one of the most powerful means by which mankind is able to counteract the physical and moral weaknesses which have, alas! kept pace with the new culture."

LING'S WRITINGS AND TEACHINGS.

We come now to the consideration of Ling's writings and teachings upon gymnastics. Ling held the most comprehensive views with regard to his art, declaring

that it was capable of being employed for the use and benefit of the whole nation, and should not be regarded as appropriate for specially interested individuals or clubs simply. Ling did not live to write a complete and exhaustive treatise. His principal works are as follows: (1) The General Principles of Gymnastics, published first in 1840 by his pupils, Liedbeck and Georgii; (2) Regulations for Gymnastics to be Used in the Army, published in 1836; and (3) Instructions in Gymnastics and Bayonet Exercises for Soldiers, published in 1838.

The General Principles of Gymnastics is divided into six parts, viz:

1. The laws of the human organism.
2. The principles of pedagogical gymnastics.
3. The principles of military gymnastics.
4. The principles of medical gymnastics.
5. The principles of æsthetic gymnastics.
6. The means or vehicle of gymnastics.

A few extracts from his "General Principles" will serve to show Ling's point of view and line of argument:

By theory of gymnastics we mean the doctrine of bodily movements in consonance with the laws discernible in the organism. We have shown in the first part that these laws aim at a complete agreement among the parts of the organism, and that health is the expression of this harmony.

On account of the relation of men, as well to themselves as the outer world, and still more by reason of human nature in its present fallen and dilapidated state, the gymnastic elements must take four principal directions, viz, a subjective-active, an objective-active, a subjective-passive, or an objective-passive. All of these different relations have their basis in the three "ground forms," the dynamic, chemical, and mechanical, since these are powers of the organism. In the first case we imagine one acting by means of his own force in order to maintain and develop it; in the second case his action is directed against some force external to himself; in the third case his organism is in a state of perturbation of some kind, so that he is less able to act than to suffer himself to be acted upon—i. e., he must submit to the mechanical influence of some external agent; in the last case one simply gives expression of his inner being to some outer being.

From these arise the four divisions of gymnastics, which are named: (1) Pedagogical gymnastics, by means of which one learns to bring his body under the control of his own will. (2) Military gymnastics, in which one seeks by means of an external thing—e. g., a weapon, or by means of his own bodily power—to subject the will of another person to his own. (3) Medical gymnastics, by means of which one seeks, either by his own proper posture or with the help of another person and by helpful movements, to diminish or overcome the ailment which has arisen in his body through its abnormal relations. (4) Æsthetic gymnastics, through which a person endeavors to give bodily expression to his inner being, thoughts, or impressions.

Pedagogical gymnastics develop the innate endowments to unity among the parts of the organism. In military gymnastics unity is sought between the body and the weapon in relation to the expressions of an antagonist. By means of medical gymnastics one seeks to restore unity between the parts, which has been lost through their abnormal relations; and through æsthetic gymnastics the subject expresses the unity which exists between the mental and bodily being. Therefore all the principal divisions have a mutual interdependence; and gymnastics, in which no regard is paid to the unity which should exist in and among these parts, have no laws, but are simply based on whim or fashion.

Inasmuch as Ling is considered by many as the originator of modern mechanotherapy, his views on the nature of health and disease possess some historical interest. Ling believed in a vital force having three "ground forms," viz: the dynamic, in which life, giving as it were an expression of its independent being, strives to liberate itself from matter; and the chemical and mechanical, in which life manifests itself in union with matter. In chemical force, however, life appears to occupy the foreground, while in mechanical force matter preponderates; therefore both of these forms may be considered as separate forms, existing under independent conditions. In the organism the nervous system corresponds to the dynamic ground form, the circulatory system to the chemical, and the muscular system to the mechanical. Health consists in the mutual harmony of these three "agents" When this harmony is disturbed disease arises in the following manner: "When the dynamic force is the

strongest element, disease takes a mechanical form; if the mechanical is the strongest element, disease takes a chemical shape; and if the chemical is the chief agent, the disease declares itself under a dynamic form."

This is very profound and edifying, no doubt, but to me it sounds very labored and inconclusive; and I must confess that I have been vastly bored in my attempts to follow Ling in his philosophical lucubrations with regard to the nature of life, the laws of organic unity, and the relation between parts and totality. Ling was undoubtedly a man of genius, a close observer in certain directions, and possessed of insight; but he was essentially an empiricist and not a scientist in his study of the nature and functions of the body. His opinions on biology, pathology, and physiology have the stamp of the fantastic speculations of the natural philosophers of the last century, and can not easily be translated into the scientific terms of to-day. He was doubtless a fair anatomist and understood much of the laws of animal mechanics, so far as they are concerned in the functions of the joints and the movements of the limbs. He was not an accomplished physiologist; in the then existing state of the science it was hardly possible that he should be.

It seems hardly fair to judge of Ling's title to fame and grateful remembrance from the exposition of views contained in his General Principles of Gymnastics, which was published after his death by two of his pupils.

The works relating to gymnastics which Ling himself gave to the world during his life were of a thoroughly practical nature. It is certain that Ling was a conscientious, inspiring, and successful teacher of gymnastics, and that he was instrumental in winning new and wide recognition of the educational and therapeutical value of systematized muscular exercise. Ling's most considerable achievements were in the departments of military and medical gymnastics. School gymnastics, as a branch of public instruction in Sweden, do not appear to have become highly organized or generally adopted till years after his death. They have developed along lines marked out by Ling, and derive many of their distinctive features from the peculiar conditions under which Ling was placed as an instructor of military cadets. The preponderance of officers of the army and navy among instructors in gymnastics in Sweden may be assigned as one reason for the comparatively slight development of popular gymnastics and athletics in that country, and for the limited vogue of Swedish gymnastics outside of Sweden.

Ling never worked out his scheme of "æsthetic gymnastics" very fully, and the attempts of certain of his successors in this direction have not proved signally successful. As has been said above, Ling's gymnastic labors were most fruitful in the fields of military and medical gymnastics. The great merit of his system, it seems to me, lies in the fact that only carefully selected forms of exercise are included in it.

Ling laid great stress on positions as distinguished from movements, and also emphasized the necessity of making all movements with care and precision at the word of command. He anticipated the common and class exercises of Spiess, and was the first to devise free movements as preparatory exercises for exercises on gymnastic machines. He subordinated exercises on apparatus to the needs and nature of the body, while Jahn subordinated the body to the nature of gymnastic machines, so to speak.

Ling divided movements into trunk, head, arm, and leg movements. He made use of "tables of movements," which are the prototypes of the present arrangement, known as the "gymnastic day's order." The following statements of Ling, in regard to the general laws of gymnastics, serve to indicate his point of view:

1. The aim of gymnastics is to develop the human body by means of properly chosen movements.
2. Those movements are to be considered properly chosen which have their true principle in the condition of the body which is to be built up.
3. The human body can not be developed farther than its original endowment or constitution permits.
4. Through lack of exercise the original endowment of bodily force may be unused, but not destroyed.

Ling's setting forth of the advantages of exercise without apparatus is interesting and instructive. He claims—

1. That more can exercise at one time under a teacher.
2. That such movements can be made in a great variety of places, e. g., on the march, in barracks, quarters, a schoolroom, or in a school yard.
3. That the trouble and expense of providing and keeping apparatus in repair are eliminated.
4. That the fact that the entire squad or class must make the exercises at the same moment promotes strength and agility and rapid attainment of bodily control.
5. That the execution of gymnastics at the word of command reenforces the effect of strictly military drill.
6. That free movements are more easily adaptable to the bodily peculiarities of individuals.
7. That they are better than machine gymnastics for overcoming awkwardness and stiffness.

In short, they afford the readiest and most rational means of laying a proper foundation for the technical drill of the military or naval recruit.

Ling's gymnastic tables, published in 1836 in his Reglement för Gymnastik, usually contain from ten to twelve movements. His first table, for instance, consists of what would now be called five order movements. Then follow: 6, a leg movement; 7, an arm movement; 8 and 9, a leg movement; 10 and 11, arm movements of a somewhat "respiratory" nature.

His sixth table comprises twelve movements: 1, leg movement; 2, arm movement; 3, head movement; 4, trunk movement or back movement; 5, leg movement; 6, arm movement; 7, leg movement; 8, arm movement; 9, jumping movement; 10, trunk movement; 11, leg movement; and 12, arm movement.

His tables also exhibit progression. Moreover, he laid down the rule that movements should be made in such wise as to promote and not hinder full, free, and deep breathing.

It was no small achievement for a man of Ling's poetic, idealistic cast of mind to attain so large a measure of success as a practical gymnasiarch, and as the founder and director of a semimilitary gymnastic institute. It speaks volumes for his character and gifts that he was able to commend his innovations to persons in power, and to win the recognition and support of the department of war.

As a teacher of military cadets, Ling was necessarily obliged to conform his procedures and methods to army regulations. It was incumbent upon him to teach with authority, to eschew useless or merely pleasurable forms of exercise, and to produce results without loss of time or the employment of elaborate or costly apparatus. Swedish gymnastics still bear witness to their semimilitary origin; and I am inclined to think that, on the whole, Ling's peculiar aims are more completely reflected and his methods more fully embodied in the physical training of recruits and soldiers than in any other department of Swedish gymnasties.

Officers in the army and navy have always figured prominently since Ling's day in the management of the Royal Central Gymnastic Institute at Stockholm. They have furnished and still furnish the largest and most influential contingent among its pupils and graduates. The military element has served to give dignity to the profession of gymnast and instructor of gymnastics in Sweden, and to preserve the Ling tradition from becoming too modern or popular. Indeed, there is ground for the belief that the rather limited vogue of the Swedish system of physical education is, in some measure, owing to the predilection of military men for unquestioning acceptance of their dicta and their inaptitude for easily readjusting themselves to new conditions and changed points of view.

Ling was a pioneer, but not the first or the last in the modern development of physical education. Among pioneers in that field he is entitled to a prominent and honorable place, because of the sagacity and devotion which characterized his labors, and of the large measure of success which crowned his endeavors to systematize and simplify the art of instruction in gymnastics and fencing. His character

was elevated, his aims patriotic and comprehensive. His methods were simple, direct, and orderly. His influence upon his pupils and disciples was deep and lasting. He gave a direction and stamp to Swedish gymnastics which they still retain. He won honor for himself and respect for his subject among his contemporaries. His spirit, his point of view, his methods, and his achievements are worthy of study and emulation.

SOME CHARACTERISTICS OF SWEDISH GYMNASTICS.

Swedish "gymnastik" may be divided into two main departments—Sjukgymnastik, or the movement treatment, so called, and Friskgymnastik. The latter embraces pedagogical gymnastics and military gymnastics. It is in the field of military training that the Swedish and German systems of gymnastics most closely resemble each other. Certain forms of apparatus in vogue in the Prussian army were introduced by Major Rothstein. In both armies the obstacle or applied gymnastics bear a strong family likeness to each other, and the practice of free and apparatus exercises by squads of men under the command of commissioned and noncommissioned officers is common to both. In the Prussian, as in the British and other armies, the piece is used as "hand apparatus" in certain styles of exercise, but "hand apparatus" is not used by the Swedes either in their school or military gymnastics. I know of no conclusive reason for utterly eschewing the use of hand apparatus by the Swedes except its cost and the fact that it is contrary to the Ling tradition.

Some attempt has been made to cultivate gymnastic and fencing clubs among the Swedes, but without very much success. It may fairly be said that the semimilitary character and labored rationalism of the Swedish gymnastics make them ill-adapted to serve the purposes of popular gymnastics for free associations of boys and young men. Gymnastic games are employed, both by Swedes and Germans, but the latter believe in them more heartily and prosecute them more generally and vigorously—witness the results of the activity of the movement for the promotion of youthful and popular sports in Germany.

In comparing German and Swedish school gymnastics the distinction between an artisan's kit of tools and instruments of precision suggests itself. Less care and attention have been given in Germany than in Sweden to the selection and arrangement of exercises, whether with or without apparatus, and the Swedes reject not a few forms of exercise as useless or injurious which pass muster in Germany. For example, the Swedes profess to discard exercises that tend to constrict the chest, those that require the breath to be held, and those that produce continuous pressure on the larger vascular and nerve trunks. One of their most stringent rules is that all gymnastic movements should help and not hinder full, free, and regular breathing.

In Swedish school gymnastics much stress is laid on precision and correctness in the execution of movements, though regard to form is by no means absent from other systems. The principles of teaching on which the success of gymnastic instruction so largely depends are pretty clearly apprehended and applied everywhere. But Swedish gymnastics are characterized by the character and amount of effort employed in coordinating the exercises belonging to a single "day's order," not only with regard to each other, but also with regard to the "day's orders" which have been practiced and the "day's orders" that are to follow. By means of the "day's order" or "table," and the principle of "gymnastic progression," which they have best worked out, the Swedes are enabled to order and vary their school gymnastics from day to day, from month to month, and from year to year in a graded series. By this means continuity is secured in the instruction; and the pupils, of whatever age or condition of health, are advanced from simple, easy, and absolutely safe exercises, to those that are complicated, difficult, or comparatively dangerous. Class leaders and memorized drills have no place in instruction of this kind. All exercises, whether by a full class or by a squad, are executed at the word of command. Continuous, progressive, and comprehensive gymnastic training can not be secured by mere imitation of a leader, or by executing memorized exercises over and over again even where music is employed. Change and variety are necessary and must be had.

They are best secured in school gymnastics by recognizing the laws of physiology and by following the principles of sound teaching. The principle of "commanded exercises" is a valuable one in school gymnastics; but it can be carried to such an extreme as to reduce spontaneity and emulation, which are the life of athletics and of popular gymnastics, to lowest terms. Teachers of gymnastics sometimes forget that children and youth were not made for gymnastics, but vice versa.

Compared with teachers of gymnastics in any other country, those of Sweden are a small and highly trained corps. From its inception the majority of the pupils of the Central Institute have been young officers in the army and navy, so that teachers of gymnastics in Sweden hold a better social position than elsewhere. Under special circumstances one may, by passing the required examinations, be licensed to teach without taking the course at the Central Institute, a course, be it said, more extended, comprehensive, and severe than is the case in any other European normal or military gymnastic school. The influence and traditions of the Central Institute are paramount in all branches of Swedish gymnastics, and have made them what they are. (For a fuller account of the Central Institute, see paper by its director, Professor Törngren, pp. 662–664, in Proceedings of International Congress of Education, published by National Education Association, 1894.) As tending to show that the principles of teaching employed in German gymnastics are not abysmally different from those termed Swedish, the following extract from the official "Leitfaden für den Turnunterricht in den Preussischen Volksschulen, Berlin, 1895," is here cited.

School gymnastics should, by means of appropriately selected and well-ordered exercises, promote the bodily development of the children, strengthen their health, habituate the body to a natural and pleasing carriage, increase the strength, endurance, and dexterity of the body in the use of its members, and secure the adoption of certain useful forms of dexterity, particularly with reference to future service under arms in the army of the fatherland. Throughout the entire course of instruction, simultaneously with increase of health, strength, and skill of the body, it is essential to secure as cooperative factors freshness of spirit, self-confidence, and resolution—discretion as well as courage—not only to arouse and strengthen these in the children, but also to accustom them to quick apprehension and accurate execution of commands, and to teach them ready subordination to the purposes of a greater whole. This can only be attained when instruction in gymnastics is so divided—in accordance with a definite plan of instruction and a carefully considered preparation on the part of the teacher for every single hour of instruction—that the material of instruction, through gradation and variety, insures regular progress to all pupils.

The main subjects of instruction are divided as follows: Order movements; free movements; apparatus exercises, and gymnastic games. Under the head of "The conduct of gymnastic instruction" the following remarks are made:

Gymnastic instruction, properly so called, begins, as a rule, with the completed eighth year of life. Nevertheless, it is incumbent on the teacher to pay attention to the bodily carriage of the children in the earlier years of school life, and to stimulate and guide them in games. Besides simple running games, in the lower classes, the so-called "imitation plays" have a place.

Every gymnastic lesson should include order and free movements as well as apparatus exercises. Free movements in place should interchange with similar movements involving change of place. Care should be taken that during the time of exercise the trunk as well as the lower limbs are exercised. During the hour of instruction the single exercises should follow one another quickly and without delay. Explanations and criticisms by the teacher should be concise and conclusive. Free and order movements as well as exercises with hand apparatus should always be made as common movements, i. e., simultaneously and in concert by all the pupils in the division at the command of the teacher.

Hitherto school gymnastics in Switzerland, Austria, Belgium, Denmark, Russia, Italy, England, and even in France, have followed or resembled German school gymnastics in the main; but in France, Denmark, England, and Russia a tendency to adopt or approximate toward Swedish methods has declared itself recently. In my opinion the Swedish system is better adapted to the needs of school children between the ages of 7 and 15 than any other. For boys above 15 and collegians—at any rate in England and America—I am inclined to think an admixture of German

forms of exercise will be found advantageous; but I would have them grounded in Swedish gymnastics to begin with.

More ink and anger have been expended in discussing the relative merits of German turnen and Swedish gymnastik than their diverse characteristics warrant. Each has its excellences and limitations, which reflect the personal and racial peculiarities of its inventors and champions. Both bear the stamp of the times and conditions under which they originated, but both have been modified and improved to suit new conditions. It is altogether likely that both will be still further modified to meet the requirements of progress in the science and art of education. It must be admitted that the leaders of German gymnastics are quicker to adapt themselves and their art to new demands and conditions than are their Swedish rivals, on whom the yoke of tradition weighs somewhat heavily. Besides the German and Swedish there is no modern system of gymnastics entitled to be designated as national in its characteristics and proportions.

In general, we may say that the Grecian gymnastics and athletics and the martial exercises of the ancient and mediæval Gauls and Teutons were of a character to affect chiefly the fundamental or earliest developed neuro-muscular mechanisms, which constitute "the coarse adjustment" of the body. The more massive bodily virtues of strength, endurance, and speed are promoted by popular sports; whereas dexterity, address, sleight of hand, quickness and accuracy of eye and hand require more specialized and complicated forms of exercise for their development. In other words, British sports are insufficient for the purpose of giving a complete training to the fundamental and accessory groups of muscles, and require to be supplemented by such drill as is afforded by the systematic gymnastics of the Swedes and Germans. For purely educational ends in many respects no system of physical training has yet been devised which is superior to the Swedish school gymnastics.

PRESENT TENDENCY IN PHYSICAL EDUCATION IN EUROPE.

In the course of the summer and autumn of 1896 the writer visited certain of the principal cities of Europe for the purpose of studying school hygiene and physical education. The principal cities visited were Dublin, Glasgow, Liverpool, Manchester, Leeds, London, Paris, Berlin, Frankfort, Cologne, Vienna, and Budapest. Of the cities mentioned Dublin, Glasgow, Leeds, and Budapest were visited by me for the first time.

Comparing the impressions gained in 1896 with those derived from studies made in former visits, I am led to the following general conclusions with regard to physical education in Great Britain, France, and Germany: Physical education as organized and administered in the public elementary and secondary schools of all those countries is of a more highly developed and efficient type than was the case on the occasion of my last previous visit in 1890. On the whole it is, as heretofore, more intelligently conceived and better organized on the Continent than in the British Islands. In German cities there has been a wide and successful movement to supplement gymnastic training (which has long been more fully provided for than in French or British cities) by the development of gymnastic games and out-of-door sports, both within and beyond the jurisdiction of the regularly constituted school authorities. As a rule German cities now provide their schools with both gymnasia and playgrounds. The former are detached or semidetached buildings, generally; the playgrounds in some instances form a part of the school yards, in others they are located in public parks or open spaces (as is more frequently the case in Britain and France), while in not a few cases special playgrounds are set apart for the school children of the city. In Paris and in London the school yards are used as playgrounds in the summer vacation, particularly in crowded districts. In Paris school gymnasia and special playgrounds for school children have increased notably in the last five years. The new French gymnastic code requires much attention to be given to games, and in accordance with it the gymnasia attached even to elementary schools are much more generally furnished with gymnastic appliances than is

yet the custom in American high schools. In Paris the school authorities maintain a large number of "vacation schools," which are officered by regular teachers. The "kinderhort" is peculiar to German schools. In it younger pupils, who otherwise would be left to their own devices while their parents are at work, remain on the school premises, under the charge of teachers specially detailed and paid for the purpose, until evening; while in the kinderhort they may receive instruction in singing, manual training, and the like. "Cantines scolaires," which furnish a simple meal for a trifling sum, constitute a marked feature of the newer schools in Paris.

School gymnasia, either in the form of special rooms or special buildings, are increasing in number year by year in Scotch and English cities, as well as in France. It is only in the United States, where physical education is in a relatively backward and undeveloped state, that the cheap device of having school gymnastics in the aisles and corridors is considered sufficient. The professional training and standing of directors and teachers of gymnastics is higher in France and Germany than in England. There has been more radical improvement and rapid progress in Paris than in London, Liverpool, or Berlin in the last six years.

Gymnastic apparatus in the school yard is not uncommon in England and Germany. As a rule the school yards are much more spacious and well adapted for school playground purposes in the cities of Europe than is the case in most American cities.

One of the most salient features of British city parks and open spaces is the varied and often ample space set apart for outdoor games for children, youth, and adults. In the parks under control of the London county council, for instance, there are no less than 23 open-air gymnasia, not to speak of fields for cricket, tennis, football, quoits, bowls, and even golf. Open-air swimming pools are found in certain city parks of Manchester, Birmingham, and London, although public baths with swimming pools are common in these as in most British cities. Swimming baths are found in several of the schools of Glasgow and Liverpool. Special funds for the instruction of school children in swimming in connection with public or semipublic baths are now provided in London, Paris, Frankfort, and Dresden.

SURVEY OF PHYSICAL TRAINING IN THE UNITED STATES.

The development of physical education in America has taken place along lines that are in general parallel to the course of the development of physical education in Europe. It may be divided roughly into periods as follows: 1. The period extending from the outbreak of the Revolutionary war to the year 1825. This was a period of premonitory criticism and slight theoretical recognition. 2. A period from 1825 to 1835 of enthusiastic discussion and of hopeful but short-lived experiments due to foreign example. 3. The period 1835 to 1860 was one of quiescence and neglect, marked by the beginnings of a reaction toward its close. 4. From 1860 to 1880 was a period of awakening, revival, and experiment. 5. The period extending from 1880 to the present time has been a time of active growth and diversified expansion.

Interest in problems pertaining to the physical side of education has never been so general, so active, or so intelligent in the United States as within the past ten years. Though that interest has continually gained in force and volume since the revival in athletics set in, after the close of the war, its spread has become much more rapid, and its manifestations much more widely diversified since the year 1884. Evidences of its extension are to be found in all parts of the country, under an increasing variety of forms. Within the period under review, the discussion by the general, the religious, the medical, and the educational press of the more superficial aspects of physical training has been notably enlarged. In certain quarters, likewise, a keener and more intelligent interest in questions relating to the scientific, historical, and pedagogical bearings of the subject has been awakened and fostered by publications emanating from the United States Bureau of Education, the North American Gymnastic Union, the National Education Association, and Associa-

tion for the Advancement of Physical Education, and from various other sources. At the same time not a little hubbub has arisen from various groups of would-be reformers and minor prophets, who are quick to scent an opportunity to call public attention to themselves and their crude and inept schemes for hastening the millenium. Systems and systemettes made up of "breathing exercises," "decomposing exercises," and "elocutionary exercises" still excite enthusiasm among faddists, but they can not be made to serve the ends of general physical education.

In the field of superior and secondary education the multiplication and improvement of material appliances have gone bravely on, and large sums of money have been expended on gymnasia, gymnastic apparatus, and playgrounds, and numerous colleges and preparatory schools for both sexes have established departments or quasi departments of physical training and personal hygiene. School boards in most parts of the country have shown a somewhat quickened sense of the need and value of bodily education and a hopeful new departure has been made in the direction of establishing public education on a really sound foundation. Since 1884 cities aggregating an enrolled school population of more than 1,000,000 have taken steps toward providing instruction in gymnastics of one kind or another for the children in their elementary schools. In promoting this end, especially in the West, the North American Turnerbund has achieved more than any other organization or class of organizations. In the East an independent movement has arisen, with Boston as its center, for the promotion and extension of the Swedish system of pedagogical gymnastics. The battle of the systems continues to be waged, but with less acrimony than at first. Its earnest and prolonged continuance will in the main, I am confident, be productive of good results, as it can not fail to bring out a large body of principles and facts which our educators as a class have ignored hitherto; and it is also likely to exercise an enlightening and humanizing influence on the too often uncritical and intolerant partisans of the systems and alleged systems of which we hear so much. Teachers that are not open minded and teachable are almost certain to prove false guides, and it is teachers and not mere gymnasts or expert foreturners that we must have if physical education is to win its proper place in the school and college world. Summer schools and a variety of nondescript "institutes" and "colleges" have shown marked activity in organizing what they are pleased to advertise as normal courses in physical culture. Of much greater consequence is the fact that several prominent normal schools have enlarged their curriculum by the appointment of special teachers of physical training, and other well-established schools of the same kind are moving in the same direction.

One of the most striking and hopeful signs of the times is the growing conviction that teachers and preachers of physical training require to be carefully and thoroughly trained for their work; and the measure of success attained by a few normal and training schools, for the special teaching of the principles and practice of physical education, that have been started or re-formed since 1880 gives ground for hope that this indispensable department of endeavor will in the future be much more adequately organized and supported. In this connection special mention should be made of the Turnlehrer Seminar in Milwaukee, the physical department of the International Young Men's Christian Association Training School at Springfield, Mass., Dr. Sargent's Normal School at Cambridge, Dr. Anderson's Normal School at New Haven, the Boston Normal School of Gymnastics, and the Posse Normal School, Boston. Each of the schools named above offers a course of theoretical and practical studies covering two years. Of summer schools and classes there is no lack. The most prominent and popular of them are the Harvard University Summer School of Physical Training, the Chautauqua School of Physical Education, and the Summer School for Physical Training maintained by the North American Turnerbund at Milwaukee. The International Young Men's Christian Association Training School also holds summer courses for the special benefit of men in charge of Young Men's Christian Association gymnasia.

The aims of the Young Men's and also the Young Women's Christian Associations

throughout the country have been greatly enlarged and their activity augmented within the last few years. The associations are to be congratulated on their success in multiplying new gymnasia and playgrounds and commended for their zeal in striving to secure a higher grade of intelligence and efficiency for the direction of their "physical departments." In the period of 1887–1896 the number of "physical directors" at work within the Young Men's Christian Association of the United States increased from 50 to 200; the training school of the Association at Springfield, Mass., numbered 20 students—all men—in March, 1896. At that date the school had had 76 students besides the 20 then enrolled. Of the 76 who had been students in the school for a year or more 51 were graduated. Excepting the Normal School of the Gymnastic Union at Milwaukee, which graduated 97 men in the period 1887–1895, the training school at Springfield has accomplished more in the way of training men for work in the field of physical education than any other institution in the country. The park commissioners of the city of Boston have taken a step that I believe is without precedent in this country in the establishment and maintenance of public out-of-door gymnasia for boys and for girls at Charlesbank and at Wood Island Park. Thanks to the interest of the park commission, backed by the influence of Mayor Quiney, the city of Boston is likely to have within a few years a comprehensive system of public playgrounds and gymnasia. The town of Brookline, Mass., and the city of Boston have each established public swimming schools that are worthy of mention. Another innovation worthy of mention is the activity shown by officers and men in organizing athletic sports and gymnastic instruction for the benefit of the rank and file at several posts of the Regular Army of the United States. The course of physical training at the United States Naval Academy, at Annapolis, and that at the United States Military Academy, at West Point, have been notably extended and improved since 1885. The use of gymnastics in retreats and asylums for the insane has also been revived.

Emphatic acknowledgment should here be made of the wisdom shown and the success achieved by the management of the State Reformatory at Elmira, N. Y., in demonstrating the fact that systematic physical training may be made a more potent factor in the mental and moral reformation of criminal dullards. The pedagogical results of the Elmira experiment are of capital importance, and the progressive spirit shown by the government of the State of New York in providing generously for the establishment and maintenance of a department of physical training in its reformatory for felons is worthy of the warmest commendation. Would that even half of our school boards and boards of college trustees were equally progressive. All things considered, the Elmira experiment constitutes the most original and conclusive attempt yet made in the United States to utilize physical training for hygienic and educative purposes. The original experimental class was composed of dullards who were the despairs of their teachers in school and shopwork. The object of the experiment was "to ascertain if physical culture, as comprised in frequent baths, massage, and daily calisthenics, would not result in a partial awakening and stimulation of dormant mental power." Increased mental activity rather than muscular development was to be the gauge of the success or failure of the experiment. Eleven men, ranging in age between 19 and 29 years, were given two hours a day of setting-up exercises and light dumb-bell drill. Each had three baths weekly; all were released from labor tasks, but given daily tasks in school. The men were simply coarse, stupid, insensitive, unambitious dullards, imprisoned for felony, not weaklings or feeble-minded.

The five months' experiment proved a surprising success. The men improved not only in physique and carriage, but also in mental power and self-control. The average marking of the class, according to the school register, was 74.16 out of a possible 100 for the five months in question, whereas the corresponding mark for the five months immediately prior to the beginning of the experiment was 45.25. In March, 1890, the reformatory gymnasium and bath house (the two establishments are under one roof) were opened. The usefulness of the department of physical

training at Elmira may be inferred from the following statement of Dr. H. D. Wey, who has been in charge of it since 1886:

It is in touch with every department, second to none in importance, and particularly related to the schools, the hospitals, and to discipline. In its relation to the schools it is a place of preliminary setting up, of physical renovation and betterment, that vegetative functions and volitional processes may be quickened and amplified and a higher grade of man evolved, which is sought, not for increased immunity from disease, decline, and death, but for corporal excellence in its entirety, with a resultant impress upon mind and manners. It is in touch with the hospital in that it receives many cases of functional disturbance and perverseness not in themselves inimical to life, but whose continuance disturbs the rhythm of the organism and the correlation of its several parts. * * * Physical training is related to discipline through the greater amenability established to law and order from the strengthening of the parts, regulation of functions, and removal of nervous irritation arising from unharmonious adjustment of the several systems of the body.

The number of inmates assigned to work in the gymnasium has steadily increased. Thus the number of assignments to it were 85 in 1890, in 1893 132, and in 1896 the number was 736, including 538 men assigned to the gymnasium on admission. Military drill and evolutions have been in vogue at Elmira since 1888-89. In his report for 1896 Dr. Wey gives it as his opinion that the military drill does not produce such far-reaching and solid results upon the physique as the gymnastics. "From a psychological point of view," he says, "the military system is of decided advantage in some particulars. * * * There is no advantage derived from the military that can not be obtained in other ways." It is noteworthy that, in addition to gymnastics, the Elmira inmates, or at least certain of them, are subjected to various forms of athletic exercise out of doors, as, for instance, sprinting, jumping, hurdle racing, putting the shot, and throwing the hammer.

THE BEGINNINGS OF PHYSICAL TRAINING IN AMERICA.

The prehistoric period of physical training in America, or the period in which the literary recognition of physical education began to manifest itself, did not close until the first quarter of the present century. It corresponds in point of time roughly with the period of preliminary experiments in Europe. During this period Americans were too busily engaged with war and politics to pay much attention to matters pertaining to educational reform. Still there were not lacking, even before the year 1800, influential and outspoken critics of what then passed for a liberal education. Among such we may mention Benjamin Franklin, Benjamin Rush, both of Philadelphia, and both signers of the Declaration of Independence; its author, Thomas Jefferson, and Noah Webster, the founder of the dictionary. It is clear that all of them held views decidedly favorable to bodily exercise of certain kinds. (See pages 495 and 496 in Report of Commissioner of Education for 1891-92.)

Noah Webster seems to have been the first American of note to propose the institution of a college course of physical training. His proposal was, however, of a rather rudimentary nature. It is found in his "Address to yung gentlemen," dated Hartford, January, 1790. He says it should be "the buzziness of yung persons to assist nature, and strengthen the growing frame by athletic exercizes. * * * When it iz not the lot of a yung person to labor in agriculture or mekanic arts some laborious amusement should constantly and daily be pursued az a substitute, and none iz preferable to fencing. A fencing skool iz, perhaps, az necessary an institution in a college az a professorship of mathematics." He further recommends running, football, quoits, and dancing as suited to the needs of sedentary persons.

Among Dr. Rush's published essays is one dated in August, 1790, "On the amusements and punishments proper for schools." In it he proposes that "the amusements of our youth shall consist of such exercises as will be most subservient to their future employments in life." He favored agricultural and mechanical employments as means of diversion and training, and notes with approval that "in the Methodist College in Maryland a large lot is divided among the scholars, and premiums are adjudged to those who raise the most vegetables." "The Methodists," he adds,

"have wisely banished every species of play from their college." Again he says: "All the amusements of the children of the Moravians at Bethlehem, Pa., are derived from their performing the subordinate parts of several of the mechanical arts." It was in accordance with such notions as these that farm, manual labor, and Fellenberg schools were founded, and societies for promoting manual labor in literary institutions were organized somewhat extensively in various parts of the United States during the first third of the present century.

The prominence given to military considerations in many of the earlier and some of the later attempts to make a place for physical education may be noticed here. Bodily accomplishments have ever been assigned a prominent place in the codes of the soldier and the gentleman; and every outburst of military ardor in our history has led to attempts to engraft certain technical forms of military training upon the general training of the rising generation. The war of the revolution, the war of 1812, and the civil war each gave rise to such attempts.

In 1790, President Washington transmitted to the First Senate of the United States an elaborate scheme prepared by Gen. Henry Knox, then Secretary of War, for the military training of all men over 18 and under 60. The youth of 18, 19, and 20 years were to receive their military education in annual camps of discipline to be formed in each State, and a certificate of military proficiency was proposed as a prerequisite to the right to vote. This plan failed of adoption, as did also the following recommendation that was urged in the national House of Representatives in 1817 and 1819, "that a corps of military instructors should be formed to attend to the gymnastic and elementary part of instruction in every school in the United States." In 1862, Congress made the teaching of military tactics obligatory on all State colleges that should avail themselves of the Morrill Act, whereby certain public lands were apportioned among the several States for the purpose of promoting education in agriculture and the mechanic arts. In 1864, a plan recommended by the State board of education for making military drill a part of the public school training of boys throughout the State narrowly escaped adoption by the legislature of Massachusetts.

Excepting the Military Academy at West Point, in whose curriculum bodily exercises have figured more or less largely since 1817, the "American Literary, Scientific, and Military Academy," founded at Norwich, Vt., in 1820, by Capt. Alden Partridge, formerly superintendent at West Point, seems to have been the first educational institution of note in America to attempt to connect "mental improvement with a regular course of bodily exercises and the full development of the physical powers." The example of the West Point and Norwich academies proved mildly stimulating, and led to the establishment of perhaps a score of select military schools for boys in the course of thirty years; but, so far as I know, that example had no effect upon the development of the public-school system of instruction in any city or State. During the civil war military drill became popular as a means of physical education for boys in private schools and high schools. There have been several exacerbations of martial ardor since the war, which have led to attempts to induce Congress and various State legislatures to sanction schemes to provide places in which ambitious veterans and militiamen should aid school boys to play at soldiering. Judging from the experience of France, England, and Germany, if the introduction of military drill should become general, the experiment would be likely to prove short-lived and disappointing. It is an inexpugnable fact that in every first-class European army, gymnastics, rather than the manual of arms, are employed in order to strengthen, supple, and "set up" the recruit.

EARLY GYMNASTICS IN NEW ENGLAND.

The impulse which led to the gladsome advocacy and espousal of physical education in the second quarter of this century was distinctly humanitarian in its nature. The movement for educational reform in Europe made but slight impression upon American thought and endeavor until after the close of the war of 1812. But the

United States shared markedly in the exalted and restless mental activity which characterized the first two or three decades following the battle of Waterloo. This period was peculiarly prolific in optimistic schemes for the amelioration of popular ignorance and misery; and American reformers became highly susceptible to the influence of foreign example, and developed a well marked aptitude for laudation and imitation. In the years 1825 and 1826 physical education became a matter of almost epidemic interest in New England; Boston in particular was a focus of infection. Although, as I shall point out, the attempt was definitely made to introduce gymnastics into a number of colleges and private schools for boys, physical education was very vaguely apprehended, as it was often held to include pretty much all that is now relegated to the department of personal hygiene. Physical education fired the imagination of educational reformers for a time, but so did monitorial instruction, manual training, the propagation of useful information, vegetarianism, teetotalism, and phrenology.

The Round Hill School, established at Northampton, Mass., in 1823, and the High School, founded in New York City in 1825, each introduced many features that were novelties in the education of American boys; but the most striking innovations by which these schools were marked were copied from Lancastrian, Fellenbergian, or Pestalozzian schools in Europe. Physical training was accorded a place both in the Round Hill School and in the New York High School, which schools constituted a sort of stella-duplex in the educational firmament, and served for some years to fire the emulation of a host of aspiring and enterprising pedagogical adventurers. As regards physical education the Round Hill School was decidedly the more refulgent. Although a rude attempt at gymnastics was made in the Monitorial School for Girls in Boston early in the spring of 1825, I know of no reason to dispute the claim of Messrs. Cogswell and Bancroft of Round Hill that they "were the first in the new continent to connect gymnastics with a purely literary establishment." The Round Hill gymnasium was established in 1825. It was in reality a turn-platz or outdoor gymnastic ground, planned, fitted, and managed in accordance with the Jahn system of turning then prevalent in Germany, and to a much less extent in England. Dr. Charles Beck, who was "instructor in Latin and gymnastics" at Round Hill, had been a pupil of Jahn himself, it is said. Gymnastics continued to be a feature at Round Hill for several years.

Harvard College started the first American college gymnasium in one of its dining halls in March, 1826; and later in the same season a variety of gymnastic appliances were put up in the playground, known as the Delta. Dr. Follen, a German exile, familiar with the Jahn turning, was the instructor and leader in gymnastics. The Boston Gymnasium, opened in the Washington Gardens October 3, 1826, with Dr. Follen as its principal instructor, seems to have been the first public gymnasium of any note in the United States. In July, 1827, Dr. Francis Lieber, who was warmly recommended by his old teacher and friend, Father Jahn, succeeded Dr. Follen. In passing it may be remarked that the managers of the Boston Gymnasium did not enter into negotiations with Dr. Lieber until their endeavors to secure Jahn as director proved futile. (For an account of the negotiations see American Physical Education Review for June, 1897.) It is said that the attendance at the Boston Gymnasium rose to four hundred in the first year and dwindled to four in the course of the second year. Gymnastic grounds were established at Yale in 1826, and at Williams, Amherst, and Brown in 1827. A dozen or more schools might be named that were established in the period 1825–1828 for the sake of giving effect to the reformed principles of education. Doubtless a much larger list might be made but for the meager and chaotic character of the educational annals of the time in question. As it is, my list comprises only such institutions as have left us printed evidence of their profession of faith. Only one of the twelve was, properly speaking, a public school. All of them promised and some of them furnished facilities of a sort for the physical education of their pupils. The day of

normal training had not come, and, so far as can be ascertained, no attempt whatever was made to train up teachers of gymnastics in a systematic, rational way.

The public-school system of the country was still in embryo. The current conception of "common-school education" was so mean and narrow, and the teaching class, at least outside of the colleges, academies, and better private-adventure schools, was so largely made up of inferior and incongruous elements that we need not wonder that the interest in physical education, in the second of our five periods, proved to be illusory and short-lived and exercised almost no influence in the field of popular education. What had been heralded as a new era in physical education in 1825 was practically closed by 1830. What might have been the result if Drs. Beck, Follen, and Lieber had not quit the field it is vain to surmise. Even they were ruled more by theoretical notions of human perfectibility than by scientific knowledge of bodily health and development.

THE PERIOD BETWEEN 1830 AND 1860.

No general or widespread revival of interest in school or college gymnastics occurred between 1830 and 1860, and athletic sports had no standing either as an elective or compulsory branch of education. Still what was loosely termed "physical education" continued to receive marked attention; but with many writers "physical education" included pretty much everything that is now classed under the head of personal hygiene. A considerable party arose who favored manual labor instead of gymnastics, and a number of enthusiastic attempts were made, prior to 1835, to provide college and seminary students with facilities for gaining health, recreation, and cash by means of agricultural and mechanical labor. Voluminous and curious evidence of this exists, particularly in a report of Mr. T. D. Weld, the general agent of the Society for Promoting Manual Labor in Literary Institutions. The society was founded in 1831, and Mr. Weld's report was published in 1835, or thereabouts.

Among the multifarious and heterogeneous stirs and movements for the regeneration of society which constitute so marked a feature of the first third of the present century the crusade for popularizing the doctrines of physiology is especially worthy of our notice, since it served to keep alive and in some measure to spread a vague theoretical interest in physical education as it was then uncritically conceived. Indeed, it is not too much to say that the physiology crusade served to perpetuate the essential spirit of the period 1825–1830 and had much to do with preparing the way for the gymnastic revival that set in just before the war broke out. This crusade had its beginnings as early as 1825, or possibly earlier. It was greatly stimulated by the furore which was created by the books and lectures of the phrenologists Spürzheim and George Combe, who argued in a solemn and taking way that education should be based on the teachings of physiology and ordered in accordance with the alleged laws of their pseudo-science. It may be said to have culminated in the year 1850, when the legislature of Massachusetts passed a law authorizing school committees throughout the Commonwealth "to make physiology and hygiene a compulsory study in all the public schools." Through the multiplication of popular manuals of physiology, which frequently contained much hortatory and laudatory matter on physical education, the general public came to entertain a nebulous notion that serviceable bodies were worth striving for and that school machinery of some sort should be devised for the purpose of securing them.

If it were worth while, a considerable list might be given of lectures, addresses, and books that helped to propagate this notion. It will suffice to mention Miss Catherine Beecher's Course of Calisthenics for Young Ladies, published in 1832; The Principles of Physiology Applied to the Preservation of Health and to the Improvement of Physical and Mental Education, by Dr. Andrew Combe, of Edinburgh, an unauthorized edition of which was published in New York in 1834, and Horace Mann's Sixth Annual Report as Secretary of the Massachusetts Board of

Education, published in 1843. Miss Beecher was a precursor of Dio Lewis as regards the advocacy of free and light gymnastics and musical drill, and appears to have been the first native American to assert claims to originality as a "system maker." Her system seems to have awakened some mild and passing attention in the proprietors of private schools for girls. In the preface to her Manual of Physiology and Calisthenics for Schools and Families, New York, 1856, Miss Beecher professes to be a disciple of Ling; but the body of the book is not written in accordance with the distinctive principles of the Swedish gymnasiarch.

Very little attention was bestowed by Americans upon German gymnastics in the period 1835 to 1860, which period as a whole was one of ground breaking and seed sowing as regards physical education. In the North American Turnerbund we have a genuine and vigorous offshoot from the German stock, but the transplanting of that sapling and its cultivation in American soil failed to excite the interest of American educationists for more than a generation. The beginnings of the Turnerbund, which for many years has been the largest, most widespread, and efficient gymnastic association in the United States, are to be found in the Turnvereine established by political refugees from Germany, who found an asylum in this country after the revolutionary year of 1848.

DIO LEWIS AND THE GYMNASTIC REVIVAL.

We have abundant evidence that there was a growing interest in gymnastic and athletic forms of exercise in the latter half of the decade ending in 1860. Such evidence is found in the effort to secure funds for the erection of school and college gymnasia; in the increased addiction of collegians and others to rowing and ball matches; in the instant popularity achieved by the Tom Brown books; in the interest excited by the lectures and exhibitions of Dr. G. B. Windship, whose public career as an exponent of heavy lifting began in Boston in 1859, and in the prominence given to topics relating to physical education in general and school gymnastics in particular by speakers at teachers' conventions and institutes, by the conductors of educational journals, and by public-school officials.

The gymnastic revival of 1860 may be said to date from the meeting of the American Institute of Instruction at Boston in August of that year, at which meeting Diocletian Lewis, commonly called Dr. Dio Lewis, took a prominent part in the discussion as to the expediency of making "calisthenics and gymnastics a part of school-teaching." This revival was not a thing apart, but grew out of the crusade for popularizing physiology and hygiene, if, indeed, it be not better described as a phase or continuation of that crusade.

It was wholly natural that Dio Lewis should figure in both movements. He was by nature an enthusiast, a radical, and a free lance. He was born and bred at a time when advocacy of the doctrines of temperance, antislavery, phrenology, homeopathy, physiology, and of educational reform savored more or less of ultraliberalism, or even of "free thinking." Before his first public appearance in Boston, when he may be said to have stormed the key to the situation by his capture of the American Institute of Instruction, Dio Lewis had traveled extensively for some years in the Southern and Western States, as a week-day lecturer on physiology and hygiene, and as a Sunday orator on temperance. He had given some attention to physical education, withal; and, being well versed in the arts of the platform, was quick and apt in taking advantage of the growing interest in gymnastics. He was unconventional, sympathetic, plausible, oracular, and self-sufficient; and the time was ripe for a gymnasiarch of that sort. The doctrines and methods of the Lewis gymnastics, which were novelties and seemed original to most of his followers and imitators, spread rapidly over the whole country, and, if we may credit certain eulogists of the system, even into "Europe, Asia, and Africa." His skill in securing the aid and backing of educationists and notabilities contributed materially toward making Dio Lewis the most conspicuous luminary, for a time, in the American gymnastical firmament, but failed to make him a fixed star.

He was in great demand as a lecturer before normal schools, teachers' associations and institutes, and lyceum audiences; and his contributions to leading periodicals were eagerly read and favorably received. He was medical practitioner, lecturer, editor, gymnasium manager, school committeeman, teacher, hotel proprietor, bath-manager, and preacher by turns. In short, Dio Lewis was a revivalist and agitator, and not a scientist in any proper sense. His originality has been much overrated—very few of his inventions, either in the line of apparatus or of methods of teaching, being really new. In his book he borrowed lavishly from German sources, so that his New Gymnastics were in the main neither new nor his own. The establishment by Dio Lewis in 1861 of the Boston Normal Institute for Physical Education was a really new departure—in America—(unless perchance the Turnlehrer Seminar of the North American Turnerbund antedated it), and constituted, perhaps, the most considerable and solid of Dio Lewis's contributions to the cause of physical education. He is also deserving of praise and credit for convincing the public of the utility of "light gymnastics," i. e., exercises with hand apparatus, and for his influential aid in popularizing gymnastics for school children of both sexes.

Teachers and school managers showed unexampled interest in the "new gymnastics," which seemed destined soon to form a part of the curriculum of the public schools of the more progressive cities of the country, as well as in a multitude of private schools and academies. For instance, the school board of Cincinnati, in 1861, and that of Boston, in 1864, formally adopted schemes looking to the general introduction of gymnastic teaching into their public schools. Owing to various reasons that I will not take time to enumerate, these and similar schemes proved illusory and impracticable. Even to-day we must admit that no important city or town in the United States has succeeded in maintaining for fifteen consecutive years a genuine and adequate system of school gymnastics.

PHYSICAL EDUCATION IN AMERICAN COLLEGES.

The civil war acted as a check to the spread of the interest excited by the gymnastic revival of 1860 in athletic and gymnastic forms of physical education on the one hand, while on the other it served to bring military forms of drill and exercise into prominence and favor. In the year 1860 the colleges of Harvard, Yale, and Amherst erected gymnasium buildings; but their example was not followed to any considerable extent by the other colleges until after the close of the war. Amherst College established a department of hygiene and physical education in 1860. Dr. Edward Hitchcock, sr., has served continuously as the professor in charge of that department since August, 1861. The example of Amherst in making gymnastics a compulsory branch of college work had but little effect upon the other colleges of the country prior to 1880.

The building of college gymnasia was resumed after the close of the war. During the decade after the war the disbanded armies of the Republic furnished to the preparatory schools and colleges a large contingent of students who had been subjected to strenuous physical training. The influence exerted by this contingent in reviving and developing an interest in physical training was far more potent in the department of athletics than in that of gymnastics or of military drill. Baseball and rowing developed rapidly and led to the multiplication of intercollegiate athletic contests. The inadequacy of the facilities afforded by the older gymnasia for the indoor exercise and training of crews, teams, and champion athletes, had much to do with inaugurating a new era of gymnasium building, and with improving the organization and administration of the departments of physical education in the leading colleges for both sexes. This era opened in 1879–80 with the completion of the Hemenway Gymnasium at Harvard University. This gymnasium, for whose erection and equipment Mr. Augustus Hemenway, of Boston, a graduate of Harvard in 1876, had given the sum of $115,000, surpassed in size, convenience, and magnificence any of the gymnasia then existing in the country. This gymnasium, both as regards its structural features, its fittings, and its methods of administration, has

served as the model for most of the gymnasia, whether public or private, that have since been built. To Dr. Sargent, the director of the Hemenway Gymnasium, we owe a debt of gratitude for many improvements in the construction of apparatus, for the invention of the so-called Sargent system of developing gymnastics, and the demonstration of the fact that gymnastic and athletic exercise on the part of young men and boys can and should be controlled and directed in the interest of healthful growth and normal development. The Sargent developing machines have come into very general use in the gymnasia of colleges, Young Mens' Christian Associations, and athletic clubs; so, too, has the Sargent system of measurements and tests to be employed in prescribing exercise and testing its results. The innovations and improvements associated with Dr. Sargent's name have done much toward securing a quasi recognition of physical education and its representatives from the exponents and devotees of "liberal studies."

Thus far the colleges of the country have been slow to advance beyond the methods of gymnastic instruction adopted at Amherst thirty years ago, or the Sargent idea of employing physical diagnosis and anthropometrical observations, in connection with the use of developing appliances, in the oversight and guidance of the physical training of students. Considerable progress has been made in the last five years in expanding and strengthening gymnastic instruction in colleges for men. In this connection honorable mention should be made of Amherst, Bowdoin, Brown, Harvard, Haverford, Oberlin, Rutgers, and Yale. Certain colleges for women have adopted Swedish pedagogical gymnastics, notably the Woman's College of Baltimore and Smith College at Northampton, Mass., and Radcliffe College at Cambridge, Mass., but Swedish gymnastics have scarcely effected an entrance as yet into colleges for men. As a rule our American gymnasia, excepting those belonging to the Turnerbund and those organized in accordance with the principles of the Swedish system, fall short of excellence as schools of physical training. This, I take it, arises from the fact that the educational worth of physical training has been largely overshadowed in the minds of those who officer and control our schools and colleges by the obvious, but in many respects less important, hygienic influences of muscular exercise. Whatever the reason for this state of things, the fact is obvious that our colleges and secondary schools, with few exceptions, have shown vastly more skill and energy in the acquisition of mere appliances than they have in developing the science and art of physical education. Indeed, one is tempted to think that those who control our colleges and our preparatory and normal schools have yet to learn that physical education has a history and is capable of being organized as a genuine department of instruction. Otherwise, why should they overlook the lesson to be learned from the marked success achieved at their very doors by the North American Turnerbund in organizing gymnastics and popular sports in such wise that adolescents and young men take part in them eagerly, but without displaying the insensate spirit of rivalry, bordering on professionalism, which has wrought such mischief in school and college athletics?

ATHLETICS—THEIR CHARACTERISTICS AND LIMITATIONS.

The best interests of rational and effectual physical training have suffered much in this country, and suffer still, from the disproportionate influence exercised by athletic ideals upon scholastic and collegiate youth; and from the undue prominence accorded athletic contests and contestants by an uncritical public and an injudicious press. It is natural for youth on the threshold of manhood, segregated from their elders under the conditions peculiar to school and college life, to be headstrong and self-sufficient. They are eager to distinguish themselves in the eyes of their fellow-tribesmen by the display of individual prowess, and, for the time being, are apt to be animated by narrow and distorted views and to be insensitive or averse to enlightened or even civilized opinion. They are strongly swayed and frequently overmastered by the spirit of rivalry which is largely inseparable

from athletic sports; so that at times doubtful and discredited methods seem admissible, if not admirable, and foul means fair. All this is natural in adolescents, who, being the sons of civilized men, pass rapidly in a few years through phases of development that their semicivilized and barbarous ancestors emerged from slowly and laboriously after generations and centuries of upward struggle.

So sudden and rapid has been the rise and spread of athleticism that the generation of men who have recently left the stage on which our athletic youth now figure so prominently and grotesquely, number but few who are qualified by insight and experience to serve as the exemplars and advisers of their juniors. The teaching class, as a whole, has so little knowledge of either the art or science of physical education, and is still so largely ruled by the traditions of medieval scholasticism, as to lack in large measure the qualities requisite for efficient leadership outside of the class room. Hence our athletes have been left, in the main, to their own crude and boyish devices, which tend, when unchecked, toward extravagance and professionalism. The powerlessness of our educational leaders to originate, and their failure to adopt effectual measures for evolving order out of the athletic and gymnastic chaos over which they nominally preside, constitutes one of the marvels of our time.

One of the most striking proofs, to my mind, that American educationists do not take physical training seriously is afforded by the famous and much-lauded report of the Committee of Ten. It is a powerful, concerted, deliberate expression by leading men of discontent with elementary and secondary education as organized and administered in the United States at the time it was made; it proposes various reform measures, but it contains no word on physical training in general or on any of its leading branches, e. g., gymnastics, athletics, or manual training. There was abundant European precedent for a different course.

Although the underlying principles of gymnastic exercises and athletic sports are identical, the distinctive aims and methods of the athletic trainer and the gymnastic teacher are divergent and to some extent antipathetic; and one reason, as it seems to me, for the lamentable neglect of genuine gymnastic instruction in the college world is found in the fact that college authorities have been so engrossed by a variety of unfamiliar and perplexing problems, forced upon them by the sudden and rapid expansion of the interest in athletic sports, that they have lacked energy for grappling further problems in bodily training. Quite naturally athletics constitute the most popular and obtrusive branch of physical training, and the athletic movement possesses much greater force and volume than any of the allied movements that have been revived or originated since 1860. Though the athlete belongs to a type that is not new to the world, he is practically a new species of man in America—a species having many varieties. The American gymnasium is a semioriginal creation that has been devised mainly by the American architect in order to provide for the expressed or fancied needs of the American athlete. The growth of athletic clubs has been a notable feature in the history of physical training of the past fifteen years. All things considered, the athletic clubs constitute the consummate and peculiar product of the athletic movement. There is nothing quite like them outside of America. Their influence, which is not salutary in all respects, is already great among schoolboys and collegians. The athletes as a class, those who aid them and those who bet on them, have had little to do with urging or promoting the educational side of physical training—for the simple reason that their interest in gymnastics is even feebler and less intelligent, considering their opportunities, than that of college faculties and boards of trust. It is chiefly in indirect or negative ways that the athletic clubs have contributed to the advancement of physical education, in its proper sense.

Athletics when wisely regulated afford valuable, I will even say invaluable, means of mental, moral, and physical training for boys and young men; but the element of rivalry and competition is so inseparable from athletic aims and methods, and excellence in the athletic specialties demands so much time and requires such costly appli-

ances, as to preclude the general adoption of athletic sports as the principal means of securing the hygienic and educational ends of physical training for the mass of pupils in our public schools, especially in urban districts.

Gymnastics, if well ordered and properly taught during the early years of school life, afford the best preparation that an aspirant for athletic honors can have. Aside from the question of expense, there is no good reason for prolonging mere gymnastic drill to the exclusion of the higher forms of gymnastics and of outdoor sports after a pupil reaches the age of fifteen years. When the managers of our high and preparatory schools shall have learned their business—as regards bodily training—they will, I believe, institute courses of gymnastic instruction after the analogy of their elementary courses in language and mathematics, so that their pupils, on entering college we will say, will be prepared to choose their athletic and gymnastic electives in much the same way as they now choose their elective studies when the opportunity is given them. When the schools perform their duty in the premises, the colleges can give up the kindergarten and grammar-school styles of physical education, and it will then be much easier for them to solve the athletic question. That question will never be satisfactorily solved till it is taken out of the hands of growing boys and professional or semiprofessional athletic trainers.

It is the part of wisdom to recognize the fact that athletics and gymnastics are coordinate departments rather than hostile camps, and to strive manfully to define their limits and determine their relations and interrelations, inasmuch as one of the weightiest questions confronting us at this time is this, How shall athletics and gymnastics be justly united in the physical training of American youth of both sexes?

GYMNASTICS IN CITY SCHOOLS IN THE UNITED STATES.

Neither the colleges nor the athletic organizations of the country have earned the right to speak with authority on the question of what constitutes a well-ordered and practicable system of physical training for elementary and secondary schools. Therefore the more or less successful introduction of school gymnastics, since 1884, by the cities of Chicago, Kansas City, Cleveland, Denver, Indianapolis, St. Louis, Milwaukee, Cincinnati, St. Paul, San Francisco, and Boston, through the action of their respective school boards, has been chiefly due to the zeal and insistence of the advocates of the German and Swedish systems of gymnastics, who were prepared to speak with knowledge and to act with intelligence. In every city named above, excepting Boston, German free and "light gymnastics" have been adopted, and the directors of physical education are graduates of the seminar or normal school of the N. A. Turnerbund. In Boston, Worcester, Cambridge, and a considerable number of other cities in Massachusetts and New England, Swedish gymnastics have been introduced more or less completely into the public schools. "Mixed systems" of an "eclectic" character are in vogue in the schools of Brooklyn, Washington, New York, and Providence.

The promotion of gymnastic teaching in the public schools has ever been one of the cherished aims of the Turnerbund; but its efforts in that direction met with but little recognition or success prior to 1881. During the last twenty years the Turnerbund has built up a flourishing system of gymnastic schools for children of school age, and the experience gained in these schools—which should not be confused with the Turnvereine—has at last been turned to some account by the school authorities of several cities where the voting strength of the Germans is great. At first sight it seems a most extraordinary circumstance that up to 1885 American educationists and system-makers should have ignored, almost entirely, the practical and efficient system of gymnastic instruction in vogue among the German-American Turners. But the truth is, the Turners were somewhat chauvinistic and inaccessible, while the educational world, in spite of occasional gusts of theoretical enthusiasm, was really apathetic and incurious with regard to the practical side of physical education. Since 1884, at about which time the Turnerbund first made a course in

English an obligatory part of its seminar curriculum, the policy of the Turners has become more liberal and their influence and success correspondingly greater.

Unlike their Teutonic kindred, the Scandinavians of this country have made no general or effective propaganda for their national gymnastics. The rise of Swedish pedagogical gymnastics within the last few years has been due chiefly to American initiative and endeavor. The appointment in 1874 of a Swedish teacher for three months' service in the Girls' High School of Boston seems to have been a fortuitous circumstance.

The gymnasium of the Woman's College of Baltimore, which was opened in 1888-89, was fitted with Swedish apparatus at the outset, and has always been managed in strict accordance with Swedish principles, the class instruction being intrusted usually to graduates of the Royal Central Gymnastic Institute only. This was the first successful experiment to adopt Swedish methods on a large scale in the physical education of American youth.

But Boston has earned the right to be considered the most influential center, in America, of the movement for promoting Swedish educational gymnastics. This result, which was brought about within the years 1888–1891, is primarily due to the wisdom, generosity, and public spirit of Mrs. Mary Hemenway, and secondarily to the adoption of the Ling gymnastics for the public schools by the Boston school board in June, 1890. Swedish free-movements form a part of the daily instruction by the class teachers throughout the primary and grammar grades, and instruction in Swedish apparatus gymnastics is regularly given by special teachers in most of the high schools for girls, and to the boys of the two lower classes of the public Latin school.

The establishment by Mrs. Hemenway of the Boston Normal School of Gymnastics, which stands in the forefront among similar schools in the country, was an event of capital importance in the history of physical training in America, and may well be ranked beside the gift to Harvard University of the Hemenway Gymnasium by Mr. Augustus Hemenway, her son. The course of study and training in this school has been widely influential in raising the standard of fitness for teaching school gymnastics. The number of private adventure schools devoted to the normal training of teachers of gymnastics has not largely increased since 1890, but the curriculum of most of them has been expanded and strengthened.

PROGRESS SINCE 1880.

Educational authorities are groping their way toward clearer views and better methods of organization and administration in the field of physical education. Here and there reactionary influences have been manifest for a time, but there can be no question as to the substantial and gratifying progress made in the field of school gymnastics since 1880.

I had occasion during 1883 and 1884 to visit the principal school and college gymnasia from Maine to Tennessee, and to ascertain the views of leading educationists respecting gymnastics and athletics, being charged by the United States Bureau of Education with the preparation of a special report on physical education (published as Circular of Information of the Bureau of Education, No. 5, 1885). Strange as it may seem, no one cited the work then carried on in educational gymnastics by the North American Turnerbund as worthy of study or imitation. Indeed, as I was setting out for Europe to study German gymnastics on their native soil, one of our foremost leaders in physical education assured me that "we had nothing to learn as to physical education from the Germans." That is hardly his opinion to-day, I am sure.

Interest in school gymnastics was at so low an ebb, and the efforts to maintain them so few and feeble at that time, that my report to the Commissioner of Education contains but scant allusion to systems of physical training in our city schools. I could not learn that any city in the United States had a system of school gymnastics that was worth holding up as an example of what we needed.

The following extract is taken from the report just alluded to, since it will serve to throw light upon the situation then existing:

We may, and too often do, lose sight of the interdependence of body and mind; but none the less is it impossible to separate the two and train either independently of the other; for, as was well said by Sterne, "the body and mind are like a jerkin and its lining; if you rumple the one you rumple the other." * * * It is only through a wise combination of gymnastic training and athletic sports that the best results can be hoped for or attained [in physical training]. Athletic sports can, if wisely managed and supervised, be made most serviceable in securing manliness and self-control to those engaging in them. The abandonment of them as a general "elective course" to the unregulated control of unripe and inexperienced youth is, to say the least, unwise. He who shall consider intelligently and critically, in the light of our present knowledge of brain and nerve and muscle physiology, the various games and sports which are deservedly popular, and shall show wherein they are valuable as a means to manly and womanly development, can not fail of contributing greatly to the advancement of pedagogical science.

So dense is the present ignorance, not only of the mass of the people, but also of a large section of the educated portion of the community, concerning the elementary truths of biological science in general, and of psycho-physical science in particular, that it would be well-nigh hopeless to attempt to institute any thoroughgoing system of physical training as a part of the system of public instruction in even the most enlightened States of the Union. Until the modern doctrine of bodily exercise is more generally apprehended, we can only look for sporadic efforts and fragmentary and discordant results in so much of the field of physical training as the richer and more advanced colleges and universities may occupy. The German, Swedish, and French systems of physical training and of educating teachers of gymnastics are well worth studying; but the greatest present need is to educate trustees, committeemen, teachers, and physicians in physiology and hygiene.

PRESENT CONDITION AND PROSPECTS OF PHYSICAL EDUCATION IN THE UNITED STATES.

Throughout the country physical training is still in the experimental or embryonic stage when compared with the physical training which obtains in the older and more highly developed educational systems of Europe.

At first sight this seems a dispiriting circumstance to many who look upon gymnastics and athletics as agencies to conjure with. But it is well to remember that though art is long and life is fleeting, physical training is only a province in the wide realm of human training, and that the struggle for its recognition and advancement is but an episode in the general campaign for making education rational, complete, and effectual—in a word, natural. The fact that education is not a closed science in any of its departments, and the present tendency to look on educational problems as problems in development whose solution depends upon conformity to the laws of nature and nurture, should suggest patience and hopefulness to those who, forgetting the backward and chaotic state of American education as a whole, are ready to bemoan the inevitable slow progress and partial success hitherto of physical training, which is one of the youngest and humblest branches of our system of American education. The inextinguishable vitality of our lowly embryonic forms of bodily training is an encouraging characteristic, since it has enabled them to survive neglect, dispraise, and hostility. It should inspire a lively expectation that the ultimate outcome of their struggle for existence will be more highly organized and vigorous adult forms than could result from excessive favoritism during prenatal and infantile states.

The situation has improved materially since 1885, particularly as regards the elementary schools in large cities, but American physical training will remain a thing of shreds and patches unless and until the promoters of educational reform and the governors of our educational institutions shall set themselves more earnestly to learn and patiently to apply the teachings of science and experience with regard to the nature, scope, and achievements of physical education.

Considered as a whole, the history of physical training in America has not been a brilliant one, and physical education is not only less advanced in America than it is abroad, but it has not even kept pace with the progress made by most other departments of education at home. Progress has been materially impeded by the pre-

possessions and prejudices of the teaching class, which, like the general public, is still largely ruled by ancient and traditional conceptions of mind and body, and has so feeble a comprehension of the new physiology and the new psychology that it is unprepared to acknowledge the just claims of physical education. Progress there has been since 1825, and more particularly since 1880; but for the most part it has been sporadic, fitful, and retarded. Too often the experiments in this field of endeavor have been characterized by furor, hurry, and failure. We are still prone to rash experiment and to uncritical imitation. It is in the comparatively rude and primitive field of athletics that the greatest triumphs have been won. Originality has been chiefly shown in the improvement of buildings and the invention of apparatus. In the field of superior education the interest of faculties and trustees in physical training is most usually manifested by costly offerings of buildings or other plant to the unappeasable "animal spirits" of their students and younger alumni. In the field of elementary education, though cheapness is a sine qua non, a number of tentative schemes have been initiated, a few of which are decidedly promising. In the professional training of the teaching class bodily training is commonly considered superfluous; and it is only here and there that public normal schools have taken any measures to provide for it. A large proportion of those who have rushed forward to fill the rôle of apostles and teachers of physical education have been self-educated or insufficiently trained; but the proportion of such persons grows less and less year by year. Agitation, discussion, imitative, and uncertain experiment have been the dominant factors in the growth of the American physical-education movement hitherto. We can not pass to the stage of constructive development unless accurate knowledge, clear ideas, definite aims, thorough training, and the capacity for sustained effort shall become much more general than is yet the case.

But the prospect is not wholly dark. There are gleams of promise in the sky. It is a significant and encouraging fact that the question of bodily training is like Banquo's ghost, and will not down. In one form or another it rises and shall rise before every generation of civilized men. For us and our immediate successors it has assumed portentous proportions by reason of the untoward influences of city life upon the rising generation. Never before have the teachings of medical science been so clear and authoritative as they are to-day regarding the necessity and the means of securing and conserving the health of the student class. Physiology and psychology have been revolutionized within sixty years, and the critics of our educational aims and methods are beginning to use the weapons thus furnished to their hands. The existing systems of physical education and "culture" are largely empirical in their nature; but the time is at hand when they shall be subjected to the scrutiny and tests of disinterested scientists and shall have judgment passed upon them by men who are able to distinguish between claims and proof, between shadow and substance. The present fashion of lauding apparatus and of multiplying gymnasia, clubhouses, and grounds is, after all, somewhat of a blessing in disguise, as it tends to force the question as to the real purpose of such appliances and the best means of securing their proper use. That our educational authorities as a class will remain oblivious of the plain teachings of science and experience as to the nature, scope, and legitimate results of physical education seems improbable. The most hopeful and distinctive characteristic of the present diversified and expanding interest in physical training is found in the growing conviction that trained intelligence must be employed to supplement and reenforce enlightened enthusiasm, and in the evident desire of a few benefactors and governors of educational foundations to provide ways and means for developing and seconding such intelligence.

Appendix I.

I.

A provisional schematic study of leading topics in physical education.

The following scheme embodies the result of the writer's attempt to arrange the leading topics pertaining to physical education in an orderly way, and to indicate certain of their relations. The arrangement offered herein is provisional and tentative.

In what follows physical education is considered as: (1) an expression, (2) a national institution, (3) a department of science, (4) a practical art.

1. Physical education as an expression.
   - A. The term is used in—
     1. A vaguely general, uncritical, and popular sense, when it means too much, being made to include matters that belong to personal and school hygiene, e. g., Bathing, diet, dress, seating of pupils, ventilation.
     2. A semigeneral sense, signifying exercise for the sake of health or recreation or the prevention of mischief, when it means too little, though it is generally so used by school boards and "educators."
     3. A strictly scientific sense, based on a critical consideration of demonstrable physiological and psychological effects and relations. Its general and special scientific significations should be distinguished and determined.
   - B. Synonymous terms, e. g., Physical training; bodily exercise; *ἄσκησις*; *γυμναστικὴ τέχνη*; *ἀθλητικὴ τέχνη*; *Turnen*; *Friskgymnastik*.
   - C. Nonsynonymous terms, e. g., Physical culture; movement cure; *Sjukgymnastik*; society gymnastics; Delsarte exercises.
2. Physical education as an institution.
   - A. History and literature enable us to trace the influence of physical training on national life and development. Its forms range from puerile and primitive customs to highly organized national institutions.
     - *a*. Primitive forms are found in children's games, which are characterized by (1) aimless and futile activity, or (2) by the spontaneous, dramatic imitation of the pursuits of their elders, particularly in hunting and warfare, e. g., Running, catching, and throwing games, and playing with weapons.

       Such forms are still found among most children and savages and many mountaineers and islanders.
     - *b*. Derived and higher forms result from the capability of games to furnish means for combativeness, rivalry, and personal distinction, under rules, captains, trainers, and judges, e. g.,
       1. Practice and preparatory exercises.
       2. Exhibitions of prowess and skill.
       3. Championship competitions and contests.
       4. Exercises and competitions for educational purposes.

       Under 2 and 3 we may place games and feats in honor of gods and heroes, such as have figured in the celebration of worship, victory, funerals, and national and religious festivals.

2. PHYSICAL EDUCATION AS AN INSTITUTION—Continued.

The following higher forms of physical education may be distinguished:

1. Ancient, e. g., Greek and Roman gymnastics and athletics.
2. Mediæval, e. g., popular sports, knightly games, and military exercises.
3. Renaissance, e. g., games and exercises in Italy and France, for recreative and educational purposes.
4. Modern, e. g., German, British, Swedish, American, etc., for hygienic or educational ends.

B. Physical education may be studied in literature.

1. In historical writings.
2. In epic poetry, mythology, and folklore.
3. In religious and semireligious rituals.
4. In legal and educational codes.
5. In philosophical and theological treatises.
6. In medical treatises.
7. In lives and handbooks of trainers and champions.
8. In works on art and the history of art, especially sculpture.
9. In periodicals and bibliography.

3. PHYSICAL EDUCATION AS A DEPARTMENT OF SCIENCE.

A. The essential, universal, necessary factor in all forms of physical training is neuro-muscular exercise. It should be critically considered in respect to—

a. Its nature and effects: (1) bodily, (2) mental.

b. Its aims, which may be: (1) recreative, (2) hygienic, (3) educative, (4) remedial.

c. Its vehicle, which may be: (1) sports and games, (2) gymnastics, (3) technical drill.

d. Its methods, which may be: (1) informal and persuasive, (2) rudely formal, (3) scientifically systematic.

e. Its results, which are: (1) anatomical, (2) physiological, (3) mental, (4) moral. Methods for testing, measuring, and setting forth the results of physical training belong to what promises to become a distinct branch of science.

B. As a branch of hygiene. Physical training serves to promote the normal growth and development of—

1. The master tissues and organs, i. e., muscles, nerves, and brain. The law of the evolution of the nervous system deserves special consideration under this head, since it constitutes a serviceable criterion of the worth and efficacy of the various forms of physical training. The natural order and rate of growth and development of the fundamental and accessory neuro-muscular mechanisms, and the characteristics of central and peripheral movements should be carefully studied in this connection.
2. The purveyor tissues and organs, i. e., the digestive and assimilative organs, and the arterial side of the circulatory and respiratory systems of organs.
3. The scavenger tissues and organs, i. e., the cutaneous, intestinal, and renal organs, and the venous side of the circulatory and respiratory organs. The scope and limitations of muscular exercise as a factor in promoting health and in modifying the growth and death rates of children and youth are deserving of special study.

C. As a pedagogic discipline. Physical training helps to develop will and intelligence, i. e., the power to know, do, endure, and forbear.

a. Its rudimentary forms are found in the training of animals, e. g., trick animals, hunting dogs, race and cavalry horses.

b. It lies at the basis of mental and moral training; hence its place should be defined and its value determined in relation to the ends and needs of:

1. Somatic or general bodily training, e. g., in the matter of carriage, walking, running, dancing.
2. Language training, e. g., singing, gesture, speaking, for general and special ends.

3. PHYSICAL EDUCATION AS A DEPARTMENT OF SCIENCE—Continued.
   3. Manual training, e. g., writing, drawing, and the use of tools for educational purposes.
   4. Industrial training. For the professional training of skilled workmen.
   5. Military training, e. g., of boys playing at soldiers, of militia, soldiers, and sailors.
   6. Normal training. General and special, in each of the chief departments of education, viz, in elementary, secondary, superior, and technical education.

4. PHYSICAL EDUCATION AS A PRACTICAL ART depends, as regards its standing and success, upon the character, capability, and training of its exponents and practitioners, who should have a clear understanding of the nature and scope of physical education as a science, and be sufficiently familiar with well-approved methods to select and use such methods as experience has shown to be best adapted to the general or special ends of the department in which they find themselves engaged. As an art, physical training includes the departments of: (1) training and instruction, (2) construction, (3) administration, (4) finance.
   1. Department of training and instruction. This includes measures looking to the development of aptitude and skill:
      A. For athletic purposes: By (*a*) instructors of individuals; (*b*) trainers of individuals; (*c*) captains of teams, crews, etc.; (*d*) coaches of teams, crews, etc. (*a, b, c, d*, are usually selected on empirical grounds, and their training is usually narrow and special.)
      B. For gymnastic purposes: By (*a*) leaders in "school games;" (*b*) vorturner and Turnlehrer in Turnvereine; (*c*) directors and assistants in departments of gymnastics, public or corporate; (*d*) normal and special schools for the training of teachers and experts in educational gymnastics. A comparative study of European and American usage as to the education, remuneration, standing, and duties of persons engaged in the athletic and gymnastic forms of physical education would be illuminating and instructive.
   2. Department of construction relates to:
      1. Buildings for (*a*) athletic clubs, general; (*b*) fives, racket, and tennis courts, special; (*c*) boathouses, cricket pavilions, etc., special; (*d*) public gymnasia, city or State; (*e*) college gymnasia; (*f*) club and Young Men's Christian Association gymnasia (*Cf.* Greek *γυμνάσιον, παλαίστρα*, Roman arena and gymnasium, German Turnhalle, Swedish gymnastiksal, American athletic clubhouse); (*g*) swimming baths and schools.
      2. Grounds and enclosures: (*a*) town and city playgrounds maintained at public expense; (*b*) school and college playgrounds for general purposes; (*c*) school, college, and club grounds of a special nature (e. g., for cricket, ball, and running games); (*d*) out-of-door gymnasia (e. g., German Turnplatz, American uncovered gymnasia, Greek *στάδιον*).
      3. Machines and appliances for (*a*) athletic purposes (e. g., bowling alleys, ball cages, rowing tanks, tackling bags, etc.); (*b*) gymnastic purposes (1, hand apparatus; 2, heavy machines; 3, Zander and Sargent machines; 4, military obstacle gymnastics); (*c*) instruments for scientific purposes (1, physical diagnosis; 2, anthropometry; 3, psycho-physical tests).
   3. Department of administration relates to the selection, organization, and control of personnel for:
      A. Maintenance and management of (*a*) contests, exhibitions, and festivals of an athletic or gymnastic character; (*b*) training and management of teams and crews by managers, trainers, and coaches; (*c*) superintendence and care of buildings, grounds, etc. (e. g., janitors and care takers, ground men, bath attendants, rubbers, clerical and special assistants, etc.).

4. Physical education as a practical art—Continued.

B. Instruction in (*a*) athletic specialties (e. g., running, boxing, and fencing—by professionals); (*b*) special schools by directors and teachers (e. g., normal schools, military gymnastic institutions); (*c*) by Turner-Wärter, Lehrer, and Vorturner in Turnvereine; (*d*) school gymnastics and games by directors, teachers, and leaders of squads and classes; (*e*) school sports (e. g., cricket, rowing, ball games, hare and hounds,, etc., ruled and managed by boys and "old boys"). The most approved and successful methods which obtain in Europe and America should be contrasted and compared, in order to prevent the adoption of obsolete, discredited, and ignorant methods of procedure.

4. Finance: The relative and proper cost of instruction, construction, and maintenance in the various branches of athletics and gymnastics should be determined. The economics of athletics and gymnastics have not been accorded due attention. Study of such topics as follow is demanded:

1. Resources: Funds raised by (*a*) taxation for schools that are public; (*b*) subscriptions, by participants and their friends; (*c*) gate money, entrance fees, dues; (*d*) entertainments. (In case of schools, clubs, etc., private and corporate.)

2. Expenditures, which include (*a*) cost of grounds, cost of buildings, cost of salaries and wages, cost of appliances, cost of teams (traveling and training), for athletic purposes; (*b*) cost of prizes, cost of grounds, cost of buildings, cost of salaries, cost of apparatus, etc., cost of repairs and maintenance (for gymnastic purposes).

3. Experience shows that the raising and expenditure of money, especially for athletic purposes, should be controlled by advisory or graduate committees in the case of school and college athletic organizations. The expenses entailed by the support of athletic and gymnastic institutions of a public nature are met and regulated by State and city officers, in many instances, at home and abroad. What constitutes parsimony, and what extravagance, in this department, is open to discussion from several points of view. It is eminently desirable that the hygienic and educational results obtainable from a given sum expended for athletics should be ascertained and set forth in comparison with similar results obtainable from a like sum spent for gymnastics.

II.

Of comprehensive handbooks relating to physical training but few have been published, and none in English. A brief account is given below of the most complete work of the kind hitherto published in any language.

The Encyklopädisches Handbuch des gesamten Turnwesens und der verwandten Gebiete. A. Pichler's Witwe & Sohn, Wien und Leipzig, 1893–1896, is a truly monumental work, edited by Prof. Dr. Carl Euler, of the Royal Prussian Normal School of Gymnastics in Berlin. Dr. Euler informs us in his "Nachwort"—dated October 1, 1896, and appended to Part 44, which concludes the series of parts begun in 1893—that the work was planned in 1885, and that it represents the collaboration of no less than 105 writers. The aim of the editor has been to make the Handbook "a reference book to provide for the needs of such as desire to obtain information quickly and conveniently concerning turning, its history, its technique as regards apparatus, its forms of exercise, its characteristic forms in schools, societies, etc., without being obliged to make laborious search through special and perhaps inaccessible works."

The work, which comprises upward of 2,000 pages and contains more than 1,000 illustrations, is published in three volumes. The publisher's price for it is 26 marks

unbound, or 32 marks bound. Out of the total number of 644 articles, 320 are biographical sketches, and the 324 remaining relate to "turnen" in all its phases and relations.

Librarians, students of bibliography, and others, who have occasion to classify pamphlets, articles, and books relating to physical education, will find the "Index of Subjects" (23 pages) and the "Typical Table of Contents" (42 pages) of Euler's Handbuch worthy of careful study. A list of the general rubrics contained in the latter, together with lists of the subheads employed in certain of them, viz, I, VI, and XVI, is given below:

TOPICAL TABLE OF CONTENTS—GENERAL RUBRICS.

I. Historical.
II. Biographical sketches (320 in number).
III. Countries and political divisions.
IV. Turning in individual cities.
V. Apparatus technology.
VI. General topics relating to bodily exercises.
VII. Anatomy and physiology.
VIII. Hygiene, therapeutical, and chamber gymnastics, and accidents during turning.
IX. Exercises upon apparatus:
  a. In general.
  b. Exercises on apparatus and machines.
  c. Exercises with hand apparatus.
X. Free exercises.
XI. Order exercises.
XII. Games.
XIII. Fencing, boxing, and wrestling.
XIV. Military gymnastics, weapon turning.
XV. Concerning method and system in turning.
XVI. School gymnastics.
XVII. Girls' gymnastics.
XVIII. Bodily exercises (turnbetrieb) in various institutions and for particular purposes.
XIX. Gymnastics of societies (vereinsturnen).
XX. Particular forms of bodily exercises (sport).

I. HISTORICAL.

I. Bodily exercises. Historical survey of, to modern times.
II. Antiquity.
  a. The civilized races of Asia and Africa and their bodily exercises. 1–5 rubrics, e. g., China, India, etc.
  b. Grecian gymnastics. 1. Athletics with reference to modern times. 2. Ancient Greece; gymnastics of the ancient Hellenes (10 illustrations). 3. Grecian national festivals. 4. Olympia (4 illustrations). 5. Olympic contests (5 illustrations). 6. Orchestrics (4 illustrations). 7. Palæstria. 8. Palæstrics. 9. Pentathlon (3 illustrations). 10. Tactical exercises of the ancient Greeks, and pilum throwing in recent school gymnastics.
  c. The Romans. 1. Roman gymnastics. 2. Games of the arena.
III. The middle ages.
  a. The Germans. (1–4.)
  b. The humanists and humanistic education. (1–17.)
IV. Recent times. (*a*–*o*.)

VI. GENERAL TOPICS RELATING TO BODILY EXERCISES (TURNEN).

1. Historical survey of bodily exercises. (C. Euler.) 2. Æsthetics of turning. (E. Angerstein.) See also articles: Palæstrics, Ling gymnastics, Rothstein. 3. Development of character by gymnastics. (J. Küppers.) 4. Singing—Turner songs. (H. Brendicke.) 5. Measurements and tests. (H. Schröer.) 6. Physics of turning. (Ernst Kohlrausch.) 7. Photographs of turners exercising (20 illustrations). (Ernst Kohlrausch.) 8. Exercises of the sense organs. (A. Gutzmann.) 9. Turners' records; e. g., in running, jumping, hammer throwing, etc. (H. Stürenburg.) 10. Turner costume. (M. Zettler.) 11. Shoes. (F. A. Schmidt.) 12. Turner lyrics. (H. Brendicke.) 13. Literature of turning. (C. Euler.) 14. Periodicals devoted to turning and sport; year books, etc. (C. Euler.) I. Published in Germany. II. Published in foreign lands. 15. Terminology of turning (turnsprache). (H. Rühl.)

XVI. SCHOOL GYMNASTICS.

1. School gymnastics (*schulturnen*). (W. Krampe.) 2. Instruction in gymnastics. (M. Zettler.) 3. Discipline. (Th. Bach.) 4. Exenses from gymnastics. (E. Angerstein.) 5. Course of instruction in gymnastics. (M. Zettler.) 6. Gymnastics for boys. (Th. Bach.) 7. Gymnastics for girls. (C. Euler.) 8. Common schools. (C. Hansmann.) 9. Secondary schools. (C. Euler.) 10. Superior schools. (J. Heinrich.) 11. Student, gymnastic, boating, and play clubs. (C. Euler.) 12. Turning excursions for schoolboys and schoolgirls. (After Bach.) 13. Turning festivals, tests of turning, exhibition turning of schoolboys. (E. Euler.) 14. Normal schools. 15. Teachers of gymnastics. 16. Normal schools of gymnastics. (C. Euler.) *A.* In Germany and Austria (8 in number). *B.* In other countries (7 in number). 17. Examinations for teachers of gymnastics. (G. Eckler.) 18. Gymnastic teachers' associations (4 in number). 19. Congresses of gymnastic teachers (12 held in period 1861–1893). (J. Heinrich.)

III.

For current information regarding physical training in the United States recourse to the following periodical publications may be had:

(1) American Physical Education Review. Published quarterly by the National Council of the American Association for the Advancement of Physical Education. Price, $1.50 per annum. Is in its second volume.

(2) Mind and Body. A monthly journal devoted to physical education. Published under the auspices of the N. A. Gymnastic Union (N. A. Turnerbund), by the Freidenker Publishing Company, Milwaukee, Wis. Subscription price, $1 annually. In its fourth volume.

(3) The Gymnasium. Monthly. Published by Coop & Boms, Providence, R. I. In its eighth volume.

(4) The Posse Gymnasium Journal. Monthly. Devoted to Swedish gymnastics. Published by Baroness Posse, Boston. $1 per year.

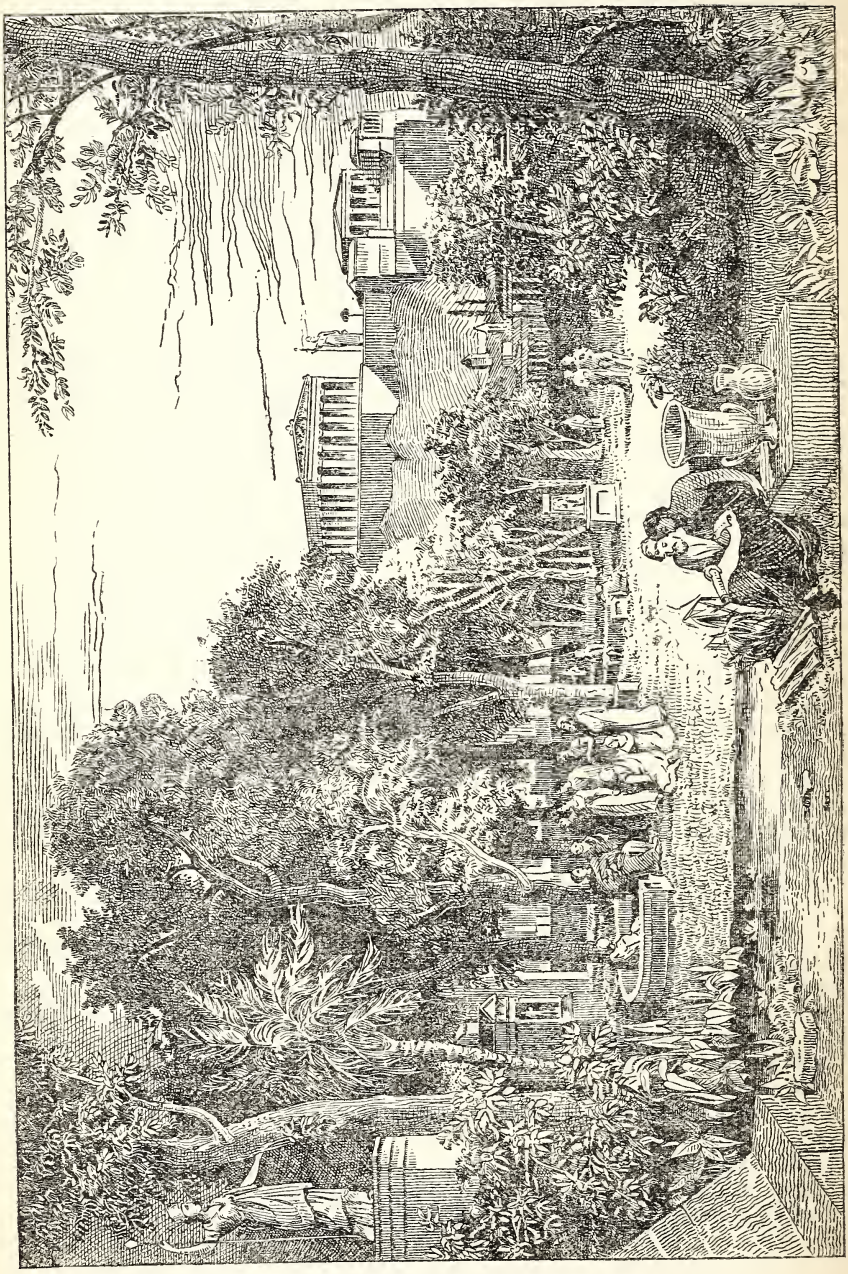
The proceedings of the ten annual meetings of the American Association for the Advancement of Physical Education (see index of the same in Volume I, American Physical Education Review, December, 1896), and The Conference on Physical Training, held in Boston in November, 1889, contain some of the most important papers that have been published in the United States in recent years. For copies of these publications application should be made to corresponding secretary A. A. A. P. E., Dr. G. W. Fitz, Cambridge, Mass.

The executive committee of the North American Gymnastic Union, St. Louis, Mo., publish a valuable Jahresbericht, and have published for gratuitous distribution numerous pamphlets in English on subjects relating to German gymnastics and school gymnastics.

Mention should also be made of the papers on physical training read at the Department Congress of Physical Education, held at the Columbian Exposition in 1893. These papers are contained in Addresses and Proceedings of International Congress of Education, 1893, published by the National Education Association, 1894.

Circular of Information, No. 5, 1885, and Chapter XIII in the Report of the Commissioner of Education for 1891-92 contain much information not to be found elsewhere.

Considerable though incomplete lists of titles of books, periodicals, articles, and brochures relating to physical training are found (1) in Hall and Mansfield's Hints Toward a Select and Descriptive Bibliography of Education. Boston. D. C. Heath & Co. 1886. pp. 212–223; and (2) in Monroe's Bibliography of Education. (International Education Series.) New York. D. Appleton & Co. 1897. pp. 140–148.



Scene in Academy at Athens.

From Williams' "Select Views in Greece." Longmans, 1829.

Appendix II.

SIGNIFICANCE OF PHYSICAL EDUCATION AMONG THE GREEKS, AS PRESENTED IN THE ANACHARSIS OF LUCIAN.

[A translation, with educational comment and notes, of the dialogue Gymnastics, by Charles E. Lowrey, Ph. D., librarian, University of Colorado, author of Philosophy of Ralph Cudworth, of Meditations on Religion, etc.]

Translator's note.—The dialogue of Lucian entitled *Anacharsis* and *Solon*, or *περὶ γυμνασίων* (Gymnastics), is one of the best presentations extant of the views of the Greeks concerning the place, the object, and the relation of exercises for the body in a system of public instruction. Lucian[1] was a careful student of Greek literature and social life. Writing as he did after each had become largely historical (A. D. 120–220), he was able to contrast the vital principle of Grecian civilization at its best with that separation of form and content which led to its decadence. These strictures are presented more largely in his *Dialogues*. Among the best known of these are the *Dialogues of the Gods*, the *Dialogues of the Dead*, the *Sale of the Philosophers*, the *Fisherman*, and the *Charon*. In them all forms of pagan customs, philosophy, and religion are described and criticised with great simplicity and humor.

In the dialogue under consideration *Solon* is the advocate of the classic Greek conception of physical education and *Anacharsis* acts as the satirist of the later excesses in gymnastics. The dialogue is also valuable for its suggestiveness in regard to the purpose and the proper method of education in general. French and German writers upon educational topics have already given the doctrine contained in it careful attention. The translator is not aware, however, of any recent English rendition and comment on this educational classic.[2]

The present translation has been made in the hope that American teachers and students might thereby have ready access to the classic Greek view of physical education. In the Greek notion of a good citizen a sound body and a sound mind were necessary correlates. The symmetrical development of neither could be neglected without serious injury to the individual, to society, and to the state. The harmonious blending of physical and mental training alone could perfect true manhood and patriotism. Lucian has clearly shown us the merits of these doctrines and has carefully guarded us against their perversions; and doubtless from his treatment of

[1]Lucian, the great satirist of Grecian manners and customs, was born at Samosata, on the Euphrates, in Syria, about A. D. 120, and lived nearly one hundred years. He was of humble parentage, and was first apprenticed to a statuary and monger of idols. Lucian spoiled several pieces of valuable work for his master. He was severely flogged for his carelessness, and in consequence returned home. He took various means to train himself as a rhetorician. In this occupation he wandered for some years about Asia Minor. He then tried to practice law, but found it more profitable to compose orations for others and to deliver lectures on the art of public speaking. As a lecturer he traveled extensively in Syria, Greece, Italy, and Gaul. Financially he was very successful in Gaul, where he tarried ten years. At the age of 40 he removed his family to Athens and devoted the remainder of his life to the study of philosophy and to the composition of his voluminous writings.

[2]Several English translations of Lucian's works have appeared: Spence's, in 1684; Moyle, Shears, and Blount's, in 1711; Dr. Thomas Franklin's, in 1780; William Tooke's, in 1820. Most of these are of indifferent merit and accuracy. Translations of selected portions have appeared from time to time. Among the more recent are selections by Rev. W. L. Collins, in 1873, and *The Dream* and *Charon* by W. Armour, in 1877.

the subject we may glean valuable hints for use in the practical consideration of a very important but, in our system of public instruction, a much-neglected phase of education.

The translation is as nearly literal as an unlabored expression of the thought will allow. Long and involved sentences of the original have frequently been separated into shorter ones. In such cases the necessary change in structure has been made. For the sake of perspicuous English, nouns in many instances have been substituted in place of their pronominal equivalents.

There is no more elegant master of the Greek language and style than Lucian. However, he purposely, especially in the earlier parts of the dialogue, places in the mouth of Anacharsis expressions hardly grammatical in structure and often quite inaccurate in significance. This, largely, to indicate the astonishment of the stranger and his lack of culture.

It is quite impossible to preserve in translation the humorous effect that these incongruities must have produced upon Lucian's Greek audience. If the paraphrase of the speeches of Anacharsis shall seem somewhat crude as compared with the translation of those of Solon, it must be remembered that this contrast was intended by the author. This apparent defect, however, in no way detracts from the vigorous thought of the Scythian.

AUTHORITIES.—I. Luciani Samosatensis Opera cum versione Tiber. Hemsterhusii et Jo. Matthiæ Gesneri, ed. Reitzius, 1743. Tomus II, pp. 883–922. II. Luciani Samosatensis Opera, Græce et Latine, post Hemsterhusium et Reitzium, ed. Lehmann, 1828. Tomus VII, pp. 147–194. III. Luciani Samosatensis Opera, ex recognitione Caroli Jacobitz, 1876, Lipsiæ sumptibus et typis B. G. Teubneri, Vol. III, pp. 52–77.

THE ARGUMENT.—Anacharsis[1] is a Scythian, who is visiting at Athens. He is the guest of Solon, the great lawgiver. With him Anacharsis enters into discussion concerning the rationality and the utility of the gymnastic exercises participated in by the young men of Greece, and especially by the youth of Attica. The temper of the opinion of the Scythian is either to deny the usefulness of such exercises or in a pleasant way to show their limitations or to make them the object of ridicule.

In reply, Solon defends with vigor the means employed by the Greeks for physical development. He shows plainly how much service reverts from these exercises to the state, both in war and in peace.

In any argument the opponent is not likely in every particular to be too easily persuaded. So in this case the decision is left somewhat in suspense. Doubtless even the contemporaries of Lucian, who still adhered to the time-honored customs of their ancestors, saw this possibility of a double interpretation of the dialogue. And to some of us of a later day the eloquent wisdom of Solon easily carries off the palm in the contest, while to others with minds less prejudiced in favor of gymnastics Anacharsis sustains his graceful satire against the perverting practices of Grecian decline.

Critics of the latter class, with reason, have endeavored to ascribe as the text of this dialogue the charge of the celebrated physician, Galen, against the gymnastic exercises of his day (A. D. 130–200). Galen made a serious accusation of excess against them, and was wont to designate the perversion by the Greek term κακοτεχνία, *corruption of art* or *overgreat refinement*. The wisdom of Anacharsis, ruder if you wish than that of Solon, but not less witty than subtle, and in no way superficial, seems to lend credence to this opinion.

THE PLACE.—The scene of the *Dialogue* is the Lyceum, noted for its connection

[1] According to Herodotus the historical Anacharsis was the son of Gnurus and brother of Saulius, king of Thrace (Herodotus, Bk. IV, 76). He came to Athens while Solon was engaged in his great legislative measures. By his simplicity, talents, and acute observations on the habits and customs of the Greeks, he won their universal esteem and by some was counted among the seven wise men. On his return to Thrace he attempted to inaugurate some changes in the forms of worship and was slain in the very act by his brother.

with the school and teachings of Aristotle. It was one of the gymnasia of Athens, and was situated just without the walls to the east. It was laid out upon the north bank of the river Ilissus and across one of its small tributaries. We gather from the writings of Plato, Xenophon, and others some general notion of these inclosures for the physical training of the youth, but we have no distinct description of them. It may be safe to say that the Lyceum, inclusive of its external approaches on the west—porticoes, groves, and walks—was of dimensions not far from 1,000 feet in length by 500 in width. Forming the eastern part was the open court, or *peristylium*, 300 feet on each side. On three sides were single colonnades, with spacious halls and seats for the elders. On the south was a double colonnade with rooms of various extent for preliminary practice, oiling, bathing, etc.[1]

Solon has made the circuit of the city with Anacharsis, and while entertaining and escorting his guest, without previous comment, suddenly brings up at the main entrance to the Lyceum, near the southwest corner of the *peristylium*.

THE DIALOGUE—ANACHARSIS AND SOLON; OR, PHYSICAL EDUCATION.[2]

ANACHARSIS. Look there, Solon. Why do your young men perform actions like that? Some embrace and trip one another, while others strangle and throw, and still others, like swine, roll and wallow in the mud. Now, indeed, to begin with, upon stripping off and being anointed profusely with oil, I noticed that they stroked each other by turn in a very friendly manner. Yet afterwards, I know not why, they incline heads, rush forward, and strike foreheads like rams. For instance, see that fellow yonder. He catches up his opponent by the legs and casts him to the ground. Then he springs upon him and does not allow him to raise his head, but forces him down into the mud. And now, to cap the climax, he clasps his legs about the belly of his victim and strangles the unfortunate fellow by throwing his forearm under his gullet. The other pats his antagonist on the shoulder, beseeching, I should judge, not to be choked to death. Nor do these contestants, on account of the oil with which they are anointed, hesitate to pollute themselves. The rather—as, with tarnished unguent and covered with much slime and sweat, they slip through the hands each of the other, like eels—I must say, they make me laugh.

Others here in the open air of the court act in the same way. To be sure they are not in the mud, but they appropriate this deep sand in the depression of the court and sprinkle one another with it. And of their own accord these very fellows wallow up the dust like hens. Oh, yes, I see; doubtless that the sand lose its slipperiness and from its dryness gives firmer hold, and that with it they may have surer grips in their embraces.

True, for when thoroughly covered with dust they stand erect, embrace, beat, and trample upon one another. Well, if this ill-starred chap here is not spitting out his teeth! From a stroke of a fist under his jaw, as you see—that is the way in which his mouth is filled with blood and sand. But for all that the master[3] here does not separate them, does not stop the fight. You see by his purple robe I mark him out as one of the masters.

Why, he even urges on and praises the one who beats his fellow. And all the rest

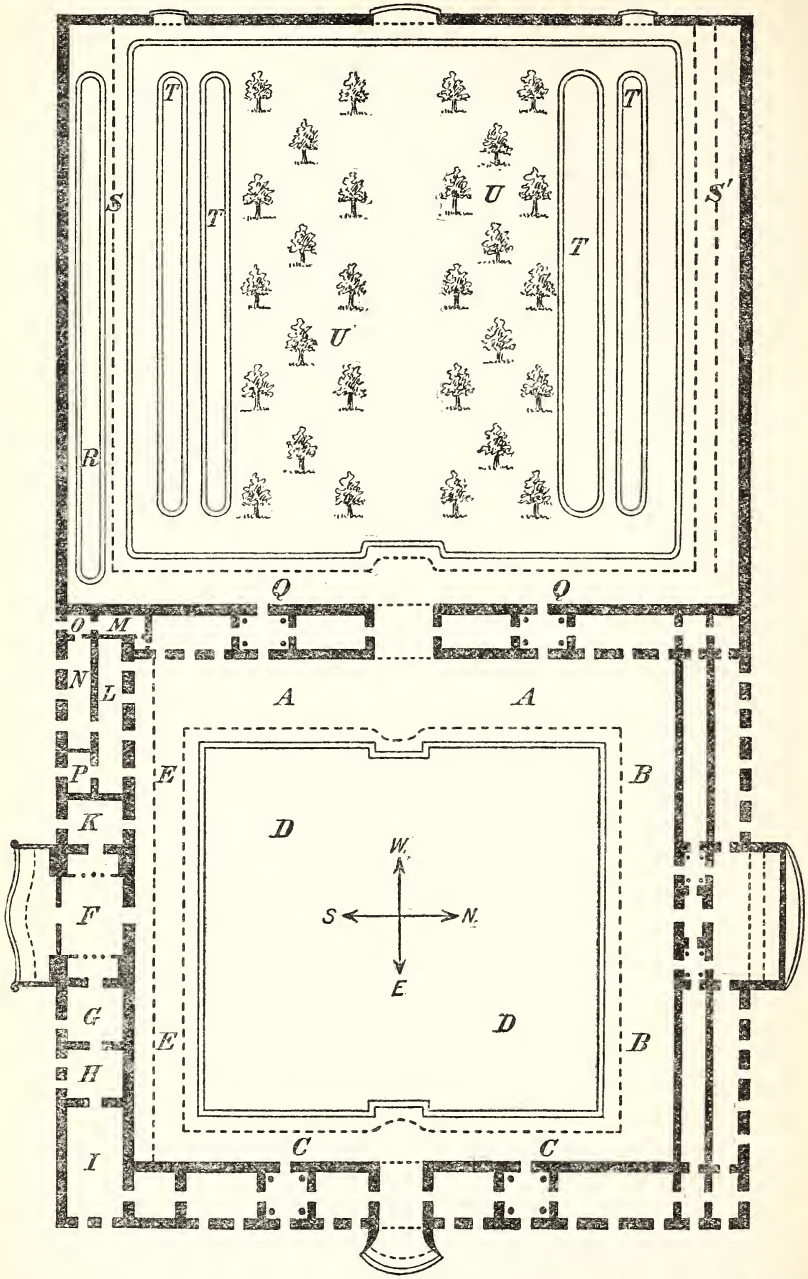
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[1] For further description and plans of the Grecian *gymnasium*, see Guhl and Koner's *The Life of the Greeks and the Romans*, p. 106 et seq.; Becker's *Charicles*, sub voce; Rich's *Dict. of Greek and Roman Antiquities*, sub voce, and Smith's *Dict. of Greek and Roman Antiquities* (Author's edition), sub voce.

[2] The Greek expression, περὶ γυμνασίων, is translated *exercises and training for the body*. This Greek phrase has a signification of broader import than the *athletics* of our modern gymnasium. Gymnastics in their various forms were practiced by persons of all ages. They accompanied every stage of intellectual development and bordered upon the combination of theory and practice. The gymnasia and the public festivals that were their inspiration were *practice schools* in the best sense. They aimed at the graceful blending of the physical and the mental, and were admirably adapted to develop a well-rounded manhood.

[3] The gymnasiarch was a civil officer at Athens. One was elected annually from each of the ten tribes. The laws for the regulation of the gymnasia were very strict, and the neglect of some of them was punished with death.

W. Newton's plan of the *gymnasium*. Compare Smith's Dictionary of Greek and Roman Antiquities.



A, B, C are spacious halls with seats; D, the *peristylium*, surrounded with colonnades; E a double portico with apartments; F, the *ephebeum*, a spacious hall with seats; G, the *coryceum*, where a species of ball was practiced; H, the *conisterium*, where the young men sprinkled themselves with dust; I, the cold bath; K, the *elaeothesium*, where the wrestling master anointed the bodies of contestants; L, the *frigidarium*, or cooling-off room; M, the furnace room; N, the vapor bath; O, the *laconicum*, or dry sweating apartment; P, the hot bath; Q, a portico; R is the xystus, or covered *stadium*, for practice in winter and in bad weather; S and S', stadial porticoes, looking out upon the uncovered stadia, or παραδρομίδες; T, U, groves with seats and walks among the trees.

of them, too, spring forth and hasten hither and thither. If they chance to halt for a moment in any place, at once they leap like racers, dart up, and beat the air with their heels. Now, I desire to know what good there is in these performances. I must confess this action seems to me very like to madness. Nor, however trustworthy be my informant, could he easily convince me that those who can act in this way are not insane.

SOLON. It is very proper, Anacharsis, that such scenes as these seem to you strange and altogether out of harmony with your Scythian customs. Likewise it is proper, doubtless, that methods and customs eminently fitting for you should to us, as Greeks, seem unusual, were any of us, like you at this time, contemplating them. However that may be, believe me, these occurrences are no exhibitions of madness. Not in the spirit of personal abuse do these beat one another and roll one another in the mud or throw dust. But the practice has a distinct value, and is not at all unpleasant to the participants. In fact, it leads to the development of not a little of that bloom and manly vigor possessed, as you perceive, by their bodies. If, perchance, you tarry for some time in Greece, as I hope you may, before long you will be one and the same in spirit with those who are besmeared and are covered with dust. Then to you also this practice will seem pleasant and at the same time profitable.

A. Begone with your talk, Solon. This may be useful and pleasant to you, but if any of you should undertake something of that kind upon our people he will know shortly that we are not in the habit of girding on our dagger in vain. But come, tell me what do you call that which is taking place? In a word, what are they doing?

S. Well, my friend, the inclosure itself is called by us the gymnasium. It is consecrated to the Lycian Apollo. You see his statue there. In it he is represented as leaning against a pillar with his bow in his left hand, while his right is bent back over his head as though to indicate that the god now rests from his long labor.

Of these gymnastics, however, that in the mud yonder is called wrestling.[1] Those struggling in the dust are wrestlers also. To beat and strike while standing erect, we call the pancration contest.[2] We have, in addition, other gymnastic exercises, such as boxing, quoits, and leaping. In all these we present contests. He who conquers is regarded as the best of his rank and receives the prize.

A. What is your prize?

S. At the Olympian games, a crown woven from wild olive; at the Isthmian, from pine; at the Nemean, from parsley. At the Pythian games apples from the sacred inclosure of the god are awarded, while at our Panathenaic, the oil from the sacred olive. But why smile, Anacharsis? Perchance, because you deem these awards of small account?

A. No, indeed. Certainly they are very stately, *πάνσεμνα*, these prizes which you mention. They are worthy of those who have contributed so liberally, so munificently, for their establishment. They are worthy also of the contestants themselves, who enter so eagerly upon an undertaking of so much concern that they endure hardships and risk dangers in strangling and weakening one another for the sake of apples and parsley; and they do all this, too, as though it were not possible without strife, without having mud rubbed in their faces, or having their bellies trampled upon by the heels of their antagonists, to procure apples in whatever quantity they desired, or to be crowned with parsley and pine.

S. But, my good friend, we do not look upon these gifts as stripped of all merit. They are regarded as symbols of victory; they are tokens by which we distinguish those who prevail. The honor that accompanies the possessors of these tokens is in every respect worthy of conquerors. For the sake of meriting this honor, those who

[1] Wrestling was that part of the gymnastic exercises of the Greeks supposed especially to develop skill in the arts of war.

[2] The *pancration contest* was an exercise in which all the powers of the combatants were engaged. Technically it was a combination of wrestling and boxing, and was too violent to be beneficial.

seek for renown from their labors deem themselves fortunate to be trampled upon. In fact, without a test of endurance this honor could not come. In the beginning it is proper for him who desires this honor to undergo many hardships, then afterwards to expect that which is of advantage and to await a joyous completion of his labors.

A. Then I am to understand you to say that the result is joyous and advantageous. And why? Well, because when the victors are crowned all will look upon them with admiration. And the people will do so, because those who have already expressed much sympathy for them on account of their wounds will in consequence praise them in their victory more heartily, while the victors in return for their hardships will deem themselves fortunate to possess apples and parsley!

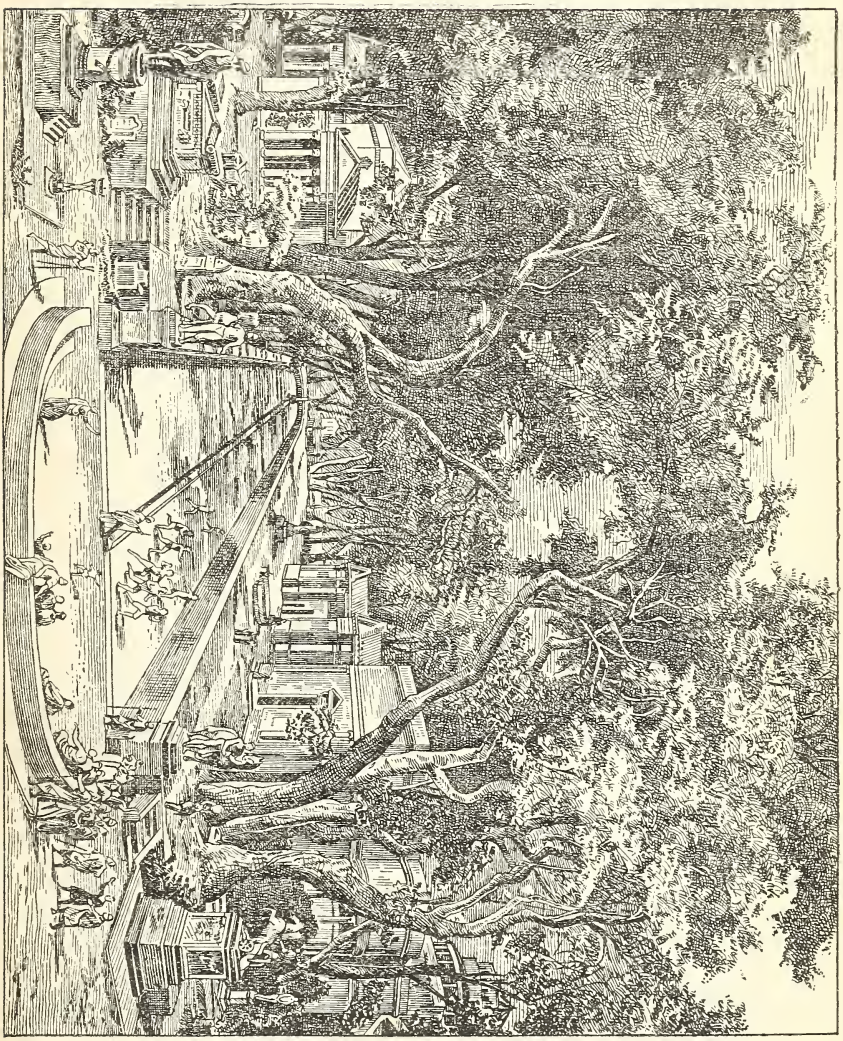
S. I must say you are still unacquainted with the spirit of our customs. But when you shall go to the public festivals, and when you shall see so great a multitude of men assembled together to behold deeds of this character, and the amphitheater filled with myriads of men, and the contestants praised, and the victor among them esteemed equal to a god, then, very shortly, you will have a different opinion of these performances.

A. Why, Solon, if you allow these cruelties not merely in the presence of a few, but also before spectators as witnesses of this wanton violence, before spectators, too, of such character that they evidently deem those contestants fortunate whom they see sprinkled with blood or strangled by their antagonists—for I perceive that these most happy circumstances belong to their victories—this fact in itself is, indeed, most pitiable. Now, among us, in Scythia, if anyone beat his fellow-citizen, or assault him and throw him, or rend his clothes, the judges impose heavy fines; and that, too, even if the person suffer this insult in the presence of only a few witnesses, nor at all, perchance, before such crowds of spectators as you say assemble at the Isthmus and at Olympia. Notwithstanding our customs in this regard, I am disposed to pity these combatants because of their sufferings. But I am very much surprised at the spectators—who, according to your statement, are your noblest men and are present at these public festivals from every quarter—that they can neglect necessary business and can have leisure to be in attendance upon such performances. Assuredly, this I shall never be able to understand, how it can be pleasant for them to behold human beings beating and sparring, and cast upon the ground and bruised by one another.[1]

S. I can only add that had you possessed the privilege of attendance upon the Olympian games, the Isthmian, or the Panathenaic, the performance itself would have taught you how, not without purpose, we have had zeal for these contests. Not with the same force could anyone in relating impress you with the pleasure of the actions there occurring, as you are affected if you sit in the midst of the spectators and behold the bravery of the men, the beauty of their bodies, their wonderfully good state of health, their marvelous skill, their unconquerable strength, their daring, their love of glory, their irresistible purpose and their incessant zeal for victory. Indeed, I know well, had you beheld these virtues, you would not now leave off your praise, cheers, and applause.

A. Yes, by Zeus, I should, and that, too, despite your sneers and mockery. All these accomplishments which you have enumerated—bravery, good health, beauty, daring—I see destroyed by you without any great purpose in view. Your country is not in danger, your fields are not devastated, your friends and families are not subject to wanton violence. Now, if those whom you call your noblest men could suffer so much to no purpose, could endure hardships, could mar their beauty with sand and their vigorous form with bruises in order, as victors, to possess the apple and the olive branch, to this extent the more would they be the object of my ridicule.

[1] The religious spirit of the scene was still a blank to Anacharsis. The possibility of divinity incarnate in man had not entered his thought; nor, scarcely more, that individual freedom of Greek life so thoroughly compatible with spiritual union of the body politic.



The Dromus, or race course, at Sparta.

From Foulke's "Greece and Rome," p. F, 16. By permission of Henry Holt, New York.

Most assuredly, so far as I am concerned, to remember rewards of such a character would certainly be my eternal happiness. But, tell me, do all the contestants receive the same prizes?

S. Why, certainly not; only he who wins.

A. Then, in such obscurity and uncertainty of a victory, do you pretend to say that so many labor, and that, too, while aware that one alone will in every respect be victorious, but that the multitude shall be conquered and shall be miserable from blows received, and some even from wounds received, to no purpose?

S. You evidently know nothing at all about a suitable form of government for a state. Did you, you would not hold in derision the most beautiful practices and customs of civil society. If ever you take the pains to acquaint yourself how a state [1] be founded most admirably and how its citizens become the noblest, you will then praise also these exercises and the love of glory which we delight to honor in these contests, and even if now the combatants seem to you to have zeal to no purpose you will then become aware that they have much that is useful mingled with their labors.

A. Yes, to be sure, I would know. On no other account, save that I might learn the laws of the Greeks, might understand your customs and manners, and might make a careful inspection of the best form of government for a state, have I traveled over so much country, have I crossed the great Euxine with its fierce storms, in fact have I come from Scythia to your city. For this very reason also I chose you from your fame as a master in such matters in preference to all the rest of the Athenians as my special friend and host, and I did this, too, without hesitation when I heard that you were the writer of divers laws, were the discoverer of the best code of morals for civic society, had proposed beneficial habits of life, and in general were a sort of joint adviser ready to assist in framing a system of government for any country. So, make me your pupil without delay. I, for my part, would gladly sit at your feet without food and drink for so long a time as you may declare sufficient, and would eagerly listen to you in a discourse concerning the government of a state and its laws.

S. Well, my good fellow, it is not easy to relate in brief all this. But if you follow part by part, you shall know of each what we hold concerning the gods, what concerning parents and marriages and related subjects. However, now, what we decree concerning young men, how when first they begin to understand the significance of improvement, we assist them to develop manly vigor of body and to endure hardships; this I will relate to you at once, that thereby you may learn why we have established these exercises for them and compel them to submit their bodies to toil. We do this not simply that the young men be able to take prizes in the contests, for but very few from the whole number procure the rewards. But we have gained, however, from this practice a far greater good to the state and to the individuals themselves. For let me remind you there is a common contest of another sort set for all good citizens. Its crown is woven not from pine, nor from the branch of the olive, nor from parsley; but whoever has a part in it sustains human happiness, and, I may say furthermore, he upholds the liberty of each private individual and that of the common fatherland, he preserves wealth, honor, the joys of ancestral festivals, the safety of his family, and, in fact, he vouchsafes all those blessings which we would pray the gods to bestow upon us. All these delightful objects have been woven in that garland of which I speak and are the result of that contest toward which these exercises and these labors lead.

A. Do you, then, my honored host, while you can relate so many prizes of such a character, deign to make mention of apples and parsley and the branch of the wild olive and pine?

S. Yes, indeed; nor will they seem longer of small account to you whenever you

[1] The Greek term for *state* signifies *city government*, community life as distinguished from nomadic life.

consider well the import of that which I tell you. In fact, all these prizes have their origin in the same purpose and are small portions of that better contest whose garland I have spoken of so favorably to you.

Now, our conversation—I know not how I came to wander from our subject—brought first to mind those scenes which take place at the Isthmian, the Olympian, and the Nemean games. However, since we have leisure, and you, as you say, desire to hear, we shall easily run back in our thought to that first principle, to that common contest, for the sake of which, I say, we pursue all these exercises.

A. This is doubtless the better course. In this way our conversation might proceed with more order; and, perchance, by this method of procedure I might very soon be persuaded no longer to hold in derision those whom I see proud to possess the wild olive or to be crowned with parsley. But, if you please, let us go to yonder shade and be seated on the chairs, that those who cry out the contests may not annoy old men like us. Besides, for I might as well own it, I can not endure upon my uncovered head this sun so dazzling and scorching. You see I left my hat at the house that I might not appear odd and in the costume of a foreigner among your people, and the season of the year is the very hottest, as you know; it is that of the star that burns up everything—I believe you call it the dog—and that makes the air dry and heated. The sun of the season, now at meridian, comes down directly upon our heads and produces this unbearable heat in our bodies. Now, really, I am surprised that, although already an old man, you neither sweat under the summer's heat as I do, nor, on the whole, do you seem annoyed, nor do you look for shade where you may recline, but you receive the sun with comfort.[1]

S. Well, it so happens, I suppose, because these seemingly useless labors, these endless tumblings in the mud, and these open-air[2] exertions in the sand furnish us with this means of defense against the sunbeams, and that protection is of such a character that we no longer have need of a hat to prevent the rays from reaching our head. But come, let us go.

And see to it not to receive that which I have to say to you concerning the laws as if in duty bound to exercise full confidence in my words, but rather, wherever anything seems to you incorrectly stated, speak at once your objection and to your liking amend my statement. For certainly neither of us in any respect should fail of our purpose, neither you by giving yourself over forcibly to believe that which you think can be gainsaid, nor I by being instructed again in such a way as no longer to discern correctly concerning these matters.[3] And for conducting the discussion in this spirit all the commonwealth of the Athenians will be quick to acknowledge its obligation to you. Since in whatever you teach me and persuade me for the better, in that you will be of the greatest assistance to the commonwealth. For my part, I desire to keep nothing hid from the people, but in such a case I shall proceed at once among them, shall take my stand in the Pryx, and shall speak to all as follows: Fellow-citizens, I have written for your direction such laws as I thought most beneficial for the welfare of the body politic. This stranger here—at this word, my friend, I shall point you out—to be sure is a Scythian. But because of his wisdom he has instructed in a different way; he has taught me other and better methods of education and of life. Therefore I propose that this man have his name handed down to posterity as your benefactor, and that you set up for him a statue in the city along with those of its founders or with that of Athena. And for your part, Anacharsis, clearly understand that the commonwealth of the Athenians is not

[1] The contrast between the endurance of Solon and of his companion is an argument from experience quite ingenuously witnessing to the practical results of systematic training.

[2] The gymnasia were carefully guarded against persons likely to corrupt the morals of the young. The exercises were conducted with bodies bare of clothing.

[3] This is the true spirit of discussion. No matter how wise, to teach successfully we must expect also to be instructed. The relation of teacher and pupil is one of reciprocity.

ashamed to examine with care propositions of advantage, even from a stranger and guest.[1]

A. Well, this speech is evidently in accord with that which I have heard concerning your Athenians, to the effect that you could be dissemblers in your discourses. How possibly could I, a nomad and a wanderer, who live upon a wagon and continually change from one section of country to another, who have not at any time made my abode in a city, nor until the present have even seen one—how could I have power to discourse concerning the government of a State and to teach men that are native born and have now dwelt for centuries under good laws in this very ancient city? And especially how could I teach you, Solon, who from youth up, they say, have made it a study to know how a State may be governed in the best way and to understand in the use of what laws it may be prosperous? However, you as lawgiver must be obeyed in this matter, and I will object, that I may learn with more vigor, if anything seem to me to be stated incorrectly. And see, too, we have now escaped the sun and are in the thick shade. A seat upon this cool stone is exceedingly pleasant and opportune. Now, take up the conversation from the beginning and tell your reasons for these customs. For example, why do you take your youths fresh from childhood and subject them to painful toil? How from this training in the mud do they issue as the noblest men among you? Why does tumbling in the dust render them accomplished in virtue? In fact, from the very first, I assure you, have I desired especially to hear you on this subject. Very properly, you can teach me concerning the other subjects mentioned, each part at the fitting time, afterwards. But in your talk with me, my friend, remember this—that you speak to a foreigner. I beg you not to perplex me and not to make your speech too extended; for I fear lest I forget the first words of the discussion if many more stream in upon them.

S. You can manage this matter better as the conversation proceeds. Whenever the argument does not seem very plain to you, or whenever in its listless flow it wanders from the subject, then you will have the privilege to interpose whatever you wish and to cut off its length. But if the words spoken be not forced, nor far from the point, I think they will cause no hindrance to your thought, even if they should be related at some length.[2] For instance, in the council of the Areopagus, which tries cases of murder among us, it is customary in a matter of this kind to determine as follows:

Whenever the council come together upon the hill to sit in judgment on a case of murder, or of premeditated assault, or of incendiarism, an opportunity for speaking is given to each of those upon whom the council pronounce judgment. They speak in turn—he who brings the accusation and the defendant. Either they speak for themselves, or they bring up pleaders in their behalf. While they argue upon the case the council allow it and listen in silence. But if anyone deliver an introduction to his argument for the purpose of making the members of the council better disposed to his case, or for the purpose of exciting pity, or if he bring in horrible circumstances extraneous to the action—such, for example, as youth under the instruction of the rhetoricians may devise—to present to dicasts,[3] or judges, then, in order that the Areopagites may see the naked facts, the herald comes forward immediately and silences him, and does not allow the pleader to speak nonsense before the council and to gloss the case over with words. Thus, my friend, in the present discussion I

[1] This catholicity of spirit was a surprise to the Scythian, who, above all, was averse to receiving suggestions concerning national affairs from foreigners. This suggestion of receiving honor from assembled Athenians at their popular place of meeting seemed a low kind of irony rather than the generous compliment that it was.

[2] Solon here meets the proverbial pedagogical difficulty. Here is a man who can not appreciate the smallest of the scenes in which he is cast without some outline of their purpose. He wishes that purpose told him before the next meal. The outline is beyond his depth. To return to particulars without ability to see their bearing were merely to satisfy curiosity, as before, and to provoke unjust comment.

[3] In number somewhat like the English jurymen; in dignity, the most revered body at Athens, and composed of the best informed of the citizens.

constitute you an Areopagite. Under the law of my council listen to me, and according to the same order, silence. If you perceive that rhetorical art is practiced upon you, so long as the discourse is relevant to the subject let it proceed at length; for, you see, we shall no longer have our conversation where, if our narrative be prolonged, the sun might annoy us, but the rather here in thick shade; and then we have leisure.

A. This is very considerate in you, Solon. I, indeed, thank you not a little for this condescension, but especially that in your digression you have also instructed me in reference to the usages of the Areopagites. How truly remarkable they are! Assuredly, they are in accord with the deeds of noble councilors, of men that cast their ballot for the truth. With this understanding, then, speak on at once, and I, as an Areopagite of your making, after the custom of that council, shall listen to you.

S. Well, then, you must needs hear first, in brief, our conception of a body politic and its citizens. Now, we do not regard a city to consist in buildings, such as walls and temples and docks.[1] These are indeed, as it were, a body ready for the reception and the safety of those who dwell therein. But we place our entire reliance upon the citizens. The citizens fill and form and direct to its designed end and guard each part of the body politic, just as the soul in each of our bodies directs every member. With this understanding, then, we take care of the body of the city as you see. We adorn it, that it may be as beautiful as possible. Internally, we have provided it with public buildings. To make it externally as safe as practicable, we have fortified it with these encircling walls. But especially as all important do we have thought for this, that the citizens grow up to be both noble in soul and strong in body. In consequence, then, we have men of that character to enter upon public life. In time of peace they conduct themselves honorably, and in war they save the body politic and preserve its freedom and its prosperity.

Now, the first steps in the training of our children[2] we assign to their mothers, to nurses, and to tutors, that they be nourished and be taught under gentle discipline. But as soon as they reach the age for graceful self-control, and there be born in them a sense of shame, and modesty, and awe, and a desire to emulate the noblest lives, and, further, their bodies also seem able to endure hardships, seems fitted to become more compact and to be possessed of more manly vigor, at that age we take them and teach them. On the one hand we impose various instruction and exercises for the soul, and on the other we gradually accustom their bodies to toil; and this, indeed, because we do not regard it sufficient that our youth, each as he is born, be allowed to grow to manhood unhindered, be it in reference either to body or to soul.

We find it necessary to subject them to culture and to science. Thus we hold that the germinal principles of good birth may become far better, and gifts indifferent may be rearranged, transformed, and improved.[3] We have an illustration in support of this doctrine from the practice of the tillers of the soil. While their fruit trees are near the earth and tender they care for them and fence them in, that they be not

[1] Solon guards against any conception of the State that is not spiritual in every particular. The external protection signifies an inward direction.

[2] Boys only are referred to in treating of education. The young man was symbolic of grace in Greece, as the beautiful maiden is in the modern world. In fact, Attic culture for young men resembled in a marked degree that modest refinement which the carefully guarded education of daughters of our better classes now receive. The youth were carefully supervised at all times till called to military service at 18. In the schools he was taught a modicum of the common branches, belles-lettres, music, respectful modesty to elders, and regard for religion, gymnastics, etc. For two years, 16 to 18, the gymnasium monopolized his time. The schools were private and none were allowed to enter. The teachers were usually men past 40 years of age, and were without other supervision save that they must fulfill the public notion of morality. No topic, however, was so much discussed at Athens as the proper education of the young men.

[3] Be man's natural gifts never so brilliant and his achievements never so great in consequence, that discipline and culture had been added would have enhanced his success. On the other hand, no man with reason is born so low that out of weakness may not be developed by persistent exercise of that very deficiency the healthy vigor of self-reliance and well-rounded manhood. Men are what they will for themselves of discipline and self-control.

damaged by the winds, but as soon as the scions have grown somewhat strong they cut off so much as is superfluous from the branches. Then, by giving the scions to the breezes, to be driven to and fro and shaken violently, they cause their trees to become more fruitful.

So first, then, we rekindle the souls of our youth by music and number; we teach them composition and to read distinctly. As they progress we adorn their minds with the thoughts of wise men, with historic deeds of valor, and with useful proverbs in verse. That the proverbs be more easily remembered, we have the youth repeat them by rote. By hearing of heroic action and of deeds of renown, our young men are little by little inspired, and attempt to imitate. That, as Hesiod and Homer are much esteemed by those of our times, they, also, may become objects of song and of admiration to posterity. So, whenever they come to share in the government of the State and there be need that they try their hand for the common weal,[1] * * * but perhaps these facts are extraneous to the case in hand. I believe we did not begin back for the purpose of telling how we trained their souls, but simply to discover why we consider it proper to exercise their bodies excessively with such severe labors.[2] So, without the order of the herald, I command silence of myself. Nor wait I for you as Areopagite. From modesty, I judge, you permitted me to speak of matters not to the purpose and so foreign to the subject.

A. Tell me, my friend, has the council not devised some punishment against those perchance who do not speak in the Areopagus of matters most essential, but keep silent respecting them?[3]

S. Why do you ask this question? Its import is not at all evident to me, I confess.

A. Because you pass by most delightful subjects and those most pleasant for me to hear—I refer to those concerning the soul—and purpose to speak of those which are less important, of gymnastics and of laborious exercises for the body.

S. Well, my honored guest, I do so because I remember the instructions given at the beginning of our discussion. You see I do not wish my narrative to stray from the subject, lest its digressive flow confuse your memory. Yet, however, as briefly as possible I shall speak of these topics also. For let us bear in mind that upon the accuracy of our examination of these moral themes may depend the perspicuity of the rest of our discourse.

To return, then, we bring the opinions of our young men into harmony with our best thought by such means as the following: We instruct them thoroughly in the common laws. These laws we have transcribed in large letters and have set them up in public places for all to read. The inscriptions give orders concerning that which it is fitting and proper for young men to do and concerning that from which they should abstain. Further we urge upon them to seek the companionship of the noblest and best men of the State, from whom they learn to speak properly, to act justly, to live together as fellow-citizens in equity; not to allow that which is disgraceful, and to desire that which is honorable, but in no case to use violence. These men who so instruct the youth we call sophists and philosophers.[4]

We also assemble our young men in the theater, and by the influence of tragedy and comedy publicly train them to contemplate both the virtues and the vices of their ancestors, that they may turn from the latter and may seek eagerly to emulate the former. And we even allow the comedians to scoff at and to rally those citizens whom they perceive conducting their lives dishonorably or in a manner unworthy

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[1] We can scarcely devise a better curriculum for youth under 16 years of age for our public schools of to-day.

[2] The elementary Grecian studies were grammar, music, and gymnastics. Under grammar were embraced reading, writing, arithmetic, elementary science; under music, poetry, composition, song, and dancing; under gymnastics, such exercises as have been considered. There are no sharp lines of division in studies.

[3] Anacharsis is willing to pass by minor subjects to know particulars concerning the judiciary at any time and under the least pretext.

[4] It may be well to note that most of these requirements or provisions for culture applied to the young men after reaching 20 years of age.

of the body politic. We allow this for the sake of the comedians, that by so doing they may become better than those whom they reproach, and also for the sake of the people in general, that they may avoid disapproval and conviction upon similar charges.[1]

A. If those whom you call tragedians and comedians answer to this description, I doubtless have seen them. The former, as I remember, wore heavy, high sandals and garments adorned with golden ribbons; they had on ridiculous masks with great, gaping mouths; they also raised a subdued cry and strode along in their sandals—how in safety I know not. I suppose your State then celebrated the feast of Dionysius. Now the comedians were somewhat more foolish than those just described; they walked upon the ground and were more like men; besides, their cry was weaker; but their masks were much more ridiculous, and, in fact, the audience as a whole laughed at them. But to those before mentioned, who were so elevated, all listened with solemn faces. I imagine they were expressing pity for those bound with such heavy fetters.

S. Not for the tragedians did they express pity; but doubtless the poet was presenting to the spectators some misfortune of the olden time; was narrating to the audience piteous tales, by which the hearers were reduced to tears. You have also observed some, probably, playing on the flute while others stood in a circle and joined in song. Nor, Anacharsis, do we regard these songs and this flute playing useless. So, then, by all these means and by their like do we whet the souls of our young men and make them better.

But to return to the subject, for it is about physical training that you desire especially to hear, we develop their bodies somewhat as follows: We strip them of their clothing;[2] as I remarked before, they are no longer delicate, and yet are not sufficiently compact for their life work. We consider that the first step is to accustom them to the air,[3] to render their bodies inured to each season, that neither with the heat they may be troubled nor may become exhausted from the frost. Next we anoint their bodies with oil to soften them and to make them more sinewy. Now, indeed, this were absurd, if we judge that skin already dead, when softened with oil, would be harder to rend and much more fitted to endure. But while the body partakes of life we opine nothing better for it than that it be treated with oil.[4] After this, we devise various kinds of gymnastic exercises and place directors[5] over each. We teach one to box and another the pancratian contest. We do this that they may become accustomed to endure hardships manfully and at the same time to avoid blows, and that not from fear of wounds they be turned back from their purpose. This discipline works out in them two very important qualities that are of great value to us. They are prepared to be courageous in danger and to take little account of their bodies, but above all their bodies become stout and capable of endurance. Further, those who catch falls in wrestling learn to fall with safety, easily to rise again, to push, to embrace, to twist, to be able to endure strangling, and to send their antagonists into the air; nor do those who exercise regard this part as useless, but without hesitation they grasp the first strong man they meet, even the very strongest. In this way their bodies are hardened to suffering and by constant toil become more robust. Nor in other respects are these exercises of small value. If ever our young men have need to make use of their skill in armor, they are already experienced. It is certainly very evident that a person so trained, upon grasping an enemy will more quickly trip and throw him, or, if he himself be

[1] The censorship of the theater was one of the most powerful in the regulation of public opinion and in correction of individual weakness in the citizens.

[2] The significance of the word *gymnasium* is *to strip of clothing, to be naked.* At 16 years of age the youth entered on this systematic preparation for military service and subsequent citizenship.

[3] The climate of Attica was peculiarly favorable for such exposure. The atmosphere is clear and usually free from excessive moisture.

[4] Such application is quite the custom in all tropical countries.

[5] There were no opportunities given in the Greek gymnasia for detrimental and abnormal development.

thrown, he will know how to spring up again most easily. We provide all these exercises for our youth, my friend, in anticipation of a contest in arms, and from the fact that they have been thus fully trained we think that we have for service much better men. By oiling their naked bodies and by subjecting them to labor, we have rendered the same firmer and stouter; we have also made them active and sinewy and of much weight against their antagonists. If these men while naked have caused fear to their enemies, I think you now understand what sort of men they are likely to be in armor. Furthermore they present no superfluous fat and white spots, no lack of flesh accompanied with paleness, like the bodies of women, bodies that waste away in the shade and tremble and perspire freely and breathe heavily under the weight of the head, and especially so if the sun as now at midday heat them. Pray, tell me, what use could anyone make of those who are easily scorched and are unable to stand the dust, who tremble immediately upon the sight of blood, who, before they are within reach of the arrow and before they are hand to hand with the enemy, anticipate death.[1]

Our young men, however, are tinged a dusky red by the sun, are masculine, have much spirit, show great zeal and manly courage, and furthermore enjoy such excellent health. They are not coarse though tawned, nor are they above weight, but are circumscribed with symmetry. They have lost all their useless and superfluous flesh in perspiration. They, however, assiduously guard that which freed from dross possesses strength and sinew.[2] In fact, that which those who winnow wheat do for it, gymnastic exercises accomplish in our bodies for us. While the winnowers blow away the husks and the chaff, they at the same time separate the perfect grain and heap it together. Even so is it necessary that we grow healthy and that we become fitted for the long and patient endurance of hardships. You may depend upon it, only after long labor would he who has been subject to this training sweat, and very rarely would he show signs of weakness. Just as would be the case—to return to the illustration from winnowing—if we should take firebrands and should throw some into the wheat itself, some into the straw, and others into the chaff. In such a case very quickly would the straw light up. But the wheat would neither raise much of a flame nor burn with a flash, but gradually and very slowly it would kindle from beneath and after a long time would be burned up. So, likewise, if disease and fatigue should unexpectedly attack such a body as our young men possess, they could neither readily dishonor it nor easily conquer it. For the inward parts of their body have been well prepared and the outward parts very firmly guarded to prevent either the heat of the sun or the cold from entering the vitals and destroying the body. In fact, when the body meets with hardships, it pours forth an abundance of that energy which has been long in preparation and has been laid aside for a time of need. Watered at once upon occasion from this fountain of manly vigor, the body is satisfied and enables those who possess it to be free for a very long period from the consciousness of fatigue. In fact previous toil and pain have produced no loss of strength, but an increase, and that strength by being rekindled has become still greater.

We train our young men to run also; we accustom them to endurance in a long race and encourage them to make a short distance in the quickest possible time. The course is not formed upon firm ground that will resist, but in the deep sand, where it is easy neither to step with firmness nor to lean forward, and where the foot is burdened with the yielding path. In addition to this we exercise them in leaping ditches, if thought necessary, or any other impediments, even with their hands filled with leaden weights. They contest, further, in throwing the javelin to a long distance. Now, I believe you noticed something else in the gymnasium. The object was of brass and was rounded somewhat like a small shield, but it was

[1] Solon was quite aware that without systematic discipline, under public supervision, Athens would easily develop such cowards as he depicts. There is doubtless also indirect allusion to the effeminate character of the Persians.

[2] The Aristotelian notion that perfection is a mean between excess and defect is evident here.

without either handle or band. You examined it as it lay in the court. You thought it heavy and from its smoothness hard to grasp. That, too, they raise in the air and throw to as great a distance as possible. Him who by throwing the plate the farthest surpasses the others we honor. This exercise strengthens their shoulders and puts sinew in their toes.

Now, my friend, if you will listen, I shall explain why the mud and the dust, which at first seemed to you very ridiculous, were thrown down. In the first place, that the fall of the young men may not be hard, but that upon a soft surface they may be thrown with safety. Then it is necessary that the slipperiness of men sweating in the mud become greater—a slipperiness which you likened to that of eels. We regard this also neither useless nor ridiculous. Whenever the contestants are compelled in this condition to seize one another with the vigor of antagonists and to hold those who are slipping from them, this effort lends not a little to the development of their strength and sinew. To grasp a person that is sweating in mud and oil, and to throw him while he is slipping hastily from your hands, is not a small thing to do. And, as I said before, all these practices are especially useful in time of war against our enemies; for instance, if it be necessary at any time to catch a wounded friend and at once to bear him away, or to come upon an enemy unawares, to grasp him while surprised, and to secure him. That while anticipating harder trials our young men may bear smaller tasks with far greater contentment we train them somewhat to excess.[1]

Then, on the contrary, we regard the dust of service in preventing them from slipping their embrace. For while they were training in the mud to hold the one who tried to escape by reason of his slipperiness, they also became accustomed to slip from the hands of those who seized them, and that, too, even when cornered. And the dust likewise seems to hold in check the perspiration and to stop an excessive or sudden flow; it thus husbands their strength for a longer time, and prevents injury from the winds that might blow upon their bodies while exposed and weakened. Furthermore, it scours off the filth also, and makes the man more glossy. Well, I would be glad to have you select any from these pale persons near us, who have passed their lives in the shade, and anyone whom you please from those who exercise in the lyceum to wash off the dust and mud; then let them present themselves before us that I may ask you this question, "Whom would you pray to be like?" I know well that at first glance, before you had tried each on his merits, you would choose to be compact and strong, rather than to be delicate, to be yielding, to be pale from weakness and from the flight of the blood to the inner parts of the body.

These are some of the reasons why we subject our young men to exercise. We expect them to become a noble guard to our body politic, and that through their protection we shall live in the enjoyment of liberty. Should our enemies invade our territory, these will conquer them. In fact, to such an extent are they now a fear to our neighbors that most of the States are in awe of us and pay tribute. In time of peace we can manage much better those who are elated by nothing disgraceful. Nor are our young men then turned from idleness to wantonness, but in such pursuits as these they wear away their leisure.[2] Finally, whenever we can say that our youth, both in peace and in war, are fitted to do the noblest deeds, that they appear

[1] Prof. Henry S. Frieze, the distinguished Latin scholar, once said: "One excellent feature about final examinations is that they furnish young men with opportunity to marshal all their powers for a definite purpose. Nor is ability to 'cram' for such occasions any small acquirement, though the particular facts vanish with the purpose for which they were acquired. In this facility in great emergencies, in this knowledge of the sources of information, we distinguish the man of cultured discipline."

[2] It is no small matter to provide fitting pursuits and occupation for those who would not otherwise be engaged, save perhaps in corrupting the body politic to gain permission to do their pleasure. Those who furnish healthy and philanthropic diversion for men of wealth and leisure are often public benefactors. Persons are usually interested in that for which they expend money. If the object is one of public weal, patriotism is the fruit.

zealous for our highest honor, then we possess that which I spoke of as the common weal, as the happy culmination of our civil prosperity.

A. Then, whenever at any time your enemies invade your territory, am I to presume that you anoint yourselves with oil, sprinkle on dust, and proceed with clenched fists in your advance against them? And, of course, they are struck with awe at the sight of you and flee from fear lest you sprinkle sand in their mouths while they gape, or lest, perchance, you spring to their rear, interweave your legs about their bellies, throw your forearm under their helmets, and strangle them.[1] Yes, by Zeus, and they will shoot arrows from their bows and will cast the javelin; but you are like statues and are colored by the sun; these weapons will not penetrate you! And you, too, are supplied with an abundance of blood. I understand you are not stubble and chaff to yield quickly to strokes. But you would show blood late, if ever, and but little then, when cut with deep wounds. If I do not altogether misinterpret your illustration, you say something of that sort, I believe. Or, perhaps you will then take upon you all the equipments of the comedians and of the tragedians. If, for instance, you propose a sally, that you may seem more frightful to your enemies, you will don those gaping masks to scare them. And doubtless also you will bind on those high sandals. Certainly they will be light for flight, if that be necessary; and if you pursue, when with such great steps you stride after the enemy, there will seem no escape for them. But, my friend, see to it lest these exercises which seem so exquisite to you prove foolishness and the rather childish sport and mere pastimes to idle young men that are willing to take their ease. Now, if you wish in every respect to be free and to be prosperous, you will need to have gymnastic training of another sort and to exercise in real armor. And the contest will not be in sport with one another, but with real enemies, where your young men may have thought of bravery in the midst of actual danger. Then you can dismiss the dust and the oil and can teach them to hurl the arrow and the javelin. Nor give light javelins that can be diverted by the wind, but rather place in hand the heavy-headed spear that is whirled through the air with a whiz. Supply also a stone that fills the hand, a battle-ax, a shield for the left arm, a breastplate, and a helmet.[2]

I can but think that you have been preserved in safety in your present condition as a people from destruction at the hands of a few light-armed troops, simply and solely by the good will of the gods. Why, you know well, should I snatch this short dagger from my girdle and even single-handed burst out against all your young men, at one cry I should have possession of the gymnasium. These brave youth would flee; no one would dare to face me with the sword, but they would stand about the statues, would hide behind the pillars, and doubtless many by their weeping and their trembling would furnish me with much amusement. Nor then, as now, would you see them with ruddy bodies, but all would immediately be changed from fear and would become colorless. In fact, I fear that long peace has brought you to such a condition that scarcely could you withstand the sight of an enemy's helmet crest.

S. Well, now, really, Anacharsis, the Thracians who made an expedition against us under Eumolpus[3] did not speak in that way, I believe; nor did those of your

[1] Anacharsis makes a common mistake. There is no need that general training be accompanied with particular weapons of warfare. Ability to adjust the body as a willing servant of the soul to any occupation whatsoever is the object to be gained. Probably no better illustration of this Grecian notion can be found than in the citizens of the United States; our activity and patriotism answer for a standing army. In the practice of the arts of peace we gain a discipline adjustable to the arts of war.

[2] Anacharsis loses sight of the fact that no possible military training in time of peace is complete. Either we must make war for the sake of training in military service or fail of working with a rational purpose. Gen. Philip H. Sheridan was wont to remark that the cowboys of the West were a better standing cavalry in the emergency of war than several times their number of regulars demoralized by the listless life of post duty in time of peace.

[3] The tradition was that Eumolpus, the founder of the mysteries at Eleusis, near Athens, was from Thrace. In a war with the Athenians Eumolpus was slain.

women with Hippolyte,[1] when they invaded our country; nor, indeed, any who have tried their strength with us in arms. Surely, my friend, it does not follow that because we subject in this way to labor the bodies of our young men while naked, on this account we lead them unarmed into danger. But when of themselves they have become the very best, after this they practice in armor.

A. And where is your gymnasium for practice in armor? Although I have made the circuit of the city, I believe I have observed nothing of the kind.

S. Now, my friend, if you tarry with us a little longer you may see an abundance of armor for each one. We make use of it whenever it is necessary. You may see crests and cheek-pieces, and horses and horsemen—well-nigh a fourth of our citizens. But let me say that to bear armor continually and to wear a dagger in time of peace we regard as superfluous. And, further, we inflict punishment upon any who may attempt to carry weapons when there is no need, or upon him who may even appear publicly in arms without cause.[2] To be sure you are pardonable in this regard. You are continually under arms. If you at your home live without protection it becomes an easy matter to plot against you. Wars are especially numerous, nor is it evident at what time some one may suddenly come upon you, drag you from your wagon, and murder you. This distrust among those who live together according to their own sweet will without law necessitates that weapons always be carried for defense against any attempted violence.

A. Then I am to understand that you think it superfluous, when there is no necessity, to carry weapons; that you judge it proper to spare the armor, as though it might be injured by use; or, rather, that you lay these instruments of war aside under guard, for use when you have need. But, on the contrary, when there is no danger pressing, I see that you beat, subject to toil, sweat, and weaken the bodies of your youth; nor do you store up their strength for the time of necessity, but wantonly pour it out in the mud and in the dust.[3]

S. You seem to conceive strength as though it were like wine, or water, or other liquid. You fear lest this strength leak away, as it were, from an earthen vessel, unperceived, in these labors, and then, after leaving the body empty and dry, that it be lost to us; and, further, that it have no inward source from which to be replenished. But this illustration does not hold good. On the contrary, to the extent that by labor we draw from it is it again filled. It is like the myth of the hydra—perchance you have heard it—in which in place of one head cut off two others always grow.

If, to begin with, a person be without training, be without sinew, and possess no enduring substance in store, then, truly, under hardships he may be injured and may pine away. To illustrate this, call to mind that which is wont to occur in case of fire and light. With your breath you may kindle a fire, and by inciting it with air for a brief time may make it larger. And also with the same breath you may put it out if the flame of the light possess not a sufficient supply of material to stand against the breeze. You see in the latter case the flame has been produced without adequate strength of root.

A. Pardon me, but I do not quite understand all this. You have spoken on this subject in a manner too subtle for me. Your treatment of the subject requires a

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[1] The story goes that Hippolyte led an army of Amazons from Thrace against Theseus at Athens and was repulsed and driven to Megara, where she died. It is doubtful if these myths had any historic significance to Anacharsis. It merely had an indirect object, to return in a mild way the sally of the Scythian.

[2] This is doubtless a revelation to the guest. We know how hard it is for the frontier settler to realize that civilization has dawned upon him, in the demand of society that he cease to carry weapons for personal protection.

[3] Solon must have realized that it required "line upon line, precept upon precept" to instruct his pupil properly. You lay aside your armor doubtless to save it, Why do you not save the strength of your youth in the same way? We hear the same argument nowadays—why learn anything that is not of immediate application? As if the demands of to-day will be those of to-morrow! Or, as if the discipline and the tact for a rational pursuit of any vocation were not common factors of success in every calling!

peculiar clearness of reflection and a sharp, discriminating power of intellect which I do not possess.[1] But possibly you can answer me this intelligibly. Why do you not in those contests at the Olympian games—the Isthmian, the Pythian, and the rest—when, you say, many assemble to see the young men engage in contests—why do you not then make a contest in armor? Why do you instead lead them forth naked and present them to be trampled upon and to be beaten, and give the victors apples and olive wreaths? Why you do this I think must be something worthy of note.

S. Because we think, my friend, if they see the victors in these contests honored and heralded among all the Greeks, that the desire for gymnastic exercises becomes greater in them, and also when they are stripped of their clothing, that they have care to be in good health lest they be ashamed to appear naked; and, further, that in this way each prepares himself as one very worthy of the victory. As I said before, the prizes are not of small account, nor is the praise of the spectators, nor that the victor becomes the most honored of the Greeks, be pointed at with the finger by the multitude, be regarded as the noblest of equals in rank.[2] Further, you must remember that many of the more mature spectators, for whom there is still training suitable to their age, go away from such exhibitions with no moderate esteem for bravery and hardships.[3] Now, my friend, if anyone dispel from his life this love for renown, of what good would he longer be to us? What incentive would he have to act nobly?[4] But now from these who, for the sake of apples and olives, show while naked such zeal for victory, you may be allowed to surmise what sort of men they would be in armor, fighting for the sake of country, children, wives, and altars. And besides, if you should chance to behold the contests of quails and cocks, as practiced among us—and there is no little zeal in these—how would you be affected? Would you not ridicule these, and especially when you learn that we establish such contests under law, and that all adults are ordered to be present to see the birds sparring to the extreme of exhaustion? But, after all, even this is not so senseless. Gradually an eagerness for dangers is implanted in the souls of the spectators, lest they appear less noble and less daring than cocks; nor will they afterwards yield under wounds or labor or other hardships. However, away with your desire to try our young men in armor and to see them wounded. It is savage, terribly cruel, and, furthermore, utterly useless to slay our bravest and noblest men, any one of whom we might better use against our enemies.

Now, Anacharsis, a word. You will travel in the rest of Greece, will you? If ever you come to Lacedæmon, bear in mind not to ridicule, nor to think that they labor to no purpose. Either if while at ball in the theater they come to blows and strike down one another, or if when they come into an open space surrounded by water they divide lines and work against one another, even while naked, the deeds of war, until one party throws the other out of the inclosing line, until the party of Heracles thrusts into the water that of Lycurgus, or the reverse, you will learn that this is a signal for peace, and no one would strike after that. But especially guard lest you ridicule if you see young men beaten upon a trestle and flowing in blood, while fathers and mothers stand hard by, and are not undone by that which occurs, but, rather, if their children do not endure the blows they chide, and they pray their offspring to be adequate for their toil as long as possible, and to be patient

[1] When Anacharsis did not grasp in an hour the wisdom of a life of experience, he hastily concludes that such learning is not for him. Probably the true teacher finds more to test his patience in the skepticism of the ignorant concerning their ability than in any other particular. He knows from his own experience that the only barriers are lack of application, lack of thought. Men are too lazy to think, hence their self-imposed limitations.

[2] A person whose motive to develop perfection is the good of the state rejoices in every exhibition of manly vigor superior to his own as an added proof of national strength.

[3] The life of the Attic freeman was never entirely devoid of opportunities for public deeds of emulation.

[4] Aside from the thought that we are members one of another in a common brotherhood, presided over by a common spirit of truth, there is no bond for the body politic.

under suffering. Many, indeed, in the past, because they have not deemed it honorable while still alive and under the eyes of their relatives to become weary and to yield to their bodies, have died in the contest. You will see the statues of such heroes set up by Sparta and their names publicly honored. When you see these customs, neither suspect that they are mad nor say that they endure suffering without adequate cause, nor that a tyrant compels them, nor that their enemies enforce this upon them. Lycurgus, their lawgiver, will speak many rational words in behalf of their customs; how from a plain understanding of the necessities of the case he chastises the youth; how he is no enemy; that he does this not from hatred, nor does he institute it to waste to no purpose the youthful energy of the body politic, but he does this because he considers that those who shall save their fatherland must be most patient and superior to all suffering. And, indeed, even if Lycurgus did not tell you this, I think you can understand that a person subject to such training if taken captive in war, merely from the torture of the enemy, would reveal no secret of Sparta, but, should they scourge him, would mock, and would institute a contest with his scourger to see who first become weary.

A. Was Lycurgus himself beaten at the proper age, or was it after he had already safely passed the age that he instituted these youthful contests?

S. When he was an old man, on his return from Crete, he wrote the laws for the Spartans But he had traveled extensively among the Cretans to observe and to hear from Minos, the son of Zeus, from Minos, the lawgiver of the Cretans, what laws were best.

A. Why, then, do you not imitate Lycurgus by chastising your young men? You seem to judge these customs of his making noble and honorable.

S. Because we consider our gymnastic exercises sufficient. Then, besides, we do not regard it worthy of our dignity to imitate foreign manners and customs.

A. No; and for good reasons doubtless. You understand, I think, that to beat to the extreme a young man, raised by his hands, is no assistance either to the individual himself or to the common body politic. But then I am to know that I shall be publicly stoned to death with dispatch if, chancing to arrive at Sparta while they are practicing these performances, I ridicule each and all whom I see beaten like thieves, robbers, and evil doers of that nature. Really, to put it plain, for allowing such absurd practices to occur under its sanction, I judge their body politic has need of hellebore.

S. Neither think, my worthy friend, that with yourself as the only speaker you will win your case by default, not that men will be wanting. Sparta will supply some to speak fitting words in defense of these manners and customs.

However, to change the subject, I have made mention of our customs, but you do not appear disposed in every respect to acquiesce. It now seems only fair to ask you in turn to tell me of the method by which you in Scythia train your young men and of the exercises to which you subject them that they become noble men of valor?

A. That is a very just request, and I shall with pleasure comply. I shall tell you of the usages of our society in Scythia. They are not so sublime, perhaps, as yours, nor scarcely similar. We, for instance, should not dare to slap young men, a single blow even, in the face. In plain language, we are cowards in the matter of discipline. I will tell you, however, what sort of customs we have.[1]

But, if you please, let us adjourn our conversation until to-morrow. In fact I desire to think over still more at my leisure that which you have said, and to call to mind and to arrange that which it may be proper for me to mention concerning our people. Besides, it is evening. Let us then leave the subject as it now stands and depart.

[1] The first sign of national decay is lack of respect among the youth for the regulations which wise men have found necessary for the perpetuity of government.

CHAPTER XIII.

NOTES ON THE HISTORY OF FOREIGN INFLUENCE UPON EDUCATION IN THE UNITED STATES.

By B. A. Hinsdale, Ph. D., LL. D., Professor of the Science and the Art of Teaching in the University of Michigan.

PREFACE.

This chapter is exactly what its name declares it to be: Notes on the History of Foreign Influence upon Education in the United States. Some of the items here jotted down I came upon in the course of my general reading; some I found as the result of special investigation. My primary motive was the accumulation of original material relating to this important phase of our educational history. The value of the chapter lies almost wholly in the original items of information that it contains, for the accompanying narrative and commentary are but slight. It will be seen that the matter relating to the establishment of contact between the mind and education of Germany, on the one hand, and the mind and education of the United States, on the other, is much the most valuable portion of the chapter. Some facts are here presented to the public for the first time.

I. ENGLISH INFLUENCE.

The educational ideas and ideals that the English colonists brought to North America were those that prevailed in England in the seventeenth century. No doubt the New England Puritans, on the whole, represented these ideas and ideals in their purest form, save in a single particular. "The proportion of learned men among them in those early days," it has been said, "was extraordinary. It is probable that between the years 1630 and 1690 there were in New England as many graduates of Cambridge and Oxford as could be found in any population of similar size in the mother country."[1] The education that these Cambridge and Oxford scholars had received was made up of Latin and Greek, Hebrew, mathematics, and rhetoric, with a little physical, mental, and moral science. The English grammar schools of the day were engaged in preparing boys to receive such a training as this at the universities. Elementary schools proper can hardly be said to have existed, at least in considerable numbers. From the days of Chaucer to the days of Shakespeare and Milton the culture of Italy deeply impressed the mind of England, but this was affected through general literature rather than through schools. There had, indeed, been a time when the English universities, like those of the Continent, had served as a strong intellectual bond among the people of western Europe, but this time had gone by. There were the best of all reasons why Englishmen should know more about France than about any other country; the best of reasons, also, why they should most dislike Frenchmen. As it was, the necessities of commerce, politics, diplomacy, and social intercourse, as well as intellectual sympathy, compelled a considerable number of Englishmen to read, speak, and write French. It must be remembered, however, that the French language had not yet become the

[1] Tyler, History of American Literature, Vol. I, p. 98 (1897).

language of general intercourse in Europe, and that the influence which the literature of France exerted for the time was neither what it had once been nor what it afterwards became. English scholars and teachers knew little of educational institutions beyond the Channel or the German Ocean, or at least were little influenced by them. Continental languages, save those of antiquity, were not taught in the English schools. No real connection had ever been established between the mind of Germany and the mind of England.

Nothing could have been more natural than that the Puritans of New England should reproduce in the New World, as far as circumstances permitted, the educational institutions with which they had been familiar in the Old World. In Harvard College they did not attempt to reproduce the University of Cambridge, but only one of the colleges comprising that university. The ideals, methods, and studies of the new college were the same as those of the old colleges. The English grammar school was reproduced in the same way. When the members of the general court of Massachusetts ordered in 1647 "that when any town shall increase to the number of one hundred families or householders they shall set up a grammar school, the master thereof being able to instruct youth as far as they may be fitted for the University," they had Eton, St. Paul's, and Winchester in their eye. The next step brings the dark. Where the members of the general court got the idea that they expressed in the previous clause, "ordered that every township in this jurisdiction, after the Lord hath increased them to the number of fifty householders, shall then forthwith appoint one within their town to teach all such children as resort to them to write and read," is far from clear.[1] We certainly fail to find anything corresponding to this description in contemporary England. The same difficulty confronts us again in Connecticut, which from the first took an equal interest with Massachusetts in education.[2] Nor are we able to tell with certainty who were the masters that taught William Penn to establish common schools in Pennsylvania.[3] But here the difficulty vanishes. None of the other English colonies gave the slightest reason for questioning the thoroughness of their English character by taking any deep interest in popular education. But the difficulty is much less serious than it has sometimes been represented as being. Protestantism had familiarized the minds of men with the conception of elementary education. Comenius, who formulated the modern division of education and was a most effective champion of popular elementary schools, was well known to Milton, Hartlib, and their associates in London.[4] He must have been well known also, by name at least, to the leading men of Massachusetts Bay, even if their representatives did not, as Cotton Mather says, offer him the presidency of Harvard College;[5] and under these conditions, certainly, we may credit the Puritans of New England, stirred by the genius of Protestantism and the Renaissance, with originality enough to invent, or rather put in operation, common elementary schools—a possibility which some controversialists do not seem to have at all considered.[6]

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[1] B. A. Hinsdale, Documents Illustrative of American Educational History, chap. 1, pt. 3, vol. 2, of Report of the Commissioner of Education, 1892-93, pp. 1232, 1237.

[2] Ibid., pp. 1240-1255.

[3] Ibid., pp. 1261-1267.

[4] W. S. Monroe, Introduction to Comenius's School of Infancy, Boston, 1896, ix; David Masson, Life and Times of John Milton, Vol. III, passim.

[5] Magnalia, vol. 2, p. 14; W. S. Monroe, Educational Review, November, 1896, "Was Comenius called to Harvard?"

[6] Unfortunately, this has become a moot subject. Mr. Douglass Campbell maintains that the Puritans obtained their ideas of common schools from the Dutch in Holland.—The Puritan in Holland, England, and America; New York, 1892, *passim*. See also A. S. Draper, "Public School Pioneering in New York and Massachusetts," Educational Review, April, 1892, October, 1892, April, 1893, and "The Inception of an American State School System," ibid., September, 1894; George H. Martin, "Public School Pioneering," ibid., June, 1892, March, 1893, and "The Evolution of the Massachusetts Public School System;" B. A. Hinsdale, Horace Mann and the Common School Revival in the United States, p. 7.

What has been said of Harvard College is equally true, with a single qualification, of the six other colleges established before 1765: William and Mary, 1693; Yale, 1700; New Jersey, 1746; King's, 1754; Philadelphia, 1755; Rhode Island, 1764. These institutions all continued the English tradition, most of them, indeed, in a small way—smaller than Harvard. Nor is this all; American colleges and universities continued to be organized and conducted on the same lines until vital contact was established between the mind and scholars of the United States and the continental countries.

We may repeat what has been said of schools and education when we deal with literature and the more general means of mental cultivation. The people of the colonies—or, rather, the English portion of them—found their spiritual sustenance in English books. In fact, as time went on they became more insular in character than their kin in England. They became more English than the English themselves, for their wide separation from Europe cut them off, for the most part, from immediate contact with the people of the Continent. What they knew of France, Spain, and the other countries they knew mainly through the mother country. Nor were they influenced by the French at the north or the Spaniards at the south of them.

It is true enough that there were diverse elements in the thirteen colonies. Dutch, Germans, Scotch-Irish, French, and Swedes were all found in numbers larger or smaller. The Dutch established schools in New York, which continued to be conducted in the vernacular language and according to Dutch models for a century after the colony passed into English hands. The Swedes of Delaware supported schools until they ceased to be a distinct element in the population. The Germans of Pennsylvania also created schools, which have continued, of course with modifications, until our own day.[1] And, finally, the revocation of the edict of Nantes sent large numbers of Huguenots to the colonies, and particularly to South Carolina, where they and their descendants formed a numerous and influential portion of the population. But little real influence was exerted by these nationalities upon the people of English descent, who gave name and character to the country. The New Englanders were not influenced in respect to education by the Dutch of New York, or the Virginians by the Germans of Pennsylvania. On the other hand, American education, as it existed down to the beginning of this century, was developed on the lines of the English tradition (barring, of course, the common schools of the few States that had them).

It would be a mistake to suppose that this tradition was merely a matter of hereditary transmission. The colonies were in the closest connection with the mother country. Englishmen continued to migrate to them, although in diminished numbers as compared with the earlier days. What is more, outside of New England, men who were able to do so, often sent their sons, and sometimes their daughters, to

[1] Gustav Körner, dealing with the subject of German emigration to the English colonies before the Revolution, says: "The emigrants continually sought their brethren on the other side of the ocean to assist in the support of their churches and schools, and these, on the other hand, sent missionaries and teachers to spread their religious ideas. In New York, and especially in Pennsylvania, there developed an active German element, which manifested itself in the latter State in a political influence which has never since been attained. A number of distinguished statesmen and scholars sprang from this German emigration [to Pennsylvania] during the first decades of the last century. The simple fact that, shortly after the war of independence, the adoption of the German language as the language of the courts and statutes was not only agitated but voted down in the legislature only by a small majority, shows how strong the German element must have been towards the end of the last century, at least in the State which was at that time the most important in the Union." Mr. Körner then enumerates a number of families that came to exercise a large influence in different parts of the Union, and then assigns causes for the relative decline of German influence in those States where it had been strongest. Das deutsche Element in den Vereinigten Staaten von Nord-Amerika, 1818–48. Von Gustav Körner. New York, E. Steiger & Co., 1884. How many of the Pennsylvania Germans sent their sons to Germany to be educated, it would be hard to determine, probably not many. We know that Rev. Dr. Muhlenberg, the father of the Lutheran Church in the United States, sent his three sons to Halle to be taught in the institutions of that city, in 1763.—W. J. Mann, Life and Times of Henry Melchior Muhlenberg, Chaps. XXIV, XXV.

Europe to be educated. This was the case in New York and Virginia, and particularly in South Carolina.[1] The Catholic planters of Maryland sometimes sent their sons to the Jesuit colleges in France and the old countries. For example, Charles Carroll, of Carrollton, when 11 years of age, was sent by his father to St. Omer, where he remained six years; from there he went to a college at Rheims, and from there again to the College of Louis le Grand at Paris. It was common also for young men to resort to Europe for professional study, as in theology, law, and medicine. Thus Carroll studied at the Inner Temple three or four years, but not with a professional view.[2] He returned to his native country the year of the Stamp Act Congress, after an absence of eighteen years. John Carroll, also, a cousin of Charles, afterwards the first Catholic bishop in the United States, studied abroad.[3]

II. FRENCH INFLUENCE.

The Declaration of Independence involved much more than politics. The formation of the American Union, and its assumption of a separate place among the powers of the earth, brought the American people into new relations, not merely with England, but with the continental countries. Congress, having cut the bond uniting the States and the mother country, began to look about for foreign connections, and so dispatched commissioners to Europe. These steps meant some immediate enlargement of the national mind, and they led to results that were little foreseen at the time. Naturally enough, Congress found an ally in the mother country's ancient enemy. The treaties of 1778 have been properly valued in respect to commerce and political and military affairs. No doubt, too, the moral reaction of the United States upon France has been sufficiently appreciated. The same observation may be repeated in respect to French influence on American morals and religion. But the same can hardly be said of French influence on American studies, science, and learning.

(1) FRENCH OFFICERS AND TRAVELERS IN THE UNITED STATES.

At the opening of the struggle with England the army suffered a lack of officers properly educated in the science and the art of war. The representatives of the Government abroad were accordingly instructed to enlist the services of foreign officers, being competent, who might be willing to accept American commissions. So successful were these efforts that serious embarrassment was felt, both at the seat of Government and in the camp of the Commander in Chief, when the time came to redeem the promises that had been made in Europe. Steuben, who furnished the plans on which the army was reorganized in 1778, was a German; so was Kalb, although he had been trained in the French army; but a majority of these soldiers of liberty or fortune were Frenchmen. In due time the French fleets and armies, under the command of D'Estaing, Rochambeau, and De Grasse, arrived. The King of France also maintained a representative, with an appropriate staff, near Congress. Besides, numerous French travelers, men of cultivation and science, began to visit the country in the spirit of scientific observation.

The truth is that continental countries had for some time been showing something besides a mere political and commercial interest in the English colonies in North America. The country and its inhabitants had become the subjects of interest and study. Peter Kalm, professor of economy in the University of Åbo, in Swedish Finland, and member of the Swedish Royal Academy of Sciences, who made his visit in 1748–49, was one of the clearest of the early prophets of American independ-

[1] Colyer Meriwether, History of Higher Education in South Carolina. Washington, D. C., 1889, pp. 24, 27, and Appendix II. B. A. Hinsdale, Horace Mann and the Common School Revival in the United States, pp. 33–45.

[2] Journals of Charles Carroll of Carrollton, etc. Printed for the Maryland Historical Society, Baltimore, 1876, p. 106.

[3] J. G. Shea, Life and Times of Archbishop Carroll, Bk. I, Chap. I.

ence.[1] In 1764 the Duc de Choiseul sent M. de Pontleroy to the States as a political agent,[2] and at a later day Kalb,[3] who afterwards fell at the battle of Camden, on a similar errand. The works of Abbé Raynal, entitled A Philosophical and Political History of the Settlements and Commerce of the Europeans in the Two Indias, first published in 1780, embraced the thirteen colonies.[4] The Abbé also published in 1781 an account of the Revolution in two volumes. The Abbé Mably, also bred up like Raynal in a Jesuit college, published in 1784 his observations on the Government and Laws of the United States of America. Again, the Marquis de Chastellux, a major-general in Rochambeau's army, and one of the forty members of the French Academy, traveled extensively in the States in 1780–1782, and his journal, although written solely for himself and a few friends, ultimately found its way into public, both in French and in English.[5] The Duc de Rochefoucauld-Liancourt also visited us in

[1] On his return home Kalm wrote an account of his travels in Swedish, which was soon translated into German, and then into English. The English translation, entitled, Travels into North America, etc., translated into English by John Reinhold Forster, F. A. S., bears the imprint "Warrington, printed by William Eyers, 1770." It comprises three volumes. The book is devoted to natural history, including a circumstantial account of the plantation and agriculture of the country in general, with its civil, ecclesiastical, and commercial state, the manners of the inhabitants, and several curious and important remarks on various subjects. Kalm declared it to be of great advantage to England that the North American colonies were so near to Canada. "There is reason to believe," he says, "that the King never was in earnest in his attempt to expel the French from their possessions there, though it might have been done with little difficulty." Referring to British interference with colonial manufactures and commerce, he said: "These and some other observations occasion the inhabitants of the English colonies to grow less tender for their mother country. This coldness is kept up by the many foreigners, such as Germans, Dutch, and French settled here and living among the English, who commonly have no particular attachment to old England. I have been told by Englishmen," he continues, "and not only by such as were born in America, but even by such as came from Europe, that the English colonies in North America, in the space of thirty or fifty years, would be able to form a state by themselves entirely independent of old England. But as a whole country, which lies along the seashore is unguarded, and on the land side is harassed by the French, in times of war these dangerous neighbors are sufficient to prevent the connection of the colonies with their mother country from being quite broken off. The English Government has therefore sufficient reason to consider the French in North America as the best means of keeping the colonies in their due submission." (Vol. 1, pp. 264–265.) A letter of Kalm's to a friend in Philadelphia, describing Niagara Falls, dated at Albany, September 2, 1750, is found in "Observations on the inhabitants, climate, etc.," made by John Bartram in his Travels from Pennsylvania to Onondaga, etc., Canada. London, 1751; reprinted 1895.

[2] Bancroft, History of the United States, New York, 1885, Vol. III, p. 75.

[3] Kalb was in the colonies in 1768, nine years after Kalm's visit. His reports to the French minister are very interesting for the light they throw upon the state of colonial opinion and feeling at the time. For example, he wrote from New York February 25: "All classes of people here are imbued with such a spirit of independence and freedom from control, that, if all the provinces can be united under a common representation, an independent state will soon be formed. At all events, it will certainly come forth in time. Whatever may be done in London, this country is growing too powerful to be much longer governed at so great a distance. The population is now estimated at 3,000,000, and it is expected to double itself in less than thirty years. It is not to be denied that children swarm everywhere like ants. The people are strong and robust, and even the English officers admit that the militia are equal to the line in every particular." (Freiderick Kapp: The Life of John Kalb, Major-General in the Revolutionary Army, New York, 1884, p. 63.)

[4] A philosophical and political history of the British settlements and trade in North America, from the French of Abbé Raynal, in two volumes, Edinburgh, 1775.

[5] Travels in North America in the Years 1780–1781–1782. By the Marquis de Chastellux. Translated from the French by an English gentleman who resided in America at the period. Two volumes, London, 1787.

Chastellux's work contains the following curious passage: "As for the Americans, they testify more surprise than peevishness at meeting with a foreigner who did not understand English. But if they are indebted for this opinion to the prejudice of education, a sort of national pride, that pride suffered not a little from the reflection which frequently occurred of the language of the country being that of their oppressors. Accordingly, they avoided these expressions, 'You speak English,' 'You understand English well;' and I have often heard them say, 'You speak American well,' 'The American is not difficult to learn.' Nay, they have even carried it so far as seriously to propose introducing a new language; and some persons are desirous, for the convenience of the public, that the Hebrew should be substituted for the English. The proposal was that it should be taught in the schools and made use of in all public acts. You may imagine that this project went no further; but we may conclude from the mere suggestion that the Americans could not express in a more energetic manner their aversion for the English. (Vol. II, pp. 265, 266.)

1795–1797. We shall soon meet him again in another connection. Dupont de Nemours published in Paris in 1800 a work entitled On National Education in the United States, written at the request of his friend Jefferson. And finally, not to make too long a list, mention may be made of the botanist Michaux, who penetrated into the country west of the Alleghany Mountains and into lower Louisiana.[1]

(2) THE AMERICAN PHILOSOPHICAL SOCIETY AND THE AMERICAN ACADEMY OF ARTS AND SCIENCES.

Americans who went to Europe under the new conditions went with a new interest. Diplomatists, like Franklin, Adams, and Jefferson, served other purposes than those of diplomacy, or even politics: they became channels for the transmission to their countrymen of foreign, and especially of French, ideas. The estimation in which Franklin was held in France by men of learning and science, and the thoroughness with which Jefferson interested himself in continental learning and science, are commonplaces. As is well known, Jefferson's Notes on Virginia were not only written but first published abroad.[2]

The war had been but a short time in progress before French influence began to make a perceptible impression in the United States. Proof of this is found where some might not expect to find it. The American Philosophical Society, at Philadelphia, was founded in 1769. The American Academy of Arts and Sciences, at Boston, was incorporated by the legislature of Massachusetts in 1780. The two bodies represent the English and the French types, respectively. To quote a writer who has dealt with their origin:

> The Philosophical Society (founded before the separation of the colonies) copied the Royal Society of Great Britain in its corporate name, as well as in that of its transactions, and in its ideals and methods of work took it for a model. The American Academy, on the other hand, "Had its origin at the time when Britain was regarded as an inveterate enemy, and France as a generous patron," and its founders have placed upon record the statement that it was their intention "To give it the air of France rather than that of England, and to follow the Royal Academy rather than the Royal Society." And so in Boston the academy published "Memoirs," while conservative Philadelphia continued to issue "Philosophical Transactions."[3]

It is curious to observe that the first president of the Academy of Arts and Sciences was James Bowdoin, whose name bespeaks his French extraction. "In time, however," our writer goes on to say, "the prejudice against the motherland became less intense, and the Academy in Boston followed the general tendency of American scientific workers" by conforming more nearly to English models. Added interest is given to this subject by the fact that John Adams, who, while by no means partial to Frenchmen, was not proof against the French genius, was the principal agent in forming the Academy, as Franklin had been in forming the Philosophical Society at Philadelphia. After he had retired to private life, Mr. Adams related that it was the conversations that he held with men of science and letters in Paris that suggested to him the idea. He observes further that the same conversations were an antecedent of value in the framing of the provisions in relation to literature and education incorporated in the constitution of Massachusetts, 1780, which was adopted the same year that the Academy was founded.[4]

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[1] Travels to the Westward of the Alleghany Mountains in the States of the Ohio, Kentucky, Tennessee, etc., undertaken in the Year X (1802), under the Auspices of His Excellency, M. Chaptal, Minister of the Interior. By F. A. Michaux, M. D. Translated by B. Lambert, London, 1805. Michaux was an agent of Genêt in his efforts to create disaffection in the western country and to embroil the United States with Spain and Great Britain. (See Justin Winsor, The Western Movement, Boston. 1897, pp. 533–537.)

[2] P. L. Ford, The Writings of Thomas Jefferson, Vol. III, pp. 68 et seq.

[3] G. Brown Goode, Ph. D.: The origin of the National, Scientific and Educational Institutions of the United States. Published by the American Historical Association, Report for 1889.

[4] Mr. Adams's account of both transactions is found in his works, Vol. IV, p. 257, et seq. The passages are quoted by B. A. Hinsdale in the Report of the Commissioner of Education, 1892–93, pp. 1316–1317.

At this distance it is difficult to appreciate the extent of the sympathy that developed in those years between the American and the French minds. Frenchmen saw in the United States a wide field for planting French science, art, and culture. It is scarcely an exaggeration to say that a propaganda was organized, or at least was on the point of organization in France, looking to that end. An account of this move ment in the most definite form that it assumed is one of the most curious chapters in the history of American education.

(3) THE ACADEMY OF SCIENCES AND ARTS OF THE UNITED STATES OF AMERICA.

Chevalier Quesnay de Beaurepaire was a grandson of Quesnay, the founder of the school of the Physiocrats, and court physician of Louis XV. This enthusiastic Frenchman came to the United States to enter as a volunteer the army of liberty, and he actually served until a failure of health compelled him to leave the army. While traveling through the country he conceived the grand idea of introducing into the United States the French culture and fine arts. His primal aim appears to have been to knit the two countries together more closely, or, as he expressed it, "of connecting the United States with my fatherland by new motives of gratitude, of conformity in taste, and of more close communications between the individuals of the two countries." He came forward with a proposition to establish in Richmond, Va., the Academy of Sciences and Fine Arts of the United States of America. The historian who has dealt most fully with the subject says the institution was to be a kind of French academy of the arts and sciences, with branch academies in Baltimore, Philadelphia, and New York. It was to be at once national and international. It was to be affiliated with the royal societies of London, Paris, and Brussels, and with other learned bodies in Europe. It was to consist of a president and vice-president, six counselors, a treasurer-general, a secretary, a recorder, an agent for taking European subscriptions, French professors, masters, artists in chief attached to the academy, and 25 resident and 175 nonresident associates selected from the best talent of both worlds. The following schools of advanced instruction were to be established: Foreign languages, mathematics, design, architecture (civil and military), painting, sculpture, engraving, experimental physics, astronomy, geography, chemistry, mineralogy, botany, anatomy (human and veterinary), and natural history. The professors and other inspectors were to be selected by a committee of correspondents established in Paris. Quesnay was to be founder and president of the Academy and chairman of the Paris committee. The institution was to have its own press and to send out its own publications.

Fantastic as this scheme may now appear, it was seriously regarded by many others than its originator. It commanded the approval of some distinguished men on both sides of the ocean. It was patronized by the French court. Thomas Jefferson lent it his endorsement. Sixty thousand francs in subscriptions were raised in America and large sums were looked for from France. In 1786 the foundation of the building that was to enshrine the mother academy was laid with imposing ceremonies. Two years later Quesnay published his programme in Paris.[1] The building was duly completed, and it is interesting to relate that it received within its walls the State convention that ratified the Federal Constitution. Had not the French Revolution come in the way the Academy would no doubt have been organized and would have run at least a brief career. As it was only one professor was ever appointed, and it is not known that he ever crossed the Atlantic. While it is impossible to suppose that the scheme could have succeeded according to the founder's expectation had there been no revolution in France, one can not help speculating on the results had the Academy once been established and attained to the proportions of a university. The writer

[1] Memoir, Statutes, and Prospectus concerning the Academy of Sciences and Fine Arts of the United States of America, established at Richmond, the capital of Virginia. Presented to their majesties of the royal family by the Chevalier Quesnay de Beaurepaire. At Paris. The printing house of Caileau, Printer of the Academy of Richmond, Rue Galland, No. 64. 1788. 118 pp. 12mo.

to whom I am indebted for the facts that I am using thinks the results might have been serious. He says:

Had Quesnay succeeded it is probable that the University of Virginia would never have been founded; the Academy would have become the center of higher education not only for Virginia but for the whole South, and possibly for a large part of the North. Supported by French capital, strengthened by French prestige, by associations with Paris, then the intellectual capital of the world, the Academy of Richmond might have become an educational stronghold comparable in some degree with the Jesuit influence in Canada, which has proved more lasting than French dominion, more impregnable than the fortress of Quebec. If French ideas had really penetrated Virginian society they would have become as dominant in the South as German ideas are now becoming in the State universities and school systems of the Northwest. French ideas survived in Virginia and in the Carolinas long after the Revolution. It was a difficult task to dislodge French philosophy from its academic strongholds in the Carolinas, and it was done by a Scotch Presbyterianism moving southward from Princeton College. In social forms French culture yet lingers in South Carolina and notably in Charleston.[1]

(4) MR. JEFFERSON AS A PROPAGANDIST OF FRENCH SCIENCE, ARTS, AND EDUCATIONAL IDEAS.

Mr. Jefferson was an enthusiast in all matters pertaining to education. He was a great lover of science and learning himself, and he devoted no little labor to the study of educational systems, organization, institutions, and courses of study. He carried on these investigations assiduously while serving as American minister at Paris. It does not appear that he extended his studies to the North, but rather confined them to the Latin countries. The name "Germany" does not occur in the indexes to the nine-volume edition of his published works. As to the North, however, one exception must be made. Writing to Mr. McAlister in 1791, he said the best school in the world was the University of Edinburgh. On the continent, he said, no other place was comparable to Geneva.[2] At an earlier time, 1785, writing to J. Bannister, he had said the Continental competition lay between Geneva and Rome. At the same time, after enumerating the advantages offered by various schools, he demands: "But why send an American youth to Europe for education." He named the various subjects of contemporaneous study, and then added: "It is true that the habit of speaking the modern languages can not be so well acquired in America; but every other article can be as well acquired at William and Mary College as at any place in Europe."[3]

Such foreign ideas as found their way into the University of Virginia were the ideas of France and the related countries. "The idea of distinct schools of art and science," says Dr. Adams, "which is so prominent a characteristic of the University of Virginia to-day, is the enduring product of Jefferson's observation in the schools of Paris and of his association and correspondence with their representative men."[4]

In 1779 Mr. Jefferson proposed certain changes in the curriculum of his alma mater, the College of William and Mary, which, it has been said, represent the first current of modern ideas which began to flow into American academical life. He proposed a cycle of eight professorships including the northern tongues (Meso-Gothic, Anglo-Saxon, and Old Icelandic) and modern languages. His bill failed in the legislature, but some of his reforms were accepted through the board of visitors.

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[1] These facts in relation to the Richmond Academy have been compiled from Dr. H. B. Adams's monograph, Thomas Jefferson and the University of Virginia, Washington, D. C., 1888. But see Dr. Goode's monograph before mentioned, pp. 101, 102. Writing of Princeton University, Prof. William M. Sloan has said: "It was her arduous labor, moreover, which destroyed the virus of French influence in Southern education, inoculated as it was into Virginia and the Carolinas by Quesnay's scheme of a French Academy and by Jefferson's sympathy. It was likewise through the teaching of her sons that religious toleration was secured in Southern colonies dominated by the English church."—Four American Universities, N. Y., 1893, p. 99.

[2] Works, Vol. II, p. 313 (Washington, 1853).

[3] Ibid., Vol. I, pp. 466, 467.

[4] Thomas Jefferson and the University of Virginia, p. 27.

A professorship of modern languages was established. The Duc de la Rochefoucauld-Liancourt, who visited Virginia in 1795–1797, found the modern languages taught in Williamsburg. At that time, however, the college was in decay.

The faculty of the college of Geneva, Switzerland, much disturbed by the political agitation growing out of the French Revolution, and particularly by its effects upon Geneva, proposed, if suitable encouragement was given, to emigrate in a body to the United States for the purpose of founding an institution of European science. At least one of the professors formally made such an overture both to John Adams and to Thomas Jefferson; it is not known how far the faculty as a whole had been consulted in the matter. The proposition, it will be seen, was to transplant one of the most famous seats of European learning to the new world, so far as this could be done. Mr. Jefferson, who had said that Geneva contested with Rome the first place among the continental universities, looked with favor upon the idea, and sought to interest Washington and the legislature of Virginia in the scheme.[1]

(5) EARLY TEACHING OF FRENCH AT HARVARD COLLEGE.

In 1735 the president and tutors of Harvard College authorized the employment of Mr. Longlossorie, a Frenchman, as instructor in the French language. In a little time the unfortunate instructor was charged with disseminating in the college dangerous errors of religion, and a committee was appointed by the overseers to investigate and report how far these errors had been prosecuted and received. The committee reported that he had freely communicated his errors to the graduates, none of whom, however, had embraced them. So the overseers voted that the permission granted to Mr. Longlossorie was void, because the immediate government had no power to introduce or permit any person to instruct scholars in arts or languages in this society; also, that inasmuch as it was not consistent with the safety of the college that he should continue to teach the French tongue any longer, the president and tutors be instructed to forbid all students, undergraduates and graduates alike, from attending his instructions either within the college walls or elsewhere. And this was the end of instruction in French at Harvard until the time of the Revolution.[2]

In 1780, the very year that saw the establishment of the Academy of Arts and Sciences and the adoption of the constitution of Massachusetts, the corporation and overseers authorized Simon Poulin to teach the French language to such students as their parents or guardians should permit, the tuition fees to be charged in their quarter bills. As the act of the immediate government in the case of Longlossorie had been annulled in 1735, this was the first legal authorization of such instruction in the college. In 1782 Albert Gallatin was authorized to teach French in the college on the same terms that Poulin had enjoyed. In 1797 students excused from the study of Hebrew were required to study French; but in 1800 instruction in French was suspended, students being permitted, on the request of their parents or guardians, to attend extramural instruction in the language at such times as should not interfere with their regular college studies. Nor was instruction in French revived until the establishment of the Smith Chair in 1819.[3]

(6) COLUMBIA, WILLIAMS, AND UNION COLLEGES, AND BROWN UNIVERSITY.

It is said that Columbia College established a chair of French in 1779, Williams College a similar chair in 1793, and Union College one in 1806.[4] It is noteworthy that previous to our great educational revival, which began to declare itself in the decade 1820–1830, the South was much more open to foreign educational influence

[1] B. A. Hinsdale, "Documents Illustrative of American Educational History," chap. 1, pt. 3, vol. 2, Report of the Commissioner of Education, 1892–93, pp. 1300–1302.

[2] Quincy, History of Harvard University, Vol. I, pp. 374, 394, 395.

[3] Ibid., Vol. II, pp. 275, 281.

[4] R. H. Boone, Education in the United States, New York, 1889, p. 171.

than the North. For this there were several reasons. The Southern people had less literature, science, and education of their own than the Northern people, and they had always been more in the habit of resorting to European schools. But foreign influence in that period, if we exclude England, was French influence exclusively.

Among other attempts to turn the French alliance to educational advantage, the one made by Brown University, that now is, should be mentioned. In June, 1784, the chancellor and president, in obedience to the instructions of the corporation, petitioned his most Christian Majesty to assist them to procure a proper collection of the best French authors, and to establish a professorship of the French language and history in the College of Rhode Island and Providence Plantations. The petition was put in the hands of the delegates of the State in Congress, who forwarded it to Mr. Jefferson, then minister of the United States at Paris. It never reached the royal ear, the minister having satisfied himself that it would be refused. He desired, he said in his reply, to spare to both parties the disagreeableness of giving and receiving a denial.[1]

In the order of exercises at the commencement of Brown University, 1788, was an oration in French on the subject, "Letters in general."[2]

(7) FRENCH INFLUENCE ON EDUCATION IN MICHIGAN.

The first attempt to organize education in Michigan savors strongly of French influence. This legislation was enacted by the governor and judges, who constituted the first Territorial legislature, in 1817. The Catholepistemiad, it will be seen, was public education as organized in the Territory or the State, a local university being only one of its constituent parts. No doubt the plan was suggested by the University of France, which dates from 1806–1808. President Angell, commenting upon the act of 1817, has said:

The original plan, which was drawn by Judge Woodward in 1817, was characterized by remarkable breadth, though sketched in language ridiculously pedantic. In the development of our strictly university work, we have yet hardly been able to realize the ideal of the eccentric but gifted man who framed the project of the "Catholepistemiad, or University of Michigania," with its "thirteen didaxiim, or professorships." Even while amusing ourselves at his polyglot vocabulary, we may remember that our statesmen of early days carried on their discussions under classical pseudonyms; that Mr. Jefferson suggested names for the Western States hardly less remarkable than the formidable title with which the university was burdened at its christening, and that the classical dictionary was fairly emptied on the towns of central New York.[3]

Pedantic as this act is, the plan was marked by great breadth of view, much of which has characterized State education, as organized in Michigan, ever since. To quote President Angell again:

In 1821 the governor and judges translated Judge Woodward's charter into modern forms of speech and modified it in some particulars. They gave to the institution the simple name of the University of Michigan. Repealing the act of 1817, they yet retained in the act or charter of 1821 the grant to the university of the power to establish colleges and schools so far as the funds, which were no longer to be furnished by taxation, would permit. The catholicity of this charter of 1821 is shown in this memorable article: "*Be it enacted,* That persons of every religious denomination shall be capable of being elected trustees; nor shall any person, as president, professor, instructor, or pupil, be refused admittance for his conscientious persuasion in matters of religion, provided he demean himself in a proper manner and conform to such rules as may be established."

For a time the university did establish and maintain branch schools in various parts of the State.[4]

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[1] Gould, Manual of Brown University, p. 412.

[2] Gould, Life, Times, and Correspondence of James Manning, and the early History of Brown University, pp. 301, 304.

[3] The Semicentennial Celebration of the Organization of the University of Michigan, 1887. See President Angell's oration.

[4] See The Spirit and Ideals of The University of Michigan, by B. A. Hinsdale, The Educational Review, April and May, 1896.

AN ACT to establish the Catholepistemiad, or University, of Michigania.[1]

Be it enacted by the Governor and the Judges of the Territory of Michigan, That there shall be in the said Territory a catholepistemiad, or university, denominated the Catholepistemiad, or University, of Michigania. The Catholepistemiad, or University, of Michigania shall be composed of thirteen didaxiim or professorships: first, a didaxia, or professorship, of catholepistemia, or universal science, the didactor, or professor, of which shall be president of the institution; second, a didaxia, or professorship, of anthropoglossica, or literature, embracing all the epistemiim or sciences relative to language; third, a didaxia, or professorship, of mathematica, or mathematics; fourth, a didaxia, or professorship, of physiognostica, or natural history; fifth, a didaxia, or professorship, of physiosophica, or natural philosophy; sixth, a didaxia, or professorship, of astronomia, or astronomy; seventh, a didaxia, or professorship, of chymia, or chemistry; eighth, a didaxia, or professorship, of iatrica, or medical sciences; ninth, a didaxia, or professorship, of oeconomica, or economical sciences; tenth, a didaxia, or professorship, of ethica, or ethical sciences; eleventh, a didaxia, or professorship, of polemitactica, or military sciences; twelfth, a didaxia, or professorship, of diegetica, or historical sciences; and, thirteenth, a didaxia, or professorship, of ennoeica, or intellectual sciences, embracing all the epistemiim, or sciences relative to the minds of animals, to the human mind, to spiritual existences, to the Deity, and to religion, the didactor or professor of which shall be vice-president of the institution. The (didactorim or) professors shall be appointed and commissioned by the governor. There shall be paid from the treasury of Michigan, in quarterly payments, to the president of the institution, to the vice-president, and to each didactor or professor, an annual salary to be fixed by law. More than one didaxia or professorship may be conferred upon the same person. The president and didactors or professors, or a majority of them assembled, shall have power to regulate all the concerns of the institution, to enact laws for that purpose, to sue, to be sued, to acquire, hold, and alien property, real, mixed, and personal, to make, to use, and to alter a seal, to provide for and to appoint all such officers and teachers under them as they may deem necessary and expedient, to establish colleges, academies, schools, libraries, museums, atheneums, botanic gardens, laboratories, and other useful literary and scientific institutions consonant to the laws of the United States of America and of Michigan, and to provide for and appoint directors, visitors, curators, librarians, instructors, and instructrixes in, among, and throughout the various counties, cities, towns, townships, or other geographical divisions of Michigan. Their name and style as a corporation shall be, "The Catholepistemiad or University of Michigan." To every subordinate instructor or instructrix appointed by the catholepistemiad or university there shall be paid from the treasury of Michigan, in quarterly payments, an annual salary to be fixed by law. The present public taxes are hereby increased fifteen per cent, and from the proceeds of the present and of all future public taxes fifteen per cent is appropriated for the benefit of the catholepistemiad or university. The treasurer of Michigan shall keep a separate account of the university fund. The catholepistemiad or university may propose and draw four successive lotteries deducting from the prizes in the same fifteen per centum for the benefit of the institution. The proceeds of the preceding sources of revenue, and of all subsequent, shall be applied in the first instance to the procurement of suitable lands and buildings, and to the establishment of a library or libraries, and afterwards to such purposes as shall be by law provided for and required. The honorarium for a course of lectures shall not exceed fifteen dollars; for classical instruction, ten dollars a quarter; for ordinary instruction, six dollars a quarter. If the judges of the court of any county, or a majority of them, shall certify that the parent or guardian of any person has not adequate means to defray the expense of the suitable instruction, and that the same ought to be a public charge, the honorarium shall be paid from the treasury of Michigan. This law, or any part of it, may be repealed by the legislative power for the time being. An annual report of the state, concerns, and transactions of the institution shall be laid before the legislative power for the time being, the same being adopted from the laws of seven of the original States, to wit, the States of Connecticut, Massachusetts, New Jersy, New York, Ohio, Pennsylvania, and Virginia, as far as necessary, and suitable to the circumstances of Michigan.[2]

[1] An exact transcript of the draft in the handwriting of Judge Woodward, now preserved in the university library. Though it bears on its back the date "Nov. 7, 1817," it appears to be the original of the act adopted by the governor and judges of the Territory August 26, 1817. Superintendent Shearman printed the act as adopted, from the executive records of Michigan, at pages 4 and 5 of his System of Public Instruction and Primary School Law of Michigan (Lansing, 1852), but apparently with many errors of transcription.

[2] The curious formula with which this act closes has a history. The Ordinance of 1787, in accordance with which Michigan was governed, did not confer upon the governor and judges power to enact original laws, but only power to adopt and publish such laws of the original States, criminal and civil, as might be necessary and best suited to the circumstances of the Territory, etc. Sometimes, however, the law-making power could not find laws that suited the circumstances of the Territory among the laws of the origi-

A table of the professorships of a university, constructed on the principles of the epistemic system.

I.—The nearest familiar and elegant names, adapted to the English language.	II.—The epistemic names, which may be engrafted without variation into every modern language.	III.—The number of the particular sciences comprehended in the several professorships.
I. Literature	I. Anthropoglossica	8
II. Mathematics	II. Mathematica	5
III. Natural history	III. Physiognostica	4
IV. Natural philosophy	IV. Physiosophica	6
V. Astronomy	V. Astronomia	1
VI. Chemistry	VI. Chymia	1
VII. The medical sciences	VII. Iätrica	8
VIII. The economical sciences	VIII. Oeconomica	5
IX. The ethical sciences	IX. Ethica	4
X. The military sciences	X. Polemitactica	8
XI. The historical sciences	XI. Diegetica	6
XII. The intellectual sciences	XII. Ennoeica	7
XIII. Universal science	XIII. Catholepistemia	63

AN ACT to fix the annual salaries of the president, vice-president, professors, instructors, and instructrices of the university.

Be it enacted by the governor and the judges of the Territory of Michigan, That the annual salary of the president of the university shall be, for the present, twenty-five dollars; of the vice-president, eighteen dollars and seventy-five cents; of each professor, twelve dollars and fifty cents, and of each instructor or instructrice, twenty-five dollars. The same, and so forth, New York.

AN ACT making a certain appropriation.

Be it enacted, and so forth, That for the payment of the annual salaries of the president and professors of the university there be appropriated from the university fund a sum not exceeding one hundred and ninety-three dollars and seventy-five cents. The same, and so forth, two Kentucky and Pennsylvania.

For instructors, two hundred.

A table of certain auxiliary terms.

I.—The nearest English names.	II.—The epistemic names.
1. A science	1. An epistemia.
2. Sciences	2. Epistemiim.
3. A university	3. Catholepistemiad.
4. A professorship	4. Didaxia.
5. A professor	5. Didactor.
6. Professorships	6. Didaxiim.
7. The compensation for instruction	7. Honorarium.
8. The vice-president of a university	8. Didactor of ennoeica.
9. The president of a university	9. Didactor of catholepistemia.

This legislation may seem curious rather than important. Still, it is more than curious. The highest legal tribunal in the State has decided that the University of Michigan has a continuous corporate existence from this early date. Still more, this legislation no doubt familiarized the people of Michigan with the conception of a system of public instruction carried on by the State. Its influence may be seen, too, in the establishment at a later date of the so-called "branches" of the university (nine in number) in various parts of the State, which were the originals of the Michigan high schools. Strictly speaking, however, the University of Michigan dates from 1837, when the State came into the Union. By that time German influence was

nal States, and so was driven (as it thought, at least) to enact original laws. In such cases the law referred, in a loose kind of way as above, to the State or States from which ostensibly it was borrowed. This fiction answered all the purposes of legislation, unless Congress interfered by setting the law aside. The governor and judges were required to report to Congress from time to time the laws that they adopted and published.

beginning to be distinctly felt by American schools and institutions of learning, and the Michigan system of public instruction was avowedly based on the Prussian ideas, viz, a system of public instruction, embracing the three divisions of primary, secondary, and higher education, supported and supervised by the State.[1]

Frenchmen bore a considerable part in the early scientific work undertaken and directed by the Government. Thus the National Capital was laid out by a French engineer. And in general it may be said that, although the French mind did not long maintain the relative influence upon the country that it exercised at the close of the Revolutionary war, it has continued to exert a steady influence, and particularly upon certain branches of science. What it has done in the field of mathematical education has been well shown by Prof. Florian Cajori in his chapter entitled "The influence of French mathematics."[2]

III. GERMAN INFLUENCE.

The establishment of contact between the mind and culture of Germany and the mind and culture of the United States, in the first half of this century, has proved to be an important factor in our intellectual, and particulary in our educational, history. In the future the importance of this factor is likely to become even more manifest than it is at present. The time to measure the quantity and the quality of German influence upon our culture has not come, even if the man were at hand; but there are facts entering into the history which have a present interest and value. However, before presenting some of these facts it will be well to take a hurried glance at the introduction of German studies into the other great English-speaking countries.

ENGLAND AND GERMANY.

Professor Brandl, of the University of Strassburg, is authority for the statement that Gessner's Idyls were the first offspring of the German muse which, under the house of Hanover, found a welcome in England. That was in 1760–1769. In that period Werther made its appearance and marks the second step. Previous to this time, says Professor Brandl, Englishmen had learned German, when they did learn it at all, only for commercial and business purposes. The third step was taken by Schiller in his early dramas. William Taylor, of Norwich, a man well known to readers of Carlyle,[3] visited Weimar between 1780 and 1787, and made his countrymen acquainted with the sound of Goethe's verse. Taylor translated Iphigenia and was the pioneer in this field in England. Between 1790 and 1799 he was followed by Monk Lewis, as he was called, who visited Germany in quest of ghost literature for the delectation of his countrymen. Wordsworth, his sister Dorothy, and Coleridge went to Germany in the winter of 1798. The Wordsworths hoped to perfect themselves in the German language, but formed no acquaintances and learned nothing, except what they acquired by reading German books alone by themselves. They remained but a few months, which they spent mainly at Gosslar. Coleridge spent several years in the country, and was profoundly affected by the German learning and philosophy as well as the German literature. Coleridge, however, first read The Robbers in translation.[4]

Robert Southey, who, Professor Dowden says, lived in and for literature more than any other man in his generation, became acquainted with some of the romantic German poets in translations while he was in Westminster School, 1788–1792.[5] He

[1] B. A. Hinsdale. "The Spirit and Ideals of the University of Michigan;" The Educational Review, Vol. XI, pp. 356, 476.

[2] The Teaching and History of Mathematics in the United States. Washington, D. C., 1890, pp. 275.

[3] The reference is to Carlyle's well-known essay, Historic Survey of German Poetry, Edinburgh Review No. 105. Historic Survey of German Poetry, interspersed with various translations, by W. Taylor, of Norwich. 3 vols., 8vo. London, 1830.

[4] Samuel Taylor Coleridge and the English Romantic School. London, passim.

[5] Southey, by Edward Dowden, in English Men of Letters. New York, 1880, passim.

continued his readings in translations, and finally acquired the language. He met William Taylor at Norwich in 1798.

In his essay On Imitation of the Ancient Ballad, written in 1830, prefixed to the edition of his Poetical Works which appeared in that year,[1] Sir Walter Scott gives an interesting account not merely of the origin of his own studies of German literature, but of the introduction of German literature into Scotland. The date is the year 1788. The agent was Henry Mackenzie, author of The Man of Feeling. Scott's first translations from the German to be published appeared in 1795. It will be seen hereafter that German literature began to make itself felt and appreciated in England about a generation before it did in the United States.

Dr. F. H. Hedge, illustrating his own remark that "the English were slow to recognize the merits of German writers, when at last it was understood that Germany had writers and a literature of her own," says:

The Germans were confounded with the people of Holland. The name Dutch was applied indiscriminately to the countrymen of Hermann, of the Minnesingers, of Luther, of Gutenberg, and to the dwellers on the Wall and the Scheldt. The Elder Disraeli, in his Curiosities of Literature,[2] has an essay entitled, Literary Dutch, in which he speaks of Germans and Hollanders as one and the same people, using the same language. He is not aware of any distinction between them. Vondel, a Dutchman of the sixteenth century, and Schubart, a German of the eighteenth century, are adduced as illustrations of the same literature. He writes with a show of candor, but concludes that, on the whole, the question of Father Bouhours whether a German can have wit had not been answered. And this was subsequent to the death of Lessing.

He cites the fact that a writer in The Edinburgh Review for October, 1825, used the most contemptuous language in speaking of Carlyle's translation of Wilhelm Meister in particular, and of German literature in general, and then adds:

Three years had not elapsed after this tirade when Thomas Carlyle published in the same journal his triumphant vindication of German literature, which marked an epoch in the history of English opinion on that subject.[3]

DR. FRANKLIN AT GÖTTINGEN.

As far as I have been able to discover, Dr. Franklin was the first American, properly so called, to investigate, or even visit, a German university. This visit was made to Göttingen in August, 1766 Lessing, we happen to know, was there at the same time. It is rather surprising to find that the man who is the best embodiment of the practical spirit of American philosophy should have been the first American to show an interest in the higher education of the land of abstract thought and science. It is surprising also to find that nearly all the facts which we possess relating to the visit are found in German authorities. In truth, I have never been able to find the slightest allusion to the visit either in Franklin's correspondence or in the leading biographies of him that have been published, although I have reason to think that some slight allusions are to be found in these sources.

For some years I had been collecting items in regard to this interesting event in Franklin's life, but, before I had finished, Dr. E. J. James, then of the University of Pennsylvania, now of Chicago, published the results of a very thorough research that he had made, thus rendering further inquiry useless. His article is of such interest, whether looked at from the American or the German point of view, that I shall venture to reproduce it in full.[4]

DR. FRANKLIN'S VISIT TO GERMANY.

Benjamin Franklin paid a visit to Germany in the year 1766, which appears to have been almost entirely neglected by his biographers, and yet it is of interest

[1] See also J. D. Lockhart, Life of Scott, vol. 1, p. 234; William Minto, Literature of the Georgian Era, pp. 204, 205.

[2] The first volume of this work appeared in 1791.

[3] Hours with German Classics. Boston, 1887, pp. 2, 3, 4.

[4] This article was first published in the Evening Post (N. Y.). The date has been lost.

from many points of view. In a letter to his wife, dated London, June 13, 1766 (printed in Sparks's Works of Franklin, Vol. VII, p. 320), he wrote: "To-morrow I set out with my friend Dr. Pringle (now Sir John) on a journey to Pyrmont, where he goes to drink the waters. * * * We must be back at farthest in eight weeks. * * * I propose to leave him in Pyrmont and visit some of the principal cities nearest to it, and call for him again when the time for our return draws nigh." That he actually went to the baths with Pringle we have satisfactory evidence in the Pyrmont Brunnenarchiv, published in Berlin in 1782, which contains a list of the guests at Pyrmont from 1752, and which, under the year 1766, contains the entry: "Leibmedicus Ritter Pringle aus London und Dr. Franklin aus Pennsylvanien, kommt aus London."

Very few references to this trip occur in his correspondence or elsewhere. It was in the midst of a very exciting period of Franklin's life, which may account for the fact that he makes such small mention of the journey himself; but the few times he mentions it he certainly shows that he enjoyed it very much, and there is various evidence from German sources pointing to the fact that his visit was regarded as a very important and interesting event in the annals of Göttingen.

The exact date of Franklin's visit to Göttingen is fortunately preserved for us in the reports of the Göttingen Academy of Sciences. In the one hundred and tenth issue of the Göttingen Anzeiger, bearing date of September 13, 1766, the statement is made that the session of the Royal Society of Sciences held on the 19th of the preceding July was more impressive than usual. "The two famous English scholars, the royal physician, Mr. Pringle, and Mr. Benjamin Franklin, from Pennsylvania, who happened to be at that time in Göttingen on a trip through Germany, took their seats as members of the society." The same periodical, in its issue of September 27, 1766, says that Pringle and Franklin visited Mr. Hartmann in Hanover in order to see his apparatus for strong electrical experiments. Sir John Pringle, in a letter dated London, September 6, 1766, to Professor Michaelis of Göttingen, thanks him for the courtesies which he and Dr. Franklin had received from him on occasion of their visit to that city. In a letter dated June 2, 1769, to the same gentleman, Pringle apologizes to him for some extraordinary statements which Franklin had made during their conversation in Göttingen in 1766 in regard to the enormous size of the Patagonians, explaining that he had been misled by the reports of sailors.

During this visit at Göttingen Professor Achenwall held a conversation with Franklin on the condition of the American colonies. He wrote out careful notes of this interview and published them subsequently in the Hannoversches Magazin, in the seventeenth, eighteenth, nineteenth, thirty-first, and thirty-second issues, the first bearing date of February 27, 1767, and the last April 20, 1767, under the title of "Some remarks upon North America and the colonies of Great Britain in that continent, from a personal interview with Dr. Franklin." He remarks in his closing note that he found Dr. Franklin very willing indeed to answer all his questions, and not only that, but to go much further and give him all the information he could in regard to matters in the New World. He also calls attention to the fact, in this footnote, that when the British colonies felt themselves aggrieved by the stamp act they showed almost exactly the same temper and mode of thought as the Corcyreans displayed toward their mother country, Corinth, on a somewhat similar occasion. (See Thucydides, I, 34, etc.)

The report of this interview with Dr. Franklin was republished subsequently in various forms: In Koehler's (J. T.) Sammlung neuer Reisebeschreibungen aus fremden Sprachen, Göttingen and Gotha, 1767–1769; also a separate edition entitled Herrn Hofrath Achenwalls in Göttingen Anmerkungen über Nord-Amerika und über dasige grossbritannische Colonien aus mündlichen Nachrichten des Herrn Dr. Franklin, Frankfort and Leipsic, 1769; also at Helmstedt in 1777. The latter edition was accompanied by an appendix consisting of a translation of John Wesley's address to his brethren and countrymen in the American colonies. There seems to have been also a Dutch translation of this interview published at Utrecht in 1778.

The book attracted considerable attention, to judge from these frequent reprints; though, so far as I am able to learn, no mention of it is made by any of Franklin's biographers or bibliographers, with one exception, and he evidently knew nothing beyond its bare title. Mr. Paul Leicester Ford, in his Franklin Bibliography (a most valuable work, by the way) mentions it, but confuses it with a supposed translation of The Examination in Parliament, published by Almon in London in 1766. He says in the Bibliography (page 133), under the title of "Examination in Parliament," that this work was reprinted several times in German, and gives the three titles which are cited above. It is evident that Mr. Ford had never seen any one of these pamphlets, or he could not have fallen into such a serious mistake. Not only do the pamphlets above mentioned treat of an entirely different subject, but they had no relation whatever to the Examination in Parliament, nor, so far as I have been able to ascertain, is any mention made in any one of them of the fact that Dr. Franklin had been examined before Parliament. The Frankfort and Leipsic edition

of 1769 is in the Philadelphia library; the Koehler edition is reported by Sabin to be in the Harvard College library, and the Helmstedt edition, he states, is in the Massachusetts Historical Society's library. Copies of the Koehler edition and of the Helmstedt edition are to be found in the British Museum, and the Leipsic edition of 1769 is also in the British Museum catalogue, but the attendants were unable to find it when I called for it.

A copy in the Philadelphia library contains 94 pages, 12mo, and discusses various topics relating to the British colonies. The style of composition bears out the statement of the author that it is essentially a series of answers to questions which he propounded in regard to the Indians, to the products of the country, its agriculture, manufactures and commerce, education, government, monetary and tax systems, law of succession, system of land-holding, slavery, redemptioners, religion, towns and cities, etc. The account of the paper money issued in Pennsylvania would of itself be ample evidence that this pamphlet rested upon statements of Franklin, as the account is very similar to that which he gives in other places.

Koehler, in his edition, evidently regards it as very necessary to correct some of Dr. Franklin's statements about the colonies on the basis of Meyer Robert's account of his travels in America, and he adds a number of footnotes which are interesting, as he plainly makes the attempt to discredit Franklin's testimony. He accuses Franklin of great carelessness in his statements to Professor Achenwall and unfairness toward other colonies than Pennsylvania. He states, for example, that Franklin had said that a college had been established in Boston when every one knew that it was at Cambridge, 6 miles from Boston. Franklin spoke, moreover, of the educational institutions of Pennsylvania as though they were the only ones in the colonies, whereas many other colonies had just as good and probably better—notably, Massachusetts, Connecticut, New York, and New Jersey. Franklin speaks of the colonists paying tribute to the Iroquois Indians in the shape of gifts; Koehler remarks that this is true probably only of the Pennsylvanians—"mostly Quakers, whom their religion makes cowards."

In speaking of the difficulties in Pennsylvania between the government and the colonists, which Franklin had described in some detail, Koehler says: "The Pennsylvanians are a 'sort of little rebels' who are violating in a criminal way the rights and dignities of their indisputable superiors, as well as the laws of nations; these people have become insolent through their too quickly acquired wealth, and deserve the severest punishment, because they give other subjects a bad example." He is not even satisfied with Franklin's description of how bear-roast is prepared in Pennsylvania; for, although he can not deny that Franklin's description is true, still he says they do this much better in Poland, where they boil the claws in burgundy, and thus make a most savory morsel.

In this interview with Achenwall, Franklin claims the credit for the establishment of the college in Philadelphia in 1749 (now the University of Pennsylvania). He declared, among other things, that the stories of the wealth of Mexico and its civilization were all a myth. "The Indians," he declared, "were barbarians. How could they build such cities as the Spaniards described?"

More than a year after his return to England, Dr. Franklin received a letter from Johann Friedrich Hartmann, dated the Calends of October, 1767, in which the writer says that he shall always remember the time when he was privileged to talk with Franklin, on the occasion of his visit to Hanover. He also states that the Prince of Schwarzburg-Rudolstadt had sent a special messenger to Göttingen to salute Franklin; but the messenger got to Göttingen the very day Franklin left and too late to see him (printed in Sparks, Vol. VII, p. 326). This Hartmann was a very prominent physician in Hanover, head of the royal hospital, and well known to scholars of that day for his interest in electrical investigations.

A further reference to this visit of Franklin's to Göttingen is found in Johann Stephan Pütter's Selbstbiographie (2 vols., Göttingen, 1798, pp. 490 and 491). Pütter there mentions the pleasure which he derived from a visit of the famous Franklin and his equally famous English companion, Dr. Pringle, then president of the Royal Academy of Sciences at London. He says that Franklin was at that time working on the plan of the establishment of an American university at Philadelphia, and that was one of the reasons which led to his visit to Göttingen. Although he was not able to speak German, he seemed to be glad to get a copy of Pütter's History of the University, and he talked with him and others about its contents. "I had the pleasure," Pütter remarks, "of having these gentlemen at my house one afternoon and evening, in company with other scholars, in Göttingen. My friend Achenwall utilized this opportunity to get exact information from my guest as to the condition of the American colonies and their relation to the mother country. He subsequently published a part of this information in the Hannoversches Magazin. What Franklin said at that time could almost be regarded as the exact prophecy of the events which afterwards took place in that quarter of the world."

In the Autobiography of Professor Michaelis, published at Leipsic in 1793, he mentions having met Franklin in the summer of 1766; and he also gives us an account of

what he calls an important conversation that he held with Franklin on one occasion at table:

"As he was dining at my house, we talked much about America, about the Indians, the rapid growth of the English colonies, their population, their doubling in twenty-five years, etc., and I remarked that when I was in London in 1741 I had taken occasion to study pretty carefully the condition of these colonies from English books and reports, and I had come to the conclusion, which I expressed at that time to various people, that the colonies would ere long become independent. They laughed at me at that time; but I said I was of the same opinion still. Franklin thereupon answered, with his earnest, significant, and shrewd expression, that I was entirely mistaken; the Americans had a great love for their mother country. I replied, that might be so, but the mighty sweep of interest would soon work very strong and outweigh or destroy the love for the mother country. He could not deny that this might be true, but he said their revolt would still be impossible, for every important place in the colonies, including Boston, New York, and Philadelphia, lay exposed to the English fleets. Boston could easily be destroyed by a bombardment. To this, of course, I could not reply. I did not think, at the time, that I was talking with a man who a few years later was destined to play such a prominent part in the fulfillment of my prophecies. When the disturbances actually broke out, I watched with great interest for the beginning of the bombardment of Boston, but things took an entirely different course."

The editor of the Autobiography of Michaelis remarks in a footnote that he had had the opportunity, as a student at Göttingen, of seeing Franklin and Pringle, who had dropped into the Göttingen library, and that they had pleased him much better than the famous Lessing, who was also stopping at that time in Göttingen. "These Englishmen, who are ordinarily reputed to be very distant in their manners, were exceedingly pleasant and condescending; Lessing, on the contrary, was distant and contemptuous."

One of the authorities who mention the visit thinks it of importance to record that at dinner Franklin kept his spectacles on. Statues of both Washington and Franklin are to-day shown in the library of Göttingen.

Franklin's part in the founding of the institution at Philadelphia, which at different times has been known as an academy, a college, and a university, is well known. But I have sought in vain for any evidence in the history of this university, or in lives of Franklin, that it shows any trace of German influence that can be attributed to this period. Prof. F. N. Thorpe's well-known work[1] is one of those that I have examined for the purpose of discovering whether the visit to Göttingen bore fruit, but in vain.

If the question why Franklin went to Göttingen rather than to some older university arises, it will be remembered that Göttingen was in Hanover; that George II had founded the university in 1737, and that the King of England was still the Elector of Hanover in 1766. So slight was the knowledge of German universities outside of Germany in those days that Englishmen as well as Americans knew next to nothing about them. Even at the later day, when Canning wrote his humorous poem, it may well be doubted whether Göttingen was anything more than a name to him.

BENJAMIN SMITH BARTON.

As far as my inquiries have led, Benjamin Smith Barton, physician, born in Lancaster, Pa., February 10, 1766, died in Philadelphia December 19, 1815, has the honor of being the first American student to take a degree from a German university. After studying medicine at York, in his native State, Dr. Barton continued his studies for a time at Philadelphia College, now the University of Pennsylvania. In 1786–1788 he studied medicine and natural science in Edinburgh and London, and then went to the University of Göttingen, where he took his doctor's degree in 1799. On his return to his native country, Dr. Barton held important positions in Philadelphia. He was the author of numerous scientific papers and works. The history of his going to Göttingen—the causes that drew him there—I have not been able to discover.[2]

[1] Benjamin Franklin and the University of Pennsylvania. Washington, 1893.

[2] This brief sketch of Dr. Barton has been abridged from the somewhat longer account found in Appleton's Cyclopædia of American Biography, vol. 1, p. 188.

GEORGE TICKNOR AT GÖTTINGEN.

The first American who went to a German university for the purpose of study and who has left us an account of his going, was Mr. George Ticknor. Mr. Ticknor was born in Boston, was educated at Dartmouth College, and was bred to the law. But, his tastes leading him to letters rather than to the bar, it was finally settled between himself and his father, after consultation with friends, that he should go to Europe and study for two or three years. It appears to have been accepted almost as a matter of course that, if he would be a scholar indeed, he must resort to the larger libraries, to the abler teachers, and the better universities of the Old World. He says:

I therefore gave up my office and turned all my attention and effort to learning what I could of the German language and German universities, to which my thoughts and wishes had been already turned as the best places for information.

The following paragraphs from an autobiographical sketch cause us as much astonishment now as the revelations made to him caused Mr. Ticknor in 1814:

The first intimation I ever had on the subject was from Mme. de Staël's work on Germany, then just published. My next came from a pamphlet, published by Villers, to defend the University of Göttingen from the ill intentions of Jerome Bonaparte, the King of Westphalia, in which he gave a sketch of the university and its courses of study. My astonishment at these revelations was increased by an account of its library, given by an Englishman who had been at Göttingen, to my friend, the Rev. Samuel C. Thacher. I was sure that I should like to study at such a university, but it was in vain that I endeavored to get further knowledge upon the subject. I would gladly have prepared for it by learning the language I should have to use there, but there was no one in Boston who could teach me.

At Jamaica Plain there was a Dr. Brosius, a native of Strasburg, who gave instruction in mathematics. He was willing to do what he could for me in German, but he warned me that his pronunciation was very bad, as was that of all Alsace, which had become a part of France. Nor was it possible to get books. I borrowed a Meidinger's Grammar, French and German, from my friend Mr. Everett, and sent to New Hampshire, where I knew there was a German dictionary, and procured it. I also obtained a copy of Goethe's Werther in German (through Mr. William S. Shaw's connivance) from among Mr. J. Q. Adams's books, deposited by him on going to Europe in the Athenæum, under Mr. Shaw's care, but without giving him permission to lend them. I got so far as to write a translation of Werther, but no further.[1]

The editor of the Life, Letters, and Journals of George Ticknor very justly remarks that the literary poverty of this country at that time can not be better illustrated than by the foregoing facts. Still, we must not give them an exaggerated relative value. The literary facilities of the country, as a whole, were then small indeed. "Possibly a few Bostonians," says Mr. Henry Adams, "could read and speak French; but Germany was nearly as unknown as China until Mme. de Staël published her famous work in 1814." "George Ticknor," he says, "discovered in that work a new world." Mr. Adams tells us, moreover, that a copy of Euripides in the original could not be bought at any bookseller's shop in New England. Pope, Addison, Beattie, and Young were the reigning poets; Burns was accepted by a few, and copies of a volume were advertised by booksellers written by a new poet called Wordsworth. Ticknor's editor informs us that in Boston Johnson was the favorite writer in prose and Pope in verse. Hervey's Meditations and Zimmermann on Solitude were popular books, and the glittering monotony of Darwin found admirers and imitators. Noah Webster, a man equally at home in Philadelphia, New York,

[1] Life, Letters, and Journals of George Ticknor, vol. 1, pp. 11, 12, 18, 19. "In the course of his journey [from Boston to Washington and Virginia in 1814–15] Mr. Ticknor met at dinner, and I believe sat next to Mr. W. B. Astor, who, having recently returned home after a long residence in Germany, could have given him most valuable information as to its universities and teachers. But, unluckily, Mr. Ticknor was not aware of the fact, and the conversation did not take such a turn as to open the subject; and so the opportunity passed by unimproved, to his great regret when he learned what he had lost." (Ibid, Vol. I, p. 26, *note.*) W. B. Astor studied at Heidelberg two years and then went to Göttingen in 1810, where he had as a tutor Chevalier Bunsen, then a student at Göttingen. J. J. Astor entered in the list below is no doubt an error.

and Boston, called the classical learning, history, chemistry, botany, and natural history that prevailed, excepting here and there a man eminent in some one of these branches—"a mere smattering." "As to libraries," he wrote, "we have no such things. There are not more than three or four tolerable libraries in America, and these are extremely imperfect. Great numbers of the most valuable authors have not found their way across the Atlantic." It is evident that in history we are much further away from those times than we are in years.[1]

Apparently, Mr. Ticknor must have learned more about Göttingen from Villers and his friend Thacher than from Madame de Staël. "Germany," the latter said, "not merely proposes to open to France new sources of poetry," but "endeavors to apply to a great nation the doctrine of progress;" or, as the same writer expresses it in another place: "The whole work is governed by a plan which is to make Germany known to the French; to explain it to them, and, by contrast, to explain France to the Germans, and make them admire her more; to reinvigorate French literature, to enlarge the horizon, and to open to poetry new avenues to new sources."[2] After the French manner, Madame de Staël tends to ideas rather than to positive information. The chapter "Of the German universities" is meager enough in respect to real knowledge, but rich in general views, which, however, relate but little to the specific subject in hand. Göttingen is mentioned in a single sentence in connection with Halle and Jena. The prevalence of the philosophic spirit, the strength of the speculative habit, the want of energy in the national character, are more inviting topics to the writer than more practical subjects. Several pages are devoted to the educational value of the study of languages, mathematics, grammar, and of attempts to convey instruction in the guise of amusement. Still we get some positive information. "All the north of Germany is filled with the most learned universities in Europe. In no country, not even in England, have the people so many means of instructing themselves and of bringing their faculties to perfection." The antiquity of the universities is remarked, and the superiority of the Protestant ones asserted. "The literary glory of Germany depends altogether upon these institutions." A few words are given to the regimen and spirit. "The rich and poor scholars were distinguished from each other only by personal merit, and the strangers who repaired from all parts of the world submitted themselves with pleasure to an equality which natural superiority alone could disturb." "In every German university several professors concurred together in each individual branch of instruction. Thus the masters themselves imbibed a principle of emulation from the interest which they felt in attaining a superiority over each other in the number of scholars they attracted." This led to "the universality of acquirements which is to be remarked in almost all the well-informed men of Germany." The writer thinks

[1] Henry Adams, History of the United States, Vol. I, pp. 62, 63, 94. The state of liberal learning in New England is in good part illustrated by Mr. Adams's account of its foremost university. "On an average of ten years, from 1790 to 1800, 39 young men annually took degrees from Harvard College, while during the ten years, 1766–1776, that preceded the Revolutionary war 43 bachelors of arts had been annually sent into the world, and even in 1720–1730 the average number had been 35. The only sign of change was that in 1720–1730 about 140 graduates had gone into the church, while in 1790–1800 only about 80 chose this career. At the earlier period the president, a professor of theology, one of mathematics, and four tutors gave instruction to the undergraduates. In 1800 the president, the professor of theology, the professor of mathematics, and a professor of Hebrew, created in 1765, with the four tutors, did the same work. The method of instruction had not changed in the interval, being suited to children 14 years of age. The instruction itself was poor and the discipline was indifferent. Harvard College had not in eighty years made as much progress as was afterwards made in twenty. Life was quickening within it as within all mankind; the spirit and vivacity of the coming age could not be wholly shut out; but none the less the college resembled a priesthood which had lost the secret of its mysteries, and patiently stood holding the flickering torch before cold altars until God should vouchsafe a new dispensation of sunlight." (P. 77.) For George Ticknor's efforts for reform in Harvard College see his Life, Letters, and Journals, Vol. I, chap. 17, and his Remarks on Changes lately proposed or adopted at Harvard College. Boston, 1825.

[2] Sorel, Madame de Staël, pp. 167, 202.

that the excellence of scholarship is due largely to the study of languages. This is the close of the chapter, which, perhaps, was as well calculated to impress the mind of an aspiring young scholar like Mr. Ticknor as any part of it:

The impartiality which is natural to the spirit of the Germans leads them to take an interest in the literature of foreign countries, and we find few men a little elevated above the common herd who are not familiar with several languages. On leaving school they are in general already well acquainted with Latin and even with Greek. The education of the German universities, says a French writer, begins where that of most nations in Europe ends. Not only the professors are men of astonishing information, but what distinguishes them above all things is their extreme scrupulousness in the art of instruction. In Germany men have a conscience in everything, and there is nothing that can dispense with it. If we examine the course of human destiny we shall see that levity of disposition may lead to everything that is bad in the world. It is only in childhood that levity has a charm; it seems as if the Creator still led the child by the hand, and assisted him to tread gently over the clouds of life, but when time abandons man to himself it is only in the seriousness of his soul that he can find reflection, sentiment, and virtue.[1]

Names of American students in Göttingen, 1789–1851.

[Copied from the Colony Book.]

Year.	Semester.	Name.	Home.	Faculty.[a]
1789		Benj. Smith Barton	Philadelphia	Med.
1812–1814		J. J. Astor	Not given	Not given.
		Edward Everett	Amerika, 11, viii, 1815 *b*	Phil.
1815–16	M–O	Ticknor	do	Jur.
1816	O–M	Everett		
		Ticknor		
1816–17	M–O	Everett		
		Ticknor		
		Thorndicke	Amerika, 1816	Phil.
1817	O–M	Everett		
		Thorndicke		
1817–18	M–O	None		
1818	O–M	do		
1818–19	M–O	George Bancroft	Amerika	Theol. *c*
1819	O–M	Bancroft		
		Patten	Amerika	Phil.
1819–20	M–O	Bancroft		
		Patten		
1820	O–M	Bancroft		
		Patten		
1820		None		
1821				
1822				
1823	M–O			
1824				
1824	O–M	G. H. Calvert	Amerika, 3, ii, 1824	Philos.
		Emerson	Amerika, 10, v, 1824	Theol.
1824–25	M–O	do		
		Calvert		
		Clark	Amerika, 25, x, 1824	Philos.
1825	O–M	Calvert		
		Clark		
1825–26	M–O	Kirkland	Amerika, 25, x, 25	Philos.
1826	O–M	do	Amerika	Philos.
		Cunningham	Amerika, 15, xii, 25	Philos.
		Amory	Amerika, 28, x, 25	Philos.
		Amory (2)	Amerika	Philos.
		Reis	Amerika, 15, iv, 26	Med.
		Clark		
1826–27	M–O	Kirkland		
		Amory		
		do		
		Reis		
1827	O–M	Amory		
		do		
		Reis		

a The Colony Book has an additional rubric giving the address in Göttingen, but I have omitted that as irrelevant.

b The date of initiation, I take it.

c This is probably an error, as Bancroft took Ph. D. here in 1820.

[1] The first French edition of On Germany was destroyed by the order of Napoleon's Government. The work was first brought out in translation by John Murray, in London, in 1813.

Names of American students in Göttingen, 1789–1851—Continued.

Year.	Semester.	Name	Home.	Faculty.
1827–28	M-O	Amory		
		Reis		
1828	O-M	Amory		
1828–29	M-O	do		
		Preble	Amerika, 26, vi, 28	Phil.
		Richmond	Amerika, 30, viii, 28	Theol.
1829	O-M	Preble		
		H. W. Longfellow	Amerika, 26, v, 29	Schöne Wissenschaft.
1829–30	M-O	Amory		Med.
		Do		Med.
1830	O-M	Dorr	Amerika, 26, ix, 29	Theol
		Haven	Amerika, 12, xi, 29	Phil.
		Harrison	Amerika, 14, xi, 29	Phil.
		Amory		Med.
		Coffin		Theol.
1830–31	M-O	Same as previous semester.		
1831	O-M	None		
1831–32	M-O	W. E. King	Charlestown *a*	Jur.
		M. C. King	do	Med.
1832	O-M	do		Med.
1832–33	M-O	do		
1833	O-M	Motley-J. Lothrop	Boston	Jur.
		M. C. King		
		C. Boehm	Baltimore	Med.
1833–34	M-O	do		
		W. Wadham	Goshen	Philos
1834	O-M	do		
		C. Boehm		
1834–35	M-O	do		
		W. Wadham		
1835	O-M	do		
		C. D. L. Brush	Vergennes	Jur.
1835–36	M-O	C. Boehm		
		C. D. L. Brush		
		H. Lindeman	Washita	Jur.
1836	O-M	do		
		C. D. L. Brush		
1836–37	M-O	H. Lindeman		
		A. Walker	Baltimore	Schöne Wissenschaft.
1837	O-M	H. Lindeman		
		A. Walker		Belles-lettres.
1837–38	M-O	Same as previous		
1840	M	None		
1840–41	M-O	C. Burton	Pittsburg	Philos.
		L. Stephens	Plymouth	Philos.
1841	O-M	do	do	
		Burton		
1841–42	M-O	E. B. Baltzel	Baltimore	Philos.
		Burton		
		Stephens		
1842	O-M	A. Litton	Nashville	Philos.
1842–43	M-O	do		
		Burton		
		Stephens		
		J. E. Cabot	Boston	Philos.
1843–47	O-M	None		
		B.A. Gould, Mar., 1847–May, 1848.	Albany	Not given.
1847–48	M-O	G. M. Lane	Cambridge	Philog.
1848	O-M	do		
		G. W. Dingle	Charleston, S. C	Law.
1848–49	M-O	J. D. M. Lieber	Columbia	Phil.
1849	O-M	do		
		Lane		
		Dingle		
1849–50	M-O	Dingle		
1850	O-M	None		
1850–51	M-O	Dingle		
1851	O-M	W. D. B. Dingle	Charleston, S. C	Law.
		F. J. Child	Boston	Philog.
		W. S. Clark	East Hampton	Philos.
		S. Lord	Charleston	Law.
		N. S. Mauross	Bristol	Philos.
		D. Ramsay	Charleston	Law.
		G. M. Lane *b*		

a Supposed to be Charleston.

b From here on the list becomes much larger in each semester, and after 1852 the Patriarchs' reports give additional information. Here one finds the names of very many American professors—i. e., professors in after years.

Names of students from the United States registered at the University of Halle previous to the year 1850.

Name.	Year.	Residence.	Faculty.
Franzis Cunningham	1826	Boston	Philology.
Do	1826-27	do	Do.
Washington Müller	1832	Charlestown	Theology.
Elisha Ballantine	1834	New York	Do.
Henry Boynton Smith	1838	Portland	Do.
George L. Prentiss	1839	do	Do.
Do	1840	do	Do.
Horatio Balch Hackett	1841	Boston	Do.
John Larkin Lincoln	1842	do	Do.
Karl August Hay	1842	York	Do.
Jabez Baldwin Lyman	1843	Easthampton	Do.
Do	1844	do	Do.
Do	1844-45	do	Do.
Geo. Washington Porter	1843	Beverly	Do.
Do	1844	do	Do.
Edward Robie	1844	Gorham	Do.
Do	1844-45	do	Do.
Daniel Gordon Estes	1848	Malden	Do.
Roswell Dwight Hitchcock	1847-48	East Machias	Do.
William Ewing	1848	Washington	Do.
Do	1848-49	do	Do.
Do	1849	do	Do.
Wm. Porter Ray	1848-49	Tewksbury	Theology and philosophy.
Do	1849	do	Do.
Francis Tiffany	1849	Baltimore	Theology.

Names of students from the United States registered at the Royal Friedrich Wilhelm University previous to the year 1850.

Year.	Name.	Residence.	Faculty.
1825	Henry Edwin Dwight (son of President Dwight, of Yale. Registered Nov. 9, 1825, and left June 26, 1826).	United States	Philosophy.
1827	Francis Cunningham (came to Berlin from Halle).	Boston	Philology.
1827	W. M. Amory (came to Berlin from Göttingen).	do	Philosophy.
1828	Alfred C. Post	New York	Medicine.
1830	George W. Haven (came to Berlin from Göttingen).	U. S. N. America	Philosophy.
1830	James Alexander Ventress (came from Paris).	Mississippi	Do.
1832	William C. King (came to Berlin from Göttingen).	Charleston, N. A	Jurisprudence.
1832	Amory Coffin (came from Göttingen)	do	Medicine.
1834	Thomas Emory Van Bibbler	Baltimore	Philosophy.
1836	Francis Booth	Boston	Do.
1837	John W. Mackie	Massachusetts	Theology.
1840	John Edward Kirkpatrick	Charleston	Philosophy.
1840	Thomas Reynolds	Charleston, S. C	Jurisprudence.
1840	Edward B. Baltzell	Baltimore	Philosophy.
1840	George L. Prentiss (came to Berlin from Halle).	Portland	Philosophy and theology.
1840	William A. Sparks	South Carolina	Medicine.
1841	James Elliot Cabot	Boston	Philosophy.
1841	J. Coolidge Shaw	do	Do.
1841	William A. Moragne	South Carolina	Jurisprudence.
1841	John Charles Peters	New York	Medicine.
1842	George Schueler	Buffalo	Do.
1842	John Larkin Lincoln	Boston	Theology.
1842	Henry W. Wales	do	Philosophy.
1844	Henry Lorenzo Low	United States	Philology.
1844	W. P. Wainwright	New York	Philosophy.
1844	George F. Simmons	Boston	Jurisprudence.
1845	Edward Robie	Gorham, Me	Theology.
1845	J. Baldwin Lyman	Easthampton	Theology and philosophy.
1846	Benjamin A. Gould	Boston	Philosophy.
1846	Charles Henry Werker	New York	Medicine.
1846	Samuel George Rosengarten	Philadelphia	Natur Wissenschafte
1846	Peter August Porter	New York	Philosophy.
1846	George C. Ward	Boston	Do.
1846	William Griswold Lane	Ohio	Do.
1846	James Mason Hoppin	Rhode Island	Theology.

Names of students from the United States registered at the Royal Friedrich Wilhelm University previous to the year 1850—Continued.

Year.	Name.	Residence.	Faculty.
1847	Isham H. Graves	North America	Jurisprudence.
1847	William W. Pearce	America	Chemistry.
1847	S. O. M. Lieber	Boston	Philosophy.
1847	John Winthrop Chanler	New York	Do.
1847	Duncan Campbell	Albany	Do.
1847	George William Curtis	New York	Do.
1847	James Burrill Curtis	do	Do.
1848	Herrmann Vezie	Philadelphia	Do.
1849	Dr. J. M. F. Giddings	Charleston	Medicine.
1849	George Martin Lane	do	Philosophy.
1849	Edmund T. Dana	Boston	Jurisprudence.
1849	Rufus Jay Kittridge	Chester, N. H	Philosophy.
1849	J. T. Lambert	New York	Do.
1849	Dave Walter	Charleston, S. C	Medicine.
1849	J. Hamilton Wilson	do	Philosophy.
1850	Lodowick Fosdick Billings	Trenton, N. J	Do.
1850	Henry W. Carr	Charleston, S. C	Do.
1850	Barsilius Lanneau Gildersheim *a*	do	Do.
1850	William Dwight Whitney	Northampton	Do.
1850	Elial J. Hall	Carroll, N. Y	Do.

a The name should no doubt be Gildersleeve.—H.

Names of students from the United States registered in the University of Leipsic previous to 1850.

Name.	Year.	Residence.
Theodore Dwight Woolsey	1827	New York.
Arthur Payson	1840	Boston.

What the two students at Leipsic studied is not given in the published list.

The foregoing lists contain, no doubt, the names of nearly all American students who studied in German universities previous to 1850. It would be easy to identify the majority of these men, but more difficult to estimate, even approximately, their great influence upon American scholarship and cultivation.[1]

A LETTER FROM DR. HARRIS.

Dr. W. T. Harris, whose thorough acquaintance with German philosophy and literature is so well known, under date of March, 1889, furnished the following interesting memoranda relating to the introduction of German studies into the United States.

Without being able to answer according to the book, I make the following suggestion in answer to the note of inquiry that has been addressed to me:

Theodore Parker's article in The Dial for January, 1841, p. 315 of vol. 1 of that famous periodical, republished in Parker's Miscellanies, was a cause of very much study of German literature, and of my own study of it among the rest.[2] It is a review of Menzel's work.

I think that Professor Stuart, of Andover, was the stimulant behind Theodore Parker. Then, of course, there was Carlyle, a great upheaving force towards the study of German literature and philosophy, and behind him Coleridge. There were the Coleridgians at the University of Vermont, who had great influence in New England.

[1] The compiler wishes to express his obligations to Mr. C. C. Plehn and Mr. J. Q. Adams for furnishing him with the lists of American students printed above. Mr. Plehn furnished the Göttingen list, Mr. Adams the other lists.

[2] The explanatory footnote to Parker's article, as it stands in his Miscellaneous Writings, is as follows: "Specimens of foreign standard literature, edited by George Ripley, vols. 7, 8, and 9, containing German literature. Translated from the German of Wolfgang Menzel, by C. C. Felton, in three volumes. Boston, 1843.

F. H. Hedge was the great German scholar, thoroughly equipped and fully possessed of the German spirit.[1] He was the German fountain among the so-called Transcendentalists. Then, of course, Horace Mann made German philosophy famous by his Report on German schools, 1843. Margaret Fuller was an influence in that direction. Henry Barnard's Journal promoted the work, and his translations from Karl von Raumer were and are the best critical pedagogy that we have in English. I thus made my acquaintance with Karl Rosenkranz, became greatly interested in his philosophy, and his pedagogical system was a favorite with me as early as 1863. I procured a translation for my Journal of Speculative Philosophy afterwards.

DR. CHARLES FOLLEN AND THE INTRODUCTION OF GERMAN INTO HARVARD COLLEGE.

Charles Follen was born at Romrod, Germany, 1796, the son of a counselor at law and a judge. He studied at Giessen, and took his degree at that university in 1818. He immediately began to teach, but his career was troubled. Unfortunately for his peace of mind and quiet of life, Follen had adopted some political principles that were not in accord with the temper of the times; he was an ardent believer in German nationality and so an ardent German patriot. As a result he was subjected to persecution by the government, which drove him to Paris, then to Switzerland, and finally to the United States. He arrived, in company with his friend, Dr. Charles Beck, also an exile, in December, 1824. In the autumn of 1825, owing to the efforts of Prof. George Ticknor and others, to whom he was strongly recommended by Lafayette, then in the country, he was appointed an instructor in German in Harvard College. He was the first teacher of the language in that great institution. One of the best sketches found in Dr. A. P. Peabody's delightful Harvard Reminiscences has Follen for its subject. This is Peabody's account of the introduction of German at Harvard, our oldest seat of learning:

German had never been taught in college before; and it was with no little difficulty that a volunteer class of eight was found desirous, or at least willing, to avail themselves of his services. I was one of that class. We were looked upon with very much the amazement with which a class in some obscure tribal dialect of the remotest Orient would now be regarded. We knew of but two or three persons in New England who could read German, though there were probably many more of whom we did not know. There were no German books in the bookstores. A friend gave me a copy of Schiller's Wallenstein, which I read as soon as I was able to do so, and then passed it from hand to hand among those who could obtain nothing else to read. There was no attainable class book that could be used as a Reader. A few copies of Noehden's Grammar were imported, and a few copies of I forget whose Pocket Dictionary, fortunately too copious for an Anglo-Saxon pocket, and suggesting the generous amplitude of the Low Dutch costume, as described in Irving's mythical History of New York. The German Reader for Beginners, compiled by our teacher, was furnished to the class in single sheets as it was needed, and was printed in Roman type, there being no German type within easy reach. There could not have been a happier introduction to German literature than this little volume. It contained choice extracts in prose, all from writers that still hold an unchallenged place in the hierarchy of genius, and poems from Schiller, Goethe, Herder, and several other poets of kindred, if inferior, fame. But in the entire volume Dr. Follen rejoiced especially in several battle pieces from Körner, the soldier and martyr of liberty, whom we then supposed to have been our teacher's fellow-soldier, though in fact he fell in battle when Dr. Follen was just entering the university. I never have heard recitations which have impressed me so strongly as the reading of those pieces by Dr. Follen, who would put into them all of the heart and soul that had made him too much a lover of his country to be suffered to dwell in it. He appended to the other poems in the first edition of the Reader, anonymously, a death song in memory of Körner, which we all knew to be his own, and which we read so often and so feelingly that it sank indelibly into permanent memory; and I find that after an

[1] "Prof. Levi Hedge was ambitious for his son [Frederick Henry Hedge], and pushed him so hard that in his twelfth year he was fitted for Harvard in the manner of the time. Too young to enter, he was sent to Germany in the care of George Bancroft, who had just graduated and was intending a course of study in Göttingen. In Germany he studied for five years in various gymnasia. It was his own opinion that his education would have made better progress if he had stayed at home. As a foreigner, he was indulged and left too much to his own devices at a time when he should have had the benefit of wholesome regulation. But he acquired a thorough knowledge of the German language, and became deeply interested in German poetry and the idealism of German metaphysic. It is difficult to see how he could otherwise have qualified himself for one of the most important functions of his life—that of a pioneer of German poetry and metaphysic in the United States."—The Nation, August 28, 1890.

interval of sixty years it is as fresh in my recollection as the hymns that I learned in my childhood.[1]

In September, 1831, Dr. Follen became professor of the German language and literature at Cambridge, and on that occasion delivered an inaugural discourse on the "Importance of the study of the German language and literature." The following paragraph points to a considerable growth of interest in German studies in the six years that had elapsed since Follen entered upon his work:

In this our own country, and particularly in this literary vicinity, the attention which is paid to this portion of universal literature is within the observation of all who hear me. The treasures contained in German works did not escape public notice, but soon gained that intelligent interest which is taken here in everything that promises to enlarge and elevate the mind. In this university, where formerly German lore was classed under the head of "non leguntur," the library has lately been augmented by a considerable number of valuable works; German books, in their native type, are issuing from the University press; and there is every year an average number of 50 students of the German language. There are German books and teachers in every place of importance in this country. In Boston, particularly, where, as I am assured, about fifty years ago not a German grammar or dictionary was to be found, there are now a number of persons who speak and a large number who read and enter into the sense and spirit of German works. Many German authors have already found a place in private libraries among the literary representatives of other countries, and gladden the eye of the stranger whose heart is not yet weaned from the pleasures of his childhood, the guides of his youth, and the great standards of his manhood."[2]

A LETTER FROM MR. BANCROFT.

A letter that George Bancroft wrote to President Eliot, of Harvard University, July 4, 1871, acquainting him with his intention to found a fellowship in that institution, contains some interesting educational history, as follows:

A little more than fifty-three years ago Edward Everett, then Eliot professor of Greek literature, in one of his letters to President Kirkland developed the idea that it would be well to send some young graduate of Harvard to study for awhile at a German university, with a view to his being called to a place on the college board. The president approved his suggestion, and his choice for this traveling scholarship fell on me. Accordingly, in the early summer of 1818, being then in my eighteenth year, I proceeded to Göttingen. After remaining more than three years in Europe, I returned to Cambridge, where I held the office of tutor for one year. There being no opening for a permanent connection, I devoted a few years to an attempt to introduce among us some parts of the German system of education, so as to divide more exactly preliminary studies from the higher scientific courses, and thus facilitate the transformation of our colleges into universities after the plan everywhere adopted in Germany. But it is not easy to change an organization that has its roots in the habits of the country, and the experiment could not succeed, for it was impossible to introduce the German usage, which permits students to pass freely from a private place of instruction to a public one, without the exaction of payments for instruction elsewhere received.

I then applied, through the late Judge Charles Jackson, a member of the corporation and a friend of mine, for leave to read lectures on history in the university. At Göttingen or at Berlin I had the right, after a few preliminary formalities, to deliver such a course. It was the only time in my life that I applied for an office for myself, and this time it was not so much an office as a permission that I desired. My request was declined by my own alma mater, so that I had not the opportunity of manifesting my affection for her by personal services, and my life has had, in consequence, unexpected variety and independence. But wherever my lot has been thrown I have always preserved in freshness and strength the love which I bore to Harvard College in my youth, and now in my old age I still gladly seek an opportunity of proving that attachment.[3]

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[1] Pp. 117, 118.

[2] The works of Charles Follen, with a memoir of his life. In five volumes. Boston, 1842. These works contain, besides the memoir, sermons, lectures on moral philosophy, fragments of a work on psychology, lectures on Schiller's life and dramas, and miscellaneous lectures and addresses.

[3] Report of the Commissioner of Education, 1892–93, vol. 2, pp. 1573–1574.

DR. COGSWELL AND THE ROUND HILL SCHOOL.

Mr. Bancroft's statement that he devoted a few years to an attempt to introduce among us some parts of the German system of education, etc., refers to the celebrated Round Hill School, founded by himself and Dr. Cogswell in 1823. In this school Dr. Cogswell was the leading spirit from the first, and it finally passed wholly into his hands. The prominence of the school in the years during which it existed will justify an account of its antecedents. These lie principally in the life of its leading founder.

Joseph Green Cogswell was born in Ipswich, Essex County, Mass., on the 27th of September, 1786. He was fitted for college at Phillips Academy, Exeter, and entered Harvard College in 1802, from which he was graduated after the usual time. After graduation he studied for the law and settled, and in 1812 opened an office in Belfast, Me. After one year of practice, broken down by the early death of his wife, he gave up his profession and applied for a tutorship in Harvard College. From 1813 to 1815 he was tutor of Latin at Harvard, resigning his post to make his second trip to Europe. In the autumn of 1816 he made his third trip to Europe, this time as tutor to Mr. A. Thorndike. By the arrival of Mr. C. and his charge the American colony was increased to four members. November 1 he arrived at Göttingen, where two of his Harvard friends, George Ticknor and Edward Everett, were students. Mr. Cogswell, who was now 31 years of age, threw himself with great ardor into a variety of subjects. He mentions, in a letter written during his second semester, spending ten hours a day in the lecture room and eight hours in study. He was not a specialist in the modern sense, but a seeker of knowledge in many fields. In March, 1817, he writes to Professor Farrar, at Cambridge—

I have been led to believe that nothing remains for me in life but to prepare for a traveler in some parts hitherto little explored, where science will be more use to me than philology, history, or politics, and therefore I lay the groundwork for more thorough geological, mineralogical, and botanical knowledge.

From his letters we see that he did not give up history and philology altogether. Between the semesters he visited Goethe, at Jena. He went prepared to dislike the great man, but succumbed at once to his charm and found a topic of mutual interest in mineralogy.

Mr. Cogswell mentions, in a letter to Mr. Ticknor, that he is having practical instruction from Professor Benecke in library management. This stood him in good stead when he came to be superintendent of the Astor Library.

In the autumn of 1817 Mr. Cogswell left Göttingen for Southern Europe. At Munich he met many men of science, among them Dr. Sömmering, the anatomist. In May, 1818, he visited Fellenberg's school at Hofwyl. The following extract from a letter written at the time gives his impressions of the institution:

Its object, originally, was agricultural, or rather, under the avowed object of improving the agriculture of this country, Mr. de Fellenberg had really in view the improvement of the system of general education. Like all philanthropists, he was an enthusiast, and believed in the possible perfectibility of man. This he thought was to be effected through the medium of education. Out of his school of theoretical agriculture grew a school for general and higher education, which has the character of being one of the best in Europe. Many of its characteristics are peculiar to itself, such as the dispensing altogether with rewards and punishments, the liberty allowed the pupil to defend himself when censured, and others which it would be interesting to examine as to their operation and influence; but the particular object of your inquiry is the establishment for the education of the children of the poor, and that is entirely distinct from the two already named.

His system embraced the two extremes of society. In his school the children of beggars and of sovereigns were to be taught to understand in what their duty and their happiness consists. * * * It was a noble effort and has already produced great good. When a little longer experiment shall have cleared it of some of its theoretic excellences, but practical defects, it will produce still greater, and probably be one means of operating a real reformation in society. I am sorry that I can not give you some account of Pestalozzi's academy at Yverdun, which I have in like manner visited.

Writing from Paris September 1, 1818, Mr. Cogswell thus describes a second visit that he made to this school:

I have paid a second visit to Mr. de Fellenberg, at Hofwyl, with even greater satisfaction than I made my first. It was the day preceding a short vacation they have once a year of three weeks. Upon this occasion Mr. de F. gives the boys a little festival. It consisted in a concert in which three-fourths of the whole school joined, for music he considers a very important part of education, after which a simple repast was given them in the grove adjoining the house, and more heartfelt joy I never witnessed in my life, not, as it seemed to me, because they were about to relax from their labors, but because they had the happiness to be placed for their education in a school the head of which was rather a father than a master to them. I saw a thousand proofs of the sentiments they entertain toward each other, and nothing could resemble more a tender and solicitous parent surrounded by a family of obedient and affectionate children. There was the greatest equality and at the same time the greatest respect, a respect of the heart, I mean, not of fear. Instructors and pupils walked arm in arm together, played together, ate at the same table, and all without any danger to their reciprocal rights. How delightful it must be to govern where love is the principle of obedience.

This idea of family life Mr. Cogswell afterwards introduced into the Round Hill School. The next year he wrote that Fellenberg had lately been attacked in an octavo of several hundred pages by Sprengel, the great econome of Schillerslage. The ground of attack, he says, was the system of agriculture adopted by Fellenberg, but the school he spared.

A few days before he wrote his first letter to Ticknor concerning the school at Hofwyl, Mr. Cogswell wrote in his diary:

May 28th. Over the Jura to Yverdun; called on Pestalozzi and spent the day in examining his institutions and minerals. Hatred and envy of Fellenberg; bad order; no obedience in scholars.

October 28, 1819, Cogswell wrote in his diary:

We have done wonders to-day to come from Concise to this place, beside making a long visit at Pestalozzi's, at Yverdun. A painful visit it was to me to see this good old man and real philanthropist going broken hearted to his grave, for broken hearted he must be, in contemplating the ruined state of the institution which he has been laboring his whole life to establish! * * * My regrets, however, are more for himself than for the public, for I do not believe his system, carried to the extent he does, is the true method of storing the mind with knowledge. It would exclude memory altogether as a medium of instructing and make use of reason alone, which is absurd. Reason must be furnished with ideas for the materials of its ratiocinations, and many of these must be laid up in and recalled by the memory. * * * This is the misery of all systems, that the makers of them are never satisfied with putting them in practice as far as they are true, merely, but have a foolish vanity of giving them universal applicability.

These extracts are worth quoting for two or three reasons: First, they are intrinsically interesting; secondly, they are, as I believe, the earliest opinions on record that any native-born American expr ssed concerning the merits of these two famous schools and their masters; while, lastly, as stated above, they are really a part of the history of Round Hill School.

In 1819 Mr. Cogswell returned to Germany from the south and paid a second and a third visit to Goethe. At this time he received the degree of doctor of philosophy at Göttingen. He was also made a member of the Helvetic Society of Natural History and of the Academy at Munich.

In 1821 we find him back again at Cambridge as librarian and professor of mineralogy and chemistry. The library he arranged on the same plan as that at Göttingen, and won the applause of Prof. George Ticknor.

In 1823 Mr. Cogswell and Mr. Bancroft founded the Round Hill School near Northampton, Mass. After a few years Mr. Bancroft retired, leaving Mr. Cogswell in sole possession. The school was abandoned in 1839, owing to the failing health of its conductor and his financial losses. This school was expected to draw its pupils mainly from the best families, and such was the fact. In the first eight years of its history it enrolled 293 pupils, drawn from 19 States and 4 foreign countries. Massa-

chusetts, of course, headed the list, but New York, Maryland, South Carolina, and Georgia all contributed pupils in considerable numbers.

The conductors of Round Hill put into practice some of the ideas that they had gathered in Germany and Switzerland, more or less modified, perhaps, to suit the change of environment. Two paragraphs from the prospectus issued in 1823 will define in a general way the purpose of this school:

The institution which we propose to establish is designed to furnish occupation for those years which in France are spent at a college and in Germany at a gymnasium. A boy who has completed his ninth year is old enough to commence his regular studies, and to delay them longer would be to waste precious time and (what is of still more moment) the period when good habits are most easily formed. For learning the modern languages, these years are so valuable that the loss of them is irreparable, because during these a purity of pronunciation (we speak with particular reference to the French) may readily be acquired, which in after life no efforts can attain. * * *

On the other side we decline assuming the charge of anyone who has already completed his twelfth year, and we conceive that a regard for the success of our school requires of us, on this point, to be explicit and decided. * * * The same discipline of mind and the same course of instruction can not be suited to boys and to young men. Between a seminary which provides for the discipline and control of its pupils, and one which, like the European universities, has in view the advancement of the sciences and public instruction in them, there is an essential difference, which must carefully be heeded in practice. To attempt uniting both would insure a failure.

Then follow remarks on the educational value of the subjects to be taught. The authors of the prospectus say:

We regard the study of languages as the proper basis of education, both because it provides the mind with the most salutary employment, and exercises the powers of invention and judgment no less than those of comparison and memory, and because it furnishes the keys of knowledge for future use.

A characteristic feature of the Round Hill School was the individual attention given to each boy. Mr. Cogswell lived with his pupils as a father, and took them with him on his vacation travels. He disclaimed the impulses of fear and emulation; each pupil recited by himself and the lash was forbidden, while out-of-door life was a strong feature.

On the abandonment of Round Hill Dr. Cogswell taught a year in Raleigh, N. C. His later labors were devoted to the organization and administration of the Astor Library. He retired from the position of librarian of this institution in 1863, and died in Cambridge at the age of 85 in 1871. For his labors at the Astor Library Dr. Cogswell is entitled to the gratitude of American scholars; but it was at Round Hill that he most impressed himself upon his generation. This school, no doubt, was the first school in the country to be largely influenced by the German ideas.[1]

PROFESSOR GRISCOM'S VISIT TO PESTALOZZI.

In 1818–19 Prof. John Griscom, of New York City, made a study of the schools, colleges, and charitable institutions of Great Britain, France, Switzerland, Italy, and Holland, and on his return home embodied the fruits of his investigations in a work of two volumes to which he gave the name, A Year in Europe. "No one volume in the first half of the nineteenth century," says Dr. Barnard, "had so wide an influence on the development of our educational, reformatory, and preventive measures, directly and indirectly, as this." Ex-President Jefferson pronounced the view that the book gave of the literary and public institutions of the countries that the author visited the best that he had ever read, and he said he found in it useful hints for the University of Virginia, which he was then engaged in establishing. Griscom visited Pestalozzi, and wrote the account of his visit that is reproduced below. A Year in Europe is now a rare book. It owes much of its

[1] The above account of Dr. Cogswell and Round Hill has been drawn from the following work: Life of Joseph Green Cogswell as sketched in his Letters. Privately printed at the Riverside Press, Cambridge, 1874. For Round Hill School see G. E. Ellis, Recollections of, Educational Review, Vol. I, p 337; J. L. Motley, Correspondence of, edited by G. W. Curtis, Vol, I, pp. 3–8.

interest to the fact that it was written by a practical educator at a time when little was known about Pestalozzi and foreign education in the United States.

Breakfast finished, our first and chief concern here was to visit the celebrated Institute of Pestalozzi. This establishment occupies a large castle the use of which was granted to Pestalozzi by the Canton of Berne, when the town of Yverdun was included in that Canton, and the government of the Pays de Vaud, to which it now belongs, continues the grant. On entering the castle, we were invited into a private room. I gave my letters to the person in attendance, who took them immediately to the chief. The good old man soon came in, seized me warmly by the hand, and seeing my hat on my head, he pointed to it in a sort of ecstacy, with his eyes almost filled with tears. I hardly knew how to interpret this emotion, and asked him if he wished me to take it off. He answered very earnestly, "No, no, no; keep it on; you are right." He seemed very glad to see us, and as he speaks French very imperfectly, and with an indistinct accent, he said he would call Monsieur Greaves to talk with us. This gentleman soon came and entered immediately into a detail of the institution, its principles, its spirit, its arrangement, etc. He is an Englishman, and, as I found upon inquiry, brother to the lady whom I had seen at Lausanne. He has been some weeks with Pestalozzi, for the purpose of understanding his system thoroughly, in order to aid a sister in England in the education of her children. He enters warmly into its concern, and will be useful in making it better known. He explained to us very clearly the leading ideas and views of human nature which induced Pestalozzi to become an instructor of youth. The two great instruments with which he works are faith and love. He discards the motives of ambition and emulation as unnecessary, and as tending to counteract the sentiment of good will toward others. He thinks there is enough in the intuitive understanding of every child to accomplish the complete growth and maturity of its faculties, if its reason be properly trained and nourished, and not warped by injudicious treatment. The common plans of education he regards as too artificial, too wide a departure from nature. Too much stress is laid upon the memory, while the imagination is too much neglected. If the native feelings of the heart are allowed to operate under the domination of the native powers of the mind, drawn out and expanded by faith and love, the child is competent of itself to arrive gradually at the most correct and important conclusions in religion and science. There is a native and inherent life, which only requires to be cherished by genial treatment to bring it into the full attainment of truth, and to the utmost perfection of its being. He therefore insists upon the greatest pains being taken to draw out this native life and to preserve it in full vigor. There is a constant danger of urging the child forward beyond its natural strength, of anticipating its conclusions, and thus weakening its confidence in its own powers. In the plans he adopts nothing is to be got by heart. The understanding is to be thoroughly reached, and then the memory will take care of itself.

His school consists at present of about 90 boys, German, Prussian, French, Swiss, Italian, Spanish, and English. It is divided into four principal classes, according to the attainments of the pupils. These classes are subdived into others. There are seven school rooms in the castle, and twelve teachers or professors. His head professor, Joseph Schmidt, has been brought up in the institution, and is a very efficient and worthy man. He is a native of one of the German cantons, and speaks and writes perfectly the German and French. He is a man of modest demeanor and entirely devoted to the institution. He has written treatises on several of the subjects taught in the school and adapted to its methods.

We spent most of the day in the different schoolrooms witnessing the exercises of the scholars. Very few books are used, as it is expected the children can read well before they come there. But to describe the modes of teaching, so as to render them clearly intelligible, would require much more time and space than I can possibly allot to it, were I ever so competent to make it known. We saw the exercises of arithmetic, writing, drawing, mathematics, lessons in music and gymnastics, something of geography, French, Latin, and German. To teach a school, in the way practiced here, without book, and almost entirely by verbal instruction, is extremely laborious. The teacher must be constantly with the child, always talking, questioning, explaining, and repeating. The pupils, however, by this process, are brought into very close intimacy with the instructor. Their capacities, all their faculties and propensities, become laid open to his observation. This gives him an advantage which can not possibly be gained in the ordinary way in which schools are generally taught. The children look well, appear very contented, and apparently live in great harmony one with another; which, considering the diversity of national character and temper here collected, can be attributed only to the spirit of love and affection which sways the breast of the principal of the institution, and extends its benign influence throughout all the departments. In the afternoon we went, with Pestalozzi, Greaves, and Bucholz, a German clergyman (who is here on a visit to the institution), and one or two others, to visit a free school of twelve or fourteen children,

which Pestalozzi has established in the village of Clendy, at a short distance from the castle. These are the children taken from the families of poor people, selected on account of their character and talents, in order to be educated as teachers, with a view to extend and perpetuate the principles and operation of the system. One half of them are boys and the other half girls. Their principal instructor is a sister of Schmidt, the chief master, an exceeding clever and interesting young woman. She has another sister also with her, younger than herself, who will soon become qualified to act as instructor. These pupils were exercised before us, in arithmetic, in drawing, and in music. The girls, seated round a table, and busy with their needles, had questions in arithmetic given them by the mistress, which they were to solve by their heads. They are thus led on, from the most simple beginnings, to comprehend the principles of arithmetic, and to work questions with great expertness, solely by a mental process. A male teacher is provided for the boys, though the mistress often assists in their instruction. This little school promises to be well cared for and of service to the Pestalozzian cause. We were much pleased with its appearance, and with the assurance it affords that whatever there is of value and importance in this system, it will not be lost.

The success of this mode of instruction greatly depends upon the personal qualifications of those who undertake to conduct it. There is nothing of mechanism in it, as in the Lancasterian plan; no laying down of precise rules for managing classes, etc. It is all mind and feeling. Its arrangements must always depend on the ages, talents, and tempers of the scholars, and require on the part of the teachers the most diligent and faithful attention. Above all, it requires that the teacher should consider himself as the father and bosom friend of his pupils, and to be animated with the most affectionate desires for their good. Pestalozzi himself is all this. His heart glows with such a spirit that the good old man can hardly refrain from bestowing kisses on all with whom he is concerned. He holds out his hands to his pupils on every occasion, and they love him as a child loves its mother. His plan of teaching is just fit for the domestic fireside, with a father or mother in the center, and a circle of happy children around them. He is aware of this, and wishes to extend the knowledge of his plan to every parent. Pestalozzi is 72 years of age. It has been quite unfortunate for the progress of his system on the continent, that he pays so little attention to exteriors, regarding dress, furniture, etc., as of no moment whatever, provided the mind and heart be right.

The weather continuing wet, we resolved to wait till the morrow, and take the diligence to Lausanne and Geneva. Much of the day was spent at the castle, in the school rooms, and in conversation with Greaves. I omitted to mention that we attended last evening to the religious exercise which terminates the business of the day. The scholars assembled in a room called the chapel, but very simply furnished, with benches and a table. When all were collected, Pestalozzi, directing his face chiefly to the boys, began to speak in German, moving about from side to side, directing his attention for some time to the boys on his right, and then advancing toward those on his left. This motion, backward and forward, continued about twenty minutes; he was constantly speaking, and sometimes with considerable earnestness. It was altogether unintelligible to me, but I afterwards learned that it consisted of a recapitulation of the occurrences of the day, noticing particularly everything of moment, and intermingling the whole with short prayers, adapted to the circumstances mentioned in the discourse. If, for example, any of the boys had quarreled, or behaved unseemly to each other, or to their teacher, he would speak to the case, and accompany his remarks with a pious ejaculation. It is probable that he sometimes engages more formally in this exercise. As it was, it appeared to gain the whole attention of his audience. It was concluded by reading from a small book what appeared to be a hymn or psalm.

A company of English visitors attended at the castle to-day, consisting of men and women. The boys performed some of their gymnastic exercises before them, consisting chiefly of simple, but simultaneous movements of the arms, legs, feet, head, etc., stepping, marching, turning, and jumping, all intended to exercise the various muscles which give motion to the limbs and head, and to make the boys acquainted with the elements of all those movements. This exercise took place in one of the large bedrooms. We attended, by invitation, last evening a lecture given by Schmidt, the head teacher, to a number of young men, among whom were four Russians, sent by the Emperor to gain information, in England, and other countries, relative to the best modes of teaching. They had been in England, and spoke our language tolerably well. The lectures are to illustrate more fully the principles and processes adopted in the Pestalozzian institution.

We had the company, this evening, at our lodgings, of Frederick Bucholz, who was lately a chaplain to the king's German legion in England. He had been some time with Pestalozzi, and was able to give us more information with respect to some parts of the system than we could obtain by a short visit to the school itself.[1]

[1] See also J. H Griscom, Memoirs of John Griscom, N. Y., 1885, pp. 230–246.

A. D. BACHE'S REPORT.

Alexander Dallas Bache, born in 1806, a great grandson of Benjamin Franklin, was called in 1836 from the chair of natural philosophy and chemistry in the University of Pennsylvania to the Presidency of Girard College, preparatory to organizing that institution. He was at once sent to Europe in quest of information that might prove useful in that work. He received his instructions from the scholastic committee of the board of trustees, Nicholas Biddle, chairman, September 19, 1836, and immediately departed on his mission. His duties in general were thus defined:

The board of trustees are charged by the city of Philadelphia to prepare a system of instruction for the Girard College for Orphans. For this purpose they are anxious to have the most accurate information of the best means used for the same purpose elsewhere, and you have been selected to obtain it. Your object, then, is to visit all establishments in Europe similar to the Girard College; and as these are found principally, if not exclusively, in England, Scotland, Ireland, France, Belgium, Holland, Switzerland, Italy, Austria, Prussia, and the rest of the States of Germany, these countries will form the natural limits of your tour. Accordingly, all institutions in each of those countries resembling the Girard College, or any others which promise to afford useful information in organizing it, you will see and examine. Your own reflection will readily suggest the points of information desired; and I will, therefore, merely enumerate a few, which may serve as a basis for your own extensive investigation.

The few points which are enumerated are sixteen in number, and most of them include several items. Only two of the points will be quoted. They are 7 and 8.

The precise extent to which moral and religious instruction is proposed to be given, and is actually given, and also by whom, and in what form that instruction is conveyed.

The mechanical arts taught—the mode of teaching them—the models, tools, and implements of all kinds employed—and the manner in which the practice of these arts is mingled with the routine of study.

The committee instructed Bache to make his examination thorough and practical; they were already in possession of all the books could teach on the subject or could easily obtain it. "It is your special duty," the committee said, "to domesticate yourself if practicable in these institutions, those to be visited, and by your own personal observation to distinguish what is useful from what is plausible in theory." In their anxiety that the investigation should be complete, the board fixed no period for his return. It confided in his diligence, feeling sure that he would not prolong his absence without ample reasons. While they were anxious to open the college with the least possible delay, they deemed it so much more important to begin well than to begin soon, that they postponed making any limit to his stay in Europe until he was able to apprise them of his progress. He was instructed, on his return, to make a final report, with a plan for the government and instruction of the college, the result of all his examination and reflection. He was to purchase text-books, and other books used in schools, or which might assist his inquiries; also models, drawings, and such philosophical instruments as would be necessary in opening the college.

Bache completed his visit abroad in October, 1838, and submitted his report in May of the following year, entitled, Report on education in Europe, to the trustees of the Girard College for Orphans, by Alex. Dallas Bache, LL. D., president of the college. Philadelphia, 1839. It was an octavo volume, and contained, inclusive of preface and appendix, nearly 700 pages.

The report is divided into two parts. The first relates to the means provided for the education of orphans, and embraces about one-fourth of the whole volume; the second relates to the systems of general instruction. Under the first head, the government, discipline, and domestic economy, as well as the instruction, are examined; under the second head, instruction is the chief point of interest.

Chapter I of Part II is devoted to infant schools. Chapters II–VII relate to primary or elementary schools, embracing the following countries: Great Britain, France, Holland, Prussia, Saxony, and Bavaria. Chapters VIII, IX deal with schools

of the elementary class, intended to prepare persons for particular occupations in life. The first of these chapters is occupied with schools of agriculture, and the second with seminaries for the preparation of teachers for primary schools. Secondary education in Scotland, Ireland, England, France, and Prussia forms the subject of chapters XI, XII. The last chapter relates to superior schools. The treatment turns far more upon the polytechnic schools and technical schools than universities. Indeed, the superior schools of liberal culture are dismissed with only three or four pages.

Bache's report is said to have done much to improve American methods of public instruction.

C. E. STOWE'S REPORT.

As Prof. Calvin E. Stowe was on the point of embarking for Europe, in March, 1836, he received from Governor Lucas, of Ohio, a communication under the great seal of the State, transmitting two resolutions that the general assembly had adopted. The principal of these resolutions requests Professor Stowe to collect, during the progress of his contemplated tour in Europe, such facts and information as he may deem useful to the State in relation to the various systems of public instruction and education which have been adopted in the several countries through which he may pass, and make report thereof with such practical observations as he may think proper to the next general assembly. Professor Stowe gladly accepted and executed this commission. His report bears the date December 18, 1839. It is entitled, Report on Elementary Public Instruction in Europe, made to the Thirty-sixth General Assembly of the State of Ohio. This report was widely circulated. The copy before me carries the following: Reprinted by order of the House of Representatives of the Legislature of Massachusetts, March 29, 1840.

The countries visited by Stowe were England, Scotland, France, Prussia, and the different States of Germany. He had opportunity, he says, to see the celebrated universities at Cambridge, Oxford, Edinburgh, Glasgow, Paris, Berlin, Halle, Leipsic, Heidelberg, and some others. He, as well as Bache, speaks of the uniform courtesy in which he was received and of the facilities afforded him for obtaining information.

After some introductory remarks, Professor Stowe drew attention to the wonderful change which had taken place in the policy of monarchical governments in respect to the education of the people—a fact that had strongly impressed his mind during the progress of his visit. He then gave an encouraging account of efforts for education in Russia—an account, it is to be feared, which the outcome did not justify. Then he speaks of the internal arrangements of the Prussian schools, institutions for reformation, course of instruction in the common schools of Prussia and Würtemberg, character of the system, and means of sustaining the system. He gives also an appendix embracing a catalogue of Prussian school laws, and answers the questions relating to moral and religious duty.

M. VICTOR COUSIN'S REPORT.

It was in 1837 that M. Victor Cousin, peer of France, counsellor of State, professor of philosophy, member of the institute, and of the royal council of education, visited Prussia and made to the Count De Montalivet, minister of public instruction and ecclesiastical affairs, the series of communications that constitute his celebrated Report on the State of Public Instruction in Prussia. He had previously made a similar report on the kingdom of Saxony, the duchy of Weimar, and the city of Frankfort. The two documents were merged together in the French edition, but the earlier one is not found in the English translation mentioned below.

Sir William Hamilton made this report, and a project of a law of instruction that grew out of it, the subject of a celebrated article in The Edinburgh Review, "Cousin on German Schools," July, 1833. (Discussions on Philosophy and Literature, Educa-

tion, and University Reform, p. 553, et seq.) This article first called the attention of the English public to the report; Hamilton declared that M. Cousin's mission in Germany was in immediate consequence to the revolution of July. Some of the points may be thus summarized:

The revolution of July gave the signal. Almost the first act of the liberated State was an attempt to ameliorate a system of public education, of which the education of the people constitutes the foundation.

Hamilton gives Cousin an eloquent eulogium:

A profound and original thinker, a lucid and eloquent writer, a scholar equally at home in ancient and in modern learning, a philosopher superior to all prejudice of age or country. From his universality both of thought and acquirement * * * and from his familiarity with German literature and philosophy, he was the fittest man in France to undertake such a work.

A German translation by Dr. Kroegger, of Hamburg, had appeared before Hamilton took up the subject. Hamilton did not anticipate that an English translation would be seen, although the report was incalculably more needed in England than in Germany. He said:

We are even ignorant of our wants. In fact, the difficulty of all educational improvement in Britain lies less in the amount of work to be performed than in the notion that not a great deal is required. Our pedagogical ignorance is only equaled by our pedagogical conceit; and where few are competent to understand, all believe themselves justified to decide.

But Hamilton was mistaken. The report on Prussia was in part translated into English by Mrs. Sarah Austin, so well known for her excellent translations of German and French works, and was published in London the year following Hamilton's article. The copy before us bears the imprint of London: Effingham Wilson, Royal Exchange, 1834. Mrs. Austin assigns two reasons for omitting portions of the report. One was that these portions were nearly one-half of the whole, while she desired to make a small and cheap volume; and the other, that it related to secondary and higher education, while she desired not to divert the attention of the English public from the subject of primary instruction—that is, that education which is absolutely necessary to moral and intellectual well-being of the mass of the people. In urging the merits of the Prussian system upon her countrymen, she said it was humiliating to notice the objection that it was foreign. (See her interesting preface.) Cousin had already encountered the same objection in France.

Mrs. Austin's translation was soon republished in the United States. It appeared in New York in 1835, and bore the imprint of Wiley & Long, 161 Broadway. Mrs. Austin's preface was retained, and a new preface was furnished by J. Orville Taylor. Mr. Taylor in this preface offers various remarks on the condition of education in the United States—remarks that have considerable interest as measuring the thought and practice of the times. He pronounces the princely school fund of Connecticut an injury to her schools.[1]

Subsequently, in 1837, M. Cousin visited Holland and published an account of the state of education in that country as regards schools for the working classes and for the poor. A translation of this account made by Leonard Horner, who also contributed preliminary observations, was published in London by John Murray in 1838. This volume is also worth mention because it contains a translation of a report on education made in 1811, made by M. Cuvier and M. Noël, members of the council, Noël being also Inspector-General of the Imperial University. (See Appendix B.)

Hamilton regarded the two documents that furnished the basis of his article as marking an epoch in the progress of national education, and as directly conducing to results important not to France only, but to Europe. A letter from Hamilton to

[1] For the influence of Cousin's Report on the Michigan System of Public Instruction, see President J. B. Angell's oration, University of Michigan, Semicentennial, pp. 139, 161, 170, 171; A. Ten Brook, American State Universities, etc., p. 110; B. A. Hinsdale, Horace Mann and the Common School Revival in the United States, pp. 285, 286.

Cousin in relation to his report is found in Vietch's Memoirs of Sir William Hamilton, pp. 171–172.

MADAME DE STAËL'S GERMANY.

"On Germany" is divided into four parts: On Germany and the manners of the Germans; On literature and the arts; On philosophy and morals, and On religion and enthusiasms. To a great extent the book is a vehicle for conveying the author's favorite philosophical ideas. Its own history is not a little remarkable. Its subject Germany, its writer a French woman, it was first published by a London bookseller in English. In the preface, dated October 1, 1813, Madame de Staël told the story of the destruction of the Paris edition in 1810 by the order of Bonaparte. We know from other sources that the manuscript was spared only when the author gave a written promise to the authorities that she would neither print the book in any other country, nor allow it to be printed by other people. The reception that the book received shows how dense was the ignorance of Germany that prevailed in other countries. It was a veritable revelation. Says Lady Blennerhassett: "Germany had never hitherto been so impartially and so sympathetically described and examined into by a stranger."[1] Sorel tells us that Madame de Staël herself learned the language and the literature of the country at the same time, viz, after her arrival in Germany in 1804. He says also that the book was, at its first appearance, and continued for a time to be, an event. It revealed to the great European public one form of the modern genius. It was, says Goethe, like a powerful battering ram opening a great breach in the Chinese wall of old prejudices raised between us and France. This book made them wish to know us beyond the Rhine and beyond the Channel, and we have gained by it the means of exercising a lively influence in the far Occident.[2] Lady Blennerhassett collects numerous testimonies to the effect that the book created. One of her authorities says it called forth a kind of revolution in the ideas of the Genevese; they all wanted now to learn German. The Poles and the Americans alike derived their first notion of Goethe from the same source.[3] Immediately following the publication of the book Sir James Mackintosh wrote in The Edinburgh Review that, owing in great part to causes that he recounts, while physical and political Germany was so familiar to foreigners, intellectual and literary Germany continued almost unknown. Thirty years ago, he said, there were probably in London as many Persian as German scholars. Neither Goethe nor Schiller conquered the repugnance. Political conclusions, a timid and exclusive taste, and the habitual neglect of foreign languages excluded German literature from France. Temporary and permanent causes contributed to banish it after a short period of success from England. Sir James calls the book the most vigorous effort of its author's genius and probably the most elaborate and masculine production of the faculties of woman. Madame de Staël herself said that German literature was much better known in England than in France. In England the foreign languages are more studied, and the Germans are more naturally connected with the English than with the French; nevertheless prejudices exist even in England both against the philosophy and literature of Germany. She examines into the cause of these prejudices, as well as inquires why it is that the eternal boundary of the Rhine separates two intellectual regions, which no less than the two countries are foreign to each other.

It can hardly have been the chapter on the Universities that captivated Mr. Ticknor. It must have been the book as a unit—the whole picture of intellectual and literary life—the sudden view of an unknown and an unsuspected world. In France, Madame de Staël wrote, people have no notion of the extent of the German intellectual culture. The innkeepers and small officials have an acquaintance with foreign tongues and books; the smallest towns possess good libraries; village

[1] Madame de Staël, London, 1889, Vol. III, p. 329. The history of On Germany is fully given in this work.

[2] Sorel, Madame de Staël, pp. 242, 243.

[3] Vol. III, pp. 446, 447.

schoolmasters know Greek and Latin. If one compares a German to a French province, centuries of development would appear to lie between them. Picard and Kotzebue have both written comedies about the provincials. The Frenchman describes them as always striving to imitate Paris; the German proves them to be proud of the incomparable advantages of their domestic circumstances. The difference in their comedy is also the difference in the habits of the two countries. The German savant can spend fifteen hours of the day undisturbed at his books. His solitude guarantees his independence; and on the other hand the coöperation of the teachers in the German universities requires the universality of culture which is peculiar to almost all the distinguished intellects in Germany. The highest praise that can be bestowed on the universities lies in the assertion that their teaching begins where that of most other nations comes to an end.

PRESIDENT MARSH, OF THE UNIVERSITY OF VERMONT.

Dr. Harris's mention of the Coleridgians at the University of Vermont suggests at once the name of President Marsh, the founder of the school, if school it may be called.

James Marsh was born in Hartford, Vt., in 1794. He received his college education at Dartmouth and his theological education at Andover Seminary. He was a tutor for a time at Dartmouth, served both as professor and president of Hampden-Sidney College, Virginia, and became president of the University of Vermont in 1826. After fulfilling the duties of the presidency ten years, he resigned the office to accept the chair of moral and intellectual philosophy, which he continued to hold until his death in 1842. The principal facts in his career that relate to the present topic will be narrated.

While at Andover he found time, in addition to his more strictly professional studies, to acquire a good knowledge of two or three modern languages, and for investigating to some extent in the original sources the history and literature of the middle ages. On February 21, 1821, he makes this entry in his journal:

> Of my progress in the German language, I have been more conscious than ever before and begin to feel as if I had conquered it. On Saturday in the forenoon I read in the regular course of my studies about fifty pages, and read it well. In Spanish, too, I have done something and shall conquer it within the year.

He read Heeren's Ideen. He learned, also, to read English books in the light of Continental scholarship. Thus he wrote of Hallam's Middle Ages:

> He does not seem to be acquainted with the opinions of De Staël and Schlegel; or, if he is, he does not, in my opinion, give them right influence in forming his notions of the human mind in the Roman Empire.

While at Andover Dr. Marsh became interested in Coleridge. One of Professor Torrey's most interesting items relating to the period is this one:

> At this time he was in the habit of studying a good deal the works of Coleridge, particularly the Sketches of his Literary Life and Opinions. With the aid of Coleridge and Madame de Staël he began, moreover, to consult Kant's Critique of Pure Reason, then a perfect *terra incognita* to American scholars.

At the same time Marsh undertook to read through the works of Plato and make a copious analysis of each dialogue. It is also related that, early in life, he admired Lord Byron's poetry, but later laid him aside for Wordsworth.

It would be interesting to know what turned Dr. Marsh's attention in these directions, which were then little trodden by American students. In respect to the study of German he may, perhaps, have received an impulse from Prof. Moses Stuart, who, about this time, was planting the seeds of German theological learning at Andover. But however that may have been, the new interests meant much to Dr. Marsh and to American thought. Fortunately, they were congruous with the native habit of his mind. One result was that he adopted a scheme of philosophical and theological thought quite different from the schemes then prevailing in the country. As

Professor Torrey puts it, the prevailing doctrine of the day was, "'Understand and then believe,' while that which Mr. Marsh would set forth, not as anything new but as the old doctrine of the Church from the earliest times, was, 'Believe that ye may understand.'" When he received a copy of Coleridge's Aids to Reflection, he was struck not merely by the coincidence of the thoughts set forth with his own views which he discovered, but especially with the adaptation of these thoughts to the ends that he sought. Thus, Dr. Marsh wished to throw aside the so-called Pailean and Caledonian schools of philosophy, as he called them, and partly to learn and partly to think out a more spiritual system. He held with Coleridge that, "so far from being irrational, the Christian faith is the perfection of human reason;" or, to quote what he himself says of Coleridge:

He proves that the scheme of Christianity, though not discoverable by reason, is yet in accordance with it—that link follows link by necessary consequence, that religion passes out of the ken of reason only when the eye of reason has reached its own horizon, and that faith is then but its continuation.

This, of course, is going a long way back toward the Christian Platonists of Alexandria.

While at the seminary, in connection with a student friend, Dr. Marsh undertook to translate and prepare for the press the German work of Bellermann on the Geography of the Scriptures, being moved thereto by the great want of a standard work in the English language on that important branch of biblical learning. In 1829 he wrote his Preliminary Essay to the American edition of the Aids to Reflection, in which he focalizes the leading points of Coleridge's system of philosophic and religious thought. This essay was republished in England and is reprinted by Dr. Shedd in his edition of Coleridge's works, published in 1853. The same year Marsh wrote for The Christian Spectator an elaborate review of Moses Stuart's Commentary on Hebrews, in which he strove to give an impulse to the new theological learning. Replying to the charge that the introduction of the German learning into the country would promote infidelity, he said:

We have more fear of injury to the cause of religion from the influence of superficial modes and systems of philosophizing than from the principles of criticism.

In 1833 he published Herder's work, The Spirit of Hebrew Poetry, which he had translated some years earlier at Hampden-Sidney.

Dr. Marsh was also an educational reformer. He brought to the presidency of the University of Vermont some ideas in regard to colleges and college education that were not then current. Professor Torrey epitomizes these ideas as follows:

First, as to the rules for the admission of students, he would have them so modified as to extend the privileges of collegiate instruction, under certain regulations, to those whose necessities would limit them to a part only of the general course. Secondly, as to the system of discipline, he would have a mode of government more entirely parental, and more exclusively confined to the exertion of moral and social influence, and where this failed would prefer simply to exclude the unworthy individual from the enjoyment of his privileges. Thirdly, as to the method of instruction, he would have it uniformly directed in all its branches to the ultimate result of a full and manly development of the individual, without thwarting or coercing the native tendencies of his mind. Fourthly, as to the system of classification or subdivision, he would have it such as at least to encourage those who showed themselves able and disposed to do more than accomplish the prescribed course, to pursue other additional studies under the advice and direction of the faculty. Fifthly, he proposed to have all designations of rank and of scholarship proceed on the absolute instead of the relative merit of the student, and to be determined on a close examination, by appropriate marks, to be recorded at the end of each year.

These views, after a full discussion, were published by the authority of the faculty in a pamphlet entitled, An Exposition of a Course of Instruction and Discipline in the University of Vermont. It will be seen that these ideas, as far as they went, were similar to the views that such educational reformers as Thomas Jefferson and George Ticknor were then seeking to carry into effect. He was like Ticknor in

another particular, he was in advance of his times; for when the University of Vermont was put on these lines it rather fell off than gained in patronage. Finally, it must be said that Dr. Marsh was deeply interested also in common schools. In 1829 he published in a Vermont newspaper a series of articles on common school education, and seven years later he devoted the larger part of his inaugural address to the same subject.[1]

THEOLOGY: PROFESSORS STUART AND SMITH.

The influence of German studies upon American theology, both thought and learning, has been very marked. The subject is one that, if carefully worked out, would require a volume. Notices of only two pioneers in this field will be introduced in this place.

Moses Stuart, the patriarch of sacred philology in America, was born in Wilton, Conn., in the year 1780. At the age of 17 he entered the sophomore class of Yale College, from which he was graduated in due time with the highest honors. After leaving college he prepared himself for the law, but before his admission to the bar he was called to a tutorship in Yale College. Here he remained two years. After a religious revival at Yale, in 1801–2, he entered the ministry and became pastor of a church in New Haven, where he remained until he was called to the professorship of sacred literature in the theological seminary at Andover, Mass., in 1810. A quotation from Professor Stuart himself gives a vivid idea of the state of American scholarship at that time.

> I came here [he says] with little more than a knowledge of the Hebrew alphabet and the power of making out, after a poor fashion, too, the bare translation of some [five or six] chapters in Genesis and a few Psalms. I had not, and never have had, the aid of any teacher in my biblical studies. Alas! for our country at that time; there was scarcely a man in it, unless by accident someone who had been educated abroad, that had such a knowledge of Hebrew as was requisite in order to be an instructor.

The youthful professor's knowledge of Greek was also scanty. Although a graduate of the second college in the land, he was, as regards his special subjects, a self-made man. In two years Professor Stuart had prepared a Hebrew grammar, which his pupils copied down from day to day. When it was published, in 1813, the author was obliged to set up a part of the type with his own hands, so great were the difficulties of printing it. This grammar, which was enlarged and reprinted six times, called forth the admiration of foreign scholars.

To facilitate his philological studies, Professor Stuart found himself obliged to learn German. No teacher was available, and the necessary apparatus only at an exorbitant price; but in two weeks' time he had read the Gospel of John in German. Through a friend he got possession of Seiler's Biblische Hermeneutik, which introduced him to the wide range of German literature. Soon the library of the seminary possessed the best collection of German biblical literature in the land. These German studies brought upon Professor Stuart the suspicion and enmity of his colleagues. German theology and philosophy would undermine his orthodoxy, they thought. But so far was this from being the case that he used the fruits of his German learning as a weapon against unitarianism in his letters to Dr. Channing. His enemies now saw the importance of German scholarship for the church. Before this controversy scarcely an American divine had any knowledge of German literature. It now became common. To Professor Stuart belongs the credit of opening American theologians to the rich storehouse of German biblical literature. In the list of his published works we find several translations from the German, viz.

[1] This account of Dr. Marsh has been drawn from a work carrying the following title page: The Remains of the Rev. James Marsh, D. D., late President and Professor of Moral and Intellectual Philosophy in the University of Vermont, with a memoir of His Life. Boston, Crocker & Brewster, 1843. The memoir was written by Prof. J. Torrey, the translator of Neander's History of the Christian Religion and Church.

1 Winer's Greek Grammar of the New Testament, translated in collaboration with Professor Robinson. 1825.

2. Roediger's Gesenius. 1846.

3. On the discrepancy between the Sabellian and Athanasian method of representing the doctrine of the Trinity, translated from Schleiermacher. 1835.

4. The Hebrew Tenses, by Ewald. 1838.

5. Doctrine respecting the person of Christ, by Dorner. 1850.

Also several works in Latin by German authors.[1]

Professor Stuart's Hebrew Grammar was based on the works of German scholars, generally the older scholars. The new edition of this work, revised and enlarged, appeared at Andover in 1823.[2]

One valuable product of Professor Stuart's studies and authorship, not mentioned in the preceding sketch, was his edition of Ernesti's work on interpretation. This book was published in 1822, and does not appear to have reached a second edition.[3]

Henry Boynton Smith, the eminent American theologian, was born in Portland, Me., on the 21st of November, 1815. He was graduated from Bowdoin College in 1834, and received his theological training at Andover Seminary and the Theological Seminary in Bangor. At Bangor he was introduced to German studies by Dr. Leonard Woods, jr., afterwards president of Bowdoin. In the autumn of 1837 he went to Europe, and in the spring of 1838 was settled at Halle, where the next year was spent in theological and metaphysical studies. He formed at Halle an intimate friendship with Professor Tholuck, who did much to stay the tide of rationalism then rife in the German universities. The second year of his European life was spent in Berlin, where he had such teachers as Leander, Trendelenberg, and Hengstenberg. Among his intimate friends was the widow of Hegel.

In July, 1840, Mr. Smith arrived in New York. After seven years work as a country pastor he was elected to the chair of mental and moral philosophy at Amherst College. In 1850 he left this position for the professorship of church history in Union Seminary, where he found full scope for his wide knowledge of German philosophy and theology. In his teaching he applied the best German methods, discarding the slavish use of text-books. In 1855 he was transferred to the professorship of theology, which he held until his retirement in 1874.

A large part of Mr. Smith's literary productions are translations of German theological and philosophical works. He was a master of the translator's art, and contributed largely to the introduction of German thought into America. Many of these translations appeared in The Bibliotheca Sacra. The following list (incomplete) shows his activity in this branch of literary work:

1. Interpretation of the number 666 in the Apocalypse, etc., by Benary.

2. The Structure of the Gospel according to Matthew, by Harless.

3. The Expiatory Sacrifices of the Greeks and Romans and their Relation to the one Sacrifice upon Golgotha, by Lasaulx.

4. Interpretation of the Baptismal Formula, by Bindseil.

5. The Doctrine respecting Angels, by Twesten

6. A Sketch of German Philosophy on the basis of an article in the Halle *Literaturzeitung* (partly translation).

7. The Trinity, by Twesten.

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[1] The foregoing account of Professor Stuart is derived from Prof. Edwards A. Park's Discourse at the funeral of Prof. Moses Stuart, 1852.

[2] A Hebrew grammar, with a praxis on select portions of Genesis and the Psalms. By Moses Stuart, professor, etc. A new edition, revised and enlarged. Andover, 1823.

[3] Elements of Interpretation, translated from the Latin of J. A. Ernesti and accompanied by notes, with an appendix containing extracts from Morus, Beck, and Keil. By Moses Stuart, associate prof. of Sac. Lit. in the Theol. Seminary at Andover. Andover, 1822.

8. Vermittlungstheologie, Twesten.
9. Parts of Hegel.
10. Lehrbuch der Dogmengeschichte, Hagenbach.
11. Church History, Gieseler (unfinished).

He also prepared elaborate articles for The New American Cyclopædia on Hegel, Kant, and Schelling.[1]

[1] This account of Dr. Smith is compiled from Lewis S. Stearns, Henry Boynton Smith (in Religious Leaders Series). Boston, 1892.

CHAPTER XIV.

THE STATUS OF WOMAN FROM THE EDUCATIONAL AND INDUSTRIAL STANDPOINT.[1]

Authorities consulted: Statistical tables.—Catalogues of universities, 1896-97.—Addresses of President Eliot (Harvard), Mrs. Louis Agassiz, Dr. Waggener of University of Texas.—Prospectus issued by Association of Collegiate Alumnæ.—Die akademische Frau: Gutachten über die Befähigung der Frau, von Arthur Kirchhoff, Berlin, 1897.—La Femme-Avocat, par Louis Frank, Paris, 1898.—Règlement de l'Université de Genève.—Le travail des femmes au XIXe siècle, par Paul Leroy-Beaulieu.—Essai sur la condition politique de la femme, par Louis Frank.—Deutsche Zeitschrift für Ausländisches Unterrichtswesen, 2ter Jhrg., Heft III.—Democracy and Liberty, by W. E. H. Lecky.—Die Entwickelung und der gegenwärtige Stand des medicinischen Frauenstudiums in den Europäischen und aussereuropäischen Ländern, von Dr. Agnes Blum.—Woman's Work in America, by Annie Nathan Meyer.—Conspectus of Law Lectures at New York University, 1896-97.—Arrêts notables de différents tribunaux du Royaume, Tome 1.—Angaænde Kvinders Adgang til Ansættelse i offentlige Stillinger, 1896.—Women Wage Earners; their Past, their Present, and their Future, by Helen Campbell.—Revue Bleue, 4 juillet 1896.—Girls' Technical Schools on the Continent, by Marion Mulhall.—Der Internationale Kongress für Frauenwerke und Frauenbestrebungen, in Berlin, 19 bis 26 September 1896.—Official Proceedings of the Third Biennial of General Federation of Women's Clubs, Louisville, 1896.—Files of Revue Internationale de l'Enseignement.—Neue Bahnen, Organ des Allgemeinen Deutschen Frauenvereins.—Die Frauenbewegung, Die Frau, Allgemeine Deutsche Lehrerzeitung, Deutsche Hausfrauenzeitung, for 1896-1897.—Journal des Débats, 1896.

INTRODUCTION.

The educational progress of woman in different countries was discussed in the Report of the Commissioner for 1894-95, pp. 893-976.[2]

This chapter gives additional information in regard to the higher education of women in America and in European countries, introduces industrial education for women (including statement by Prof. Edward S. Joynes), presents a few facts regarding women's congresses and federations (including Report on General Federation of Woman's Clubs, by Mrs. Ellen M. Henrotin, president, in 1897), and also includes a paper by Miss Margaret J. Evans, principal of the woman's department of Carleton College, Minnesota, on "Women's Clubs as an Educational Factor."

WOMAN'S COLLEGIATE WORK IN AMERICA.

In speaking of the attitude of people in general toward woman's development, it has been stated[3] that—

Twenty-five years ago the ability of a woman to master subjects thought necessary for a man's education was disputed. It was seriously questioned at the time

[1] Prepared by Miss Frances Graham French.

[2] *Topical Outline in 1894-95:* The woman question in general.—The college-bred woman: Statistics of women's colleges, 1893-94, compared with 1891-92.—Woman's colleges (Vassar, Smith, Wellesley, Bryn Mawr).—Woman's development in Western, Eastern, and Southern States.—The education of women in different countries.—Women in the professions (medicine, law, theology); regulations in various countries.—Woman as a promotive force in education.—School legislation in the United States and other countries.—Marriage rate of college-bred women.—Bibliography.

[3] By Dr. Leslie Waggener, of the University of Texas.

whether the "female" mind could untangle the intricacies of pure mathematics, could appreciate the abstruse speculations of metaphysics, or could follow, step by step, the inductions of a scientific investigation. It was contended in the educational discussions of that day, that one of two alternatives was necessary if young women were admitted to colleges and universities manned and equipped to prepare young men for the intellectual conflicts of life. It was asserted that either the standard of scholarship would be lowered, or that the young woman would be left hopelessly behind, and the experiment prove, as far as they were concerned, a dismal failure. This prediction has, on trial, proved absolutely groundless. Whatever may be the distinction between a "male" and a "female" mind it is not of such a character as to prevent young women from holding their own in intellectual competition with young men. The teaching of actual experience is that the scholarship of all of our higher institutions of learning has been raised, and in many cases the presence of young women in the classes has been the stimulus and the inspiration.

Oftentimes the women are the "quickest, brightest, most receptive, and most appreciative students," and, considering their numbers, they carry off more than their share of honors. A training by which a young woman is made able, if need be, to make her own living, secures for her the privilege of being independent. A woman trained with men learns other things than those found in the text-books, or in the crucibles of the laboratory. Among these the most important, perhaps, is the knowledge she acquires of men. The fact that a woman has competed with a man in the class room is a great help to her when it becomes necessary for her to compete with him in the occupations of life. The fact that she has outstripped him, perhaps, in the race for university honors, is a reason why she feels no trepidation when she contends with men for the substantial prizes of life, and the reason, too, why she captures them with the assurance of one to whom they rightly belong.

Again it is stated[1] that—

In the midst of her higher education, woman must not forget her responsibilities. She should rather adapt the new means to the condition of woman's life; she must show that she is benefited by having her observation trained.

Again the indirect motives of the higher education of women are dwelt upon:[2]

It is a quarter of a century since the college doors were opened to women. Since that time, where girls and boys have been educated together, it has become an historical fact that women have made rapid strides, and captured a greater number of honors in proportion to their number than men. Since the advent of women into colleges the secondary schools have been better supported and are more wisely directed.

The number of women students in different collegiate institutions is presented in the second volume of this Report. A short résumé of the same is given here, however, for convenience' sake.

The admission requirements, standards of instruction, and general organization of a few of the women's colleges of this country are in accord with the characteristics of colleges of liberal arts, and form a group (Division A) by themselves.[3] Their work is essentially collegiate, and in this they differ from the older seminaries for women, which, while making more or less provision for the distinctive studies of the college curriculum, are schools for general instruction.

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[1] By Mrs. Louis Agassiz, in an address to the Radcliffe graduates in 1896.

[2] By President Eliot, of Harvard College, in an address on the same occasion.

[3] See tables of colleges for women, vol. 2 of this Report.

Colleges for women, 1895–96 and 1896–97.

DIVISION A.—PROFESSORS AND STUDENTS.

	United States.	
	1895–96.	1896–97.
Institutions	14	14
Professors and instructors:		
Preparatory department—		
Male		
Female	20	22
Collegiate department—		
Male	221	242
Female	282	281
Total—		
Male	221	248
Female	293	313
Students:		
Preparatory department	254	168
Collegiate department	3,718	3,721
Graduate department	192	192
Total	a 4,328	a 4,421

a Includes students in music, art, etc., not included under any other department.

The number of degrees conferred in this class of colleges (Division A) for women in 1896–97[1] for the whole United States was 514 A. B., 123 B. L., 41 A. M., 25 B. S., 1 Ph. D., and 5 B. Mus. The other colleges give more general instruction, and are reported as follows:

Colleges for women, 1895–96 and 1896–97.

DIVISION B.—PROFESSORS AND STUDENTS.

	United States.	
	1895–96.	1896–97.
Institutions	148	143
Professors and instructors:		
Males	457	447
Females	1,581	1,510
Students:		
Primary department	1,937	2,166
Preparatory department	4,891	4,532
Collegiate department	10,321	10,669
Graduate department	192	260
Total	20,335	19,534
In collegiate department, pursuing courses leading to—		
A. B. degree	2,745	3,071
Ph. B. degree	59	5
M. E. L. or B. L. degree	877	1,958
B. S. degree	748	984
Other first degrees	271	160
In pedagogical courses	508	702
In music	8,272	7,843
In art	2,451	2,152

The degrees conferred by colleges for women, Division B, for the whole United States in 1896–97[2] were as follows: 343 M. E. L. or B. L., 478 A. B., 128 B. S., 19 A. M., 113 B. Mus., 23 B. Paint., 5 L. A., 1 M. L. A., 1 B. Ped., 1 M. L.

In coeducational universities and colleges in 1896–97[3] throughout the United States

[1] The number of degrees conferred for 1895–96 for the whole United States was 459 A. B.; 105 B. L.; 40 A. M.; 27 B. S.; 5 Ph. D., and 3 B. Mus.

[2] The degrees conferred by colleges for women, Division B, were for the whole United States in 1895–96, as follows: 244 M. E. L. or B. L., 419 A. B., 82 B. L., 35 A. M., 1 M. L. A., 4 L. A., 3 L. S., 118 B. Mus., 29 B. Paint., 9 M. L.

[3] Degrees in 1895–96 were: 706 A. B., 277 B. S., 271 Ph. B., 348 B. L., 15 M. E. L., 123 A. M., 30 M. S., 8 M. L., 12 Ph. M., 22 Ph. D., 3 Sc. D., 1 B. Arch., 43 B. Mus., 8 B. Paint., 6 B. O., 39 Ped. B., 7 Pd. M., 2 Pd. D.

the following were the number of women receiving different degrees: 713 A. B., 327 B. S., 375 Ph. B., 283 B. L., 11 M. E. L., 101 A. M., 23 M. S., 28 M. L., 18 Ph. M., 14 Ph. D, 60 B. Mus., 4 B. Paint., 27 Ped. B., 8 Pd. M., 3 Pd. D.

Yale University, which admitted women into its graduate department three years ago, made a new and important departure in 1897. The faculty had arranged for the establishment of a teachers' course, open to all teachers, male and female, of public and private schools of the State. The course consisted of twenty-four lectures—eight in the fall, eight in the winter, and eight in the spring term. The lectures, given on Saturdays from 10 to 11, were open to graduates of colleges and to those who had qualified themselves by previous study. The tickets for the course—$20—admitted the holders to the college library exhibition rooms, Peabody Museum, and the Art School collections. Teachers taking this course have their names entered on the university catalogue, but are not regarded as candidates for degrees.

Similar courses for teachers were reported in the University of Pennsylvania (Catalogue 1896–97, pp. 162–163), the courses being adjusted to the needs of persons who had had normal or high-school training and who wished to avail themselves of opportunities for more advanced work. These courses do not lead to a degree.

The general tendencies of the times in the United States are toward the entering of coeducational universities, where men and women may have equal opportunities for higher studies. With this tendency comes a gradual diminution in women's colleges per se, although the same high requirements, as in former years, are found in such colleges as Vassar, Smith, Wellesley, and Bryn Mawr.

Large numbers of students seek home or foreign fellowships, and the studies pursued by such students tend more toward higher attainments than was noticeable a decade or more ago. Traveling fellowships are endowed by well-known philanthropic women, and the recipients of such fellowships gravitate to Leipsic, Heidelberg, Berlin, Göttingen, Zurich, Cambridge, Oxford, the Sorbonne, and the Collège de France. Special courses are pursued in Greek and Latin, English and the Romance languages, political economy, chemistry, biology, and mathematics, or possibly in Teutonic philology, history, political science, and philosophy. Typical of the higher studies pursued in women's colleges may be mentioned the following, which were observed in a catalogue of Bryn Mawr for 1896. Among the subjects treated were: "The use of the historical present in early Latin," "Singular solutions of differential equations of the first order in two variants, and the geometrical properties of certain invariants and covariants of their complete privatives," "The American colonies as a source of naval supplies for Great Britain," "The Latin hymn 'Christe Qui Lux es et Dies,' and its mediæval and modern translations in English, German, and Dutch," "The Anglo-Saxon metrical version of Psalms L to CL." The ladies presenting these theses held degrees from other home colleges or had pursued their studies in foreign universities or possessed fellowships granted for superior work.

As a matter of encouragement to women desiring to pursue higher branches, the Collegiate Alumnæ a few years back decided to aid those desiring European or American fellowships. The prospectus here presented indicates their methods, and their efforts are being crowned with success:[1]

The Association of Collegiate Alumnæ is desirous of encouraging the pursuit of advanced courses of study among women graduates of colleges. It therefore proposes to devote $500 every year toward paying the expenses of some young woman who wishes to carry on her studies in a foreign country, and $350 toward the expenses of another who proposes to take advanced studies in this country. Applications for these fellowships will be received by any member of the committee having them in charge. The candidates must be graduates of colleges belonging to the association, and applications for the year 1896–97 must be handed in before April 10, 1896. The fellowships will be awarded only to candidates who give promise of distinction in the subjects to which they devote themselves. It will be the aim of the committee

[1]Signed by Mrs. Bessie Bradwell Hebner, 1428 Michigan avenue, Chicago, Ill.; Mrs. Helen Hiscock Backus, 57 Livingston street, Brooklyn, N. Y.; Miss Winifred E. Merrill, 268 State street, Albany, N. Y.

to appoint the candidates who are best fitted for the positions through original gifts, previous training, energy, power of endurance, and health. To this end they will receive applications in writing from eligible candidates, who will present as clearly as possible their claims to the fellowships. A competitive examination will not be held, but the bestowal of the fellowships will be based upon evidence of the candidate's ability and of her prospect of success in her chosen line of study. Such evidence will naturally consist of (*a*) her college diploma, (*b*) testimonials as to superior ability and high character from her professors and other qualified judges, (*c*) satisfactory evidence of thoroughly good health, (*d*) a statement of the work in which she proposes to engage subsequently, (*e*) last, and of chief importance, examples of her scientific or literary work in the form of papers or articles or accounts of scientific investigations which she has carried out.

The fellowships will not usually be granted to those who are intending to take up the practice of any of the three learned professions, though such are not formally excluded from the competition; they will rather be bestowed upon those who are looking forward to positions as professors and teachers and to literary and scientific vocations. Preference will be given, other things being equal, to graduates of not more than five years standing. The fellowships will, in general, be held for one year, but in an unusually promising case the term may be extended at the discretion of the committee.

The barriers to woman's higher education seem effectually removed, and to-day eight-tenths of the colleges, universities, and professional schools of the United States are open to women students. As is stated by ex-President Alice Freeman Palmer, of Wellesley College, "30,000 girls have already graduated from colleges, while 40,000 more are preparing to graduate." The obtaining of a collegiate education gives the women more ambition to enter a profession, or, if they decide to marry, it is stated that—

The advanced education they have received has added to their natural endowments wisdom, strength, patience, balance, and self-control * * * and that in addition to a wise discharge of their domestic duties, their homes have become centers of scientific or literary study or of philanthropy in the communities where they live.[1]

THE PROFESSIONS.

It is stated that the advancement of women in professional life is less rapid than in literature. The training of women for medical practice was long opposed by medical schools and men physicians. Equally tedious was the effort to obtain legal instruction and admission to the legal profession, and even to-day the admission to theological schools and the ministry is seriously contested; yet all these professions are gradually being opened to women. In 1896–97 there were in the United States 1,583 women pursuing medical studies to 1,471 in 1895–96; in dentistry, 150 women in 1896–97 to 143 in 1895–96; in pharmacy, 131 in 1896–97 to 140 in 1895–96. In law courses of professional schools were 131 women in 1896–97 to 77 in 1895–96; in theological courses 193 women in 1896–97.

Medicine.—The subject of women in the medical profession[2] was quite fully treated in the Report of the Commissioner of Education for 1894–95, pages 950–956, however a few additional facts are here appended. To quote from W. E. H. Lecky:

The special aptitude of women for the management of the sick has been fully recognized. Nothing is better attested than that, in the power of quick and delicate observation of slight changes, which is at least one of the most essential qualities that are required for the successful treatment of disease, women are, on the whole, superior to men; as nurses they have always been preeminent; but in our generation, to the incalculable benefit of both sexes, the profession has been much augmented and raised by skillful training to a much higher degree of competence.[3]

In New York City in 1897 a movement bearing upon this subject was on foot, which is here presented:

The changes asked for on behalf of the women of the city have been embodied in separate bills and will come in as supplemental legislation. In March, 1897, Senator

[1] From address by Mrs. Mary A. Livermore before the Woman's Club of Denver in 1897.

[2] It may be stated here as a seeming innovation that the Massachusetts Eclectic Medical Society has decided to admit women.

[3] From Democracy and Liberty, by William Edward Hartpole Lecky, vol. 2.

Charles C. Page in the senate, and Mr. George C. Austin in the assembly, both Republicans of New York, introduced a bill drawn by Dr. Mary Putnam-Jacobi, providing that there be two women commissioners of charities so that the board, instead of consisting as at present of three men, be made up of three men and two women. Dr. Jacobi felt that this would be the surest way in which to obtain the appointment of women physicians in all public institutions and the admission of women students to the hospitals.

Still another indication of the advanced conditions from the medical standpoint was reported from New Orleans on April 19, 1897:

The Louisiana State board of medical examiners to-day gave a diploma to Mrs. Emma Wakefield to practice medicine. She is the first negro woman in the South, and, it is said, in the Union, to receive this honor. She is the daughter of ex-Senator Wakefield, and a graduate of the medical department of the New Orleans Colored University.

During the year laws were passed regarding State examinations for physicians; similar laws have been passed for the District of Columbia. Further information regarding women physicians of the United States is found in another part of this volume.[1]

Law.—The major part of the law schools of the United States admit women to their law classes when application is made, and in 1890 the dean of the department of law of Michigan University wrote that "the women who have attended the law school have compared favorably in the matter of scholarship with the men. They are quite as capable of acquiring legal knowledge as men."[2] The dean of the Union College of Law adds his quota to the general discussion as to the advisability of women studying law, for he says "we discover no difference in the capacity of the sexes to comprehend and apply legal principles." At the close of the seventh year of the woman's law class of New York University on April 14, 1897, the graduating class was composed of a larger number of women than men. These ladies mastered the rudiments of law in order to fit themselves to transact business as men transact it, and to take their places intelligently in the professions which are now open to women. There were 15 women in the senior law class, and about 25 in the junior law class.

The law courses connected with New York University, and founded by the Woman's Legal Education Society, sent out the following circular in 1896-97, which is indicative of their work:

These courses are framed to meet the wants of business women and women in private life who desire familiarity with the existing law, either for practical purposes to assist their judgment as litigants, witnesses, and custodians of trust estates, or as a higher study for their mental development. They also furnish preparation for entrance upon the professional study of the law, with a view to active practice at the bar.

Four courses of lectures on law will be given during the winter of 1896-97. Course I begins Monday, October 26, 1896: General jurisprudence, international law, and constitutional law. Course II begins Monday, November 23, 1896: Historical jurisprudence, domestic relations, wills and administration. Course III begins Monday, January 4, 1897: The law of contracts, agency, sale, partnership, commercial paper, insurance, shipping. Course IV begins Monday, February 1, 1897: The law of real property, torts, equity, pleading, evidence, procedure, courts and their jurisdiction, crimes and their punishment. No examination is necessary for admission to the class.

The fees are $6 for each of the four courses, or $20 for the four courses, payable in advance. A graduation fee of $5, covering the charge for diploma and the expenses of the closing exercises, must be paid by all who apply for the chancellor's certificate.

There are ten entirely free and twenty half-free scholarships, which may be obtained by applicants who will attend the four courses and can not afford to pay the fee.

A prize of $25, the generous gift of Mrs. Ralph L. Shainwald, ex-president of the Alumnæ Association, will be awarded at the closing exercises to the member of the graduating class of 1897 who writes the best essay on this subject: "What women have accomplished for the protection of public health." The essay must be presented to the president before March 15, 1897.

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[1] Reported upon under Professional Instruction, in a subsequent part of this Report.

[2] Woman in Law, by Ada M. Bittenbender, in "Woman's Work in America," by Annie Nathan Meyer.

A prize scholarship, valued at $200, in the form of two years' free tuition in the university law school, will be awarded to the student who passes the best examination for the chancellor's certificate.

There are three lectures weekly—Monday, Wednesday, and Friday. There are two classes—a morning class, meeting at 11 o'clock, and an evening class, meeting at 8 o'clock. Students are free to elect to attend either of these classes, and may occasionally attend either or both, as may suit their convenience.

Eight days will be devoted to review in preparation for examination.

No student need take the examination, but the chancellor's certificate will be awarded only to those who pass a strict final examination. This certificate will be publicly conferred at the closing exercises, to be held in the month of April, 1897.

The method of instruction is strictly academic. A quiz is held at the opening of the hour, in which volunteers only are expected to participate. Any legal question that may be proposed will be discussed by the lecturer as fully as time will permit.

Professor Russell's Outline Study of Law will be used as the class text-book. The following books are recommended for reading, collateral to the lectures: Cooley's Constitutional Law, Woolsey's International Law, Hadley's Roman Law, Robinson's Elementary Law, Browne's Domestic Relations, Remsen's Intestate Succession, and Benjamin's Principles of Contracts.

The scope of the lectures given during the year will appear from the subjects of the lectures, as follows:

Course I.—1. Introduction to the study of law. 2. Nature of law in general. 3. Public law of nations. 4. International law in time of peace. 5. International law in time of war. 6. Equality before the law. 7. Leading doctrines of civil policy. 8. Politico-economic force in constitutional development. 9. Studies in constitutional and political history. 10. Right of suffrage; the status of the Indians. 11. The Federal judiciary. 12. Constitutional amendments.

Course II.—13. The study of Roman law. 14. The family and succession at Roman law. 15. Christianity and modern Roman law. 16. Husband and wife. 17. Divorce. 18. Parent and child. 19. Master and servant; guardian and ward. 20. Legal incapacity. 21. Corporations. 22. Wills. 23. Intestate succession. 24. Executors and administrators

Course III.—25. Contracts and their construction. 26. The statute of frauds; the statute of limitations. 27. Illegal contracts. 28. Consideration. 29. Sale and warranty 30 Agents, attorneys, factors, and brokers. 31. Commercial paper 32. Partnership. 33. Bailments, innkeepers and common carriers. 34. Insurance. 35. Shipping. 36. Patents, copyrights, and trade-marks.

Course IV.—37. The feudal system. 38. Deeds and their covenants. 39. Tenure of real property. 40. Leases, mortgages, searching titles. 41. Torts and damages. 42. Equity jurisprudence. 43. Pleading. 44. Evidence. 45. Principles of proof. 46. Courts and their jurisdiction. 47. Principles of criminal law. 48. Crimes and their punishment.

The Woman's Legal Education Society, which has for its board of directors, President, Mrs. John P. Munn; vice-president, Miss Helen M. Gould; secretary, Miss Isabella Mary Pettus; Mrs. Alexander Forman, Mrs. Esther Herrman, Mrs. Henry Dormitzer, Miss Lucette P. Banks, has for six years supported the chair for the woman's law class of the university.

Membership in the Woman's Legal Education Society is open to all interested in the work on election by the board of directors and payment of dues. The annual subscription is $5, which entitles the subscriber to one course of twelve lectures at the university.

Under the auspices of the society, several eminent writers and lecturers have generously agreed to present occasional addresses on topics of special interest.

EDUCATION OF WOMEN IN FOREIGN COUNTRIES.[1]

The conditions are gradually changing as regards women in the universities of foreign countries; the courses of study in secondary schools of Germany are being made to correspond with the requirements for university entrance examinations; the constant efforts of women in various countries to have the professions opened to them are all producing a change in the views of even those most opposed to woman's advancement. The general state of mind in regard to the admission of women into the universities of Germany is that of resignation—if it must be, so be it.[2]

[1] This subject was fully treated in the Report of the Commissioner of Education for 1894-95, pp. 907-949, and the gradual opening of the universities to women was reported upon.

[2] Résumé of statements from "Die akademische Frau," von Herrn Arthur Kirchhoff. Berlin, 1897. This work contains the opinions of many prominent professors of Germany who were appealed to in regard to university study for women.

Equality of intellect is conceded to the sexes by some professors; power of mathematical study is accredited to them; but the professors of history are more reserved in their opinion of woman's development. They do not recognize the value of the general ideas, methods, or judgment of the women who pursue historical study; they indicate that women deal too much with details and are often incapable of grasping the whole subject. They are opposed to women studying for professions which are already overfull; the professors also cling to the idea that academic studies may produce doctors, lawyers, engineers and Greek students, but that these studies do not bring out the feminine qualities. A few professors concede that woman should be allowed to develop mentally, as the conditions are such in the present century that all women, whatever may be their natural aptitude for home life, should be trained to carry on a life work if it be necessary that they become breadwinners. Higher courses for girls should be established, say some of the professors, so that all persons, irrespective of sex, be permitted to carry on higher studies. Another professor views the subject from the opposite side. He considers that the desire on the part of women to follow academic studies is the product of an unnatural hyperculture. From the point of legal studies it is said that women may be helpful to men in solving problems, yet it is not conceded that she possesses the mental endowment for practice before the courts; her nature is too emotional. In medicine the aptitude of women in hospital service, as nurses, and as a help in sudden emergencies, is conceded; but the pursuing of a line of study in clinics for dissection impresses the professors unpleasantly, as does also the carrying on of surgical operations. In philological and philosophical studies the professors allow that there seems to be no special objection to the pursuance of such studies if the preparatory training has been sufficient. And, again, a professor writes: "By all means create higher courses of study for girls, such as 'mädchen-gymnasia,' for therein will be found none of the inconveniences attendant upon the studying with men in universities and other like institutions." In certain cases the professors consider that coeducation from the lowest through the highest grades will be beneficial to both sexes, and they would withhold no advantage from those who desire to prepare themselves for the highest class of instruction. Yet the generality of opinion is unfavorable to the higher development of the woman's mind, as taking away somewhat from the femininity of the woman, thus withdrawing her from her natural sphere.

The reorganization of girls' schools in Prussia according to the regulations of May 31, 1894, by which those who are graduated as teachers may now obtain positions in secondary schools (whereas formerly they were limited to positions in elementary grades), the passing of a second examination, the "Wissenschaftliche" or "Oberlehrerinnen-Prüfung," which permits the undertaking of special work, indicate advance in the woman movement.

The minister of ecclesiastical affairs, instruction, and medical affairs, in 1896, accorded permission in Prussia to a woman to try for the examination of "Abiturient" before the college authorities of a Prussian gymnasium.

Higher courses of study for girls, now thoroughly established in Carlsruhe, Leipsic, Berlin, and Bremen, are similar in their aim to the curriculum of the gymnasia for boys, and the ministerial authorities in the different principalities see no objection to women acquiring the maturity certificate which leads to university study. In the winter of 1896-97 there were 93 women "Hospitanten" in Berlin University to 35 in 1895-96 and 39 in summer of 1896.

At present (1897) the universities of Heidelberg, Leipsic, Jena, Freiburg, and Berlin receive women students as "hearers," and Göttingen admits them as regular students.[1]

The following authoritative statement regarding admission to Berlin University was published in June, 1896. The minister of ecclesiastical affairs, instruction, and

[1] La Femme-Avocat, par Louis Frank, Paris, 1898, p. 64.

medical affairs in Prussia states that women who are desirous of attending university lectures must have the permission of the minister. Such would-be students are required to indicate the course of scientific study to be pursued, to give proofs of their preparation for the desired course and of their financial position. The permission accorded, then their legitimation papers and their diploma, or certificate of preparation, are to be presented to the rector of the university, after due announcement at the secretary's office of the university. After these papers and diplomas have been duly examined by the rector, the permission of the professors or docenten in the special sciences is required. The permission of attendance having been received through the university "Quæstor," then there is an honorar of 3 marks (71.4 cents) for the authorization papers (Erlaubnisschein), and 5 marks ($1.19) hearer money (Auditoriengelder) each semester. If a woman desires to come up for examination, an application book is handed her in which are the indications of lectures, etc., leading to such goal. At each semester the permission of the rector has to be renewed. These are the prerequisites for all women who wish to attend any lectures, and none are open to them without. As a certain supervision will always be exercised over the students, it is considered advisable to always have the rector's permission (Rektorats-Erlaubnisschein) in one's possession.[1] Such are the prerequisites for admission to Berlin University. In other universities of Germany efforts have been made by women to be recognized as regular students, but no definite action has been taken so that regulations may be given for the universities as a whole.

The minister of public instruction in Baden subordinates his decision in regard to the admission of women students to the universities by stating that the rector of each university is free to decide whether women shall be permitted to enter the examinations or not.

In Göttingen twelve women passed an excellent examination before the university authorities in 1896–97. The examining board has not yet decided to accord women official diplomas (Staatlich geltende Zeugnisse), but they do give them private certificates from the docents, and the board has asked that official authorization may be accorded. During the winter of 1895–96 there were thirty-one women, mostly from countries outside of Germany, attending the lectures in Göttingen.

The Senatus of the University of Munich discussed the possible admission of an English woman to the philosophical faculty as "hearer"—a student of Cambridge University in natural sciences. She desired to continue paleontological and geological studies. The matter was referred to the minister of public instruction.[2]

The Royal Academy for General Sciences (Königliche Akademie der gemeinnützigen Wissenschaften) in Erfurt decided to give a prize of 300 marks ($71.40) in 1896 for the best dissertation on the most expedient education for young women of from 15 to 20 years in the higher classes (Wie lässt sich die Erziehung der weiblichen Jugend in den höheren Berufsklassen unseres Volkes vom 15. bis zum 20. Lebensjahre am zweckmässigsten gestalten?).[3] The Royal Academy reserved the right of publication of the article. The subject-matter was to cover the social-ethical, literary-esthetic, and economic phases of the question, so that the young maiden might obtain knowledge of the best methods of development for whatever position or profession she may be called upon to occupy.

The work accomplished by women's organizations in Germany has doubtless aided in the furtherance of the higher education of woman. At least the educational status is greatly benefited by the establishment of women's gymnasia, with courses of study leading toward breadth of character and higher ambitions than would follow from being merely satisfied with the domestic-economic side of life. The "Verein für Förderung der Frauenbildung" in Bonn, established in 1890, aims to

[1] Revue Internationale de l'Enseignement, 15 mars 1896, pp. 283, 284, and 15 juin 1896, pp. 597, 598.

[2] Die Frauenbewegung, 15. Februar und 15. April 1896, pp. 41, 81.

[3] The MSS. to be sent by December, 1896, to the secretary, Prof. Dr. Heinzelmann, Erfurt

keep itself in touch with other women's associations of Germany, and more, in its own immediate vicinity it has established lecture courses, given by university professors, to treat upon subjects of interest to women. The distinguished women who are in charge have also established commercial schools for girls and adults who may desire thorough instruction along such lines as will enable them to keep books, act as housekeepers, and be thoroughly versed in exchange, brokerage, etc. The courses are half-year ones, held in the winter, and deemed especially valuable to wives and daughters of small tradespeople and industrialists. The object is not so much to prepare for commercial life as to thoroughly train for positions where all such information will be of assistance in keeping accounts, acting as cashiers, as landladies of inns, etc. Places are found for students of the commercial schools, and the 135 members of the "Verein" are proud of the success of the 20 students who passed excellent examinations in bookkeeping, correspondence for business purposes, brokerage, banking, stenography, typewriting, fine penmanship, and commercial law. The lecture courses have been well attended and the interest manifested has made the lady members of the association fully satisfied with the work undertaken.

The "Frauenbildungsverein zu Breslau" has undertaken, in addition to other instruction, to teach cooking, ironing, sewing by hand and machine, to servants, to women engaged in manufactories, and to other persons of a similar class. Seventy-four pupils in these branches were reported in the six months of the winter of 1895–1896. This woman's association has charge of an institution for woman's work (Lehranstalt für Frauenarbeiten) with 571 pupils, of a continuation school (Fortbildungsschule) with 303 students, a school for the care of children (Kinderpflegerinschule) with 79 pupils, a peoples' kindergarten (Volkskindergarten), 123 pupils; a normal school for instruction of teachers in woman's work (Handarbeitslehrerin-Seminar) with 30 pupils, a commercial school (Handelsschule) with 41 pupils, a high-grade school (Hochschule) with 133 pupils, school for domestic economy (Haushaltungsschule), 109 pupils; an institution for teaching photography (Photographische Lehranstalt), 17 pupils, and an evening high school with 74 pupils. In all, 1,480 women and girls were learning one or more of the above branches of instruction, many attending at least two subdivisions of the above schools. The association has also succeeded in obtaining admission for women to the lecture courses at Breslau University (12 ladies already attend), and other lecture courses on psychology and pedagogy are held. Other associations are doing good work in extending the education of girls in different directions. The courses preparatory to university study, under charge of Fräulein Helena Lange, in Berlin, are awakening great interest among young women of that vicinity.[1]

The general trend throughout Germany during the year 1896 was toward the advancement of woman's higher education, and Frau Augusta Schmidt, of the General German Woman's Association (Allgemeiner Deutschen Frauen-Verein), states that notwithstanding the fact that the legal rights of women have not reached the point desired, there is still progress indicated along educational lines, and that the old adage of "Leben ist Streben" still holds good.[2]

Still another phase of the same subject is that of higher study for women in agricultural schools. On November 21, 1896, the rector of the Landwirthschaftliche Hochschule in Berlin brought to the attention of the minister of ecclesiastical affairs, instruction, and medical affairs the fact that women desired to pursue the course at that school. The result was a ministerial decree permitting such study, if the rector sees no objection—this being a similar ruling to that pertaining to the entrance into the university. The course of study is such that the scientific agricultural knowledge obtained will be of value to women who may have the control of estates,

[1] These courses in Berlin and other cities are described on pp. 921–924 of Report of Commissioner of Education for 1894–95.

[2] Neue Bahnen: Organ des Allgemeinen Deutschen Frauen-Vereins, 1. Jänner 1897.

or who may wish to be more thoroughly conversant with such specialties as dairying, fruit culture, poultrying, cultivation of vegetables, etc.

The summer semester of the school commences between the 21st and 28th of April; the honorarium for ordinary and extraordinary hearers (ordentliche und ausserordentliche Hörer) is 120 marks ($28.56) a semester, for "Hospitanten" per hour, weekly and semester 5 marks ($1.19), the registration fee 10 marks ($2.38).

Private docents receive a special honorarium of 5 marks ($1.19) per weekly hour and semester. Sixty marks ($14.88) are required of "Hospitanten" for practical work in the greater chemical laboratory, and 20 marks ($5.76), in the smaller chemical laboratory, and in the agronomo-pedological laboratory, 20 marks ($5.76). There are six departments of study: (1) agriculture, forestry, and gardening; (2) natural sciences; (3) veterinary sciences; (4) science of law and political economy; (5) kulturtechnic (æsthetics) and architecture; (6) geodesy and mathematics.

In Austria the minister of public instruction and ecclesiastical affairs, Dr. Baron D. Gautsch von Frankenthurn, in discussing the question of woman's education, said (in the Abgeordnetenhaus on February 27, 1896) that in his opinion there were too many secondary schools for girls. He considered that the educational facilities need not be so extended that all women should have opportunities to study for a special profession, but that the general trend should be toward a thorough education for the position of wife and motherhood, although there were women who were eminently capable of carrying on and completing higher studies. Dr. Gautsch considered it advisable to establish a higher grade of school for girls in different parts of the Austro-Hungarian Empire which should give instruction especially suited to the considerations of life in the locality. This is what is most needed for the purpose of benefiting the middle classes, and the educational authorities have it in view to formulate a plan which they may deem the best for the establishment of schools with courses tending toward such higher education of women.[1]

For those women who desire still higher study the opportunities are being conceded, for the Emperor permits women, on suggestion of the minister in charge of educational affairs, to register themselves for the courses of medicine, pharmacy, and philosophy; the minister is, however, upon each demand of a woman for entrance into the universities, to take the question of her fitness under consideration. The proposition to establish Latin courses in secondary schools for girls, preparatory to university study, has also been taken into consideration. Several young women endeavored to enter the university at Prague (Bohemian division) and were refused admittance as students, yet were allowed to become "Hospitanten," although some professors objected even to that on account of the infraction of discipline.[2] The young women who requested admission had especially prepared themselves for the medical and academic departments in the "Minerva" gymnasium for girls opened in Prague in 1890, which adopted, in the main, the same course of study as in the boys' gymnasia. A most rigorous standard of scholarship is demanded.

On October 15, 1895, it was stated that a private university, exclusively devoted to women students was opened in Vienna. According to a statement of later date the minister of ecclesiastical affairs and public instruction has decreed[3] that women may enter the philosophical faculty of the universities as ordinary or extraordinary hearers (ordentliche and ausserordentliche Hörerinnen). The ordinary hearers are required to present a certificate that they have passed their eighteenth year, and they must also present the graduation certificate of a State gymnasium. The extraordinary hearers can be received in the philosophical faculty if they have graduated from a normal school, or from a girls' school of a grade recognized by the minister

[1] This authoritative statement is reported in Oesterreichische Schulbote, April, 1896, p. 162.

[2] Revue Internationale de l' Enseignement, 15 mai 1896, p. 162.

[3] Reported in the Organ of the General Teachers' Association, viz, Neue Bahnen, April 15, 1897, pp. 77–78.

as giving a suitable certificate. The extraordinary hearers are expected to be registered for ten lessons a week. If women desire to attend single lectures they can only do so when the docents request of the college of professors that such permission be given. The decree also admits ordinary and extraordinary hearers to the teachers' examination for girls' higher schools, and for girls middle grade schools (Mädchen-Mittelschulen). In October 1897 this decree goes into effect.

From 1896[1] on women are to be admitted to universities in Hungary in medical, pharmaceutical, and philosophical branches, providing the minister of worship and education and the rector of the university decide that the woman candidate has the required qualifications. A "Reskript des K. Ung. Ministers für Kultus and Unterricht," dating from December 19, 1895, announces that a decree of November 18, 1895, concerning university education of women, has been promulgated by his Majesty the Emperor of Austro-Hungary. This decree permits women to receive diplomas of capacity, which indicate the passing of the required examination and permit entering upon professions of physician or pharmacist, or following a career which may be an outcome of philosophic study. On October 3, 1896, a gymnasia for girls was opened in Budapest. There are 92 pupils who aim to follow higher or university studies.

In Switzerland, at the University of Geneva, there are the same requirements for admission for men and women. As is stated by the secretary[2] of the International Society of Women Students ("Société Internationale des Étudiantes"), foreigners are permitted to enter upon university studies if they have given proof of the requisite knowledge. Each individual case has due consideration given it. The course of study of the secondary classical schools for boys (gymnasia) gives the requisite foundation of knowledge. The cost per student depends somewhat upon the number of lectures attended. Work in the laboratories (for natural sciences and medicine) costs from 50 to 90 francs ($9.65 to $17.37) for each semester. The recitations, or explanations connected with such work, take place once a week and cost 20 francs ($3.86) a semester. The cost of living is not dear in Geneva, and food and lodging can be obtained for 100 francs ($19.30) a month. The "Règlement de l'Université de Genève pour 1893" states that the semester opens on October 15 with examinations for degrees and for those who are not up to the required standard in their studies. The regular courses commence October 22 and terminate March 22. The spring semester opens on April 8 and closes July 15, the last week being given up to final examinations for the year, and for degrees. Persons of either sex who desire to become students address themselves to the secretary and treasurer, stating the faculty in which they desire to study, and placing their diplomas and other required papers at his disposal. These are referred to the dean of the faculty. "Hearers" must be 18 years of age, but the law does not require any prerequisites in their case. Students and "hearers" are free to indicate what lectures they desire to attend. In order to graduate at the University of Geneva, it is not necessary to have been a student there. One may come up for the examinations and, if able to fulfill the conditions imposed upon the regular students, graduation follows, after the registration fee is paid. This fee is 20 francs ($3.86). The fee per course is 5 francs (96 cents) each lesson, of an hour each, per week. The baccalaureate costs 50 francs ($9.65); the licentiate, 100 francs ($19.30); diploma of pharmacy, 100 francs ($19.30); diploma of chemistry, 200 francs ($38.60); the doctor's degree, 200 francs ($38.60).[3] In 1892 there were 541 women connected with the universities who freely followed the lectures, or were regularly connected with the universities as students. Of the 236 "immatrikulierte Zuhörerinnen" 84 were at Geneva University, 79 at Berne, 67 at Zurich, 5 at Lausanne, and 1 in Basel. Classified according to subject matter: Medicine, 161; philosophy, 46; natural sciences, 21; juridical studies, 5; at the Polytechnicum in Zurich, 3.

[1] Revue Internationale de l'Enseignement, Sept. 15, 1896.

[2] Letter of March 23, 1896.

[3] Règlement de l'Université de Genève, 1893.

To the reports from the Society of Foreign Students connected with the university at Geneva, Switzerland, may be added the following from the Society of Foreign Students in Zurich, which, a part of the consular reports of the Department of State, was courteously forwarded by the Secretary of State to this office:

A society of American women students was organized in this city a year or so ago, its purpose being to promote friendly intercourse, disseminate useful information, and lend a helping hand to women students. A committee has prepared the following circular:

To American women students intending to visit the University of Zurich:

Although the gradual opening to them of the German universities is likely to decrease the number of American women studying in Switzerland, yet it is probable that for a long time to come many will prefer to work in a place where, as in Zurich, they stand officially on exactly the same footing with men. * * *

The university recognizes two classes of workers—the matriculated students and the hearers. The hearers are received without test of fitness, but are admitted to examination and receive certificates of having attended given courses of lectures only through the courtesy of the lecturers. The matriculated students have a few privileges not granted to hearers, and usually, though not necessarily, take an examination. The latter consist of the teacher, the doctor, and the State examination. * * *

As American students usually wish the doctor's degree, we describe somewhat in detail the line of work leading thereto.

A person who successfully passes the doctor's examination receives the degree of LL. D., Ph. D., or M. D. The length of time required for preparation is usually three to four years, except in the case of medicine, when five and a half years' hard work are necessary. A diploma from an American college is accepted in lieu of entrance examination. Certificates of successful teaching may also be accepted, but should be submitted in advance, as the decision appears to be made upon the merits of each case. In addition, a certificate of good character is necessary, and, for an American, a passport.

In the medical school the entire course is laid down; elsewhere no course is formulated, but each student is required to choose one major (Hauptfach) and two or three minors (Nebenfaecher). Work is carried on almost entirely by lectures and laboratory work, with occasional quizzes.

There are no semester or annual examinations, as is so commonly the case in America, but the entire work is tested at its completion. The test consists of three parts. First and chief, comes the dissertation—a piece of original work prepared under the direction of the professor and treating a topic drawn from the Hauptfach. If this is satisfactory, then follows, second, the written work—the "Klausurarbeit"—an examination upon the Hauptfach, occupying about three hours, and written under supervision; and (in some departments) the "Hausarbeit," a paper on a theme drawn from the first Nebenfach, prepared at home with the aid of books, etc. The written work satisfactorily accomplished, is followed by, third, an oral examination in all the subjects.

As Zurich is distinctly a university rather than a college, it makes no provision for the guidance of those who are unable to work independently. A woman who has not had the equivalent of a college training is likely to waste a great deal of time and to obtain only indifferent results. Newcomers, even when they have already selected the Hauptfach and have a considerable knowledge of the subject, often find much difficulty in deciding what lectures to hear. There is no central bureau of advice, and each professor feels the importance of his work. It is therefore desirable to come at the end of a semester, when, by going into the various lectures and by talking with students, one may be able to reach a decision. The long vacations of six to ten weeks, which separate the semesters, make this plan difficult for one coming directly from America; as all lectures are open for the first week or two of the semester, a decision can then be made, though with some delay. A list of all the lectures to be given in any semester (Verzeichniss der Vorlesungen) is published some weeks before its opening and may be had from the university.

The fees in Zurich are small. For a course of lectures coming once a week for a semester, the usual charge is 5 francs; for one coming twice a week, 10 francs, and so on. Seminars and quizzes are free. Even when a good deal of laboratory work is done, fees for the entire year rarely amount to more than $60 to $75.

There is no university library. Books are scattered among four or five libraries situated in different parts of the town, and open usually only a few hours daily.

A few other points: First. It is etiquette in Zurich for a student who is intending to take work with a given professor to call upon him in advance at his house, preferably between 11 and 12 o'clock, to announce her intention and ask his advice.

Second. No woman should come to Zurich with the immediate intention of univer-

sity study, unless she has a reading and speaking knowledge of German. Zurich is not the place to acquire this knowledge; the dialect which one hears almost everywhere and the number of foreigners of various nationalities in the town make it unsatisfactory for the language student.

Third. Pensions (boarding houses) are not usually good, and the price varies from 90 to 150 francs per month. Board in private families for about the same price can often be obtained. The greater number of students take lodgings (usually a single room), get their own breakfasts and suppers, and go out to dinners. By this method a good manager can live comfortably for 95 francs per month. More elaborate housekeeping is usually possible if one rents a suite by the year, and the difficulties involved in this mode of life are many and serious. Whatever style of life is chosen, it is advisable to make arrangements as early as the middle of October or April for the coming semester.

Inquiries about the university should be addressed, "Kanzlei der Universität, Zurich."

The American women students have formed a committee for the purpose of giving information to their newly-arrived countrywomen, and they extend the same courtesy to English women

Names and addresses of the members of the committee may be obtained from the Kanzlei or from the American consul.

For the committee:

MARY ALICE WILCOX,
Professor of Zoology, Wellesley College.

EUGENE GERMAIN,
Consul.

ZURICH, *February 2, 1897.*

In Spain a royal decree of March 16, 1882, forbade women following university courses; one of April 23, 1888, authorized young girls, after finishing their secondary studies, to present themselves for examination; a decree of June 26, 1888, admitted women to university privileges with the sanction of the director-general of public instruction, and 20 women are now in attendance. Still another decree, of May, 1892, gave women the privilege of being "hearers" at the universities.[1]

In the Netherlands there is progress in the matter of the education of women, the coeducation of the sexes being recognized and approved. The majority of the schools are open to both sexes—among these the normal schools of Leyden and Amsterdam, the 20 State intermediate-grade schools, and the most of the gymnasia. The courses of the four universities are open to women as well as men, while the majority of women pursue either medical or literary courses. In 1897 there were 75 women students in the universities—at Groningen, 11; at Leyden, 16; at Utrecht, 16; at the Commercial University of Amsterdam, 32. Of these 18 were studying medicine; 20, philosophy and letters; 35, physics and mathematical sciences; 2, law. Four women doctors were reported in the Netherlands, several pharmacists, and a number of aids in pharmacies. The numbers of these last mentioned are as follows: 727 aids in pharmacies, of whom 414 are men and 313 women.[2]

Previous to the formation of a united Italy (in 1870) girls received their education in convent schools, but now the majority of educational institutions, from elementary school to university, are open to women. When the girl has passed through the five years of the elementary school, she may pass into the "scuola normale," from whence, after a three years' course, she is prepared to be a teacher in the State elementary schools; still, it is stated that there are not enough places, and that 900 pupils of the normal school for girls in Rome were awaiting places in 1895. The "ginnasii" (five years' course) and "licei" (three years' course) of Italy are open to girls, and when provided with the "licenza liceale," or after passing the required examination, they may enter the university. If the Italian girl desires to follow a technical career, then a seven years' course gives the "licenza d' istituto," which also prepares for study of mathematics and natural sciences in the universities of the Kingdom, in which institutions the young women aspirants for the doctor's degree generally choose philosophy, mathematics, or other sciences. The women

[1] La Femme-Avocat, par Louis Frank, Paris, 1898, pp. 123–124.
[2] Ibid., p. 84.

students generally gravitate to Turin, Padua, Bologna, or Pisa university, rather than to the more southern universities. There are also, since 1882, in Rome and Florence a "scuola superiore di magistero femminile," in which a higher school education and special instruction in modern languages are found. The diplomas of these two schools entitle to the position of teacher of special branches. Within the last twenty-five years woman's education has advanced greatly in Italy, but it is usually among the burghers rather than among the higher classes that this effort toward a higher education is observed.[1] In September, 1896, the minister of public instruction signified that there were 10 vacancies in higher schools for girls for teachers of Italian history and literature and 10 for history. The candidates had to pass a special examination for such positions. The majority of successful candidates were women—that is, 10 for Italian literature and 8 for history. Of the many individuals who competed, 2 men won places as teachers of history. The women gaining these positions were graduates of the "scuole de magistero" in Rome and Florence, which schools rank with universities in their course of study.[2]

In Bulgaria a large number of women students in gymnasia is noticeable. In the 7 gymnasia for girls there were 355 "Abiturienten" who came up for the maturity examination. In 6 pedagogical institutions (pedagogicèsko uĉilischte) there were 475 "Abiturienten," and it is stated that in the examinations the women obtained a greater per cent than the men.[3]

In Roumania women have been admitted to the courses of the universities at Bucharest and Yassy for the past ten years. In 1895–96, of the 1,680 students at the University of Bucharest, 118 were young women. Four women physicians practice their profession in Roumania, and there are two women jurists who carry on their legal pursuits, no difficulties being offered by the governing powers.[4]

The higher education of women in Russia was presented in the Report of the Commissioner of Education for 1892–93, pages 687–690; on pages 401–409 of that Report for 1893–94, and again on pages 929–934, and 942–943 of the Report for 1894–95.

An interesting résumé of the efforts to place the higher education of women in Russia upon a firmer basis is given in the XIX Century of January, 1898, pages 117–134. Some of the facts chronicled by Princess Kropotkin are quoted herewith:

Very little is known in Western Europe about the struggles which Russian women have sustained to obtain the right to a better education; still less about the wonderful organizing powers which they have displayed in the creation and maintenance of their educational institutions. * * * And they succeed so well in their endeavors, that the English readers will probably be astonished to learn how much has already been done in Russia for the intermediate and the higher education of women; how considerable are the numbers of women who have already received university education; and to what useful account most of them have turned their knowledge. * * *

A stupendous intellectual revival took place in Russia after the Crimean war and the death of Nicholas I. In less than eight years, 1857 to 1864, the whole system of Russian life was entirely changed. The serfs were liberated, and peasant self-government was introduced. * * * The schools for girls were very few at that time; even in the well-to-do classes, one girl only out of a hundred had the chance to receive education at schools. * * * There were the instituts de demoiselles for the daughters of noblemen, schools for the daughters of the merchant class, for the daughters of the clergy, for the daughters of the artisans, and almost none whatever for the toiling tax-paying classes.

Most of them were boarding schools, as strict in their inner organization as convents. In the instituts de demoiselles, whereto only the selected few were admitted, the girls stayed from six to nine years, separated from their homes and from the whole world. * * *

They were taught all sorts of accomplishments, but seldom the voice of an earnest teacher appealed to their higher intellectual faculties. * * *

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[1] From article by Helen Zimmern in Deutsche Zeitschrift für ausländisches Unterrichtswesen, 2ter Jhrg., Heft III, pp. 211-215.

[2] Die Frauenbewegung, 1. März 1897, p. 52.

[3] Allgemeine Deutsche Lehrerzeitung, 2. Mai 1897, p. 178.

[4] La Femme-Avocat, par Louis Frank, Paris, 1898, pp. 106, 120.

The insufficiency of that sort of education was broadly felt, and already in 1847 and 1855 an attempt was made to reform the institutes. * * *

The first gymnasium for girls was opened in 1857—that is, only four years after Queen's College had received the sanction of Parliament and the necessity of a thorough education for women was proclaimed in this country;[1] fifteen years before the public day schools began to be opened in England; and very nearly thirty years before the lycées de demoiselles were opened in France. * * *

From the beginning the girls' gymnasia were put on the same footing as the best institutions of that class in Western Europe. Each gymnasium had seven forms, and an eighth was added later for pedagogical training. The teachers were chiefly men, the possession of a university degree being a necessary condition. The fees were 50 roubles (£5) a year.

A demand for such schools came from all parts of the country, and the Government encouraged both the demand and private donations for that purpose. Gradually high schools for girls were opened in each province, even in the remotest parts of Caucasia and Siberia. At the present time there are no less than 343 gymnasia for girls in the Empire (a few of them being progymnasia, with four forms only), with no less than 80,000 pupils. * * *

The girls' gymnasia opened a new era for the Russian women. The subjects were taught in a serious and attractive way by university men; the girl's brain was really working. * * * To obtain access to the university, now became the watchword of this young generation. * * *

The most energetic workers for higher education were those women who came to the conclusion that the greatest happiness in life is to procure happiness and relief from sorrow for others. * * *

To mention at least a few of them, namely, Miss N. V. Stasoff, who died in 1895 at the age of 70, literally at the work of her life; Madam M. V. Troubnikoff, who died the same year at the age of 60, after a life given to the woman's cause, and to whom J. S. Mill addressed, in 1868, that letter "To Russian women," which was read all over the civilized world; Madam V. P. Tarnovsky, Madam A. P. Philosophoff, and Madam E. J. Conrady. They grouped together a mass of sympathizers and organized a society which assisted poor working women, supplied them with healthy lodgings, and procured better earnings, and took care of the children while the mothers were at work. They took the liveliest part in Sunday schools. They founded a society for translating and publishing good books with the view of securing work to a number of women, and so on. * * *

The first and most natural step in that direction was to take advantage of every opportunity for getting admission to the male universities. A few of the most energetic and promising young women were allowed by some of the professors of the St. Petersburg University to attend their lectures as free-comers; and the old, venerated anatomist, Dr. Gruber, admitted a few ladies to work in his anatomical laboratory at the Military Medical Academy. * * * About that time (in 1861) several professors of the St. Petersburg University opened a sort of free university in the municipal hall of St. Petersburg, and their lectures were crowded by women. * * * In 1862, as a result of a reactionary spirit, the St. Petersburg University was closed for a year, free lectures were forbidden, and Sunday schools were closed. * * * The programme of education in the girls' gymnasia was found too extensive, and was curtailed in the natural sciences. * * * Our women, however, went abroad to study in the German and Swiss universities, which about that time opened their doors to ladies. * * * Hundreds of girls were, however, too poor, * * * so they continued to go to St. Petersburg or to Moscow, in the hope of still getting an education. * * * A great impetus was given to the whole question by a quite personal step taken by one of these ladies, Madame Conrady, who, at the first congress of Russian naturalists and doctors at St. Petersburg, in 1867, addressed to the gathering a memorandum upon the necessity of higher education for women. * * * All the ladies wanted was the permission to open regular university courses for ladies in the halls and laboratories of the university evenings or at such hours as would not interfere with the work of the students. They undertook to cover all expenses themselves. * * * The plan found warm sympathy with the St. Petersburg professors, * * * but permission was needed to make a start. In the meantime the ladies organized a number of drawing-room lectures for those girls who were not quite ready to begin university studies. In 1868 they opened "pedagogical courses," with the idea of preparing teachers for girls' schools and of giving pedagogical instruction to future mothers, and these courses were soon attended by from 200 to 300 women, anxious to obtain a sort of intermediate education between the gymnasium and the expected university. The whole was organized and supported entirely by the women themselves.

In December, 1869, permission was given to open lectures for persons of both

[1] Great Britain is here referred to.

sexes in history, Russian literature, physics, inorganic and organic chemistry, botany, zoology and geology, anatomy of man, and physiology. The programme of these courses was the same as in the university, but the full course in each subject had to be completed in two years. And finally the students received no degrees and no rights whatever. * * * On January 20, 1870, the first of the "Lectures for persons of both sexes" took place, and 740 women were in attendance. * * * The business part of the courses was conducted by a committee of ladies * * * and the number of students steadily increased, reaching 1,027 in 1889. These courses were removed in 1874 to the lecture rooms of a girls' gymnasium. * * *

Those who wanted to get a complete university education or a professional training were not satisfied with these lectures and many women went to Germany, and especially to Zurich, where they could study and work at the university and at the polytechnic school without any restrictions. Over a hundred Russian women (108) were at Zurich in 1872; and how they studied may be seen from the most eulogistic memoir issued by the Zurich professors in defense of the admission of women to the universities. * * *

In St. Petersburg the lectures were transformed and were reopened in 1878 under the name of "High courses for women." They were divided into three faculties—philological, physico-mathematical, and mathematical. * * * The institution prospered, and at one time had more than a thousand students. The society for their maintenance grew every year, so that it was enabled, in 1885, to purchase a house of its own at the cost of 200,000 roubles (£20,000). * * *

Public courses for women were opened at Moscow in 1869 by a few gymnasia teachers. The aim of these courses (which were known as the "Lubyansky courses") was to bring the womens' education to the level required by the boy's classical gymnasia programme. * * * All subjects taught at the historical and philological faculty of the university were to be taught. * * *

The Moscow municipality subscribed £50 a year. In 1882 "Lubyansky courses" were transformed into a physical and mathematical faculty, with a four years' curriculum. Moscow thus had its ladies' university.

At Kazan special high courses for women were opened in 1876 under professor Sorokin's management, and lectures were delivered in the evenings in the university building and 575 women attended them. * * *

At Kieff University lectures for women were opened in 1878. They were divided into two faculties—mathematical and historico-philological—and the curriculum was of four years' duration. By 1886 no less than 1,098 women had passed through these courses.

At Odessa, Kharkoff, and Warsaw feminine courses were not permitted to be opened; the Finland University at Helsingfors opened its doors to women.[1] * * *

The medical education of women took a somewhat different course.

A special medical school was opened for women in 1872 at the Military Medical Academy. It was thus under the patronage of the ministry of war that the first medical university for women was created. * * * From the very beginning the ladies obtained permission that all subjects should be taught as they were to male students and the yearly examinations should be exactly the same. First, in 1876 (at the approach of the Turkish war), the ladies were allowed to stay full five years at the academy. Judicial medicine was excluded from the programme, but in return the women's and children's diseases were studied more extensively than they are studied by men students. Women obtained only the degree of a "Learned Midwife," after having passed examinations entitling to the M. D. degree. * * * Women having conquered the right to higher medical training, accepted any unfavorable conditions. The school soon had as many as 1,000 students. As soon as some of them had completed their studies the zemstvos (county and district councils) invited them to occupy the positions of zemstvo's doctors. * * *

The first "learned midwives" passed their examinations on the eve of the Turkish war of 1877, and numbers of them went to the army hospitals. The report of the chief medical department spoke in the highest possible terms of the activity of women during the war, and in 1880 they were allowed the degree of "Woman Doctor." * * *

In the year 1886 there were in Russia four university courses for women in connection with the four chief universities and a Medical Academy. Russia was thus endowed with five higher educational institutions for women, but in 1886 all high courses for women and the Medical Academy were closed. * * *

The lady students who had already gained admittance were allowed to finish their studies, but no more were admitted. In the meantime those who could, went abroad. The universities of Bern, Zurich, Geneva, Paris, and Liège soon became crowded

[1] In 1870 the authorization was given which permitted women to enter the university at Helsingfors. In 1893 young girls formed 3 per cent of the students, and in 1897 there was 10 per cent of young girls studying. These were apportioned as follows: 10 in law, 125 in historico-philological studies, 71 in physico-mathematical studies, and 9 in medicine, out of 2,064 students. (La Femme-Avocat, p. 106).

with Russian women. They went even to Finland, where the teaching is in Swedish, and to Italian universities. The Government published, in 1889, the normal statutes of the future women's universities, which was applied, however, at St. Petersburg only. * * *

The number of students desirous to gain admittance was so great that the limitation to 400 had soon to be extended to 500, and then to 600. This year (1897) there are 695 students, and yet 212 women, who were ready to comply with all the regulations and pass the examinations, were refused. All the expenses, with the exception of £300 contributed by the State, are covered by the society, and they now obtain £10,800 a year. As to the Medical Academy, the further admittance of students was stopped in 1887—but of the 698 ladies who had obtained the degree of "Woman Doctor," 178 of them held official positions in hospitals and schools—so that subscriptions for reopening the courses came in from municipalites and private persons, and the result is that the Society for the Support of the Medical Courses is said to have now 700,000 roubles (£70,000) in hand, and a guaranteed yearly income of £4,000.

The conditions pertaining to admission of women in the universities of Denmark (by royal decree of June 25, 1875); in Sweden (royal decree of June 3, 1870); and in Norway (royal decree of June 14, 1884) were fully described in the Report of the Commissioner of Education for 1894–1895, pages 915–920, and consequently are not dwelt upon here. As will be observed, Sweden was the first of the three countries to permit university study for women, and by decree of November 7, 1873, woman was accorded the privilege of academic degrees. By decree of June 12, 1891, she was permitted to become a pharmacist; three women are now practicing medicine, but theological studies are yet denied them.

In Norway they are allowed to pass all examinations, to receive all degrees, to be bursars, and have all university privileges that are accorded to the male students. From 1882 to 1895, 145 young women had passed the examen artium, 33 the Latin artium, 112 the real artium. At the university in Christiania there are at present 28 women students, viz, 2 in law, 1 in theology, 2 in mathematical sciences, 3 in philology, and 19 in medicine.[1]

In Iceland, an ordinance of December 4, 1886, accorded to women the right of becoming doctor of literature, and of entering the medical and ecclesiastical schools at Reikiavik. To pursue a course in law the woman goes to the university in Copenhagen. While that sex may obtain degrees she can not become a State functionary or occupy the position of Lutheran pastor.

THE PROFESSIONS.

Medicine.—In discussing the general woman movement M. Maurice Spronck, of the Journal des Débats, states (Dec. 30, 1896):

The line of demarcation between the two sexes is slowly effacing itself, and the admirable dogma of the equality of the sexes has already received practical application. In France there is felt to be disadvantage in multiplying numbers in professions which are already overfilled, but, although this is the case in the medical profession, in the colonies there is room for the woman physician.

English women of that profession have gone out among the Mohammedans, and have won success. Mme. Chellier, of France, has carried out a similar plan among the natives of Algiers and also among the distant tribes in Afghanistan. Her ministrations have been helpful to women and children and also to men. When the Arabs endeavored to express their gratitude she gave them to understand that it was the French Government to which they were indebted. To Mme. Chellier seems to be due [says M. Spronck], the drawing nearer together of dissimilar people, a pacification of the Mussulmans, which may be considered a thoroughly feminine work.

Although the French University did not officially open its doors to women until 1888, the study of medicine by women had long before become an accomplished fact. Mme. Madeline Brès appealed to the dean of the École de Médecine in 1867 for admission to the lectures given there. The dean told her she must first prove to him that she had taken her degree of M. D., and when, a year later, she was able to do this, he laid her petition before the ministry. The École de Médecine is not yet largely frequented. In 1878 it had 32 women medical students, and in 1894–95 the number did not exceed 183. The students are chiefly foreigners, Russians and Poles.

[1] La Femme-Avocat, par Louis Frank, Paris, 1898, pp. 97–107.

French women show little inclination for practical medical study, great as is their liking for natural sciences.

Although only 18 of the 183 medical students above referred to were natives, 226 out of the 248 students of natural science were French women. Eleven women doctors practice in Paris, and several other French cities can likewise boast of having women physicians.

The efforts of various women's associations in Germany, in presenting petitions to demand equal rights for women, are apparently crowned with success.

The advisability of allowing women to study at the universities of Germany was formerly ignored by the Reichstag and Diet, or the petitioners were sent from one authority to another. Last year's [1894] petitions were assigned for examination to a committee consisting of members of the Prussian Chamber of Deputies. The report of this committee is now under discussion, and is expressed as follows:

The subject touched upon in the petition has been under constant consideration by the Government. Women candidates have been entered for examination at the gymnasia in isolated cases, and the philosophical faculties of the universities, first and foremost those of Berlin and Göttingen, have allowed women to participate in lectures of their own choosing, in accordance with the consent of the teachers and rectors and the formal permission of the Government. No unpleasant consequences have resulted from this concession. The faculty of medicine has come to the conclusion that the presence of women at lectures is not desirable, but that, on the other hand, the question of admitting women as regular medical students must eventually come under serious consideration, inasmuch as the law on trades and professions, according to the interpretation put upon it by the chief imperial authorities, does not oppose their admission.

It is further stated that the imperial chancellor has advised the Prussian Government that he sees no difficulties in the way of extending greater privileges to women, and permitting them to pursue medical studies and secure degrees, which discussion has served to awaken fresh and broader interest in the question of what women shall study.

The reception which the petitions above referred to have met with leads us to deem the time not far distant when advantages for academic study will be as easily obtained by women as by men.

In Germany women are permitted to practice, but not to study medicine. Six of the seven women physicians now practicing in Berlin pursued their studies at Swiss universities. The seventh took her course in Leipsic, where the study of medicine by women was favorably regarded by many of the professors. German women doctors have practiced in Berlin since 1876, and have been at the head of a polyclinic for women since 1878. The remainder of the seven German women physicians are practicing in Berlin, Leipsic, Frankfort on the Main, and Munich.

In Italy Maria Terné has been the Queen's body physician since 1885, and women have studied medicine since 1876, and in 1888 Dr. Giuseppa Catani was called to the University of Pisa as professor of pathology.

In Spain and Portugal there are women medical students and physicians.[1]

In Belgium fourteen women received different degrees in medical faculties between 1881 and 1891, and the Belgian Parliament has decided that "women may be admitted to the full practice of medicine and pharmacy."

In Holland there was no law to prevent women studying at the universities, and the first woman physician was graduated in Groningen; the University of Amsterdam next gave degrees to women, and there are women students at all four universities. In 1894–95 11 of the 55 students were taking medical courses. Women physicians are practicing both in Holland and Belgium, and both countries have a goodly number of women apothecaries. The Turkish Government permitted women to study medicine a year and a half ago, and assigned the right to practice to those women physicians who have taken a degree at some foreign university. A woman

[1] From "Die Entwickelung und der gegenwärtige Stand des medicinischen Frauenstudiums in den europäischen und aussereuropäischen Ländern," von Dr. Agnes Blum. [In Deutsche Medicinische Wochenschrift, Sept. 26, 1895.]

physician has also been appointed to the imperial harem, and there are Turkish women studying at French universities.

In Roumania women both study and practice medicine, and it is stated that women medical students in Hungary will, in all probability, be admitted to the University of Budapest during the next term.[1]

Countess Vilma Hugonnay, the only woman physician in Budapest, recently made an application for admission to the medical society of the Hungarian capital. After a stormy session the society refused her application. The countess-doctor intends to renew her application next year, and expects to have it granted.

A few months ago, says Dr. Agnes Blum, the minister of education of Austria issued a rescript asking the professors to consider the advisability of receiving women as students at the universities; the philosophical and medical faculties being very much in favor of admitting them to their lectures, a resolution to that effect was passed by the university board.

Austrian women can be present at the lectures or medical courses connected with the university, and may compete for examinations separately from the men students, yet women are entitled to no official rights. A short time ago the right to practice was refused a young Viennese lady who had passed the most successful examinations both in Austria and in Switzerland. Yet it was not very long ago that the Austrian Government called for and gave governmental positions to two women physicians in Bosnia. The right to practice and to have a private clinic has been extended to Dr. Rosa Kirschbaumer (who formerly acted as assistant to her husband) in recognition of her capabilities.[2]

In 1897, a woman, the Freiin Gabriele Passauer von Ehrenthal, was promoted to doctor at the Vienna University. She studied and obtained her degree at Zurich University, and practiced in Switzerland. In order to obtain the desired position in Austria she was obliged to pass examinations in Austria,[3] and it is stated that between July, 1896, and March, 1897, she passed through 20 examinations.

In Switzerland the adoption of the medical profession by women has been attended with few difficulties. A Russian lady registered as a medical student in Zurich as early as 1864–65. The number of the medical students increased to 1871 and beyond, and then diminished again, as 77 out of 88 students were Russians, who were forbidden by an imperial ukase to pursue their studies in Switzerland. Zurich has shown a steady increase in the number of her medical students. The term now in progress [in 1895] is attended by 99 women medical students, of whom 24 are Germans, 8 Swiss, 40 Russians. The other Swiss universities have followed the example of Zurich, so that all Swiss medical colleges are as accessible to women as to men.

The following table gives the relative proportions of women students in the medical faculties of the different Swiss universities from 1887 to 1894:[4]

Enrollment of medical students.

Semestri.	Basel.		Zurich.		Berne.		Geneva.		Lausanne.		Total.	
	Students.	Women.	Students.	Women.	Students.	Women.	Students.	Women.	Students.	Women.	Students.	Women.
1894	158	3	315	80	204	44	214	52	102	16	993	195
1893–94	160	3	291	75	215	43	240	63	104	20	1,010	204
1893	153	3	297	68	224	46	224	52	84	6	982	175
1892–93	157	1	275	64	247	61	248	64	96	11	1,023	201
1892	146	1	266	44	227	63	233	49	81	1	953	158
1891–92	141	1	245	43	249	63	223	55	83	2	941	164
1891	127	1	280	44	276	71	204	43	78	1	965	160
1890–91	125	1	273	43	263	66	219	45	63	1	943	156
1890	116	1	300	51	246	49	187	31	32	1	881	133
1889–90	123	.....	276	54	285	55	186	28	34	1	904	138
1889	109	.....	288	50	251	46	189	21	22	1	859	118
1888–89	131	.....	264	46	230	46	193	19	35	4	853	115
1888	114	.....	261	43	227	45	141	10	28	3	771	101
1887–88	122	.....	265	44	233	49	129	8	28	3	777	104
1887	113	.....	277	37	212	32	115	7	27	3	744	79

[1] Cited from Dr. Agnes Blum.

[2] Die Medicinische Wochenschrift, Sept. 26, 1895.

[3] Die Deutsche Hausfrauen-Zeitung, 18. April, 1897.

[4] "Die akademische Frau," p. 391.

In an interesting presentation in regard to the study of medicine by women in Russia[1] it is stated that there is satisfaction in regard to the manner in which women carry out the duties of physician wherever employed, but especially in the Commune, in rural districts, and in gymnasia for girls. In the sixties the subject of medical study for women became of interest, but this interest only amounted to permitting them to study midwifery, to act as nurses, to vaccinate, and to attend to other minor affairs. They sought more than this and desired to pursue medicine scientifically. Some gravitated to Berne and Zurich, others (165 from Charkow in 1870) requested from the authorities permission to attend university courses with male students, but were refused because, as the minister of public instruction said, they were not sufficiently prepared. Later, in 1872, other advice prevailed, and 89 young women began a thorough study of medicine. In 1877 the services of the women students of medicine were of such nature during the war period that they were given the Stanislaus order of the third class, and from that date there was recognition of the fact that the medical profession might well be opened to women. In a ten years' period, in 1872–1881, there were 959 women attending medical courses, and in 1880, official sanction was given to women physicians—a badge (jeton) worn on the breast indicating their profession. There were schools for medical study opened, then closed again, but at present writing, in April, 1895, official sanction has been given to the establishment of a new medical institute for women.[2] This institute is to be affiliated with the ministry of public instruction, and the age of those who intend to pursue the course should be not less than 20 and not more than 35 years.

Those who have certificates for gymnasial studies are required to pass an examination in Latin, which examination is to be held in a town where there are one or more secondary schools for boys (gymnasia), the curator of the district deciding where such examinations shall be held. Those who have pursued the higher course for women in St. Petersburg, or have obtained a certificate from Gymnasia for women, and have also passed the examination in Latin, can enter the institute without further examination. The whole course lasts five years, or ten semesters, the fifth year being given to practice in special hospitals or in clinics for women and children.

The examination during the course and the final are arranged in consonance with the regulations governing the medical profession throughout Russia. Those who pass the examinations receive a diploma as women physicians, which enables them to practice throughout the Empire under regulations similar to those governing male physicians.

It is stated from other authorities that "there are now more than 600 women physicians in Russia. Fifteen out of the 24 physicians engaged in municipal service in St. Petersburg are women, and there is a woman physician in Finland who occupies a like post. The first Mohammedan woman to become a physician studied in St. Petersburg, and has for two years occupied a governmental position in Riazan."

In 1894 more than 177 women doctors were found registered in the British Medical Register. Sixty-three physicians are practicing in London, 31 in the Provinces, 25 in Scotland, and 6 in Ireland, while many others are doing active work in foreign countries, as, for instance, in Australia, China, and Afghanistan.[3]

India has now no less than 57 women doctors, and 15 hospitals where 334 women

[1] In Die Akademische Frau, von Arthur Kirchhoff, pp. 358–368.

[2] This institute was opened on January 1, 1897. The graduates are to be permitted to practice their profession throughout the Empire, particularly as specialists for women and children. Friends have contributed 567,490 rubles (77.2 cents is a ruble) for carrying on the institution. (In Deutsche Hausfrauen Zeitung, den 21 Februar, 1897, p. 89.)

[3] The subject of the education of women in the British Empire was presented on pages 805–891, 907–911, and 950–952 of the Report of the Commissioner of Education for 1894–95, and more lately in Progress in Women's Education in the British Empire, London, 1898, so that reference is simply made to those books.

are employed as assistants or directors. Furthermore, India possesses 11 medical colleges, which in 1892 contained 261 women students.[1]

At the University of Edinburgh, during 1896, 188 women students matriculated; of these 176 were enrolled in the faculty of arts, 3 in the faculty of science, 6 in the faculty of medicine, and 3 in that of music.[2] Moreover, there were 54 nonmatriculates who paid the 5-shilling entrance fee—the majority for attendance on the music classes—while 68 women medical students were attending the extra-mural lectures with a view to graduation in medicine. In this connection it is interesting to note that the first woman—Miss Martha Thomas—who competed for a scholarship in the department of arts at the University of Durham was successful.

From Mexico comes the statement that "Miss Columba Rivera has been licensed as a practicing physician, and appointed to the women's ward of San Andres Hospital. She is the first woman in Mexico to obtain such a position, after having studied medicine for four years and passed her examinations with great credit."

In Cuba the University of Havana has been open to women for fifteen years. In 1887 the degree of Ph. D. was given to a woman, and in 1889 Laura Carvajal received an M. D. degree and has distinguished herself as an oculist. Several Cuban women are pharmacists.[3]

Law.—The "femme-avocat" of European countries is discussed by Dr. Louis Frank, of the faculty of law of Bologna, who is advocate at the court of Brussels. From this source[4] important data were gathered for the statement concerning women in the legal profession in the Report of the Commissioner of Education for 1894–95, and reference is made to that chapter for information regarding women law students in foreign countries. A statement may be made that while liberal careers are open to women abroad, the profession of advocate is generally inaccessible to them. Roman law forbade women to act in a court of justice for the benefit of others, although she might do so for her own benefit. The law, according to Justinian, forbade any woman to hold office, to be a judge, or in any way to qualify herself for any so-called virile position. Laws and customs did not permit either women or slaves to fill "des offices viriles." When in Italy and Belgium efforts were made to enter the legal profession the refusals were based upon Roman laws. Canonical laws reiterated the same objections as were presented in the ancient Roman laws, while the common law dwelt upon the incapacity of woman to fulfill the functions of an advocate. Philippe de Beaumanoir lays stress upon the old Roman laws against woman as advocate, while M. Boutillier cites as incapacitated from such position "minors, deaf, blind, ecclesiastics, sergeants, and women." In France, in 1327, an ordinance of February 13 considered the advocate a publie official equally with the judge and procurator, but did not authorize women to hold such position, women not being admitted to plead in any jurisdiction; in the seventeenth century the president of the council at Metz admitted that women were capable of being admitted to plead.[5] As early as 1807—in fact, under the old régime—there were women who plead for themselves in France.

The European law courts have invariably refused women authority to act as advocate, and in so doing they have based such refusal upon Roman and canonical laws; they have thought only of Gaius, Tertullian, St. Jerome, Tiraquellus,

[1] Two women doctors have been specially honored by the India Office. Dr. Margaret Marion Traill Christie, M. D., and Dr. Alice M. Corthven, M. B., have been appointed to look after the hospitals for native women in Bombay, specially in connection with the bubonic plague. Dr. Alice Corthven at present holds the office of demonstrator of physiology at the London School of Medicine for Women.

[2] In the Edinburgh School of Medicine for Women every student sent to the university during the year 1896–97 has passed a record probably unprecedented in the annals of any other school. Five women received caps at the graduation ceremony, and were enthusiastically greeted by their fellow-students and the audience.

[3] La Femme-Avocat, pp. 123–124.

[4] Essai sur la condition politique de la femme, par Louis Frank. Paris, 1892, pp. 282–301.

[5] M. Mathieu Augeard, Arrests notables de différents tribunaux du Royaume, tome 1, p. 362.

Luther, and Bossuet,[1] forgetting that there has been a march of improvement within the last few hundred years.

The few women in Russia, Sweden, Denmark, Italy, Belgium, and Switzerland who have fitted themselves for the position of lawyer have had much to contend with, and whenever they have sought official sanction to fill public positions a refusal has been the general outcome of such demand. Yet there are said to be 37 of the United States which admit women to the bar, and permission to plead before the United States Supreme Court is assured.

In the German-speaking countries conditions differ as to women lawyers. In Germany, women not being admitted regularly to university studies can not claim registration as lawyers; in Austria the law faculties are closed to them; in Switzerland, however, where there is no federal legislation regarding the legal profession, there are cantonal regulations;[2] in Neuchâtel women are permitted to plead before the tribunals; in Geneva and Zurich only citizens[3] have had the liberty to practice as lawyers, but since July 3, 1896, enactments have taken place which permit (in Zurich canton) any person to practice law who has the "capacité civile de contracter;" women, however, must have the consent of their husbands. In Appenzell, R. E., Mlle. Graf (doctor of law of the University of Berne in 1895) practices her profession in that Canton.

The admission of women to university privileges in Hungary (decree of November 18, 1895) will eventually bring them into the legal profession.

In 1888 Mlle. Popelin, who had followed the course in law in one of the universities of Belgium, endeavored to enter upon a career as lawyer, but the courts decided against her. In the early nineties this subject was again discussed, but (although in 1893 the court of appeals at Brussels decided, by vote of 3 to 2, that the profession of advocate might be opened to women) it was decided at the general assembly of lawyers of that city (on April 30, 1894) "qu'il n'y avait pas lieu de rendre accessible aux femmes la profession d'avocat."[4] In the Netherlands the admission of women to the courses in the universities naturally leads to a discussion of her opportunities for a legal career. The decree of September 13, 1838, in regard to regulations for lawyers, modified by decrees of December 5, 1844, of December 17, 1875, and of June 1, 1879, did not touch upon the subject of woman's admission to the bar, but it is generally conceded that if she receives the degree of LL. D. (docteur-en-droit) she will be permitted to follow that profession.[5]

The decision of the court of appeals in Turin, November 14, 1883, and of the court of cassation of the same city, April 18, 1884, which forbade a woman following the profession of advocate, has not yet been changed. When the subject came up for discussion in other cities of the Kingdom of Italy, it was decided that there was no occasion for a change of opinion.[6] No difficulty was found in Roumania in giving Mlle. Sarmisa D. Bilcesco (doctor of law of the faculté of Paris) admission to the bar in Bucharest. The council of the order of advocates decided the matter unanimously and without discussion on June 26, 1891. Mlle. H. Popovitz, licentiate in law, of Bucharest, is the second woman lawyer in Roumania.[7]

In Russia there has been no special call for a decision regarding women in the legal profession. Generally speaking, women are excluded from university courses, and in 1876 they were forbidden to enter upon the profession of law. However, a Russian governmental commission of 1897 discussed the subject of the imperial ukase of 1876 and decided that women should be authorized in justice to exercise the profes-

[1] Essai sur la condition politique de la femme, par Louis Frank, pp. 299–301.
[2] La Femme-Avocat, par Louis Frank. Paris, 1898, pp. 64–65, 108–114.
[3] "Ayant le droit de citoyen actif."
[4] La Femme-Avocat, par Louis Frank. Paris, 1898, p. 84.
[5] Opinion of M. Aug. Philips, one of the most eminent la · yers of Holland.
[6] La Femme-Avocat, pp. 85–97.
[7] Ibid., p. 120.

sion of "agent d'affaires assermenté."[1] In the Grand Duchy of Finland the lawyer's profession is absolutely free to all, and, although the Government has taken no special action regarding the position of women in this profession, there were 14 young women studying law at the university in Helsingfors in 1897. In 1895 Fröken Signe Silèn appeared before the tribunals in a law case, and she has also plead before the Finnish senate. In the Viborg district Fröken Anna Akesson defended a case in the "Häradshöfding" or district court, as authorized by the magistrates of that district.

In Denmark a law of 1868 gave women the power to defend their own cause before courts and tribunals, but unless it was a question of honor or life in their own family they were not permitted to plead before the supreme court. A royal decree of June 25, 1875, admitted women to university privileges, and women who had passed the examen artium were allowed to go up for the complete juridical examination, which, however, gave them no right to hold public office (nomination publique). A royal decree of May 12, 1882, permitted women to pass an "incomplete" examination in law, but with no authorization to fill a lawyer's position. Notwithstanding the adverse attitude of the Danish authorities toward women in the legal profession, Mlle. Nanna Berg, having passed the juridical examination, has several times endeavored to practice before the courts, but so far without success.[2]

In Norway and Sweden women are allowed to act as advocates. Admitted in the former country to university privileges in 1884, a woman claimed admission to the bar (after due examination) in 1890. In 1895 the Storthing at Christiana unanimously permitted women to have the same privileges of legal practice as are accorded to men. In Sweden university privileges were accorded to women in 1870, and it has generally been conceded that she had the right to plead in provincial courts.[3] The success of a woman law student at Upsala and the favorable attitude of the rector of that university toward women who desired to practice before all courts, led to discussions of the subject. After the pros and cons were duly considered, a committee of the Riksdag placed the matter so clearly before the senate that on April 24, 1897, by acclamation, woman's position was made such that she can study, teach, and practice law—an important beginning for still more widely extended powers, which will come in due time.[4]

From India comes information of the success of Miss Cornelia Sobraji, who took the degree of B. C. L. at Oxford about three years ago as a barrister, not only in the native but in British courts. At first she only practiced in the former, but in July, 1896, she was intrusted with the defense in a murder case, tried at Poona, in a British court. As usual in such trials, where all the witnesses are natives, much false evidence was offered. Miss Sobraji, who had faith in her client's innocence, conducted the case with great ability and secured a verdict of acquittal after the jury had deliberated twenty minutes. It is stated that the lady barrister received many congratulations on the result of her forensic ability.[5]

In Canada Miss Clara Brett Martin received notification in December, 1896, that she might present herself on February 2, 1897, to be admitted to the Ontario bar. Miss Martin, who is the first lady to select this profession in Canada, purposes making an especial study of law as it relates to woman, concerning her individual responsibilities, her estates, her children, her citizenship. Her efforts are described in the Canadian Home Journal:

It is six years since Miss Martin, having taken her B. A. degree, notified the benchers of her desire to enter as a law student. The leading senators took nine months to consider the matter and then notified the young lady that they had not

[1] La Femme-Avocat, pp. 115-120.

[2] Ibid., pp. 97-99.

[3] Angaænde Kvinders Adgang til Ansættlse i offentlige Stillinger, 1896.

[4] La Femme-Avocat, par Louis Frank, pp. 100-105.

[5] Die Frauenbewegung, 1ten März 1897; Deutsche Hausfrauenzeitung, den 2ten Mai 1897, and La Femme-Avocat, p. 97.

the power to grant her request, since the regulations did not admit the enrollment of women. Nothing daunted, Miss Martin began working among the members of the Ontario parliament, and succeeded so far that in 1892 a bill permitting benchers to admit women was brought in and carried by a majority of 1. Next came the difficulty of finding a firm that would take her as articled clerk. That was accomplished in 1893, when she entered the office of Messrs. Mulock, Miller, Crowther & Montgomery. But the bill of 1892 permitted women to practice as solicitors only, which would limit their work and prevent them from pleading before a judge in high or county courts. Miss Martin desired full barristership. The legislature being again approached, a majority of 37 authorized the benchers to call women to the bar as full-fledged barristers. Miss Martin was ready, but the benchers were not. They postponed, discussed, and argued behind closed doors. Miss Martin enlisted the active service of many sympathizers, and her case came up seven times during the last six months of the year and was at last decided as above stated.

WOMEN IN INDUSTRIAL WORK.

The efforts which have been made by women to enter upon practical occupations, or to so train themselves that when necessity offered they could compete with men in the industrial world, have led to the establishment of schools intended more especially for practical rather than intellectual avocations.

A presentation of the subject of technical and industrial study has been made by Marion Mulhall,[1] from the English standpoint, and by Professor Joynes,[2] from the American point of view. These statements, dealing with schools on the continent, are prefaced by a short résumé of the general condition of women in the industrial world, as viewed by Helen Campbell.[3]

Mrs. Campbell states that—

The history of women as wage-earners, though actually comprised within the limits of a few centuries, would, if given in full, mean a summary of the whole history of working humanity. The position of working women all over the civilized world is still affected not only by the traditions, but the direct inheritance from the past, and thus the nature of that inheritance must be understood before passing to any detailed consideration of the subject under its various divisions. It is the conditions underlying history, and rooted and grounded in the facts of human life itself, which we must know, since from the beginning life and work have been practically synonymous, and, in the nature of things, remain so.

Up to the time of the civil war, aside from factory employments, the trades open to women were limited, and the majority of their occupations were still carried on at home, or with but few in numbers, as in dressmaking establishments, millinery, and the like. With the new conditions brought about at this time and the vast number of women thrown upon their own resources came the flocking into trades for which there had been no training and which had been considered as the exclusive property of men. A surplus of untrained workers at once appeared, and this and general financial depression brought the wage to its lowest terms; but when this had in part ended, the trades still remained open. At the close of the war some hundred were regarded as practicable. Ten years later the number had more than doubled, and to-day we find over four hundred occupations, while, as new inventions arise, the number of possibilities in this direction steadily increases.

The gain of women in trades in 1880 over the census of 1870 was 64 per cent, the total percentage of women workers for the whole country being 49. The ten years just ended show a still larger percentage, and many of the trades which a decade since still hesitated to admit women are now open. Those regarded as most peculiarly the province of men received many feminine recruits.

* * * So far as opportunity is concerned, it is the United States only that offers a practically unlimited field to women workers, to whom some four hundred trades and occupations are now open. Comparison with other countries is, however, essential if we would judge fairly of conditions as a whole, and thus we turn first to that other English-speaking race and the English worker at home. * * * In 1861 the returns gave for England and Wales 1,024,277 women at work. Twenty years later the number had doubled, half a million being found in London alone. This does

[1] Extracts from "Girls' Technical Schools on the Continent," in Contemporary Review, July, 1896, pp. 136-143.

[2] *See* accompanying report by Edward S. Joynes.

[3] Extracts from "Women-Wage Earners: Their Past, their Present, and their Future," in Arena, January, February, May, 1893.

not include all, since, as Mr. Charles Booth notes in his recent Labor and Life of the People, many employed women do not return their employments. * * *

Outside of the cities, where the needle is almost the sole refuge of the unskilled worker, every industry is invaded. A recent report as to English nail and chain workers shows hours and general conditions to be almost intolerable, while the wage averages 8 pence a day. In the mines, despite steady action concerning them, women are working by hundreds for the same rate. In short, from every quarter comes in repeated testimony that the majority of working English women are struggling for a livelihood; that a pound a week is a fortune, and that the majority live on a wage below subsistence point.

Statistics presented in 1892 show that out of 19,352,000 artisans in France there are 4,415,000 women who receive in wages or dividends nearly $500,000,000 a year. Their wage is much less in proportion to the work they do than that of men, yet they draw 35 per cent of the entire sum spent in wages. In Paris alone over 8,000 women are doing business on an independent footing, and of 3,858 suits judged in 1892 by the Workingman's Council, 1,674 concerned women. * * *

Passing to Germany, a good two-thirds of the women are at work in field or shop or home, the proportion of women in agriculture being larger than in any other country of Europe.

It may be said that till recently legislation in Prussia has been in behalf of child workers, and women have been practically ignored; but factory legislation is minute and extended, and the questions involved in the labor of women, and its bearing on health, longevity, etc., are now coming under consideration. In Silesia, as early as 1868, women were excluded from the salt mines, and the Labor Congress of 1889 brought about many changes of the laws on this point for Belgium and Germany. In Italy, in which country industrial education is now receiving much attention, the labor of women, continuous, severe, and underpaid as it is known to be, finds small mention save among special students of social questions. Russia has practically no data from which judgment can be formed. * * *

This subject has been treated quite in extenso of late years by different writers on sociological questions; but it is only to our purpose to-day to refer to conditions in the industrial world, and to call attention to what may be considered as the next phase of the subject, i. e., the technical and industrial schools for girls on the Continent, which, treated by different writers, give indications how industrial occupations are filled. Marion Mulhall says:[1]

The technical instruction of girls has simultaneously taken a front rank in the municipal cares and duties of almost every town and city in such a manner as to astonish any woman who feels sufficient interest in female work to induce her to study the systems in their various stages. Thirty years ago the schools alluded to were unknown; to-day they are counted by the hundred in all the kingdoms of central Europe. Formerly the public authorities paid little heed to the instruction of girls beyond seeing to their moral and religious training and teaching them needlework. It is now admitted on all sides that girls should also be taught to earn their bread in an honorable and suitable occupation, and, above all, that they should be well trained in domestic economy. * * *

There are two kinds of schools in Holland, Belgium, Switzerland, Austria, and Hungary—the head schools and the hand schools. They are both under the same roof, and the pupils attend for three hours at one of the schools and three hours at the other; in other words, half the day is given to ordinary education and half to whatever trade or profession the girl has chosen in which to earn her bread. When a girl leaves these schools she is able to command a fair salary, thus avoiding the dangers of apprenticeship in the ateliers. These schools are found so useful that in most cities and towns two-thirds of the expenditure is defrayed out of municipal funds and one-third by the national treasury, the fees charged being only nominal. First come Les Écoles Ménagères, or housekeeping schools; secondly, Écoles Professionnelles des Jeunes Filles, or handwork schools for girls. * * *

The handwork school for girls at Amsterdam is not only the oldest, but also one of the finest of the kind in Europe. It was founded by private subscription in 1865, and is lodged in a fine building close to the botanical garden. It is intended for the daughters of the bourgeoisie, or shopkeepers, but any girl over 12 years of age is admitted if she can pass the preliminary examination in reading, writing, arithmetic, and drawing. A small fee is charged and the course is one of three years, the principal classes being for drawing, leather work, wood carving, dressmaking, millinery, plain needlework, artificial flowers, and lace. New occupations, such as typewriting, telegraphy, etc., are constantly added. There are more than two hundred girls, all

[1] Extracts from "Girls' Technical Schools on the Continent," by Marion Mulhall, Contemporary Review, July, 1896, pp. 136-143.

externes, and the proceeds of their work pay about one-third of the annual cost, the rest of the burden being shared equally between the Dutch Government and the municipality of Amsterdam.

At Brussels the housekeeping school is in the workmen's quarter near the Allée Verte. It is in connection with a kindergarten and the communal or national girls' school that is in adjoining premises. It is limited to 10 girls at a time, who must be over 12 years old and must have finished the ordinary course in the primary school of reading, writing, drawing, and arithmetic. The girls are taught in batches of ten for a week, each class coming back four times in the year; thus each girl receives nearly thirty days' instruction per annum, and at the end of their term, which lasts usually about three years, she is quite able to manage a small or even a good-sized establishment. The corporation allow 6d. a day for each person, and the girls must limit their expenditure to this sum. They go to market themselves, and out of this modest sum all necessaries—bread, butter, meat, vegetables, fruit, beer, and sundries, but not fuel—for two meals must be provided. * * *

The text-book of these schools is a little manual called Économie Domestique, by Mlles. Destesche and Marcelli. * * * The book comprises three sections: First, hygiene, embracing all particulars connected with ventilation, cleanliness, drainage, light, water, disinfection, etc.; secondly, the proper economy of a household in all that concerns food and clothing, showing the quality and attributes of each kind of food, those which contain most nutriment, and those in which the element of nutrition is cheapest. Estimates for the weekly cost of living of a large or small family in the middle or working class are given in the fullest detail. Finally, the third section is devoted altogether to kitchen gardening for the supply of all manner of vegetables and fruits, gardens of this kind in Belgium being mostly cultivated by women. There is also an appendix showing a simple system of bookkeeping for the woman who has charge of a house, in which all the branches of ordinary expenditure are properly classified, month by month. * * *

The cookery school at Brussels costs the municipality 12,000 francs, or £480 a year, and teaches 100 girls in the year.

Brussels is also proud of her Écoles Professionelles for girls. The earliest and principal one is situated in the Rue de Marais. It was projected by a few charitable ladies, and was founded by 134 benefactors in March, 1865, with the object of preventing girls from going into factories, and teaching them various kinds of useful and lucrative employment. * * * The school was opened on April 25, 1865, and continued to be managed by the ladies till 1868, when the Government gave a subsidy and resolved to enlarge the sphere of action, for which reason the school was handed over to the city council. * * * The course of instruction extends over three years, and includes arithmetic, history, geography, natural sciences, dressmaking, hygiene, domestic economy, drawing, modelling, painting on china, artificial flowers, millinery, lace making, embroidery, typewriting, telegraphy, etc., so as to enable girls to earn their own livelihood after leaving school. Drawing is the groundwork of all technical education on the Continent; it is considered necessary for every profession. It was in 1872 that the class for painting on china was begun, and it has proved such a success that the pupils find a ready sale for their work. In the following year the painting of fans was introduced, but this branch of industry has had a doubtful result, only a few girls being able to sell their productions. In 1882 painting on glass was added to the programme. The manufacture of artificial flowers was first tried in 1870; before that time Belgium imported all her flowers from France, now she not only has ceased to import, but actually exports flowers in large quantities to other countries. This class costs nothing for maintenance, the mistress providing the materials, and being allowed to sell on her own account the flowers made by the pupils * * *

The École Professionelle has 16 professors—all women, with the exception of those for drawing and painting. * * * At present there are 150 paying and 170 free pupils. * * * The minimum age for admission is 12 years, and applicants must be able to pass an examination in reading, writing, drawing, arithmetic, and one modern language besides their own. The institution serves to raise the intellectual level of middle-class women by turning out yearly 100 girls accomplished in useful arts. * * *

In Würtemberg and Bavaria one is likewise struck with the great progress that has been made in female education in the last thirty years. Not far from Stuttgart is the famous girls' work school of Reutlingen, founded in 1868, the first of the kind established in Germany, and the idea of which would seem to have been suggested by the École Professionelle, of Brussels, started three years before. * * *

The pupils are externes, about 300 in number, and pay a fee of £2 a session, drawing and needlework being the branches of most importance. The course lasts two years. * * *

The Munich school has also its cooking classes, and attached to it is the best arranged laundry that I have met with in my travels. Like the École Professionelle,

this school owes its origin to the generosity of a number of benevolent persons called the Society for Improving the Working Classes. It was started in 1873, and occupies a large building which was formerly a convent, and counts 500 pupils, all externes, who pay a fee of 3s. a month. There is a special department for training schoolmistresses, from which twenty or thirty young girls receive certificates every year. * * *

Some of the Swiss cantons have evening classes for girls, where they are taught drawing, needlework, and singing. The most remarkable girls' school is the Gewerbeschule, near Zurich, which is so similar in every respect to that of Reutlingen that I need not give any further description of it. * * *

Austria, until recent times, paid little attention to female instruction. Technical schools existed for boys, but it was considered unnecessary to teach girls anything useful, on the supposition that their mothers taught them to spin and weave. The ladies of Klagenfurth, in Carinthia, in 1868 founded the first women's work school in the Empire, and now there are 398, attended by 18,000 girls. Some are maintained solely by ladies, some receive subsidies from the Crown or the local authorities, some are free, while a fee of 2 or 3 shillings a month is charged in others. Most of these schools are on the model of the École Professionelle at Brussels. The purpose mainly in view has been, as in Belgium, to provide honorable and useful occupations for the daughters of the petite bourgeoisie, or the artisan classes. Besides these schools, the good ladies of Vienna have not forgotten the training of girls for domestic service, and for this purpose they founded a school where the highest form of cooking is taught by one of the first chefs in Vienna, also the duties of housemaid, and waitress, and the most necessary art of mending table linen. * * *

The girls have to pass a practical examination before receiving their diploma. * * * But the glory of Vienna is the Government Art School of Embroidery, the classes of which are under the direction of Madame St. George, perhaps the most accomplished designer and needlewoman in the world. * * * The entire course of instruction, which is quite free, lasts five years, but many pupils leave after two or three years, especially ladies who do not intend to make art work their profession and are satisfied with knowing the rudiments of either lacework or art embroidery, for every year has its special course. * * * Every year's course has its special room and instructress, and the pupils can not go from one to the other until the year expires. * * *

A movement is on foot in Denmark, corresponding with the needlework industries of England and Ireland, to advance the farming and dairy interests for the benefit of women. Little girls are being trained to raise poultry, make cheese and butter, and brand them with the badge of excellence. The agricultural, industrial, and scientific worlds are levied upon for improved machinery and appliances. By the use of special methods 10 per cent more butter is extracted from a gallon of milk than has heretofore been the custom. These fancy products are put in the highest markets, and yield a much greater revenue than by the old system of woman's work.

In Germany the first horticultural school (Gartenbau school) for cultured women was opened on October 1, 1894, in Friedenau, near Berlin. Nineteen pupils are studying, some with the purpose of carrying out more rational plans on their own estates, others so as to become horticulturists themselves. Seven women are to graduate in 1896, one of whom goes to Riga as teacher in a school founded on the same plan as that of Friedenau. Two women graduated from a one year's course, and have for a year successfully taken charge of the gardening on small estates in Germany. The object of this school is to give thorough training in all that appertains to gardening; the courses are in charge of scientifically trained persons.[1] There is said to be a demand for thoroughly trained women horticulturists as superintendents of gardens on large estates. The fact that this training is intended for "gebildete Frauen und Mädchen" is especially emphasized. In January, 1896, a society for the promotion of the support of women by means of fruit culture and gardening was formed, with Fräulein Anna Blum, of Spandau, as secretary.

Among the associations in Austria which are aiding in the industrial education of women is the "Wiener Frauen Gewerbe Verein," which in 1894–95 expended 89,268 gulden for such purpose. In the different schools under charge of this association were 1,892 pupils, subdivided as follows: Girls' lyceum, 246; commercial school, 103,

[1] Die Frauenbewegung, April 15 and May 15, 1896, pp. 82, 101.

of whom 42 received the diploma of graduation, and 24 obtained permanent positions. In the language school (where English, French, and Italian are taught) there were 174 pupils. The drawing school, in which are ateliers for industrial and decorative art (kunstgewerbliche Maltechnik), has a variety of courses of longer or shorter duration. In another subdivision instruction in pattern-drawing and embroidery is given. Still a third group of schools embraces instruction in sewing, cutting, hair-dressing, laundrying, cooking, etc.; the pupils of these branches number several hundred.[1]

The subject of the industrial education of women in Germany is one that interests those who have not had opportunities to visit any of the numerous schools which aim to train in this branch of education. A report made by Prof. Edward S. Joynes, of South Carolina College, and commissioner for that State, gives a clear account of the strictly industrial or professional schools visited by him during the summer of 1895. Professor Joynes (owing to the fact that his visit was during the summer vacations—in Germany July 1 to September 1, in France July to September or October) only visited the principal industrial schools for women, in Hamburg, Berlin, Munich, Dresden, Baden, and three in Paris. He thus describes the various appliances and methods of instruction, premising that these schools do not attempt general education, as this has been attended to in the common schools, which "pupils are required to have finished before admission;" nor are the fine arts taught, the purpose being to keep "strictly within industrial limits as a means of livelihood or for purposes of teaching":

In general the German industrial schools for women are divided into four departments. They do not include normal courses at all—the normal schools being quite distinct—except so far as higher industrial courses are themselves given as preparation for teaching. This fact, as well as the more thorough preparation of their pupils, greatly simplifies their work. Another advantage, with, however, some drawbacks, to which I shall refer more fully hereafter, is that being situated in large cities, they are for the most part day schools, and hence free from many of the burdens of a large boarding school. The entire management is thus simpler and less expensive.

The four departments are, in general, as follows: (1) The review course, including certain school studies; (2) the commercial department; (3) the professional department, including fine arts; (4) the domestic department.

(1) The review course includes chiefly: Penmanship (a good handwriting is required); elementary drawing, German language, arithmetic, theoretical and practical; French or English, or both (optional). Students may be exempted from this course if qualified, or it may be required for one or two years.

The utmost stress is laid on the mother tongue in speaking and reading and in manifold forms of writing, composition, correspondence, etc. A good knowledge of German is deemed essential in every commercial or professional pursuit.

Drawing is insisted upon from the beginning to the end of the course, the full course continuing for four years. The instruction begins with the simplest elements and passes by thorough stages, through all sorts of models and designs, up to the most artistic forms. To a greater or less extent drawing is demanded in all professional courses. For example, the dressmaker must know how to draw a pattern for the most elaborate costume; how, from a miniature, to enlarge a pattern mathematically to life size; or, vice versa, to draw a miniature pattern from a completed dress. The milliner must know how to design or copy patterns for bonnets, in different attitudes; the decorative artists to exhibit the effects of light and shade on curtains, to draw ornamental furniture, etc., to sketch the figures for a carpet or for new patterns of dress goods, etc. Drawing is made the indispensable foundation of industrial education and is required in every professional department. Outside of this, the disciplinary value of drawing is highly prized. * * *

(2) The commercial course: From one to two years—includes (besides typewriting, stenography, French, and English, as optionals), penmanship, mental and commercial arithmetic, commercial forms and correspondence, bookkeeping, single and double entry. In the higher courses, also, the elements of political economy and of commercial law, and what is called commercial geography. This includes the geography, first of Germany, with reference to climate, location, productions, routes, and modes of transportation, peculiar features of trade, etc., and the same with reference to other countries with which Germany deals, including a knowledge of their customs and postage

[1] Die Frau, February, 1896, p. 313.

laws, their currency, coins, weights, measures, etc.; also different forms of banking, exchange, and every kind of commercial paper or countinghouse forms, both German and foreign. In the programme of the trade school at Berlin such commercial course is set forth in full detail. The importance of such a course is justified and illustrated by the presence of women in every branch of mercantile trade in Germany or France. In almost every store you find women, usually trained experts, behind the counter and in the countingroom, to such a degree that I often wondered where all the men could be.

Telegraphy I found nowhere provided for.

(3) Professional departments: When I come to the professional departments proper, I find myself unable, for lack of technical knowledge, to describe what I saw, therefore I will only roughly indicate the several departments and their work.

(*a*) Household handiwork—sewing, knitting, patching, darning, and use of the sewing machine.

(*b*) Cutting and making of white goods, cotton, linen and woolen, chemises, shirts, underwear of men, women, and children.

(*c*) Washing, fluting, plaiting, and ironing of fine goods, shirt bosoms, laces, etc.

(*d*) Dressmaking, measuring, cutting, pattern drawing, and manufacture.

(*e*) Millinery—making, trimming, and fitting of bonnets and hats; also hairdressing.

f) Ornamental work—crocheting, embroidery, stitching, bobbing, lace making, marking in letters, monograms, etc., with the needle.

All these branches—with other items not named—are taught both theoretically and practically. In Hamburg I was conducted through a series of rooms where young women were at work, from the simple hemming of a handkerchief to the most elaborate finished costumes. I saw dresses and ornamental work, made wholly by the young ladies of the school, which would have done honor to any mantuamaker. I was told that the most fashionable ladies of the city had their work done there, and orders are received far beyond the power of the school to execute—the parties supplying the materials and the wages furnishing a considerable income. The same is true of the millinery department and other branches of ornamental or decorative work; also that the students of these departments are usually engaged, before graduating, for lucrative positions, while others easily establish a successful trade for themselves. * * *

Coming now to the department of fine arts, included under the professional studies, I may briefly state:

(*a*) Drawing—elementary, mechanical, and freehand; solid and descriptive geometry; theory of lights and shades, and perspective.

(*b*) Ornamental drawing—coloring, painting in water and oil, on canvas, wood, porcelain, etc.

(*c*) Etching on wood, stone and metals; lithography; modeling in clay and plaster.

(*d*) Lectures on history and principles of art.

Here belongs also:

(*e*) Needle work—embroidery, stitching, lace making, patterning, and designing; for curtains, carpets, table covers, dress goods, etc., both for decorative work and for manufacture.

This department is furnished with rich collections of patterns, models, charts, etc. The work of the pupils is placed on exhibition and on sale, and orders are constantly received from outside. The work of this department is held strictly within purely industrial limits, and no arts are taught as merely personal accomplishments. Such special instruction is held to be inconsistent with the purpose of the schools. * * *

Photography: One department of art which has but recently been introduced, yet with the greatest success, is that of photography. Inquiring into this, I was told that the delicacy of this work fitted it peculiarly for the gentle hand, the quick eye, and the fine taste of woman; that its combined scientific and artistic character adapted it especially for women of intelligence, taste, and culture; that the machinery was simple and inexpensive, and one teacher could accommodate many pupils; that already women were employed as assistants by many photographers, and there was no reason why they should not themselves conduct the business and reap the profits. At any rate, the classes in photography are large and increasing, with an increasing demand for such graduates. In the programmes of the Berlin school, and especially in that at Dresden, the course in photography is set forth with great fullness and in very interesting detail. I had no idea until I read these courses what scope is here afforded both for scientific training and for a wide range of artistic culture. Feminine intelligence, taste, and skill may here find an ample field and rich reward.

Printing is taught in the Berlin school, and practice work is furnished under contract by a printing office in the city; but I found it nowhere else. In Hamburg it had been definitely discussed and rejected. On inquiry for the reason of this, I was

told: First, that printing requires constant standing, which is regarded as unfavorable to the health of women; second, the custom of printers' unions would subject women printers to unfriendly competition on the part of men, and, in case of a strike, perhaps to indignities, if they should offer to take the place of discharged union men. I had no opportunity of learning the affirmative arguments at Berlin—the only school, so far as I know, in which printing is taught.

I come finally to perhaps the most interesting section of all.

(4) The domestic department: This is divided into three branches, and each of them into what I may call, though not so entitled, major and minor courses. These branches are (*a*) household service, (*b*) washing, (*c*) cooking, and, as will appear, all of these may be pursued in whole or in part.

(*a*) The household service includes, in home schools suited for the purpose, the training of house servants or chambermaids—the care of beds, rooms, furniture, etc., along with plain sewing, washing, and cooking—a service performed in Europe by white girls, with far more industry, economy, and efficiency than by our negro women. Besides this—and especially in day schools not adapted for this purpose—are found two minor courses; one for training of ladies' maids, another for the training of housekeepers. These, besides lighter household service, include only fine washing and cooking, with plain sewing, tailoring, and millinery—such as may be needed in families. These courses are intended for young women who desire only select or temporary employment, as upper servants, or more permanently, as housekeepers in their own or other houses.

(*b*) Washing is taught and performed in a businesslike way. It includes the actual washing, drying, folding, ironing of household wash—sheets, tablecloths, napkins, etc., and of personal clothing of all kinds. Afterwards fine washing—including plaiting, fluting, etc., of shirt bosoms, collars, laces, etc. This latter may be taken also as a minor course by those who do not wish to learn ordinary washing. Washing is done as work, not as play. Besides the actual wash of the house and of the girls thus employed, washing is taken in from outside; and it is done so well and so cheap that the orders would far exceed the capacity of execution. With the improved machinery employed for washing, rinsing, drying, folding, ironing, etc., the labor is not severe, and may be performed by delicate women. Especially the course of fine washing is a valuable accomplishment for the proudest lady. These courses are taken by successive sections of girls—each serving for a certain number of weeks, and for so many hours a day. Practical skill in the service of washerwomen is aimed at. How far the actual washing for a school of 300 to 400 persons may be undertaken by our girls—or how far, under our conditions, this may be desirable—are questions I will not undertake to answer. But at least it is desirable that every housewife should know what constitutes good washing, and how to direct its performance by servants. Outside of neatness and comfort, there is no greater economy than good washing—no greater source of waste, scolding, and even profanity, than bad washing. The labor-saving machinery and the refined materials of the present day redeem this work from the greater part of its old-time drudgery.

(*c*) Cooking and kitchen economy: This department is taught with great fullness. Its especial interest may justify a somewhat detailed though brief description, which may be stated as follows:

(1) The theoretical course, in practical and experimental lectures. These include, so far as applicable to the subject—

Physics: The structure and management of stoves, ovens, utensils; the pressure of water, hot and cold; ventilation, etc.

Chemistry, in its manifold applications to the materials and processes of cooking; also to the preservation, degeneration, adulteration, and testing of foods; the special chemistry of important materials, as milk, eggs, etc.

Botany and zoology: The knowledge of the most important sorts of vegetable and animal foods—their characteristics and relative values as to nutrition, digestibility, etc.

Physiology and hygiene: The functions of the body in the digestion and assimilation of food, the principles of dietetics, and especially the requirements of food for the sick. This course is shown in the Hamburg and Berlin schools, but with especial fullness of detail in the household school of Munich.

(2) The business course, or kitchen economy: This includes going to market, under guidance of the teacher; the examination, selection, and purchase of provisions; the weighing out of supplies and ingredients from the storeroom; and therewith, the preparation of a businesslike account of expenses, by the day and by the week, which must then be engrossed into account books. The pupils are also taught to prepare in advance bills of fare for a day or for a week, or adapted to different seasons of the year, with estimates of cost, including all the ingredients; which estimates are then criticised, corrected, and experimentally tested. This line of study and experiment seems to me to be of the greatest value.

Next, and of very great interest, is what I may call—

(3) The fine arts of the kitchen, by which I mean pickling, preserving, the making of sauces, of desserts and ornamental dishes, the preparation of food for the sick, and especially the making of side dishes, stews, etc., and the saving and employment of remnants. These last items are capital elements of economy and of special interest for us. Many housewives provide about twice as much as the family will consume. The remnants, except in case of a ham or large roast, go to the kitchen, and, after extravagantly feeding the servants, are thrown to the fowls, or reserved for the colored friends of the cook, and the next day the same waste is repeated. In Germany and France, after proper provision for the servants, these remnants are carefully saved, and the next day reappear in new and palatable forms, or skillfully combined into stews or other made dishes, most excellent and wholesome. A cut of beef appears to-day boiled, having furnished a light soup, which will be prepared in a variety of attractive forms; the next day as a roast, with a gravy or sauce; the next, a stew, with sauce and vegetables, and at breakfast the fourth day, probably in appetizing croquettes, until the last morsels are consumed, and each day it seems more palatable than before. I speak here of what I have seen during a long residence in Germany. * * *

(4) I come, finally, to actual cooking and kitchen work. These include also the dishing and serving of food, the setting and serving of the table, and cleaning up. All this work is done thoroughly, under the supervision of a teacher, as work, not as play nor as mere practice of a theory. The best machinery (cooking stoves, tables, dressers, utensils, hot and cold water, etc.) is used to rob the work of its drudgery and dirt; but then the work is done thoroughly and in the best style. It is taught in sections, to each for a certain period, and a given section, after a certain time devoted to plain cooking, pass to a smaller kitchen, where fine cooking, preserving, pickling, etc., as above described, are taught. I went into the kitchen at Hamburg, where eight young women were getting dinner. Their outer skirts were neatly tucked up, their arms were bare to the elbow, on their heads were little white caps, and they wore clean white aprons—a pretty picture. One was stringing beans, another peeling potatoes, another skimming the soup, another basting the roast, another making pastry, etc. All were busy. They had themselves bought those provisions at market; and from that until the dishes were finally washed and put away, the whole work was done by these young girls under the eye of the teacher. It is possible that a single servant or scullion was employed, but of this I am not positive. Only those are thus taught who select the course of cooking, and these are kept at their work, by sections, long enough to acquire practical skill. At the same time it is possible, in some of the schools at least, to take the course of fine cooking only, which has been described above as a minor course.

Most of these schools being mainly day schools, the problem presented itself, how to provide for the consumption of the food cooked; for it was felt that only cooking for actual consumption, and not mere theoretical practice, could give the requisite training. This problem was solved by the opening of a boarding table for ladies only, who take their meals regularly at the school, or for families living near by, to whom cooked provisions are sent. Thus the food is disposed of, and the cooking school is made to pay for itself. It is to be remarked in every case that such is the reputation of these schools for furnishing good food at low price that the applications for board are more than can be supplied. Pupils may also secure their midday lunch at the school. It is a question (as in the case of washing) how far the cooking necessary for 300 to 400 persons can be done by the pupils of the school. * * *

In addition to the courses of study already outlined I should add that physical culture, gymnastics, and calisthenics are required of all pupils; also vocal culture, the reading of music, and choral singing. * * *

These schools are either municipal (as in Hamburg and Paris) or founded by voluntary association and contribution (as in Berlin and Karlsruhe, etc.). In no case are they founded or directly supported by the state. In Germany tuition seems to be generally charged, with a certain number of free endowed scholarships. In Paris the city pays for a certain number of scholarships, which are conferred by competitive examination. In no case do I find free tuition in our sense of the term. * * * The superintendence, or presidency, and the regular instruction are in all cases in the hands of women. Men in some cases are employed to teach, but only by the hour, for special classes. The governing boards in all cases include women as well as men, and the internal supervision is intrusted mainly to the women of the board.

All these schools being situated in large cities are mostly day schools, but in most cases provision is made for boarders from abroad. Especially, so far as possible, the students of the household department are required to lodge in the school, or to spend most of their time there, and special establishments exist for this purpose. * * *

All these schools are of quite recent origin, mostly from small beginnings; but their success has been very great, and many like schools will doubtless soon be founded. In Hamburg I note an attendance of 581 compared with 479 the previous

year; in the various branches of the Berlin school a total of 1,918. The association supporting this school includes 1,233 members. In the grand duchy of Baden, comprising less than 6,000 square miles, besides the great central schools at Karlsruhe, there are 195 local associations, comprising 26,042 members, and supporting 18 local industrial schools for girls and 53 establishments of public benevolence, hospitals, orphan asylums, retreats for the aged, etc., all largely due to the benevolence and public spirit of the grand duchess. Thus the industrial education of women has taken strong hold upon the public mind and is rapidly growing in importance. The time is probably not distant when it must receive the direct care of the Government. * * *

These schools are arranged on the elective plan, each student electing one course of study, and usually only one (except such review studies, etc., as may be required). With courses thus distinct, and with an ample supply of teachers, there is very little conflict of studies or hours, and each pupil may be amply occupied in her own course of study. The school work proper has been done in advance. The normal courses are provided in separate normal schools, and with departments thus subdivided the work of the industrial school is comparatively simple. In the same way, for men, the mechanical and technical schools are in large cities, the agricultural and mining schools, etc., are in the country, and the work of each is thus greatly simplified. * * * Yet what I saw and learned has only served to impress me deeply with a sense of what remains and of the great importance to our new and difficult work of the thorough study by an expert of the organization, methods, appliances, and results of these famous industrial schools. * * *

In the Eighth Annual Report of the Commissioner of Labor, Washington, 1893, the status of industrial education in European countries is treated in extenso. Reference is made to pp. 163–586 of that report for additional information in regard to schools for the industrial training of girls.

WOMAN'S CONGRESSES AND FEDERATIONS.

The year 1896 was prolific in woman's congresses, which were of marked importance to the woman question. In 1897 a woman's congress was held in Brussels, Belgium, which dealt more especially with the legal rights of women, but so far no reports of that congress have reached this office. In 1898 (June), the fourth biennial of the General Federation of Woman's Clubs was held in Denver, Colo. Owing to the significance of the congresses for the year 1896 their main discussions are here chronicled.

The Woman's International Congress was held in Paris from the 8th to 13th of April, 1896; the Grand Federation of Woman's Clubs was held in Louisville, Ky. (May, 1896), and the International Congress for Woman's Work and Woman's Endeavor (Internationaler Kongress für Frauenwerke und Frauenbestrebungen) was held September 19–27, 1896, in Berlin, Germany.

The main object of the French congress was to aid in the "amelioration of the position of women, working girls, and children." According to reports received from Paris, the congress discussed the subject of woman's rights, marriage, divorce, etc. Fifty-four foreign societies were represented, among them Belgian, German, English, Dutch, Italian, and Finnish societies. It seems to have been a recognized fact ere the meeting closed that the programme was too comprehensive for a four days' meeting, and the fifteen-minute time limit for speakers became a dead letter, but the general consensus of opinion was that the women had won a right to debate live questions, and that each year would bring renewed effort, stronger and more earnest discussions.

The president, Mme. Pognon, in her opening address, pointed out the great contradiction in the Code Napoleon, "which considers woman a minor when there is a question of rights, but a responsible citizen where her duties are concerned." She also spoke warmly of the work of Maria Deraismes for liberty and equality of woman, and of the lodge she founded, where men and women are accepted as members on equal terms. She said further that—

The French laws concerning women are not logical at all. On the one hand, the whole law treats them as minors, too ignorant to be responsible and to dispose of their fortunes; on the other hand, the penal law admits them as witnesses, and a woman pays for her crime with her head. There are 8,000 women at the head of

commercial houses in the Department of the Seine. These have not the suffrage possessed by their employees and domestics. One-third of the workers in French industries are women, but it is only the men who may discuss and vote the laws concerning them and their work. Still we are progressing, for in 1892 we acquired the right to be members of councils of trade. The Chamber of Deputies has voted our rights to act as witnesses at births, marriages, and deaths, and the right of married women to accept and dispose of their personal earnings.

Among the questions which reached a vote were the following:

A married woman should not acquire the nationality of her husband or lose her own except by an express manifestation of her own will; children born of parents of different nationalities should be at liberty at the time of their majority, their marriage, or of drawing lots (for entrance into the army) to choose between the father's and mother's nationality; children from birth to majority should be under the protection of society, not only for education but for maintenance as well, and mothers ought to have a right to assistance from the state; the work of shop girls and female employees should be regulated by legislation; the minimum salary of women should be fixed by the municipal council proportionately to the cost of food and with fair equality for both sexes.

Coeducation was favorably spoken of and the Government was petitioned to apply it progressively in educational establishments of diverse grades—elementary, secondary, and higher. An announcement was made that henceforth there would be an annual national woman's congress held in Paris, and that a great international congress would meet in 1900 during the exposition. The need of a fund for pensions in old age and for assistance to those women who are out of work was discussed; so also the admission of women to departments for agricultural study. The subject of bicycling was also introduced and favorably reported upon; so also that of women in the journalistic profession.[1]

On September 19–26, 1896, the Internationaler Kongress für Frauenwerke und Frauenbestrebungen was held in Berlin, Germany. This, the first international congress ever called together by German women, was a success in point of interest and numbers. Held in the "Festsaal," or festival hall of the new Rathhaus, the sessions were daily attended by hundreds of interested listeners. Estimates place the numbers present at from 1,200 to 3,000 people. It is sufficient, however, to state that the papers on educational, sociological, industrial, and economic questions were listened to by numbers of attentive women and men. Delegates were present from America, France, Great Britain, Finland, the Scandinavian countries, the various principalities of Germany, Austria, Italy, Roumania, etc. The principal journals of Germany sent reporters to chronicle the discussions at each session of the congress, and their résumés of the papers presented were read with interest. Preliminary to the subjects mentioned in the accompanying conspectus were the reports presented by delegates from different countries.

The Berlin local committee, composed of the ladies Frau Lina Morgenstern, editress of the Hausfrauen-Zeitung, Frau Schulrat Minna Cauer, editress of Die Frauenbewegung, Frau Kempin, Prof. u. Dr. jur., Frau Bürgermeister Kirschner, Frau Rechtsanwalt Hannah Bieber-Böhm, Frau San. Dr. Schwerin, Frau Dr. Eliza Ichenhäuser, Frl. Laura Hermann, Oberlehrerin, Frl. Agnes Bluhm, Dr. med., Frl. Raschke, Lehrerin, Frau von Witt, Frau Maria Gubitz, Frau Prof. Schoenflies, Frl. Dr. Elvira Castner, Frau Red. Stromer, Frau Rechtsanwalt Rosenheim, Frau Hedwig Dohm, Frl. Katharina Strahl, Frau Dr. Maybaum, Frau Generalconsul Schlesinger, Frau Jean Christ-Gutbier, Schriftst., received substantial aid from the authorities in Berlin toward making this congress a success.

The programme for each day's sessions indicated how desirous the organizers of this congress were to present to the public vital subjects for discussion and to awaken interest in questions which had received due attention in countries where possibly public opinion was more inclined to be favorable to the woman movement.

The holding of the congress in Berlin indicated, too, that this city is in touch with modern progress, and the earnestness of those present from day to day indicated the success of the undertaking. The congress opened with an evening meeting,

[1] Journal des Débats, mai, juin, 1896, and other files.

which included greetings to delegates, business pertaining to the eight-day meetings, reading of reports from home and foreign delegates, social converse. The German programme presents the following topics:

I. Addresses concerning woman's endeavor; the care of children; kindergartens; children's aid societies; reports from different countries, and discussions; visits to industrial exhibition, etc.

II. Elementary schools; higher schools for girls, including "Mädchengymnasia;" teachers' positions; continuation, special, and normal schools; reports from different countries, with discussion; visit to exhibition, with study of educational institutions.

III. Scientific study in universities; education for the medical profession—as physicians, dentists, pharmacists, nurses, etc.; hospital service; reports from different countries; visits to the laboratories, hospitals, etc.

IV. Hygiene and sanitation; nutrition; cooking schools and schools for domestic economy; convalescent homes; lying-in asylums; vacation colonies; visits to cooking schools, and drive to school of domestic economy at Marienfeld.

V. Working women and their wages in industrial and commercial establishments; welfare of working women; organization of trade and employment unions; the servant question; morality problems; reports and discussions; visits to institutions for working people.

VI. Woman in the law—her rights, etc.; reports of woman's position in different countries—in school legislation, in charitable work, care of orphans, as guardian; discussions; visit to institutions or excursion.

VII. Woman in art, science, and literature; woman in peace movements and organizations; reports and discussions; resolutions; visit to art exhibits; social gathering, receptions,[1] etc.

The papers presented by the earnest workers in educational and other fields of human endeavor were indicative of sincere conviction and deep, clear purpose. The position of the woman movement in different countries was ably presented by the delegates, the papers being of both a theoretical and practical character. The work and success of the gymnasia for girls, lately established in Carlsruhe, Berlin, and Leipsic, for the purpose of preparing for university courses, was presented by directresses or teachers connected with such secondary schools. The strength and vitality of the woman movement in Finland were due, said the Baroness Alexandra Grippenberg, to the fact that "it is not confined to the well-to-do classes, but has permeated the far larger mass of the workers." Trade and labor questions, the wages of working women, and other similar topics were discussed on the day set apart for such subjects; the delegate presenting the question from the English standpoint stated that over 100,000 women belong to women's trades unions in that country to-day. The success of the children's country holiday fund, established in Berlin; methods used in caring for the sick; the nurses' training home; woman's work in the relief of the poor and as guardians of the poor; temperance questions, and woman suffrage were a few of the topics presented by those women who had, in many cases, given much time to the carrying on of such movements. Reports presented by the delegates[2] of different organizations in the United States (dealing with woman's position in the professions, in education, in industries, in club work, and before the law)

[1] Résumé of Conspectus of "Internationaler Kongress für Frauenwerke und Frauenbestrebungen am 19–26, September, 1896." See also "Der Internationaler Kongress für Frauenwerke und Frauenbestrebungen in Berlin, 19 bis 26 September, 1896. Herausgegeben von der Redaktions-Kommission, Berlin, 1897."

[2] These delegates were, in the order of the presentation of their papers (*vide* the report of the Congress, i. e., "Der internationale Kongress für Frauenwerke und Frauenbestrebungen in Berlin: eine Sammlung der Vorträge und Aussprachen, Berlin, 1897"): Miss Frances Graham French, with a paper entitled Die Frauenbewegung in den Vereinigten Staaten; The Civic Club of Philadelphia, by Dr. Bertha Lewis; Mrs. Eliza B. Kirkbride, "Women's clubs in the United States;" Mrs. M. F. Crowe (read by Miss Richert), "Frauenstudien in Amerika;" Mrs. E. S. Brinton, "Report of the Woman Suffrage Association of the District of Columbia;" "Political rights of women in the United States," by Mrs. Belva A. Lockwood, barrister, etc.

were received with marked interest as being typical of the progress of women in America. Woman's position in art, science, and literature, and her share in the peace movement were treated by thoughtful women cognizant with such subjects. So many were the papers presented at each session of the Woman's Congress that there was little time for discussion of the momentous question of the higher education of women. The general consensus of opinion was, however, that the woman movement in Germany had received great impetus—I, from the interest manifested by the large body of earnest women present; II, from the general presentation through the press of Germany of the most notable papers given at each day's proceedings.

The General Federation of Women's Clubs, which held its biennial meeting in Louisville, Ky., beginning May 27, 1896, has now a membership of 100,000. Organized six years ago, its object is the union of the clubs of the country to "promote their efficiency by the comparison of methods of work, to enlarge and quicken the intellectual and social life of women."[1]

The subjects discussed during the session covered education, literature, philanthropy, social economics, and finance. This was the first time that separate department meetings were held. Under the heading of literature came discussion of the study of local history, of history by periods, work of traveling clubs in connection with historical study, Shakespeare's historical plays, the historical novel and drama as interpreters of history, modern criticism as applied to the study of history, uses of university extension lectures, uses of public and traveling libraries, influence of literature on character, the message of music, the college girl and society.

In the department of education the papers covered the philosophy of the kindergarten, the schools a moral factor in the nation, relation of the college to the lower school. In the home department the discussions were on the household (such as food supply, chemistry, and art of body building, sanitation); on physical culture; on the social aspects of home life.

Under the headings philanthropy and social economics there were papers on social regeneration, working girls' clubs, women as conservators of the public health, sociology, State boards of charity, civilization an economic fact, public and private duty to the dependent child, municipal reforms, village and township improvement associations, trend of American sentiment toward labor movements. Then the subjects of women in art, medicine, pharmacy, agriculture, as engravers, nurses, in trades and professions were presented, as also the objects and limitations of both State and general federations.

REPORT ON THE GENERAL FEDERATION OF WOMEN'S CLUBS.

By Mrs. Ellen M. Henrotin, President.

The woman's club movement had its rise in the new social and economic conditions which faced women in the early sixties. Prior to that time the church and philanthropic associations had absorbed the activities of women outside the home. The invention of machinery, the capitalization of great industries, which underlie the home, gave leisure to hundreds of women who had carried on these industries in their own homes, for no matter how well situated financially was the woman of that period she considered it her duty to sew and to do thousands of things in her own home which are now done for her by manufacturing. A wealthy woman to-day who devotes her time to production in the shape of garments, or who, in fact, does anything for herself which can be accomplished by a professional, really commits an immoral action, but in the sixties life was on an entirely different ethical and industrial plane. Women began to feel more or less vaguely at this time that they would soon be called upon to face new conditions. Those of them who had passed the school age began to look about for some educational factor which would fit them to adequately meet the new conditions. Even education was, in the sixties, in a most

[1] From address of president of the Federation of Woman's Clubs, Mrs. Ellen M. Henrotin; also from Official Proceedings of Third Biennial, Louisville, 1896. As this report is going to press the fourth biennial is being held in Denver, Colo. (June, 1898).

rudimentary stage. Girls' schools were rarely well organized, and the higher education among women was provided by a few colleges, such as the Emma Willard and Mount Holyoke, and the female seminary abounded in the land. Happily, that phase of education which the latter represents is almost extinct.

This educational factor the women found in the woman's club. Little groups of women, met together in what was more a study class than anything else, began to educate themselves. They usually studied history, and invariably commenced with the country farthest from home. The same phenomena may be observed with the religious work connected with the Protestant churches, the foreign missions absorbing the time and interests of most of the women who first entered philanthropy as a career. This came from the natural timidity of the sex to face conditions around them. They dare not act on the religious convictions which would be forced on them by consideration of religious problems in Christendom and the social problems which they must face in studying the history of present conditions of their own country. In no way is the advancement of woman better illustrated than in her present eagerness to face the religious and social problems of her own country at the present time.

Gradually as the women educated themselves, became accustomed to speak in public and study parliamentary law, the wish to put into action this knowledge and to try to realize some of the Utopias which their research into history and philosophy had evolved, became so strong that a new phase of club life was organized—the department club—which embraced the following departments: The home, education, philanthropy, social economics, art and literature, science and philosophy.

Of course all these departments are capable of immense subdivision. By this time the woman's club movement and kindred organizations of women were powerfully affecting the civilization of this country, for of necessity the active participation of one-half of the citizens of a country, and that half of the community specially pledged by tradition and instinct to maintain the cause of law and order, to promote the peaceful arts and protect childhood, would ultimately influence all social questions.

Many of these clubs, for the movement had focused so rapidly that clubs were now formed in all the principal cities of the Union, were chartered corporations, and several of them had formed stock companies and built their own clubhouses. This, of course, gives the club an entirely different stand in the community from that of an organization meeting from house to house and which has assumed no financial responsibility. All the clubs in the country are now becoming anxious to have a permanent meeting place, convinced that they can thus increase their usefulness and extend hospitality to sister associations. Several of the larger clubs hold their meetings in clubhouses which belong to men. The work of men and women is, of necessity, so interdependent that the mutual use of all social privileges is a wise conservation of energy and wealth.

Among the larger clubs owning their own clubhouse are the following: The New Century, of Philadelphia; the Acorn Club, of Philadelphia; the New Century, of Wilmington, Del.; the Peoria Woman's Club; the Propylæum, of Indianapolis; the Twentieth Century, of Utica; the Athenæum, of Milwaukee; the Woman's Club, of central Kentucky; the Richmond County Club, of New York; the Woman's Industrial and Educational Union, of Buffalo; the Bradford Woman's Club, of Pennsylvania.

In March, 1889, the General Federation of Women's Clubs was organized at a meeting held in New York City, at which Sorosis was hostess. The General Federation was incorporated under the laws of the State of New Jersey, entitled "An act to incorporate benevolent and charitable associations," approved April 9, 1875, and a supplement approved April 6, 1876. The first president of the General Federation was Mrs. Charlotte Emerson Brown, president of the East Orange Woman's Club, New Jersey. Mrs. Brown retired from office in May, 1894, having served the two consecutive terms allowed by the constitution. Mrs. Charles Henrotin, of Chicago, succeeded her in office, and was reelected at the biennial held in Louisville in May, 1896. Rotation in office is a distinctive feature of the club movement, and thus a large number of women are educated as leaders, who contribute their enthusiasm and work to the club As the organization has within itself a germ of constant renewal, it is in a strong position to cope with the demands of our exacting civilization.

The aim of the federation is to unite the clubs and promote their efficiency by thus quickening the intellectual, social, and ethical life of woman. The federation is to-day an organization of vast dimensions, numbering 455 clubs and 24 State federations. The membership of these clubs includes the large city club of many hundred members and the small club whose members do not exceed 30 or 40. The membership of the General Federation, by State federations, is as follows: Colorado, District of Columbia, Georgia, Illinois, Iowa, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio,

Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Washington, Wisconsin. There are also 3 in India, 1 in England, and 1 in Australia.

The corresponding secretary, Mrs. Philip N. Moore, reported at the biennial of 1896 that, of the nearly 500 clubs in the General Federation, 50 clubs only are pursuing purely literary lines of work. In the department clubs 371 have a department of literary work, which includes art, science, philosophy, and kindred subjects. Two hundred and thirty-two of the department clubs have a department of education, which includes practical work in kindergartens and schools. One hundred and seventy-four clubs have a department in philanthropy, theoretical and practical. One hundred and sixty-five clubs have a department of household economics in various lines. One hundred and sixty-five have departments of social economics, which includes practical work in the municipal and legislative bodies and village improvement societies.

The State federations were organized through the efforts of the delegates who, having attended the biennial, realized the benefits they derived from those meetings, and felt that such gatherings of the State clubs, which could be held annually, would be of incalculable benefit not only to the State, but to the members of the clubs.

The federation was also so large that it would have been impossible to establish a system of study or of work available for all the clubs, for the needs of every locality differ. Maine, Iowa, Massachusetts, and the Social Science Federation of Kansas led the movement of State federation, and all the State federations have affiliated at once with the general federation, with the exception of two States—Alabama and Florida. The Florida federation is a collection of village improvement associations, and is in most friendly correspondence with the general federation, with which it would have affiliated before this had not the members felt restricted, owing to the hard times in financial resources.

The annual meetings of the State federations testify to the practical advantages which have accrued to the clubs by the formation of State federations in the broadening of social life, and in the practical work which has been inaugurated. The programmes presented have, above all, been marked by growing interest in sociology and civics.

The State federations report their work as follows:

Colorado: The study of civics, study and practice of civil government, traveling libraries.

District of Columbia: Legislative work, education.

Georgia: Just organized.

Illinois: Educational work, particularly the State system of education from kindergarten to university; care of dependent and delinquent children on educational lines.

Iowa: General educational work, public libraries, traveling libraries, village improvement associations.

Kansas: Department work, discussion of practical and vital issues.

Kentucky: Establishing public libraries throughout the State.

Maine: Education, particularly in the public schools; kindergarten, household economics.

Massachusetts: Educational, legislative, and literary work.

Michigan: Education, household economics.

Minnesota: Town and country clubs, town and village improvement association, education, art interchange.

Missouri: Club extension, education.

Nebraska: Applied economics, domestic science.

New Hampshire: Legislative, education, care of dependent and delinquent children.

New Jersey: Forestry, traveling libraries.

New York: Department work.

Ohio: Traveling libraries, legislative, education.

Pennsylvania: Public libraries, traveling libraries.

Rhode Island: Organized to bring together, for mutual help, for intellectual improvement, and for social union, the women's clubs of the State.

Tennessee: Education, traveling libraries.

Utah: Intellectual improvement and social union, education.

Vermont: To bring together for mutual help, for intellectual improvement, and for social union, the women's clubs of this State.

Washington: Just organized.

Wisconsin: Just organized.

The number of clubs in the State federations is very large. The membership of Colorado by latest report, 58; District of Columbia, 11; Georgia, 22; Illinois, 105; Iowa, 138; Kansas, 37; Kentucky, 32; Maine, 74; Massachusetts, 86: Michigan, 75; Minnesota, 52; Missouri, 47; Nebraska, 55; New Hampshire, 32; New Jersey, 52;

New York, 135; Ohio, 119; Pennsylvania, 33; Rhode Island, 9; Tennessee, 19; Utah, 11; Vermont, Wisconsin, and Washington, number unknown.

The States having the largest number of clubs in the general federation are Massachusetts, Iowa, Ohio, New York, and Illinois. These States have also the largest State federations.

The work of the biennial of the general federation is divided into departments as follows: Literature, education, philanthropy, social economics, the home, and finance.

The department report of the biennial, a volume of 440 pages, gives an account of the meetings, the papers read, and the prominent points in the discussions, and contains essays by the leading women of the country, not only in club life, but as students of sociology and writers.

The federation has many honorary members in England and Europe.

WOMEN'S CLUBS AS AN EDUCATIONAL FACTOR.[1]

By MARGARET J. EVANS, Principal of the Woman's Department, Carleton College, Minnesota.[2]

Women's clubs are in their origin, practice, and purpose educational.

Through these three ideas—of the value of the individual mind, of organization, and of the responsibility of every individual for the welfare of every other, has it come about that, by the most conservative estimate, 160,000 women are enrolled in clubs.

THE CLUBS AN EDUCATIONAL FACTOR FOR THE MEMBERS.

A large number of the clubs are study clubs and seek the mental improvement of their members in literary, sociological, and artistic lines. They are, therefore, educational; are, indeed, a part of that great current of universal education through which has resulted that condition portrayed by President Hall: "Woman is no longer beautiful as an angel and silly as a goose." The courses of study pursued in many of these study clubs is as thorough and exhaustive as any university course, and in nearly all the clubs the outline of study is worthy of the respect of any educator.

A close student of political economy is well quoted as saying: "I consider the women's clubs movement as one of the most logical developments of the new education which has yet been evolved."

For the home and the community the club is also an important indirect educational factor. At least 100,000 homes are being educated by club study. The tone of community life is also improved by these mature students, by the open sessions of the clubs, as well as by the lectures and by the university extension courses given through the clubs.

THE CLUBS A DIRECT EDUCATIONAL FACTOR.

It is through the expression of their sense of responsibility and of duty as the "daughter of the Voice of God" that the clubs are bound together and secure that "Unity in diversity" which their motto enjoins. No form of activity has, however, aroused so much interest and enlisted so many members as that of public education in all its phases. Of the great mass of evidence on this subject only a few significant facts may be adduced.

Libraries have had much attention. The need is evidenced by the fact that few States have adequate library facilities; that even in New Hampshire forty towns are without public libraries; that in nearly all States the libraries, except in large cities, are few and meager; that in many States not half of the population, in others not a third, have anything to supply adequately mind hunger. However, club women have initiated libraries and induced the cities to assume them. In Georgia seven libraries have thus been given by the clubs.

Traveling libraries have been secured from the States. Ohio and Iowa are especially happy in their results there. Where State libraries can not yet be obtained the clubs are operating local traveling libraries. Nearly every club in Georgia now operates such libraries. Minnesota, Wisconsin, Michigan, and New Jersey clubs have many such in circulation. Nearly every State is working for them. School libraries have also been encouraged and aided in many ways. The Colorado clubs have secured many new school libraries. The Chicago clubs have aided nearly every school library in the city. Other Illinois clubs have contributed largely to libraries, one club contributing $1,200.

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[1] An address delivered before the National Educational Association, July 12, 1898, Washington, D. C.

[2] Miss Margaret J. Evans, principal of the woman's department of Carleton College, Michigan, was graduated from the classical course of Wisconsin University in 1868, and four years later took degree of M. A. from the same. In 1878, spent one year in Berlin studying; five years later, spent an academic year at Oxford; in 1892-93, studied at Heidelberg; president of Wisconsin federation, and chairman of educational committee of general federation.—Woman's Journal, July 30, 1898, p. 242.

The Georgia clubs circulate books in remote country districts. The Minnesota Federation issues a list of children's books.

In nearly every one of the thirty State federations, as in Iowa, where 45 clubs have aided libraries, the good work is going on.

ART IN THE COMMUNITY AND IN THE PUBLIC SCHOOLS.

One part of man's complex nature has, in our civilization, received scant nourishment. It is the aesthetic nature. To remedy this defect the women's clubs are exerting themselves to promote in every way the knowledge and love of art. They are decorating schoolrooms and giving to the schools reproductions of the masterpieces of art in pictures, casts, and portfolios of photographs. They lend fine pictures to homes, admit school children free to art exhibitions. Such work as that of the Minneapolis Improvement League, which has given to 25 schoolrooms valuable pictures as prizes for the cultivation of flowers, speaks for itself. The school art leagues indicate another form of result from aesthetic development.

Outdoor art and village improvement work for children is another field worked by the clubs. The next generation will have, through these efforts, better notions of civic cleanliness, and may be able to avoid the three direful d's—disorder, dirt, and disease, so prevalent now. The civic work for children in New York, Philadelphia, and in many large cities; the placards enjoining the care for the beauty and cleanliness of the town, of the Minnesota schoolrooms, emphasized as they are, in language lessons; the Rochester, N. Y., prize questions on the natural, architectural, and possible beauties of their city, are educational straws of value.

Instruction in household economics and manual training have also occupied the women of the clubs. Two quotations in the Minnesota circular emphasize the need: "Half of the money earned in the United States is spent for food; $600,000,000 are annually wasted in American kitchens." The clubs are expending large amounts of money and energy in securing instruction in cooking, as well as in sewing and other manual training, and in obtaining departments of household economics in colleges and universities.

KINDERGARTENS.

It is said that the chief of police in San Francisco once said: "If there were kindergartens enough for all children, no police would be necessary in the next generation." There is truth enough in the optimistic statement to warrant the efforts of the clubs in twenty States in laboring to promote free kindergartens and to incorporate them into the public school system. The clubs of several States have largely succeeded—others, as in Chicago and in Georgia, are operating the kindergartens as an object lesson.

Promotion of vacation schools and playgrounds also makes the clubs an educational factor. To prevent the training in crime and immorality, which the idleness and the associations of the streets give to many children, schools and playgrounds have been provided and aided by the clubs in New York, Philadelphia, Chicago, and other cities, with most encouraging results.

Night schools and schools for needy working boys and girls have also done good work. In one town 60 teachers in the poor districts are supported by the clubs.

Mothers' clubs, parents' and teachers' leagues and child study classes have all come under the fostering care of the clubs. One of the important steps of the year has been the organization of a large number of such clubs and the union of those which already existed into a closer bond. The special committees of the State federations for this purpose have accomplished much. Of one typical mothers' club it is said: "Hebrews, Catholics, Protestants, and those of no creed meet continually in harmonious emulation."

Similar to this interest has been that in the establishment of children's leagues and reading circles. Georgia reports 130 such circles started by the federation circular.

Open educational meetings have done much where no mothers' club is organized.

Auxiliary clubs for self-supporting women, for girls and boys, for all sorts and conditions of women indicate a wider educational effort.

Visitation of schools and investigation of school conditions have been organized by the clubs to remove the anomalous separation hitherto existing between the home and school. "Mother, don't you come to visit our school; no one else does, and the boys will all think I've gotten into trouble," is the thought of more than the Chicago boy who uttered it. Nearly every club has now a committee to study personally the needs and excellences of the schools. The clubs have thus secured by petition more schoolrooms, better ventilation, greater cleanliness, needed changes in arrangement and school conditions. The statement of one State superintendent of instruction is still true of some schools in almost every State: "The condition of things

would disgrace an Apache Indian." But information is beginning to bring reformation. The needs and excellences of our schools afford abundant room for investigation. Hostile criticisms have no place in the club scheme.

Cooperation and coordination with other educational forces mark a further advance. Union with teachers' associations, local and State, has been found fruitful. Discussions in meetings on such topics as, "How the homes may help the schools," and "What the schools may do for the homes" have brought parents and teachers together. In fifteen or twenty States conferences between the women of the homes and of the schools have been held. Club women have been invited in large numbers to address educational associations. County and State superintendents have been glad to accept the aid of the clubs and to cooperate with them. It is manifest that club work must rest its greatest hopes on this cooperation. It must enter the social world also. Not until parents and all interested realize what they owe to noble, faithful teachers, and come into friendly, social intercourse with them by inviting them to their homes, can any true sympathy exist between the parents and the schools.

Legislation to improve school conditions has occupied the clubs. The results may only be hinted at. Georgia has secured a library commission, with the chairman of the federation committee upon it, and is also seeking to open her university to women. Missouri has taken steps to provide for women on school boards. Minnesota has secured permission for a public vote on library suffrage for women. Maine clubs aided in passing 22 bills for improving school conditions. Many States have prepared bills for traveling libraries, for better truant laws, for free text-books, for skilled superintendence for united schools. In one case the clubs have secured 1 per cent of the school funds for raising teachers' salaries. There is a concerted effort everywhere to induce good women to serve on school boards.

Knowledge of school conditions and general interest is, however, the greatest result already accomplished by the club educational efforts.

That 160,000 thoughtful women are considering the needs of our schools is a promising indication. In many States the clubs have undertaken all these various lines of work. In 25 States one or more lines have been begun. The reports from all read nearly as does Colorado's. In several towns new public or circulating libraries and reading rooms have been opened. Three clubs have established traveling libraries. The study and appreciation of the best in music and art have been promoted in hundreds of towns in the State. Three clubs have given fine exhibitions of pictures, and have loaned many pictures to the schools. Kitchen-garden work has been successfully carried on, and the study of household economics with classes. In 5 towns child-study circles have been formed by the women's clubs; in 10, parents' meetings are held; in 9, women are members of school boards; in 4, public kindergartens have been established; in 3, manual training has been introduced into the public schools. Teachers are welcome members of the clubs. The women are studying the schools.

The desire to secure systematic instruction in morals in the public schools is, however, the most discussed feature of the clubs as an educational factor. That right moral character is of more importance than all other things which I have mentioned put together, that to secure it for pupils is success and not to secure it is failure in education, all are agreed. Yet, practically, upon this part of education is placed less emphasis, is given less thought and attention, to it applied less system and method, than to any other phase.

Theoretically the responsibility for moral education is laid upon the home; but the home is accustomed to shirk educational responsibility, and is often intrinsically inadequate to the task. Besides, in many cases the moral tone of the home depends upon the training which the parents have received in the schools. Even the best homes need, in moral training, the cooperation of the schools. To give adequate moral education neither Sunday school, church, nor press can be depended upon. The public schools are intended to give it. The solemn and majestic declaration of the "ordinance of 1797" is: "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged." Religion, morality, and knowledge! A reaction against denominationalism has made the teaching of religion as such in our schools objectionable.

Morality and knowledge are still in our purpose; morality, as distinguished from religion, being chief. Yet in some strange way it has come about that moral education receives less scientific attention than any other phase; is treated in most schools in the most haphazard, incidental way, or is not considered at all, being left at the option of the most indolent, indifferent, or inexperienced teacher.

To be sure, a large part of the school routine and discipline tends directly to aid in building up moral character. School virtues, such as obedience, self-control, and many others, are developed in some degree. The incidental lessons of history and literature can not be overestimated. The example of noble teachers is an incalcula-

ble power, which, with the other aids, have kept our nation and its citizens from moral destruction.

The roseate theory is: "Morals in the public schools are absolutely without intermission, but without intrusion. The entire atmosphere of the schoolroom and of the playground is redolent with grace and truth." That the facts do not support this theory we all acknowledge. Every teacher wishes for a higher tone of moral life in the school, and for nobler moral character in the pupils.

Picked-up ideas, without clear explanation and instruction, and a pervasive atmosphere of morality work as well for the business of living, as picked-up ideas and a pervasive atmosphere of arithmetic for the business life, and little better. Yet we trust to picked-up ideas and a pervasive atmosphere. In all other subjects we have evolved good methods of teaching and of training teachers.

Only a visionary expects the immediate perfectibility of the race. Is it visionary, however, to expect to secure through the schools a constantly ennobled moral character?

The women's clubs, while valuing deeply all that has been done, are questioning the possibility of a great advance in education—for every pupil of our public schools, even for the 80 per cent who leave school forever at the end of the fourth grade, to secure a scientific, systematic, continuous course of instruction in morality, as distinguished from religion.

In few things has there been greater progress in the last two decades than in education in general. Yet, in moral instruction, has there not been a lack of progress, if not retrogression?

With the Bible and the teacher's prayer went out of the school not much religious instruction, but much explanation and emphasis of moral truth, and of its application to daily life. What has taken the place of this moral instruction in most schools? Nothing.

Systematic instruction is necessary to give clear distinction between right and wrong. Miss Addams tells us how the votes in a certain ward of Chicago elected a corrupt alderman, because to them the big-hearted friend who gave turkeys, flowers, and wedding gifts, and, above all, employment, even from stolen property, was a good man. She says: "It is precisely on the undeveloped morality of voters that municipal corruption flourishes. Theirs is largely the crime of ignorance of what morality is; they live up to the highest conception of morality and civic duty."

Where shall the next generation of voters get their higher conceptions of morality and civic duty if not in the public schools? Systematic instruction in morality is also necessary to secure that robustness of moral power which preserves from self-deception in moral emergencies. "Yes, it was right for me to lie then; I had to; there wasn't any other way out of it," said a boy. He has many companions self-deceived from lack of moral robustness. When shall they obtain the instruction which will give them moral vigor? Of the need of a place for systematic training of the will in our school curriculum, I may only hint. To prevent crime by this means is surely wise.

These are the burning educational questions discussed in the women's clubs. They appreciate the philosophical difficulty of reconciling the schools which differ on the basis of morality. But women believe that this difficulty is mainly theoretical, and need not interfere seriously with the teaching of that body of moral truth which is the possession of the age. The women see the difficulties as to methods of teaching. It is evident that preaching and the tedious repetition of moral maxims will avail little. The instruction must manifestly be concrete, and be illustrated by examples adapted to the age and experience of the pupil.

All difficulties as to principle or method will doubtless vanish as they have vanished in other departments when due attention and thought are given by educators to these things.

The clubs are asking: "Is it too much to hope that the National Educational Association may give due attention and thought to this, the most important subject possible for their consideration? Is it too much to hope for a special committee upon it?" It is surely as pressing as any subject which has come before committees of ten or fifteen. Teachers desire it; parents long for it; Catholics and Protestants, Lutherans and agnostics, unite upon this. "Lift up the child."

CHAPTER XV.

THE PUBLIC SCHOOL AND THE PUBLIC LIBRARY.

[The following articles on the relations between the public school and the public library are reprinted by permission from the school number of the *Library Journal*, April, 1897.]

CONTENTS: *Work Between Libraries and Schools—A Symposium: At Worcester, by S. S. Green; at St. Louis, by F. M. Crunden; at Cleveland, by Linda A. Eastman; at Detroit, by H. M. Utley; at Milwaukee, by Mary E. Dousman; at Springfield, Mass., by Mary Medlicott. Children's Reading: What Some of the Teachers Say, J. C. Dana. School Libraries, Electra C. Doren. Observations upon Children's Reading. Best 50 books of 1896 for a Village Library. Library Round Table Session of the N. E. A. "Evaluation" of Books for Children. A Children's Bookmark.*

WORK BETWEEN LIBRARIES AND SCHOOLS—A SYMPOSIUM.

AT WORCESTER, MASS.

By SAMUEL SWETT GREEN, Librarian Free Public Library, Worcester.

In the year 1879 systematic efforts were made to bring about a close connection between the public library and the grammar schools of the city of Worcester.

The objects of the efforts were twofold, namely, to afford aid to teachers and scholars in making studies more interesting and profitable, and to raise the standard of the reading of children.

For several years previous to 1879 there had been intimate relations between the library and the high school, the normal school, and collegiate institutions.

Certain obstacles have been encountered in doing school work, but they have been overcome, and this work has grown into large proportions. To-day, during the colder months of the year, 2,000 volumes belonging to the library are in use in school-rooms or homes under the supervision of teachers every day that schools are open.

There is, of course, a large use of books by children additional to the school use. The general use is looked after at the library with care. There seems to be but one opinion among the teachers of Worcester regarding the usefulness of the work. Work of this kind is facilitated and rendered large when, as is the case in Worcester, it is encouraged by the superintendent of schools.

Besides the work done with books sent to schoolhouses, there is a very large use by children for school purposes of books within the library building. Pupils are there taught how to use books in getting information, and, in large numbers, make little investigations there every day.

At first books were taken by scholars to and from schoolhouses in lined baskets provided by the school department. Now the superintendent of schools sends a wagon to every school building once in two weeks to bring away books that are to be returned and to carry books which are wanted.

A large use is made in doing school work of exhibitions of pictures in the library building. The walls of a lecture hall are covered at one time with photographs, etchings, etc., illustrative of the civil war, the time selected being that at which the pupils have just finished studying about the later portions of American history. The scenes in which Shakespeare moved, facsimiles of the earliest editions of his works, and views of London and its famous places in the time of Addison are shown

at times when interest is alive in the works of these authors. As I am writing a notable exhibition is going on. Catlin's representations of customs among North American Indians, Moran's scenes in the Yellowstone Park, a set of plates in use in German schools to illustrate pictures in natural scenery, and Trouvelot's representations of heavenly objects as seen through the telescope, have been placed on the walls of a large room, and scholars (accompanied by teachers) from the different school buildings come successive days after school, that is to say about 4.30 p. m., to see them. Such scholars come as wish to; none are obliged to come, but large numbers avail themselves daily of the privilege offered. The scholars gather in groups about the different sets of pictures, and the librarian and teachers talk with them about the scenes represented.

The free public library in Worcester was a pioneer in bringing about a close connection between a public library and schools. It was sometime after it began its work before confidence was inspired in authorities in many other places to undertake similar work. After a few years, however, when success in doing this kind of work had become very evident and its usefulness clearly and indisputably demonstrated, attention was attracted everywhere, and all over the country town and city libraries undertook work similar to that done in Worcester, and tried, each library in its own way, to make themselves useful to teachers and scholars and effect as much as possible by working through the teachers.

It would be interesting to show how the work started in Worcester and to give particulars in regard to its conduct and results, but in such an article as this there is room only to make the general statements which have been given.

At St. Louis, Mo.

By Frederick M. Crunden, Librarian Public Library, St. Louis.

The St. Louis Public Library was, until two years ago last June, a public library only in name. The handicap of a subscription fee was particularly heavy in the work that a public library should do in the schools. Before the fee was removed, however, we furnished to schools that wished them sets of books—50 copies of a single book, such as Franklin's Autobiography, Scudder's Book of Folk Stories and Book of Fables. That more was not done was owing chiefly to the fee, but also to lack of active cooperation on the part of teachers.

Since the library was made free its use by children has increased enormously. While the total number of card holders has increased (in less than three years) from 5,000 to 45,000, the enrollment of persons under 17 years has grown from about 1,000 to 20,000. We send to any school that will take them a collection of 100 or 200 books, to be exchanged as often as desired. Most of the principals, however, do not care to take upon themselves the trouble and responsibility, and prefer to rely on the delivery stations. It is therefore our policy to locate delivery stations so that each will be convenient to several large schools. We have now 29 stations, through which 14,235 volumes were issued in February. The issue shows a marked increase from month to month. It now constitutes about one-fourth of the total circulation, and of it about 60 per cent consists of children's books.

During the last five months we have registered an average of more than 1,500 names a month, which is about the average for the whole period since the library was opened free to the public. As readers have come in about as fast as we could possibly care for them, we have not found it necessary, or, indeed, had time to make special efforts in any one direction. We try, however, to serve the schools by giving every teacher who desires it a "teacher's card," on which six books can be drawn at once for school use. This additional to the regular and the "extra" or "nonfiction" card to which every reader is entitled. This has been in operation for seven months, and 312 teachers availed themselves of the privilege.

Our teachers, like teachers all over the country, are realizing more and more the value, the necessity of books other than text-books; and I hope to see the day when

the initiative will come from the teacher, as it does now in a few cases—when the teacher will agree with the editor of the Springfield Republican, that "the liking for a good book is of vastly more importance to youth than a knowledge of equation of payments or adverbial elements of the third form." When that truth, with all it implies, has been accepted by teachers, superintendents, and school directors, the value of our schools will be doubled through their cooperation with the public library.

Let me add, as a postscript, that we are supplying four Sunday schools, three Congregational and one Baptist. To three of them a stock of books—200 to one, and 100 to each of the others—was sent, to be changed from time to time; while the fourth makes a weekly requisition for books wanted, which are sent on Saturday. This school has asked for a stock of books to supply a branch library and reading room, which it purposes keeping open every evening in the week.

At Cleveland, Ohio.

By Linda A. Eastman, Public Library, Cleveland, Ohio.

The cooperation of the library with the schools in Cleveland practically began in 1884, with the issue of teachers' cards, entitling the holder to draw five books at a time. Some three or four years later came the next important step, the issuing of books to the schools, in sets of from 20 to 50, to be reissued to the pupils; the results of this plan proved so satisfactory to the teachers, in spite of the responsibility for the books which it entailed, that almost from the beginning the demand for books by the schools has been greater than the library could meet. The best books for children are duplicated largely for this use; for instance, the shelf lists show 178 copies of Little Women, and several hundred volumes of Pratt's American History Stories.

In issuing books to the schools, the teachers are allowed to make their own selection of books, so far as is possible and advisable. In two or three districts the principals have personally overseen the work, as described by one of them, Miss Comstock, in last year's school number of the Library Journal; in most instances, however, the books for each room are in charge of the teacher. This year one principal has been furnished with ten copies each of the books in the pupils' reading course, published by the Ohio Teachers' Association, and the children of this building are being encouraged in a systematic reading of the course. In two school districts a work has been begun which deserves more than the brief mention which it can receive here. I refer to a work with the mothers in which the library is taking a part, by circulating books on childtraining, housekeeping, and homemaking, etc., and which may go farther than any work heretofore done in the cooperation of library and school, as it brings in a third (or shall I say a first?) great power, the power of the home, and goes back of the child, to the parent as affecting the child.

In the same way as to the day school, books are issued to the night schools, to a number of boys' clubs, to Y. M. C. A. classes, and to Goodrich House social settlement.

In January, 1896, the central high school and the library joined hands in establishing a branch library for the use of the school. The school furnishes the room and the greater number of the books, while one of the regular assistants of the library has charge of the work, which is done according to our regular methods. This branch has so grown in importance that it now contains 3,500 volumes belonging to the school, and about 1,000 more loaned from the library; each day, while school is in session, books are sent out from the main library to fill any temporary demand. The reports show an average daily reference attendance of over 225 throughout the past term, and an average daily issue of 115 books for home use. The reading lists which the high school has published for each grade, with helpful suggestions about reading, have done much to guide the pupils in their selection of books.

The normal school is looking more and more to the library as a fruitful resource; and excepting such books as may be wanted as text-books, the library puts no limit on the books sent there for actual use. Most encouraging is the fact that a realization is very surely growing of the importance of a study of juvenile literature as a legitimate part of the normal-school course; there yet remains to be emphasized the fact that pupils need systematic instruction in the use of books.

The teachers' reading room, equipped with the leading school journals and a reference library of several hundred pedagogical works, has been moved from the school headquarters, owing to its overcrowded condition, into the alcove of the library, which contains the books on education, and this has tended to bring the teachers into closer touch with the library. The school holiday series of special reading lists published by the library this year has added largely to the use of the library by the schools.

With the expansion of our branch system, the use of the library by the children themselves has grown rapidly, as each branch is easily available to the pupils of several large school buildings. When the new south side branch was opened a few weeks ago, such crowds of children presented themselves that it became necessary to send a notice to the schools in that part of the city, assigning to each grade one day on which the pupils of that grade, and none others, could be registered and given cards; so far it has been impossible to supply books fast enough to meet the demands of this branch, and repeatedly comes the word from there, "Send more juvenile books; there is not a juvenile book on the shelves."

During the holiday vacation, and again during the present spring vacation, we advertised "Children's week at the library," with the result that many little folk have sought and found much of their vacation pleasure here. One thing which is sure to lead to a wiser and more diversified choice of reading on the part of the children has been the bringing together of all of the children's books into what is known as the juvenile alcove. This alcove has heretofore contained only the juvenile fiction, and many of the best books for young people, scattered throughout the library wherever their classification with the subject put them, were practically lost to the children.

A bookmark, which originated, like many other good things, in Wisconsin, has appealed very successfully to Cleveland children with its little story. The formation of the Children's Library League is our latest development for the creation of a sentiment of respect for books and for careful usage of them; it is in its first infancy, but it seems to promise a worthy future.

A plan of organizing reading committees of the teachers best qualified to pass judgment on every juvenile book put into the library has the hearty support of the school authorities, and the first steps have been taken toward putting it into operation.

The success of the plan of circulating pictures is assured by the cooperation of the superintendent and the master of drawing of the public schools and of the faculty of the school of art.

Coming to the higher education, it may be of interest to note that books are sent by messenger from our library to the Hatch library of Western Reserve University, to supply books wanted there, just as they are sent to the branch libraries.

This is the merest outline of a work for which there seems to be unlimited possibilities of expansion. Is any line of library work better worth while?

At Detroit, Mich.

By Henry M. Utley, Librarian Public Library, Detroit.

Since 1887 the Detroit Public Library has supplied books specially for the reading of the children of the public schools. The scheme, which was begun in a small and experimental way, has been extended from time to time, until, at the opening of the present year, upward of 7,000 books are circulated from 55 schoolhouses. Books

have not been provided for the grades below the fourth, but it is not improbable that the young children will yet be favored in a manner similar to their elders, and that every public school in the city will be made a branch of the Public Library. The books are duplicates specially selected for the purpose, and the number of copies of each ranges all the way from a dozen to a hundred. They were carefully chosen with a view to meet all tastes, and include the books which have become classics by reason of the universal approval of young people, and those in which children are known to take delight.

The books are exchanged once in eight weeks, or five times during the school year. If requests come from teachers respecting the assignment of certain books, they are complied with; otherwise the distribution is made by the library assistant in charge of this department. The task of caring for these books at the school is not made irksome to the teachers. They are sent out in chests, in which they may be kept in the schoolroom. There is no formality about giving them out. Of course, every child in a school is personally known to the teacher. No guaranty is required. The receipt on file shows the whereabouts of every book. If a volume is lost or destroyed the parent of the child is expected to pay the cost of replacing it, if able. Books in houses in which there are contagious diseases are returned directly to the library and destroyed.

When the books are received at the schools they are assigned to the different rooms in proportion to the number of children, and any pupil is entitled to draw any one of the books to be taken home and kept until read or its return is required by the teacher. A ticket in the form of a receipt is made out by the child, giving the title of the book, the date when drawn, and name of the person drawing. These tickets are filed in their order. When the books are returned they are transferred to another file, and at the end of each month are counted and the result entered in a blank form of report, which reports are compiled at the library at the end of the year and show the school circulation. Last year this amounted, in the fourth grade, to 19,692; fifth and sixth grades, 20,756; seventh and eighth grades, 8,932; ninth to twelfth grades, 43,364; a total of 93,744. The reports from the several schools show that the comparative use of the books bears no uniform relation to the number of children in the school. One school, with an enrollment more than 40 per cent greater than another, shows less than half its circulation; one school shows every pupil to have read on the average 8.5 books; another shows an average reading of only 2.8. There are two grounds of explanation of this discrepancy—proximity of the school to the library and the interest taken by the teachers in the work. Children may have library cards and make use of the library, and many whose homes are not distant and in the more prosperous sections of the city, who have read most of the books offered them at the schools, choose instead to go directly to the library for their books. But more than all things else does the interest taken by the teachers show itself in the reading of the children. Enthusiastic teachers not only inspire their pupils with desire to read the books sent out to them, but lead them to the library and help them to make judicious selections. This influence is a matter of common observation at the library. It is encouraging to note that the interest and enthusiasm among teachers are growing. As they see the results of the reading of good books in the stimulation of the mental activity of the pupils in the acquirement of knowledge and improvement of taste, they are more than ever eager to promote the good work.

This system is building up a clientage for the Public Library which will increase as the years go on. The habit of reading good books is not only one of the best things which the school can furnish to the child, but is insuring to the Public Library stanch friends and patrons. In very many cases, especially in the poor and more remote portions of the city, the books taken home from the schools are read by all the members of the family, and in some known instances have been the means of inducing the taking out of library cards and of advertising the library in quarters where it had been hitherto unknown or little thought of.

At Milwaukee, Wis.

By Mary Ella Dousman, Public Library, Milwaukee, Wis.

The motive which underlies the work done in the Milwaukee Public Library may be fittingly expressed in the words of President Eliot, that "It is always through the children that the best work is to be done for the uplifting of any community."

There is no age limit, and the library strives to win the attention of the youngest through a plentiful supply of the best colored picture books obtainable, which it urges parents to take home to the little ones. These picture books are also sent in large numbers to kindergartens and primary grades, where they are received with great delight, one teacher having reported that some of her children wept when they were promoted from the primary grades to others where there were no picture books. As long as there is a demand for these books in the intermediate grades there seems no reason why a few should not be sent for the pleasure of the children who still enjoy them. The library has published a list of these picture books, which teachers and parents find useful in making a selection. The number of times these books are issued in the primary grades is a matter of surprise even to the most sanguine, one teacher issuing 30 books over 1,600 times during the two months the books were retained. Another teacher says, "After once having the books I can not do without them;" and another, having a rude and unmannerly class of children, says she must have a new set of books immediately, as a carefully selected set of stories does much toward teaching the children to be kind and gentle to one another.

The teachers are urged to come to the library to make their own selection of books, but when this is not possible they are asked to send lists or discuss the special needs of their classes with the assistant in charge of the school circulation. To keep the resources of the library ever in the minds of the teachers, a complete catalogue of the books for young people has been made a part of the manual of school instruction, and special reference lists have been published on holidays, such as Independence Day, Memorial Day, Washington's Birthday, Thanksgiving Day, and Christmas.

To still further assist parents and teachers, a list of 25 best books for primary and intermediate grades has recently been published, giving the name of publisher and price of book, thus assisting those wishing to purchase suitable books for home libraries. The list may also be used as a call slip at the library, and includes such books as Scudder's Verse and Prose for Beginners, Norton's Heart of Oak books, Andrews's Seven Little Sisters, Schwatka's Children of the Cold, Stevenson's Child's Garden of Verse, Eggleston's Stories of Great Americans for Little Americans, Stories of American Life and Adventure, and others.

To show the steady growth of the system of circulation of books through the public schools of Milwaukee one has only to glance through the annual reports of the library since the plan was put in operation in 1888, when the necessity of making the library better known to children living in the outlying districts became apparent.

The library assumed the cost of transportation, and the teacher acted as librarian, issuing books to such children as were provided with library cards.

During the first year 2,235 books were drawn by various teachers and given out 6,728 times, each volume being read on an average three times during the six weeks the books were retained. The experiment proved an unqualified success, and in order to meet the increasing demand for books the library board decided to expend $500 in duplicating the best books for young people.

During the second year the work was greatly extended, taking in almost every school in the city, and at the request of the teachers the time of retaining books was extended from six weeks to two months, and over $1,000 was expended for duplicates. The hearty cooperation of the teachers, the generosity of the board of trustees in the matter of buying duplicates, and the enthusiasm and untiring efforts of the superintendent of the circulating department have made it possible to carry on the work to its present extent.

During the year beginning in September, 1895, 20,691 books were issued 65,943 times by 246 teachers in 41 graded schools, 3 high schools, 1 State normal school, 1 school for the deaf, 3 Sunday schools, and 2 private schools. Books were also sent to hospitals, homes for the aged, and the State industrial school for girls. As soon as one set of books was returned from the schools or institutions there was an eager demand for "more books."

The present year shows a still greater increase in the work, or, as the old man who delivers the books expresses it, "They are hungry for books." It is indeed true, as the rapid increase at the main library testifies. Many a child living in the outlying districts, after reading all the books sent to his school, requests the teacher to give him his card that he may visit the library, which is probably miles from his home, there to still further satisfy his "hunger" for more books.

In addition to the books there is a collection of over 2,000 mounted pictures, which are loaned to the schools. These pictures, which are taken from the extra copies of Harper's Weekly, London Illustrated News, and other good weeklies, are neatly mounted on manila board. The work of cutting and pasting is mainly done by the assistants during the summer, when the regular work is not so heavy, although teachers have offered their services on several occasions and at such times have been assisted by their pupils. These pictures are sent to the schools for the same length of time as the books and prove a source of great pleasure to the children.

At Springfield, Mass.

By Mary Medlicott, Reference Department, City Library, Springfield.

The work of our library as an aid to the schools of the city has been a growth of years, developing with use and further acquaintance with its desirability.

We, of course, provide works on the principles of education and on the theory and art of teaching, for the use of instructors; the writings of standard educational authors; pedagogical periodicals, and reports of the board of education of our own State, the commissioner of education, and others; also the latest and best books of a practical character as they come from the press. We furnish many of the best books for reading, directly illustrative of the various studies pursued in the schools, for collateral and general study.

Each teacher is furnished with a personal card and also a teacher's card, entitling to the use of six books at a time for school work. Pupils of 12 years old and over are also entitled to cards for personal use. Teachers are invited to furnish in advance the topics they propose to give to their classes, and we select the best available books upon these topics, placing them at the disposal of the students for use out of school hours. This tends to improvement in the work of the schools and to familiarity with the use of books for purposes of study, cultivating habits of investigation, which will be of service later on in life.

To go a little more into detail as to methods: We lately placed in the reference room additional shelves, which are used exclusively for books for classes in the schools, assigning special shelves to each class or teacher who desires it, and labeling them (in L. B. label holders) with the subject represented on the shelf, changing the label when the books or subjects are changed, as, for instance, French history, general history, American literature, astronomy, electricity, glass making, etc. Thus the scholars soon learn where to go for their books, and if they require additional help they have only to ask at the reference desk. Sometimes the teachers prefer to make their own selections of books.

For this work we utilize the best material that the library can furnish—books, the newest encyclopedias, magazine articles, and even newspaper cuttings occasionally, especially for recent biography. All these are treated as reference books for the time and not allowed to be taken home. The scholars are also encouraged to search out for themselves books or magazine articles that will be useful by the aid of the catalogues, Poole's Index, etc., thus varying the methods of study. In our monthly

bulletins we frequently print special lists which are of help to them, and we are always glad when any of the teachers will aid in the selection of the best books for these printed lists.

We have been very fortunate in the spirit of harmony and cooperation between library officials and teachers, resulting in mutual benefit.

Our library is especially well located for the work of helping the public schools. It is in close proximity to the high school, so that often during school hours some of the pupils will come in—between two "periods"—to use the books set apart for them, and again after school closes. In immediate connection with the library and under its management is the Art and Natural History Museum, and the resources of both collections are available for purposes of school study.

From the duplicate geological, mineralogical, and lithological specimens in the Natural History Museum, collections have been prepared and loaned to the various grammar schools of the city. We have prepared and printed in our monthly bulletin a selected list of the best books in our library to use in connection with the study of these specimens, and which may also serve as a guide in the building up of school libraries.

A course of lectures on natural woods, vegetable fibers, and kindred topics is being given before the teachers, in the natural history hall, and for this, too, we have prepared a list of helpful books, which has been printed for circulation among the teachers.

For the weekly lectures or talks on art, given to high-school pupils in one of our lecture rooms, we likewise furnish much material in the way of illustrative books, both for lecturer and pupil. To these may be added the easy and practical examination of art objects and pictures, and art books, and of the fuller natural history collections.

The teachers bear witness to the usefulness of the library in these ways, and to the extension of the so-called "laboratory method" to all branches and grades of study. One of our school principals writes: "The books thus supplied in history, geography, and other departments of school study are of inestimable value, stimulating and developing in the pupils a taste for solid literature, and enabling the teachers to give a broader education than could possibly be done by the use of text-books and oral instruction alone." Indeed, he adds that, "after having been accustomed for a time to this method, he should hardly know what to do with his school if he could not avail himself of the opportunities for this supplementary use of books in connection with the text-books in use."

The librarians also notice gradual improvement in the methods of study in those who come week after week, perhaps year after year, to make use of our books for school work.

Children's Reading: What Some of the Teachers Say.

By John Cotton Dana, Librarian Denver Public Library.

The Public Library of Denver is maintained by school district No. 1, a district embracing about half the population of the city and a large proportion of its taxable property. It has at present an enrollment of about 10,000 children. The library is a part of the district's educational system, and while it serves the public as effectively as its resources permit, every care is taken to make it popular with the teachers, attractive to the children, and adapted generally to the needs of the schools. With this end in view a great deal of attention has been paid to the purchase of books for teachers and pupils, and every effort has been made to induce both teachers and pupils to make use of the library. A recent inquiry showed that of the 700 children in the high school over 90 per cent have library cards. Of the total books lent for home use about one-third are from the juvenile room, which contains about one-fifth of the library's lending department. Of the total number of visitors to the library—they have averaged for a good part of the last winter about 1,500 per day—nearly 700 are children.

The library came into existence, as an institution of practical use to the schools, about five years ago, with about 7,500 volumes. Since that time its connection with the schools has increased as rapidly as the growth of volumes on the shelves has permitted. It now has 35,000 volumes, a great many of which are all the time in teachers' and pupils' hands. Collections of from 10 to 50 and 60 volumes are sent to teachers' rooms on their request and largely of their own selection, and are kept for one month or six months, or as long as wanted. Teachers lend these books for home use, or not, as to them seems best. This work in the schools has been going on for several years, but to a large extent only during the past twelve months.

The school district itself purchased, four years ago, about 3,000 volumes of supplementary readers. This collection it has increased to about 8,000 volumes, the list now including not only supplementary readers but a large number of books called desk books, like Matthews's American Literature, Portraits and Sketches of American Authors, How to Teach Reading, Dole's American Citizen, etc.

The fact that the school district sustains and controls the library, that it is under the supervision of the superintendent of schools, and that it has been for several years in close touch with teachers and pupils explains the interest taken by teachers in a circular of inquiry about children's reading which was recently sent, through the principals, to every teacher in grades one to four, 101 in all. The principals were requested, at one of their meetings, to call the attention of the teachers to the fact that in answering these inquiries they could help the library in its work, but that they were under no obligations whatever to make any reply, and that no one save themselves and the librarian would ever know whether they replied or not. The object of this explanation was to make sure that only those teachers who were interested in the matter for its own sake should express any opinions. Of the 101 circulars sent out, 73 were returned. The principals of the grade schools, 16 in number, were also asked to reply to the questions, and 13 did so. Their replies are included in the figures below. The questions and the replies, the latter tabulated as fully as possible, were as follows:

CHILDREN'S READING: OPINIONS AND SUGGESTIONS OF TEACHERS

Will you help the public library by answering as fully as you can the following questions? Return this sheet by mail in the inclosed envelope.

1. (*a*) Do you think it would be well for pupils in your grade to read more books? (*b*) What are the reasons for your opinion?

To (*a*) 13 answer, yes; 1 answers, no.

2. How early in their school life is it possible, on the average, to interest children in independent, outside reading?

Thirty-two say, in the first grade (children about 6½ years old); 25 say, in the second grade (children about 7½ years old); 14 say, in the third grade (children about 8½ years old).

3. (*a*) Could you increase the amount of reading done by the children in your grade if you had books which you could lend them for home use? (*b*) Could you increase the reading, even in the first grade, if you had appropriate books to lend?

To (*a*) 73 say, yes; 2 say, no. To (*b*) 44 say, yes; 6 say, no.

4. Can you name some of the more essential characteristics of the books which especially interest the children in your grade?

Thirty-one say, "Should be about plants, animals, and other familiar things;" 24 say, "Should be about fairies and the like;" 11 say, "Must have human interest" (this essential is also impliedly mentioned in many other replies); 10 say, "Should have illustrations."

5. (*a*) To the children of what grade can you show the difference between books—between those that are true to life and those that are not; between those that may be called literature, and those that may be called silly? (*b*) To those, say, below the fifth grade?

To (*b*) 32 say, yes; 5 say, no.

6. What proportion of the children under your care do you think are in the habit of reading books—as many as one in ten?

Average of all estimates is 30 per cent.

7. Do the children under your care read the trashy story-paper and "nickel libraries" to any great extent?

Fifty-one say, no; 6 say, yes.

8. If so, do you think some of them would change to better reading if the better were offered them?

9. If you have any decided views on children's reading in general, will you write them down on the other side of this sheet?

The replies to question 1 (*a*) are perhaps what might naturally have been expected, and yet it seems a little remarkable that there are among 101 average teachers of children between 6 and 11, or among the 73 who replied, only 1 who is of the opinion that it would not be well for pupils to read more books than they now read. The reasons for the affirmative replies, and a good idea of the character of the notes accompanying them, will be found in the following extracts:

The reading habit should be formed early.

Reading would add greatly to their limited vocabulary, and improve their language, written and oral.

Reading will make them more intelligent thinkers.

The pupil who does the most outside reading is a better reader than the one who does little or none; is more intelligent and a better talker.

I find all my good readers are those who read at home.

Those who are liberally supplied by their parents with good books as a rule express their thoughts correctly.

It is easier to influence a child's taste for good reading at the age of 8 or 9 than several years later.

Reading awakens their interest for other things.

Children who read good books are better prepared for their grade work.

I find that pupils who read most are those who most intelligently grasp nearly all subjects.

If outside reading did nothing but familiarize children with good conversational English it would be worth while.

The answers to the second question are probably very much affected by the experience of those who make the replies. Teachers who have never taught in the first grade would be commonly, I suppose, more skeptical about interesting children in reading while they are still in that grade than those who have had experience in primary work. It will be noted that the 71 replies to this question all say that it is possible to interest children in outside reading by the time they are in the third grade. This means by the time they are 10 years of age.

Question 3 (*a*) comes as a natural result of the opinions indicated in the replies to 1 and 2. If one can draw any conclusions from these answers it would seem that they indicate that not yet has sufficient attention been paid to the reading of the very young. We have been talking about the "juveniles" in our library work for years, and have meant, in general, books for children of the age for Oliver Optic and Harry Castlemon; we should have been putting in a good part of our time in the consideration of books for children of the age for Mother Goose and Puss in Boots and Jack the Giant Killer.

Question 3 (*b*) is also in effect a part of the reply to question 2. Forty-four out of 50 teachers are evidently of the opinion that children of 6 and 7 years of age could easily be persuaded to take an interest in books at home. In their replies to question 2, teachers make such remarks as the following:

"Every child would read at home if he had anything interesting to read."

"You can interest children in outside reading just as soon as they are able to read at all."

"My pupils are second grade, and have surprised me by asking for stories."

In replying to question 3 some of them say:

"Surely, and to great advantage even in the first grade, and in this grade many more books are needed than we now have. The little ones are greedy for them."

Another says that most of the children in her grade are from homes where parents have little or no leisure to procure books, but gladly make use of whatever is placed in their way for the children.

Another says: "I find that two-thirds of my children's reading is confined to Sunday-school papers."

The replies to question 4 must be considered as being the natural outcome of the movement of recent years toward nature study. In the schools of this district, in the last two or three years, very much attention has been paid to natural history. The most elaborate of the courses of study issued by the district last fall was devoted to the sciences of botany, geology, zoology, metallurgy, astronomy, etc. It would seem from these replies, in the first place, that it is evident that teachers can interest their children in any subjects they wish; and, in the second place, that the result of the work of recent years, in these particular schools at least, has been to interest children in plants, animals, and like familiar things. Of course, it is not yet proven that paying so much attention to natural history is a good thing from an educational point of view. The important point to note is that teachers can produce certain specific effects upon children—can direct their attention and their interests, if they wish.

In answering question 4 some of the teachers say:

Almost any subject if expressed in short sentences and illustrated.

Must be true to the child's experience, and expressed in the child's simple way.

You can interest primary children in any tale on earth that you tell them, and in almost any that you read to them.

A child is interested in the life and actions of a normal child if naturally and pleasantly described; he is very fond of detail.

I find the boys mostly interested in historical works, while the girls are attracted toward accounts of the manners and customs of the various nations.

They like stories of modern life which come near enough to their own experience to be easily understood.

Question 5 is, of course, very much of a leap in the dark, and not much reliance can be placed upon the replies.

It was understood in the drawing up of these questions that they would not be of any great value by reason of the replies to them that might be received. The object kept in view in preparing them, and in sending them out, was the interesting teachers in several aspects of the problem of children's reading. We wished to draw attention to the library and to books in general; and we took pains to frame the questions in such a way as to call the attention of the teachers to their own indifference, if they were indifferent, and their own ignorance, if they were ignorant, of the things the circular spoke of. Question 5 it was thought would raise certain questions, and, perhaps, for the first time in a good many of the teachers' minds. The replies to 5 would indicate that more of the teachers had given the question serious consideration than librarians generally have supposed. They say, for example, that first-grade children "can appreciate the difference between a good story and 'goody-goody' stories." And "any child of average intelligence can be made to see and understand the difference, if one will give time and attention to the effort."

The replies to question 6 are, on the whole, rather encouraging. If one-third of the children from 6 to 11 in the average city school are in the habit of reading, we have a great field for work, and there is enough to do to keep us all busy for many years in taking pains that the reading they do is of the proper kind.

In regard to question 7, the general opinion seems to be that the story paper and the "nickel library" do not come into a child's life until he is past the fourth grade, or is nearly 12 years of age. It would be interesting to know if this is a fact.

I believe the teachers who made replies to question 7 know what they are talking about.

If children can be led to read during the years from 6 to 11; if they can be induced to read, in the main, whatever the teacher may care to give them; if they are not likely to come in contact with cheap and nasty literature until they have passed this period, then is it most evident that this is the period in young folks' lives within which the public library and schoolroom library can, and should, do its best and most enduring work. Here is the period when the reading habit should be formed; here is the period when, to as great an extent as possible, right taste should be formed. It is suggested by the replies to these questions that it is possible, at least, that a great deal of our public library work has been aimed at people who are already beyond salvation, and that we should amend our ways, widen out our children's departments, work our way still more thoroughly and effectively into the schools, gain the cooperation and the aid of the teachers—they above all others can help us—win the sympathy and good will and assistance of the parents, and get at the children between the ages of 6 and 11.

School Libraries.

By Electra C. Doren, Librarian Dayton (Ohio) Public Library.

As great even as a good book is the power to communicate to another the love for one. To win children to this love, to lead them to appropriate to themselves ideals from characters in books, to appeal to the sense of ethical relation through their imaginations, to deepen and enrich the emotions by suggestion; in other words, to so read a good book into a child that he is bound in some way to live it out in himself, is a privilege, the hope of which alone is enough to sweeten days of unseen and never-to-be acknowledged drudgeries of the schoolroom and the library. To make possible this privilege, and to realize to a greater degree than has heretofore been done the ideal mission of the book to the people, is the ultimate aim of the school library system of Dayton.

It is one thing to select books for a given purpose and bring them together as a symmetrical collection of ideas tending toward that purpose; it is another to invent and operate the machinery for distributing them to convenient points for the user; and it is another and a very different thing to use the book—to open it to the reader, be he child, woman, or man, so that it shall be felt by him to be a real thing.

Within the limits of opportunity and with such means as have been at its command, the public library of Dayton has taken the first and the second step. The last can only be taken when the public shall demand that the course of instruction shall include the pleasure of reading, as well as the study of it as a word-calling exercise. To describe this movement so far as it has taken place in Dayton, with the third step as its goal in view, is my object.

A fondness for reading as a preferred form of idleness is not necessarily a love for good books; it is too often a love for bad books, and if unguarded by circumstance, which in itself is a kind of circumspect prohibition, or uncorrected by natural good taste or conscience, it will soon develop into a vicious habit, and the speedy degeneration of memory and will power takes place. Mental and moral fiber, having been attacked and weakened, are thus prepared to succumb before temptation of a more active sort when the opportunity for it shall arrive. Notwithstanding the solicitude often expressed by parents, educators, and librarians upon the subject of children's reading, it is a matter which has been left largely to regulate itself by chance. To organize chance and to array it upon the side of good sense is the better part of valor in a reformation of this sort, for such in part it must be.

Having at my disposal, last spring, three months of good leisure, I determined with Miss Eastman, then the assistant librarian at Dayton, to follow up a series of library lectures instituted by the library board during the preceding winter, with a study of the use made of the public library by teachers and pupils of the public

schools. The address at the opening of this lecture course by Mr. Frank Conover, the secretary of the board, upon the "Relation of the public library to the public school," and also that of Dr. W. J. Conklin, the vice-president, upon the "Educational value of the public museum," had called special attention to these institutions as educational factors, and were an excellent preface for the purpose which we had in view. This purpose is set forth in the following note addressed by us to each of the principals of the public schools:

We are seeking information concerning the reading of children as a working basis for ourselves in making selected book lists which we hope will help the child in his choice of out-of-school reading, and at the same time be a means by which we may cooperate intelligently with the teacher in the work of his education. To this end we have formulated the questions inclosed. The ruled blank we would like to have filled out by yourself and the list of questions by the children as indicated in the note inclosed to the teacher.

In order to better inform ourselves as to the mental grasp of the children in the various grades of school work, and also better to appreciate the educational system of which we deem the public library and museum a part, we are, with the consent of the superintendent of instruction, visiting the schoolrooms from the fourth to the eighth grades, and hope within a few days to visit your district.

The following questions inclosed to the teachers were answered in writing by each child:

1. About how many books have you read since Christmas?
(*a*) Name as many of these as you can.
(*b*) What book in your own home library is most read and best liked in your family? What magazine? What paper?
2. What book did you like the best of all the books you ever read?
3. Have you a card to draw books from the public library?
4. Do you take books from any library other than the public library?
5. Do your parents ever tell you good books to read and help you select them?
6. If not, do you choose your own books?
7. Do you read any newspaper? Name.
8. Have you ever been in the museum above the library?
(*a*) How many times?

In the course of the three months, from March until the latter part of May, we visited the schoolrooms of the city in each of the 20 districts, paying particular attention to the four grades between the third reader and the grade next to the high school. Thus we became personally acquainted with the teachers on their own ground and had an opportunity for judging of the children as we saw them in class recitations and in the brief talks which we were permitted to have with them. We heard something of their histories, and saw their homes and the conditions of the localities from which they came, walked the distances which they must walk to get a book from the library, and gathered on all sides a store of impressions by which we might better interpret their answers, and realize in a more perfect way the needs and capacities of those for whom we hoped to see fuller provisions made. The distance of schoolhouses from the library varies from a block and a half to 2 miles or more, four of the schoolhouses only being within 1 mile of it.

Omitting the answers of the third reader grades and the rooms of two districts which made no returns to us, 3,192 children between the ages of 10 and 14 years sent in papers. Of these, 1,069, or about one-third only, said that they drew books from the public library; 733, or less than one-fourth, drew from other libraries, such as the Sunday-school, Y. M. C. A., etc. In most cases these children were also public library readers, some of them drawing from three different libraries at one time. A little less than two-thirds of the entire 3,192 did not take books from any library, nor had they books at home. Over one-half of those who did take said they chose their own books.

To the questions, "Do your parents ever tell you good books to read, and help you to select them?" the answers, "Not very often," "Nobody helps me," "I choose my own books," from pitiful little 10-year-olds, had a most mournful aspect. In one case a small urchin of the eighth grade who had read 58 books since Christmas, "an

average," according to his calculations, "of three to five books a week," naively replies to the question, "Do you choose your own books?" "Yes, by the help of ———, one of the librarians." The list is as follows:

LIBRARY WORK.

Eighth grade; Willie L.; first district: I have read on an average of 3 to 5 books a week.

Little Bobtail.
Poor and Proud.
Sink or Swim.
Strive and Succeed.
Toby Tyler.
Mr. Stubb.
Mr. Stubb's Brother.
Tom Newcombe.
A Rolling Stone Gathers No Moss.
Ben's Motto.
Ragged Dick.
Fame and Fortune.
Bob Burton.
Tattered Tom.
Fill, the Fiddler.
Mark, the Match Boy.
Ben, the Luggage Boy.
The Circus Rider.
Ben's Nugget.
Out West.
Young Savior.
Young Boatman.
Young Pioneer.
Ned in the Blockhouse.
Frank, the Young Naturalist.
Frank on the Prairie.
Frank in the Woods.
Frank on a Gunboat.
Frank Before Vicksburg.
Frank in the Mountains.
Frank in Don Carlos' Ranch.
Frank Among the Trappers.
Frank in the Forecastle.
Snowed Up.
Sportsman's Club Among the Trappers.
Sportsman's Club in the Saddle.
Sportsman's Club Among the Bears.
Stem to Stern.
Boat Builders.
Bivouac and Battle.
Dorcas Club.
Afloat.
On a Coral Reef.
Drifted Ashore.
Ten Weeks in a Skiff.
Iron Horse.
The Canoe Club.
Young Outlaw.
Sam's Chance.
New Guinea.
A Floating Island.
A Buried Treasure.
The White Chief.
Gold in California.
Dog Crusoe.
In School and Out.
On the Blockade.
Running the Gauntlet.

and almost all the boys' books in the library.

2. Castleman's, Aldgier's, Optic's, and Ellis's books are the best.
3. Three in our family.
4. None but my own.
5. Not very often.
6. Yes, by the help of ———, one of the librarians.
7. I read Evening Post, Herald, and Morning Times.
8. Yes, very often.
9. Been in the museum almost every Sunday that it was open, and once or twice every week.

It is difficult to say which child is the more hopeful case of the two; the one whom we have just quoted or another who sent in the following dreary string of negatives:

Fifth grade; Willie W.; fifth district: (3) No, (4) no, (5) no, (6) no, (7) Post, (8) no, (9) no.

Neither list is an exception. They are types of hundreds of others.

After collecting and counting the children's answers, conferences of the teachers of each grade were held at the library, where we discussed informally the books which they had found suitable to children of their grade, book lists, the children's answers, and their own experiences. The attention of the teachers was also called to Miss Eastman's article, "The child, the school, and the library," a copy of which was given to each of them, it having been reprinted by the library board from the Library Journal for this purpose.

Having reported the results of our study to the board, we were directed to recommend a suitable list of juvenile books for purchase, and in November the board of education was requested by the secretary of the library board to allow the circulation of books to children through the agency of the schools. By the last week in January, 1897, nearly 1,200 books had been placed in 63 schoolrooms in the city.

The library has since been increased to 2,100 volumes, and 113 teachers are now supplied.

The system of distribution is practically that of a traveling library. Each teacher is allowed to have one-half as many books as there are pupils in her room. This number will be increased as the library is able to purchase more books. She selects her own library, which is delivered to the schoolroom in a neat walnut-stained case, with lock and key, and a portfolio provided with the blanks for a simple charging system. The library may be kept in the school for three months, the children taking the books for seven days at a time. There are no fines or penalties except the temporary suspension of library privileges in case of negligence in returning or taking care of a book. Thus far, however, the children have shown great zeal in keeping their books nicely. Usually they are covered as soon as they are taken home. Teachers report that the general effect upon their pupils has been to stimulate and quicken their minds in all directions.

The books of the school department form a distinct collection from the general library, and are kept in a bright, sunny room apart from it, where, unrestricted by rules necessary for order in other parts of the building, the teachers may have free access to the shelves, and meet with one another in the exchange of books and opinions upon them. In the summer vacation this room will be opened to children also, a special assistant being in charge. There is also a juvenile library in the general collection.

We can not soon forget the eager, serious, childish faces, young and old, of the army of little human beings which confronted us in the schoolroom last spring; a host, three-fourths of whom, if statistics count for anything, will in all likelihood leave school forever before they are 12 years of age, having after that time no guide or opportunity for mental pleasure or growth except such as chance may throw in their way; and in many cases, for lack of a very little training and knowledge, ignorant even of such means as really do exist for after-school or out-of-school education. To place these in their way and to give them some knowledge beforehand seems at least but the complement to the idea of popular education, and a reasonable service for the schools to perform; but it is one the need of which has not yet been definitely realized and therefore only fitfully performed. Until the course of study in our public schools is modified and the emphasis of its methods is differently placed neither the eagerness of children for books nor the enthusiasm of teachers, or the readiness of public libraries to furnish books, can avail half of their worth and power.

It is to be hoped that the committee appointed from State and national associations of teachers and librarians to cooperate in school and library work will take note of this fact, and that an effort will be made to put the love of literature in its logical and ethical relation to the teaching of it, and thus avoid the anomaly of attempting to teach literature in the higher schools to pupils in whom neither love nor understanding nor desire for it has been implanted. As the course of study is planned where the per cent system reigns as the sole criterion of attainment there is not one-half hour in the day, hardly one hour in the week, when teacher and pupil may meet in the schoolroom in the friendship of books—of real books—apart from task work and per cents. Such an interchange would be a vitalizing current, a fertilizing ray from distant suns; but it is one which never falls across the path of their hard-beaten routine. As between them no living thing of hope or imagination can spring from such soil in such an atmosphere.

In the series of panels of his "Romaunt of the rose," Burne Jones gives us the allegory of Love and the Pilgrim. Worn, bleeding, and tear-stained, Love finds the Pilgrim among briers and cruel rocks. She, counseled by a flight of tender doves ever circling above her head, reaches to the sufferer her hand and draws her onward toward a mountain height beyond which lies the expanse of ocean, air, and sky. In the place where Love finds the Pilgrim there is a land-girt stream, which, failing to find its way through the barrier of the mountains, returns in a sad circle upon

itself, and the land, self-fed and watered by sluggish streams, is barren. Which is Love and which is the Pilgrim in this union of the library and the school is not for us to say, but certain it is that when they together shall reach the summit and shall see the bright expanse and the morning sunshine making straight the path before them, the fresh, salt winds wafting toward them messages from beyond, then a life undreamed of in the pent, self-returning round, being newly fed, will spring into richer, purer feeling.

Behold!
A new beatitude I make;
Blessed are the books, I say,
For honey of the soul are they!

Observations upon Children's Reading.

Prof. James E. Russell, of the University of Colorado, is engaged upon a systematic study of the kind and amount of reading done by children, based upon careful statistical inquiry in the public schools of Colorado. His investigations have not yet been concluded, but are sufficiently systematized to afford some ground for the following propositions:

(1) That pupils of a given age read approximately the same amount whether the town is well supplied with libraries or not. In towns poorly supplied with books there is a regular system of exchange in vogue. Many instances have been found of a single book being passed about until every member of a grade had read it. This is the natural traveling library.

(2) That the chief influence of libraries, especially of schoolroom libraries, is to improve the quality of reading.

(3) That much more reading is done in the seventh grade (age 13½ to 14½) than in any other grade, including the high school. Girls seem to reach the maximum a year earlier, but hold over during the seventh.

(4) At the time of most intense reading there seems to be a great diversity in the character of the books read. Pupils of the seventh grade read everything that comes into their hands. In the high school the taste seems to be better developed and more uniform; one reads fiction and little else; another reads history chiefly; another is interested in scientific books, etc. In any case the tendency is generally well marked. This raises the query whether more attention should not be given to reading in the sixth, seventh, and eighth grades.

These generalizations are based upon returns from towns of widely different tastes and tendencies; they have yet to be fully worked out, but they give interesting indications of the valuable results that may be expected.

The Best Fifty Books of 1896 for a Village Library.

A list of 489 of the leading books of 1896 was recently submitted by the public libraries division of the New York State Library to the librarians of New York and other States, to obtain an expression of opinion respecting the best fifty books of 1896 to be added to a village library.

From 200 lists that met the conditions the following choice is indicated:

Rank.		Votes.
1.	Barrie, J. M. Sentimental Tommy. Scribner. $1.50	162
2.	Ward, Mrs. Humphrey. Sir George Tressady. 2 v. Macmillan. $2	125
3.	Parker, Gilbert. Seats of the Mighty. Appleton. $1.50	116
4.	Morse, J. T., jr. Life and Letters of Oliver Wendell Holmes. 2 v. Houghton. $7	113
5.	Smith, F. H. Tom Grogan. Houghton. $1.50	110
6.	Skinner, C. M. Myths and Legends of our Own Land. 2 v. Lippincott. $3.	108
7.	Barrie, J. M. Margaret Ogilvy. Scribner. $1.25	107
8.	Kipling, Rudyard. Seven Seas. Appleton. $1.50	104
9.	Krehbiel, H. E. How to Listen to Music. Scribner. $1.25	101

9. [1] Wiggin, Mrs. K. D. Marm Lisa. Houghton. $1 101
11. Eggleston, Edward. Beginners of a Nation. Appleton. $1.50 99
12. Shaler, N. S. American Highways. Century. $1.50 98
13. Brooks, E. S. Century Book of Famous Americans. Century. $1.50 95
14. Andrews, E. B. History of the Last Quarter-century in the United States, 1870–1895. 2 v. Scribner. $6 89
15. Lang. Animal Story Book. Longmans. $2 88
16. Watson, John. Kate Carnegie. Dodd. $1.50 87
17. Beard, D. C. Outdoor Games for all Seasons. Scribner. $2.50 82
17. Jewett, S. O. Country of the Pointed Firs. Houghton. $1.25 82
19. Stimson, F. J. King Noanett. Lamson. $2 81
20. Saintsbury, George. History of Nineteenth Century Literature, 1780–1895. Macmillan. $1.50 79
20. Clemens, S. L. Personal Recollections of Joan of Arc. Harper. $2.50 79
22. Gras, Felix. Reds of the Midi. Appleton. $1 77
23. Stevenson, R. L. Weir of Hermiston. Scribner. $1.50 75
24. Field, Eugene. Songs and Other Verse. Scribner. $1.25 74
25. Stockton, F. R. Mrs. Cliff's Yacht. Scribner. $1.50 73
26. Perry, Nora. Three Little Daughters of the Revolution. Houghton. 75c 70
27. Walker, F. A. International Bimetallism. Holt. $1.25 68
28. Dana, Mrs. F. T. Plants and their Children. Am. Bk. Co. 65c 67
28. Harper's Dictionary of Classical Literature and Antiquities. Harper. $6 67
28. Stevenson, R. L. In the South Seas. Scribner. $1.50 67
28. White, A. D. History of the Warfare of Science with Theology in Christendom. 2 v. Appleton. $5 67
32. Abbott, Lyman. Christianity and Social Problems. Houghton, $1.25 66
33. Lowell, F. C. Joan of Arc. Houghton. $2 65
34. Earle, Mrs. A. M. Colonial Days in old New York. Scribner. $1.25 64
34. Wilson, Woodrow. George Washington. Harper. $3 64
36. Davis, R. H. Three Gringoes in Venezuela and Central America. Harper. $1.50 63
37. Rolfe, W. J. Shakespeare the Boy. Harper. $1.25 62
38. Watson, John. Mind of the Master. Dodd. $1.50 61
39. Spencer, Herbert. The Principles of Sociology, v. 3. (Synthetic philosophy, v. 8.) Appleton. $2 60
39. Hearn, Lafcadio. Kokoro. Houghton. $1.25 60
41. Bourinot, J. G. Story of Canada. Putnam. $1.50 59
41. Mabie, H. W. Books and Culture. Dodd. $1.25 59
41. White, E. O. Little Girl of Long Ago. Houghton. $1 59
44. Ford, P. L. True George Washington. Lippincott. $2 58
45. Martin, E. A. Story of a Piece of Coal. Appleton. 40c 56
45. Godkin, E. L. Problems of Modern Democracy. Scribner. $2 56
47. Crockett, S. R. Sweetheart Travelers. Stokes. $1.50 55
48. Bigelow, Poultney. History of the German Struggle for Liberty. 2 v. Harper. $5 54
48. Follett, M. P. The Speaker of the House of Representatives. Longmans. $1.75 54
50. Henty, G. A. At Agincourt. Scribner. $1.50 53

Roughly classified, the list includes 12 novels—rather less than a fourth of the whole selection; 7 juvenile books; 5 biographies; 4 works each in the divisions of description and travel, social science, and poetry and literature; 3 books in American history; 3 in religion; 2 in natural science, and 6 in miscellaneous divisions.

[1] When two or more books received the same number of votes the same rank number is given to both or each.

Library Round-Table Session of the N. E. A.

At the meeting of the Department of Superintendence of the N. E. A. at Indianapolis on February 16–18, 1897, through some combination of unfortunate circumstances, the Library Round Table did not receive the attention it would otherwise have had. The topics set down for discussion were: (1) The reading of teachers; (2) the proper function of the National Library as a part of the American educational system; what it might do to assist schools and libraries throughout the country; (3) practical help in the evolution from book borrowing to book owning; (4) the function of schools in training readers for the public library; (5) using books *v.* reading books, by E. A. Winship, Boston.

In introducing the first topic Mr. Crunden said that one of the greatest desiderata in our public schools is that the teachers should be readers. The most beneficial thing to a pupil is contact with a live teacher. But there is no life without growth. A teacher can not impart life to, or awaken life in, his pupils unless his own mind is growing; and to this end he must be a reader and a student—not of professional books alone, but of the best literature. The great point is that the teacher should be a well-read, well-informed man or woman, growing intellectually from year to year. As Bishop Spalding says:

What the teacher is, not what he inculcates, is the important thing. The life he lives, and above all what in his inmost soul he hopes, believes, and loves, have far deeper and more potent influence than mere lessons can ever have.

In the preface to his Special Methods in Reading, Dr. C. A. McMurry, speaking of the list of books he therein recommends for teachers, says:

If all our teachers in the common schools should read with thoughtful appreciation ten or a dozen of the best books in this series, it would surely improve the teaching in all our schools 25 per cent.

Mr. Crunden added that it would also bring to teachers the greatest pleasure that can come into their lives. This pleasure they would gain in three ways: (1) Through their own intellectual clarification and spiritual exaltation; (2) through witnessing the delight of fresh young minds when first brought into the realm of noble thoughts; and (3) through the lightened burden and increased success of their professional work. Teachers should read widely as well as deeply.

In the course of the discussion of the first topic, Mr. F. A. Hutchins, library clerk of the office of the superintendent of public instruction of Wisconsin, said:

Teachers should be thoroughly familiar with the great children's classics, and should enjoy them so thoroughly that they can inspire a love for these classics in the breasts of all their pupils. The school libraries will not do their best work until we have a generation of teachers who have been reared in childhood in homes and schools where the best books are habitually read. The teacher who has done very little reading can well afford to begin with the children's classics for other reasons than to be better able to help her pupils.

Mr. A. F. Foerste, teacher of physics in the Steele High School, Dayton, Ohio, spoke on making a library useful to high-school pupils. He said:

In some of the larger city libraries the books on the various sciences, whether in the line of natural history, or of physics, chemistry, and the like, are too exclusively of service to the very few, to the specialists, or those having had higher courses of training. Too great emphasis can not be laid upon the fact that these libraries are mainly for the general public, and that the most careful selection should be made of such books as would be of value to those who have not had previous training.

Following out the line of thought with which the discussion started, a superintendent present condemned a strictly professional course of reading for teachers. Teachers, he said, should read the same books as other cultivated people. He believed general culture was of more value than professional training.

To accommodate Dr. Winship, who wanted to attend another meeting, the last topic was next taken up. Dr. Winship spoke for half an hour in fervid appeal to teachers to own books, to come into intimate association with them. He said there

should be the closest cooperation between teachers and librarians, and indulged in some reflections on the aloofness and loftiness of librarians, which caused the librarians present to exchange smiles of amusement.

Miss Eary E. Ahern replied briefly to this charge by telling Dr. Winship that he had evidently never attended a meeting of the A. L. A., or observed the work American public libraries are doing and trying to do. She informed him that, so far from preserving a distant attitude towards teachers, librarians had been chasing after them for twenty years and only lately were beginning to catch them.

Throughout the discussion of the first and fifth topics there was a constant tendency to digress to the fourth, which to all seemed the most important and interesting subject; and as no one seemed to have anything to say on the second and third, the fourth topic was taken up. In introducing this, Mr. Crunden related his experience as a grammar-school pupil passing in a change of schools from the old to the new idea, and said that during the last two years of the old regime he received more benefit from the surreptitious reading of good literature than he did from his lessons. When he changed principals he was encouraged to read, and at the same time and for that reason found his lessons more interesting and valuable. As a grammar-school principal, he had found that those teachers who led their pupils to do general reading made the best showing at text-book examinations. He quoted from Sir John Lubbock to the effect that the chief thing was "that every boy and girl should wish to learn," and from Dr. Harris's Fabyan paper: "The school is set at the task of teaching the pupil how to use the library in the best manner. That, I take it, is the central object toward which our American methods have been unconsciously guided." And in conclusion he read a number of pertinent extracts from C. D. Warner's Relation of Literature to Life.

Superintendent Van Sickle, in response to a request, gave a brief account of the cooperative work done by the schools and libraries of Denver.

Remarks were made by a number of others, and before interest had begun to flag the lateness of the hour compelled adjournment.

"Evaluation" of Books for Children.

A promising plan recently set afoot in the Dayton Public Library is the system adopted for utilizing the reading of teachers, the library staff, and others interested, for the "evaluation" of books for the children. It was one of the outgrowths of the local teachers' library conferences held last year, and is being usefully and widely developed. The following printed reading slip, of the usual L. B. standard size, is given to the person who acts as "evaluator," and on it is noted the information desired:

Reading slip for persons who evalue books for school library.

Author ———.
Title ———.
Date ———. Reader ———.
Suitable for boy? —— girl? ——. Age ——. Grade ——.
Subject ———.
Locality ———. Period ———.
Information ———.
Language ———. Illustrations ———.
Moral tendency ———.
Comment ———.

The way in which the system works is illustrated by this completed reading slip on Miss Seawell's "Paul Jones:"

Author. Molly Elliot Seawell.
Title. Paul Jones.

Date. 2 Ja. '97. Reader. B.
Sex. Both. Grade. 6–8.
Moral tendency. Excellent.
Language. Pure.
Material. History and biography related in a story-telling way.
Correctness of information. Exact.
Illustrated. Yes.
Comments. General appearance—very pleasing; it would create an interest in reading history and the greatest admiration for those who had served their country; gives good idea of hardships in early years, and life in the Navy.

These slips, it will be seen, may be filed away to serve the librarian as an "evaluated" card catalogue of school literature, but the plan is capable of wide extension into other branches of reading, the giving of special subjects to special authorities, and, indeed, a partial attainment of comprehensive "evaluation" of library books.

A Children's Bookmark.

The following bookmark is used by the libraries of Milwaukee, Cleveland, Dayton, and other cities, and the attractively disguised preachment that it addresses to the children has proved decidedly effective:

Dayton Public Library.

BOOKMARK.

"Once on a time" a Library Book was overheard talking to a little boy who had just borrowed it. The words seemed worth recording, and here they are:

"Please don't handle me with dirty hands. I should feel ashamed to be seen when the next little boy borrowed me.

"Or leave me out in the rain. Books can catch cold as well as children.

"Or make marks on me with your pen or pencil. It would spoil my looks.

"Or lean on me with your elbows when you are reading me. It hurts.

"Or open me and lay me face down on the table. You wouldn't like to be treated so.

"Or put between my leaves a pencil or anything thicker than a single sheet of thin paper. It would strain my back.

"Whenever you are through reading me, if you are afraid of losing your place, don't turn down the corner of one of my leaves, but have a neat little Bookmark to put in where you stop, and then close me and lay me down on my side so that I can have a good, comfortable rest.

"Remember that I want to visit a great many other little boys after you are through with me. Besides, I may meet you again some day, and you would be sorry to see me looking old and torn and soiled. Help me to keep fresh and clean, and I will help you to be happy."

CHAPTER XVI.

EDUCATION IN FRANCE.[1]

France, republic: Area, 204,092 square miles. Population, 38,517,975 (1896).

PREVIOUS ARTICLES.

The educational system of France. (Report, 1888–89, Vol. 1, pp. 112–149.)

Report of the educational congresses and exhibition held in Paris, 1889. (Report, 1889–90, Vol. 1, pp. 41–186, by W. H. Widgery.)

Brief view of the educational system, with statistics for 1888–89. (Report, 1889–90, Vol. 1, pp. 249–261.)

Elementary education in London and Paris. (Ibid., pp. 263–280.)

Education in France: Statistics, 1890–91; progress of primary schools since Guizot's law, 1833; higher primary and classical schools of France. (Report, 1890–91, Vol. 1, pp. 95–124.)

Education in France: Outline of the system, and statistics for 1892; State faculties; proposed transformations and development of teaching functions. (Report, 1891–92, Vol. 1, pp. 73–95.)

Civil service in France, by W. F. and W. W. Willoughby. (Ibid., pp. 369–412.)

Education in France: Outline view, with current statistics; inspection of infant schools: recent changes in the baccalaureate: reorganization of medical studies and of the scientific course preparatory thereto. (Report, 1892–93, Vol. 1, pp. 219–237.)

Education in France: Statistics for 1891–92–93; recent modifications in the department of secondary education; recent development of the faculties (universities); progress of the system of primary instruction: schools for adults; movements for the admission of American students to the universities of France. (Report, 1894–95, Vol. 1, pp. 289–312.)

Education in France: Statistics for 1894–95: summarized view of primary schools, proposed modifications of secondary institutions; the law of July 10, 1896, transforming the State faculties into universities: status of medical students in France, with special reference to foreigners: Dr. Alcée Fortier on the French lycées. (Report, 1895–96, Vol. 1, pp. 611–639.)

Education in France: Statistics, current and comparative; opening of the universities under the law of July 10, 1896: the new doctorate open to foreigners; state secondary schools vs. church establishments; the law of July, 1893, respecting salaries of teachers of primary schools: the superior primary schools—progress, organization and scope; M. Boutmy on the reform of the baccalaureate: M. Bréal on the study of Greek. (Report, 1896–97, Vol. 1, pp. 29–70.)

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[1] Prepared by Miss Anna Tolman Smith.

TOPICAL OUTLINE.

Educational statistics, 1896—The State teaching system an index of the strength of the Government; the central authority actively present throughout the country by means of the academic organization and the service of inspection; decentralizing tendencies shown by the elective character of the councils (superior and academic), the reconstitution of the universities, the efforts to free the lycées from too rigid control and by communal responsibility in respect to primary schools—Statistical summary illustrating the progress of the system and of the movement toward local freedom; comparative statistics of universities; of secondary schools; of primary schools—Results of popular instruction shown in the diminishing ratio of illiterates; complaints of the moral degeneracy of youth lead to efforts for continuing moral restraints after the close of the obligatory school period and for increasing the moral influence of the school; instruction in temperance introduced into all primary and secondary schools—State education completed by provision for manual training and technical schools.

Appended papers: Report of Mr. Charles Copland Perry on technical education in France—Review of the measures facilitating the admission of American students into French universities—Review of the career of M. Victor Duruy, minister of public instruction, 1863-1869, by the Duc de Broglie—Review of the work of M. Henri Marion, first professor of the science of education at the Sorbonne, by M. F. Buisson.

Educational statistics, 1896.

Classes of institutions.	Date.	Enrollment.		Teachers.		Current expenditures.
		Male.	Female.	Men.	Women.	
Primary schools (public and private):						
Infant schools (écoles maternelles), ages 2 to 6	1896	720,120			9,300	
Primary schools (public and private), ages 6 to 13; 13-16	1896	5,533,511		151,563		*a* $37,890,173
Secondary schools:						
Public, ages 8 to 20	1896	85,514	14,436			4,096,447
Private, ages 8 to 20	1896	95,842				
Primary normal schools, ages 16 to 20	1895-96	3,930	3,926			1,780,900
Universities:						
Faculties—						
Public	1896	27,055				*b* 2,590,816
Private	1893	988				

a Public primary only.

b State appropriations for university faculties. As the receipts of the faculties amount to about $1,250,000, their net cost to the State was little above that amount. There were appropriated in addition for superior schools, $545,700; for scientific bureaus and societies, for the national library, administration, etc., $1,411,784, making the total appropriation for the department of superior instruction, $4,578,300. The total State appropriation for education, including the administrative service, was $38,808,367.

The highly centralized system of public instruction in France, the university,[1] or State teaching, as it is commonly termed, is of spe-

[1] This was the name given by Napoleon to the imperial system; by the law of March 15, 1850, it ceased to be the legal designation. The notion of solidarity, of personality even, attaching to the system is illustrated in the current use of the name. Thus M. Jules Lemaître protests against the obligatory study of the classics under the caption "The crimes of the university."—See Revue Bleue, June 18, 1898.

cial interest at this time, because of the culmination of a series of measures whose purpose is plainly decentralizing. The organization and history of the system will be considered here with special reference to these measures, which have really brought the system to the dawn of a new period.

The chief of the system, the minister of public instruction,[1] has large powers in respect to appointments, the regulation of schools, colleges, and universities, courses of study, the standards for degree examinations, etc. Member of the cabinet, he stands or falls with the ministry to which he belongs; a high degree of stability is, however, imparted to the system by the constitution of the superior council of public instruction, which survives party changes, and by the division of the system into departments, primary, secondary, and superior, each under its own director.[2] These officers are appointed by the President of the Republic and, like the council, do not change with the change of ministers. It should, moreover, be considered that the essential principles and many practical details of the system are established by law, and therefore not subject to the fluctuations of party success.

The principles upon which the French Republic is professedly founded are the legacy of the Revolution, but it employs in their application instruments created by Napoleon, and intended to serve the purposes of an imperial will. This is particularly noticeable in respect to public instruction. The reason is apparently twofold—the policy suits the traditional tendencies of the people, and it has been considered necessary as a means of securing to the state the influence formerly possessed by the church. Said Jules Ferry, in 1879, in a speech on the project of law requiring all teachers to have a State diploma:

> We find ourselves face to face with a power which intends nothing less than placing over against and above the right of the state and of civil society a sort of inviolability of a religious society which recognizes neither the law nor the right of the state.[3]

In this spirit, wisely or unwisely, the system of education was at first administered. It was aggressive in order that it might live. For this reason the growth of the system, and especially the growth of a liberal policy, measures to some degree, at least, the strength of the Government. At the same time the gradual process of decentralization that is going on in the system indicates a growing capacity for self-direction on the part of institutions. The changes in the

[1] M. Rambaud was succeeded in this post, July 2, 1898, by M. Bourgeois.

[2] The director of superior instruction is M. Louis Liard; of secondary, M. Rabier; of primary, M. C. Bayet, who succeeded M. F. Buisson in 1897, the latter, after twenty years' incumbency of this office, having been appointed to fill the chair of pedagogy at the Sorbonne, made vacant by the death of M. Henri Marion.

[3] Discours et opinions, Vol. III, p. 531.

Superior Council of Public Instruction early showed the purpose of the Republic to exalt professional above official influences. Under the imperial régime the council was formed wholly by appointment. As constituted by the law of February 27, 1880,[1] inspired by Jules Ferry, it is professional and largely elective, and since its organization on this basis it has included in its membership almost every man of note in the educational fraternity of France.

The central authority in the system of education is not a remote, impersonal force existing as a name merely in the regions beyond the capital. It is felt as a living presence throughout the country. The University is really a body of officials whose qualifications, duties, emoluments, and ranks are rigidly defined. They comprise seventeen academies or groups. At the head of each group is a rector appointed by the minister, whom he represents in the district to which he is assigned. He must be a university man, possessed of the doctor's degree. He is the executive head of the university (formerly faculties) of his district, and of all the secondary and primary schools in the same area. The 90 departments (civil divisions, 87 in France and 3 in Algiers) are unequally distributed among the academies. The Paris Academy is the seat of the chief university and of the leading classical colleges. It comprises 9 departments, with a population of 6,265,456. The Academy of Lyons, whose university is the second in importance, comprises 4 departments, with a population of 2,399,394. Chambéry, which has only the beginnings of a university, comprises 2 departments, with a population less than 550,000. These differences affect somewhat the dignity and influence of the rectorship. The minister is the virtual head of the Paris Academy, and the duties of the rector fall to the vice-rector. M. Gréard has filled the position during the whole period of the Republic. His salary is $3,600 (18,000 francs), the same as that of the rectors of Bordeaux, Dijon, and

[1] The superior council is composed of 60 members, three fourths of whom are chosen by their peers from the three teaching orders. Teachers and professors of all grades, and even women engaged in governmental or in private schools, are eligible to membership. Private schools and colleges send four members. These are appointed by the President of the Republic on the nomination of the minister.

All members are elected for four years, but they are eligible for reelection. Nine members are appointed councilors by a decree of the President of the Republic, and these, with six members chosen by the minister, form the permanent section of the council. This section meets every week; the council meets only twice a year—in July and December. The permanent section studies all questions appertaining to the discipline, administration, and management of schools, nominates to professional chairs, brings before the council all matters which have to be discussed by it, giving at the same time minutes of their own committees. The minister is also assisted by an advisory council (comité consultatif) appointed by himself from the ranks of the general inspectors, university professors, academic rectors, etc. Their term of service is one year, but their appointments are renewable. The committee is divided into three sections, corresponding to the three orders of instruction. (Decree May 11, 1880.)

Lyons. The lowest salary paid a rector is $2,600. The rector is assisted by an academic council,[1] in which there is a hint of local influences, since it includes members chosen by the minister from the councils of the departments and of the municipalities, which are elected bodies. The professional influence predominates, so far as numbers go, the majority of the members of the academic council being professors elected by their colleagues.

The deliberations of the academic council related formerly to secondary and to superior institutions, but by the transformation of the faculties into universities the academic council ceases to have jurisdiction over them. Their affairs are administered by a general council composed as follows: The rector, the deans of the faculties, and two delegates from each faculty, elected by their colleagues.[2] Thus the universities have become organic and self-governing, so far as comports with their character as State institutions. This is a change whose effects are felt beyond the circle of the universities themselves.

The law imposes upon the universities the task of developing specialties and of providing increased equipments, but at the same time permits them henceforth to control a large proportion of their income. There are already signs of a revival of the local activity in respect to learning which formerly characterized several centers. The traditions of this earlier period survive in many private associations for the promotion of science and letters which have withstood political revolutions.[3]

The reorganization of the universities will have its effect also upon the secondary establishments (lycées and communal colleges) which prepare students for matriculation. The endeavor to free these secondary schools from the effects of a too rigid control, to impart to them independence, spontaneity, and individuality,[4] has been the

[1] The academic council is composed of the academic inspectors, one for each department included in the academy; the dean of the university faculties, a certain number of professors chosen by their colleagues and two members appointed by the minister from the general councils of the departments, and two from the councils of municipalities that contribute to secondary and superior establishments. (Law of February 27, 1880.)

[2] The constitution was determined by decree of July 25, 1885, the first of a series of measures which culminated in the law of July 10, 1896. The decree of 1885 permitted the faculties to hold property, to receive gifts, and to manage their own estates. They were also empowered to receive funds from cities, departments, private corporations, and individuals. The law of 1896 provides that from January 1, 1898, the respective universities may retain the fees for tuition, registration, use of library and laboratories.

[3] Among these associations may be noted the Academy of Sciences, Arts, and Belles-lettres of Bordeaux, founded 1712; of Marseilles, 1721; Academy of Sciences, Inscriptions, and Belles-lettres of Toulouse, 1809.

[4] Such was the avowed purpose of the decrees of August 4, 1890, and June 4, 1891, modifying the courses of secondary instruction. In his circular of instruc-

least successful of all endeavors undertaken by the Republic for the improvement of education. The spirit of these efforts is clearly set forth in the review of M. Marion's work, appended to this article. They are being renewed at this time and will be aided by the revived spirit of university freedom. The development of specialties that is going on in the universities will necessarily tend to break up the extreme uniformity of the classical schools. At the same time the influence of another order of secondary schools which have developed upwards from the department of primary instruction is working to the same end. These superior primary schools, or, as we should say, high schools, although authorized by Guizot's law of 1833 as a feature of a national system, are truly local in their origin, having arisen in response to the demands of modern business and being an integral part of the new life, the era of the bourgeoisie, as it is sometimes and, perhaps, contemptuously called. These schools, liberally supported by the municipalities, are essentially modern; that is, scientific and technical. Their influence is already marked and is destined to increase.

It is in the department of primary instruction that the greatest need of local interest arises, and since this interest can hardly exist apart from the sense of responsibility it is here that the anomalous character of the French system is most clearly seen. Every commune in France is obliged by law to establish a public school.[1] But the communes do not control and manage their own schools, as do districts and towns in our country and in English-speaking countries in general.

Reference must here be made to the service of inspection which, like the academy system, represents the central authority throughout the country. This service comprises general inspectors,[2] whose oversight extends to all grades of instructions; academic inspectors, at least one for each department, who are appointed by the minister, but subject to the academic rector, and primary inspectors who come into the closest relations with the individual schools. The academic inspectors are the most important of these functionaries so far as the interests of elementary schools are concerned. They name the candidates from whom the prefects (civil chiefs) of departments may appoint

tions accompanying the decrees, M. Bourgeois, then minister of public instruction, urges the principals of secondary schools to exercise more freedom in respect to the daily routine and to promote the natural, spontaneous activity of the students. (Bulletin Administratif, No. 922, 1890, supplement).

[1] Guizot's law of 1833. Reaffirmed by law of June 16, 1881.

[2] There are thirteen general inspectors assigned to secondary instruction, five to primary, besides a certain number to the oversight of special subjects, as manual training, gymnastics, etc. Three general inspectresses also have the oversight of infant schools. These officers visit the section of country assigned to them during the winter and return to Paris in the spring for the work of preparing examinations, reports, etc. Their service dates from a decree of March 9, 1852.

full teachers; have the sole appointment of probationers and a large measure of control over all teachers. They must approve the time-tables of individual schools, and receive the reports of the primary inspectors of their respective departments. They have also to establish amicable relations between the prefecture and the academy, to mediate, as it were, between the exigencies of politics and pedagogy, for a man may be an excellent teacher but opposed to the party in power, and in that case he may be supported by the inspector and opposed by the prefect.

This general oversight is supplemented by the closer surveillance of the primary inspectors, of whom there are between 450 and 500, or about 1 to every 150 schools. They visit the schools of their respective districts twice at least in the year and report their state to the academic inspector; they preside over the teachers' conferences, conduct the examinations of candidates for the certificate of primary studies, report infringements of the compulsory law, direct the establishing of public schools, decide as to the opening of private schools, of classes for adults, the creation of local funds for aiding poor pupils, etc. The discipline and the reward of teachers is also largely determined by their recommendation.[1]

With this close oversight maintained by special officers of education and by the departmental prefects, all of whom owe their positions to the central authority, there appears to be little chance for the exercise of local authority in respect to the schools; but if from the administrative side the schools seem to be wholly the creations of the State, from the financial standpoint the view is changed.

The taxes on which, after all, the whole fabric rests have to be raised from the people. Besides the four direct taxes[2] levied by the State for general purposes, there is a school tax amounting to 8.12 centimes additional to the product of the four direct taxes.[3] These taxes accrue to the public treasury, from which an annual appropriation is made covering the salaries of primary teachers and the current expenses of primary normal schools. In addition to the school tax, the communes provide the sites and buildings for the primary schools, the furnishing and care of the same, the wages of servants in infant or other schools, the allowances made to foremen, assistants, and workmen required for special courses—agricultural, commercial, or industrial—and also lodgings for the regular teachers or money equivalent for the same. The funds for these expenditures are voted by the municipal or communal councils, which are elected by the citizens of the commune.

The statistics do not enable us to determine what proportion of the

[1] A decree of January 18, 1887, determines these duties.

[2] By law of July 14, 1884, the direct taxes are the tax upon land, the tax upon personal property, the license tax, and the tax upon doors and windows.

[3] Law of July, 1889, Chap. III, Art. 27.

amount appropriated by the State for the expenses of primary schools is covered by the 8.12 additional centimes.

In a comparison of the school income of 1887 with that of 1892 it is stated that in the former year the State contributed 49 per cent of the total obligatory expenditure for primary schools and in the latter year 67.6 per cent, and that the increase is due chiefly to the transfer of the 8 centimes additional to the State budget [1] which was first effected in 1890.

The interest of the people in their schools is not, however, solely a financial one. In each commune a local school committee (commission scolaire) is formed to supervise and encourage school attendance. This committee consists [2] of the mayor, or of an assistant delegated by him as president; of a cantonal delegate, and in communes comprising several cantons of one delegate for each, appointed by the academy inspector; of members designated by the municipal council, not exceeding in number one-third the members of the council. In case the municipal council fail to nominate these members they are appointed by the prefect of the department.[3] These committees were constituted to assist in carrying out the law of compulsory instruction and have no authority with respect to the matters and methods of instruction. They meet formally for business once every three months on the call of the president or the primary inspector. In case any accusation is made by them against guardians or parents, appeal may be made by the parties interested to the prefect. For obvious reasons they have accomplished little in respect to the enforcement of the obligatory law and have been of little account save where their efforts have been directed chiefly to promoting the well-being of the pupils. They afford rather proof that local interest is the strongest inducement to the maintenance of effective schools, a truth which is emphasized further by the effects of the funds for the aid of poor pupils (caisses des écoles) maintained by the communes. As to the prefect of the department, who has larger authority with respect to the schools than any officer outside the educational body, self-interest naturally prompts him to render himself acceptable to the people over whom he is appointed.

I remember [says Mr. Bodley] to have seen the préfet surrounded by the leading citizens of Lyons, distinguished men who devote their lives to the local institutions of the second town of France, the independent spirit of which is their pride.

[1] Statistique de l'enseignement, 1891–92, p. cxxv.

[2] Law of March 28, 1882.

[3] A department is divided into arrondissements which are administered by a subprefect. A canton is a division made with respect to judicial affairs, a justice of the peace being assigned to the chief place of each canton. The canton is entitled to a representative in the departmental council and to several representatives in the council of the arrondissement. A commune is a community entitled to self-government. A large commune, as Paris or Lyons, may include several arrondissements or several cantons.

We may concur, with reference to this whole system of local administration, so unlike that of our own country, in the opinion which this author adds:

> If, therefore, a great civic population, composed of conflicting elements, accept complacently the governance of an imposed authority, it is clear that the system is in accordance with the sentiments of the community.

It has been said that under the Republic there is less freedom in respect to primary education than before the revolution, when it was left entirely to the communes. In reality the schools were at that time under the control of the church. It is, as already stated, the purpose of the State to break up the monopoly of the church, not by destroying church schools, but by maintaining and favoring public schools. It has adopted for this purpose the university organization of Napoleon, but it has infused therein the spirit of professional liberty rather than repressed local activity. Says M. Faquet:

> The diverse laws which have established in France the liberty of primary, secondary, and superior instruction are decentralizing revolutions.

It is proper to notice in this connection that the civil liberty of the communes is continually increasing. Mme. Darmesteter points out in a recent article that the law of July 24, 1867, transferred the authority controlling the discussions of the mayor and council from the bureau in Paris to the prefecture. The Republic has gone further; the laws of April 7, 1884, have greatly increased the power of the mayor, "and by the institution of permanent committees have enabled private citizens to partake, in some measure, of the affairs of the Commonwealth. Finally, the law voted on October 27, 1896, gives a certain financial control to the municipal councils and adds to their faculties."[1]

In view of the movements here traced, the official statistics assume an importance beyond that of serving merely to show the present state of the various institutions.

The following tables are from reports published under the Republic, which comprise also revised summaries of statistics from 1829 to 1876, the date of the first report under the present government.[2]

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[1] Review of Bodley's France by Mary Darmesteter.—Contemporary, July, 1898, p. 62.

[2] The reports issued by the ministry of public instruction since 1870 are: Statistique de l'enseignement supérieur, 1876, 1878, 1888; secondaire, 1876; secondaire des garçons, 1887; secondaire des jeunes filles, 1887; Statistique de l'enseignement primaire, 1876-77, 1881-82, 1886-87, 1891-92. The minister has published also for several years a brief annual report of primary education.—Résumé des Etats de situation de l'enseignement primaries.

Number of students in the university faculties for years specified.

State faculties.	1875.	1885.	1891-92.	1895.*a*	1896.	1897.	Per cent of increase, 1885-1895.
Paris	17,630	8,530	9,387	10,951	27,035	26,912	28.4
Provincial		7,446	12,679	13,404			80
Total	17,630	15,976	22,066	24,355	*b* 27,035	26,912	52.44

a In January; these figures are taken from a report made to the Chamber of Deputies in 1896, accompanying the project of law relative to the constitution of the universities, as reported in the Revue internationale de l'enseignement of February 15, 1896, p. 193.
b Includes 1,828 foreigners.

Distribution of university students by faculties. *a*

Faculties.	Students registered.						Increase or decrease, 1891-1896.
	1891.	1892.	1893.	1894.	1895.	1896.	
Protestant theology	94	98	89	96	89	91	— 3
Law	7,728	8,019	8,210	8,358	8,143	8,876	+ 1,148
Medicine	6,212	7,069	7,589	8,897	8,996	8,485	+ 2,273
Sciences	1,647	1,848	1,866	1,654	2,307	3,050	+ 1,403
Letters	2,647	2,835	3,000	3,070	3,230	3,457	+ 810
Pharmacy	2,457	2,560	2,643	2,823	2,897	3,076	+ 619
Total	20,785	22,429	23,397	24,893	*b* 25,662	27,035	+ 6,250

a From report of the committee on the budget for 1897, p. 14.
b The difference between this total and the corresponding total in the preceding table is probably due to the fact that certain municipal students are here included that were omitted in the other table, or possibly the two counts were made for different months of the year.

Financial statistics.

Year.	Expenditures by the State for university faculties and schools.	Receipts of faculties turned into the public treasury.	Net expense of the faculties to the Government.	Number of students.	Expense per capita.	
					Total.	Net to the Government.
1877 *a*	$1,607,596	$895,796	$711,800	13,951	$115.25	$51.00
1887 *a*	2,296,539	941,956	1,354,583	16,163	142.00	84.00
1895 *b*	2,628,415	1,326,400	1,302,015	24,355	106.50	54.00

a From Statistique de l'enseignement supérieur, 1878-1887.
b From speech of minister quoted in Revue internationale de l'enseignement, February 15, 1896.

From the first of the foregoing tables it is seen that while there has been a marked increase in the number of university students in the past two decades, the provincial faculties share in this increase to a greater degree even than Paris. The second table is of interest as showing the success of the efforts to increase attendance upon the faculties of letters and sciences, which correspond very nearly to the philosophical faculty in German universities. This increase has been accompanied by the development of the teaching function as contrasted with lecturing and examining, and also by a gradual change in the character of the students matriculating in those faculties. As pointed out recently by a minister of public instruction, the number was so small in 1876 they were not mentioned. Then through the cre-

ation of scholarship funds (bourses) and examinations (agrégation) for special professors, candidates for the licentiate or for the title of agrégé were attracted to the faculties of letters and of sciences, and more recently the number has been increased by students having in view other careers.

The increase of the university receipts and the consequent diminution of the per capita expenditure by the State that has been going on since 1887, as shown in the third table, may be justly regarded as an outcome of the measures for giving autonomy to the several universities.

SECONDARY SCHOOLS.

The status of the secondary schools of France appears at this time to be less satisfactory than that of any other department. The efforts that have been made by the Government to modify the curriculum and the constitution of the State lycées have been considered in full in previous reports. The statistics carefully reported from year to year have shown a gradual falling off in the attendance upon the public secondary schools and a proportionate increase in the attendance upon the church establishments. This tendency is viewed with some concern by the Government, and inquiries have been instituted with a view to ascertain the exact causes of the movement. The attendance upon the five classes of secondary schools, i. e., the lycées and communal colleges which belong to the State system, and the three classes of private schools which are almost without exception church establishments, has been as follows, for the successive years 1892–1897, inclusive:

Classes for institutions.	Enrollment.					
	1892.	1893.	1894.	1895.	1896.	1897.
Lycées (public)	52,945	53,974	53,490	53,962	53,290	52,427
Communal colleges (public)	32,508	32,709	32,421	32,161	32,224	32,412
Church schools	51,087	51,377	56,265	57,250	58,506	62,188
Small seminaries, clerical (petits séminaires)	23,948	23,849	25,354	25,407	21,737	22,381
Private establishments	16,306	14,028	14,214	12,011	13,599	12,813
Total	176,794	175,937	181,744	180,791	179,356	182,221

The proportion of students in the lycées and colleges fell from 48.33 per cent in 1892 to 46.55 in 1897. The decline, although not great, has been increasing from year to year; its causes are not yet well defined. Meanwhile, it is noted in the official reports that although the status of the State schools with respect to attendance is not wholly satisfactory, they contribute a much larger proportion of students to the special schools of the highest order than the rival institutions. This is an important matter, as these graduates enter eventually into the most influential public services. The following

table shows the comparative standing of the several classes of schools in this particular:

Name of special schools.	Students entering the special schools from—														
	Lycées, colleges, and other establishments of the State or of the city of Paris (Prytanée, Chaptal, etc.).					Private establishments having special relation to the State schools (Ste. Barbe, Stanislas, etc.).					Private establishments, lay and clerical.				
	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.
Superior normal school	41	41	42	41	37	1	1	1	1	2	.....	.....	.....	.....	.....
Polytechnic school	185	180	174	165	162	41	38	26	32	30	38	31	23	35	38
School of Saint Cyr	301	316	416	365	354	34	41	49	51	44	90	121	139	136	130
Naval school	43	40	44	42	33	7	12	6	13	12	20	23	25	21	25
Central school	138	150	160	145	140	27	45	24	27	20	97	66	71	74	70
Agronomic institute	.....	25	44	44	48	.....	18	21	14	10	.....	2	29	30	16

State appropriations for secondary education.—For buildings and equipments alone the State has contributed to secondary institutions since 1878 the sum of $22,173,333, of which a little above $2,000,000 went to the secondary schools for girls. The annual appropriations for the current expenses of the lycées and communal colleges (for boys) and the public secondary schools for girls have been as follows for the years named: 1894, $4,038,248; 1895, $4,073,165; 1896, $4,096,447; 1897, $4,045,119.

PRIMARY SCHOOLS.

The statistics of primary schools are of chief interest in this inquiry. In the category of primary schools are included infant schools (écoles maternelles) established at the option of the communes; elementary primaries, public and private [the law requires at least one public school in every commune; only 96 communes out of 36,492 have not met the requirements]; superior primaries, and primary normal schools. The complete statistics have been given previously. The statistics here to be considered relate only to the primary schools (elementary and superior) in France, excluding Algiers. Their significance will be better appreciated by a view of the general movement of the population during the two decades, 1876–1896. The child population of France, it should be observed, bears a smaller ratio to the total population than is the case in the neighboring countries. This is attributed to the low birth rate in France, the immigration chiefly of adults, and the unusual vitality of the adult population.

The state of the population as indicated by successive censuses is somewhat anomalous. From 1821 to 1866 each census showed an increase over the preceding, but at gradually diminishing rates until 1866, when the rate of increase showed a slight rise above the rate for the preceding five years, to be followed by an actual decrease of population, amounting to 3.05 per cent, for the decade of 1866 to 1876. The movement from 1876 to 1896 is shown by the following table:

Movement of population.

Year.	Total population.	Increase or decrease.	Children between 6 and 13, inclusive.	Increase or decrease.	Ratio to total population.
		Per cent.		*Per cent.*	*Per cent.*
1876	36,905,788		4,502,506		12.2
1886	38,218,903	+3.55	4,729,144	+5.03	12.4
1891	38,343,192	+0.32	4,639,526	−1.89	12.1
1896	38,517,975	+0.79			

Enrollment in primary schools.

Year.	Total.	Boys.	Girls.	Increase or decrease.	Ratio of enrollment to total population.
				Per cent.	*Per cent.*
1876–77	4,716,935	2,400,882	2,316,053		12.78
1886–87	*a* 5,526,365	2,789,685	2,736,680	+17.08	14.46
1891–92	*b* 5,471,402	2,757,566	2,713,836	−1.00	14.27
1895–96	*c* 5,533,511				14.36

a In addition, 70,554 in Algiers. *b* In addition, 85,068 in Algiers. *c* Algiers included.

The statistics of enrollment in primary schools show a remarkable increase for the decade 1876–77 to 1886–87 and a slight decrease in the five years following. The analysis is not carried to 1896 because the enrollment for France, excluding Algiers, has not yet been reported. The decline is really less than that in the child population, and would scarcely excite attention were it not limited to the public schools.

In the five years from 1881–82 to 1886–87 the enrollment in the public primaries increased by 2 per cent and in the private primaries by 10 per cent. In the succeeding five years (1886–87 to 1891–92) the enrollment in public schools declined by 5.3 per cent, while in the private primaries there was an increase of 16.8 per cent, or a higher rate of increase than in the previous period.

Of the total enrollment, public primaries had 81.6 per cent in 1881–82; in 1886–87 only 80.4 per cent, and in 1891–92 the proportion had fallen to 76.8.

The movement is more clearly shown by the following statistics, giving the distribution of the pupils between the public and private schools classified as secular and church, that is, schools having teachers belonging to a religious order:

Distribution of pupils in different classes of primary schools.

	1881–82.	1886–87.	Increase (+) or decrease (−).	1891–92.	Increase (+) or decrease (−), 1886–87 and 1891–92.
Secular:					
Public—			*Per cent.*		*Per cent.*
Boys	2,188,487	2,293,062	+ 4.8	2,274,372	− 0.8
Girls	1,161,286	1,351,497	+16.4	1,409,716	+ 4.3
Private—					
Boys	65,997	60,240	− 8.7	53,574	−11
Girls	152,091	114,311	−24.8	93,367	−18.3
Total	3,567,861	3,819,110	− 7	3,831,029	+ 0.3

Distribution of pupils in different classes of primary schools—Continued.

	1881–82.	1886–87.	Increase (+) or decrease (−).	1891–92.	Increase (+) or decrease (−), 1886–87 and 1891–92.
Church:					
Public—			*Per cent.*		*Per cent.*
Boys	254,094	169,360	−33.3	36,290	−78.5
Girls	755,389	630,649	−16.5	487,050	−22.7
Private—					
Boys	199,932	267,023	+33.6	393,330	+47.3
Girls	563,935	640,223	+13.5	723,703	+13
Total	1,773,350	1,707,255	−3.8	1,640,373	−3.9

It will be seen from the foregoing that the decline of enrollment from 1886–87 to 1891–92 was in secular private schools and in public schools having church teachers. The former are probably giving place to public schools; the latter are in many cases losing pupils through the enforcement of the law of 1886, forbidding the employment of religious teachers in public schools. The law was to go into full effect as regards schools for boys in 1891, which would account for the decrease of 78 per cent in the enrollment of public schools of this class. The change in schools for girls was not limited in time, and is effected gradually, as circumstances permit.

Teaching force.

Primary schools.	1886–87.			1891–92.			Total, 1896. *a*
	Men.	Women.	Total.	Men.	Women.	Total.	
Public	54,822	42,469	97,291	54,645	45,790	100,435	105,587
Private	8,330	31,194	39,524	10,566	33,229	43,795	45,976
Total	63,152	73,663	136,815	65,211	79,019	144,230	151,563

a Classification by sex not yet reported.

It appears from the above that the increase in the total teaching force was 5.5 per cent from 1886 to 1891–92, and 5 per cent from 1891–92 to 1896. For public schools only the increase in the former period was 3.2 per cent, and in the latter period 5.1 per cent.

As previously stated, the form in which the financial appropriations are reported does not enable us to determine the actual part borne by the communes in the support of their schools. Many communes are too poor to support a school; the great cities, on the contrary, not only bear the expenses of their own schools but contribute something in excess. The status of the public funds in aid of poor children (caisses des écoles) indicates, in a measure, the ability of the communes to care for their own children.

The number of communes was 36,461 in 1887, and 36,492 in 1892. The number having more than 500 inhabitants at the former date was 19,403, and at the latter 19,021. This shows that the increase was wholly in the number of small communes.

The status of the funds in and for the two years named was as follows:

	1887.	1891–92.
Number of communes having funds	17,080	16,121
Total fund	$1,039,590	$1,032,612
Total expenditure	716,841	801,255

The number of these funds rose from 928 in 1880 to 17,000 in 1887. The falling off since that date is due to the inability of certain very poor communes to maintain the fund without special aid from the public treasury, which was guaranteed by the law of 1892, but abrogated in 1896.

The total expenditure for public primary schools, including infant and normal schools, in France and Algiers, was as follows at the dates specified:

Year.	Amount.	Increase.
		Per cent.
1886	$34,051,229	
1891–92	37,261,215	9.42
1895	37,890,173	1.68

The expenditure per capita of population at each date was—

1886	$0.89
1891–92	.97
1895	.98

The detailed statistics show that the expenditure for the public primaries, excluding infant and normal schools, amounted to $23,987,275 in 1886, equivalent to $5.32 per capita of enrollment, and to $34,270,041, equivalent to $8.07 in 1891–92. Later detailed statistics have not been reported.

The per capita estimates are made upon the enrollment in public schools, or about three-fourths of the total enrollment. The church schools still bear the expense of educating nearly 25 per cent of the children of school age.

The statistics here presented show on the whole a decided and stable progress in the system of public instruction. The slight decline at a few points is probably due to temporary causes, and is in no case sufficient to raise any question as to the ability of the Government to maintain the system, while infusing therein a higher degree of freedom and local activity.

One result of the spread of elementary instruction is seen in the diminishing ratio of illiterates. In 1892, of the young men examined on the conscription list, 7.5 per cent could neither read nor write. In 1896 the proportion was only 5.3 per cent.

It has been maintained by opponents of the system that its moral

influence is bad, a charge based chiefly upon the secular character of the public schools, or, to speak more plainly, upon the exclusion of religious instruction.

It has been proved over and over again that the statistics of crime do not support this aspersion, but the agitation of the subject has served to bring into clear light a very great evil in respect to the training of youth. Under the obligatory school law all children must receive elementary instruction, but the majority pass from school at 11 or 12 years of age with sharpened wits and a modicum of knowledge. In the period of adolescence, when most susceptible to temptation, many are left without restraint or discipline of any kind and without innocent diversion suited to their age. This is an evil for which the schools are not responsible, but which the school system by its management and its records of juvenile life helps to disclose. The result of the widespread agitation of this evil is a concerted action on the part of public school authorities, private associations, and private citizens to devise and foster means for its correction. This is the cause of the immense revival of what are termed "adult courses," but which are really continuation courses, in which instruction and practical training are mingled with recreation and social intercourse.

In 1896–97 there were reported 1,200 societies engaged in this work, and 417,421 youths in attendance upon the evening or continuation classes, which employed above 33,000 teachers, most of them belonging to the State service.[1]

The discussion of this subject has also had some effect in strengthening the moral influences exerted by the schools themselves. In proof of this may be cited the ministerial order of March 9, 1897, organizing temperance instruction (enseignement antialcoolique) in all primary schools (including high and normal schools), and also in the lycées. In conformity with this order, the official programmes of hygiene, political economy, and morals in these several classes of schools have been modified by the introduction of scientific principles which it is believed will prove the best safeguard against intemperance. French children are to be taught that alcohol, under whatever form taken, is a poison; that it is the chief producer of insanity and crime; that it destroys, by degrees, individuals and families, the race, society, even the country.

The success of this instruction is held to be closely connected with the formation of school leagues, where the practice of intemperance will respond to the theoretic instruction. These leagues are commended in express terms by the minister.

The institutions already considered, superior, secondary, and primary, do not comprise the entire work of public instruction undertaken by the Republic. The efforts in respect to manual and technical edu-

[1] For details, see the Report of the Commissioner of Education, 1896–97, Vol. 1, pp. 53–56.

cation must not be overlooked. Although related more or less intimately to the provision for general education, they form a separate chapter in the history. A recent report on this work by an English expert, Mr. Charles Copland Perry, commissioned by the science and art department to investigate the subject, presents a complete survey of this field. In France, as elsewhere, technical education was advocated as a means of replacing the obsolete system of apprenticeship. The significant lesson of the history which Mr. Perry has emphasized is the failure of the efforts to graft technical training upon general primary instruction. Independent organization and early specialization are apparently the irresistible tendencies of this work; meanwhile the importance of preserving intact for primary instruction—that is, instruction below the high school grade—the character of general as opposed to all specialized instruction, is emphasized by the French experience.

Mr. Perry's report is reproduced in full among the papers appended. This report is followed by a summary of the measures facilitating the admission of foreign students to the French universities. This movement, which has been directed with a special view to the demands of American students, may also be regarded as an evidence of the freer life upon which the universities have recently entered.

There are also appended papers relating to two eminent men who have played each an important part, though in different spheres, in developing the system of public instruction. The informing purposes, the high ideals of the system, are reflected in their utterances and their efforts.

REPORT TO THE SCIENCE AND ART DEPARTMENT ON RECENT PROGRESS OF FRENCH TECHNICAL EDUCATION.

By Charles Copland Perry, M. A., New College, Oxford; Ph. D., Marburg (Prussia).

Recent Legislation on Primary Technical Instruction in France.

The State organization of primary technical instruction in France owes its original inception to a discussion in the Chamber of Deputies in January, 1878. The results of French industry, as displayed in the Paris Exhibition of that year, were held to be unsatisfactory. Chambers of commerce and leading manufactures had for years past urged upon the Government the necessity of taking measures to arrest the gradual decline of technical skill which was due to the very unsatisfactory conditions attending ordinary apprenticeship in the workshops, and which was seriously affecting the interests of the country. It was now proposed that a special grant should be made to the ministry of agriculture and commerce for the purpose of creating a complete system of primary technical instruction which would comprise a technical school in each department under the immediate supervision of the conseil général, or county council. This proposal, which involved the idea of assigning a special and independent position to technical education, and was, largely on this account, an unpopular one, was defeated. A counter proposal was made to "annex" technical or primary instruction, or, in other words, to graft new technical schools on existing elementary ones. This project was, with some modifications, accepted, and finally, after con-

siderable delay, an agreement was entered into by the ministry of public instruction, on the one hand, and the ministry of agriculture and commerce on the other, which resulted in the law of the 11th of May, 1880.

The effect of the main provisions of this law was:

(1) To create a new and distinct order of schools, under the name of écoles manuelles d'apprentissage. This somewhat ungrammatical title was, at the time, a good deal criticised, but was, it was thought, intended to designate a class of schools which aimed at providing general technical instruction, and not an apprenticeship to any definite trade. Their object, as defined by the law itself, was "to develop in youths intended for manual trades the requisite dexterity and technical knowledge." In a decree of January, 1887, they are said to be intended "to develop technical skill and to complete, in a special direction, the instruction of the elementary school."

(2) In the second place the law of 1880 assimilated to the above écoles d'apprentissage those higher grade primary schools which comprised courses, or classes, for technical instruction.

(3) It placed both the above kinds of school in the general category of "primary schools," and thereby made the expenditure in connection with them obligatory on the commune or the department.

(4) It placed the écoles d'apprentissage, and the schools assimilated to them, under the dual control of the ministers of public instruction and of agriculture and commerce, respectively.

In July, 1881, an administrative order, intended to give effect to the above law, practically made it a dead letter. It established a distinction between the two kinds of school which the law itself had expressly united, and it, moreover, separated the functions of the two ministers. The minister of agriculture and commerce was made financially responsible both for the erection and the annual expenditure of the écoles d'apprentissage, regardless of the fact that no grant had been made to his department for that purpose. The consequence of this blunder was that from 1880–1888 it was impossible to found a single public school of the kind. The law of 1880 was, therefore, so far as the écoles manuelles d'apprentissage are concerned, never carried out. This fact was admitted in the French Senate during the discussion of the budget of 1887.

In response to the renewed appeals of various municipalities, a commission was appointed in February, 1886, for the purpose of considering the best means of giving practical effect to the law of 1880. After hearing a good deal of conflicting evidence on the rival claims of primary and technical instruction, the commission at length succeeded in effecting a compromise which took practical shape in the decree of the 17th of March, 1888. This decree forms the basis of the agreement which still exists at the present time between the two ministries. It applies only to the schools subject to the law of December, 1880, i. e., the écoles d'apprentissage and the écoles primaires supérieures professionnelles, or technical higher grade schools. Moreover, it confirms the principle of dual control established by the law of 1880, and places all the schools subject to that law under the joint authority of the two ministries. The cost, both of the écoles d'apprentissage and of the écoles primaires supérieures professionnelles, is to be defrayed, partly by the ministry of public instruction, and partly from the budget of the department or of the commune, according as the school is departmental or communal. No charges of any kind are to be incurred in connection with these schools by the ministry of commerce, which may, however, make, within the limits of its resources, such voluntary grants as it may from time to time deem advisable.

Every school subject to the law of 1880 is governed by a school council, which, in the case of a commune, consists of the mayor as president, two municipal councillors, three members chosen by the municipal council from amongst local manufacturers, and, finally, a representative of each ministry. It is the duty of

the council to watch over the material interests of the school, to prepare the budget in conjunction with the principal, and to draw up, subject to ministerial approval, the syllabus of work. In the case of the écoles primaires supérieures professionnelles, as distinguished from the écoles d'apprentissage, a second additional body, the comité de patronage, was instituted, which may, however, take the place of a council. The members of the comité de patronage are appointed by, and are absolutely subject to the influence of the ministry of public instruction. To the same ministry belongs the initiative in appointing the principals and teachers of all primary technical schools, of whatever kind, with the exception of national schools. Such appointments, however, require confirmation by the ministry of commerce. In the case of national schools, like Vierzon, Voiron, and Armentières, appointments can only be made conjointly, the initiative belonging to neither ministry. The joint authority of the ministry of commerce extends only to those higher-grade primary schools and cours complémentaires (higher-grade classes attached to a primary school), which prepare directly for commercial or industrial life. Schools in which there is no technical element, or in which it is considered quite subordinate, remain, as before, under the sole authority of the minister of public instruction.

Boys can not enter either class of school before 12 years of age. Between the age of 12 and 13 they must be able to show a certificat d'études primaires; after 13 years of age they are allowed, in lieu of this, to pass an entrance examination.

All schools are, in theory, obliged to conform to a syllabus of work laid down by the two ministries. They may, however, be authorized to draw up a special programme adapted to the needs of the school.

In both classes of school the duration of the course is, except in special cases, three years. In some schools there is a fourth year, which is subject to a special syllabus.

Schools may prepare either for commercial or industrial life only, or for both concurrently. The special character of the school is, in the case of communal schools, decided by the municipal council. In industrial schools the obligatory technical subjects are handicraft, drawing, science, and technology; in commercial schools, bookkeeping and business routine, commercial geography, modern languages, and drawing.

Every industrial school must possess at least one foreman or manager, who is expressly included by the regulations among the teaching staff. His technical qualifications must be attested by the council of the school, and he is selected by the mayor from a list of three names submitted by the council.

The following is the official syllabus laid down for industrial and commercial schools:

	Hours a day.		
	First year.	Second year.	Third year.
Industrial schools:			
Primary instruction	2	2	2
Manual work	3	4	5
Drawing	1	1	1
Science and technology	1	1	
Meals, etc	2	2	2
	9	10	11
Commercial schools:			
Primary instruction	1	1	1
Bookkeeping, etc	2	3	3
Commercial geography	1	1	1
Foreign languages	2	1	2
Drawing	1	1	1
Meals	2	3	3
	9	10	11

Such is the outline of a scheme of technical instruction under the two ministries. Sufficient time has now elapsed to enable an opinion to be expressed as to results achieved. The project of establishing a distinct order of écoles manuelles d'apprentissage had up to 1888 been a failure, and though the ministry of commerce was now relieved from any direct financial responsibility in connection with them they met with no better success. On the other hand, the écoles primaires supérieures professionnelles, which were to have been "assimilated" to these schools, have developed considerably since 1880. It may, however, be confidently affirmed that, so far as the real interests of technical education are concerned, they have failed to fulfill the task assigned to them. Where comparative success has been achieved, this is due to special local effort, not to State regulations. In the great majority of cases the bias of these schools is toward a general education of a totally indefinite character and not, as the law of 1860 intended, toward distinctly industrial teaching. In theory "professionnel," they are, in most cases, merely ordinary higher grade schools. The smattering of technical instruction which they provide is nothing more than an "extra." A charge now frequently brought against these schools by competent authorities in France is that, as a rule, they only succeed in turning out "déclassés," youths who "se croient des savants" (think themselves savants), and who become useless members of society. It is by no means easy to ascertain the exact part which manual work plays in the curriculum of these schools, for the syllabus of work presented on demand may fail to tally with the facts. I have, however, repeatedly been assured on good authority that in some schools not more than four hours a week are devoted to the workshop, an amount of time which is considered useless for practical purposes. The minimum number of hours which, in the opinion of the best French authorities, is sufficient to prepare boys for future apprenticeship in trade workshops is twenty-five to thirty hours a week, and this must be continued for at least three years. If to this be added the time required for the scientific side of technical instruction, it must be evident that not much leisure is left for a "literary education."

The defects of a system in which two ministries of divergent tendencies exercise a joint control over technical education are obvious and now generally admitted. Its establishment was due to the initial error of underestimating the task which technical education has to accomplish, and of viewing the latter only in the light of a complement of general education. It is beginning to be recognized that the relative claims of the two do not admit of any compromise based on abstract principles, and, that, unless a definite standard of efficiency is attained, technical education misses the main purpose for which it was instituted. This standard of efficiency must not be set by academic considerations of general culture, but by the exigencies of modern competition in trade. No good results could be expected from the ill-assorted union of two ministries which, though nominally equal, in reality occupy the position of superior and dependent, or from a compromise in which a new and important State interest is practically regulated by a powerful organization whose knowledge and whose sympathy are both inadequate to the task. The present tendency of opinion in France is in favor of ending a union which has proved so unfruitful and of recognizing that, while technical instruction must necessarily be based on elementary education, it must also enjoy an independent status of its own.

The combined agency of the two ministries, which has, on the whole, been so unproductive, is nevertheless entitled to claim one success. This consists in the foundation of the three national technical schools of Vierzon, Voiron, and Armentières. The law of December, 1880, did not in itself provide for the foundation of State schools for primary technical instruction. A commission was, however, appointed in May, 1881, by the minister of public instruction, in agreement with the minister of commerce and industry, to examine the question of organizing a

State school, which was to unite higher grade elementary with technical instruction, and which was to serve as a model to the communes and departments which desired to found schools of the order specified by the law of 1880.

The commission expressed themselves in favor of creating not merely an école d'apprentissage, but one which would, in one and the same establishment, combine a school for very young children (école maternelle), a primary and a higher elementary technical school. The commission was further of opinion that "all specialization in manual instruction should be avoided." Before the report of the commission was officially presented the decree of the 9th July, 1881, issued at the instance of the two ministries, directed the creation of a "National school of higher elementary and technical instruction intended to serve in preparation for apprenticeship" (école nationale d'enseignement primaire supérieur et d'enseignement professionel préparatoire á l'apprentissage). The school at Vierzon was designed "as a pattern for similar establishments," to be founded in execution of the law of 1880. Two further schools of the same kind were created at Armentières and Voiron by the decrees of the 10th and 26th July, 1882. Finally, the decree of the 17th March, 1888, provided for the future foundation and regulation of other schools of the same class. The school at Voiron was opened in 1886, those at Vierzon and Armentières in 1887. A report of M. Buisson, director of primary instruction, defines the purpose of these three schools as follows:

Vierzon, Voiron, and Armentières are not, in any sense, special technical schools, more or less complete schools of engineering (écoles d'arts et métiers); they are associations of schools comprising an infant and a primary elementary school, and at each stage technical instruction which, commencing from the earliest age, when it is of little importance, continues up to the very end of the course, when it becomes of the first moment. When he has arrived at this final stage the apprentice, who now only needs the practice of his trade to become a workman, leaves the national school and goes either into a workshop or into a technical school, in the proper sense of the term. Hence these three establishments provide a general preparation for artisan and industrial life. They lead a youth right up to the threshold of the factory or the engineering school, armed with every kind of general and special knowledge, with the aptitudes and habits of work which will enable him either to select a particular calling, or, if needs be, pass from one calling to the other, sure of being, after a few months of practice, a finished workman.

It need hardly be said that this rather highly-pitched statement is in want of some modification. Even the best pupils of primary technical schools require, I believe, a year or two before they can be considered masters of their craft.

The number of these schools is at present still limited to three. The directors, as well as the whole staff, are appointed in common by the two ministries. The three establishments each comprise (1) an infant school (age 3 to 7), to which only boys are admitted, (2) an elementary school, (3) a higher elementary technical school. There is some manual work even in the primary school, but of the most rudimentary kind, intended to develop quickness of hand without entailing physical effort. The work in the shops begins at 12 or 13 years of age, when the children enter the higher grade school. In the first year it occupies three hours a day; in the second year, four hours; in the third year, five hours. In the first year there is no specialization; five months are spent in the joiner's shop and five in the fitter's. At the beginning of the second year a selection is made of some special branch of trade, according to the aptitude of the boy or the wishes of his parents. From this time forward he works at carpentering or modeling, turning in wood, fitting, turning in metal, or (as at Armentières) weaving. From the second year, when the specialization begins, the work done bears an immediate relation to the special trades of the district in which the schools are situated; working in iron and painting on pottery at Vierzon; working in paper, linen, and silk at Voiron; working in iron, modeling, and weaving at Armentières. Each school provides special preparation for the écoles d'arts et métiers and for naval

engineering. The instruction is gratuitous for day pupils; boarders pay 500 francs per annum. Boys can not enter the school before 12 years of age, and they must be able to show a certificate d'études primaires or pass an equivalent entrance examination.

The above schools may be regarded as representing the highest ideal formed by the French State of a combined general and technical education. They stand as the official solution of a difficult if not insoluble problem. In view of the general failure which has attended the joint efforts of the two ministries, their success may appear to require some explanation. This is, no doubt, largely to be found in the presence of three factors which are absent in the great majority of higher elementary technical schools, the cachet, which a State institution always possesses in the eyes of a French parent, the absence of municipal control, and, lastly, in the avowed predominance of technical instruction. The prospectus of the school at Armentières is careful to point out that—

This school, of which the staff is appointed by the minister of public instruction, with the assent of the minister of commerce and industry, is distinguished from ordinary schools by the ampler opportunities which it affords for learning the use of tools as well as the nature and management of machinery, for practical exercises in drawing and modeling, and for chemical experiments. It is no less distinguished from apprenticeship schools by the range and the intrinsic excellence of its syllabus of work. It forms skillful and capable workmen and able foremen and managers, who form the élite of the working population.

We have now reached the extreme limits of the concerted action of the two departments, and we may notice that technical instruction is already in the ascendant. In the next stage the ministries part company, and the ministry of commerce and industry for the first time takes an independent line of its own. Though the agreement of March, 1888, between the two ministries nominally gave them a joint share in the control of the écoles d'apprentissage and the écoles primaires supérieures professionnelles, yet practically the provision in that agreement which laid the cost of these schools exclusively on the ministry of public instruction deprived the ministry of commerce of any real power of intervention. The action of the latter was virtually limited to tendering advice. The further provision, on the other hand, which rendered it necessary that every detail of organization should have been jointly approved of by the two ministries was the cause of constant friction and delay. These serious defects were at last rectified by the insertion in the financial law of January 26, 1892, of a clause which created an entirely new category of schools under the name of écoles pratiques de commerce ou d'industrie. The creation of these schools may, if we except the national schools of Vierzon, Voiron, and Armentières, be regarded as the first serious step which the French State has taken in the direction of primary technical education. The best proof of a consciousness that the policy of 1880 and 1888 had been a failure is afforded by the official language in which the new project was introduced. It almost suggests that the subject of primary technical instruction is now being mooted for the first time. The evils lamented in 1878 remain apparently unabated after an interval of fourteen years. In two circulars, dated June, 1893, and addressed to prefects of departments and directors of schools, the ministry of commerce and industry calls attention to the fact that the law of January 26, 1892, placed under the control of his department those écoles primaires supérieures professionnelles in which the instruction is principally industrial or commercial, and gave them the title of écoles pratiques de commerce ou d'industrie.

There is [the circular states] an essential distinction between those newly created écoles pratiques and those écoles primaires supérieures in which a certain amount of attention is given to technical (professionnel) instruction as a preparation for apprenticeship. The écoles pratiques are intended to do more than this, viz, to form clerks (employés de commerce) and workmen whose services can be at once utilized in the countinghouse and the workshop. The value of a general education, both for its own sake and as a necessary basis for technical knowledge, is of

course incontestable. No one would desire to banish it from the écoles pratiques, which will include some primary instruction, and into which no boy will be admitted who has not fulfilled the conditions imposed by the compulsory education bill of March, 1882. On the other hand, it is essential that special provision should be made at the present time for the requirements of industry and commerce. The keenness of international competition has revolutionized the conditions of trade. The wholesale use of machinery and the minute subdivision of labor has practically extinguished apprenticeship in the workshop. Yet, in view of the constant changes to which machinery is subject, it is evident that there never was a time when it was so requisite that workmen should possess scientific knowledge and should be thoroughly versed in all the requirements of the workshop. It is the special aim of the école pratique to fill the void which now exists both in commerce and in industry.

The bill of 1892 contains the following provisions: A special council (conseil de perfectionnement) is to be elected for each school. The director of the school is, however, not subject to this council, but is directly responsible to the minister himself. His authority extends over every department of the school, including the technical portion of it, which is under the charge of a manual instructor. A special regulation creates two kinds of certificat d'aptitude, the one for the post of director, the other for that of a teacher at these schools. This provision, it may here be mentioned, has not as yet been carried into practice. Those who are placed in charge of the workshops (préposés à l'apprentissage) are proposed by the council of the school and are appointed by the prefect or the mayor. The syllabus of instruction requires the approval of the minister. On leaving the school pupils receive a certificate of their commercial or industrial training. The boys usually wear a special dress for the workshop.

The teaching staff, both for general and for scientific subjects, are paid by the State. This also applies to the foremen and managers (chefs de travaux et chefs d'atelier). The staff is appointed by the minister on the nomination of the prefect or the mayor, according as the school belongs to the department or the commune, and with the advice of the school council. The foremen and manual instructors (contre-maîtres et ouvriers instructeurs) are appointed by the prefect or the mayor, and are paid by the department or the commune. Great care, especially in regard to moral character, is to be exercised in the appointment of the foremen and instructors. The expenses of plant and maintenance are defrayed by the department or the commune, who have to enter into an engagement to support the school for a minimum period of five years. A resolution of the conseil général of the department, or of the municipal council, is sufficient for the purpose of converting an école primaire supérieure professionnelle into an école pratique, thereby withdrawing it from the joint authority of the two ministries and placing it under the exclusive jurisdiction of the ministry of commerce. Such a resolution is to be transmitted to the latter, and a duplicate of the same to the minister of public instruction. It may be added that the question of deciding as to the exact circumstances under which an école primaire professionnelle is to be converted into an école pratique has naturally proved rather a difficult one. With a view of arriving at a decision in each case, a special commission was appointed in January, 1895, but so far its deliberations have experienced a good deal of delay. There are at the present time (December, 1897) 10 écoles pratiques d'industrie, or exclusively industrial schools; 11 écoles pratiques d'industrie et de commerce, industrial and commercial (three of these are for girls), and 1 école pratique de commerce, which is purely commercial. They contain a total of 3,125 pupils.

In aid of the erection and fitting up of such schools the ministry of commerce is authorized to grant subventions to departments and communes up to one-fourth of the total outlay. Schools may be founded by several departments or communes in conjunction. This provision, it is pointed out, will prove useful in the case of small towns situated in industrial or commercial districts whose individual resources would be insufficient to provide a technical school.

In the écoles pratiques de commerce ou d'industrie the French State has for the first time successfully introduced the principle of trade teaching into the general system of primary technical education. The fact that these schools are the outcome of much controversy and many years of effort entitle them to be regarded with some interest.

Primary technical education in France may now be said to have passed through the four stages of subordination, predominance, independence, and annexation. The first stage is represented by the ordinary municipal école professionnelle; the second stage by the State schools of Vierzon, Voiron, and Armentières; the third by the écoles pratiques, subject to the exclusive control of the ministry of commerce; and, finally, the fourth stage by the comparatively recent and not yet fully developed tendency to convert some of the more important écoles professionnelles into écoles pratiques. It is a fact worthy of note that M. Paul Jacquemart, inspector-general of technical education, in his report on the occasion of the Paris Exhibition of 1889, expressed the opinion that all the écoles primaires supérieures were likely to assume a technical character, to become écoles primaires professionnelles. At the present day it is predicted that all the écoles primaires professionnelles are destined, sooner or later, to be converted into écoles pratiques, whether of commerce or industry. The ministry of commerce will, if slowly, yet surely extend its borders. The point which offers least resistance to its advances is the neutral zone of schools which have not been definitely assigned to either ministry. Of these the important school of Vaucanson, near Grenoble, will, it is said, shortly pass over to the ministry of commerce. Even the question of converting the three écoles nationales professionnelles of Vierzon, Voiron, and Armentières, the joint creation of the two ministries, has been mooted. Such a measure would, however, be one of doubtful expediency, and would run counter to the views of some of the best French authorities, who recognize the danger of introducing too great a uniformity into technical education. It would appear preferable that the two types of school should continue to exist side by side, and that, while both recognize the predominance of trade teaching, the one should be specially adapted to the more liberal and varied, the other to the more restricted and mechanical, requirements of industrial life.

The following account of some of the primary and secondary schools which, with the kind permission of the French ministry of commerce and industry, I have personally visited, may serve to illustrate both the course of legislation which has just been sketched, and the progress, in recent years, of French technical education. In the selection of the schools described I have been guided by the desire to supplement the report of the royal commission on technical instruction of 1881, and at the same time to describe some new and typical schools which have grown up since that date.

Visits to Schools—Primary and Secondary.

Écoles primaires supérieures professionnelles

(Under two ministries.)

National Schools.

Voiren, Vierzon, and Armentières.

The general character and status of the écoles nationales professionnelles, Voiron, Vierzon, and Armentières, have already been explained. They owe their initiation to the report of a Government commission which, after the passing of the law of 1880, was sent to inquire into the condition of German, more especially of Bavarian, apprenticeship schools. Though designed as models for a new order of primary technical schools, they have not met with any direct imitation. Independently of the financial difficulties which, as has already been pointed out,

rendered the law of 1880 nugatory, the trend of public opinion in France on the subject of primary technical education has not, on the whole, been favorable to this type of school. The tendency has been rather to accentuate still more the line of demarcation between technical and general instruction, and to render the former, where it exists at all, as predominant as possible. The ground which the three Government schools were to occupy has, in large measure, been encroached upon by the creation in 1899 of the écoles pratiques d'industrie, and by the reorganization, in the same year, of the écoles primaires supérieures. The écoles pratiques d'industrie are, as has been shown, the outcome of an urgent demand for genuine trade schools, in which theories on the advantages of a judiciously mixed education are subordinated to the imperious need of forming, in view of the complete collapse of the apprenticeship system, a new class of apprentices and workmen. The latitude which enables the écoles pratiques to provide a practical industrial and commercial education, either concurrently or separately, adds very much to their usefulness and their adaptability to local needs. The écoles primaires supérieures, on the other hand, have so amplified and varied their programme as also in some measure to meet the special needs of an industrial, commercial, or agricultural population. The three Government schools, however, though they have not been generally accepted as a solution of the practically insolvable problem of an education which shall satisfy at once the requirements of general culture and of modern trade, may claim to possess all the advantages which a policy of compromise is capable of. They may be considered as representing, in the most attractive form, the principles on which their foundation is based. They call attention in their programmes to the advantages of their system, and desire, apparently, to be considered as far removed from the narrow mechanical groove of the écoles pratiques d'industrie as from the vague and abstract training of the mere école primaire supérieure. Some opinion on this question may be formed from the following comparative statement of the time allotted, in the official time-tables of the three types of school, to the principal subjects of instruction. For purposes of comparison, the industrial, as contrasted with the general, section of the écoles primaires supérieures has been selected. The industrial, like the two other special sections, the commercial and the agricultural, applies only to the second and third year of the course. The subjects given do not include the preparation of lessons, to which, in the case of the écoles pratiques, nine hours a week are allotted.

Subjects.	Écoles primaires supérieures. (Section industrielle.)			Écoles nationales professionnelles. (Voiron.)				Écoles pratiques d'industrie.		
	First year.	Second year.	Third year.	First year.	Second year.	Third year.		First year.	Second year.	Third year.
						a.	*b.*			
Workshops or maual work	.....	6	6	14	17½	24½	17	30	30	33
Arithmetic, algebra, geometry, mechanics, etc	.....	3	3	5	6	4	10	3	3	4½
Writing and drawing of various kinds	.....	5½	5½	6	6	6	10½	6	6	6
Natural science and history	.....	3	3	4	4	4	....	1½	4½	3
Literary:										
Reading, grammar, composition, geography, history, languages	.....	5	5	9	8	6½	7	6	6	1½
Other subjects:										
Book-keeping, technology, singing, gymnastics	.....	7½	7½	2	2½	2	2½	.....	.....	3
Hours per week	.....	30	30	40	44	47	45	46½	49½	51

It is apparent from this table that, owing to the much greater length of the hours of work at the écoles nationales professionnelles, as well as the écoles pratiques, these two types of school provide more instruction than the industrial sections of the écoles primaires supérieures or higher grade schools, not only in

technical, but in purely literary subjects, such as reading, grammar, composition, geography, history, and languages. It is also evident that, except in drawing, which is an essential accompaniment to workshop practice, the écoles nationales professionnelles devote considerably more time to theoretical instruction than the écoles pratiques d'industrie. It may be added that the regulation number of hours for the general, as well as for the other sections in the écoles primaires supérieures is thirty a week.

Voiron.—The establishment at Voiron embraces, as already explained, three schools, representing three grades of primary education, and each school is housed in a separate building. Moreover, in the higher grade school, a distinct wing of the building is allotted, both for teaching and other purposes, to each of the three years of the course. The grounds and buildings cover an area of nearly ten acres. The total number of children is about 450, viz., 100 in the infant school (into which boys only, from 2 years of age, are admitted), 100 in the primary school and 250 in the higher grade school. Of these 250 about 200 are boarders.

The full annual school fee is £20, which represents the actual expenses of board, as the instruction itself is quite free. There is, however, a charge of £1 a year to defray the cost of books, tools, and materials. Parents are also expected in every case to provide their children on entering the school with a general outfit, of which the value is estimated at £8. The Government awards a certain number of scholarships which cover, wholly, or in part, the amount of the school fees. These scholarships are competitive, and are open to boys of the écoles primaires supérieures and the cours complémentaires and to all who hold the certificate of a primary school, and have attended, in places where it is established, the cours supérieur (11 to 13 years of age) of an elementary school. Candidates must be at least 12, and not over 15, on the 1st of October of the year in which the examination takes place. The examination comprises (1) composition on a subject relating to history, geography, or moral and civic education; (2) treatment of a subject connected with elementary, natural, and physical science; (3) a sum in arithmetic. Two hours is allowed for each of these subjects. The candidates who qualify in them have, after an interval, to pass an oral and practical examination which extends over three days. The oral part consists in (1) reading a page of a French author, with questions on spelling and grammar; (2) elementary questions on history, geography, and the duties of a citizen; (3) elementary questions on natural and physical science, up to the standard of the higher course of an elementary school. The practical examination consists in geometrical drawing, a test in manual work, and a gymnastic exercise. The examination board, which is appointed by the two ministries, draws up, in order of merit, a list of candidates who have finally qualified, and makes recommendations as to the scholarships to be awarded. At Voiron, at the present time, about 18 of the boarders, i. e., 1 in 12, are in receipt of the whole, or part, of a Government scholarship.

About four-fifths of the boys remain at the school for the full three years. The remainder, through the poverty of their parents, or for other reasons, only stay till the end of the first or the second year. The number of boys who annually leave the school is on an average about 100. Last year it was 117. I am indebted to the directors of the school for the following comparative table, giving, from the date of the original foundation of the school, the average of the different employments which the total number of these boys have taken up:

Government or military establishments (about)	5
Railways (below)	5
Trade (about)	10
Agriculture (about)	10
Secondary instruction (Arts et Métiers, Cluny, marine engineering) (about)	20–30
Industrial occupations (about)	50
Various employments, or unclassed (about)	10

The various occupations of the parents of the boys show the following percentage:

	Per cent.
Railways	5
Professional or independent	5
Small officials	10
Agriculture (below)	20
Trade	20–30
Industrial	40

Each of the three schools is the center of an industrial region, and is designed to train apprentices for definite trades. Besides metal and wood work, which is common to the three districts, each school has a specialty—Voiron, the weaving of mixed silk and flax; Vierzon, pottery, and Armentières, the weaving of flax and cotton.

In the third year of the course there is a special section which prepares for the Écoles d'Arts et Métiers, Cluny, and schools of marine engineering. At Armentières there is also preparation for the Institut Industriel at Lille. The present organization of school work at Vierzon is as follows:

First year: Three parallel classes,	Section A Section B Section C	General education and commencement of industrial apprenticeship.
Second year: Two parallel classes,	Section A Section B	
Third year: Two distinct classes.	(1) Special section, preparatory for écoles d'arts et métiers, etc. (2) Normal section, theoretical and practical training for industrial apprenticeship.	

At each of the three écoles d'arts et métiers, Châlons, Aix, and Angers, five scholarships are reserved, by special regulation, for the first five successful candidates sent up by primary technical schools recognized by the ministry of commerce.

Voiron also provides teaching in agriculture. About a year ago a special section, with a building and garden of its own, was added to the school for the purpose of training boys for the agricultural industries of the department of the Isère, which are of considerable importance. By utilizing the numerous waterfalls of the surrounding country for electric and water power, a considerable impetus has of late years been given both to chemical industries connected with agriculture and to the manufacture of paper from wood. The new subject of instruction, which was introduced with the desire of avoiding the expense of a separate school of agriculture, such as is really needed, has not met with any success. The section is found to be out of keeping and difficult to work in a school which is mainly industrial. It has at present only 15 pupils.

The accommodation of the workshops is very complete. The carpenters' shop measures 24 meters square, and contains 50 benches. The boys of the third year work at carpentering about twenty-five hours a week, at the rate of about four hours a day. The forge room is about 12 meters square and has 9 forges. The fitting room is 25 meters square and contains 104 vices. The greater part of the machines have been constructed by the boys. At the opening of the school there were only 2 machines and 30 vices in the room. The weaving room measures 24 meters square and contains 5 power and 12 hand looms. A small room, hitherto used for drawing, is shortly to be fitted up for electrical apparatus. There is a special course of electricity, and some electrical apparatus are also constructed. Steam power is provided in all the workshops, and the building is lit throughout by electricity.

A court, in which the boys do gymnastics, measures 20 by 11 meters. It is used by sections of 40 boys at a time. During the first year there is walking exercise on two days, and during the second and third year on one day in the week.

The town does not contribute anything to the maintenance of the school itself. At its foundation, however, it made a grant of £15,200. There is no subvention from the commune as is the case in communal schools. In these the teachers receive, besides their salary from the State, which is uniform for the whole of France, a small allowance, the so-called indemnité de résidence, which is intended to cover the expenses of board, and which varies according to the population and the consequent local cost of living. Thus, at the higher grade school at Grenoble, a master receives £96 ($480) from the State and £44 ($220) from the commune as indemnité de résidence. In addition to the latter, the commune provides the building and the whole cost of heating, lighting, and teaching plant. This arrangement is common to the whole system of primary education throughout France in elementary as well as in higher grade schools, with the important distinction that in the case of elementary schools the expense incurred by the commune is obligatory, whereas for higher grade schools it is optional.

In 1876 the revenue of the school at Voiron amounted to about £9,960 ($49,800), and the expenditures to about £7,719 ($38,595), including about £3,092 ($15,460) for the teaching staff, £2,537 ($12,685) for food, £1,246 ($6,230) for plant, etc.

It may, in conclusion, be said that both as Government schools, with all the attendant prestige which an official stamp always brings with it in France, and as centers of important industrial districts, whose requirements they are specially adapted to meet, Voiron, Vierzon, and Armentières occupy a strong position. From a purely administrative point of view, however, as institutions which, in spite of the predominantly technical character of their instruction, are still under the divided control of two ministries, their status is somewhat anomalous, and it is doubtful whether it will be long maintained. The probability is that, as already said, they will eventually come under the exclusive jurisdiction of the ministry of commerce. This would be a further step in the direction of simplifying a system of which the complexity has been productive of considerable friction and loss of energy.

Communal Schools.

Paris.

The primary technical schools of Paris fall under the official designation of écoles primaires supérieures professionnelles, and are under the operation of the law of December, 1880. In their case, however, "professionnel" must be taken to denote a much higher standard of technical instruction than is usually signified by that term in the provinces. In Paris an école professionnelle means a school "qui enseigne une profession, qui fait de l'apprentissage." In the country the title may be applied to a school where the time devoted to manual work is quite inadequate for the practical purposes of any calling or trade. The Écoles Diderot, Boulle, and Estienne (in Paris) are in all respects trade schools, differing in name only, not in kind, from the schools which, in the provinces, are classed under the official name of écoles pratiques d'industrie.

The Paris schools have the great advantage of being under the active supervision of a rich and powerful municipality, which is very jealous of its independence, and though nominally subject to the authority of the ministries of public instruction and of commerce, is practically autonomous. In 1897, in addition to special grants, to the value of £6,000 ($30,000), the sum spent by the town on her primary technical schools for boys and girls and on the secondary school of chemistry and physics in the rue Lhomond, amounted to about £61,698 ($308,490). It must be borne in mind that the instruction is in all cases gratuitous, and that at the école de physique et de chimie industrielles just referred to, the pupils, who belong to Paris, are even paid £2 ($10) a month during the term of their studies.

Industrial art.—There are three schools at Paris which teach decorative art in its direct application to industry—the École Nationale des Arts Décoratifs (appli-

cation des beauxs arts à l'industrie), the École Germain-Pilon, in the rue Sainte Elisabeth, and the École Bernard-Palissy, in the rue des Petits-Hôtels. With the first of these, which includes advanced as well as elementary instruction, and which has not undergone any change of importance since the visit of the royal commission, this report is not specially concerned. It is a Government institution under the immediate jurisdiction of the ministry of public instruction, with an annual grant of £4,320 ($21,600). The town of Paris no longer contributes anything to its support. There are both day and evening classes. The majority of the pupils, of whom there are now 1,200, as compared with 800 in 1882, are between the ages of 10 and 20. Many of them return to the school after they have completed one year's military service. A law passed in 1889 granted a special dispensation from the usual term of three years with the army to all art students engaged in a regular study of sculpture, painting, and architecture. This exemption was, as may readily be conceived, sufficient to give all schools of art an immense increase of popularity, so much so that the new privilege had to be made a matter of competition. At the École Nationale des Arts Décoratifs there are seven different kinds of prizes to which the exemption is specially attached. Scholarships, amounting to the annual value of £128 ($640), used formerly to be given to 8 students. The same sum is now spent in prizes which are distributed among 20 or 30 recipients. It was found that the usual effect of the scholarships was to render the holders of them idle and unproductive. The school premises are in a bad state of repair, and their accommodation is quite inadequate. There is now question of erecting another building on a new site.

The report of the royal commission refers to the fact that "in no school in Paris is drawing at present taught solely in its application to special trades." It also calls attention to the new decree of December 20, 1882, by which "the school of the rue Sainte-Elisabeth and that of the rue des Petits-Hôtels are to be reconstituted and created écoles d'application des beaux-arts à l'industrie, thus giving a more technical character to some of the art teaching in Paris." A distinction must, however, here be made. It was not the intention of the decree referred to, or of the municipality, to create two schools independent of one another, both teaching, in an equal degree, the application of art to industry. The schools were, on the contrary, to be closely connected, being respectively preparatory and complementary to one another. While the École Germain-Pilon is an école municipale préparatoire de dessin pratique, the École Bernard-Palissy is an école spéciale municipale d'application des beaux-arts à l'industrie. The École Germain-Pilon is an école d'application de dessin, teaching the principles of drawing in their relation to industrial art as a whole, but without reference to any special branch of it, and without any practical work in workshop or studio. The École Bernard-Palissy, on the other hand, is an école d'application in a more literal sense, intended for the purpose of forming ouvriers artistes for four different trades, and having four special ateliers for painting in porcelain, sculpture in wood, stone, and marble, theatrical and domestic decoration, and, lastly, for designing in stuffs. While there still continues to be an essential distinction in the aims and the practical training of the two schools, time has shown the original scheme of their interdependence to be impracticable. It was found, as might have been expected, that the parents of the boys could not afford a course of study extending over six years. In order to counteract the loss of pupils which the new system entailed on the École Bernard-Palissy, leave was granted to the latter to take boys who had not passed through the École Germain-Pilon, and to add a fourth year to its course, the first year now becoming a stage preliminary to admission into the workshops. This new arrangement, which virtually renders the two schools separate and independent, though their connection still nominally exists, has proved beneficial to both of them. Besides saving the École Bernard-

Palissy from gradual extinction, it has given a great impulse to the development of the École Germain-Pilon under the experienced management of its present director. Since 1889, the year of his appointment, important alterations have been introduced, tending at once to make the teaching more scientific and to place the school in closer touch with local industries. Special attention is now given to geometrical drawing, which, in the second and third year, includes perspective and the projection of shadows. The syllabus also includes decoration as applied to architecture, water color, the history of furniture and of the chief objects of art connected with it, the history of art, modeling, analysis of style, decorative composition and anatomy. The ultimate object of each branch is declared to be one and the same: L'art décoratif est le but vers lequel est dirigé tout l'enseignement de l'école. Instruction in casting (moulage) and in passementerie and embroidery are subjects recently introduced. In order to meet the wishes of the master guild of brodeurs and passementiers, which was on the point of forming a special school of its own, it was arranged that 12 lessons on these subjects should be given at the school during the last three months of the year by special instructors, who are paid by the guild. The pupils who have attended these lessons, and subsequently enter the trade, receive wages at once. Special prizes are awarded, and the guild moreover engages to find places for five apprentices annually. Similar arrangements with other guilds will probably be made in the future. A case was mentioned to me in which a master locksmith applied to the school for an apprentice, who learned his business in six months, and is now, after three years' experience, in charge of the establishment and earning £16 ($80) a month. The municipal council appears to be satisfied with the general support given to the school by trade employers.

The instruction is still limited to theory; thus the theory of artistic style, as applied to furniture, is taught by the same teacher who, at the Ecole Boulle, the special school of furniture at Paris, teaches the actual construction of the articles themselves.

The École Germain-Pilon is conducted on the strict lines of an ordinary school. The absence of a pupil is at once reported to the parents; whereas at the École des Arts Décoratifs above mentioned, much greater liberty is allowed. The director is immediately responsible only for the day boys. Evening pupils come, or stay away, more or less as they please. They must, however, attend at least 60 times a year in order to be allowed to compete for prizes. Boys who have the certificat d'études primaires are admitted at the age of 13, those without it at 14 years of age. In the latter case parents must engage to leave their children at the school for three years. At the end of each year there is a remove examination (concours de passage). The present number of day boys is 40 in the first year, 36 in the second, and 16 in the third. There are, besides, about 180 evening pupils, making 272 in all. There is no accommodation for more than these. The maximum number taken by one teacher is 40. Work begins at 8. The morning is spent in desk work. At 11 there is an interval of two hours. The afternoon, from 1 to 4, is occupied with class teaching, except on Saturdays, when there is painting in water-colors. At 8 o'clock the evening classes commence. The school is entirely under the control of the Paris municipality, which makes an annual grant of from £2,200 to £2,400 ($11,000 to $12,000). This amount, £1,640 ($8,200) of which is accounted for by the salaries of the director, teachers, and superintendents, shows only a slight increase since 1883.

Owing to the unique position which the École Germain-Pilon occupies in Paris and in France generally, the school is not infrequently visited by strangers who are experts in the artistic training of children. The impression usually produced on his German visitors, whose opinion he evidently values, was referred to by the director, and may be cited as characteristic. Their general remark with regard to the prize exhibits of the first and second year boys is merely "The standard is

much the same as that of our own schools;" but, on seeing the work of the third year, they freely admit "We can do nothing as good as this." This verdict, so often due to the delicacy of French touch, is, no doubt, specially applicable to those simpler and purer realms of decorative design which are specially suitable to the young, and in which natural artistic instinct is unaffected by the willful eccentricities of modern fashion.

A few more details may now be given with regard to the École Bernard-Palissy. There are at present 112 day and 122 evening pupils. The former, who are not admitted till the age of 13, enter the workshops at the end of the first—preparatory—year, and, having spent about a fortnight in each of them, are definitely attached to the one for which they have shown most aptitude. Most of the boys remain for the whole course of four years. The evening pupils, who must be at least 14 years old on entry, have complete liberty of choice as to the subjects which they take up, and are not bound to the same regular attendance as the day boys. The workshop apprentices are distinguished as peintres, décorateurs, dessinateurs pour les étoffes, sculpteurs, et céramistes. The evening classes are also attended by a certain number of adult workmen. The hours in the morning are from 8 to 11 o'clock, in the afternoon from 1 till 4 in the winter, and from 1 till 5 in the summer; and, lastly, in the evening from 8 to 10.

The town makes an annual grant to the school of £2,920 ($14,600), of which £2,240 ($11,200) goes to the teaching staff. Six bursaries, of £8 ($40) to £24 ($120), are also annually awarded. One hundred and sixty pounds ($800), in prizes is divided every three months among about 20 pupils. The department makes a breakfast allowance of 50 centimes (10 cents) to a certain number of children who come from the suburbs of Paris. All the chief materials used in the studio, such as wood, stone, and paints, are supplied gratuitously, but copy books, pencils, etc., are not furnished. Some of the models in use are borrowed from the Trocadero Museum, but most of them are purchased, the outlay being very considerable. Among other objects serving as patterns of taste, a beautiful panel from an old chateau at Bercy called to mind the advantages which France derives from the memorials of her artistic past. I am informed that the practical utility of the school, of which, it may be mentioned, the accommodation is very poor, is still a matter of doubt. Considerable difficulty is experienced in finding suitable trade employment for boys at the end of their course. Fear of competition renders the actual workers in the trade unfavorably disposed. The employers, who are usually designers in fabrics and furniture, on the other hand complain that the work of boys fresh from the school is not sufficiently profitable. They do not get through their work fast enough, and have not acquired the requisite "tour de main." The three hours a day spent in learning their business at school are not sufficient to place them on an equality with trade apprentices, who are daily engaged for ten hours.

Things are, however, improving somewhat. There were applications for three apprentices in March of this year and one in the first week in April. A few employers, one of whom lives in the rue Paradis, even insist on having apprentices who have passed through the school. From another employer, who deals in painted glass, a former pupil receives 9 francs a day, but this is exceptional. A certain number of pupils pass on to the Académie des Beaux-Arts. Such a course is, however, considered abnormal and undesirable, for it is not the purpose of the school to form painters or sculptors in the ordinary sense of the term.

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MANUAL WORK.

École Salicis.—In contrast with the Paris schools already mentioned, of which all have the interests of trade as their immediate object, it may be of advantage to give some information with regard to one, which represents the cause of man-

ual, as distinguished from trade, instruction. The elementary school in the rue Tournefort is remarkable as having a more complete organization of manual work than any other school of the same kind at Paris. The town has at present about 185 elementary schools, of these 88 have wood work, 32 both wood and iron work, while 65 have neither one nor the other. The time usually spent on manual work in an elementary school is three hours a week. The original foundation of the École Salicis is curiously associated with the Franco-German war of 1870, and was largely due to the initiation of the present director of the École Germain-Pilon, to whom I am indebted for information on the subject. It was, as he humorously expressed it, as an "école obsidionale" that the school first came into existence, being formed during the siege of Paris, when he was mayor of the fifth arrondissement, for the purpose of providing employment for the numerous children who were left without occupation, as well as for the teachers who had been compelled to withdraw from the suburbs of the city. The school survived the state of siege from which it had taken birth, and M. Salicis, the well-known late inspector of public instruction, whose name it bears, found in it a suitable field for carrying out his enthusiastic views on the subject of manual instruction. The general aim underlying these views was to utilize primary schools throughout the country as nurseries of future industrial skill by introducing a carefully graduated course of manual work, ranging from the simplest exercises in cutting out paper to workshop practice in wood and iron work. It is now generally recognized in France that this idea, though it contains much that is valuable, is subject to strict limitations. The exaggerations to which it has given rise have deprived it of much of its former popularity. So far as organization and the provision of general instruction is concerned, there is no difference between the École Salicis and other primary schools at Paris. The three divisions of the school contain 250 children in the following proportions:

Cours supérieur, one class	45
Cours moyen, two classes, of 50 each	100
Cours élementaire, two classes, of 50 and 55	105

The manual work is supplementary to the general instruction, and occupies daily two and one-half hours for the cours supérieur and one and one-half hours for the cours moyen and the cours élementaire, i. e., twelve and one-half hours a week for the first, six hours for the second, and five hours for the third. The children of the elementary course do not enter the workshop, but are occupied in the ordinary cutting out and weaving of paper (pliage et découpage), common to primary schools. Workshop practice begins in the middle division, which spends three hours a week on manual work (wood and iron), two hours on modeling, and one on technology and making sketches. The higher division spends seven and one-half hours a week on manual work—wood, iron, and modeling—and five hours on technology and sketching. The whole body of boys who do manual work are formed into three separate sections, which are alternately occupied in ironwork, woodwork, and modeling. The woodwork is taught by a carpenter, the ironwork by a mechanic, the theory of the subject having been previously explained in class by the teachers of the school. The workmen come every day for four hours in the evening, three of which are spent in instruction and one in preparing materials and in setting and repairing tools. In the morning they spend four hours at another primary school. Their salary for attending to these two schools is £96 ($480) per annum. The annual expenditure for the materials used in connection with the manual work amounts to £28 ($140) per annum. The modeling and also some casting is taught by the teachers themselves, who all hold the Government certificate for manual work. The teaching staff consists of five masters and the director. In addition to their State salary they receive the usual indemnité de résidence, of which the aggregate amount is £204 ($1,020). The school

used to have the independent management of its manual instruction until about three years ago, when the subject was officially organized and placed under the supervision of a special committee of the town council. The manual instruction which the school affords has avowedly an educative, not an industrial, aim in view. Its object is not to form trade apprentices, but merely to train hand and eye in preparation for future apprenticeship. Among employers, however, as the director informed me, the purpose of the school is still largely misconceived. They commonly regard it as an apprenticeship school, though, at the same time, there is little demand for the services of the boys. In the opinion of the director of the École Germain-Pilon the practical utility of the school is much open to question. Its system, though excellent in theory, has so far produced no very definite results, and there has even been question in the town council of suppressing the school altogether. The fact is, no doubt, that a school which gives so important a place in its curriculum to manual training is exposed to twofold criticism. While inadequate for trade purposes, such instruction may, from a purely educative point of view, be regarded as excessive in amount. It is a case of too little or too much. The latest tendency of French opinion is to look with disfavor on all vagueness of purpose in matters of technical instruction, and to condemn, as an unwarrantable luxury, any system of which the educational advantages are dubious, while the public expenditure is certain. It may be mentioned, in conclusion, that the accommodation of the school is very defective. It is probable that on the expiration of the present lease, in three years' time, other premises will be taken.

In connection with the École Salicis it may be of interest to examine in brief outline the position which manual, as opposed to trade, instruction occupies at the present moment in France. Some interesting facts on the subject are given by M. Réné Leblanc, inspector-general of manual instruction in the department of public instruction, in his recent publication, Enseignement Agricole et Enseignement Manuel (Librarie Larousse). The advantages of manual teaching have long been recognized in France. In the days of the revolution a decree of the convention made the enjoyment of civil rights conditional on the exercise of some handicraft. As early as 1845 manual instruction was given in many primary schools. In the form of trade teaching it was successfully introduced at Havre in 1867, and at Paris (École Didero) in 1872. The principle of manual instruction, in its special sense, was, as has been said, for the first time realized on a larger scale in the École Salicis.

Manual work was rendered obligatory in all primary schools in 1882, when the compulsory education bill was passed, the new subject being officially termed "Travaux manuels et usage des outils des principaux métiers." The well-known minister, Paul Bert, defined the purpose of this innovation as follows: "We do not desire to give a professional character to the primary school, which is not intended to produce either locksmiths or vintners. On the other hand, we do consider that scientific instruction should not be confined to mere theory, but that a practical application in various existing industries should be kept steadily in view." He insisted further on the distinction between manual instruction, as furnished by the primary school, and the technical (professionnel) training "which is the special province of higher grade schools, to whose prosperity it appears to be indispensable." The official directions on the subject called the attention of teachers to the value of manual instruction as a powerful aid to the teaching of drawing.

Toward the end of 1882, at the instigation of M. Salicis, who had been commissioned by the Government to study the conditions existing in foreign countries, a course of lectures, intended to provide training colleges and higher grade schools with teachers in manual instruction, was opened in December, 1882, in the rue

Louis-Thuillier. A special Government certificate in the subject was created in 1883.

In January, 1884, in which the English royal commission visited France, a special school of manual instruction was established in the rue des Ursulines, but in the following September this school was incorporated with the higher training college at St. Cloud. This step was officially ascribed to motives of economy and a desire to improve the status of the new subject by associating it closely with an old-established institution. It may be mentioned that the object of the higher training college at St. Cloud is to form teachers for primary training colleges and higher grade schools. The course of study extends nominally over three years, but is practically limited to two. It comprises two sections, the literary and the scientific. There is a competitive entrance examination, including a practical test either in modeling or in iron or wood work. This test is confined to candidates for the scientific section, for whom alone the subsequent course in manual instruction, which comprises carpentry, fitting, turning, and modeling, is obligatory. The number of students who are annually admitted into, and pass out of, the colleges varies between 15 and 20. The new subject was at first coldly received at St. Cloud, but M. Salicis continued his efforts and in less than three years succeeded in establishing in most of the training colleges workshops for wood and iron, a room for modeling, and a chemical laboratory.

In 1886 official directions of a provisional nature as to manual instruction at training colleges were issued. They were followed in January, 1891, by a scheme with a detailed syllabus of manual instruction for a three years' course. Three hours a week in each year are assigned to the subject, and it is further directed that students of the second and third year shall teach the first year's syllabus in the elementary school annexed to the college. This injunction has, M. Leblanc says, been largely neglected hitherto from a mistaken notion that a student's time would be wasted in teaching the very rudimentary exercises specified in the syllabus. At the training college itself the lecturer is to be assisted by a workman (aide-ouvrier) whose duty it is to keep the tools in a proper state of repair, and to prepare and distribute the materials required by each student. He may on occasion even take part in the teaching, but in this case he is to limit himself strictly to giving such practical hints as may help students to carry out the directions of the lecturer himself. In colleges of more than 80 students two master workmen may be engaged.

Concurrently with the above regulations the conditions of the Government certificate for manual instruction in training colleges and higher grade schools were modified so as to allow the examination board to judge candidates, not only according to manual skill, but to their ability in teaching. This ability is tested in the examination by requiring candidates to treat some detail of this subject in the form of a short model lesson.

The above measures were brought to completion in January, 1893, when official directions were issued as to the manual and agricultural instruction to be given under the new organization of higher grade schools. The instruction at these schools is distinguished as general, industrial, commercial, and agricultural. In the general section four hours, in the industrial and agricultural six hours, and in the commercial two hours a week are assigned to manual and agricultural work. The time given to drawing and modeling in the same section is, respectively, three, four and a half, and one and a half hours.

The special Government certificate of manual instruction, which is not limited to students at St. Cloud, but is open to all who can qualify for it, has attracted an increasing number of candidates. The examination is held at the Sorbonne, in Paris. The requisite standard of efficiency is maintained, not only by the school at St. Cloud, but notably by special courses organized by the city of Paris, with

regard to which I am indebted to the director of the École Salicis for the following details.

A higher course of manual instruction preparatory for the Government certificate is given during six months in the year, from October to Easter, in a municipal school in the rue de la Jussienne. It is given by one of the municipal inspectors of manual instruction, assisted by two subinspectors, and occupies about ten hours a week, viz, six to seven hours on Thursday, the usual school half holiday, and four hours on Sunday morning, from eight to twelve. To teachers who hold the Government certificate the town makes an annual allowance of 150 francs ($30). In addition to this course there are three elementary courses of instruction in manual work, or specially in pliage and découpage, which are intended for the requirements of elementary school teachers in Paris. They are held on Sundays 8 to 12. To teachers who pass the examination held in connection with these courses, the town grants a certificate, which carries with it an annual allowance of 50 francs. In both primary and higher grade schools the teachers of manual work are assisted by master workmen, whose duty it is to attend to the practice, as opposed to the theory, of the subject; to prepare the necessary materials, and to keep the tools in good repair. In Paris a special body of such workmen has been formed. Their present number is 95, i. e., 80 carpenters and 15 mechanics. They are in all cases subjected to an examination which, in addition to practical work, includes some geometry and drawing.

In recent times manual instruction has made little progress in primary schools in spite of the fact that it has been an obligatory subject since 1882. This is chiefly due to the law itself which, through the extravagance of its wording, has remained inoperative. Its provision regarding "Usage des outils des principaux métiers," would, if strictly interpreted, have entailed the establishment of workshops in 30,000 communes. The practical impossibility of satisfying the greater demand has led to the neglect of the lesser, the travaux manuels. It is this state of things which M. Leblanc would wish to see remedied.

He points out that manual instruction, rightly understood, offers the best possible concrete illustration of the abstract ideas conveyed to a child in arithmetic or geometry. The properties of a square or an oblong may find their most palpable expression in paper or cardboard. If manual instruction is to be fruitful, and not to be felt as an additional burden on an already overloaded time-table, it must not hold a distinct and isolated position in the school curriculum. It must justify its existence by the services which, as a living exponent of abstract principles, it renders to the cause of general education. The aim of manual instruction is purely educative. It is not intended to prepare boys, even distantly, to become professional craftsmen in wood and iron, though it may be most valuable in giving them the taste and aptitude for an industrial career. This truth, M. Leblanc acknowledges, is not admitted by all. There are some, and their opinion is entitled to respect, who hold that manual instruction should begin in the workshop, that boys even under 10 years of age should be taught to use the tools of their future trade. There is, on the other hand, evidence to prove that boys of so immature an age are incapable either of using tools at all or of using them in such a way as to avoid physical injury or the contraction of bad habits. The law of 1882 was followed by the establishment in several large towns of school workshops for carpentry, turning, and iron work. The experiment proved a failure. It was discovered that boys were, as a rule, incapable of handling a file or a chisel before the age of 12 or 13. To organize such work for the last year of school life would therefore be useless except in cases where (as in the cours complémentaire) higher grade classes form part of the primary school. The earliest stage at which, in urban schools, provided with workshops, the simplest kinds of wood and iron work should commence, is the second year of the cours moyen (10 to 11 years of age). The

official regulations of 1887 contemplate workshop instruction only for the higher course (cours supérieur, 11 to 13 years) in primary schools, but this course is only organized in a few town schools.

In Paris elementary schools boys of 10 to 12 are taught wire and repoussé work instead of fitting, as was formerly the case. The turning lathes have, in spite of their popularity, been given up both on grounds of economy and of the inadequate manual training which they afforded. The workshop instruction also includes, besides modeling, woodwork in which only the simplest tools, such as the rasp and plane, are used. This is continued in the higher course by less elementary exercises.

The employment of master workmen is in all cases considered essential. As workshops can only be maintained in large urban schools, the tools used necessarily pass through many hands and require constant attention. The wood, too, needs special preparation. Only a professional workman can adequately attend to such matters. Though there is no intention of forming apprentices, it is essential that in the handling of the tools, in the positions taken up during their use, the most approved methods should be followed. The choice of exercises, too, and the processes to be employed, must conform to the best workshop practice, and in all such matters numberless pitfalls present themselves to the amateur instructor. On the other hand, the drawing and tracing, the requisite technical calculations and explanations, and finally, the adaptation of the whole to the mental level of the class and to their progress in other subjects, is the special province of the teacher.

Manual instruction in elementary schools is, in M. Leblanc's opinion, considerably prejudiced by the fact that it does not, like sewing in the case of girls, form a subject of examination or the primary leaving certificate. Some test, which need not necessarily be one of manual skill, but might be confined to drawing, is, he thinks, certainly required.

LYONS.

École de la Martinière.—The École Martinière was visited by the English royal commission in 1881. Up to 1895 the organization of the school remained practically unaltered. In that year, however, the administrative council decided to enter upon a radical change of policy, which will very shortly come into practical effect. In 1893 a committee was appointed to examine the question of introducing reforms into the existing system of instruction. Their report was issued in 1895, and contained a unanimous opinion in favor of giving a more strictly technical character to the teaching of the school. It was proposed that this should be done by dividing the third year of the course into three distinct technical sections, specially adapted to meet the wants of the principal trades and industries of Lyons and the surrounding region, viz, sections for (1) commerce and weaving; (2) industrial chemistry; (3) civil engineering. The committee enter fully into the considerations which have led them to these proposals, considerations which, as they are based on a general survey of primary technical education in France, and appear to have a direct bearing on the position of many English technical institutions at the present day, may be regarded as of general interest. Whatever their intrinsic merit, they claim attention from the fact that they represent the opinion of experts as to the type of primary technical school which is best adapted to the present requirements of the most important industrial town in France. They may also serve to illustrate, in the case of a single school, a process of evolution through which, though in a more moderate degree, many French schools are probably destined to pass. The report commences by giving a definition of the present character and purpose of the school as expressed in the words of a pamphlet published by Mr. Lang in 1883:

In view of the special character of the instruction, the Martinière may be said to occupy a position intermediate between that of a higher grade primary and a special secondary school. It is higher grade in virtue of the standard of the boys which it receives from primary schools; it is secondary in view of the extent to which the instruction in certain subjects is carried. Manual work is common to all the pupils of the first year; in the second and third years it is restricted to those who intend to take up an industrial career. In the case of boys destined for commercial pursuits it is replaced by instruction in silk weaving. This is the only trace of specialization which exists at the present time in the school curriculum. In other respects the authorities have been guided by the principle that the purpose of the school is not to prepare boys for the exercise of this or that calling, but to render them capable of succeeding in every calling through the advantages derived from an active intelligence, a habit of logical reasoning and a comparatively large stock of knowledge, but more especially through that passion for work which is the peculiar characteristic of members of this school.

Mr. Lang is further quoted to the effect that:

The Martinière does not claim to be an apprenticeship school which provides boys with manual preparation for definite callings. It is either more or less than that, according to the point of view taken. It is what may be called an école professionnelle générale. In a school of this kind boys should obtain, besides the indispensable complement of primary instruction, a stock of special knowledge which may render them capable of succeeding in any calling, industrial, commercial, or even artistic, according to their abilities. Such instruction will produce neither turners, mechanics, employees on railways and public works, or clerks; but the boys who have received it will be superior in any of these callings to those who have not enjoyed its advantages.

Such are the views on the work and mission of the Martinière which were held by Mr. Lang in 1883, and to which, in all essential particulars, he still adheres. The new school council, however, which came into office in 1892, decided against them, and appointed the committee whose report we now proceed to consider. In this report the accuracy of Mr. Lang's definition of the part hitherto played by the school is fully recognized. The instruction actually provided may, the committee consider, be regarded in virtue of its scientific element as of a general technical nature (enseignement professionnel général). On the other hand, it is evidently more general than technical. It contents itself with enabling boys to enter every calling indifferently, but it does not train them practically and positively for the exercise of these callings. The question is whether this is the true part which the school ought to play; whether originally founded, as it was, to satisfy the requirements of trade and commerce, it should content itself with merely leading its pupils to the threshold of indefinite occupations. Ought it not rather to give them a distinctively technical education and thereby prepare them directly for the principal careers which are open to them? No one would wish to deny the just claims of general instruction, but, on the other hand, it is of the first importance that the services of boys on leaving the school should not only be useful but of immediate use, and for this purpose a genuinely technical training is indispensable. Nor is this a view, the committee contend, which has been hastily formed. It is one which merely accords with the whole tendency of public opinion on the subject of technical education for more than thirty years. It is but the practical realization of a scheme which has on various occasions been mooted for giving a more special character to the instruction at the school. Tabureau, to whom the creation of the school is principally due, originally intended it for the practical training of workmen, foremen, and managers. Owing to the backward conditions of primary education at that period, and on other grounds, this scheme was not practicable in its entirety, but had to be limited to the establishment of courses in mathematics, mechanics, and chemistry. To these was subsequently added manual work, which for a long period occupied a predominant position at the school. The addition in 1868 of a third year to the school course was another step in the direction of specialization, but one which was destined to fail owing to the

defective conditions under which it was carried out. Special courses adapted to the requirements of different callings were formed. Among these courses, however, boys were allowed complete liberty of choice, a liberty which they were unfitted to exercise. The experience of this system during more than ten years was, on the whole, unfavorable. On the one hand, the choice made by the boys was often injudicious, and, on the other hand, the discipline of the school suffered. In 1879 this right of option was suppressed, and the courses of the third year, like those of the first and second, became obligatory. Of the old system the only survival at the present day is the arrangement by which boys at the beginning of the second year may, at the desire of their parents, choose between the theory of weaving and manual work.

Finally, in 1892, a proposal was made by Mr. Lang to the effect that a fourth year should be added to the school course, a year in which special preparation was to be given for the three different branches of industry which the majority of boys usually enter, viz, commerce, chemical industries, and mechanical construction. This proposal of Mr. Lang the school council adopted in principle, but, owing to the expiration of their term of office, did not carry into effect.

The committee consider that the above recital proves incontestably that the authorities who have successively administered the school have always examined this question with the same result, viz, that the instruction given at the Martinière is of too general a character, and that it is indispensable it should be made more directly technical (professionnel). The time has now arrived for carrying into effect a reform which two considerations in particular render more urgent than ever. The first of them is the great advance which has been made in primary instruction during the last seventy years. In former days when such instruction, more especially in science and drawing, was quite unorganized, the paramount claims of elementary knowledge of a general kind left no room for a strictly technical training. At the present day the situation is entirely altered. Not only has the standard of elementary education very much improved, but a new order of schools, those of a higher grade, have been created for the express purpose of completing the general instruction acquired at the primary school. Under these circumstances is it the duty of the Martinière to do work which is already provided for by an increasing number of higher grade schools? Is it not rather to fulfill the purpose for which her endowments were originally given, and to provide that technical instruction of which Lyons has long felt the want?

In the second place, it is not only the progress of primary education, but the actual requirements of trade and commerce which necessitates this conclusion. Technical instruction is not like the teaching at a classical school, fixed and uniform through successive generations. It is essentially special, and to be effective must remain in touch with the constant fluctuations to which trade and commerce are subject. The apprentices whom a tradesman or industrial employer stands most in need of at the present day are not those who have received a general education, even though such general education may be of a more or less technical tinge, but those whom the actual technical knowledge which they bring with them renders useful at once, or with the least possible delay in some particular trade. An employee who has a thorough knowledge of mechanics, geometry, and drawing is of little use to a merchant, but he is, on the other hand, required to know how to keep books, to understand banking business, or to speak several foreign languages. Again, an industrial employer will trouble himself very little about the commercial acquirements of his foremen and workmen. He will judge them exclusively by the thoroughness of their technical knowledge.

Having thus demonstrated the necessity of introducing some reform, the committee proceed to consider the merits of three different projects which have been put forward. The first proposal was to give a technical character to the teaching

from the commencement, and thus to transform the Martinière into a commercial and industrial apprenticeship school (école pratique de commerce ou d'industrie) such as exist in various towns in France. These schools provide an exceptionally thorough training, both for the countinghouse and the workshop, and enable the boys on leaving school at once to earn good wages as clerks or workmen. There were, however, in the opinion of the committee, objections to this course. While holding specialization in some form or other to be essential, they consider that it should be based on a sound foundation of general instruction. For such general instruction, apprenticeship schools do not appear to offer sufficient guaranty. Though well adapted to form subordinate clerks and workmen, or even foremen, they are less calculated to fit youths for really responsible positions in commerce or industry.

The second project, which has already been referred to, was that of Mr. Lang. He proposed to add a fourth year, to be devoted to distinctively technical preparation, the character of the instruction during the existing three years remaining unaltered. In theory there were strong arguments in favor of a scheme which at once raised the educational status of the school, satisfied the demands of technical specialism, and yet left the general instruction unimpaired. In practice, however, there is, the committee considers, a fatal objection to it. The great majority of the parents who send their children to the Martinière could not afford to spend four years on their education. This is proved by the fact that a large number of the parents withdraw their boys from the school at the end of the second, or even of the first, year. It appears from statistics of the last ten years (1885–1895) that, out of 250 boys who annually enter the school, only 137 pass into the second year's and only 71 into the third year's course. It is, moreover, quite the exception for French technical schools to have a curriculum of more than three years. In the case of a few schools, like that at St. Chamond, which has a four years' course, it must be remembered that the first year is really preparatory, and is intended to be complementary to primary instruction. In other cases such schools aim at giving a complete training for a limited number of trades, or even for a single trade, so that the apprentice on leaving the school is almost a finished workman. It may be added that the effect of adding a fourth year to the course would be to give boys whose parents were in easy circumstances an undue advantage over their poorer comrades in gaining the leaving certificate of the school. This would be contrary to the popular traditions of the Martinière.

While compelled to reject the two proposals in question, the committee have decided unanimously in favor of a third scheme, which without effecting any change in the present three years' course appears, in their opinion, fully to satisfy the paramount consideration of giving boys a really practical training and enabling them to rise to the highest position in their respective callings. It consists in maintaining the existing course of general instruction during the first two years, and in giving to the third year an exclusively technical specialization.

This decision has met with certain criticisms, to which the committee briefly reply. It has been urged that it compels boys to make premature choice of a definite calling. If the specialization began in the first year of the course this objection might be valid. But after two years of general instruction a boy is certainly qualified to choose, if not one particular occupation, yet a definite group of occupations. An opinion has, on the other hand, been expressed that the reduction of the course of general instruction from three years to two must necessarily have a prejudicial effect on the intellectual and moral training of the pupils. In former days there would, no doubt, have been some force in this criticism. At the present day the stock of general knowledge which boys bring with them on entering the Martinière is amply sufficient, when supplemented by a two years' training at the school itself, to serve as a basis for technical instruction. It has finally been

objected that a single year of specialization is insufficient to provide an adequate preparation for a commercial or industrial career; that for this purpose a course of at least two years, such as that which the local higher school of commerce and the école centrale supply, would be requisite. This criticism appears to overlook the fact that two years of general instruction precede the specialization of the third year, and that consequently such specialization must necessarily be more intense and fruitful in result than that of any other establishment.

The principle of specialization having thus been established, the next question for the committee was to determine the particular objects to which it ought to be applied. The industries of Lyons are too numerous to admit of special preparation in every case; nor, as a matter of fact, do they all require it. The preference must necessarily be given to those which the majority of boys on leaving school usually enter. They are three in number, viz: (1) commerce; (2) civil engineering (engineering, architecture, mechanical construction, and electricity); (3) chemical industries. Taking this as a starting point, it has been decided to divide the third year into the three sections of (1) commerce and weaving, (2) civil engineering and electricity, (3) chemical industries. In view of the constantly increasing importance of electricity and the important place which the silk industry occupies at Lyons and in the surrounding country, there was much to be said in favor of forming separate sections of electricity and weaving. On further consideration, however, the committee decided to combine electricity with civil engineering and weaving with commerce generally. At the present day mechanical construction and electricity stand in close relations. The man who is put in charge of a steam engine is expected also to understand the working, setting up, and repairing of a dynamo. Nor has it appeared advisable to draw any sharp distinction between weaving and commerce generally. The future pupils of the commercial section will not be in a position to choose definitely beforehand any one branch of trade. They differ in this respect from the students at the higher school of commerce at Lyons, who are for the most part sons of manufacturers and tradesmen, and are looking forward to occupying a definite position in their fathers' business. This is not the case with the pupils of the Martinière, who are glad to take any place which may be open to them, whether in weaving or in any other trade. Their preparation must, consequently, be of a general, not of a special, kind. Moreover, a special course of weaving already exists at Lyons at the municipal school in the rue Belfort, which is always open to those who wish to give more attention to the subject.

Adhering to the principle that the specialization of the third year of the course should be rendered as effective as possible, the committee have thought it advisable to eliminate every element which is not directly conducive to that result, such as, for instance, the history of commerce and weaving, a subject which belongs rather to general than to technical education. On the other hand, the most prominent place has been given to those practical subjects which appear to lead most directly to the object in view. Such are English and bookkeeping in the section of commerce, practical work in the section of industrial chemistry, and workshop practice in that of civil engineering and electricity. The subjects comprised in the different sections will be as follows, taking them in the order of their importance:

I. Section of commerce and weaving: Bookkeeping, English (which is taught exclusively with a view to conversation and commercial correspondence), French and commercial correspondence (the formation of a clear and succinct style being of great importance), weaving, penmanship, articles of trade, commercial legislation, commercial geography, political economy.

II. Industrial chemistry: This section, of which the principal subject is chemistry, both as a science and in its practical application to industry, will include (1) a course of chemistry continued throughout the year, (2) practical experi-

ments, (3) lectures preparatory to practical work. Subjects accessory to the above are, (1) German language (a knowledge of which the constant progress of chemical research in Germany renders essential), (2) industrial legislation (a subject common to this and the previous section), including the law affecting patents, etc., (3) drawing of machinery as applied to chemical industries, (4) one lecture on physics in each half-year.

III. Section of civil engineering and electricity: This section, like the last, will include both theory and practice, viz.: (1) pure mathematics, including an elementary knowledge of the theory of differential and integral calculus, general notions on curves referred to two axes of coordinates, properties of tangents and normals, geometrical definitions of speed and acceleration, etc., (2) mechanics, (3) electricity, (4) descriptive geometry, (5) civil engineering construction. The practical work will comprise, (1) practical electricity, including the handling and installation of ordinary apparatus, (2) practical mechanics, with separate divisions for founding, fitting, turning, and modeling, (3) drawing of machines and works of construction.

As to the general instruction of the first two years of the course, it will remain as it is, excepting a few alterations which are requisite in order to bring it into harmony with the new syllabus of the third year. These alterations affect (1) mathematics, which will now, in the first year, include logarithms, compound interest and annuities, and in the second year spherical geometry, trinomials and the higher parts of trigonometry; (2) mechanics. The subjects of the second year will include the study of simple machines, friction, and the higher parts of statics, (3) descriptive geometry, comprising change of position, rotation, projections, and plain sections of polyhedra, (4) bookkeeping, with a view to giving boys who subsequently enter the engineering and chemical sections general notions on the subject, (5) history, which will now extend to modern times, (6) modern languages. English and German will be taught in the second year, the choice between the subjects being left to the parents of boys.

The report, of which the above is a summary, was presented in June, 1895, and was unanimously adopted by the council of the school. A proposal that the new technical sections should be open, not only to members of the school, but also, after examination, to all boys holding the certificates of a higher grade school, or its equivalent, was likewise approved of. The new arrangements were to have dated from the present year, but, owing to the extension of the school buildings, which is still in progress, they will not be complete till October, 1898, at an estimated cost of £32,000 ($160,000). This expense will be easily borne by the school which is one of the richest in the world and has recently come into a bequest of about £120,000 ($600,000). The following tables show the time allotted to the different subjects included in the three technical sections:

Section of commerce and weaving.

Subjects.	Weekly number of lessons.	Weekly number of hours.	
		Winter.	Summer.
Bookkeeping	5	8.20	10
English	8	8	8.45
French and commercial correspondence	5	6.15	6.15
Weaving	3	5	5.45
Penmanship	3	3	3
Articles of trade	3	3	3
Legislation	2	2	2
Commercial geography	2	2	2
Political economy	1	1	1
Total	32	38.35	41.45

Section of industrial chemistry.

Subjects.	Weekly number of lessons.	Weekly number of hours.	
		Winter.	Summer.
Course of industrial chemistry	3	3.45	3.45
Practical work	5	13	15
Preparatory lectures	3	3.45	3.45
German	3	3.45	3.45
Industrial law	1	1	1
Machine drawing	2	2	3
Physics	2	2.15	2.15
Preparation and questions	6	9	9
Total	25	38.30	41.30

Section of civil engineering and electricity.

Subjects.	Weekly number of lessons.	Weekly number of hours.	
		Winter.	Summer.
Pure mathematics	3	3.30	3.30
Mechanics	3	3.30	3.30
Electricity	2	2	2
Descriptive geometry	1	1.15	1.15
Construction	1	1	1
Industrial law	1	1	1
Machine drawing	3	4.30	6
Constructional drawing	3	4.30	6
Practical work:			
Electrical fittings	2	2.30	2.30
Electrical construction	2	2.30	3
Mechanical construction	12	12	12
Total	33	38.15	41.45

The above programme is, perhaps, chiefly remarkable for the large demands which it makes on schoolboys of 15 to 16 years of age. The premises and conclusions of the committee appear to be most carefully formed, and are in themselves unimpeachable. Their defect appears to lie rather in their application. The desire for specialization, so strongly and unanimously urged, no doubt expresses a genuine want which has long been felt at Lyons. Such a want, however, can hardly be satisfied by an attempt to graft an engineering and industrial college on a higher grade school. A secondary technical school, which boys would enter, not leave, at 15 or 16 years of age, might better answer the purpose.

It is evident from what has preceded that the new arrangements do not meet with Mr. Lang's approval. In his opinion the two years to which the course of general instruction has now been reduced are inadequate for the purpose. The requirements of technical specialization should have been provided for by the addition of a fourth year. To specialize the third year is, he considers, a great mistake, for, even supposing that a lad of 16 can be a competent chemist, engineer, or electrician, his mind is necessarily still unformed, and it is certain that no employer is likely to intrust any serious business to his care. He must become a man before he can be a specialist. Nor are Mr. Lang's views in harmony with the general tendency of technical education in France. He disapproves on principle of trade schools, or, according to the current phrase, l'atelier dans l'école. Such a system, he considers, sets theory and practice at variance in the mind of the apprentice, and inevitably leads him to neglect one or other of two rival interests. Schools like the École Diderot, and all apprenticeship schools, are in his opinion a mistake, because a trade can only be learned properly in a real workshop.

In France there are two distinct schools of opinion, one of which is in favor of

the "school in the workshop," while the other advocates the "workshop in the school." Of the former system there is an instance at the great works at Creuzot, while the latter is represented by the École Diderot. In both systems, according to Mr. Lang's view, one part of the curriculum is pursued at the expense of the other. To maintain an equilibrium between the two is impossible. The school at Creuzot is excellent from a technical point of view, but is defective so far as general education is concerned. Moreover, it is only in very large works where such an arrangement is even possible. With regard to the system prevailing at the École Diderot, Mr. Lang's views have already been referred to. Mr. Lang fully admits the evils of trade apprenticeship in the form in which it too often exists. Even under favorable circumstances, much of the time spent by the apprentice is entirely wasted, from a technical point of view. During the first year his duties chiefly consist in sweeping out the shop and running on errands. In other cases, such as appear to be very common in France, the workshop is a school, not of technical instruction, but of moral corruption. A satisfactory solution of the problem is, therefore, a most difficult matter. Of one point, however, Mr. Lang feels assured. In a technical school of the primary grade the general portion of the education should be the predominant one. There should be no pretense of turning out finished apprentices, such as the workshop alone can produce. The chief object should be to discover the technical capabilities of a pupil and direct him toward certain crafts. In addition to this, an equipment of theoretical instruction should be provided, which, after the practical knowledge of a trade has been thoroughly mastered in the regular apprenticeship of a workshop, will produce really capable workmen. It is, furthermore, of great importance that local authorities should not lose sight of the boys on their leaving the higher grade school. The object should be not only to make them retain the knowledge there acquired, but to diminish, as far as possible, the admitted evils in the life of an apprentice. This is most effectually achieved by carefully organizing a system of evening classes, such as that of the Société pour l'enseignement industriel du Rhône, in which Mr. Lang has so long taken an interest. For boys who are to be workmen the instruction of the primary, as distinguished from that of the higher grade school, is sufficient, provided they are able to retain and develop their knowledge by means of such evening instruction. In this connection Mr. Lang approves in principle of the instruction supplied by the London polytechnics.

With regard to manual work in French primary schools, Mr. Lang considers that there has been no advance, but rather retrogression since 1884, a fact due to the exaggerations which were imported into the movement. It is a good thing, he considers, to teach manual work during the last year of the primary school course, not as a training for a definite trade, but merely as enabling an opinion to be formed as to what trade a boy has most aptitude for. To introduce actual technical instruction into rural schools would, he thinks, be a great mistake, as it would only increase the existing tendency of migration from the country into the town.

Mr. Lang's great experience necessarily gives an interest to his views, though these are in most respects diametrically opposed to the present tendency in France. They are, no doubt, to some extent affected by circumstances which are local and peculiar. The system of technical education contemplated by Mr. Lang, which is merely preparatory and complementary to, and in no way a substitute for, a trade apprenticeship, is no doubt one for which Lyons, with its many industries, offers exceptional facilities. By means of the extensive organization of the Société pour l'enseignement industriel du Rhône, Mr. Lang has himself worked powerfully toward carrying such a system into practical effect. Yet it is in Lyons itself, in a school of which he is director, and which stands in close relation with the chief industrial interests of the city, that a body of experts has unanimously decided in favor of trade teaching. Such a fact can only be accounted for by an impatience,

whether justifiable or not, of past methods and results. Even Mr. Lang is in favor of the principle of specialization, though not of the proposed scheme of which the ambitious nature may be aptly characterized in the words of another authority, himself the head of an important establishment at Lyons, "C'est la grenouille qui voudrait se faire bœuf."

SECONDARY TECHNICAL EDUCATION.

Écoles Nationales d'Arts et Métiers.

Aix, Angers, and Châlons.

The original purpose of the écoles d'arts et métiers, and their success in achieving even more than that purpose, were aptly characterized by President Faure in a speech delivered two years ago to an assembly of past members of these schools. Though originally only designed, as he said, to provide the great army of industry with sergeants—i. e., with managers and foremen of works—the results have so far surpassed expectation that in many instances the sergeant has become the commissioned officer, and the manager has developed into the engineer. The system which assigns to each of these institutions a certain number of departments as its special domain gives them an all-embracing, as well as uniform, influence. As the principal training grounds of mechanical skill, more especially in metallurgy, they are, undoubtedly, of first-rate importance to the country. They possess the initial advantage of a high standard of admission, permanently secured by a difficult competitive examination. The students are thus from the outset picked candidates, and not only have they an entrance examination to pass, but the teachers of theory, the engineers, the managers of workshops, are themselves selected by a competition of which the conditions are determined by the ministry of commerce. The director of the school holds his appointment directly from the same minister. Only those students who pass through the entire course of three years receive a diploma, which is subject to an examination, and which confers the title of "Élève breveté des écoles Nationales d'arts et métiers." No student who is without this diploma has any title to call himself a pupil of the school. A special diploma is reserved for those who pass the final examination with distinction. The schools themselves are under the jurisdiction of the minister of commerce, and under the immediate supervision of the prefect of the department in which they are situated. They are subject to annual inspection by a government inspector, who reports on their condition to the minister. In spite of their obvious defects, which arise mainly from false views of moral and physical training, their popularity is very great. For the 300 places, in round numbers, which they offer for competition each year there are no less than between 1,200 and 1,300 candidates. They have all the prestige of government institutions by which a French parent lays so much store. An even more potent source of attraction is the prospect which they hold out to all fairly industrious and well-conducted students of escaping two years of military service. Such dispensation is granted by law to four-fifths of the number of students who at the leaving examination succeed in obtaining 65 per cent of the possible total of marks. In 1895 the successful candidates at Châlons numbered 51, at Angers 54, at Aix 56.

Though admission to the schools is nominally subject to an annual fee of £24 ($120), the scholarships granted by the State, the department, or the commune render the education of two-thirds of the students partly or wholly free. The entire cost of a pupil is at the present time about £64 ($320) a year. The annual expenses of the school at Châlons amount to about £17,000 ($85,000), showing a slight decrease in comparison with former years, due to recent retrenchments.

CHÂLONS.

The English Technical Instruction Commission of 1881, which devoted a good deal of attention to the school at Châlons, expressed the view that there were two respects in which the system of instruction pursued there laid itself open to criticism, viz, the artificial overelaboration of the work, and the fact that the importance of the element of time in the question of production was not sufficiently considered. It is satisfactory to know that the truth of both these criticisms is fully admitted by the present director, whose appointment is comparatively recent, and who may therefore be regarded as viewing the matter in an impartial light. He considers that his efforts to guard against these defects have been, in great measure, successful. This is more especially the case with regard to the preparation of dimensioned sketches, rapidity in the execution of which has been encouraged by a new system of awarding marks. In the practical work itself the difficulty of effecting a change has proved greater, but the importance of observing greater strictness in the economy of time and in the avoidance of artificial finish, a defect which is admittedly still to be found, is fully recognized. The director emphasized his desire to give as much development as possible to the practical, as opposed to the theoretical, side of the work. In his opinion the general training of the school produces much better results than that of the École Centrale at Paris, which is too exclusively scientific. The theoretical training at Châlons, though inferior to that of the Paris school, is superior to that given at Cluny, a comparatively new and lower-grade school, where, on the other hand, as much as seven hours a day are spent in workshop practice, as against six at Châlons. It may be added that, in the opinion of the same informant, the general level of technical knowledge has been decidedly raised throughout France during the last twelve years. This is due principally to the better preparation provided by the écoles pratiques d'industrie and the écoles professionnelles for the écoles d'Arts et Métiers, at which the standard of the entrance examination, especially in geometry and algebra, has been considerably increased in recent years.

The English commission of 1881 were struck by the severity of the system enforced at Châlons. This discipline, which is common to all the three schools, is strictly military as regards dress and routine, and is more than military in the minuteness of the regulations which govern every waking moment of the day, and impose penalties on almost every conceivable offense. A school may well be thought severe whose pupils rise, go to rest, and bathe to beat of drum; where all "dangerous games," all newspapers, political and illustrated, are forbidden, and where the only form of distraction provided, from one week's end to the other, is a compulsory walk on Sundays, under strict supervision. A former pupil of the school at Aix, and subsequently head of a technical school at Cairo, discussing in 1887 the criticisms of the Royal commission, says:

As to the want of amusements and the extreme vigor of the discipline, unfortunately there is no exaggeration in the statement of the English commission. For my part, I do not think the treatment could be worse in a house of correction than was customary in my time at the School of Arts and Trade at Aix. It is astonishing that the central administration has not yet recognized that the periodical disorders, invariably followed by removals in mass, are only the consequence of a repression and of annoyances that nothing can justify. It is not necessary to employ gendarmes to supervise pupils, but masters, well informed and of good families, possessing the education, tact, and patience necessary for the performance of such delicate functions.

My own visit to Châlons was made under circumstances which must have rendered the presence of a stranger embarrassing even to French courtesy. On the previous day the school had been the scene of a serious mutiny. Traces of the popular excitement which it had aroused were still evident. The school buildings were in occupation of military police and a company of regular soldiers.

The entrance gate was barred by sentries. I was, consequently, requested to defer my coming till the afternoon, by which time the whole body of 300 students had been expelled and marched to the railway station under military escort. On my return the busy life of the school had been replaced by silent corridors and empty workshops. This did not, however, prevent my receiving a most courteous reception from the director and other officials, who enabled me to see every part of the school and obtain all requisite information. The outbreak, it appears, originated with the 100 students of the first year, who had refused to enter their class rooms, and had insulted their teachers. The sentence of expulsion from the school, which these acts of insubordination entailed, had the immediate effect of inciting the remaining 200 students to make common cause with their fellow-pupils. Having wreaked their displeasure on the furniture of the establishment, the united 300 poured out into the streets and marched to the prefecture, where, with loud shouts, they demanded the instant dismissal of the director. Followed by a considerable proportion of the populace, they then proceeded to parade the town for several hours. They finally returned to a late supper at the school, and on the following morning were, as already stated, sent back to their homes. In the opinion of the director himself, the incident was in great measure due to the evil influence of the day students, an element which was first introduced into the school a few years ago, but which has recently been suppressed. It can easily be imagined that the amusements of a garrison town to which, in the absence of healthy outlets, these members of the school would devote their greater liberty, would not be conducive to discipline. From another source I learned that the disturbances were due to the abolition of certain privileges, with regard to leave of absence, hitherto enjoyed by the day students. It may be mentioned that among the townspeople, whose standard of hardship are the woes of the military recruit, there appears to be little sympathy for the grievances of the students.

In 1891 a new department, the section normale, was opened at Châlons. It is intended to train teachers who already possess the certificate for teaching in higher-grade schools as technical instructors for the écoles pratiques d'industrie and the écoles professionnelles. The students of this section follow nearly the same course of instruction as the other, but with less completeness, for they remain only two years. They do not live in the school itself, but at the Training College for Schoolmasters in the town, and they wear no uniform. They all hold government scholarships. The institution of this department has not proved a success. Between the years 1891 and 1896 the total number of candidates has not exceeded 26. The director considers that the training of technical-school teachers is rather out of place at Châlons, and would be more conveniently carried on at Cluny.

In 1895 the school at Châlons met with great losses through a fire which entirely destroyed the fitting shop and a large part of the machinery. Much of the latter has, therefore, had to be renovated or entirely replaced, at a cost of £8,000 ($40,000). Owing to the work of repair, it has not been possible to undertake any orders from without, except in the foundry, where they amount to the annual value of £400 to £600 ($2,000 to $3,000). The present new fitting shop has a cubic space twice as great as that of the old one, and in superficial area it is larger by one-third. All the workshops are lighted by electric light and heated by steam.

It has of late years become increasingly difficult for apprentices on leaving the school to find situations as foremen of works. The director always advises the students to spend one or two years in a workshop before they fulfill their term of military service. According to the regulations of the school, boys who enter must be at least 15 and not over 17 on the 1st of October of the current year. They leave, therefore, at 18 or 19, and have one or two years before they need enter the ranks. The number of those who annually pass out of the school is about 90. Of

these about 50 to 55 do only one year's service, in accordance with the military law of 1889 already referred to.

As a means of arriving at a practical estimate of the part which the three important engineering schools of Châlons, Angers, and Aix play at the present time in the industrial life of France, I have endeavored to examine into the nature as well as the actual amount of the employment which is open to students at the end of their training. As a basis of this investigation I have, by special permission, made use of the last annual report of the Société des Anciens Élèves des Écoles Nationales d'Arts et Métiers. This influential association, which was founded in 1846, and whose handsome new premises in the rue Chauchat were opened by President Félix Faure in February, 1895, is joined by more than half of all the students who annually leave the three schools. The figures given below apply only to this larger half, which may, however, be considered as more than representative of the practical outcome, under the most favorable conditions, of the institutions in question. Membership of a society to which so many distinguished former pupils of the schools belong is in itself a guaranty of professional standing and bona fides. It may, on the other hand, be taken for granted that in the information which members supply as to their present position they are under no inducement to depreciate its actual status. The case is, perhaps, rather the reverse. It is in some cases difficult to determine the exact nature of an appointment where a term such as that of engineer may be used somewhat indefinitely. The statistics here considered refer to students who entered the schools in the years 1887–1893, and who, therefore, allowing for a three years' course, quitted them within the years 1890–1896. With regard to the figures themselves, the two items which evidently call for most attention are those under the heads "Without specified position" and "Without any specified occupation." Together they constitute 0.32 of the total number of students. In view of the fact that the general tendency would, if anything, be rather to exaggerate than to underestimate professional standing it is no doubt justifiable to assume that where no employment is mentioned in the club register it does not exist. Moreover, the use of the indefinite title of dessinateur or draftsman, without reference to any particular place of business or department of trade, fairly leads to the conclusion that employment, if it exists at all, is of an uncertain and irregular character. The deduction to be made, for instance, where a student on the completion of his training is independent of a calling or does not desire it to be known is of little account. The general impression produced by the figures will no doubt be that, while the outlets which are open to the pupils of these schools are both substantial and varied, embracing, as they do, all the principal departments of industrial life, the present demand for the better positions, such as that of manager or foremen, or indeed for any positions, very much exceeds the supply.

By far the most important numerically are the draftsmen, who in the aggregate number no less than 260 out of 866, or about three-tenths of the whole. The engineers and subengineers number 42, the managers and submanagers 25, the foremen and subforemen 41. A comparatively insignificant number of students appear to obtain work abroad on the conclusion of their training. Of employees, including workmen, with definite occupations, there are 72, or about one-twelfth of the whole.

Of great importance from a national point of view is the element of marine engineers, who number 58, about one-fifteenth of the total. In the rigorous training peculiar to these schools they must receive an exceptionally thorough preparation for the duties of their calling. They are responsible for the safety of some of the principal vessels in the fleet. M. Faure, on the occasion alluded to above, specially referred to the valuable services which they render to the French navy.

As to the position occupied by the écoles d'arts et métiers at the present day, it

may be said that they have to a great extent deviated from the original purpose for which they were founded. That purpose was to form workmen, whose theoretical training would, in many cases, eventually fit them to become foremen or even managers, but whose scientific outfit could not under any circumstances give promise of a higher career. At the present day a student of one of these schools who has met with any success no longer desires to be regarded, according to the current phrase, as a "Sous-officier de l'industrie française," but as an "engineer," who has issued from a school which, though it can not aspire to the high mathematical standard of the École Centrale at Paris, more than compensates for this fact by the unrivaled practical training which it affords. In this sense, therefore, and accepting them at their own, perhaps exaggerated, valuation, the écoles d'arts et métiers are to be considered as belonging no longer to secondary, but to higher technical education. In proportion as their standard has been raised, they have become more and more out of touch with the average école professionnelle, whose resources are now generally condemned as inadequate even for the more moderate demands of modern technical knowledge. Preparation for the écoles d'arts et métiers has, consequently, in large measure, been restricted to certain schools which have made this their specialty. This state of things will, no doubt, be greatly improved by the development of the écoles pratiques d'industrie, which represents the technically regenerated école professionnelle. But, however good the training in these schools may be, it is professedly more practical than scientific. They are to be the first and as a rule the only training ground of the workman proper. There must, moreover, in the nature of things, always remain a large number of boys who, while fitted to become excellent practical workmen, altogether lack the mathematical ability requisite for gaining admission to the écoles d'arts et métiers. It was therefore to be expected that a real need should make itself felt of some place of strictly intermediate education to take up the rôle which the écoles d'arts et métiers have to a great extent abandoned. It was to meet this want that the new government school at Cluny was created, an institution which may be best described as the Châlons of twenty-five years ago.

CLUNY.

(École Nationale Pratique d'Ouvriers et de Contremaîtres.)

The ancient and celebrated Abbey of Cluny has, since 1891, been the home of an important technical school, whose special aim is to train workmen in such a manner as to fit them subsequently to become foremen in the various trades connected with metal and wood work. The actual site of the school is considerably larger than that of any of the écoles d'arts et métiers, as it extends over no less than 22 acres, about 7 acres of which are occupied by the buildings themselves. For many years the same premises were tenanted by a secondary training college for teachers, which was suppressed, when, in 1891, the modern side of French secondary education underwent a complete reorganization. The general arrangements of the school are the same as those at the écoles d'arts et métiers. Like these it is a State school under the ministry of commerce, with a three years' course. Diplomas are awarded after examination at the end of the third year, but do not, as in the case of the écoles d'arts et métiers, qualify without further examination, for the position of apprentice engineer in the fleet. The cost of training is rather lower than at the schools referred to, the annual budget amounting to about £12,000 ($60,000). The school fees are £20 ($100 per annum, but, in the great majority of cases, they are covered wholly or in part by bursaries. In 1895, out of 100 candidates admitted, 54 were altogether exempt, 18 paid one-quarter, and 20 one-half the amount of the fee. Every student is, however expected to deposit 4 guineas for general expenses, and this charge is in every case exacted.

The entrance examination includes writing, spelling, arithmetic (the first four rules—fractions, decimals, proportion, square root), and the elements of geometry (including plane surfaces). There is also a practical test in carpentering, fitting, forging, or founding. The selections among these subjects is left to the candidate, and determine the particular workshop in which, after his admission to the school, he spends the entire course of three years. Three-fifths of the maximum number of marks, with a fixed minimum in each subject, qualify for admission. Of those who qualify, the first 100 are definitely admitted. In addition to the resident pupils there have hitherto been a small number of day boarders, but, as at Châlons, this element has now been condemned and suppressed. The annual number of candidates for admission to the school number about 340 to 350.

The apprentices are occupied for twelve hours a day, the routine being as follows: Rise at 5.30 a. m.; 6 to 7, preparation; 7 to 7.30, breakfast; 7.30 to 9, drawing lesson; then follows seven hours' workshop practice; from 5.30 to 7, a lesson in mathematics, physics, chemistry, or French. After supper, an hour's preparation. A walk on Sunday, on which day there is also preparation work for three or four hours. It will be evident from this recital that the severity of the routine is equal to that of the école d'arts et métiers.

The theoretical instruction, which is directly practical in its tendency, includes arithmetic, projections, and a general knowledge of logarithms. Elementary geometry, general notions as to the ellipse, hyperbola, parabola, circle, cycloid, and epicycloid. Algebra, up to quadratic equations, exclusive. Plane trigonometry, very elementary. Descriptive geometry, up to and including the intersection of bodies; the screw and conical spiral, screw with square and triangular threads. Laws of motion, change of motion in machines, kinematics of machines. Industrial mechanics, elementary notions, descriptions of the chief parts of machines and of the machines and apparatus used in the wood and iron industries, detailed and full description of steam engines and hydraulic motors, with formulæ of work. Elementary knowledge of the resistance of materials; physics and chemistry, elementary knowledge; industrial drawing, writing and bookkeeping, grammar, history of France and geography of France and her colonies, hygiene. The staff of teachers includes one for mathematics, one for mechanics, two for drawing, and one for French.

The practical instruction comprises carpentry and model making, forging, founding, locksmithing, boiler making, and fitting and mounting, in six separate departments, of which the three first have each about 30 apprentices, 10 of each year. In the fourth department, still in formation, there will be 15; in the fifth, which is likewise new, 15; while the sixth has nearly 200 apprentices, who are arranged, according to age, into three divisions. There are special sections for machinery and instrument making, which are formed by these three divisions in turn. It is ultimately intended to confine the instrument making principally to electrical apparatus, but at present the requisite funds are not available.

Over each of these departments there is a submanager, except where for economical reasons the position is held by a master workman. The submanagers receive a salary of £96 ($480), £108 ($540), or £120 ($600), according to their grade. The technical staff includes, besides the director, who is at the same time engineer in chief, 1 chief manager, 9 submanagers, and 12 workmen, 5 of whom are ouvrier instructeurs or workmen instructors. The official regulation which provides that all submanagers shall be selected by competitive examination, is in practice overlooked. They are engaged on the strength of testimonials, and provisionally. For the post of chief manager, however, and for that of all teachers on the staff, there is a special examination which is held at the Conservatoire des Arts et Métiers at Paris.

The chief engineer exercises a general supervision over all the work, both prac-

tical and scientific. All drawings are designed by him or one of the managers, and are then executed under the supervision of one of the teachers of drawing.

The carpentry and model making shop measures 35 by 15 meters. It is a low-vaulted room, used in the former days of the abbey for storing flour. It has the disadvantage of being at a greater distance from the foundry than is desirable, or than is usual in trade establishments. The dimensions of the fitting shop are about 60 by 20 meters, the accommodation being barely sufficient. The foundry, which measures 30 by 20 meters, is also rather too crowded. It contains 30 furnaces; 6 more are in construction. The boiler making, which is at present included in this department, is to be placed in a separate workshop, as the noise which it occasions is found to be a serious annoyance to the founders.

Every piece of work is first modeled in the carpentry and model making shop. Having passed through the foundry, it is sent to the fitting room, where, in order to avoid the specialization of the ordinary workshop, it is mounted and fitted by the same apprentices. The outside orders executed at Cluny are insignificant in amount. Since the foundation of the school the apprentices have been almost exclusively occupied in supplying their own requirements. With the exception of a few larger engines with which the school was started, all the machines in use have been constructed under the supervision of the chief engineer and his subordinates. This fact in itself says a great deal for the really practical nature of the instruction. The apprentices have recently been engaged in the construction of two turbines for the supply of electric light; as samples of their work, two drilling machines (a stamp-hammer, marteau pilon), of 1,200 kilograms, two filing machine vises, and a steam engine may also be mentioned. They have, moreover, been employed on repairs and alterations in the building itself.

With regard to the criticisms passed by the English commission of 1881 on the over-elaboration and want of quickness in the work at Châlons, the chief manager admitted that the same remark would no doubt apply to Cluny. These features, however, he considers to be almost inevitable, if the primary object of securing careful and accurate work is to be kept in view. Under pressure, the requisite quickness would, he thinks, be acquired later on.

As to the prospects open to pupils at the close of their training, some difficulty is, it appears, found at Cluny, as at other schools, in finding places for them. The difficulty is, however, much lessened if they are willing to become workmen. Many apprentices on leaving the school try to find occupation in drawing offices, because the work is both easier and more lucrative. Of the great numbers who look for such employment an idea may be formed from the statistics already given in connection with the school at Châlons. So far as Cluny is concerned, the chief manager considers that those who take this course really stultify the main purpose of their training. They are no longer workmen, but draftsmen. At the school itself, too, pupils are disposed to neglect their workshop practice in order to spend as much time as possible on drawing, which they consider will be more useful and profitable to them. The disproportionate attention given to drawing is, it appears, to some extent due to the fact that, in view of the insufficient number of regular teachers of drawing, apprentices themselves are often employed in executing the details of rough sketches.

The foundation of Cluny has been too recent to admit of any exact estimate as to the future success of the school or the place which it will eventually occupy in the technical hierarchy. Its local position, though it has, in one sense, many natural advantages, is not altogether favorable to the prosperity of the school. The great works at Creuzot, though comparatively so near, are rendered almost inaccessible by bad railway communication. The little town itself has no industries to speak of, and is, from a strictly modern point of view, un trou. With regard to the character of the instruction, I am informed that even at Cluny a

certain tendency to give prominence to the theoretical at the expense of the practical side of the training is becoming visible. This is no doubt the tendency of all technical colleges in other countries no less than in France. Wherever an organized system of teaching exists, the academic element is, perhaps, naturally inclined to encroach on more practical interests.

At the present time one of the chief uses of the school at Cluny is to receive the great overflow of candidates who do not succeed in gaining admission into the écoles d'arts et métiers. Besides the 700 or 800 who fail altogether, there are every year about 200 who, though they have qualified for admission by obtaining three-fifths of the examination marks, are not included among the successful first 100. For both these categories Cluny offers another chance. The entrance examination is purposely deferred till October, after the publication of the list of successful candidates at the écoles d'arts et métiers. A third class to whom Cluny is open are a limited number of those members of the écoles d'arts et métiers who have failed to pass the intermediate examinations at the end of their first or second year, and who are allowed to migrate to Cluny.

Summary.

French views on technical education may be said to demand attention chiefly in so far as they bear on the organization of primary technical schools. If in secondary and higher technical instruction we admit the authority of German methods, we may well look to France for some light on a subject to which the State, in conjunction with the best authorities of the country, has devoted close attention for more than twenty years. It can not, at any rate, be doubted that in French experience we may find ample illustration, if not in every case an adequate solution, of questions which in our country are still subject to discussion and tentative experiment. * * *

By the law of December, 1880, primary technical instruction was for the first time placed on a definite basis. As a nucleus of the new organization the apprenticeship school, such as already existed under municipal management in different parts of the country, was adopted, and was now incorporated into the public system of primary instruction under the name of école manuelle d'apprentissage. To this type of school a number of other schools, styled, in virtue of the modicum of technical instruction which they provided, professionnelles, were to be "assimilated." It is the progress of this assimilation, to use the expression in a more literal sense, which may be said to constitute the history of primary technical instruction in France during the last eighteen years. The gradual approximation of a less practical to a more practical type of school is but the logical outcome of a policy which, recognizing that old methods of trade instruction are extinct, has deliberately resolved to create in their place a new and living bond between the apprentice and the trade workshop, a bond which, slender at first, has been continually growing in strength. The development which has taken place in the interval between the legislation of 1880 and the establishment of the écoles pratiques de commerce ou d'industrie in 1893 appears most clearly in the gradual transition from "Travaux manuels" to "Ateliers," from mere manual instruction, limited in amount and indefinite in aim, to definite workshop instruction. The peculiar title of écoles manuelles d'apprentissage, which was given to the type of school contemplated by the bill of 1880, appears, as already observed, to indicate a system intermediate between manual instruction on the one hand and trade teaching on the other. Uncertainty as to the precise nature and method of the instruction to be given was further increased by the fact that for eight years after the original bill no uniform standard of efficiency existed, each school drawing up its own programme, subject to ministerial supervision of a more or less nominal nature. It was not till the establishment, in 1886 and 1887, of the Écoles Nationales

Professionnelles at Voiron, Vierzon, and Armentières, that a definite step was taken by the two ministries toward the realization of their declared policy of approximating educational methods to the requirements of trade, the école manuelle d'apprentissage to which the école professionnelle was to have been assimilated, having, as we have seen, never come into existence at all as an official type of school. In each of the écoles nationales, with their three divisions, we see a general education culminating in an industrial one, manual instruction in the elementary school being followed by systematic workshop training in the higher grade school. By the provision which they afford for special trades in different districts these establishments are intended more particularly to represent the principle of variety and adaptability in technical instruction. In 1888 a definite standard, applicable equally to an école manuelle d'apprentissage and an école professionnelle, was laid down by the issue of an official syllabus, which is specially noteworthy as being the first detailed scheme proposed by the two ministries as the basis of a national system of primary technical education.

Though with the foundation of the écoles nationales and the issue of a syllabus the limit of the concerted action of the two departments has been reached, and the next step is taken by the ministry of commerce on its own responsibility, the legislation of 1892 is no more than the natural development of a movement of which the principal aim had from the very first been the approximation of the school to the workshop. It was the inevitable recognition of the continued failure of the average école primaire supérieure professionnelle as distinguished from the écoles nationales and a few other good schools to satisfy the industrial requirements of the country. In a special degree, however, the institution of the écoles pratiques was intended to remedy the existing scarcity of workmen in the mechanical trades, which was recognized as constituting a serious danger to the general prosperity. In the words of the official programme—

> Apprentices are no longer formed in workshops, hence the disturbing prospect of a scarcity of workmen in the future: for this state of things, if not speedily remedied, will insensibly lead to the decadence of natural industry.

The greater sense of freedom now felt by the department of commerce in its new capacity as an independent authority, with financial resources at its disposal, is reflected in the syllabus of 1893 as compared with that of 1888. The practical work no longer figures as "Travaux manuels," but as "Ateliers," and occupies thirty to thirty-three hours a week as against sixteen to twenty-seven. The weekly total of hours, which was fixed at about forty to fifty for an école manuelle d'apprentissage or an école professionnelle, is now raised to fifty-five to sixty. The time devoted to general instruction shows a reduction as compared with that laid down for an industrial school in 1888. The feature, however, which must be regarded as of most importance in the scheme of 1893 is the clear distinction drawn between the aims and methods of an école pratique d'industrie as compared with those of an ordinary école professionnelle. The latter schools "ont simplement pour objet la préparation à l'apprentissage" (simply prepare for apprenticeship). The new type of school, on the other hand, aims at forming clerks and workmen capable of being "immédiatement utilisés au comptoir et à l'atelier" (immediately employed at the counter or in the workshop). To insure this, and to prevent the apprentices on entering the trade shop from being "trop inférieurs" to the actual workmen, the official syllabus declares it to be essential that workshop practice should play a large part in the curriculum of the school. It is in conformity with this principle that at the École Pratique of St. Étienne the apprentices of the third-year work spend, during the two last months of the year, as much as seven hours a day in the workshop. A further indication of the essentially practical character of the new schools appears in the recommendations which the official programme makes with regard to metal and wood work. The scheme of instruction in the

latter subject is not to contain anything calculated "to make a mere amusement" of the work. Certain exercises, which are prescribed in some methods and which consist in "the execution of small models and little articles on a reduced scale, with a view to giving the hand a certain dexterity, although the pupil is as yet ignorant of the proper way to handle the tool which he is using," are condemned as quite unsuited to form the basis of serious apprenticeship. The view here expressed is noteworthy not only as establishing an essential distinction between some of the generally accepted methods of manual instruction as opposed to those of the trade shop, but as contesting the utility of the one as a preparation for the other.

It should be noticed that though it is in the écoles pratiques that we see the system of apprenticeship carried out in its fullest extent, the principle underlying the system is not confined to these schools, but is practically inherent in every form of technical instruction in France which is in any way preparatory to trade apprenticeship. The distinction between preparation at a school for trade apprenticeship, and actual school apprenticeship preparatory to trade apprenticeship which the official circular of 1893 declares to be an essential one, is in reality one of degree, not of principle. No sharp line of division can be drawn between the two systems. Thus, at Vierzon, which, as one of the écoles nationales professionnelles, was intended to be merely "préparatoire à l'apprentissage" (preparatory to apprenticeship), the school syllabus describes the first two years of the course as embracing "Culture générale et commencement de l'apprentissage général," while in the third year the "normal section" provides "préparation à la vie industrielle par des études pratiques et des travaux d'apprentissage." The claim made, with some exaggeration, by M. Buisson, as director of primary instruction, on behalf of the three national schools, that their curriculum "leads a youth up to the threshold of the factory or the engineering school, and enables him to become a finished workman after a few months' practice," is not less, but greater, than that advanced even in the case of an école pratique. The practical unanimity of opinion existing at the present time in France with regard to the approximation of the school to the workshop appears further in the view expressed in the report of the administrative commission of the École Martinière at Lyons:

> What is demanded to-day by a merchant or manufacturer is not only young men who have received general instruction, even although this general instruction has a technical leaning more or less pronounced. It is young men whom they can utilize immediately or as soon as possible, because they have received technical training specially appropriate to the trade which they propose to follow. * * *

The actual degree of school apprenticeship is practically determined by the nature of the particular trade in view and the proximity of the workshop, this proximity being naturally greater where primary is not followed by secondary technical education than where this is the case. The prevalence of a system of apprenticeship both in primary and secondary instruction renders it more and more incumbent on all schools with any pretensions to efficiency not only to recognize the important principle of concurrent theory and practice, but to keep the character of the work itself in touch with the principles and methods of the trade workshop. Even for those boys who, in the comparative ease of a municipal école professionnelle like that at Rouen, escape for a time the hardships of the strictest form of apprenticeship, the road to future employment lies, in a large number of cases, through the rigorous workshop training of one of the écoles d'arts et métiers or of the school at Cluny. It may be regarded as one of the most important results of the efforts made to approximate the school to the workshop that it has drawn much closer than before the bonds existing between primary and secondary technical instruction.

With the doctrine of "immediate utilization" the approximation of the school to the workshop may be said to have reached its completion and French primary

technical education its climax. It would, however, be a mistake to suppose that this principle carries with it that of actual supersession of trade apprenticeship itself. Such an intention the official syllabus expressly disavows.

It is not to be expected that an apprentice on entering a trade shop should at once reap the advantages of the technical training which he has received at school, or that he should receive the same wages as a workman already inured to the toil of a regular day's work. It must be remembered that the practical value of an artisan consists not only in the knowledge of his craft, but in the amount of work which he produces. At a school an apprentice acquires a theoretical and practical knowledge of his trade, but only a trade shop can teach him to produce. He enters the trade shop as a petit ouvrier to finish the second stage of his apprenticeship. Though many trade processes will be new to him the principle underlying them will be familiar, and, as his experience grows, he will, in virtue of his technical knowledge, infallibly outstrip those fellow apprentices who have not had the advantages of a school training.

The essential distinction existing between school apprenticeship, of however strict a type, and trade apprenticeship, between the educational methods of the one and the economical working of the other, has always been recognized in France. Thus amongst the regulations of the year 1886 at the well-known école d'apprentissage at Havre, before its conversion into an école pratique d'industrie, we find it expressly stated that "the purpose of the school is to form good apprentices and not to produce." The same principle holds good to a large extent even in secondary technical education, and to it is due that over-elaboration and indifference to the element of time which was noted by the English commission of 1881 as characteristic of the work at Châlons.

A system which aims at forming apprentices whose services are of immediate utility to the trade must necessarily include the principle of specialization. On this question, as on that of apprenticeship itself, French views are marked by much greater clearness than was formerly the case. The report of the government commission appointed in 1881 for the purpose of devising a scheme for a national technical school contained the recommendation that "all specialization in manual instruction should be avoided." How this was practicable in a school like that at Vierzon, which was expressly intended as a training ground for special local industries, was not explained. At the present time specialization is regarded as an essential feature in all government schools. To quote the programme of Vierzon, In the second year students specialize according to their tastes and aptitudes ("En 2e année ils se spécialisent selon leur goût et leurs aptitudes.") Each of the three national schools comprises from five to seven distinct departments. At every school which prepares for trade apprenticeship, whether an école pratique, école nationale professionnelle, or one of the trade schools of Paris, a short preparatory period, intended to give an insight into the trade as a whole, is followed by a much longer period of special instruction. The length of this preliminary period varies. In the école pratiques, as in the écoles nationales professionnelles, it is usually one year; at the écoles Diderot, Palissy, Boulle, and Estienne it varies from about two to six months. In the separate workshops of these schools each recognized subdivision of a trade finds its counterpart.

In the types of school just referred to a system of specialization is inherent, and there can only be question of the degree and manner in which it is applied. Of the actual growth of this principle, on the other hand, of its recognized necessity under present industrial conditions, the best evidence is to be found in its recent adoption by one of the oldest and most conservative schools in France, which had up to that time expressly repudiated any connection with a system of apprenticeship or specialization. The report of the Martinière commission, of which a summary has been given, is chiefly interesting in so far as it raises in a clear and trenchant manner a direct issue between two fundamentally distinct systems of technical instruction, a theoretical and scientific training on the one hand, and a

direct preparation for a definite trade on the other—"Enseignement professionnel général" versus "Enseignement véritablement professionnel." With the adoption of the principle of specialization by the Martinière the most important stronghold of a system of generalization in French primary technical instruction may be said to have fallen.

If we turn for a moment to draw a brief comparison between French primary technical instruction and its equivalent in our own country, we find that, outwardly at least, the contrasts presented by the two systems are far greater than the analogies. While the French system is based on the generally recognized fact that trade apprenticeship, in the older sense of the term, is extinct, our own system may be said to rest on the supremacy of the trade shop, on its complete sufficiency when combined with a modicum of subsidiary instruction, to meet the industrial needs of the country. Whereas in the one case we have a deliberate policy of definite trade teaching and a specially adapted scholastic organization recognizing the two principles of conjoint theory and practice and of specialization, we have, on the other hand, an express prohibition of instruction in trade methods and a course of training which, when based on a school system, is chiefly theoretical and scientific, and where of a practical nature is merely supplementary. Great as these distinctions undoubtedly are, we find on closer inspection that they are of degree rather than of kind, and indicative not so much of a radical difference of system as of separate stages of development. So far as school organization is concerned, we find a link between the two systems in the fact that the general attitude of our higher grade technical school of to-day is very much that of the école professionnelle of fifteen or twenty years ago. * * *

How far, it may fairly be asked, can a system be called really "practical" which does not give a distinct bias toward the exercise of a particular profession? And how can such a bias be given except through the decided preponderance of some one particular subject of instruction, in other words, by a system of specialization? Is it not unreasonable to suppose that a boy whose mind, so far as it has been influenced at all, has been impelled by elementary education toward some form of clerical work should receive an entirely new impulse toward a practical trade or profession by what is virtually a mere continuation of such elementary education, slightly tinged with instruction in elementary science? It is somewhat difficult to imagine that a few hours of instruction during the week in manual work or in chemistry should create a predisposition in a boy's mind to become a mechanic or a chemist. It would appear more probable that a predominantly "literary" education, combined with a slight knowledge of chemistry or physics, should, if anything, produce a leaning toward the life of a clerk or a school teacher. Even when considerable prominence is given to scientific instruction it may be contended that, unless it is closely associated with some practical trade, its influence on the industries of a country can only be of an indirect and fortuitous nature.

While English primary and secondary technical instruction is still to a large extent supplementary, and is given through the medium of separate courses, whose interconnection, where it exists, is necessarily partial and imperfect, French enseignement professionnel, so far as it is regarded as of national importance, is based on the systematic organization of a school. In France, as in England, classes on technical subjects cover a wide and varied field of usefulness. At one of the two great technical societies of Paris, the Association Polytechnique, the number of distinct courses is about 575, while the attendances amount to over 11,000 a week. At the classes held by the Association Philotechnique, amongst over 500 classes, the average weekly attendances exceed 7,000. At Lyons over 5,000 names are entered every year for the classes which, to the number of about 140, are provided by the Société d'Enseignement Professionnel du Rhône. While

such instruction, in view of the public benefits which it confers, is much appreciated, technical authorities in France are fully alive to its practical limitations. Intended as it is principally for adults, it is regarded rather as a remedy for neglected education, than an education itself. It is the left, not the right, hand of industrial instruction. It is hardly necessary to insist on the essential distinction between a disconnected or imperfectly connected system of supplementary class work and the regular homogeneous and prolonged instruction of a school. It is a distinction, however, which in England is not unfrequently obscured by the loose way in which the word "school" is applied to places of technical instruction which have few of the essential characteristics properly connoted by the term. Amongst such characteristics we may include examinations both on entrance and at periodical intervals, a graduated course of instruction, obligatory on all, and extending over at least three years, and the practice of making the award of certificates conditional on an attendance at school for at least two years.

In view of the national interests at stake it appears to be a matter of real importance that we should draw a clear distinction between the results which we may reasonably expect to derive from a supplementary training on the one hand and a scholastic system on the other. It appears to be hardly sufficiently recognized that the mere multiplication of subjects and classes does not constitute a school, and is not in itself a criterion of efficiency. It may be noted as one of the inherent weaknesses of a supplementary organization, more especially when such organization is part of the accepted machinery of a national system of industrial education, that it is so largely dependent on the element of popularity. The importance attached to the mere numbers of those to whom instruction of some particular institution has, in however fleeting and transient a form, been dispensed is in marked contrast to the indifference displayed to actual length and continuity of training in the case of individual students. It must be evident that the mere fact of a boy having attended a particular place of instruction is in itself of very little importance in comparison with the question how long he has been there, and whether, under the most favorable circumstances, it has been possible for him to acquire any knowledge of a useful character.

As a further trait natural to a system of supplemental instruction, may be noted a defective sense of proportion, a tendency to regard the industrial world in the light of an oriental bazaar, in which every trade and craft is represented, but where none has any preference over the other. It is in harmony with such a conception that ironmongery and dressmaking, plumbing and bee keeping, carpentry and cookery are mentioned in the same breath, and that instruction in one or all of these subjects is "provided" with equal impartiality. A scholastic system, on the other hand, regards certain forms of industrial activity as standing, in virtue of the wideness of their scope and the diversity of their application, to a position of unquestioned preeminence. These it cultivates and fosters by organized methods, viewing them as the main arteries through which the industrial life of the country flows. If there is any drawback to the enormous increase of supplemental technical instruction in this country, it would appear to consist in the fact that the very display of so much energy may blind us to the truth that such instruction, however extended, can, from an international point of view, as an equipment against foreign competition in trade, never replace the solid advantages of a regular and systematic school training any more than university-extension lectures can replace the universities or the volunteer movement the Regular Army.

The scant favor with which the principle of apprenticeship schools is regarded in England may be said to be due to reasons partly of a practical and partly of an educational order. It is said, on the one hand, that practical work can only be learned in the trade shop, and on the other, that the mechanical drudgery which this type of school involves is contrary to the spirit of education.

In view of the recent development and improvement of such schools in France, these views appear to need some modification. The question whether the highest form of practical skill can only be learned in the trade shop must depend on the actual state of apprenticeship. If this is extinct, as is, for instance, said to be the case in our building trades, the shop can hardly be said to be any longer a school of practical workmanship. French schools do not, as has been shown, profess to supersede the shop, but it may be claimed for them that they not only tend to maintain the highest standard in the methods of workshop practice, but that they have a powerful influence in improving these methods themselves, inasmuch as the work of a school apprenticeship is conducted, not by rule of thumb, or mere tradition, but in the light of the best and latest scientific principles. In instituting the écoles pratiques the French authorities have been inspired by a conviction that it is for the interest of the country that not only foremen and managers of works, but artisans as a class, should pass through a systematic course of school training. The importance attached to the formation of a distinct body of picked workmen is further shown by the recent institution of the school at Cluny for candidates whose mathematical and scientific knowledge is unequal to the demands of the écoles d'arts et métiers. In England, though workmen have many places of supplementary instruction open to them, they have little or no opportunity of a complete industrial education. So far as the question of general education is concerned, it is a striking fact that the time devoted at Voiron, one of the écoles nationales professionnelles, in which the principle of apprenticeship has been shown to be recognized, to purely literary subjects, is actually greater than that given to the same purpose by an English technical school like the People's Palace Day School.

It can hardly be doubted that our present attitude toward the whole question of industrial education is a somewhat illogical one. While in theory we forbid the employment of public money for trade instruction in schools, such money is, in practice, spent by municipal bodies for the support of trade classes and institutions restricted to the use of trade apprentices. If the history of the recent progress in French technical instruction has any lesson to teach, it would appear to be that the time has arrived for us also to adopt a bolder and more consistent policy as regards industrial education, and by giving greater prominence to practical, special, and scholastic, as opposed to theoretical, scientific, and supplemental requirements, to render our system of technical instruction, so far as it is intended to help us to meet foreign trade competition, "un enseignement véritablement professionnel."

ADMISSION OF FOREIGN STUDENTS TO THE FRENCH UNIVERSITIES.

The recent movement for facilitating the admission of foreign students to the French universities has been considered in previous reports. A summary of the principal measures is here presented, bringing the account to the present date.

The movement began in Paris and was publicly advocated at the international congress on secondary and superior instruction held in connection with the Paris Exposition of 1889. The great hindrance to foreign students arose from the fact that their diplomas had no weight in France. It was proposed at the congress that this difficulty should be overcome by an official order establishing conditions of equivalence for foreign diplomas. Nothing came of these proposals until 1895, when Professor Furber, of Chicago, took up the matter in

the interests of American students and urged it directly upon the minister of public instruction. In his memorial to the minister[1] the liberal course of the German universities was contrasted with the exclusive policy of the French system. The special difficulty in the way of American students was stated to be the compulsory examinations. These, to quoté the memorial, "when frequent, not only tie the student more closely to set lines of study than is advantageous for the American, but, on account of the strangeness of the language, during the early portion of his course are doubly arduous. An arrangement similar in principle to that which the French faculties of medicine have already adopted, whereby a foreigner, under certain circumstances, may take all his tests en bloc, would relieve him of every obstacle in this direction. This, and possibly a designation of the American colleges whose degrees would be accepted as an equivalent for the diploma of the French lycée, are the principal concessions the American student would desire." Soon after the presentation of the memorial a meeting was called at the Sorbonne (June 26) to consider the subject. The meeting was remarkable for the number and distinction of the men who took part therein. An article from the pen of M. Bréal, which appeared the same month in the Journal des Débats, greatly increased interest in the matter, and as a result of these several efforts a committee of leading university men was formed, under the name of the Franco-American Committee,[2] for the express purpose of giving effect to Mr. Furber's proposal. An American advisory committee was also formed, under the presidency of Prof. Simon Newcomb.[3] This committee formulated their views as to the importance of freer access for American students to French universities in a series of resolutions,[4] and recommended the two following measures for promoting the end in view:

(1) The acceptance by the French universities, as candidates for the doctor's degree, of Americans holding the bachelor's degree from any institution of learning of good standing in the United States; this degree being accepted as equivalent of that of the French lycées.

(2) Owing to the disadvantage under which the student would labor, especially in the early part of his course, on account of his lack of familiarity with the French language, it is suggested that, instead of the frequent rigorous examinations required by the French system, informal ones should be instituted, the successful passage of which should not be obligatory.

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[1] See Commissioner's Report for 1894–95, Vol. 1, pp. 305–308.

[2] For list of members, see Report for 1894–95, Vol. 1, p. 310.

[3] The committee included also, among others, W. T. Harris, Commissioner of Education; Carroll D. Wright, Chief of the Labor Bureau; Andrew D. White, and the presidents of the Johns Hopkins, Yale, Harvard, Clark, Cornell, and Columbia universities, and of the University of Michigan. A committee was also formed by Americans resident in Paris with a view to foster the same work. The late Dr. Thomas W. Evans was made president of the local committee, and Dr. E. A. Crane, who still holds the position, secretary.

[4] Report of Commissioner of Education, 1894–95, Vol. 1, pp. 310, 311.

The success of these efforts is apparent in a series of official decrees modifying the requirements for foreign students who seek admission to the French universities, particularly on the lines originally suggested by Professor Furber and confirmed by the American committee. The first of these orders, issued in January, 1896, opened the French faculties of science to foreigners on liberal conditions. The full details as furnished to the office by M. Paul Melon, secretary of the Franco-American Committee, are to be found in the Report for 1895–96. It suffices to repeat that by these conditions an American student will be admitted to these faculties on his bachelor's degree, and will be permitted to choose his studies. After pursuing any scientific course a year, he can, if he wishes, apply for an examination in this branch, and if successful, obtain a certificat d'étude. Three such certificates—taken, for instance, in calculus, pure mechanics, and astronomy—will make him a licencié, and he can then secure the French doctorate upon the presentation of a satisfactory thesis. If the student has the ability, and so desires, he can discharge all three subjects the same year; or, if he prefers, he can do this in successive years, migrating, if he wishes, from one university to another, and studying at the same time whatever other subjects he may choose.

It was announced at the time the decree was passed that the faculty of theology was about to make valuable concessions, and as the faculty of medicine was already opened on favorable terms to foreigners, there remained only to secure arrangements with the faculties of law and of letters. That the situation may be made clearer, a comparison of the conditions with those required for the German doctorate, which are generally understood in this country, is here quoted from the American Register (Paris) of February 1, 1896:

> The new decree introduces into the faculties of science all the better features of the German system, so popular with students from America. As compared with the regulations which have hitherto obtained, the decree establishes three important innovations: (1) Wide latitude in the choice of studies; (2) the liberty of migrating from one institution to another, and (3) the privilege of taking examinations either in succession or en bloc. According to the ancient system, a student was held strictly to a certain group of studies with no power of varying his programme; he was obliged to discharge his subjects simultaneously, and was without the right of removing to another faculty, except for very urgent reasons. He will now, however, be at liberty to elect to a wide extent the branches he will follow; he will be able to change his place of residence, pursuing courses in one city and another. These two features are preeminently German. The third, relative to the order of examination, is French; and is such, it would seem, as should give to the French system a possible advantage. In Germany, in order to secure a doctorate, the student first submits his thesis and takes his examinations afterwards. He receives the doctorate or nothing. In France, on the contrary, the examinations coming first, the student secures a certificat d'étude for every study he discharges, and the degree of licencié when he has completed three. He thus, it will be seen, receives independent credit for every step he takes—a consideration of importance to those who may be interrupted in their course.

If the student is an able man, and thoroughly prepared, he can secure his license in a year by carrying three studies simultaneously; or he may, if he prefers, pursue them in succession, traveling from one university center to another, and following at the same time a variety of courses, the doctorate being open to him at any time after he has taken his license. At the German universities, again, three years' study are required before the doctorate is given. In France it may be obtained in one, provided the candidate can within this time secure his license and have his thesis ready to sustain. Be it said, however, at this juncture, that though the minimum of time which the French require may be less, the value of their doctorate is equal to that conferred by any German university. The French doctorate demands a decidedly high grade of research. But this need not deter our better class of students. There are many whose abilities will be equal to the test, while the right of discharging their examinations first and leaving the doctor thesis to later years or riper powers confers a privilege to be prized both by students who may doubt their intellectual maturity and by those who for any reason are unable to spend a great amount of time abroad. Both classes, after a not too lengthy stay in France, will be able to secure the license, a degree of excellent repute, returning home, if they so choose, to prepare their theses at their leisure.

The satisfaction caused by the favorable action in respect to the faculty of sciences was considerably lessened at the report of a proposition in the superior council to close the Paris faculty of medicine to foreigners.

The prospect was the more depressing because this faculty above all others attracts foreign students. The course of the council, it was believed, was influenced, if not wholly dictated, by the opposition of French students to their foreign compeers—an opposition at marked variance with the cordial welcome accorded strangers by the students of other faculties. The representations by the committees interested in the international movement brought a statement from the ministry of the cause for the proposed change in the medical faculty to the following effect: Despite the great increase of equipment and accommodation recently made for medical students in Paris, it was found impossible to meet the requirements of the native students, and consequently the authorities entertained the proposition of distributing a portion of the foreign clientèle among the provincial faculties until the facilities at Paris could be further increased. It was asserted that through the advance made in the last few years the provincial faculties rival in many cases those of Paris; and, further, that students subject to the new measure would be beginners, to which class America scarcely contributes. Rarely does an American enter a professional school of Europe for any other purpose than to pursue a specialty which he has already begun. The relation of foreign students to the faculties of medicine was finally regulated by a decree of July 21, 1896,[1] which obliges all foreign students aspiring to the diploma of doctor of medicine to submit to precisely the same conditions as French students. For foreigners who do not aspire to this

[1] See Report of Commissioner for 1895-96, Vol. 1, p. 634.

diploma, which permits them to practice medicine in France, the facilities already extended will be continued and even increased. Such students will, however, only be entitled to a special diploma intended solely for foreigners and granting no rights to practice in France. This favorable close to what seemed for a time an unfriendly course shows the influence of the committees that are seeking to promote scholastic relations between our own country and France. The last act by which the Government affirms its sanction of the efforts of the committees is the decree of July 21, 1897, empowering the universities to institute in any faculty a special doctorate which shall be open to natives and to foreigners.[1] This title is quite independent of the degrees established by the State, and confers none of the rights and privileges attached by law and regulation to those degrees, nor can it be substituted for them.

In pursuance of this decree, the University of Paris has instituted the degree of Doctor of the University of Paris in the faculties of letters, of sciences, and of medicine. The decision bears date April 1, 1898, and is to take effect at the close of the scholastic year 1897–98.

Foreign aspirants for the new doctorate are received on the diplomas of their own colleges, the faculty in each case reserving to itself the right to determine the value of the same. The faculty of letters requires the candidate to spend at least four semesters in study, part of which may be accomplished in one of the French universities or in any foreign university, at the discretion of the faculty. The faculty of sciences requires a year's study to be passed in residence; in the faculty of medicine the doctorate can only be obtained by candidates who have pursued the courses and passed the examinations of the faculty. It may be added that these arrangements benefit men and women students alike, as the French universities are open to both sexes.

The full text of the order is as follows:

THE COUNCIL OF THE UNIVERSITY OF PARIS.

After citing the decree of July 21, 1897, the order proceeds as follows:

I. GENERAL REQUIREMENTS.

ART. 1. A doctorate of the University of Paris is created.

ART. 2. Aspirants for this degree must be enrolled on a special registry at the secretariate of the faculty or the school of the university in which they wish to pursue their studies.

At the time of enrollment they must present their diplomas, special certificates (attestations d'études), or scientific degrees.

They must complete the required term of study as prescribed hereafter. They must pass the public examinations.

ART. 3. They must submit to the rules and discipline of the university.

ART. 4. The diploma will state the subjects in which they have been examined.

The diploma will be signed by the members of the examining jury and by the

[1] See Report of Commissioner for 1896–97, Vol. 1, p. 37.

dean of the faculty or the director of the school in which the candidate has passed his examination.

It is delivered under the seal and in the name of the University of Paris by the president of the university council.

II. PARTICULAR REQUIREMENTS.

ART. 5. In the faculty of letters, candidates natives of France must present the diploma of the licentiate in letters (licencié ès-lettres), the faculty reserving to itself at all times the right to permit the substitution of other degrees for that; foreign candidates may present their own diplomas, the faculty reserving to itself the decision as to their value.

The period of study is at least four semesters.

It may be passed in one of the great scientific schools of Paris or in a university of France or of a foreign country.

The period of study may be abridged by decision of the faculty.

The examinations comprise (1) a thesis written in French or in Latin; (2) questions upon propositions submitted by the candidate with the approval of the faculty.

ART. 6. In the faculty of sciences candidates must present the certificate of superior studies in two of the following subjects:

1. Differential and integral calculus.
2. Rational mechanics.
3. Astronomy.
4. Higher analysis.
5. Higher geometry.
6. Celestial mechanics.
7. Mathematical physics.
8. Physical and experimental mechanics.
9. General physics.
10. General chemistry.
11. Mineralogy.
12. Biological chemistry.
13. Zoology.
14. Botany.
15. Geology.
16. General physiology.
17. Physical geography.

In the case of foreign candidates the faculty reserves to itself the right of determining the equivalence of their diplomas.

The period of study is one year.

The examinations comprise a thesis embodying the results of original research and questions upon problems proposed by the faculty.

At the Superior School of Pharmacy the aspirants, if natives of France, must present the diploma of pharmacy, first class; if they are foreigners, two special certificates (certificats d'études): one, the certificate of chemical pharmacy and toxicology; the other, the certificate of galenic pharmacy and materia medica. The school reserves to itself the decision as to the equivalence of foreign diplomas. The term of study is one year at least. The study must be accomplished at the school. The examination consists of a thesis embodying the results of original research.

ART. 8. This order will take effect at the close of the school year 1897–98.

Paris, March 28, 1898.

M. GRÉARD,
Vice-rector, President of the University Council.

Prof. E. LAVISSE,
Secretary of the Council.

A subsequent order of the university council, with respect to the doctorate in the faculty of medicine, determines the conditions as follows:

The degree of doctor of the University of Paris will be conferred, under the conditions prescribed, upon foreign students who have been admitted to the

courses and have passed the examinations of the faculty of medicine at Paris without having obtained the degree of bachelor (French).

The following are the fees for the examinations for the doctorate: Faculty of letters, $26 (residence, 4 semesters); faculty of sciences, $60 (residence, 2 semesters); faculty of pharmacy, $186 (residence, 4 semesters); faculty of medicine, $135 (residence, 4 semesters); faculty of divinity, $32 (residence, 2 semesters); faculty of law, $64 (residence, 2 semesters).

A letter recently addressed to a member of the Franco-American committee by the dean of the Paris Faculty of Law in respect to a student who desired to pursue his studies in Paris is of interest in this connection. The letter states that the candidate must make his application to the Minister of Public Instruction, accompanied with copies of his diplomas, translated and sworn to before a notary, which he offers as a substitute for the French baccalaureate of letters, and as a means of securing dispensation from the required term of study in France.

If it appears that the title of his own college (in this case graduate of the University of Chicago) is conferred after three years of study, it is probable that the minister will accord dispensations from the course of three years in the French University.

The candidate then, after he passes successfully the examinations of the first, second, and third years, and pays the fees for enrollment and examinations, may very soon secure the doctorate.

The advantage of these important concessions, which are due in the main to the initiative and continued efforts of Americans, are not confined to our own country. In England the new opportunities are greatly appreciated and free acknowledgment made of the service which American zeal has accomplished for all students.

The revival of old sympathies between the universities of Edinburgh and Paris is an interesting feature of the general movement. The comfort of foreign students who go to pursue their studies in France is greatly promoted by the "Committee of Patronage of Foreign Students," which has an American section and a Scotch section. Paris is the seat of the committee, but it has branches in all the French universities. At the annual reunion of 1896 the Scotch delegates were the recipients of marked attentions, which they acknowledged afterwards in a very complimentary letter. As a consequence of the good will thus excited, the Scotch committee received important additions to its membership, among these being named, specially, the Duke of Fife, the Marquis of Lothian, Lord Kelvin, the rectors of the Scotch universities, and Sir Archibald Geikie. This committee has raised several scholarship funds for the support of Scotch students in France. The "Committee of Patronage" not only endeavors to find suitable homes for foreign students, but seeks in many other ways to promote their social and intellectual advantage. Especially helpful are the courses in the French language maintained by members of the committee. By means of these the foreign student secures for a small fee the benefit of special lessons and practical exercises. The

efforts of the committee have extended even to Japan, where a branch has been formed with the object of attracting Japanese students to France and insuring their comfort in the strange land. Similar efforts are in progress in China, and the committee report that a company of students will be sent from Pekin to Paris.[1]

It may be said, indeed, that of even greater importance than the scholastic advantages secured is the fraternal spirit which the movement has awakened, and which is manifested in the most delightful manner on festive occasions. A notable instance was the inaugural of the American University Club in Paris on Thanksgiving Day, 1896. United States Ambassador James B. Eustis presided at dinner, and the toasts and responses celebrated in the most felicitous manner the fraternal spirit and aims of higher education in all countries. On that occasion, also, attention was especially called to the fact that the new privileges extended to foreigners are in full accord with the revived liberty of the French universities.

In response to a call for a general statement of what had been accomplished, Dr. E. A. Crane, secretary of the American committee, dwelt particularly upon this aspect of the subject. He said:

You are probably aware that within the past two or three years the French university system has been subjected to a process of reorganization—the object being to decentralize it, to modernize it, and to more perfectly adapt it to the special needs of our time, that condition educational work in France, as well as everywhere else; and that the re-creation of the University of Paris, which was celebrated on Thursday last with brilliant ceremony at the Sorbonne, marked the first stage of the proposed reform.

This reformation, which in its inception was essentially French, and had in view only the national interest, has been greatly promoted by a study of some of the results the Germans have obtained from their liberal policy of according degrees to students who have completed special academic courses. And as students are matriculated in the German universities without reference to their nationality, not only have the universities become centers of light and learning in Germany itself, in all matters pertaining to science and letters, but their fame has gone abroad and they are frequented by multitudes of foreign students.

On the other hand, in French institutions, famous in the history of "the humanities," and of equal or even greater present repute, foreign students are very few in number.

The preference recently shown by Americans for Germany, as a country in which to complete their "higher education," is certainly remarkable. There are to-day hundreds of young Americans pursuing their studies in German universities, while there are less than forty Americans regularly matriculated in the faculties of France.

The significance of this statement will be still more manifest when you are informed—as we have been on good authority—that nearly two thousand American young men and women come to Paris every year either to attend the "free courses," or to profit by private instruction.

[1] Among other advantages this committee is able to obtain a reduction of 30 per cent on the steamers of the Gallic Trans-Atlantic Company for American students in France. All desired information can be obtained from M. Paul Melon, secretary of the Franco-American Committee, 24 Place Malesherbes.

After rehearsing the efforts of Professor Furber and the several committees, he concluded with an eloquent defense of the free exchange of knowledge as a means of promoting civilization, individual progress, and international friendship.

The true importance of the facilities extended to foreign students arises from the high standard of the French doctorate, and it does not appear that any of the concessions lower the standard for foreigners.

The following account of the University of Paris by Prof. Bonet-Maury, of the faculty of Protestant theology, received as this goes to press, throws further light on the conditions that will be met by the student in Paris. It shows the organization of the university and confirms the view of the general tendencies that have been traced in the opening part of this chapter.

The University of Paris in 1898.[1]

[By Prof. Gaston Bonet-Maury.]

The present University of Paris is younger than the University of Chicago, since it was established by the law of July 10, 1896, together with 15 other universities, in order to replace the University of France, which was a strongly centralized institution for national education, in its three branches, founded by Napoleon Bonaparte I, in 1808. The present organization, on the contrary, is an attempt to decentralize public education and to revive some of the 22 universities which existed in France before 1789. Each of the 15 present universities is an "incorporated body" having a government and a budget of its own; the only connection with the central government being the distribution of a part of the State budget, the appointment of the professors by the President of the Republic (out of a list of candidates proposed by the senate of each university), and the general supervision by the "higher council of education" (Conseil supérieur de l'instruction publique), or by the inspecteur général.

The University of Paris consists of six schools or faculties: (1) Letters, (2) sciences, (3) law, (4) medicine, (5) school of pharmacy, (6) protestant school of divinity.

There are besides, in Paris, a dozen auxiliary schools which are, as it were, the vanguard and wings of the army of scholars; for instance, the "Collège de France," which is the vanguard; l'École des Chartes; l'École Pratique des Hautes Études; l'École Polytechnique, museum of natural history; school of modern oriental languages; school of political sciences; the Pasteur institute of bacteriology, etc. Except in the last two there is no fee for admission in all these schools; only for the work done in the laboratories is a fee required.

Each of the six faculties or schools which compose the University of Paris is a self-governing body, electing its own dean, who is assisted by the body of professors and lecturers (Conseil de faculté) and distributing independently the budget assigned to it. Each faculty elects three deputies (of which the dean is necessarily one) to the general assembly of the university (Conseil général des facultés) which meets once a month at the Sorbonne and is presided over by the rector (or president of the university). This senate or general assembly discusses matters of general interest, the creation of new lectureships or the permission to auxiliary

[1] An address delivered before the members of the University of Chicago at the special meeting held on Tuesday, August 1, 1898, Kent Theater, 5 p. m. Reproduced from the University Record, Vol. III, No. 19, August 5, 1898.

lecturers to deliver courses (cours libres), the distribution of the budget or other financial affairs; passes judgment on cases of discipline, elects the delegates, and votes the addresses sent to foreign universities.

There are, at Paris, three committees which attend to the moral and financial condition of the students: (1) The Committee for the Protection of Foreign Students (Comité de Patronage des Étudiants Étrangers), which has its office at the Sorbonne and is under the chairmanship of M. Casimir Périer, a former President of the French Republic. Its agent is M. Paul Melon. It has under its control the home (125 boulevard St. Michel), which is managed by Miss Chalamet, a distinguished Protestant lady. (2) The Club of the Protestant Students (24 rue de Vaugirard) under the control of its founder, Rev. Jean Monnier. (3) The General Association of the Students of the University of Paris (79 rue des Écoles).

There are three regular degrees, the degrees of bachelor, licentiate, and doctor in each faculty; the law school, however, has only two, the licentiate and the doctor; and the medical school only one, the doctor. The highest degree can be obtained only after from five to six years of work, which for strangers would involve too large an expenditure of time and money. Therefore, at the initiative of Dr. Harry Furber, of Chicago, and through the activity of a Franco-American committee under the chairmanship of Prof. Michel Bréal, a new degree was created July 21, 1897, which allows foreign students, after a shorter time of residence and under certain conditions, to obtain the doctorate of the University of Paris or of the other universities of France.

What now will be the spiritual tendencies of the new University of Paris? Leaving to the past all that is dead, it will keep up all that was true and beneficial for mankind in the traditions of the ancient university. Of the old Sorbonne it will drop that narrowness of mind and intolerance which led that institution to condemn Luther, Melanchthon, and Jansenism; but it will preserve that sense of catholicity which made her the alma mater of all universities of Europe in the Middle Ages, so that she welcomed the students of every nation, who had at Paris their own colleges. To the former university will be left the antiquated ceremonies and expensive fees for conferring degrees, which render them inaccessible to poor students, and the new university will be imbued by a democratic and liberal spirit. But, above all, our new university will pursue this aim, namely, not only to educate scholars or engineers, chemists or physicians, but to make of its students good men and good women (for women are admitted as candidates for degrees in every faculty, except that of divinity), conscious of their responsibilities as citizens and Christian men and women. There is not much difference between the French and the American ideal of a university; both aim at the recognition of the independence of science, the search for truth in itself, and endeavor to render the achievements of science useful to their fellow-citizens. Therefore I hope that the intercourse between the University of Paris and the University of Chicago may become more frequent and continue as cordial as in the past. In the name of your trans-Atlantic brethren at Paris I wish all prosperity to you, the president and the members of the University of Chicago, since you are coworkers in the noble task of aiding humanity on its onward march toward truth and righteousness, peace and good will among all nations, who are one and all children of God.

As the vast proportion of—practically indeed, all—the foreign students studying in France are found in Paris, we may properly close this review by a statistical summary of the students registered in the Paris University for the latest year reported and four years preceding:

Students.

Faculties.	Total number.	Total foreign.	Total from the Republics of North America and Central America.
1891–92.			
Protestant theology	39	3	
Law	3,612	203	11
Medicine	3,404	663	10
Sciences	609	70	7
Letters	1,163	93	6
Pharmacy	1,038	17	
Total	*a* 9,925	1,049	34
1892–93.			
Protestant theology	47	7	
Law	3,503	208	41
Medicine	3,634	662	11
Sciences	539	60	5
Letters	1,230	99	23
Pharmacy	1,097	18	
Total	*b* 10,110	1,054	51
1893–94.			
Protestant theology	53	11	
Law	3,195	231	13
Medicine	4,205	786	14
Sciences	465	44	
Letters	1,450	117	18
Pharmacy	1,209	23	
Total	*c* 10,577	1,192	45
1894–95.			
Protestant theology	58	9	
Law	2,916	143	6
Medicine	4,369	802	13
Sciences	776	89	4
Letters	1,552	129	20
Pharmacy	1,280	26	1
Total	*d* 10,951	1,189	44
1895–96.			
Protestant theology	53	5	
Law	3,363	186	6
Medicine	4,044	623	32
Sciences	937	82	5
Letters	1,407	104	18
Pharmacy	1,366	24	3
Total	*e* 11,170	1,024	64

a Including 244 women students, of whom 112 were French and 132 foreigners.
b Including 238 women students, of whom 121 were French and 117 foreigners.
c Including 390 women students, of whom 215 were French and 117 foreigners.
d Including 453 women students, of whom 243 were French and 210 foreigners.
e Including 522 women students, of whom 288 were French and 234 foreigners.

These statistics, it will be seen, bring the record simply to the year following that in which Professor Furber began his mission. It is somewhat surprising to note that the number of German students has been increasing during the period reviewed, rising from 32 in 1891–92 to 59 in 1895–96. It is stated that as a result of the decree of January, 1896, modifying the requirements for the admission to the regular doctorate in the faculty of sciences, the number of German students registered rose from 59 to 112.

VICTOR DURUY, MINISTER OF PUBLIC INSTRUCTION, 1863-1869.

The system of public education by the Republic is an outcome of the revolution of 1789; it perpetuates also, as we have seen, many external features of the system created by Napoleon, but to the period that separates the present Republic from the Imperial régime, the system owes its best elements.

Among the men who were ministers of public instruction during that period two were preeminent, Guizot (minister of public instruction, 1832–1836), who laid the basis of the primary school system, and Duruy (minister of public instruction, 1863–1869), whose impress is indelibly stamped upon superior instruction. The recent death of M. Duruy has been the occasion of reviewing his eminent service as an author and statesman. The following citation from an address delivered by the Duc de Broglie, is an admirable summary, not alone of M. Duruy's career, but of the entire movement of education during the eventful period of the Restoration, the second Republic (1848), and the second Empire.

VICTOR DURUY.

[From the Revue des Deux Mondes, 1st Feb., 1898.]

According to a custom recently adopted by the Academy of Moral and Political Sciences each new member must present to the academy a notice of the life and works of his predecessor. The Duc de Broglie, being called to succeed M. Duruy, acquitted himself of this duty by communicating the following study of the career of that eminent man:

I.

The portrait of M. Duruy was drawn immediately after his death by companions of his youth, whose friendship had followed him through all the phases of his valuable life, and by disciples who, after leaving his instruction, entered, under his auspices, upon the career in which he was their guide. They had been his intimates, and could reproduce faithfully the features of the model they painted. They were able to entertain us with describing the gentle gravity of his private life and the charm of his intercourse at the same time that they demonstrated the merits of his writings, of which they were better judges than anyone else could be. So, when I was called upon to perform the same task with Messrs. Jules Simon, Lavisse, and Lemaître, I could not attempt it under the same conditions of competence and talent as those gentlemen enjoyed. I had known M. Duruy only in the later years of his life, and I can only testify to those rare qualities which it was vouchsafed to me to observe, such as his serenity, which was not disturbed by the natural melancholy of age and retirement, and his eagerness to forget strong and even bitter dissent and his willingness to endure even contradiction in matters in which he had the right not to allow his authority to be questioned.

I must therefore borrow from better witnesses than myself certain interesting details of the beginnings of this laborious life. Nothing could be more striking than the picture that M. Ernest Lavisse has given us of Duruy's childhood, passed in the ancient royal establishment of the Gobelins, where, for seven generations, the Duruy family had practiced a profession as much artistic as industrial, and so had been in a condition to cultivate elevated tastes and sen-

timents in a modest way. Duruy's father expected, as a matter of course, to leave his situation to his son, when his attention was called to the fact that the young apprentice, whenever he could save a few moments of freedom in the intervals of weaving tapestries, laid aside his needle to study a book that he kept by him. This was an indubitable indication of taste. All his instincts appealed for a higher education. But such an education would demand a heavy sacrifice on the part of the father and would derange all the economical calculations of a household whose pecuniary resources were limited. The paternal affection, however, decided in favor of it, and was speedily recompensed by the success of the boy who, soon after entering college, gained a scholarship.

The institution to which Duruy was sent, and which has since become the Collège Rollin, was under the directorship of an enlightened ecclesiastic, the Abbé Nicolle, whose name has remained, I believe, justly honored in the university. So that it was a priest and a personal friend of one of the first ministers of the restoration who presided over the institution he had founded. But, despite the character of the master and the nature of his relations, such was the general spirit of the time that nearly all the students shared in all respects, and especially in religion, the same sentiments which the royal administration professed, often with more zeal than prudence. A fellow student of M. Duruy, whose name has also made some noise in the world, Charles de Montalembert, declared that among his comrades there was not one in twenty who cared to make an open profession of his Christian convictions, and it required considerable courage to persevere in this course. "One day," says another pupil of this institution, who was a student of philosophy at the time, "the fancy took us to discuss among ourselves the existence of God. We had the delicacy to request our teacher to withdraw, so as to leave us greater liberty and not compromise himself. The discussion was lively and profound, and when the question was put to vote the existence of God had the majority of 1."[1]

I do not know whether Victor Duruy took part in this deliberative assembly or not. If he did, nothing in his subsequent opinions on this point prevents us from believing that his was the vote that preserved the Creator in being.

But, in other respects, it was natural that he should follow the general current, and that, upon entering the École normale immediately after the revolution of July 1830, after having even endeavored to participate in actual combat, he should share the generous passions, the illusions, and even the prejudices, of the young men of the period, in all their effervescence. He was therefore actuated by the prevailing spirit of opposition which considered it a crime on the part of the new royalty not to push to its extreme consequences, and especially not to propagate, the democratic and liberal movement of which it was the outcome. The severity of this judgment which, later on, age and experience taught him to moderate, still persisted when he was called upon unexpectedly to leave the provincial position which was the scene of his début and go to Paris to teach history at the college Henri IV, at which institution King Louis Philippe had entered his youngest sons. He was chosen for this position of trust simply because his name was the first on the list of competitive candidates. This selection shows that the royal advisers cared little for personal opinions where capacity was assured, and, at any rate, that there was no spirit of inquisition in making the selection. Duruy's prejudices or convictions were, nevertheless, not disarmed, so little indeed, that the marked favor with which he was received at the Tuileries, far from moving him, seemed, according to M. Lavisse, to have caused him a kind of malicious surprise, as if he regarded it as something not to be expected from the royal dignity. Accordingly he remained thereafter, in spite of this kindly reception, in an attitude of cold reserve toward the family of his pupils, which however, did not prevent him from

[1] Souvenirs du Vicomte Armand de Melun, Tome I, p. 20.

conceiving a real attachment for them, and later on from following with constant interest in all its vicissitudes the agitated and brilliant career of that one of them whom France and letters have recently lost.

Duruy married early and the salary of an assistant professor was insufficient to meet the requirements of a rapidly growing family. An indispensable addition to his income was furnished by the preparation of school books, which was intrusted to him by the great publishing house of Hachette, then as now in possession of a large trade in this line. This work consisted of a series of text books on nearly all imaginable subjects in history and geography. M. Jules Simon has made a list of them which is really frightful, and includes at least sixty. As a matter of fact this species of composition is not very difficult. Facts are taken at second hand from the proper sources and are accompanied by commonplace reflections together with anecdotes of greater or less authenticity. But, as M. Jules Simon has pointed out, this is not the character of the elementary works which bore the name, then little known, of M. Duruy. Every one of them bears the marks of personal labor and thought. They exhibit a selection of facts drawn from the best sources, even those most recently discovered, and the whole is arranged and discussed with an erudition which is carefully disguised. The remarks and reflections that accompany the text are concise and full of originality. It is not surprising that since he extended his researches to so many subjects at once, besides keeping his new editions, that succeeded each other rapidly, up to date in all scientific matters, M. Duruy needed all of fourteen hours a day for his indefatigable labor, and that he could say of himself "I am a beast of burden." A single comparison will show how much study and reflection each of these school books represents.

Every one knows the great history of Rome which marked the culminating point of Duruy's talent and reputation. Place this vast work side by side with a brief summary of the same subject published by him thirty years before with nearly the same title, and, notwithstanding the disproportion in the size of the two works, you would be astonished at their resemblance. Not only is the narrative similar, but the opinions are substantially unchanged, differing only by the extent of the developments upon which they are based. It is clear that his final work was already contained in the germ in his earlier one, which seems to be a résumé of the former.

Long years passed, however, before such publications, notwithstanding their number and the justly high esteem in which they were held by those who were qualified to appreciate them, extended Duruy's reputation beyond the limited circle of the scholastic public. A few works on a larger scale, namely, an essay upon Greek history, which he has since largely reworded, and the first books of the history of Rome, which he has also since recast nearly entirely, attracted more attention. Yet while bestowing a prize upon one of these works in the name of the French Academy, the perpetual secretary, M. Villemain, simply said that it was a conscientious study prepared by an able professor of a lycée. Nor was the advancement of their author in the career of instruction very rapid, since he had only risen from a second to a first class professorship by the time he had reached the full maturity of age. Yet he never complained, but passed the time in his cherished occupations, without impatience, without regret, and without other relaxation than that which he found in the charms of domestic affection, when there came upon him what M. Jules Simon calls the great and inconceivable surprise of his life. By this he means those unforeseen relations which had been established, without being sought for, between the modest man of learning and the all-powerful master whom France had just placed over herself. These relations were about to become the origin of a fortune of which the scholar had never dreamed.

The immediate occasion of the change in his circumstances had apparently no

great significance. The Emperor, in the moments of freedom which the affairs of state allowed him, had undertaken the preparation of his Life of Cæsar, only the first part of which ever appeared, owing to the reverses in the latter years of its author's life. He sought aid from those who had the reputation of having made a thorough study of Roman history, among whom it was natural that M. Duruy should be one of the first consulted. What was less to be expected was that not only did his advice receive respectful attention, but the adviser himself was so quickly appreciated that the prince did not hesitate to advance him at once over all the degrees of instruction by nominating him in 1861 master of examinations at the école normale and academic inspector; in 1862 placing him in charge of the historical studies at the école polytechnique and appointing him inspector-general; then attaching him to his person as one of his own secretaries, and finally (to quote Saint-Simon) projecting him like a bomb into the position of minister of public instruction in 1863—all within less than four years.

M. Jules Simon is right. Great and equally natural was the astonishment among those who knew and shared the sentiments of which M. Duruy made no mystery. Although he had never made any pretensions to a political rôle and had no personal reason for feeling an attachment for the republican constitution of 1848, he had never concealed his displeasure at the coup d'état of the 2d December that put an end to it, and he had openly voted against the plebiscites that established the new Empire. Moreover, the general tendency of his opinions differed from that which prevailed in the first years of the imperial régime sufficiently to draw censure on several occasions upon certain passages in his works from the authorities, to whom in those days the writings as well as the acts of the members of the teaching force were subject. This censure was not without weight, because the Empire had withdrawn even from the highest positions in the university both their character of immovability and their guarantee of dignity and independence, which the national assembly of 1871, as soon as it met, restored to them, greatly to its own honor. Not being agreeable to the official directors of instruction, as his biographer points out, and being even somewhat under suspicion from them, how can we explain the fact that the sovereign himself sought him out to take him from his retirement and admit him to the intimacy of personal service and decided to confer upon him that portion of his authority of which governments are habitually most jealous, that, namely, which seems to dispose of the future by the direction given to the education of the young? And how could M. Duruy, but now the opponent of a power the origin of which he had combated, ally himself with this same power and become an associate in exercising its authority? Upon reflection it seems that we need not go far to find the cause of this unexpected reconciliation.

Let us say at once that, notwithstanding the habitual injustice of political passions, no one ever suspected M. Duruy of having obtained the Emperor's favor by the least sacrifice of the dignity of his character or the freedom of his opinions. I never heard any comments of this kind made upon M. Duruy, even among the most malevolent. What we have learned since then shows that people were right to abstain from such charges.

It was already known that when he consented to become associated with the cabinet of the Emperor, M. Duruy had insisted upon retaining his position of inspector-general, and had refused to accept a place carrying a higher salary. It was also noticed that when he was invited to the fêtes at Compiègne he never appeared there. We know further now that on his first interview with the Emperor, he seized that natural occasion to relate what had been his attitude at the moment of the coup d'état and to explain his motives. His interlocutor either understood them, or, eager for an understanding upon other matters, thought it not worth while to take special notice of them. But the same subject could not have failed to come up often, notably when the Emperor, in order to give M.

Duruy a full understanding of the historical work he was contemplating, thought it proper to communicate to him a preface in which he sought to establish the doctrine that there are certain privileged men who are destined by Providence to save society in times of trial, and who are therefore entitled to raise themselves above common rules.

Although M. Duruy must have certainly understood that this theory had a personal application, and that any refutation of it must have a similar character, he none the less criticised it quite sharply, and, coming to speak of assaults upon the existing order which, in the interests of public good, may become legalized, he said, "Such things are sometimes done, but it is better not to speak of them." This was not any formal blame of the act itself, but it was a positive refusal to join in the approbation which the victorious and crowned author wished to impose upon his readers. I do not know whether it was upon this occasion or another that, when coming out of the Tuileries and crossing the Place de la Concorde, M. Duruy questioned whether his replies had not done more harm than they had given instruction. It made little difference; the Emperor had simply said, "I do not share all the ideas of M. Duruy; nevertheless he is a very intelligent man."

It is clear, nevertheless, that these returns to recollections of contemporary politics were rare and were only approached occasionally, and en passant in the early conversations. The Emperor had called M. Duruy into consultation as a guide in his historical researches, so that it was chiefly history, and especially the great subject the Emperor desired to treat, that must have formed the principal subjects of the interviews. Now, he must soon have discovered that M. Duruy thought as he did on the subject he had most at heart. Upon the genius of Cæsar, upon the part he played and the influence he exerted, the judgment of M. Duruy differed from that of Napoleon III only in the degree of intensity which separates the approbation of reflection from the admiration of enthusiasm.

However little to his taste had been the transition from a republic to an empire in France in 1852, yet a similar revolution at Rome eighteen hundred years before (under conditions which he properly judged were very different) seemed justified to the conscience of Duruy as a historian. The political changes attempted by Cæsar, which death alone prevented him from completing and which his heir really did complete, seemed to Duruy to have been not only necessary at the time they occurred but desirable. The Emperor could ask no more for the glory of the hero whose life he wished to celebrate. The good understanding between the sovereign and his future minister was therefore complete as regards the first and principal subject of their common treatment, and this concord was the origin of a mutual confidence, the effect of which, by a transition to be noted presently, was destined to extend to all their relations, although the latter could hardly be expected to depend upon that single bond. By a circumstance the like of which, I believe, has never existed, although everything for the present separated the two men, a union between them sprung up from their study and equal appreciation of the past, so that a kind of literary collaboration preceded and prepared their political association.

The homage which he rendered to the genius of Julius Cæsar and to the character of the work, the remembrance of which remains attached to his name, was not with M. Duruy an opinion born of circumstances and still less of complaisance. He had already established it publicly on two occasions long before there could have been a question of any relation between the Emperor and himself. The first was in one of the chapters of his History of Rome already published, in which, while recounting the impotent efforts of Caius Gracchus, he called that tribune a precursor of Cæsar, and regretted that he had not established a civil tyranny at Rome, which would have been preferable to the military tyranny which had to follow necessarily. He of course used the word tyranny (which he

took pains to underline) in the sense in which it was used at Athens and not in the French acceptation of the expression. The next occasion was when, having to undergo an examination for the doctor's degree, he had taken for the subject of his thesis the condition of the Roman world at the time of the establishment of the Empire, and he had resolutely battered down the old classical tradition which deplored Cæsar's victory at Pharsalia while mourning for Cato and Cicero, and which regarded Brutus and Cassius as the last of the Romans.

He showed by good reasons (which are, I believe, quite generally accepted to-day) that if the imperial régime, as a false rhetoric had always maintained, had only carried shame and oppression in its train, it would never have been accepted (as it was in fact) by the populations of the Roman world, not only without resistance but with an eager and grateful submission. The reason is, said he, that the republic to which Cæsar gave the death stroke had come to be only the shadow of itself and a bloody one. Torn by factions within, which decimated and proscribed one another in turn, it nevertheless continued to exercise without a tyrannical and corrupt dominion, so that the day that terminated in the capital a liberty which had become purely nominal was the signal for an era of deliverance in all the provinces which was welcomed with an acclamation of hope. He had also questioned seriously, by the way, many of the legendary horrors or scandals imputed to the first emperors on the strength of the somber pictures of Tacitus or the cynical anecdotes of Suetonius.

Next, after establishing the truth that some good was always mingled with evil even in the worst days of the Empire, he proceeded to herald with lively satisfaction the coming of the great emperors of the second century. Trajan, Antoninus, Adrian and Marcus Aurelius, those enlightened administrators and philosophical legislators who, holding the nations of the world in peaceful unity in their hands, gave them, in his view, long years of material prosperity and moral progress. Those times he did not hesitate at a later period to count among the happiest that it has been given to humanity to enjoy.

This apology, or, to speak more correctly, this explanation, of a great historic fact was little to the taste of that portion of the liberal party who made the dangers of what was then called Cæsarism the constant theme of their opposition, and for whom the saddest recollections and most grievous occurrences of the Roman Empire furnished a convenient means and transparent veil for covering the French Empire with bitter epigrams. We remember with what talent men who were not without both knowledge and taste, like Ampère, Beulé, and Prevost-Paradol, devoted themselves, through the whole reign of Napoleon III, to this kind of polemics, the only kind that was compatible with the reserve then imposed upon the press.

The picture of the [Roman] Empire presented by M. Duruy was not favorable to this method of discussion, for which generous sentiments relieved by a sarcastic turn had rapidly acquired a great vogue. In the opposition, where he still belonged, some regrets were expressed for his course, but it was not in the nature of his mind to place history at the service of even the highest ideas, even those which were dearest to him; he would have been afraid to falsify its character by such use. He gave testimony to the truth as he found it after a loyal and deliberate examination, without caring whether it proved pleasant or otherwise. Therefore he was not disturbed when, upon the day of his thesis, the venerable President Leclerc, faithful to his traditional college opinions, reproached him somewhat sharply for having shown too much indulgence for crowned criminals. He would have paid no attention to this thrust if one of the examiners, M. Nisard, who was openly attached to the new régime, had not intervened in the capacity of official defender and engaged, by way of rejecting the accusation, in some quite compromising moral distinction which M. Duruy hastened to disavow.

Whether or not the Emperor was informed of this incident of the session which made some stir at the time, I do not know, nor do I know whether he had it in mind when he sent for M. Duruy. It is not impossible, because the literary world being then, in the silence of the tribune, the refuge of political life, everything which happened in it might well have attracted his attention. At any rate, the point of view in which M. Duruy had placed himself was certainly that which best accorded with his own sentiments, for it was true of Cæsar's work that its legitimacy and resulting benefits were demonstrated by its results as much as by its causes. Moreover, when this theme was developed by M. Duruy with the ample and severe guise which was best suited to it, and with the accent of gravity to which a profound conviction added a touch of emotion, no language was better suited than his to cast a veritable spell over the auditor who listened to it and drank in the speaker's words with dreamy eyes, as is described by M. Lavisse.

This grand figure of a popular Empire, hailed by the acclamations of the multitude, soothing the wounds of civil strife, fusing all interests into one powerful unity, this pacificatory action of a sovereign power, was it not the ideal vision which had nourished in the leisure of exile or captivity the imagination of the nephew of a new Cæsar who was the elect of five millions of voters? If the world had received the assurance of one who certainly was no flatterer that this model had been realized in the past, why could not one flatter one's self that it could be reproduced in the future? No doubt the times, manners, and situation were all different, and comparisons are dangerous. M. Duruy knew this too well not to have uttered a warning. Besides, while recognizing the happy effects of imperialism in the ancient world, he had never disguised the feebleness and vices which had too often disturbed and dishonored its progress, and had finally caused its ruin, nor the abasement of character and the enfeeblement of civic virtues; nor the dangerous intoxication of absolute power and the absence of all regularity in the succession which made of each change of reign the occasion of a bloody crisis and left the possessor of an ephemeral authority a prey to the constant menaces of conspirators and assassins. The saying even escaped him on one occasion, "At Rome, to become a god upon earth it was only necessary to stab one breast," and he recalled that from Augustus to Constantine forty imperial breasts had been so pierced. Such a remark must have given matter for reflection to him who had so recently escaped Orsini's bombs, but the Emperor might have thought that he had provided for the future in reestablishing the principle of monarchical heredity. Besides, the illusion that flatters self-esteem is complacent and is not destroyed so easily as it is created.

One phrase of M. Duruy's in particular would have touched a sensitive spot in the Emperor's mind if it had been repeated to him or commented upon before him, and, I am sure, he would have been glad to engrave it as a device upon the imperial escutcheon. It was this: "Humanity advances at different times as much by the authority of a single individual as through the liberty of all."[1] He could find in these three lines justification for the act that had made him master of the supreme power and an indication of the course he should pursue to make a noble use of it. Since this supreme authority thus placed in the hands of a single man might alone be sufficient to forward the development of an entire community there was only one course for the possessor of it at that time to pursue, namely, to keep his trust intact, not for the mere pleasure and pride of using it, still less to associate it with retrograde or reactionary ideas, but as a productive and energetic instrument to be placed at the service of the general cause of progress. What could better conform to the natural inclination of a mind that had always mingled generous chimeras with its designs of personal ambition?

But as soon as M. Duruy recognized and even defined so well the service that the authority of a single master can render to the general well-being, the idea

[1] Tnesis on the state of the Roman world.

would naturally arise to consult him upon the means of accomplishing the duties imposed by this great task. In this way can be explained the long conversations described by M. Jules Simon, which sometimes lasted one or two hours a day, in which the Emperor and M. Duruy began by talking about the life of Cæsar, but ended by discussing very different matters. At the end of a few months Cæsar was no longer either the occasion nor even the pretext of these interviews.

The duties of his secretaryship also raised subjects of a most varied character, in dealing with which M. Duruy gave proof of a rare combination of elevated ideas and practical sense. His advice, which was given with a frankness that contrasted strongly with the usual insipidity of official praise, gave no offense. What were the subjects of these communications which were the product of a growing intimacy? Did M. Duruy use them to call the Emperor's attention to a subject that was entirely within his ken and near to his heart, viz, the vices in the organization of public instruction in France and the means of remedying them which his experience had shown him? Did he insist upon the duty of extending the benefits of this instruction to the lower classes? We may believe so, for a whole series of reforms was called for which, though stamped with a spirit of enlightened liberalism and even of democratic boldness, yet made no attempt upon the authoritorial principle of the constitution of 1852; and the Emperor must soon have perceived the advantages he could derive from them in furtherance of his aspirations for the public weal and for increasing the popularity of his reign without sacrificing any of his personal prerogatives—a step he could resolve to take only after some years had passed. With these limitations, the plans of M. Duruy harmonized perfectly with the state of his own feelings at the time. Nothing was more simple, then, than to intrust the application of the reformatory ideas to him who had conceived them. This was the object and meaning of the nomination of M. Duruy to the ministry of public instruction.

On his part M. Duruy had early become very sensible of the high esteem which was manifested toward him. He was astonished to find himself listened to with a breadth of mind and a complacency for generous ideas for which the picture he had formed of the author of a coup d'état had not prepared him. At the end of six months of this daily intercourse he had not perhaps yet acquired all the confidence that made him affirm a little later to the young laureates of the concours général that the Emperor was the most liberal man in his Empire, but he was already disposed to carry out whatever should be expected of him.

M. Lavisse says: M. Duruy believed that the position of chef du cabinet would be offered him after the retirement of M. Mocquart, and he avowed his inability to decline it. In fact, why should he endeavor to withhold himself from such an appointment? Was it not one of the merits of the good Emperors whose benefits to the race he was fond of celebrating to have received enlightened ministers into their confidence, often taken from among the men of letters of the time who, while assisting their masters to perform the task allotted to them, also secured a just consideration for their own names from posterity?

Was it to be wondered at that Pliny was the proconsul of Trajan, and Papinian and Ulpian the pretorial prefects of Septimius and Alexander Severus? I do not believe that M. Duruy ever thought, as M. Renan somewhere said, "that all that was wanting to Marcus Aurelius to enable him to accomplish a durable good was to have been able to give a good direction to public instruction." This semijocose way of approaching a subject was not in M. Duruy's way of thinking, because he always treated serious things seriously. But if he did think that in order to introduce into the education of youth reforms that he judged useful, and the necessity of which his position of inspector-general had shown him all the more clearly, an extended authority placed at his disposal by the favor of the Prince was a means of action not to be neglected and that he could take advantage of, this was a legitimate hope, and the result showed that it was a well-founded one.

II.

He did not, however, expect his nomination, notice of which surprised him at Moulins while on a tour of inspection. Returning rapidly to Paris as soon as he was certain that the choice had been made in earnest and that the Emperor was waiting to confirm it, he set to work and at once showed in action the same power of work that he had carried into study. And what was particularly remarkable in his administration, which only lasted six years (in those days a ministry of six years was considered too short), was that he approached the task he had undertaken on nearly all sides at once, but yet with so much method and precision at each point that no confusion resulted from these simultaneous attacks. So that if we pass in review all the branches of higher secondary and primary instruction we shall find that he left in each a trace of his fortunate presence and gave to them an impulse that is still felt.

It is an equally remarkable thing that the activity of M. Duruy was found to have its most effective results on ground where its influence would at first seem to be the most limited and least directly exerted, viz, in the branch of higher instruction. In that field, as we now know, everything was to be remade. Our learned confrère, M. Liard, has shown in his clear and complete account in what a regrettable condition of imperfection and insufficiency was higher instruction in France in 1863. Not assuredly that one can say that this highest degree of instruction had been without fruit until then, and had not maintained the renown and sustained the movement of the French intellect. This would be cheapening too much the memory of Royer-Collard, Guizot, Villemain, Cousin, Arago, Ampère, Thénard, Poisson, and Gay-Lussac, all of whom, in different degrees on different scenes of activity, at the Sorbonne, the Collège de France, or in special schools, figured in the list of superior instruction. But it is undeniable that this development, through vices of organization, was neither continuous nor general, although it had intervals of brilliancy. No regular service could be expected from a small number of faculties scattered over the country, and even when they were near each other—juxtaposed rather than united by any bond of collaboration—scientific studies suffered nearly everywhere from a want of sufficient apparatus, and history and literature were given over to generalities rather than devoted to an exact study of facts or texts.

M. Duruy was neither the first nor the only one who was struck with this condition of languor and want of unity. More than one of his predecessors had been disturbed by it, particularly M. Cousin who, thirty years before, after a visit to the German universities, sorrowfully compared with them our French faculties, scattered, as he expressed it, and moribund, forming nowhere a real focus of light, and he was earnest in his endeavor to substitute for them "scientific centers, not too many, but well placed." But all his predecessors as well as M. Duruy himself would have been checked by the want of the funds necessary for perfecting such a transformation, and by the fear of displeasing the small departmental centers which hold on to their courses of science or literature as to titles of honor, they being a source of profit and a means of affording an honorable and useful diversion to connoisseurs of leisure. The really original idea of M. Duruy was this: Instead of applying the ax to an ancient system that still had life enough to find defenders, he intended to create, from all the scattered portions, at a moderate cost and on a limited scale, a new institution which should realize that union between all the branches of human knowledge which was wanting among the existing faculties. This was to be an exemplar or model for them to follow and to which public opinion would force them to conform sooner or later.

Our confrère, M. Gabriel Monod, took down from the lips of M. Duruy himself an account of the plan he had conceived and the success he expected from it. "I shall always remember," he says in the interesting account which I permit myself

to borrow from him, "the interview that M. Duruy did me the honor to grant me in the spring of 1863, when I had just returned from Germany, in which he explained to me his plan of a school of higher studies. I said to him that we had too many special schools, and that, instead of creating a new one, it would be better to reorganize the faculties by working over the lists and introducing into them new elements and a new spirit." "It is impossible," he said; "old bodies cannot be reformed against their will, and, besides, I have no money. To create the school I have in mind I only need a pen and a sheet of paper. I could obtain money for such a school when they would give me none for the faculties. In order to make Frenchmen understand an idea you must find a name for it that will strike their minds. It will be enough to create a new school and put in it men who are devoted to the idea that inspired its origin, in order that, if this idea is just, it may act upon and transform everything about it. L'école des hautes études is a seed that I am planting in the cracked walls of the old Sorbonne. As it develops it will cause them to crumble and fall." "What followed," adds M. Monod, "is well known. L'école des hautes études has continued to grow and prosper. . . . And as to the old Sorbonne, it is so transformed as hardly to be recognized to-day." Never, therefore, was prevision better realized. I think there was never an occasion when M. Duruy more clearly showed that, added to a speculative and elevated turn of mind, he possessed a veritable practical ability and the art of avoiding those obstacles which too often prevent the passage from theory to application.

Moreover the liveliest opposition M. Duruy's administration ever encountered and one which dragged it into a parliamentary conflict of very uncertain issue arose out of a question relating to superior instruction. I also think that that was the only occasion when he was subjected to such a trial, for which his career and training had not prepared him. Few things made a greater noise at the time than the discussion in the senate of the Empire upon a petition for liberty of superior instruction,[1] and, it may be added, there are few things which are less interesting to recall now, because that liberty being now established and peacefully practiced, most of the arguments pro and con which were used at the time of the discussion have now lost their opportuneness. It is enough to remember that superior instruction was at that time the only portion of public instruction still under the exclusive control of the university. Primary instruction had been liberated from it by the liberal law of M. Guizot in 1833. The legislative assembly of the second Republic had opened the same facility to competition in secondary instruction by the law of 1850, and by the last article of this same law it had clearly announced its intention to extend the benefit thereof to superior instruction, but time failing to fulfill this undertaking it had dropped out of sight. This neglect was the fault of those whom this liberty would principally benefit, especially the French episcopacy, which being drawn into a general reactionary movement, preferred the kindly support of the Government for the defense and propagation of the truths which are dear to it rather than the test of competition. After divers indications had shown this body that the time for such confidence was past, it was too late to revive an undertaking which had apparently been left to prescription.

To awaken opinion it was deemed best to make the demand for liberty rest upon the objectionable character of the doctrines taught in some of the courses of the university, which were described as dangerous to morals and the public peace. Many of these charges were based upon ill-interpreted texts, others were very much exaggerated, and all were preferred in a tone of bitterness and passion little suited to the elevated nature of the subject. Even if they had been better justified and presented it was not in this way that liberty should be demanded.

[1] That is, the recognition of other agencies than those created by the State.

The abuse of power is assuredly among the causes that may render liberty desirable at a given moment and even necessary, but if it is to be sure, durable, and worthy it must be derived from a higher source and rest on more solid foundations. Especially in matters of education the cause to be invoked is the right of conscience and of the family not to be constrained to leave their dearest interests to the discretion of any human power. Therefore, from not having been placed on the grounds of right, the question, badly put, was badly discussed on both sides. The discussion even went so far as to touch upon metaphysical and even medical theories, which assuredly were beyond the scope of a deliberative assembly. Such was the confusion when the question was put to the vote that its real signification could no longer be recognized, and so it happened that M. Sainte-Beuve, who on that day made his first appearance in the senate with a ringing defense of the liberty of thought, ended by adhering to an ordre du jour which refused this liberty to those who did not agree with him.

The part played by M. Duruy in this debate was an ungrateful one, and yet I do not know that any minister could have done better under the circumstances. He had to defend professors whom he believed to be unjustly attacked, but he had at the same time to reassure the majority of the Senate, which was visibly disturbed by the charges brought against university instruction. He thought it incumbent upon him, in order to fulfill this double duty, to offer a kind of profession of faith in the name of the entire corps of instruction and as a sort of obligatory condition of its existence. This declaration included, besides the existence of God, religious duties, moral liberty, and even the immortality of the soul. It was a noble body of doctrine, entirely in accord with the sincerity of his personal convictions; but it was, none the less, a kind of philosophy of state to which, as such, many of those whom he wished to protect would never have consented to subscribe, so that this method of defense only half pleased them. How much better it would have been for him, and how much more in conformity with his straightforward and high-spirited nature, to have accepted the contested freedom frankly and have taken up the challenge of competition in the name of the university! But we are led to believe that the authority to follow his own inclination was denied him, for he ended by opposing to the petition a most positive refusal, and went so far as to ask of the assembly to remove the subject from debate by means of what is called in parliamentary language the previous question.

This offensive form of proceeding, which took away all hope, even in future, irritated the friends of the question of freedom, who imputed to him the rigor of this refusal of justice, so that he descended from the tribune without having satisfied anyone. A majority, which was obtained by complaisance rather than conviction, did not strengthen his ministerial situation in any respect, and it was rather compromised, besides, by the obvious malevolence of his colleagues, none of whom would come to his aid or even extend his hand to him when he finally took his seat.

The truth is that he was absolutely alone in the council, of which he was a member, his liberal feelings having no support, except the favor and personal friendship of the Emperor. This circumstance alone would be a proof of his isolation. To console us rejected defenders of the freedom of superior instruction, he consented to the organization of a series of public lectures which, from their subjects and their character, would resemble the courses of free faculties. I, for one, inscribed my name as one of the lecturers in the course which had been inaugurated with a certain éclat by M. Saint Marc Girardin, and our regretted confrère and my dear friend, M. Cochin, and myself had prepared and even published a programme of several lectures that we intended to deliver alternately. We heard of no objection on the part of the minister of public instruction, but at the last moment the minister of the interior sent a formal interdiction, and

our notices had to be ruthlessly destroyed. M. Duruy had the kindness to send for us in order to explain this sudden change, which had occasioned us no little surprise. He said, with kindly embarrassment, "Gentlemen, what can you expect? You know that the absolute is not of this world." To which M. Cochin answered, "Excuse me, Monsieur le Ministre, it seems to me that there is still something of the absolute here below, and that is the authority of the police."

Four years later[1] the police themselves had to allow the liberty we were contending for. The Empire having entered upon constitutional paths, one of its first concessions was the liberty of superior instruction, and a committee was appointed to regulate the conditions. M. Guizot, although an octogenarian, consented to direct its labors, and I had the honor to take part in it in company with the most eminent members of the university and clergy, M. Dubois, former director of the École Normale, M. Bersot, M. Boissier, M. Franck, and Père Perraud, now cardinal. My recollection of this time is full of emotion, for I sat at the side of Prevost Paradol, who was so near his sad end, and I was opposite the amiable Père Captier, who fell under the bullets of the communists the following year. Then could be seen how factitious had been the emotions which had been aroused a short time before, and how easy it was, as soon as the ground of liberty was loyally accepted, for conscientious men to come to an understanding as to the best means of putting it in practice; for I can affirm that no language betraying animus, no over-lively debate even, disturbed the harmony of our discussions, and it was by an act of unanimity, in a real feeling of harmony, despite a few inevitable divergencies, that we finally reached a project the dispositions of which were more liberal than those enjoyed by superior instruction to-day. Thenceforth the cause was so nearly gained that M. Duruy himself could take pleasure in declaring that the obstacles that had been the cause of his negative vote had disappeared. On June 28, 1870, he, being now a simple senator, took the lead in forming a projet de loi on the same subject, the account of which was drawn up in a real spirit of conciliation, but which unfortunately did not appear in the Journal Officiel until just before the disastrous news announcing the fall of the Empire.

I have already told how M. Duruy succeeded in modifying superior instruction by founding a new establishment, the École des Hautes Études, by the side of the existing faculties. Was he expecting a similar success with secondary instruction by creating for it, beside the instruction given in the lycées and colleges, a new order of instruction that he called special? Not at all. The object was not analogous nor the result equal. This time there was no question of replacing classical instruction with a different programme of sciences and studies. M. Duruy has never authorized anyone to think that he underrated or regretted the high and preponderating position that classical instruction has always held in the intellectual development of France. He had lived too much himself in familiarity with and admiration of the great models of antiquity not to know to how great an extent their inspiration has penetrated into the very substance of the French intellect, so that it would be difficult to say what langour would seize upon it if this vital element should be taken from the atmosphere it breathes.

But M. Duruy was not the first to ask if these important studies ought to continue to occupy exclusively all the years of childhood and early youth, in the presence of all the new knowledge with which the progress of science has enriched human learning, and even if any uniform preparation whatsoever could suit the different needs of the commercial and industrial life of modern times. The problem once proposed, he undertook the solution with his accustomed resolution. His special instruction was intended, as the name indicates, to provide subjects suitable for all vocations, while classical instruction would continue to provide a

[1] The law to that effect was passed July 12, 1875.

more delicate culture in a narrower sphere, the benefit of which should be felt by exercising a general influence upon society at large.

Has the result fully answered this expectation? It would be difficult to say so, since the epithet "modern" has already replaced the former "special," a change which certainly means more than a mere change of name. Will this new form of the same thought be the last? It may well be doubted, because it is already being actively attacked on two sides at once, by those who think it has taken too much from classical instruction, and by those who complain that it still leaves that instruction too many privileges. The truth is that we are here in face of a problem the solution of which must be left to time and experience. Classical studies are essentially unselfish or disinterested—that is to say, their main object is not to prepare for any particular calling, but to form in the mind the general qualities of accuracy and propriety, of scope and elevation of ideas, which, once acquired, are applicable to everything and are of equal importance to whatever use they may be put. But this kind of superiority does not become manifest at once, and is recognized and appreciated, if at all, only with difficulty in a democratic society in which every one is pushing for immediate success and no one can wait.

Shall we then ask what immediate advantage there is in literary culture and what profits can be derived from it for any given profession? The result of an estimate of such a kind, narrowly utilitarian as it is, can always be disputed, and, from not being willing to admit that classical studies are good for everything, we may run the risk of concluding that they are good for nothing. M. Duruy assuredly can not be reproached with not having settled at once a question that is still open to discussion.

After his good fortune with superior instruction and an unsatisfactory result with secondary instruction, M. Duruy's efforts in the primary grade had a very different fate. The movement that he impressed upon it has only not exceeded the object he had in view, such an expression would be inexact. It is better to say that it deviated from the direction he intended to give it. The first organization of a general plan of primary instruction is to be found in that law of which I have already spoken and which forms one of M. Guizot's best titles to renown. Its development had been continuous and its progress constant during the constitutional monarchy, since the report presented by M. Salvandy, on the eve of the revolution of 1848, showed that in less than fifteen years 33,000 schools had been opened in France. This growth, which had been checked a little during the first years of the Empire, received a strong impulse from the ministry of M. Duruy through the construction of a great many school buildings, the opening of many courses for adults, and a regulated organization of the primary instruction of girls.

Yet the law that M. Duruy proposed, and which was passed in 1867, did not depart from the original plan, the principles whereof it only extended, while it perfected their application. But when presenting the bill he made it clear that he wished to introduce two important innovations, viz, to extend gratuity of instruction to all (the benefit of this provision had been previously confined to paupers), and to make instruction equally obligatory upon all. If these provisions did not appear in the projet in question, it was because the Emperor, after having given his assent to them, withdrew it in face of the unanimous opposition of the council of his ministers, to which was added, according to M. Jules Simon, the objection of the Empress.

The double intention of M. Duruy in this respect is, as every one knows, now an accomplished fact. Primary instruction was made gratuitous and obligatory by the law of 1881. The feature of gratuity has been made effective, but obligation is nearly nominal. Besides the two features of this famous law a third was

added, of which M. Duruy had not thought, and to which, at least in the abusive interpretation that has been given it, he would never have assented: Lay instruction, consisting in the exclusion of religious instruction from the school programme; in forbidding the admission of the priest to the school in his clerical character; in refusing Christian education to the population even when it demands it and deplores its absence, would not have had a place in any law proposed under his name. When this projet first became known to him he passed upon it the judgment which was eloquently expressed before the senate by your perpetual secretary, M. Jules Simon, and which his worthy successor, M. Georges Picot, repeated in his name in your last public session.

The sentiments of M. Duruy on this point were so positive that he was willing to air them even to those who had the least right to expect such a confidence from him. It was in this way that he informed me of them on an occasion which could hardly have been expected to lead to such an explanation. I had allowed myself to make some observations, in a paper which I sent him, upon his sketch of the character of the Emperor Constantine, in the last volume of his History of Rome, which my own studies had led me to question. He answered, in a letter which I have religiously preserved, that he had scarcely done Constantine justice in recognizing his ability in effecting a great religious revolution without disturbing the public peace, by which he had justified the title upon his triumphal arch of quietis custos. "How rejoiced," he added, "would we be, who are the sorrowing witnesses of lay proselyting to the uttermost and of religious strife, to behold a government that would take for its device quietis custos." Then our correspondence continued upon matters in which I wished for his advice, and he told me that in a circular addressed by him to 89 prefects this recommendation occurred: "Whenever a municipal council asks you to change the character of its schools, use all the means at your disposal to satisfy yourself that the council really expresses the wishes of the heads of families."

It may be judged from this sentence what he must have thought of a process that consists in going counter to the wishes of entire communes, even when they are supported by their representatives. I have reason to believe, too, that even if he did qualify in the somewhat strenuous manner the favors shown, rightly or wrongly, to the ecclesiastic or the religious sister, he would never, at least, have consented to make the religious habit a cause of legal disability and even indignity.

Indeed he called my attention to the fact, and not without sorrow, that these intentions of his were very different from those attributed to him by his Catholic opponents, particularly the most eloquent of them all, Mgr. Dupanloup, bishop of Orleans. This was true, and the illustrious prelate could hardly have been ignorant of it. In truth M. Duruy might have answered further that the sentiments he expressed in the above frank declaration differed no less from those which his own heated apologists attributed to him in the course of their polemics, sentiments that were not always denied and many of which were precisely those that he complained of as having perverted his work while pretending to continue it, so that the mistake was excusable. He might have added that if, as far as the measures themselves were concerned which were then being actively discussed, his criticisms were somewhat severe, the same can not be said of his fears for the future and his presentiments.

However this may be, our communications upon this important subject had become so familiar that on the day when the French Academy was to designate the member of the Institute who was to take his seat in the superior council of public instruction, I, having like every one else inscribed his name on my ballot, went up to him and said in joke, "Monsieur Duruy, neither of us would have suspected this fifteen years ago, but of course you must take your part; I have voted for you in your capacity of clerical." He had the good taste to take the joke in

good part and added that all the friends of justice and liberty might count upon him to defend their rights in that high tribunal against the prejudices of a sectarian spirit.

M. Duruy was to leave the ministry in July, 1869, when, in consequence of a new legislative election, a cabinet was constituted whose brief existence was destined to set the pace of the march which the Empire was about to begin along the way of liberality and constitutionality. At first sight there was no reason for leaving him out of a combination that had nothing contrary to his natural tendencies, and therefore when the Emperor asked for the resignation of all his colleagues, he seemed to have made an exception in his case, for he made no such request of him. It is probable that the members of the new ministry, being advised of the serious difficulties that awaited them, were unwilling to add to their number by taking upon themselves the opposition that M. Duruy had aroused on the part of the high clergy whose influence might make itself felt in the entourage of the Empress and in a small faction of the legislature. At any rate, hardly had he arrived at his country house of Villeneuve-Saint-Georges, where he was looking forward to a few days of repose, when he received a letter from the Emperor, filled with assurances of friendship and regrets, but informing him of the necessity the latter was under of dispensing with his services. The writing of the letter was so difficult to make out that M. Duruy had to call his secretary to his aid in deciphering the name of his successor. When he discovered it (it was an honorable name, but of no great note) he repeated it several times in different tones of voice, with surprise mingled with disapprobation, for it was not the person he would have selected to continue the numerous enterprises he had left incomplete. This feeling lasted only a short time. The next day he was found in his study seated at his desk in the midst of a mass of papers which he had taken from a closet where they had been lying for six years. They constituted the first draft of one of the volumes of the History of Rome, together with all the notes and references he had collected to complete it. He already thought of nothing but his work. Unfortunately it was not given him to concentrate himself upon it long. I believe it was Montesquieu who said that there is no grief that can not be forgotten by an hour's work. M. Duruy, notwithstanding his firmness, did not affect this stoical indifference. Perhaps, too, when the author of the Spirit of the Laws made the remark he had never experienced, nor even had any presentiment, of such misfortunes as poured upon France in 1870.

To the sorrow which M. Duruy shared with all Frenchmen there was joined the regret of having foreseen the imminence and seriousness of the perils without having the power to escape them. Not that external politics were ever seriously discussed in the council where he sat. The Emperor never confided his plans, or rather dreams, to anyone, not even, as is well known, to those whom he associated with himself in carrying them out, so that the fatal incline, down which French politics glided after the Italian war, may have been hidden from M. Duruy's eyes for a long time; but the victory of the Prussians at Sadowa opened them with fright. He instantly beheld the consequences of this victory in his imagination, enlightened with all the memories of our history. He at once comprehended that to suffer a united and armed agglomeration of over forty millions of men (whether such agglomeration be called Austria or Prussia) upon a frontier ill-defended by nature would be to risk upon the chance of battle what had been the soul, the aim, and the fruit of all the efforts of French courage and genius during eight centuries of monarchy. He drew up for the Emperor a letter, a draft of which he did not hesitate to show, in which he implored him to send 50,000 men to the Rhine to preserve the heritage of Henry IV, of Richelieu, and of Louis XIV. "We are," said he, "in the presence of a young and ambitious state which will only feel sure of keeping what it holds and taking what it wants

after humiliating France as it has already humiliated Austria. War is inevitable and near at hand. Not that I think that the Prussians will attack Strasburg or Metz, but their restless ambition will carry them into some enterprise in which they will necessarily have us in their front."

This was talking as a politician. When the hour of trial came he was willing to act as a soldier. His age forbade him to follow his son into active service, the high-minded Albert Duruy, who departed for the seat of war among the first, and whose budding talents were then the object of hopes that are now only regrets. At least he insisted on taking his place in the national guard, and, in fact, although over 60 years of age, he performed his military duties until the last day of the siege with an indefatigable and persevering activity. He was one of those who, never ceasing to hope and being never weary of enduring, advised the valiant city to continue its defense to the last.

Only after arms had been laid down by the combatants did study retake possession of him, and after that it held complete control of him. The twenty years that were still left him, during which he suffered sad domestic afflictions, were employed in completing and perfecting his histories of Greece and Rome, the two great works with which his name will always be associated and which general opinion has placed in a rank from which nothing can remove them. They will remain as models of the art of applying to historical pictures of great extent all the conscientious research and the minute attention to details of modern erudition.

HENRI MARION, PHILOSOPHER AND TEACHER.

[Address by M. F. Buisson on opening the course in the science of education at the Sorbonne, December 3, 1896.][1]

LADIES, GENTLEMEN: Is it not true that on this day of reopening your first thought, as mine, is of him whom we all had hoped to meet here? Alas! The course we supposed only for a time suspended was forever ended. Silent forevermore is the voice which you used to hear, deep and charming like the soul which imparted its expression. Yet the chair which he comes not to fill will always seem to be his. Hereafter no man, in France or elsewhere, will enter the domain of the science of education without finding there some trace and saluting the name of Henri Marion.

To devote this first hour to speaking of him will be only to render to the memory of the most beloved and lovable of masters the homage which is his due. Indeed it is the necessary introduction to our studies. The unanimous sentiment of the faculty demanding the continuance of this chair with no change is sufficient indication that the new subject has achieved the rights of citizenship. Here, then, is already a tradition; we have the honor of joining its first threads.

I must resist in the beginning a most excusable impulse. It is not the biography of Marion that I have the right to present on this occasion. It belongs to others to make the man live again in the beauty of his character, the philosopher in the steady lucidity of his doctrine, the moralist in the profoundness of his observation, lastly the writer in that style whose purity was equaled only by that of his thought. Here I shall attempt only to give the history of the chair of pedagogy.

It seemed that Marion was predestined for his work by a twofold preparation. He was fortified for its theory by solid philosophic studies, for its practice by personal experience in the work of instruction. We can take only a cursory view of these two forms of his preparation.

Among the philosophic works which to some degree led to his career as a teacher, the first was "a careful and close study" of Locke, his Life and Works, published in 1878. M. Boutroux, in a page referring to what now constitutes the

[1] Translated from the Revue Internationale de l'Enseignement, of December 15, 1896.

principal charm of that little book, said, "The author there portrays his hero with his mobile calm physiognomy, sweet and bright; in everything perfect simplicity. Everything about him had that character; his guileless traits, his countenance wasted, but open and sincere, his manners, his language; no other individuality than an exquisite distinction, a sensibility charming without common-place, and the rarest combination of elegance and character, of ease and of seriousness. Bold and impassioned, yet having a horror for purely destructive criticism, and little taste for mere speculation."

With M. Boutroux you ask, Is this the portrait of Locke or that of Marion?[1]

But this accidental likeness between the two men must not cause us to lose all view of the book and its value. In the brief chapter devoted to Locke's "Thoughts upon education," one could foresee your future professor. At that time he had already assumed a decided position upon all important points. He clearly evolved the leading thought, or rather the method of which Locke was the originator, somewhat after the English fashion, by means of examples and details, without apparent plan, sometimes without proportion, yet with what vivacity of tone, what freedom of spirit, with what sense of the real, with what disregard of the expedient. It is a marvelous faculty, that of impelling one's thoughts straightforward, inspiring oneself with life, and not with books, bestowing more attention, as he expressed it, "upon the unstudied questions of a child, curious and eager for information, than upon the discourses of mature men, which revolve constantly in the same circle and conform to borrowed notions." Marion cheerfully followed his master on that road. He adopted his views, for example, on the importance of physical education, on the absolute uselessness of certain exercises that are still regarded as belonging to classic culture, such as the making of Latin verses and even Latin orations,[2] upon the necessity of a school discipline free from servile methods and founded entirely upon what Locke calls the "sentiment of honor." These were only the germs; we shall see them develop. Observe only that Marion fully understood the import of this work. After maintaining that the "Thoughts" of Locke are, upon the whole, newer than the "Émile," he added: "I am persuaded that if a separate edition were brought out in this country the success would be considerable in the midst of our heated discussions of the programmes of public instruction." You know that that appeal has been heeded; it has been of value to us to read the original text of Locke, admirably translated by that Frenchman who, with Marion, possessed the highest gifts for treating educational subjects, M. Compayré.

The second work of Marion in this preparatory stage is his thesis for the doctorate, which has become a classic work.

It is not a mere coincidence that the creator of high pedagogic instruction in France was the author of a fine work on moral solidarity. Under this title Marion undertook to analyze, both in the individual and in society, the facts which show human liberty to be at once irreducibly real and strictly limited by the numberless conditions that control its exercise: exterior conditions proceeding from nature, heredity, physical and historical surroundings; interior conditions engendered by liberty itself, and resulting from its own acts, chains of its own forging, habitudes that it has acquired, predilections from which it can not free itself. To pass in review "all other forces than our own, and which concur with our freedom to make us morally what we are, to study the genesis of incentives and motives and their interrelation in the depths of our will, which by their various combinations they incline in divers directions, that is to study," said the author, "the con-

[1] See the article of M. Boutroux on Marion in the Rev. Int. de l'Enseignement for October 15, 1896.

[2] "Must it be confessed," cried Marion, "that Locke, two hundred years ago, pleaded for the same reforms which were essayed in earnest in France in 1873, but only with the result of raising a tempest?"

ditions of human improvement." This is, also, I will add, to study in advance the profound conditions of all human energy.

That study the author had conceived and conducted in a manner which already revealed the educator under the philosopher. It is a book not of metaphysics or of sociology, but essentially of moral psychology. When he sustained the thesis he was congratulated upon having known how to find the rarest thing in the world—the new in the known. This is why the work, so strong and concise, nevertheless, is charming to read. "It contains," said one of his colleagues, "many delicate observations and just reflections that every one accepts with pleasure, because, rightly or wrongly, he believes himself capable of making them himself, and because therein he recalls thoughts that he has had all his life."[1]

Whence came to the young moralist his authority and force of persuasion? M. Caro answered: "It is because he believes in the good. He searches for it, and he finds it. He encourages man to have confidence in man." "One feels, also," added this able judge, "that he is interested in the life passing before him; he considers that it has a meaning, an object, an end."[2] A French pedagogue, now forgotten, said, in the beginning of the century, "To love men is the first condition for forming them in infancy and in youth—for guiding and governing them in mature age."[3]

But with Marion neither that confidence in mankind nor that love of men extended to blind optimism. We can see this in the firmness of the conclusions set forth in that book. "Nothing in this world depends absolutely upon ourselves alone—not even the use of our freedom; but pessimists forget that our miseries are in part our own work, that ofttimes the fatalities of which people complain were created by themselves. Our species is not necessarily destined either to happiness or to misery. It is what it makes itself, and will have the lot it merits. Progress thus far has not come of itself. Just as little will it continue by the sole force of circumstances. It should suffice for us that progress is possible—our task is to work for it."

I will not speak of the other works of Marion having no direct relation to pedagogy, but I should reproach myself did I not mention one of his writings of special importance, The Duties and Rights of Man. Under this title, Marion, in 1883, published in the Bibliothèque de la Société d'Instruction Républicaine an excellent little manual of secular, moral, and civic education. This sort of work, at that time, was a bold innovation.

At the time when he began his writings upon the science of education he was directly engaged in its practice. What manner of professor he was at Pau, afterwards at Bordeaux, later at the Lycée Henry IV, there are many to witness. One, most authoritative, will suffice for all. Note how M. Lachelier concluded a report of general inspection twenty-three years ago.

"M. Marion possessed a mind open and broad, just, firm, and clear. He handled with rare felicity all that science and philosophy have put forth in these latter days of ingenious ideas and precise facts." But what was particularly his own was the style, able though somewhat learned, of his lessons. The fine remarks and delicate strokes in which the heart played as great a part as the intellect; and, in fine, the easiness, the constant fairness, and the elegant simplicity of his exposition. If we add to these merits the charm of his person and his words, and the conscientious care with which he bore himself toward his students we shall not be surprised at the naive testimony of one of them, the son of an eminent engineer, who said to me (March 8, 1874), "Monsieur, I can not tell you how much we loved him. We all loved him. And the last year—as we know from our comrades—it was still the same thing."

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[1] M. Victor Brochard, Revue Philosophique, 1880, II, p. 90.

[2] Journal des Savants, 1880, p. 663.

[3] Jullien (de Paris), Essai Général d'Éducation.

It was the same wherever he went. This will perhaps aid us presently in understanding his theories of discipline in the Lycées. Said another of his students, now in his turn become a master, "There was in Marion a rare, winning sweetness, which, without effort on his part, made him master of the souls of his students. He understood how to infuse into their hearts the noble idea of living for others more than for themselves."

Appointed to deliver, at the distribution of prizes at the general competition (concours) in 1881, the first French discourse that the Sorbonne heard on that occasion, he did not hesitate to speak the right word in summing up the whole spirit of reform in this formula, "we should wish that our good scholars, at the end of their studies, should be really men prepared for life, the men of whom the Republic has need."

At the superior council, to which he was elected without opposition by the professors of philosophy (April 15, 1880), it was he who, in a subcommittee of three members, presided over by our venerated master, M. Paul Janet, drew up for the normal schools the programs of moral instruction and of psychology applied to education. It was he, especially who, when the law of Camille Sée covered a wide gap, rather social than educational, reported regulations relating to the secondary education of young girls. Of all the fields in which his influence could be happily exerted, this seemed most properly to belong to him. And to-day, if any considerations can temper the regrets that we feel, it is to know that the school at Sèvres will, for a long time, have no other inspiration than his, expressed better than by the best of books; his spirit has passed into that house, and will permeate its life.

There is another great school for women which will never forget what it owes to him. He himself has recounted in this place, with characteristic modesty, the appeal addressed to him when M. Jules Ferry established the school at Fontenay, designed to furnish, if one may so term it, instructresses of instructresses—that is to say, mistresses capable of conducting the secular normal schools about to be opened. If old erroneous ideas had prevailed, this institution designed to regulate primary instruction would have been entrusted to teachers selected from the most competent in the primary department. But M. Ferry said openly in the Sorbonne: "Primary education itself should become liberal education," and he called to Fontenay, and afterwards to the similar school at St. Cloud for men, teachers who perhaps had never seen a village school, but who had reflected upon the needs of our national education, and who knew one thing at least, that for the education of the people only that suffices which is of the highest excellence.

"Never," said Marion rightly, "was given greater proof of faith in philosophy than on the day when it was thus summoned to aid in laying in this country the foundation of a national culture of the people."[1] Elsewhere, for he loved to speak of that "springtime of Fontenay," he said: "We have since seen, beside the professors chosen from the Lycées of Paris and from the universities, all soon possessed by the spirit of a pedagogic apostolate, the most distinguished men in the country consider it an honor to bring before this school, in lectures of great force, all that philosophy or science seemed to them to offer for the benefit of those who are called to form the minds of others."[2] It pleased him to recall the names of the earliest volunteers, MM. Croiset, Vidal-Lablache, Melouzay, Albert Sorel, Boutroux, Liard, Bréal, Ravaisson, and that other tender-hearted stoic, so fully his compeer, and whom he lamented as a brother, Charles Bigot.

That which Marion did not say, namely, the part which was due to him in the foundation of Fontenay, you all have read in the admirable notice bestowed upon him by M. Pécaut.[3] What a task he accepted: to establish for young girls instruc-

[1] Address at the opening, 1883.

[2] Monographies pédagogiques, 1889, Vol. I, p. 15.

[3] Revue Pédagogique, May 15, 1895.

tion in psychology, afterwards in morals, regarded from the standpoint of education! The two solid and luminous manuals wherein he has summed up that double instruction give but an indistinct idea of it. "That which placed pupils under the charm of the course," said M. Pécaut, "was the rational discipline which the professor exercised." It was the first time that young women heard the full, impartial discussion, without bias or passion, of the grandest themes of human thought. He spoke to women as to beings capable of reason and of conscience, and not as to minors for whom is required a system of tutelage and authority.

M. Pécaut had besides a veritable presentiment. That modest chair presaged another. M. Jules Ferry had been present at one of the lectures given by our friend at Fontenay. He was happy to receive a proposition made to him by Albert Dumont. That director of superior education—and his doctrine constitutes the law to-day—intended that superior education should be the guide of all other orders, to the end that it might become indeed the tutelary genius of democracy. He maintained that the only thing that the Sorbonne did not teach was the art of teaching. Not holding to the dogma that "the business of a professor can not be learned except at the expense of making bad classes,"[1] he asked the minister to assign to Marion a complementary course on the science of education, which M. Burdeau raised to a professor's chair in the budget of 1887.

What was Marion's instruction here, several of you know from having been his faithful listeners. Many know it almost as well in another way. It has been sufficient to observe one of his old pupils at work. Not one of these who took part in his conferences has ever spoken of them, even years afterwards in the remote provincial regions, without a brightening of the face, and a trembling tone of voice. I have witnessed this more than once, and I thus discovered the influence exerted by this gentle master. Would that I could read to you some of the confidential letters of his old pupils, now professors in a lycée or normal school, recounting how he established a bond of sympathy between himself and them, which imparted to the most timid courage to speak, how he put them at their ease, drawing examples from his own experience, from the education of his children, from his recollections as a professor, or even as a student of philosophy at Louis le Grand in the class of M. Charles, who remained for him the type of an incomparable teacher. "The lesson ended," said one of them, "we were astonished that from things so simple and which to us had appeared almost commonplace, he could draw distinctions at once so delicately just, and so large and so elevated."[2]

Happy the master who leaves his image engraved in such traits upon the hearts of his pupils! To give an idea of the profound nature of his influence, I recall that one said of him: "Here was not a professor, but a director of conscience." Let us accept the word, but only in the sense in which he would have accepted it. Director of spirits and disseminator of ideas, yes, he was surely that, but not after the manner of those who, consciously or not, mold others to their image, leaving their imprint upon all they touch and making themselves the consciences of others. This is what he dreaded above all else. His manner of answering those who consulted him upon problems of metaphysics or of life, was to compel them to interrogate themselves until they worked out from the depths of their own minds the answer they sought. A good judge has well defined that means of aiding others. "Marion never said, 'Imitate me,' he always said, 'Find your way, be yourselves.'"[3]

Beside the private lectures, the public course was continued by him regularly from the opening of 1883 until February last with only one interruption, caused by his first attack of sickness (1890–92). He had taken up successively and

[1] Edm. Dreyfus-Brisac, l'Éducation nouvelle, p. 211.
[2] Cornuel, professor of the normal school at Bourges.
[3] M. Henry Michel, Revue Universitaire, May, 1896.

methodically all portions of theoretic pedagogy (education—physical, intellectual, moral); afterwards its applications to primary and secondary education; then the psychology of the child and the young girl. And he had begun a review of foreign education; he had treated of England and the United States, and was about to take up Germany. After that long period of professorship our friend had commenced to compile his rich gatherings in an educational work, only the first chapters of which he was able to write. You will understand why I refrain from all attempt to supply a work which only he could have undertaken.[1]

I have been permitted, however, to go over the volumes of manuscripts, wherein are reviewed, week by week, the eleven years nearly complete of his instruction. There is no need to say with what reverence I entered upon that reading, but how my admiration was increased when I had surveyed the whole work! Each one of those lessons doubtless seemed to you who listened to them like a delightful talk, such was the clearness of the ideas, the freedom, grace, and ease of style. But there is not one of which the plan had not been changed, reviewed, begun again, corrected, pen in hand, different points of doctrine scrupulously studied, terms carefully weighed, so much so that the simple sketch of each one of those courses would make a book, and a fine book. One of them, that which treats of the education of women, is complete. Let us hope that it will be given to you after a little while. It will be one of the first texts which we shall propose as a subject of study in our private sessions.

It remains for me to speak to you of that which chiefly attracted public attention to our friend—his rôle in the reform of secondary education. Let me approach that delicate subject, in the only manner that is worthy of Marion, with entire frankness.

He had been urged to take a place in the grand commission which the ministry consulted in 1889 upon that reform. He was not one of those to avoid or to shirk, and therefore he accepted the appointment to make a report in regard to a question of general controversy namely, that of discipline in the lycées. His report appeared in the collection of Ministerial Instructions, July 15, 1890. Two years afterwards he published what serves as an ample commentary, the fine work, Education in the University. This should have been introduced by the brief, masterly address that he made here at the reopening of 1890, to the corps of Fellows (boursiers d'agrégation), a paper of rare value deserving to be called the introduction to university life.

One idea inspired all that he wrote upon discipline. Since the State now educates (whether it be a good, or an evil, it is a fact), since it gives education, "this ought to be the best, the finest, the most noble, the most complete, and the most effica-

[1] Note at least the list of subjects treated in those public courses of eleven years.

Marion planned to begin with a sort of general review of the subject. The first four years were devoted to a treatise on the science of education, whose grand divisions corresponding to the university years were, at first, the study of the ends and principles of education in general (1883–84); then physical education (1884–85); moral education (culture of the will, then of sensibility, (1885–86), and education of the understanding (1886–87).

This vast cycle covered, Marion took up teaching considered as a means of education; one year (1887–88) was occupied with primary education, another (1888–89) with secondary.

The following year (1889–90) he devoted 24 lessons to a thorough study of the psychology of the child.

Afterwards, from 1893 to 1894, he treated of the psychology of women, and the education of young girls, in this last subject including their physical, moral, esthetic, and practical or domestic education, as well as teaching of all degrees and in diverse branches.

His tenth course complete, he turned to foreign countries. First England, whose characteristic institutions he studied in detail, after having himself traced documents to their sources. He has published part of his conclusions in a thorough study, which he gave to the Revue Bleue, on the books of M. Max Leclerc, works of singular value for imparting the principle of English education. Just one year ago he took up the United States. He had gotten nearly through with this review, and proposed next to consider Germany, when he was compelled to vacate his chair to occupy it never more (February, 1896).

cious." What is this education? There is only one kind becoming to a free country, to wit, that which makes free men. It is well to repeat to the public until they thoroughly understand it that the only school that prepares for liberty is liberty. We have not accomplished the education of a young man, because we have watched him closely, and prevented him day after day from doing evil. "We must lead him," said Montaigne long ago, "to renounce evil not for want of power but from want of will." For external restraint, indispensable in earliest infancy, should be substituted by degrees an internal faith, that of conscience. To support the young child at first by a series of influences that encompass him with tenderness, to bring him up in moral surroundings, and as he grows older to exercise him gradually to will, to judge, to reflect, and to restrain himself, to watch over and correct himself of his own motion, this is not the best, it is the only education. This is a complete disciplinary regimen, looking no longer to passive obedience, but to obedience willing and rational; from this proceeds the thought not so much of outward effect but of an inward order resulting from the slow, secret, and imperceptible formation in youth of a conscience, a reason, a character.

Such is the programme that Marion undertook to develop, not by certain general views, but in all the details of the organization of a lycée. In following it to its full application, he multiplied examples; he did not omit a single one of the practical difficulties; he passed in review all those nothings of which a collegian's life is made up, in class or in the study room, in the refectory, the playground, the promenade. There was not another pen in France capable of transfiguring these infinitely small things and placing them in the high light of principles.

Nobody, however prejudiced he may be, can read that book without receiving an unusual impression of sympathy, gratitude, and respect, first for the author, but also for the university, because one sees on every page that it is the spirit of the university which speaks. It is that, not Marion only, which feels horror for the brutal authority of mere command, mechanical procedures in instruction, factitious preparations for examinations, base means and police qualifications in the matter of surveillance, in fine, all that tends to usurp the place of education by the preparation and cultivation of the spirit, by the proper fashioning of manners. Unite all these distinctive traits of our French pedagogy, and you have the "liberal discipline" of Marion.

Is the latter easier than the other? Oh, no; assuredly not. To substitute true emulation for false; conscientious estimate of daily work for the phantasmagory of places and rewards; for punishments and silly recompenses, a word of the master, a word of praise or blame uttered in a certain tone; for the passion for success, the estimate of endeavor; for the threat of a task ("pensum") and confinement, reproach of conscience—these are the only things of which, at all times, the best masters have been and will be capable. For their encouragement, Marion loved to say: "In general, we have not a sufficiently good opinion of children, especially of those well grown up. I have found always that the most elevated thing one can say to them, if it is said with simplicity, is the most deeply felt and appreciated by them. We are not enough aware of the influence that a master, like a father, may acquire over a child by the sole fact of noticing his endeavors and gladly recognizing them."

Is this excess of confidence? Does it not tend to make children effeminate to treat them with such courtesies? Marion answered this with his customary precision:

"It is not by imitating too much the conditions of actual life, in subjecting the child prematurely to trials which await the adult, that we can best prepare him to sustain them. The school should have an ideal atmosphere. It is especially needful that justice should breathe therein, the justice that a child can comprehend, to the end that it may fill his own heart as a provision for life, and that he may never cease to believe in it."

How is it, then, that such a plan of education did not at once receive universal assent? And whence comes it that so many members of the university—I mean those most devoted to the work—speak of it yet with expressions of reserve?

In France, in respect to the manner in which reforms, educational and otherwise, should be made, we still have uncertain notions and strange illusions.

As a rule, among us, the first words of those who have a good idea is: "If I were the Government!" Let the Government adopt it, and, as it seems to them, all is said. It may happen that the Government does not adopt it. Then breaks out the traditional lamentation as to the lot reserved among us for all reforms. One more to be buried in the shade and oblivion of a dusty roll of papers at the bottom of a pigeon hole!

But it has happened more frequently within fifteen years—at least in our university system—that the administration has been quite ready to entertain new ideas. And then? Then the minister makes his own the propositions which have been submitted to him by most competent men. He ratifies them by his signature, includes them in a circular addressed to all of his subordinates. And at once they are not what they were. In passing through official transcription these ideas have lost, I know not what, of their virtue, and, on the other side, have taken on a double character that they did not have before—they have become general and imperative.

General—and note, for example, that paternal discipline practiced by you in the sweet familiarity of a little class or a little college, see it applied from day to day to boarding schools of 1,500 pupils, where the material installation would suffice to make it impossible.

Imperative—for after all, the minister can not speak in the same tone as a professor. For the fine pages in the report of Marion, all filled with judicious observations which you were silently to absorb, you get twenty-three articles of regulations, a faithful analysis but a rigid expression. Involuntarily you shut yourself up, as the leaf which was about to unfold itself is shut by too hasty handling.

Marion, who knew well his former colleagues in the lycées, foresaw that it would be difficult to "overcome a certain timidity, altogether French, which holds back the expression of moral truths upon the lips of superiors." This is what M. Fouillée styles modesty turned the wrong way (pudeur à rebours). If it had occurred to him, Marion would have been able at the same time to fortify the administration against that other susceptibility, also wholly French, which makes nothing so disagreeable to us as to hear ourselves ordered to do that which we desire to do. People always prefer to render obedience to their own hearts than to a rule. Such is the difference between the pleasure of going ahead to reconnoiter, and that of advancing by lock-step.

No, despite appearances, even in this country of centralization, neither is a minister all powerful, nor a Superior Council, nor a Parliament. The least reform which, leaving out questions of words, concerns the direction of minds, minds both of men and children, requires time and much time. It requires the more time, the less mechanical it is. The spirit is more difficult to correct than the letter. So, progress, such as we are discussing, exacts personal efforts, intelligent and voluntary, a progress which in the first place supposes conviction, afterwards devotedness, ever increasing perseverance and much tact; such progress is not the work of a day, nor of one minister. Who ever knew that better than Marion? And, as he frankly told you at the opening of one of his last courses, "Just as ministers and rectors will do nothing without the cordial cooperation of professors, just so, all together will do nothing without the collaboration of opinion, of environments, in one word, of families. And it is for that," he added, "that these lectures are addressed not only to future professors, but to the great public."

The ready cooperation of professors, the intelligent cooperation of families in this liberal plan for the education of the bourgeoisie, shall it be long awaited? I do not think so.

On the part of professors it is not the reform itself that has excited anxieties, but divers conditions that accompanied it, and, in their opinion, complicated and compromised it. But listen attentively to those who show themselves the most hostile to the idea of "liberal discipline;" suffer them to search to the very bottom of their complaints. And when they have finished, put to them naturally the question if the conclusion is not that we must go backward, bring back the instructions of 1890, and restore the old regulations. You will see their astonishment. You will hardly find one who will subscribe to that proposition. * * *

Let us not insist. Let us shut the book of Marion and wait and let time be judge. In ten years or so talk again with those who now say to you, "Excellent book, but full of chimeras. He asks for the impossible." They will say to you then with the same assurance, that of men who have the prevailing opinion about them, and have never had any other, "Excellent book, but full of commonplace; it breaks down open gates." Truth in this world has two names—what is no longer called utopian is named commonplace.

You see, gentlemen, remembering the limits of my subject, I have spoken only of Marion, the pedagogue. Can I separate him from Marion, the philosopher? What are his teachings upon education but the expression of his teachings concerning human nature? If he believed in the virtue of liberal discipline, it was because he had faith in human nature. If he believed that even with a child he should appeal to his free, open will, it was because he knew no other influence in this world to which to intrust the direction of humanity. M. Pécaut has said: "The method of Marion is the rational method." This is as true of his philosophy as of his pedagogy. Let others, poets or metaphysicians, please themselves with exploring the vague regions of the soul wherein reigns the clare-obscure of the conscious or the subconscious; let them employ themselves further in obtaining glimpses, beyond the normal limits of our intellectual vision, of dreamy imaginings, of latent volitions, and I know not what of undefined aspirations toward being and action, as are diffused beyond the colors of the solar spectrum rays that the eye can not seize. Marion was far from contradicting such as these, and he let science take care of itself. But when the question was of directing a man or a child, the citizen or the community, toward practical life, he lays claim to full light. He knew no other instrument that one could honestly employ than conscience and reason—no other guide, no other criterion. He mistrusted whosoever was mistrustful of the clear daylight of rational thought. Certainly he suppresses neither sentiment nor imagination; he knew the depth of tenderness that the human soul entertains for the unknowable; he was not surprised that a modern and very subtle mysticism has for our spirits, eager for the infinite, irresistible attractions. But he did not allow himself to be seduced by these. You saw this in particular when he began, in the course of his studies on the psychology of woman, the subject of the education of the sentiments, which he extended to the domain of religion. In one of his first lessons he said (December 14, 1893): "To make morality the basis is to give to religion, as it grows, especially in the heart of woman, its strongest support. An exalted rational morality guarantees pure religion more surely than such morality is guaranteed by ardent devotion."

Before this he had said, in his work l'Éducation dans l'Université: "No respectable belief has anything to fear from an education wholly of reason and liberty," and elsewhere: "It is very true that morality, being the flower of culture, to be perfectly taught, ought to be so with the whole soul; let us say without hesitation, with religious fervor, since it is also religion itself in its purest essence."[1]

[1] De l'école au régiment (Revue Bleue, Sept. 7, 1895).

The sovereign rôle assigned by him to morality is one of the dominant traits of his thought. With respect to popular instruction in philosophy, Marion was one of the first among us to shift the axis. What he found in the depth of human nature was not a problem essentially intellectual, but rather practical. It is important to know; much more so to will. As much stress as the ancient philosophy placed upon reasoning, so much he placed on the side of free will, upon which alone safety depends. To the Cartesian formula, always true, "I think, therefore I am," Marion, with his masters, Renouvier and Secrétan, readily superadded, "I will, therefore I am." He did not dissemble. His doctrine, both in morals and in education, is the doctrine of effort. He did not even consent, as some most eminent persons suggested to him, to substitute for that word, somewhat rude, one more to the French taste, honor, or dignity, or generosity.[1] He would smile when one spoke to him of his optimistic tendencies. "No," said he, borrowing from an English psychologist a word which eventually will come into the language, "it is not optimism; it is meliorism. I do not say that all is well; I say that we should strive to attain to that which is better."

There is only one conclusion to the long and very incomplete study which I have addressed to you. All friends of French education must wish that something, the most that is possible, of the spirit of Marion may survive him. It is my most earnest prayer. The only promise I give is to recall him often to your memories. To be a faithful continuer of his work, my ambition aspires no further.

Indeed, it seems to me, let me remark, that I am representing one absent, that to the best of my ability I am furnishing, in the place of the friend prematurely prostrated, the end of a course which, to human view, seemed to belong to him. We had known each other, he and I, from the day when, in this old Sorbonne, we found ourselves side by side at the examination for the Fellowship of Philosophy. After his return to Paris, after his entrance into the Superior Council, I had the privilege of seeing in him a brother in arms, since never did he refuse me his cooperation; since at every opportunity, with more force than anybody else, he defended the school work whose high theory he traced out here, while I was pursuing elsewhere its obscure and laborious application. Soldiers in the same cause, the younger of the two, and by far the better, he was the first to fall. The other has sought the honor of lifting up the standard, without asking himself if it shall be given to him to raise it as high. Those at the Sorbonne and in the ministry, upon whom the decision rests, have not disdained the good intentions of a veteran. And it is thus that you see me before you, a professor somewhat extraordinary, I think, profoundly touched by the mark of sympathy bestowed in my person upon the grand army of primary instruction, embarrassed, but happy to have here no other task than to speak to you with open heart of what my heart is full—with one sole regret, in fine, if I must say it, that of leaving the house where for a long time I have worked, at the very moment when the minister is appointed under whom, above all others, I would have been happy to serve, and under whom I expected to revive the days of Jules Ferry.

To you, gentlemen, I have but one wish to express: May the accord, the identity of inspiration, which will appear to you at once between the professor of yesterday and him of to-day, keep you from realizing that anything else is changed.

Perhaps the subject for this year's course[2] will seem to indicate that we are destroying all sequence with those considerations in which that sagacious, astute psychologist knew you to be interested. No, indeed! In truth, it is still an idea of his that inspires us, one which, as you have seen, was among those most cherished by him—that of social solidarity.

It is an idea, gentlemen, which has singularly grown since the day when Marion

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[1] Raymond Thamin, Revue de métaphysique et de morale, Nov., 1895.

[2] The subject is the following: "Of the social rôle of education in democracy."

introduced it into the Sorbonne, and it will continue to grow. Of all the new ideas that have germinated in silence within one or two generations in the bosom of the public conscience, whose bursting forth one of these days will astonish those who have known nothing of it, the strongest and the most profound, without doubt, is the sentiment of the social duty, we should better say, of the social obligation which weighs upon every one of us, but of which for a long time we have taken no more note than of the air that surrounds us.

You heard some days ago, gentlemen, the words that were spoken to the students of the University of Paris. They were, do not doubt it, the language of a new era, and when the highest in authority among their masters, with evident sincerity, set before them the true condition of France in this brief summary, "We are divided between the hope of realizing justice in our laws and in our society by generous reason, and the apprehension that the passions of some and the indifference of others may precipitate us into unknown abysses or into old abysses too well known," at that very moment you heard the exclamations of these young men, happy to be so well understood and ready for the summons. The noble apostrophe of the master was not concluded when it was overwhelmed, shall we say with applause? No; but by a solemn engagement to honor it.

If such are the dispositions of masters and students to-day, shall not the results be felt in questions of education? Henceforth there is a social aspect even in pedagogy. One may see marked out there as well as in philosophy, not less than in the economic and political order, a movement tending to a very close revision of the claims of individualism. We have no fear of that examination. The individual, taken in himself, has never been our idol, and it costs us nothing to agree that the abstract right of the individual is not the final aim of society, the only reason of things divine and human, the supreme purpose of thought and action.

It was not a contemporary socialist, it was Spinoza—and one of the philosophers of that school has done well to say it to a popular audience—it was Spinoza who long ago assigned as the object of a philosopher's meditations not only the elevation of himself to the full dignity of what he calls "the higher human nature," but to labor for "the establishment of such a society" (these are his own words) "that the greatest number can easily and surely attain to that degree of perfection."[1] How can we in the full tide of democracy repudiate the ideal which the secluded thinker dared to introduce into the old monarchies?

Speak, then, in full confidence, both of social justice and of the indefinite betterment of the conditions of human life, and of the new duties and the new aspirations which will lift us to more complete forms of sociality, to whatever is more human and more beautiful, if possible, than evangelical charity and republican fraternity. We will not cry blasphemy, for we know that the human soul is larger than all religions and more profound than all philosophies.

We men of education have always been more or less idealists. And of all dreams with which we love to be enchanted, that of a better society, since Plato, is the fondest. The habit of living with children is doubtless the reason that in imagination we are a good quarter of a century in advance of reasoning people. Albert Dumont has well expressed it: "The future," said he, "is our raison d'être. It is for the future that we toil; it is toward the future that we march with fixed eyes." So also when we hear a noble spirit, like William Morris, who has just died, cry: "I affirm that all social order which does not tend by all of its forces toward the greatest good of all its members ought to give place to another which at least essays to do so," our first impulse is not to guard ourselves against impru-

[1] Cited by M. G. Séailles in his address La philosophie et l'éducation du peuple, made April 11, 1896, at l'Union pour l'action morale.

dences that this formula may conceal. Our first impulse would be rather to acquiesce in the sentiment by which it was dictated.

But upon one condition.

On condition that this new justice may not be made up of injustices, nor that equality of equal servitudes, nor that grandeur of the society to come of the debasement of persons, nor that social conscience of the suppression of our consciences as men. Demand of us all sacrifices except that of honor. Our honor requires us to guard with jealous care a certain number of ideas which we have not originated—which have come down to us from the beginning of the centuries, slowly formed by the highest, purest human thought; the idea of our liberty and our responsibility; the idea of right and personal duty; the idea of work and its dignity; the idea of family and the idea of country—two sacred images without which we could not live; the idea of a political society based upon national sovereignty and regulated by law; the idea of free inquiry, which creates science, and of progress, the child of science; the idea of what is beyond, the infinite unknown which extends before us individuals, before us societies, and which incites to ever-renewed endeavor toward an ideal continually enlarging, all the best energies of our nature. This is our treasure. We will not consent to dispose of it at the beginning of the journey, under the pretext of exchanging for a better to-morrow.

We know well that all these present notions, moral and social, which are the life of humanity and which make civilization—we know well that they have not reached a form perfect and immutable; they will go on modifying themselves in order to increase. Increase them, therefore, if you can, but do not begin by erasing all; that is barbarism.

In the golden book of humanity there remain, we do not doubt, many blank pages on which from age to age are to be written truths yet unknown. Is this a reason for tearing from it its first pages, which running we read, those which give the key to the whole poem? We are willing to learn new lessons, but not to unlearn the old. Enamored as we may be of social progress, let us not imagine that it is to be purchased by some form of moral deterioration.

We still hear the voice of one of the masters of the last generation—of him who, under the Monarchy of July, had the honor of being the living soul of the youth, and during the Empire of being the conscience of mute France: "Take care," said Edgar Quinet, and that even at the time when he preached at the College of France what he dared name "the holy war for religious and social liberty," "guard yourself from lowering the plane of morality, expecting by that to make more easy the progress of democracy. That can be only a new progress of the spirit, of civilization, of universal order. It will be all that, or it will be nothing, which it is impious to suppose."

It seems as if it were a response to this programme that the doctrine of solidarity outlined by Marion attempts to make. Far from opposing the one to the other, the individual to society, it shows that we can no longer even separate the two terms, for neither lives without the other. From it we learn no longer to consider society either as a cloud of atoms diffused to infinitude nor as a formless mass wherein the elements composing it, absorbed and dissolved, disappear, but as an equitable and harmonious coordination of living beings in a whole, which lives in itself also, but which lives in them, with them, and by them. Instead of solidarity imposed, it is willing solidarity; between the two there is the whole distance from the unconscious march of things to the deliberate evolution of liberty. The bond of mutual dependence which free beings establish between themselves is an act of wisdom and morality; it supposes the government of minds by reason, of wills by justice.

This is why solidarism (if one may invent the word) can respond, it seems to me, to the twofold aspiration of educators; it invites them to perfect society by

perfecting man, to work for the city by working for the citizen; it presents with equal force the two sides of their task, not joined together by an empirical conciliation but founded upon an exalted harmony. For, indeed, although it is in its infancy, this young social philosophy, as justly maintained a public officer who has at least the merit of having sought to define it with great moral elevation—is indeed that which will from now on oppose the strongest barriers to the egoism of society and the individual; it says to society, taken as a moral person, "that it never can be great unless all of its members are so in themselves, great in spirit and in morality." And it says to the individual "that he ought to account to society for every increase of responsibility; because it is just to restore to the collective treasury what he could not have gotten without collective effort."[1]

Is it on this ground that some day the science of education will be settled? With my dear and noble predecessor, I hope so. Nevertheless, for the present let not the words "Science of Education" delude anybody. Possibly they promise more than, on our part at least, we should know how to maintain. Let us guard against misunderstanding. We do not pretend here to pure science, not even to erudition, still less to a course of sociology. Instruction, as the ancients would have said, perhaps not without some disdain, in this subject will be essentially exoteric. It does not address itself to the initiated, but to those who, having charge of teachers, men and women, in the family, in the school, in society, judge it well to devote some hours to putting in order the principles by which they are to be directed, to make clear the reasons of their actions, to make their choice among divers theories and divers practices, and to reflect methodically upon the end to be sought and the ways that lead to it.

Before the porch of our old churches of the Middle Ages it was customary to reserve a space within the sacred precincts but distinct from the sanctuary, a sort of transition from the agitation without to the quiet contemplation of the temple. It was there where were delivered in the common tongue the familiar communications of the clergy, there the "mysteries" were sometimes represented, the small schools installed. This was called the *parvis*.

It seems to me that our course is a sort of parvis to the Sorbonne. This may be said without fear of degrading the instruction of which Marion created the type. We do not humiliate pedagogy by recalling that it can be only an applied science and that at secondhand. *Ancilla philosophiæ*, its rôle is to follow other moral sciences, and yet to follow them at such a distance as not to enter prematurely on any road, advancing only when the way, well-worn, well-explored, is perfectly sure. This science appropriates to itself only truths long established, those which admit of translation into the language of all, and into the life of all. For education is not the art nor the trade of a few; it is that which every man and every woman ought to be in a state to exercise on his own account some day or other. It is more; that which by its direct consequences affects the whole country, especially a country of universal suffrage. Double reason for the Sorbonne to be freely open to it.

It was especially to place in clearer light the social importance of the education of the popular masses that Marion, some months back, wrote that very interesting letter to Henri Bérenger.[2] He could commend those congresses which sought to break up public indifference by calling to mind all that remained to be done after the school in order that the child of a workman or a peasant might not be abandoned morally. Listen to that last appeal. From the severity of his tone you will judge if he took this problem to heart. He addressed himself to the young French bourgeoisie. He showed them that they would lose all right to govern the

[1] Discourse of M. Léon Bourgeois at the Polytechnic Association, Nov. 4, 1894.

[2] Revue Bleue, Sept. 7, 1895.

country if they did not take in hand that sort of second education of our people throughout youth, and he added:

"But where is it, that youth, enlightened—I mean enlightened as it should be—sufficiently serious, sufficiently ardent (outside of sectarian agitations and the spirit of party) to devote itself to this work of solidarity? That modest elite, as valuable in a nation as are officers in an army, how are we to form them? How many professors in the Lycées have ever reflected on what might be the social function of the sons of farmers or of rural proprietors whom they educate? Who talks to those young men of the good they can do, and takes pains to put them in the condition to do it? What child of the bourgeoisie, lower or upper, is educated in the requisite sentiments of civic duty, and is made equal to his responsibilities?

"The truth is that we have not yet seriously comprehended that the whole political and social problem is a problem of education. Henceforth, education alone, absolutely that alone, can rescue our modern societies from the perils that threaten them. I do not know anybody who is not convinced of that. But those who know it the best too seldom reflect upon it, and we act almost as if we knew it not.

"The work whose pressing urgency is to-day apparent to all eyes can be commenced at once, because of the generous instincts which, thank God, superabound in France. But it will not succeed unless we make those who are to come after us better prepared for it than ourselves."

These grave words, poignant as grave, were, we may say, the last words of Marion's public instruction. Let them be my first.

CHAPTER XVII.

NOTES ON THE HISTORY OF AMERICAN TEXT-BOOKS ON ARITHMETIC.

By JAMES M. GREENWOOD, LL. D., Superintendent of Schools, Kansas City, Mo., and ARTEMAS MARTIN, LL. D., Editor of the Mathematical Magazine, Washington, D. C.

Chronological table.

[The dates following the title indicate the year of publication. The letters in parentheses indicate whether the copy seen belongs to the Library of Congress (L. C.), the Bureau of Education (B. E.), the Athenæum Library, Boston (A. L.), or the library of Artemas Martin (A. M.).]

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INTRODUCTORY NOTES.

Some years ago, in studying the history of arithmetic, I secured a copy of Arithmetical Books, by Prof. Augustus De Morgan, published in London in 1847. In this work Professor De Morgan mentions 1,580 names of authors and editors of works on arithmetic, but he actually examined and briefly described less than one-third of these books.

Remarkable as it may appear, De Morgan knew nothing, comparatively, of American arithmetics. He mentions The American Accountant, by William Milns, printed in New York, 1797; A Memoir of Zerah Colburn, written by himself, with his peculiar methods of calculation, Springfield, 1833; and in the List of Names of Authors, Pike, probably Nicolas or Stephen Pike, is given.[1]

When Arithmetical Books appeared, more than eighty different American authors had written text-books on arithmetic.

Finding this blank in the mathematical literature of our country, I decided to make a collection of American works, describe them, and, whenever possible, to give a brief sketch of each author.

Public and private libraries from Boston to San Francisco were examined with a view of furnishing as complete a list of authors as possible. The most extensive works on American biography contain few names, comparatively, of our school-book authors.

Much of the information concerning these authors was obtained through private sources. I have endeavored to make the list exhaustive, yet I am satisfied that some names are omitted, and perhaps many volumes are stored away in garrets and other out-of-the-way places. For instance, after a two years' search, I succeeded in finding one copy only of Jesse Guthrie's Arithmetic. Yet this book was printed in 1804 and was quite extensively used seventy or eighty years ago. This is a fair illustration of the search for other works of earlier and later dates.

For fifty years after the appearance of Nicolas Pike's Arithmetic little progress was made either in the matter or method of the arithmetics published. A new era, however, is marked by the writings of Warren Colburn, Greenleaf, Davies, Ray, Perkins, Thomson, Stoddard, and Brooks.

The notices of the books, with the few exceptions mentioned in the text, were written after a personal examination of each volume. In all cases, whenever possible, the first edition is described. The estimate placed upon each book is simply an expression of my own judgment after examination. If what is here attempted is carried out with other subjects, in a short time a tolerably complete bibliography of American schoolbooks can be made, which will give a very correct history of any one of these subjects viewed either from a literary or educational standpoint; and while such performances may not be esteemed of much value now, nevertheless they will form much of the material from which the history of education in this country will be eventually written. In the arithmetics of the past are mirrored the methods of instruction that prevailed at that time.

No effort was made to obtain a list of the commercial and business arithmetics except those of an early date. Books marked "A. M." in the Table of Contents belong to Dr. Artemas Martin's library; those marked "B. E." are in the library

[1] He also mentions, on page 87, the third edition of John Farrar's translation of Lacroix's Arithmetic, Cambridge, Mass., 1825.—A. M.

of the Bureau of Education, Washington; those marked "A. L." are in the Athenæum Library, Boston, and those marked "L. C." are in the Library of Congress, Washington, D. C.

I acknowledge with gratitude my obligations to Dr. Artemas Martin, Washington, D. C.; Mr. George A. Plimpton, New York; Prof. F. Cajori, Denver; Mr. J. W. H. Walden, Boston, and Miss Edith A. Woodman, Somerville, Mass., for valuable hints received from time to time during the preparation of the manuscript. The publishers of arithmetics also extended every courtesy in regard to their publications and information concerning authors.

As a contribution to the arithmetical literature of this country, and to preserve some account of American authors, this work is submitted.

J. M. GREENWOOD, *Kansas City, Mo.*

In order to distinguish my part of the work from that of Professor Greenwood, I have added my initials, A. M., to the books I have described. In most cases I have confined myself to giving a transcript of the title pages, for want of time to make a critical examination of the contents of the books.

Probably some mistakes have been made in estimating the sizes of the books. It was not always an easy matter to determine whether a book was 18mo, 16mo, or 12mo, on account of close trimming; and in some cases an 8vo may have been trimmed down to the size of a 12mo in rebinding.

Doubtless there are in existence many American arithmetics (some "quaint and curious") besides those described, as I have not had access to any library or collection outside of Washington.

The material for the biographical sketches of authors I have taken from Appleton's Cyclopædia of American Biography, except that of Rev. U. Jesse Knisely, which is from the Mathematical Visitor, Vol. II, No. 2, p. 27.

My thanks are due to Hon. W. T. Harris, Commissioner of Education, and Mr. J. W. Holcombe, chief clerk, for access to the collection of arithmetics in the library of the Bureau of Education; and to Mr. A. R. Spofford, Librarian of Congress, and Mr. David Hutcheson, assistant librarian, for access to the extensive collection of arithmetics in the Library of Congress, probably the largest collection of American arithmetics in the United States, without which this work would have been very incomplete.

ARTEMAS MARTIN, *Washington, D. C.*

A LIST OF ARITHMETICS NOT EXAMINED.

Hodder's Arithmetic, reprinted, Boston, 1719.

Pieter Venema's Coffer Konst, translated and printed in New York, 1730.

Daniel Fenning's Geschwinde Rechner, by Sower, 1774.

Cocker's Arithmetic, reprinted, Philadelphia, 1779.

Ludwig Höcker's Rechenbüchlein, Ephrata, Pa., 1786.

Thomas Sarjeant's Elementary Principles of Arithmetic. Philadelphia, 1788.

Gordon Johnson's Arithmetic, Springfield, 1792.

John Todd, American Tutor's Assistant, 3d edition, Philadelphia, 1797.

Jonathan Grout's Guide to Practical Arithmetic, 1802.

L. I. M. Chevogne's Mathematical Manual for the use of St. Mary's College of Baltimore, Baltimore, 1806.

Ballard's Gauging Unmasked, 1806.

J. Dougall's Treatise on Arithmetic, 1810.

De Wolf and Brown's First Lines of Arithmetic, 1818.

Phinehas Merrill's Scholar's Guide to Arithmetic, 1818.

Mordecai Stewart's Youth's Guide, 1818.

SKETCH OF ARITHMETIC.[1]

The origin of arithmetic is unknown, but the term is derived from the Greek word "arithmos"—number. Different nations have been accredited with the invention of this science. For instance, Josephus says:

> For whereas the Egyptians were formerly addicted to different customs and despised one another's sacred and accustomed rites and were very angry with one another on that account, Abram conferred with each of them and confuting the reasons they made use of, every one for his own practices, he demonstrated that such reasonings were vain and void of truth; whereupon he was admired by them in those conferences as a very wise man and one of great sagacity when he discoursed on any subject he undertook, and this not only in understanding it but in persuading other men also to assent to him. He communicated to them arithmetic and delivered to them the science of astronomy, for before Abram came into Egypt they were unacquainted with those parts of learning, and that science came from the Chaldeans into Egypt, and from thence to the Greeks also.

All that can be inferred from the foregoing extract is that Abram had some knowledge of this science, which either originated with the Hebrews or was derived by them from surrounding nations.

For a time the science was supposed to have originated with the Egyptians; others again ascribed it to the Chaldeans, while others gave the credit to the Phœnicians because of their nautical skill. Gradually each of these claims has faded away and modern investigation points unmistakably to its origin as having been in India. It must not be inferred, however, that other nations did not possess some methods of computation or of counting.

Counting is certainly coeval with the race. Even "barter," which is the most primitive method of exchange, could not be carried on between individuals without some system of estimating values by "how many and how much." While probably each of the great nations of antiquity had some method of computation, yet the origin and progress of the science, which has now reached a high degree of perfection, belong to India.

The science in its modern form became possible only through the present system of notation, consequently the most important event in the history of this science was the invention of the denary system. Among the ancient nations which possessed the art of writing it was natural to represent numbers by letters.

This we see from the Roman method of notation, which is a step in advance of the methods employed by the Greeks and the Hebrews. Both these nations used the first letters of their alphabets to represent numbers from one to ten, with the exception that the Greeks inserted a new character to represent "6," so as to conform to the Hebrew notation, since there is no letter in the Greek language corresponding to the sixth letter in the Hebrew.

These two systems correspond "closely, character for character, up to 80," yet the Greeks had another notation for inscriptions which resembles the Roman system quite closely. The Roman notation with which we are familiar employs fewer characters than the Greek and admits of more and simpler combinations, yet it is a clumsy system to work with, notwithstanding its advantages over the notations used by the Hebrews and Greeks.

The Arabic characters have been traced back to the Hindus, who in turn claim a divine origin for the invention. As early as the fifth century of the Christian Era the nine digits and zero, very nearly in the same form as we now have them, were known to the people of India, and not then as a recent invention, but as holding a permanent position in their literature. Dr. Edward Brooks, in speaking upon this subject, says:

> Among the sacred writings of the Hindus there is preserved a treatise upon arithmetic and mensuration, written in the Sanskrit language, called Liliwati. This was regarded as of such

[1] By James M. Greenwood, M. A.

inestimable value as to be ascribed by them to the immediate inspiration of Heaven. After an introductory preamble and colloquy of the gods, it begins with the expression of numbers by the nine digits and the cipher, or small o. The characters are similar to those in present use, and the method of notation is the same. It contains the common rules of arithmetic and the extraction of the square root as far as two places. The examples are generally very easy, scarcely forming any part of the text, and are written on the margin with red ink. This work is very old, and proves that the Hindus have possessed this system for many centuries. Their knowledge of the science, however, is quite limited. They have no idea of the decimal scale descending, and their management of fractions is tedious and embarrassed.

The general belief, till the discoveries made in Indian literature, was that the present system of arithmetic originated with the Arabs; but the honor of introducing it into Europe belongs to them. It appears that the Arabs obtained a knowledge of arithmetic either directly from India during the seventh or eighth century, or from the Persians, who had received it from the people of India.

As early as the ninth century the Indian system of notation was known to the Arabs. During the succeeding century it was in common use, at about which date it is supposed to have been introduced into Spain by the conquerors and thence spread gradually to the other European countries. However, the sources of information are so conflicting that it can not be definitely determined at what date it was actually made known in Europe. Some authorities are inclined to place it in the latter part of the eighth century or early in the ninth, while others think it at least two centuries later.

Prof. Benjamin Greenleaf says:

> It is evident that our numeral characters and our method of computing by them were in use among the Arabians about the beginning of the eighth century, when they invaded Spain, and it is probable that a knowledge of them was communicated to the inhabitants of Spain and gradually to those of the other European countries.

In the Encyclopedia Britannica, ninth edition, vol. 11, p. 461, is this statement:

> The method was known to the Arabians in the ninth century, and in the course of the tenth it seems to have come into general use among them, especially in their astronomical tables and their writings. It was probably in the following century that the Arabs introduced the notation into Spain, but in regard to this we have no explicit information, and different accounts are given of the earliest instances of the use of the system in Europe. On the one hand, it is alleged that the figures first occur in a translation of Ptolemy, of the date 1136, while others maintain that they were introduced (about 1252) by means of the celebrated astronomical tables published by and named from Alphonso the Wise. That their use was known in Italy at the commencement of the thirteenth century appears to be satisfactorily established, for there is no good reason to doubt the genuineness of the MS. writings of Leonardo of Pisa, copies of which have been found bearing dates of 1202 and 1220. Numerous other instances are given of the early use of the nine figures and the cipher, especially by astronomers and in calendars.

While this account of the introduction of figures into Europe appears quite reasonable notwithstanding the discrepancies in regard to dates, yet recent investigations tend to show a somewhat different account of the matter. The counterclaim is that the symbols or characters had been brought into Europe before the Arabs invaded Spain.

During the ninth century, it is claimed, the Arabs learned the Indian arithmetic from a work that is still extant, and that this treatise is founded upon a former collection of works brought from India to Bagdad about the year 773. The Arab treatise was translated into Latin during the Middle Ages, and became known partially to some European scholars. Also, upon careful comparison, it is thought by some that the figures used by the Europeans during the Middle Ages agree very closely with those used by the Arabs in Spain and northern Africa, while they differ materially from those used by the Arabs in the East. Upon this difference it has been conjectured that the system the Arabs took to Spain was not the same, so far as the form is concerned, as that which they received from India. Again, it is inferred that the Neo-Pythagoreans, who taught the Greeks and Romans the art of "ciphering," had learned directly from the people of India, and that

Bœthius and his successors used these figures in their mathematical handbooks, and thus they found way by degrees into European schools.

This introduces the characters into Europe from Alexandria. From cumulative evidence it seems quite probable that the Indian arithmetic was introduced into Europe through two sources—one through Egypt, probably during the fifth or sixth century, and the other passing through Bagdad and from thence into Europe by the way of Spain somewhat later. That the characters bore a general resemblance, though differing in some respects, to my mind is one of the strongest presumptions in support of a common origin. Exact uniformity was impossible before the art of printing was known. That once discovered, the shapes of the characters are fixed.

At present the earliest writers on arithmetic, so far as is known, were Greeks. Their writings abound chiefly in matters of speculation.

Pythagoras, nearly 2,500 years ago, attached great importance to numbers. To-day we follow his classification of numbers into prime and composite, perfect and imperfect, redundant and defective, solid, triangular, square, cubical, and pyramidal. Odd numbers he imagined masculine and even numbers as feminine.

Euclid treats of numbers in the seventh, eighth, ninth, and tenth books of his Elements of Geometry. He discusses proportion, prime and composite numbers; but from the fact that these books are omitted from the Elements, except in Dr. Barrow's edition, the contribution to the science of arithmetic is of little value.

About a century after, Eratosthenes invented a way of separating prime numbers from composite numbers. He inscribed the series of odd numbers on parchment, then he cut out such numbers as he found to be composite. The parchment thus cut was called a *sieve*. The method is known in mathematical literature as "Eratosthenes's sieve."

Diophantus of Alexandria wrote somewhat extensively upon the properties of numbers. He composed thirteen books or chapters upon this subject, but seven of them were lost or destroyed, so that the contents of six only are really known. Diophantus is, however, much better known as a writer on algebra than on arithmetic.

Following Diophantus, a century or more later, was Bœthius, somewhat distinguished as an author, whose writings were held as classic in Europe during the Middle Ages. Bœthius gave no rules for computing by numbers, but confined himself to the discussion of their properties.

A work in manuscript discovered in the library in Cairo, written by Avicenna, an Arab physician, who lived at Bokhara about the year A. D. 1100, is believed to be the first work that employed the Indian characters and the decimal system. This treatise contains the four fundamental rules besides many curious and interesting properties of numbers. It is frequently referred to as the oldest text-book, excepting, of course, the Indian treatises.

We now enter upon the printing period of books, and, notwithstanding the discovery and propagation of this art, it is difficult to decide who was the author of the first printed treatise on arithmetic.

Dr. Peacock and others contend that Lucas di Borgo, an Italian monk, is the author of the first printed arithmetic, called Summa di Arithmetica, published in 1494. This is also said to be the first book that used the Arabic characters, but Professor De Morgan is of the opinion that this treatise was preceded by the works of Calandri and Peter Borgo. He admits that the treatise by Philip Calandri on arithmetic was published in 1491, three years before the arithmetic of Lucas di Borgo.

After the appearance of the first few printed arithmetics, others appeared in rapid succession compared to the long intervals between writers of earlier times.

In 1501 John Huswit wrote a small arithmetic in the German language. It

was published at Cologne. He proved the fundamental rules by *casting out the nines.*

Thirteen years later John Kobel published a book at Augsburg. The Arabic figures are inserted, but not used by this author. He employed counters and the *Roman letters* instead of figures.

The next arithmetic was published in Paris in 1515 by Gaspar-Lax. The author added nothing new in this volume of about 250 pages.

From this time onward there are evidences of original work. The science was added to by one and then by another.

For instance, in 1522 Bishop Tonstall in his Art of Computation professes to have read all the books which had been published, and he says there was hardly a nation that did not have such books.

The next writer of note was John Schoner, who edited Regiomontanus's Arithmetic in 1534. Regiomontanus was a celebrated German astronomer, whose proper name was Johann Müller. He demonstrated that the number of figures in a cube number could not exceed three times the number of figures in the root.

Jerome Cardan, an Italian physician, mathematician, and author, "celebrated for his science, self-conceit, and absurd vagaries," was born at Pavia in 1501. At the age of 38 he published at Milan his Practica Arithmetica, a work of curious significance.

The properties of numbers were treated according to the manner of his predecessors, and he then dealt somewhat extravagantly with the supposed mystic properties of numbers in foretelling future events. These properties he inferred from the numbers that he found in the Scriptures.

This curious discovery is not so much a matter of surprise when it is remembered that "he dealt much in astrology and was a professed adept in the magical arts." His great epoch, says Hallam, is in the science of algebra.

The first arithmetic printed in English in 1540 was written by Robert Recorde, an eminent British mathematician, born about the year 1500. This book was entitled the Ground of Arts, Teaching the Work and Practice of Arithmetic. Recorde's original book has been greatly changed by the editors of different editions. They interlarded the text with their own observations, so much so as to leave the reader in doubt as to what Recorde originally wrote. A copy of the original edition is in the Greenville Library of the British Museum, and from it Mr. Heppel states that Recorde calls the unit figure a digit, and the other parts "articles;" thus, 5437 is made up of the articles 5000, 400, 30, and the digit 7. In the table of contents we find, with more descriptive writing than is necessary to quote here, the main subjects: Declaration of the profit of arithmetic; numeration, where Recorde does not venture beyond ten thousands of millions; addition; subtraction; multiplication; division; reduction; progressions; the golden rule; the Backer rule; the rule of double proportion; the use of fellowship, both with time and without time, and lastly, in Recorde's words, "Unto all these is added their proof."

The Backer rule is inverse proportion.

John Timbs, F. S. A., in speaking of Robert Recorde, uses the following language:

> Here should be mentioned the founder of the school of English writers, that is to say, to any useful or sensible purpose, Robert Recorde, the physician, a man whose memory deserves, on several accounts, a much larger portion of fame than it has met with. He was the first who wrote on arithmetic, and the first who wrote on geometry in English; the first who introduced algebra into England; the first who wrote on astronomy and the doctrine of the sphere in England, and finally, the first Englishman (in all probability) who adopted the system of Copernicus.
>
> Recorde was also the inventor of the present method of extracting the square root; the inventor of the sign of equality, and the inventor of the method of extracting the square root of multinomial algebraic quantities. According to Wood, his family was Welsh, and he himself a fellow of All Souls' College, Oxford, in 1531. He died in 1558, in the King's Bench Prison, where

he was confined for debt. Some have said that he was physician to Edward VI and Mary, to whom his books are mostly dedicated. They are all written in dialogue between master and scholar, in the rude English of the time. (School Days of Eminent Men, p. 118.)

Three inventions are ascribed to Michael Stifel, a Lutheran minister, who published his Arithmetica Integra at Nuremberg in 1544. He used the signs $\times$, $-$, and $\surd$. Stifel acknowledges his obligations to Adam Riscu and Christopher Rudolph.

Nicolas Tartaglia ("Stammer"), whose family name is unknown, published a mammoth treatise on arithmetic and algebra in the year 1556. It would require a volume to describe it, according to Professor De Morgan.

Humphrey Baker, an English mathematician, published in 1562 The Well Spring of Science, a very popular work on arithmetic.

Of all works on arithmetic prior to the publication of Crocker's celebrated book on the same subject (1668), this of Baker's approaches nearest to the masterpiece of that celebrated arithmetician. * * * It continued to be constantly reprinted till 1687, the latest edition we have met with. (Rose's Biog. Dict.)

The author, so it appears, tried to bridge the chasm between the pure abstract properties of numbers upon the one hand and the practical affairs of daily life upon the other. To adapt numbers to commerce and ordinary business was a wide departure, and marks an era in the science.

Simon Stevin, a Flemish engineer and mathematician, born at Bruges about 1550, made some very important discoveries in arithmetic, algebra, mechanics, and navigation. In 1585 he published at Leyden an arithmetic in which he devotes some space to interest tables and to decimals. This is the first notice of decimal fractions.

Albert Girard, another Dutch mathematician, edited Stevin's Arithmetic in 1634, and made such changes as he regarded as desirable. He changed the vinculum for the parenthesis.

John Mellis revised Robert Recorde's Grounde of Arts, London, 1579, 1582, 1590, 8vo.; and in 1588 issued Bookes of Accompts, 8vo. This is reputed to be the oldest English work on double entry bookkeeping.

In an old English work entitled The Pathway of Knowledge, which was published in London in 1596, are the following lines:

Thirtie daies hath September, Aprill, June, and November, Februarie, eight and twenty alone; all the rest thirtie and one.

This book was translated from the Dutch by W. P., who is supposed to be the author of the couplet.

An Italian mathematician, Pietro Antonio Cataldi, was born at Bologna in 1548 and died in 1626. He was professor of mathematics in the university of his native city for more than forty years. At Bologna he founded an academy of mathematics, which is said to have been the most ancient institution of that kind known, but it was suppressed by the senate.

Cataldi was an original investigator in different branches of mathematics. His discoveries in arithmetic are methods of extracting the square root of numbers, and the treatment of continued fractions.

New ideas seem to have sprung up in his mind in great profusion. He occupies a distinguished position among the Italian mathematicians of that century, and his works were used in more than a hundred towns and cities of Italy.

The first English book containing tables of compound interest was a work by Richard Witt, published in 1613. This book contained tables which the author called "Breviats," which were used to aid in the solution of problems in compound interest, annuities, rents, etc. The author appears to have used a line for the decimal point—that is, the tables were treated as numerators having 100 * * * for denominator, according to the number of figures in the numerator.

Four years after the appearance of Witt's treatise John Napier published his arithmetic. He claims the invention of the decimal point, and he also states that Stevin (Stevinus) first discovered decimal fractions. Professor De Morgan is of the opinion that Napier did not invent the decimal point, but that he borrowed it from some other author.

Robert Flood, an English physician and writer, born at Milgate in 1574, used P and M with strokes drawn through them. The first was the sign for addition; the second for subtraction. The work containing these signs was published in 1617–1619.

A work written ten years later by Albert Girard does not use the decimal point. His method of expressing 23.375 would be thus: 23/375. This indicates a carefulness in adopting new inventions.

William Oughtred, an eminent divine and a distinguished mathematician, born in 1573, introduced the sign ×, St. Andrew's Cross, in his Clavis Mathematica in 1631. Benjamin Martin says of Oughtred:

> His stile was very concise, obscure, and dry, and his rules and precepts so involved in symbols and abbreviations, as rendered his mathematical writings very difficult to be understood.

From that time to the present the science of arithmetic has been perfected in many ways. More authors in England and in America have written on this subject since the days of Oughtred than on any other, with the exception perhaps of English grammar.

For the benefit of American teachers and pupils, a tolerably complete bibliography of American authors is presented in this connection.

AMERICAN AUTHORS.

1729. ISAAC GREENWOOD.

Isaac Greenwood was born May 7, 1702, and died at Charlestown, Mass., October 22, 1745. He graduated from Harvard College in 1721, and in 1728 was chosen to fill the chair of mathematics and natural philosophy in Harvard College. This chair was founded by Thomas Hollis, of London, England, and this is the first instance in which a native of this country had been selected to fill such a professorship. In the year 1729 he published an arithmetic, the first book of the kind issued in this country, and no other came after it for nearly sixty years. On July 3, 1738, Professor Greenwood resigned the position which he had held ten years.

The following from Mr. J. W. H. Walden, a student in Harvard University, gives as complete an account of this book as anyone could wish:

CAMBRIDGE, *April 18, 1888.*

DEAR SIR: I have the pleasure to inform you that I have looked up Mr. Greenwood's "Arithmetick," with the following result:

There are two copies[1] of the work in the Harvard College library. One of the two, presented to the library by Rev F W P Greenwood, of Boston, 1831, has on the first page the signature of the presenter, followed by these words in writing: "Said to be by Prof. Isaac Greenwood." On the title-page is written. By. Isaac: Greenwood: M: H: et: Pf: M: The other volume, presented by Mrs. Mary Jane Seal Porter, of Waterford, Me., 1856, bears the following manuscript note on the title-page: "Supposed that Sam.l Greenwood was the Author hereof;" and beneath, in another hand, "By others said to be by Isaac Greenwood."

So much for the authorship.

The book is a small 12mo of 158 pages, exclusive of an advertisement (4 pages) prefixed, and the table of contents (4 pages) put at the end. The following is a faithful transcript of the title page:

Arithmetick | Vulgar and Decimal: | with the | Application | thereof, to | A variety of Cases | in | Trade, and Commerce. | [Vignette] | —— | Boston: N. E. | Printed by S. Kneeland and T. Green, for T. Hancock at the Sign of the Bible and Three Crowns in Ann street. MDCCXXIX.

[1] There is also a copy in the Library of Congress.—A. M.

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In the advertisement Mr. Greenwood says that "The Author's Design in the following Treatise is to give a very concise Account of such Rules, as are of the easiest Practice in all the Parts of Vulgar and Decimal Arithmetick; and to illustrate each with such Examples, as may be sufficient to lead the Learner to the full Use thereof in all other Instances."

He very particularly mentions that "he has had his mind all along upon Persons of some Education and Curiosity. It was in this view the whole was undertaken." He accordingly "has thought it improper to go into an elaborate Explanation of the Rules in the lower Parts of Arithmetick, as most authors have done," and "He has been very cautious of multiplying

Examples under the same Rules, consulting such a method as should encourage the Reader rather to the true Sense and Use of each particular Rule, than the useless Practice of Multiplication, Division, and the like."

He goes on to say, "there are many things in the following Treatise of greater Curiosity, the necessity in the Practice of Numbers. Such are the Methods of performing Multiplication by Addition, and Division by Subtraction, the Method of Contracting Decimal Multiplication and Division, the Rules concerning Circulating Figures, Sir Isaac Newton's Contraction in the Evolution of the Square Root, &c." His chief innovation seems to be explained in the following paragraph:

"The Reader will observe, that the Author has inserted under all those Rules, where it was proper, Examples with Blanks for his Practice. This was a Principal End to the Undertaking; that such Persons as were desirous thereof might have a comprehensive Collection of all the best Rules in the Art of Numbring, with Examples wrought by themselves. And that nothing might be wanting to favour this Design, the Impression is made upon several of the best Sorts of Paper. This Method is entirely new, * * * ."

The paper used in the book is thick, the type large. Words and phrases to which the author desires to call special attention are printed in italic characters, and, as more than half the book is, in the author's eyes, important, more than half is printed in italics. The method followed by the author seems to be in most cases to give the rule in each subject, then examples illustrating the rule, then examples for the student, and finally the proof. There is very little explanation aside from the rule. Each example has a "blank" beneath it for the student's "practice."

There are no collections of examples, as in modern books. At times, though not always, terms, such as annuity, interest, etc., are explained.

The copy which I have before me would have an additional interest for some persons from the fact that on every page is the impress, not of a machine, but of a human hand. Each example has been worked out by some person with the greatest care and elaborateness.

1737. THE SECRETARY'S GUIDE, OR YOUNG MAN'S COMPANION.

This is a volume of 249 pages, printed and sold by Andrew Bradford at the Sign of the Bible, Philadelphia, 1737.

The work is divided into four parts, as follows:

Part I.—Directions for spelling, reading, and writing true English, with the pronunciation, etc., to page 48.

Part II.—How to write letters of compliment, friendship, or business, with proper directions for external and internal superscriptions, and other things necessary to be understood in that affair, to page 88.

Part III.—Arithmetick made easy, and the rules thereof explained and made familiar to the capacities of those that desire to learn, with a short and easy method of shop and book keeping, merchants' accompts, etc.; and tables, how to lay out and measure land, gauging vessels, measuring boards, glass, round or square timber, buying or selling anything by the hundred; also a table of interest at 6 or 8 per cent, to page 160.

Part IV.—Forms of the most useful writings, such as bills, bonds, letters of attorney, indentures, bonds of arbitrations, awards, umpirages, deeds of sale, deeds of gift, assignments, leases and releases, counter securities, declarations of trust, with many other useful writings, bills of exchange, etc. With monthly observations in gardening, planting, grafting, and inoculating fruit trees, and the best time to prune them.

To which is added—

The Family Companion, containing rules and directions how to make cyder, mead, wines of our own growth, etc., with a collection of choice and safe remedies, very useful in families. Page 242.

Part III of arithmetic the author says: "Arithmetick is the art of numbering well, or of accounting well by numbers." Under the head of numeral letters, the learner is advised to learn these letters "for the readier reading the dates of years, frequently used at the foot of title-pages of books, on funeral monuments, and in Roman history, etc."

The four fundamental rules, the compound rules, and reduction are treated of in 27 pages. The rule of three in 5 pages, and contains five problems, each in simple proportion. Directions for bookkeeping include 14 pages, measuring and gauging 19 pages, and the interest table a page. The answers are omitted to the problems to be solved.

This book, as its parts indicate, is a compendium of such subjects as were deemed useful in that day. President George L. Farnham, Peru, Nebr., owns the volume that is here described.

1783. WHITTIER PERKIN'S ARITHMETIC.

This is a small 12mo book in manuscript, stitched, and covered with heavy linen, which has paper pasted on both sides of the cover. The title-page bears the author's name and date, "1783." The book contains 114 pages of the neatest pen work I ever examined. The letters are small,

round, and beautiful. All rules, tables, and solutions are written out in full. Important matters are written in larger and heavier letters. When the author concludes a subject two heavy horizontal parallel lines are drawn. Where several problems, as in reduction, are solved on a page, the author draws two heavy perpendicular lines down through the middle of the page. Occasionally problems are illustrated by pictures neatly and artistically made. From a careful examination of the work I think it is not a copy of any arithmetic that has been published, but that it is an original production which the author had prepared with a view to publication. Under the title, "The combination, election, permutation, and combination of numbers or quantities," the author adds several ingenious problems on "throwing dice," and finally concludes the subject as follows: "And in the last place, because the contrivance may please and divert the readers, we will here annex the tables themselves, with the manner of their use, and so conclude this rule." The tables are six of hexameters, and five of pentameters, followed by directions how to use them. From whatever light the volume is viewed, it is a unique one.

1786. THOMAS DILWORTH.

The Schoolmaster's Assistant. Being a Compendium of Arithmetic, both Practical and Theoretical. In Five Parts. The Twenty-Third Edition. By Thomas Dilworth. Hartford: Printed and Sold by Nathaniel Patten. 1786. pp. 199.

An American reprint of a once-famous English Arithmetic. This edition is dedicated "To the Reverend and Worthy Schoolmasters in Great Britain, Ireland and America." On the back of the title-page is a poem "To Mr. Thomas Dilworth on his Schoolmaster's Assistant" by William Deane, dated "Halifax, Oct. 20, 1765."

I have another copy, published at Wilmington, "Printed and Sold by Peter Brynberg, 1796," which contains a curious portrait of Dilworth. The "Preface Dedicatory" is omitted. This edition contains 192 pages.

I have still another copy, styled "The latest Edition," published at "New-London: (Connecticut.) Printed by Samuel Green for Naphtali Judah, New York, 1797," containing 192 pages, in which the "Preface Dedicatory" is addressed "To the Reverend and Worthy Schoolmasters of Great Britain and Ireland," America not being mentioned.—A. M.

1788. NICOLAS PIKE.

Nicolas Pike, the author of A New and Complete System of Arithmetic, composed for the use of the citizens of the United States, was the son of the Rev. James Pike. Nicolas was born at Somerworth, New Haven, October 6, 1743, and died at Newburyport, Mass., December 9, 1819. He graduated from Harvard College in 1766.

The first edition of Pike's Arithmetic was published in Newburyport, 1788 (8vo, pp. 512), and the second edition, revised and corrected by Ebenezer Adams, A. M., was printed at Worcester, Mass., 1797 (8vo, pp. 516). The third edition was published by Nathaniel Lord, in Boston, 1808, and one of the last editions was issued in New York under the editorial supervision of Dewees.[1]

Preface to the first edition: "It may, perhaps, by some be thought needless, when authors are so multiplied, to attempt publishing anything further on arithmetic, as it may be imagined there can be nothing more than the repetition of a subject already exhausted. It is, however, the opinion of not a few, who are conspicuous for their knowledge in the mathematics, that the books now in use among us are generally deficient in the illustration and application of the rules; of the truth of which the general complaint among schoolmasters is a strong confirmation. And not only so, but as the United States are now an independent nation, it was judged that a system might be calculated more suitable to our meridian, than those heretofore published.

"Although I had sufficient reason to distrust my abilities for so arduous a task, yet not knowing anyone who would take upon himself the trouble, and apprehending I could not render the public more essential service, than by an attempt to remove the difficulties complained of, with diffidence I devoted myself to the work.

"I have availed myself of the best authors which could be obtained, but have followed none particularly, except Bonnycastle's Method of Demonstration.

"Although I have arranged the work in such order as appeared to me the most regular and natural, the student is not obliged to pay a strict adherence to it, but may pass from one rule to another, as his inclination or opportunity for study may require.

"The Federal coin, being purely decimal, most naturally falls in after decimal fractions.

[1] I think this is a mistake and that it should be Dewey. The fourth edition was edited by Chester Dewey, and published at Troy, N. Y., 1822. The fifth edition was edited also by Chester Dewey, and published at Troy, N. Y., 1832. I have not seen any later edition.—A. M.

"I have given several methods of extracting the cube root, and am indebted to a learned friend, who declines having his name made public, for the investigation of two very concise algebraic theorems for the extraction of all roots, and of a particular theorem for the sursolid.

"Among the miscellaneous questions, I have given some of a philosophical nature, as well with a view to inspire the pupil with a relish for philosophical studies as to the usefulness of them in the common businesses of life.

"The short introduction to algebra, which is subjoined, was abstracted principally from Bonnycastle, and that of conic sections from Emerson's works.

"Being sensible the following treatise will stand or fall according to its real merit or demerit, I submit it to the judgment of the *candid*.

"With pleasure I embrace this opportunity to express my gratitude to those learned gentlemen who have honored this treatise with their approbation, as well as to such gentlemen as have encouraged it by their subscriptions, and to request the reader to excuse any errors he may meet with; for although great pains have been taken in correcting, yet it is difficult to prevent errors from creeping into the press, and some may have escaped my own observation; in either case a hint from the candid will much oblige their

"Most obedient and humble servant, "THE AUTHOR."

I have the second edition in an octavo volume of 516 pages. The work is composed of an arithmetic, 412 pages; plane geometry, trigonometry, and mensuration, 60 pages; introduction to algebra, 33 pages, and an introduction to conic sections, 10 pages.

The arrangement of topics is judicious, and the character of the work indicates a clear comprehension of the subjects and the wants of the learner. It is not only a text-book, but a comprehensive treatise containing very nearly all that was then known upon the subject. There is also a logical precision about the definitions which is in striking contrast to many English treatises of about the same period.

The arrangement of topics is not materially different from that of the present in our best books. After the fundamental rules and a portion of compound numbers and reduction, fractions are introduced and treated in a clear concise manner. The author's plan in the treatment of a new topic is this: Definitions, rule, solution of a problem, exercises.

From the large amount of space given to the reduction of coins it may be inferred that the currency question was the important topic of public interest before the people of the United States. The miscellaneous and chronological problems are well chosen, interesting, and sufficiently difficult to tax all the resources of the advanced arithmetician.

Geometry and trigonometry, algebra, and conics are treated briefly.

RECOMMENDATIONS OF PIKE'S ARITHMETIC.

DARTMOUTH UNIVERSITY, A. D. 1786.

At the request of Nicholas Pike, Esq. we have inspected his System of Arithmetic, which we cheerfully recommend to the public, as easy, accurate and complete. And we apprehend there is no treatise of the kind extant, from which so great utility may arise to Schools.

B. WOODWARD,
Math. and Phil. Prof.

JOHN SMITH,
Prof. of the Learned Languages.

I do most sincerely concur in the preceding recommendation.

J. WHEELOCK,
President of the University.

PROVIDENCE, STATE OF RHODE ISLAND, 1785.

Whoever may have the perusal of this treatise on arithmetic may naturally conclude I might have spared myself the trouble of giving it this recommendation, as the work will speak more for itself than the most elaborate recommendation from my pen can speak for it. But as I have always been much delighted with the contemplation of mathematical subjects, and at the same time fully sensible of the utility of a work of this nature, was willing to render every assistance in my power to bring it to the public view. And should the student read it with the same pleasure with which I perused the sheets before they went to the press, am persuaded he will not fail of reaping that benefit from it which he may expect or wish for, to satisfy his curiosity in a subject of this nature. The author, in treating on numbers, has done it with so much perspicuity and singular address that I am convinced the study thereof will become more a pleasure than a task.

The arrangement of the work and the method by which he leads the tyro into the first principles of numbers are novelties I have not met with in any book I have seen. Wingate, Hatton, Ward, Hill, and many other authors, whose names might be adduced, if necessary, have claimed a considerable share of merit, but when brought into a comparative point of view with this treatise they are inadequate and defective. This volume contains, besides what is useful and necessary in the common affairs of life, a great fund for amusement and entertainment. The

mechanic will find in it much more than he may have occasion for; the lawyer, merchant, and mathematician will find an ample field for the exercise of their genius, and I am well assured it may be read to great advantage by students of every class, from the lowest school to the university. More than this need not be said by me, and to have said less would be keeping back a tribute justly due to the merit of this work.

BENJAMIN WEST.

UNIVERSITY IN CAMBRIDGE, A. D. 1786.

Having, by the desire of Nicholas Pike, esq., inspected the following volume in manuscript, we beg leave to acquaint the public that in our opinion it is a work well executed and contains a complete system of arithmetic. The rules are plain and the demonstrations perspicuous and satisfactory, and we esteem it the best calculated, of any single piece we have met with, to lead youth, by natural and easy gradations, into a methodical and thorough acquaintance with the science of figures. Persons of all descriptions may find in it everything respecting numbers necessary to their business; and not only so, but if they have a speculative turn and mathematical taste, may meet with much for their entertainment at a leisure hour.

We are happy to see so useful an American production, which, if it should meet with the encouragement it deserves among the inhabitants of the United States, will save much money in the country which would otherwise be sent to Europe for publications of this kind.

We heartily recommend it to schools and to the community at large, and wish that the industry and skill of the author may be rewarded for so beneficial a work by meeting with the general approbation and encouragement of the public.

JOSEPH WILLARD, D. D.,
Pres. of the University.
E. WIGGLESWORTH, S. T. P.,
Hollis.
S. WILLIAMS, L L. D.,
Math. et Phil. Nat. Prof., Hollis.

YALE COLLEGE, 1786.

Upon examining Mr. Pike's system of arithmetic and geometry in manuscript, I find it to be a work of such mathematical ingenuity that I esteem myself honored in joining with the Rev. President Willard and other learned gentlemen in recommending it to the public as a production of genius, interspersed with originality in this part of learning, and as a book suitable to be taught in schools—of utility to the merchant, and well adapted even for the university instruction. I consider it of such merit as that it will probably gain a very general reception and use throughout the republic of letters.

EZRA STILES, *President.*

BOSTON, 1786.

From the known character of the gentlemen who have recommended Mr. Pike's system of arithmetic, there can be no room to doubt that it is a valuable performance, and will be, if published, a very useful one. I therefore wish him success in its publication.

JAMES BOWDOIN.

The reader will be interested in the following letter which was published recently in The American Bookmaker through the courtesy of Col. Nicolas Pike, of Brooklyn, and J. Trevitt Pike, of the same place—grandson and great grandson of the author of the arithmetic:

MOUNT VERNON, *June 20, 1788.*

SIR: I request you will accept my best thanks for your polite letter of the 1st of January (which did not get to my hand 'till yesterday)—and also for the copy of your "System of Arithmetic" which you were pleased to present to me.—

The handsome manner in which that work is printed and the elegant manner in which it is bound, are pleasing proofs of the progress which the arts are making in this Country. But I should do violence to my own feelings, if I suppressed an acknowledgement of the belief that the work itself is calculated to be equally useful and honorable to the United States.—

It is but right, however, to apprise you, that, diffident of my own decision, the favourable opinion I entertain of your performance is founded rather on the explicit and ample testimonies of Gentlemen confessedly possessed of great mathematical knowledge, than on the partial and incompetent attention I have been able to pay to it myself —But I must be permitted to remark that the subject, in my estimation, holds a higher rank in the literary scale than you are disposed to allow.—The science of figures, to a certain degree, is not only indispensably requisite in every walk of civilised life, but the investigation of mathematical truths accustoms the mind to method and correctness in reasoning, and is an employm. peculiarly worthy of rational beings. In a cloudy state of existence, where so many things appear precarious to the bewildered research, it is here that the rational faculties find a firm foundation to rest upon. From the high ground of Mathematical & Philosophical demonstration, we are insensibly led to far nobler speculations & sublime meditations.

I hope & trust that the work will ultimately prove not less profitable than reputable to yourself.—It seems to have been conceded, on all hands, that such a system was much wanted. Its merits being established by the approbation of competent judges, I flatter myself that the idea of its being an American production and the first of the kind which has appeared; will induce every patriotic and liberal character to give it all the countenance & patronage in his power.—In all events, you may rest assured, that, as no person takes more interest in the encouragement of American genius, so no one will be more highly gratified with the success of your ingenious, arduous & useful undertaking than he, who has the unfeigned pleasure to subscribe himself with esteem & regard

Sir Your Most Obed^{t} and Very H^{ble} Servant

G:o WASHINGTON

NICHOLAS PIKE, Esqr.

1788. BENJAMIN WORKMAN.

Treatise of Arithmetic, in Theory and Practice; containing everything important in the Study of Abstract and Applicate Numbers. Adapted to the Commerce of Great-Britain and Ireland. By John Gough. To which are added many valuable Additions and Amendments; more particularly fitting the Work for the Improvement of American Youth. By Benjamin Workman, A. M.

Philadelphia: Printed for William Young, Bookseller, No. 52, Second-Street, the corner of Chestnut-Street. 1792.

The preface is dated "August 5, 1788," 18mo, pp. 370.—A. M.

1790. CONSIDER AND JOHN STERRY.

In searching through various works of reference I have failed to find any account of Consider Sterry, and only a very brief sketch of John Sterry, in Allibone's Dictionary. John Sterry, a Baptist clergyman, was born in Providence, R. I., in 1766, and died in 1823. He was pastor of the First Baptist Church at Norwich, Conn., and while there devoted much of his leisure time to literary work and to editing a newspaper.

In 1790 the brothers published "The American Youth: Being a New and Complete Course of Introductory Mathematics." (Providence, Bennett Wheeler, 1790.)

The book is a 12mo of 388 pages. The title on the back, in distinct letters, is "American Youth." The work is divided into two parts. The first treats of arithmetic, in 239 pages, and the remainder, consisting of 147 pages, is devoted to algebra. It was designed for the American youth as a new and complete course of introductory mathematics, and also to assist private learners. The preface is long and bombastic. The opening sentence, a fair specimen, begins: "Time, ever big with wonders to be unfolded to the human mind, has ushered in, through a series of the most important events, the rising empire of America."

At the end of the preface is the following: "The Authors. Preston (Connecticut), July, 1790."

The arithmetic proper is not a production of great merit. The definitions and explanations are plain and straightforward, yet not always correct. Few problems are given and they are not difficult. Little is left for the learner to do except to look over the solved problems and to read the rules and comments.

Nearly all the subjects treated in the English arithmetics of the last century are included in this book.

In 1795 the authors published an arithmetic for the use of schools in the United States. Neither work had an extensive circulation.

1792. VINALL'S ARITHMETIC.

Vinall's "Preceptor's Assistant" was published in Boston in 1792 (12mo, pp. 288). The author, John Vinall, was a teacher of mathematics and writing in Boston, and dedicated his arithmetic "To His Excellency, John Hancock, esquire, Governor and Commander in Chief of the Commonwealth of Massachusetts."

"Arithmetic," the author says, "is fitly divided into three distinct parts, two of which are properly called *natural* and the third *artificial*." Natural, which treats of whole numbers, he calls *vulgar arithmetic;* and that which treats of broken or divided units is the *doctrine of vulgar fractions. Artificial arithmetic* is *decimal arithmetic.*

Among his preliminary definitions, that of a *plain number* is the most singular. The author's definition is as follows: "A plain number arises out of two other numbers—thus, three times 4 is 12, a plain number." He also uses *compound* number as we now denote a composite number. In 135 pages are treated the fundamental rules, compound numbers, the rule of three, vulgar and decimal fractions. The next 90 pages are devoted to mercantile arithmetic, which includes practice, interest and its applications, fellowship, exchange, duodecimals, etc. The remainder of the book treats of the extraction of roots, progressions, alligation, position, and permutation.

The definitions, explanations, solutions, rules, and directions are expressed usually in very clear language. In order to give the learner as little trouble as possible, the author works out all the problems, and occasionally under the head of "operation at large." The arithmetic is a good key to itself.

1793. BENJAMIN WORKMAN.

The American Accountant; or, Schoolmasters' New Assistant. Comprised in Four Books. And including all the Questions in the Philadelphia Edition of Gough, with many others. The Rules are either new, or those of that Treatise so compendized, as to be both brief and perfectly applicable. The whole adapted to the Commerce of the United States; and comprehending every Thing necessary to a complete practical Knowledge of the Science of Arithmetic. By Benjamin Workman, A. M. The Second Edition. Revised and corrected by R. Patterson, A. M., Professor of Mathematics in the University of Pennsylvania. Philadelphia, Printed for William Young, No. 52, the Corner of Chesnut and Second-street.—1793.

18mo, 220 pages.—A. M.

1793. THOMAS SARJEANT.

The Federal Arithmetician, or, the Science of Numbers, Improved. By Thomas Sarjeant. Philadelphia: Printed and Published by Thomas Dobson. 1793.

18mo, pp. 263.—A M.

1794. GEORGE FISHER.

The Instructor: or, American Young Man's best Companion. Containing, Spelling, Reading, Writing, and Arithmetick, in an easier way than any yet published; and how to qualify any Person for Business, without the Help of a Master, Etc. By George Fisher, Accomptant. Printed at Walpole, Newhampshire, by Isaiah Thomas and David Carlisle. For said Thomas, in Worcester, Massachusetts; said Thomas, and Andrews, D. West and E. Larkin, jun. in Boston. 1794.

Pages 68-162 are devoted to arithmetic.—A. M.

1795. THE TRADER'S BEST COMPANION, BY JOSEPH CHAPLIN.

A tract, printed by William Barrett at his office, Merrimack street, Newburyport, July 24, 1795, pp. 36.

This tract contains various arithmetical rules, by which simple addition, subtraction, multiplication, division, reduction, interest, loss and gain, bookkeeping, etc., are applied to the Federal currency, with several useful tables.

1795. THE STRANGER'S ASSISTANT AND SCHOOLBOY'S INSTRUCTOR.

This is a 12mo., containing 179 pages. It was published in New York in 1795. The author's name is suppressed under the title of "A Citizen."

The four fundamental rules are omitted, and the work begins properly with the tables of measure, weight, and value. Reduction is followed by "tare and tret," then fractions, vulgar and decimal, proportion, reduction of currencies, practice, interest, square and cube root, mensuration, position, and duties.

The author uses the following steps in presenting a subject: (1) The rule; (2) the solution of a problem under the rule; (3) exercises, if any are used.

1796. ERASTUS ROOT'S INTRODUCTION TO ARITHMETIC.

Printed and sold by Thomas Hubbard, Norwich, 1796, pp. 105.

This contains the simple rules, rule of three, practice, interest and discount, equation of payments, double rule of three, tare and tret, alligation, followed by a chapter of useful rules, such as "area of a circle," "circumference of a wheel," "notes and orders," and a supplement of bookkeeping.

1797. JAMES NOYES.

The Federal Arithmetic; or, a Compendium of the Most Useful Rules of that Science, adapted to the Currency of the United States. For the Use of Schools and private Persons. Published agreeably to Act of Congress. By James Noyes. Printed at Exeter, by Henry Raulet, for the Author. 1797.

18mo, pp. 128.—A. M.

1797. THE AMERICAN ACCOMPTANT.

The American Accomptant, by Chauncey Lee, A. M., was printed at Lansingburg, by William W. Wands, in 1797. The author resided at Burlington, Vt. He outlines the work on the title page as follows: "The American Accomptant; being a plain, practical and systematic *Compendium* of *Federal Arithmetic;* in three parts: designed for the use of schools, and especially calculated for the *commercial Meridian* of the United States of America." (Pp. 308.)

On the fly leaf, opposite the title page, are vignettes of the American eagle, Spanish pistole, French guinea, Johannes Portugal, British guinea, half moidore of Portugal. The head and tail of each coin are represented. Following the title page are four testimonials, and then 37 pages of an "introduction" in which the author presents many excellent and original suggestions connected with methods of teaching arithmetic and the reduction of the tables to the Federal system. He cautions the reader as follows: "Lest any one should entertain a mistaken idea of the design of this compendium, and hence be led to expect many things in it which he will not find, I would here apprise him that I have attempted in it to treat of and simplify the system of commercial arithmetic only—to render many of its rules more easy and concise and better adapted to the instruction of young minds in the method and progress of common-school education. With this view I have omitted several rules contained in former arithmetical treatises that are perhaps more calculated either to amuse or puzzle than to profit the common-school student, or at least are inapplicable or unneccessary to trade and business and the common affairs of human life."

Further on he speaks of this imperfection in most arithmetics in which the authors had not made the first principles sufficiently plain for beginners:

"But taking many things for granted, as already well known and understood, though needing at the same time as particular explanation as the more abstruse and complicated parts, the student, as he proceeds, is subjected to the arduous task of erecting a superstructure without a foundation.

"Here, too, originates a similar error—I mean a superficial mode of instruction in many of the common schools. The boy, advanced perhaps some way in his teens, is sent to a winter school for two or three months to complete his education—for he can not attend in any other season, nor indeed then but quite unsteadily. But as he is almost a man, he must go to school to cipher, and as he has but a short time for the business he must cipher fast. He goes to school, vulgarly speaking, raw, perhaps scarcely able to form an arithmetical figure. His master sets him a sum in addition and tells him he must carry one for every ten, but why is a mystery which neither master nor scholar gives himself any trouble about; however, with a deal of pains, he at length gets his sum done, without ever being asked or knowing how to read the sum total or any number expressed in the statement. But it is ciphering, and that is sufficient. If he is taught to commit any of the rules to memory he learns them like a parrot, without any knowledge of their reasoning or application. After this manner he gropes along from rule to rule, till he ends his blind career with the rule of three, and in the end the only and truest account he can give of the whole is that he has been over it. But he has completed his school education and is well qualified to teach a school himself the next winter after."

Next the author proceeds to show the great importance of a thorough understanding of notation, addition, subtraction, multiplication, and division, with running comments on teaching these subjects. Further on Federal Arithmetic is presented, and it is in this department

that the most radical changes are suggested. The plan is to reduce all tables of weights and measures to a basis of 10. To illustrate with "Federal avoirdupois."

10 drams make 1 ounce.
10 ounces 1 pound.
100 pounds 1 hundredweight.
10 hundreds 1 thousand.

Troy weight is Federalized thus:

10 cents make 1 grain.
10 grains 1 pennyweight.
10 pennyweights 1 ounce.
10 ounces 1 pound.

Federal board measure:

10 pepper-corns make 1 inch.
10 inches 1 foot.
10 square feet 1 pannel.
10 pannels 1 gaug.
10 gaugs 1 thousand feet.

These specimens will serve to show the author's views on these varying tables. He contends that much time is lost by use of the tables then in vogue, and urges Congress to Americanize a system of weights and measures that would be easily understood and simple in application to business matters.

The arithmetic proper is divided into three parts: The first part treats of the simple rules, Federal money, and simpler exercises in reduction. This division of the book extends to page 110, and the topics are divided into lessons. Many of the lessons consist of questions and answers.

Part second is entitled commutation. By commutation the author means nearly the same as is now known as reduction. His answer to "What is commutation?" is "It is the changing of numbers or quantities of one or more denominations into others of different denominations, but of the same value."

Commutation is still further divided into reduction and consolidation, and each of these into direct and indirect. This division is treated of in 72 pages.

The third division includes fractions, proportion, partnership, and interest, filling 65 pages. The remainder of the book is devoted to bookkeeping and legal forms such as were in use in the last century, and a 12-page list of the names of subscribers.

The entire work is written with great clearness.

The only copy [1] that I know of belongs to Superintendent William H. Benedict, Port Henry, Essex County, N. Y. This book was his grandfather's.

Chauncey Lee was born in Coventry, Conn., July 10, 1718; [2] died November 5, 1842, in Hartwick, N. Y. He was graduated at Yale in 1784. After practicing law a short time he studied theology, and was ordained pastor of the Congregational Church at Sunderland, Vt., in 1790. He was also pastor at Colebrook, N. Y., and at Marlboro, Conn. He retired from active duty in 1835. Columbia College gave him the degree of D. D. in 1823. He was the author of several publications besides his arithmetic.

Dr. Lee's Arithmetic is the earliest one in which I have found the "dollar mark," about the origin of which there has been so much discussion; it is but a rude representation of the character now in use. He uses it first on page 56, without any explanation.—A. M.

1797. THE AMERICAN ACCOUNTANT.

The American Accountant, by William Milns, was printed in New York in 1797, copyright secured. It is a volume of 320 pages, completely filled with problems applicable to the business of that age.

1798. PETER THARP.

New and Complete System of Federal Arithmetic; in Three Parts. With an Appendix, containing Board and Timber Measure. Designed for The Use of Schools. By Peter Tharp, Math. Newburgh: Printed by D. Denniston for the Author.—1798.

A little 24mo of 138 pages, which probably never attained much popularity. I have seen only one copy.—A. M.

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[1] There is a copy in the Library of the Bureau of Education, one in the Library of Congress, and I have one.—A. M.

[2] This date is given in Appleton's Cyclopædia of American Biography, Vol. III, p. 661, but it is evidently wrong, as he would be 66 years old when he graduated and 124 at his death.

1798. ZACHARIAH JESS.

The American Tutor's Assistant, Improved: or, a Compendious System of Decimal, Practical Arithmetic, Comprising the Usual Methods of Calculation, with the addition of Federal Money, and other Decimals, dispersed through the several rules of that useful Science. Adapted for the easy and regular Instruction of Youth in the United States. Compiled by Zachariah Jess. Fourth Edition, Corrected and Revised. Wilmington: Printed and sold by Hezekiah Niles, Bookseller, Market Street. 1805.

18mo, pp. 204.

This is the earliest edition I have seen. Seems to have been a popular work in its day. Many editions were issued. The fifth edition is dated 1808; the sixth, 1811; the eleventh, 1818. It was copyrighted in 1798, which is probably the date of publication of the first edition.—A. M.

1799. LITTLE'S ARITHMETIC.

The title of Ezekiel Little's Arithmetic is "The Usher." It was published by act of Congress in 1799, at Exeter, N. H.

This is a 12mo of 240 pages, beginning with arithmetic and branching off into surveying. The author, as was frequently the case, put a little of almost everything into his book.

1799. DABOLL'S ARITHMETIC.

History tells us little of Nathan Daboll, the author of Daboll's Schoolmaster's Assistant. He is spoken of as an educator, born about 1750, who died in Groton, Conn., 9th of March, 1818. He was known as an excellent teacher of navigation, having instructed 1,500 persons in that branch of mathematics alone. In the year 1799 he published at New London the Schoolmaster's Assistant, a treatise on arithmetic.

This book was regarded as a standard work and had a large circulation. It has 240 pages, of which 26 are an appendix. The first 4 pages after the index embrace all the tables, and the fifth page the explanation of the characters used. The general plan of the work is to define a subject, if necessary, and then to give the rule. Perhaps the most noticeable feature of the book is that the author uses the comma for the decimal point.

The arrangement of topics is quite different in many respects from that in use at present. For instance, decimal fractions follow the compound numbers, with common fractions after exchange and only a few pages before square root. Many of the miscellaneous problems are very good, and if a learner can solve all of them he is pretty well advanced in arithmetic.

In the preface the author says: "The design of this work is to furnish the schools of the United States with a methodical and comprehensive system of practical arithmetic, in which I have endeavored, through the whole, to have rules as concise and familiar as the nature of the subject will permit.

"During the long time which I have devoted to the instruction of youth in arithmetic I have made use of various systems which have just claims to scientific merit; but the authors appear to have been deficient in an important point—the practical teacher's experience. They have been too sparing of examples, especially in the first rudiments; in consequence of which the young pupil is hurried through the ground rules too fast for his capacity. This objection I have endeavored to obviate in the following treatise.

"Although the Federal coin is purely decimal, it is so nearly allied to whole numbers, and so absolutely necessary to be understood by everyone, that I have introduced it immediately after addition of whole numbers, and also shown how to find the value of goods therein, immediately after simple multiplication; which may be of great advantage to many, who perhaps will not have an opportunity of learning fractions.

In the arrangement of fractions, I have taken an entire new method, the advantages and facility of which will sufficiently apologize for its not being according to other systems. As decimal fractions may be learned much easier than vulgar, and are more simple, useful, and necessary, and soonest wanted in more useful branches of arithmetic, they ought to be learned first, and vulgar fractions omitted until further progress in the science shall make them necessary. It may be well to obtain a general idea of them and to attend to two or three easy problems therein; after which the scholar may learn decimals, which will be necessary in the reduction of currencies, computing interest, and many other branches.

"In simple interest, in Federal money, I have given several new and concise rules, some of which are particularly designed for the use of the compting-house."

The "Recommendations" quoted in the book are curious examples of criticism:

"I have read Daboll's Schoolmaster's Assistant. The arrangement of the different branches of arithmetic is judicious and perspicuous. The author has well explained decimal arithmetic, and has applied it in a plain and elegant manner in the solution of various questions, and especially to those relative to the Federal computation of money. I think it will be a very useful book to schoolmasters and their pupils.

"JOSIAH MEIGS,
"*Professor of Mathematics and Natural Philosophy.*

"YALE COLLEGE, *November 27, 1799.*"

"I have given some attention to the work above mentioned, and concur with Mr. Professor Meigs in his opinion of its merits.

"NOAH WEBSTER.

"NEW HAVEN, *December 12, 1799.*"

"RHODE ISLAND COLLEGE, *November 30, 1799.*

"I have run through Mr. Daboll's Schoolmaster's Assistant, and have formed of it a very favorable opinion. According to its original design I think it well 'calculated to furnish schools in general with a methodical, easy, and comprehensive system of practical arithmetic.' I therefore hope it may find a generous patronage and have an extensive spread.

"ASA MESSER,
"*Professor of the Learned Languages and Teacher of Mathematics.*"

Daboll's Treatise on Navigation was also extensively used in the higher institutions of learning, as well as by many private students.

1800. DAVID COOK, JR.

Cook's American Arithmetic; being a System of Decimal Arithmetic; Comporting with the Federal Currency of the United States of America. To which is annexed, by way of Second Part, The American Surveyor. The whole on an entire New Plan. To which is added, a Draught of Instruments, adapted to carry the above into effect. The work is rendered easy, and may be of Great Use to the Citizens of the United States. By David Cook, Jun.

New Haven: Printed by Thomas Green and Son. 1800.

18 mo, 107 + 9 pp.—A. M.

1800. GEORGE FISHER.

Arithmetic, in the Plainest and most Concise Methods hitherto extant: with New Improvements for Dispatch of Business in all the several rules. As also Fractions, Vulgar and Decimal, wrought together after a New Method, that Renders both easy to be understood in their Nature and Use. The whole perused and approved of by the most eminent Accomptants in the several Offices of the Revenue, viz. Customs, Excise, &c. as the only Book of its kind for variety of Rules and brevity of Work. By George Fisher, Accomptant. To which is added an Appendix, containing The Construction and Use of Tables, for calculating Questions in Compound Interest, and Annuities or Leases in Possession or Reversion. London, Printed:— Wilmington: Re-printed and Sold by Peter Brynberg, Market-Street. 1800.

Evidently an American reprint. 18mo, sheep, 312 pp.

1800. JOHN GOUGH.

Practical Arithmetick in Four Books. I. Whole Numbers, Weights and Measures. II. Fractions, Vulgar and Decimal. III. Mercantile Arithmetick. IV. Extraction of Roots, Progression, &c. Extracted from the Large and Entire Treatise, and Adapted to the Commerce of Ireland, as well as that of Great-Britain. For the use of Schools. By John Gough, Author of the Practical English Grammar. Carefully Revised by Thomas Telfair, Philomath. And now fitted to The Commerce of America. With an Appendix of Algebra, by the late W. Atkinson, of Belfast. Dublin, Printed: Wilmington: Re-printed, and Sold, by Peter Brynberg. 1800.

18 mo, sheep, pp. 359.—A. M.

1801. WALSH'S ARITHMETIC.

Michael Walsh was a native of Ireland. He came to America early in life and settled in Massachusetts. For many years he was usher at Marblehead Academy, and received an honorary degree from Harvard College in 1803. While engaged as an instructor many young men were his pupils who afterward became eminent citizens. Among the number was Chief Justice Story. In 1801 Professor Walsh published the Mercantile Arithmetic, and in 1826 a New System of Bookkeeping. He lived to the age of 77 years, and died August 20, 1840, at Amesbury, Mass.

The title of his book is: A New System of Mercantile Arithmetic; Adapted to the Commerce of the United States, in its Domestic and Foreign Relations; with Forms of Accounts, and Other Writings Usually Occurring in Trade. By Michael Walsh, A. M. ..... Iter est breve per exampla.—Seneca. First Northampton, From Third Newburyport Edition. Northampton. Published by S. & E. Butler, proprietors of the copyright. Sold also by Hudson & Goodwin, Oliver D. Cooke, and Lincoln & Gleason, Hartford; Beers & Howe, and Increase Cooke & Co., New Haven. ..... T. M. Pomeroy, Printer.—1807.

This is a 12 mo, of 274 pages. It was entered for copyright April 24, 1800, and the printed testimonials, three in number, from Newburyport, Boston, and Salem, are signed by leading business men, and bear the date of 1800. In the preface to the third edition the author says: "The merit of Walsh's Mercantile Arithmetic having been submitted to the public, and established by the most liberal and unequivocal encouragement, the editor feels a confidence in offering a third edition of 20,000 copies." This edition is fuller under the general head of Exchange than the preceding. Up to the 145th page this treatise differs little from other treatises published prior to and after it; but on the 146th page exchange is introduced and covers 81 pages, including exchange with all the countries with which we traded. Following are progressions, involution and evolution, permutation, duodecimals, and mercantile transactions of various kinds. It has few definitions, no explanations, rather obscure rules for solving problems, and a large collection of problems. An edition was published in Boston in 1826.

1801. DANIEL ADAMS.

Daniel Adams was born in Townsend, Mass., September 29, 1773, and died in Keene, N. H., June 8, 1864. In 1797 he graduated from Dartmouth College; afterwards studied medicine, and settled at Leominster to practice his profession. He turned his attention to the preparation of schoolbooks, which include grammar, arithmetic, and reading. He also took an active interest in public affairs. In 1806 he removed to Boston, opened a select school, and edited the Medical and Agricultural Register. Next he removed to Mount Vernon in 1813; resumed the practice of medicine, revised his arithmetic and issued it under the title of Adams' New Arithmetic. He moved to Keene, N. H., in 1846, where he spent the remainder of his life. From 1838 to 1840 he served as State Senator. For many years he was president of the State Bible Society, and was for a time the president of the State Medical Society; but he is known chiefly through his mathematical writings.

The earliest copy of his Scholars' Arithmetic that I have seen is the second edition, which was printed in 1802. The title page was missing, but the recommendations and the author's preface remain intact. The book is clearly printed and contains 216 pages. It is divided into four sections: (1) Fundamental rules; (2) rules essentially necessary for every person to fit and qualify himself for the transactions of business; (3) rules occasionally useful to men in particular employments of life; (4) miscellaneous questions. There are added six pages on "Forms of notes, deeds, bonds, and other instruments of writing."

His method of treating a subject differs from every other author that I have examined. Take multiplication as an example: He defines multiplication and illustrates it by a problem; next is the table, followed by the rule, then examples with methods of proof. Some of the problems are printed with blank spaces between them. These blanks are left for the pupil to write the solutions in—a custom formerly practiced in this country. This work is the foundation of the author's later arithmetics, which are described further on.

The only other arithmetic by this author that I have seen is the edition published at Keene, N. H., in 1827. The title page reads as follows:

Adams' New Arithmetic. Arithmetic, in which the Principles of Operating by numbers are Analytically Explained and Synthetically applied. Thus combining

the advantages to be derived from both the Inductive and Synthetic Mode of instruction: the whole made familiar by a great variety of useful and interesting examples, calculated at once to engage the pupil in the study, and to give him a full knowledge of figures in their application to all the practical purposes of life. Designed for the use of Schools and Academies in the United States. By Daniel Adams, M. D. Author of the Scholar's Arithmetic, School Geography, etc. Keene, N. H. Published by J. & J. W. Prentiss, and for sale by them and Booksellers generally.

In the preface the author refers to "The Scholar's Arithmetic," which was published in 1801, as being synthetic, and says "if that is a fault of the work, it is a fault of the times in which it appeared." He also refers to the inductive method of teaching as being an improvement of later years and ascribes delicate praise to Pestalozzi and Warren Colburn for what they had done in advancing the cause of education. The book is a 12mo volume of 261 pages. It is well printed and in clear type. The arrangement of subjects does not differ materially from that of the present. At the beginning of a new subject the author uses simple exercises; from these the rule is deduced, and at the close of the chapter or subject, supplementary problems are inserted as reviews. There are 203 miscellaneous examples at the close of the arithmetic proper. These are well selected and their solution will call into active exercise all that the pupil had passed over. The last few pages of the book contain business forms and a few simple explanations on bookkeeping.

1801. SAMUEL WEBBER.

Mathematics, compiled from the best authors and intended to be The Text-Book of the Course of Private Lectures on these sciences in the University at Cambridge. Under the direction of Samuel Webber, A. M., A. A. S., Hollis Professor of Mathematics and Nautural Philosophy. In two volumes. Boston. Printed for the University at Cambridge, by Thomas & Andrews, 1801.

8 vo, 426 and 610 pages. 245 pages of the first volume are occupied with arithmetic. A second edition was issued in 1808. In the second edition the part devoted to arithmetic is reduced to 215 pages. Vol. I of the second edition contains 464 pages and Vol. II 508 pages.

Samuel Webber was born in Byfield, Mass., in 1759; died in Cambridge, Mass., July 17, 1810. He was graduated at Harvard in 1784, taking high rank in mathematics; entered the ministry, and in 1787 was made tutor. In 1789 he was chosen professor of mathematics and natural philosophy, which position he held till he was made president of the college in 1804. Dr. Webber was one of the commissioners that were appointed to settle the boundary line between the United States and the British provinces. He was the author of a System of Mathematics, which was intended for use in Harvard, and for a long time was almost the only text-book on that subject in New England (2 vols, Boston, 1801).—A. M.

1802. THOMAS DILWORTH'S ARITHMETIC, BY DANIEL HAWLEY.

In 1802 Daniel Hawley published The Federal Calculator, or American Schoolmaster's Assistant and Young Man's Companion, which is "altered from Thomas Dilworth's Arithmetic, and adapted to the currency of the United States." The copy that I have examined of The Federal Calculator was kindly lent to me by Superintendent John H. Phillips, Birmingham, Ala. It is the fifth stereotyped edition, revised and corrected, and improved by William Stoddard, and printed in Troy, N. Y., 1817. The recommendations, notices of the different editions, etc., indicate slight alterations from the first edition by Daniel Hawley in 1802.

I have a copy of Dilworth's The Schoolmaster's Assistant, published in London, 1743. However, there is not much similarity between it and The Federal Calculator, as revised and edited by Hawley. The Federal Calculator is a 12mo book of 236 pages. It is divided into five parts: (1) Of whole numbers; (2) of vulgar fractions; (3) of decimal fractions; (4) of duodecimals; (5) a collection of questions and exercises. The divisions are arbitrary. For instance, the third part includes decimals, involution, evolution, interest, annuities, etc. A topic is usually presented in the following order: (1) A question and its answer; (2) a note or explanation; (3) exercises. The problems are well chosen, and while none are very difficult, yet many are severe enough to tax the learner's powers to a considerable extent. The book averages fairly well with other works of this date.

1802. ALEXANDER'S ARITHMETIC.

Caleb Alexander's New and Complete System of Arithmetic is a small 12mo, of 214 pages, published at Albany, N. Y., 1802. The work is divided into two parts, 180 pages of arithmetic, and the remainder consisting of geometrical problems and some exercises in dividing land, which the author calls surveying.

1803. FINLAY'S ARITHMETICAL MAGAZINE.

This is a business and commercial treatise on arithmetic published in New York in 1803. It is designed to further the commercial interests of the United States—the active supporters of trade and agriculture. This book is a large 12mo, 252 pages, containing some problems and many tables of the currencies of various nations.

1803. CHESTER WRIGHT.

The Federal Compendium: being a plain, concise, and easy Introduction to Arthmetic; designed for the Use of Common Schools. By Chester Wright, Preceptor of an English School in Middlebury. First Edition. Middlebury, Vermont: Printed by Huntington & Fitch, for the Author. 1803.

18mo, pp. 108.—A. M.

1804. GUTHRIE'S ARITHMETIC.

Jesse Guthrie, of Kentucky, the author of The American Schoolmaster's Assistant, prepared his arithmetic, which was published at Lexington, Ky., 1804. pp. 231.

This work attained a good circulation in the West soon after its publication. The treatise was a good book in its day. Other editions were printed at various places.

1805. THE YOUTH'S ARITHMETICAL GUIDE.

The Youth's Arithmetical Guide being a Compendious System of Practical Questions in Arithmetic. By Thomas Watson, Daniel Jaudon, and Stephen Addington. Printed in 1805 by D. Hogan, No. 51 south Third street. pp. 200.

The first part includes the simple rules, proportion, single and double rule of three, tare and tret, simple and compound interest, insurance, brokerage, etc. The second part includes discount, common and decimal fractions, alligation, and duodecimals.

1805. ROBERT PATTERSON.

The Schoolmaster's Assistant: being a complete system of Practical Arithmetic. By Thomas Dilworth. Carefully Revised and Amended. To which is Added, a Compendious System of Practical Gauging. Second Edition. By Robert Patterson: Professor of Mathematics in The University of Pennsylvania, Philadelphia: Printed and sold by John Bioren, No. 88 Chesnut Street. 1805. pp. 227.

Robert Patterson was born near Hillsborough, County Down, Ireland, May 30, 1743; died in Philadelphia, Pa., July 22, 1824. He emigrated to Pennsylvania in 1768, found employment as a teacher, and in 1774 was chosen principal of Wilmington Academy, Delaware. He volunteered in the patriot army when the Revolution began, and served in the various capacities of military instructor, adjutant, assistant surgeon, and brigade-major. In 1779 he was elected professor of mathematics in the University of Pennsylvania, which position he occupied for thirty-five years, and was vice-provost in 1810-1813. He was appointed director of the mint in 1805 by President Jefferson, and filled that office with great success until his last illness. Professor Patterson published The Newtonian System (Philadelphia, 1808), and a Treatise on Practical Arithmetic (Pittsburg, Pa., 1818), and edited Thomas Dilworth's Schoolmaster's Assistant (Philadelphia, 1805), James Ferguson's Lectures on Mechanics (2 vols, 1806), his Astronomy (1809), John Webster's Natural Philosophy (1808), and Rev. John Ewing's Natural Philosophy, with a memoir of the author (1809).—A. M.

1806. KEY TO THE TUTOR'S GUIDE.

This is a key, or the Arithmetician's Repository, containing the solutions of the questions, etc., in the Tutor's Guide, to which are added some useful rules, etc., and an appendix showing the combination of quantities, the different ways they may be varied with the method of filling magic squares, the whole being designed for the ease of schoolmasters, prepared by Charles Vyse, ninth edition, carefully revised, corrected, and augmented, and printed by Joseph Crukshank, Philadelphia, 1806.

12mo, pp. 368. The preface has this signature attached: "15 Walnut-tree Walk, Lambeth, 1802, Charles Vyse." Forty-eight pages are devoted to the elements of algebra. The only value the Key possesses is the methods of solution illustrated in it. The Guide itself, judged by the Key, must have been a very complete treatise.

1806. CHARLES VYSE.

The Tutor's Guide, being a Complete System of Arithmetic; with Various Branches in the Mathematics. In Six Parts. * * * To which is added, an Appendix Containing Different Forms of Acquittances, Bills of Exchange, &c., &c. * * * By Charles Vyse. The Thirteenth Edition corrected. Philadelphia: Printed by Joseph Crukshank. 1806.

12mo, pp. 320. An American reprint of an English work, the first edition of which was published in 1770 or 1771. I have a copy of "The ninth edition, corrected and improved," London, 1796, pp. 324. The preface is dated 1793.—A. M.

1806. ALEXANDER WATT.

A New, Plain, and Systematic Compendium of Practical Arithmetic, adapted to the Commerce of the United States: with a Key, constructed as Telfair's Key to Gough's Arithmetic. By Alexander Watt. The Second Edition, corrected by the Author. Philadelphia. 1814.

12mo, pp. 155.—A. M.

1807. JOHN GOUGH.

A System of Practical Arithmetick, in Four Books, agreeably to Telfair's Edition of Gough's Arithmetic: to which is added a great variety of Rules adapted to the Commerce of the United States with the various nations of the world, as well as of the different individual States with each other. Copy Right Secured. Baltimore: Printed by Warner & Hanna, at the Bible and Heart Printing-Office, and Sold at their Book-Store, Corner of south Gay and Market-Streets. 1807.

12 mo, pp. 342.

A second edition was printed at Baltimore by William Warner in 1817. An American reprint of a once-famous Irish arithmetic, which is said to have "had such extensive currency in Ireland (where it was first published in 1758) that the name of the author became almost synonymous with arithmetic; insomuch that when Professor Thomson's was first published in that country, it went by the name of 'Thomson's Gough!'" (See De Morgan's "Arithmetical Books," pp. 79–80.)—A. M.

1807. TITUS BENNETT.

A New System of Practical Arithmetic, particularly calculated for the Use of Schools in the United States; containing a large proportion of Examples in Federal Money, in each Rule throughout the Work. Compiled by Titus Bennett. Seventh Edition Revised and Improved. Philadelphia: Published by Bennett and Walton, No. 37 Market Street. 1818.

18 mo, pp. 203.—A. M.

1808. EMMOR KIMBER.

Arithmetic made easy to children: being a collection of Useful and Familiar Examples, Methodically Arranged under their Respective Heads. By Emmor Kimber. The third edition enlarged and improved. Philadelphia: Printed and sold by Kimber & Conrad, No. 93, Market Street, and No. 170 South Second-street. 1808.

24mo, pp. 132. The sixth edition, containing 120 pages, was published in 1816.—A. M.

1809. KINNE'S ARITHMETIC.

A short system of arithmetic by William Kinne was published at Hallowell, Me., 1809. Pp. 177.

1810. FENWICK'S ARITHMETIC.

George Fenwick, surveyor of Washington City, D. C., wrote this arithmetical essay in 1810. It is a little 12mo. of 259 pages. The author's motto is "Utile Dulci," and he endeavored to carry this out in his collection of problems.

1810. CARLETON'S COMPENDIUM.

Carleton's Compendium of Practical Arithmetic, by Osgood Carleton. Applied to the Federal and Other Currencies. Designed for the use of Schools in the United States. Boston: Thomas Wells, 1810.

This book of about 251 pages was compiled at the request of the associated instructors of youth in Boston. It is arranged throughout very systematically, beginning with the simple rules, then proportion, brokerage, the extraction of cube and square root, etc., followed by the forms of bills, notes, and receipts. The demonstrations are omitted, because, the author says, "They would swell the book to little advantage to young pupils." The book contains everything that is necessary to the merchant, the mechanic, the mariner, and the farmer.

The problems are all made interesting to the pupils, inasmuch as each seems to be a little story or poem.

As an example:

"Nineteen and ten, good honest men,
With sixteen more, and 40;
Spoke to a victualler to provide,
Meals for their little party;
He charged them ninety-five cents each,
Because they ate quite hearty;
Pray how much money was the bill
Paid by this little party?"

Osgood Carleton was born in 1742, and died in Litchfield, N. H., in June, 1816. He served in the French war, and was an officer in the Revolutionary army. Besides his arithmetic, he published valuable maps of Massachusetts and the district of Maine; The American Navigator (1810); South American Pilot (1804); and a Map of the United States (1806).—A. M.

1810. THE AMERICAN TUTOR'S ASSISTANT.

Who the author of this volume is I do not know.[1] The title-page of the book is: "The | American Tutor's Assistant | revised: | or, | A Compendious System of Practical Arithmetic; | containing the several rules of that useful science to which is | added, a course of Book-keeping by Single Entry. | Philadelphia, | Printed and sold by Joseph Crukshank, | 1810. |

This book has 212 pages. The arithmetic proper fills 180 pages, and the bookkeeping 32 pages of additional matter, which was not included in the first addition. Fractions, as usual in most books of this date, are placed before involution, or near the close of the book.

In decimals the (,) and the period (.) are used interchangeably to denote the decimal point. Usage was not well established, perhaps. The rule of three has a very extensive application in the book. In some way the rule of three and position seem to have been the keys with which authors solved all difficult arithmetical questions.

1810. CHARLES HUTTON.

A Complete System of Practical Arithmetic; and Book-keeping, both by Single and Double Entry adapted to the use of Schools. By Charles Hutton, LL. D. and F. R. S. &c. First American, from the latest London Edition. New York: Printed and sold by Smith & Forman, No. 195 and 213 Greenwich-street. 1810.

12 mo, pp. 224.—A. M.

[1] "Originally compiled by Sundry Teachers in and near Philadelphia." So says the title-page, but I find on comparing the book with the arithmetic of Zachariah Jess that it is undoubtedly an edition of Jess's work. The books are almost identical. I have a copy of the eighth edition, dated 1808, containing 204 pages. The preface is signed, "by desire and on behalf of the editors," by John Todd, Zachariah Jess, William Waring, and Jeremiah Paul.—A. M.

1811. DUDLEY LEAVITT.

The Scholar's Review, and Teacher's Daily Assistant. Being a Compendium of Literary and Scientific Works, Original, Improved and Selected. Designed as a summary retrospect of the principal and most curious rules of Practical Knowledge; to be used by the Teacher in instructing and examining his scholars; to accomplish the student in his classical studies; and to facilitate the acquisition and practice of useful and polite learning to persons of every class. Portland: Published and sold by A. Lyman & Co. at the sign of the Bible, Insurance-buildings, Exchange-street. 1811.

18 mo, pp. 125.

The first 20 pages are devoted to "language and poetry;" pp. 21-42, to arithmetic; pp. 43-53, to description and use of mathematical instruments; pp. 54-57, to "explanation and construction of mathematical tables;" pp. 58-64, to mensuration; pp. 65-71, to surveying; pp. 72-78, to navigation; pp. 79-85, to music; pp. 86-91, to "perpetual almanac;" pp. 92-96, to astronomy; pp. 97-110, to "a key to mathematical authors;" pp. 111-116, to "explanations on Gibson's surveying;" p. 117, to "explanation on Flint's surveying and a key to Bowditch's Navigator;" p. 118 to the end of the book (p. 125), to "comments on Webber's mathematics." In the "key to mathematical authors" are given solutions of questions in Pike's, Walsh's, Merrill's, Hilton's, and Goodale's arithmetics.—A. M.

Dudley Leavitt was born in Exeter, N. H., May 23, 1772; died in Meredith, N. H., September 15, 1851. He taught school in winter and worked on his farm the rest of the year, making almanacs, arithmetics, and grammars during the long winter evenings. He was known throughout his native State as "Old Master Leavitt," and made its almanacs for over half a century.—A. M.

1811. STEPHEN PIKE'S ARITHMETIC.

The Teacher's Assistant, by Stephen Pike, was published in 1811 by Benjamin Warner, of Richmond, Va. The work is called a compilation, and the testimonials are dated Philadelphia, 1811. From this I infer that the author resided in Philadelphia.

The oldest edition I have is the third, printed in Richmond in 1817,[1] pp. 198. An edition marked "revised," published by Thomas Davidson, of Philadelphia, in 1838, is the same as the one of 1811, and a still later edition in 1852 by M. Polock, of Philadelphia, is different only in date. The general arrangement of topics is interesting as a matter of history. First, the simple rules, then the compound rules, followed by the rule of three, practice, tare and tret, interest, etc., and fractions just before square root and cube root.

1812. WEBBER'S ARITHMETIC.

President Webber's Arithmetic, published at Cambridge, 1812, is a well-printed volume of 248 pages. It is a scholarly treatise, somewhat on the plan of the French arithmetics.

1812. JOHN J. WHITE.

A Collection of The Most Useful Arithmetical Tables. Among which are, Monies of Account in most Foreign Commercial Countries—their Exchanges—value of their Exchanges in Federal Money—Rules for reducing Federal Money to other Monies—and Vice Versa—Superseding entirely the necessity of Pupils in Common Schools, making use of any other Arithmetic. To which is added a Perpetual Almanac. Making in the whole a useful Pocket Companion. By John J. White. Hartford: Printed and sold by Hale and Hosmer. 1812.

Small 18 mo, pp. 72. A fourth edition was issued in 1815.—A. M.

1812. A TEACHER OF ARITHMETIC, IN NEW YORK.

A Key to Dilworth's Arithmetic; wherein every Question is worked out at full length, in a short and comprehensive manner: containing beside, Solutions to many Original Questions introduced in the best edition of that work, adapted to the American Mathematician. By a Teacher of Arithmetic, in New York. Smith &

[1] I have a copy of the first edition, 1811, pp. 198.—A. M.

Forman's First Edition. Printed and published by Smith & Forman, at the Franklin Juvenile Bookstores, 195 and 213, Greenwich-street. 1812.

12 mo, pp. 212.—A. M.

1813. SAMUEL TEMPLE'S CONCISE INTRODUCTION TO PRACTICAL ARITHMETIC.

This book was published by Lincoln and Edmands. 1813.

It is a small book of 108 pages. In size it resembles that of the little old-fashioned primers. The covers are of wood, covered with paper, and have a leather back. In this arithmetic all the rules that occur in common business are applied to the federal currency. One of the examples in compound multiplication: "What will 24 yards come to at 8s. and 6d. 3 farthings per yard?" The definition given for division: "Division teacheth to find how often one number is contained in another."

1813. LEAVITT'S ARITHMETIC.

Elements of Arithmetic, by Dudley Leavitt, is a diminutive volume, published at Exeter, N. H. 1813. Pp. 109.

1814. WELCH'S AMERICAN ARITHMETIC.

This book is a compilation by Oliver Welch, published in Boston. 1814.

"First Lessons," filling 22 pages, constitute the first division of the work. Then 152 pages cover the subjects usually found in common school arithmetics of fifty years ago. Part second, consisting of 65 pages, is an excellent arithmetical treatise on mensuration of planes and solids. The highest problems reached in this division of the book is "to find the solidity of an elliptic spindle." Eight pages of well-chosen miscellaneous examples conclude the arithmetic proper; but there is a practical appendix of 21 pages on currency and bookkeeping, assumed to be valuable for farmers and mechanics. Subjects are presented in the following order: (1) Definition; (2) rule; (3) questions on the preceding; (4) examples. To render the work easy the author works the first problem as a general thing. Taken as a whole, the author succeeded admirably. It is a pretty strong book, and the problems are generally of a very practical character. In the preface to the revised edition the author states that not less than 26,000 copies had been sold.

1817. SCHOLAR'S ARITHMETIC.

Jacob Willetts' Scholar's Arithmetic first appeared in 1817, and passed through more than fifty editions in a few years. It was designed for use in the common schools, and had an extensive sale at one time. It was published in Philadelphia. Augustus R. McCord brought out a revised edition of this work in 1849—an excellent edition of 324 pages.

Jacob Willetts was born in Fishkill, N. Y., in 1785; died near Mechanic, Dutchess County, N. Y., September 12, 1860. He was educated at the Friends' Boarding School, near Mechanic, and on his eighteenth birthday became its head teacher. About 1813 he settled on the island of Nantucket, where, with his wife, he conducted a flourishing school for many years. But in 1824 they returned to Dutchess County and established a school near Mechanic, which they continued until 1852. Mr. Willetts was an accomplished mathematician, and published text-books of geography, arithmetic, and bookkeeping, which were much used throughout the country.—A. M.

1817. WILLIAM STODDARD.

The Federal Calculator; or, American Schoolmaster's Assistant and Young Man's Companion. Being a Compendium of Federal Arithmetic, both Practical and Theoretical. In Five Parts. Altered from Dilworth's Arithmetic, and adapted to the Currency of the United States, By Daniel Hawley. Stereotype Edition. Revised, corrected, and greatly Improved. By William Stoddard, Teacher of the Troy Grammar School. New York: Collins and Hannay, 230 Pearl-Street. W. E. Dean, Printer. 1832.

18mo, 228 pages. The "Advertisement to the stereotype edition" is dated "October, 1817."—A. M.

1818. BONNYCASTLE'S ARITHMETIC.

The Scholar's Guide to Arithmetic, with notes, by John Bonnycastle, was republished in Philadelphia by Collins and Croft in 1818. 12mo, pp. 240.

1818. REV. JOHN WHITE.

A Practical System of Mental Arithmetic. By Rev. John White, Preceptor of Youth in Philadelphia. Printed by D. Heartt, for the Author. 1818.

This is "A new method of making calculations by the action of the mind, without pen, ink, pencil, or paper, illustrated by numerous examples under each rule. To which is subjoined as an appendix a variety of contracted examples in the rules of direct and inverse proportion, commonly called the rules of three and five, regularly arranged and fully illustrated. Also, a precise and easy method of working the rule of three and other ordinary processes of arithmetic by logarithms, and the method of finding the logarithms of any number fully exemplified." There is, besides, a self-instructor, which enables the most illiterate to become his own teacher on an entirely new and easy plan. Also a key to the appendix, and a chapter on the art of measuring. This book contains over 300 pages.

1818. STANIFORD'S ARITHMETIC.

Daniel Staniford, A. M., published a practical arithmetic in Boston in 1818. It has 324 pages, 196 being devoted to arithmetic and the remainder to bookkeeping, but is not a very remarkable production in any respect.

1818. ELIJAH HINSDALE BURRITT.

Logarithmic Arithmetick containing a new and correct Table of Logarithms of the Natural Numbers from 1 to 10,000, extended to seven decimal places besides the index; and so contrived, that the Logarithm may be easily found to any number between 1 and 10,000,000.

Also, an Easy Method of constructing a Table of Logarithms, together with their numerous and important uses in the more difficult parts of Arithmetick. To which are added a number of Astronomical Tables, by which the different Phases of the Moon,—the Times of her Opposition and Conjunction, may be computed with the greatest ease and exactness; and an Easy Method of Calculating Solar and Lunar Eclipses: illustrated with Geometrical Projections; designed for the Instruction of Youth in the Schools and Academies of New England. By Elijah Hinsdale Burritt.

Williamsburgh: Printed by Ephraim Whitman. 1818.

8vo, sheep, pp. 351.—A. M.

1818. ROBERT PATTERSON.

A Treatise of Practical Arithmetic, intended for the Use of Schools; in Two Parts. Part I. By Robert Patterson, late Professor of Mathematics and Natural Philosophy, in the University of Pennsylvania. Pittsburgh: Published by B. Patterson and Lambdin. 1818.

18mo, pp. 234.—A. M.

1818. JOHN D. WILLIAMS.

A Key to Daboll's Arithmetic, containing Correct Solutions to all the Examples and Questions, at full length, (wherever there is the least appearance of Difficulty in the Operation) arranged under their proper heads, and numbered as in the Arithmetic; to which is added, a new method of Solving the Irreducible Case of Cubic Equations, and applied to the Extraction of the Cube Root; also, 250 Curious and Abstruse, Arithmetical, Mathematical, and Philosophical Questions, with their Solutions at full length; many of which have never before been published. By John D. Williams, Private Teacher of Mathematics and Natural Philosophy, and Author of a Key to Hutton's Mathematics, Key to Willetts' Arithmetic, an Elementary Treatise on Arithmetic, and an Elementary Treatise on Algebra. New-York: Published by H. &. S. Raynor, 76 Bowery. 1839.

18mo, sheep, 180 pages. The preface is dated 1818. I have not seen his arithmetic.—A. M.

1818. JOHN J. WHITE.

Arithmetic Simplified: being a Plain, Practical System, adapted to the Capacity of Youth, and designed for the Use of Schools; in the United States. In Two Parts. By John J. White. Published for the Author, by Samuel G. Goodrich; and sold at his Bookstore, Hartford. 1818.

18mo, pp. 348.—A. M.

1819. McCURDY'S ARITHMETIC.

The Columbian Tutor's Assistant for the several calculations of common, decimal, and duodecimal arithmetic, by D. McCurdy, was published in Washington in 1819. Pp. 208.

1819. REV. J. JOYCE.

A System of Practical Arithmetick, for the use of Schools. By the Rev. J. Joyce. Adapted to the Commerce of the United States by J. Walker. Baltimore: Published by N. G. Maxwell, 140, Market-Street. 1819.

18mo, pp. 287.—A. M.

1820. FIROR'S ARITHMETIC.

The Young Man's Monitory, by Jacob Firor, was compiled and published in Frederick-Town, Md., 1820.

The Arithmetic proper contains 218 pages, and an introduction to bookkeeping of 27 additional pages. The work is not remarkable in any respect.

1821. MAGINNESS' ARITHMETIC.

James Maginness wrote a "New, copious, and complete system of arithmetic," which was published at Harrisburg, 1821.

12mo, pp. 240.
This is a much better book than the ordinary ones of the period.

1821. FARRAR'S ARITHMETIC.

An Elementary Treatise on Arithmetic, taken principally from the arithmetic of S. F. Lacroix, translated into English with such alterations and additions as were found necessary in order to adapt it to the use of the American student, by John Farrar, professor of mathematics and natural philosophy in the University of Cambridge. Second edition, revised and corrected. Cambridge, New England. Printed by Hilliard & Metcalf, at the University Press, 1821.

This is a small manual on arithmetic, containing 128 pages. The introduction, table of contents, and explanation of roman numerals cover 12 pages; the 4 fundamental rules, 18 pages, mostly discussion of principles, with very few problems; fractions, common and decimal, 34 pages; tables of coin, weight, and measure, 4 pages; reduction and compound numbers, 22 pages; proportion, 16 pages; fellowship, alligation, and miscellaneous questions, 13 pages; and the appendix, which contains various tables of weights and measures, including the new French weights and measures, 8 pages. This book is bound with the Elements of Algebra,[1] translated from the same author, and the Elements of Geometry and Trigonometry, translated from the French of A. M. Legendre by David Brewster. As will be seen by the table of contents the arithmetic is a meager treatise, compared with what is included in a modern treatise. With rare exceptions the problems are omitted, and the work is more of a thesis upon the subject than a text-book of exercises in which the learner should be drilled. However, it marks the transition period in American arithmetics.

John Farrar was born in Lincoln, Mass., July 1, 1779; died in Cambridge, Mass., May 8, 1853. He was graduated at Harvard in 1803, and was chosen Hollis profesor of mathematics and natural philosophy in the same institution in 1807 and retained the chair till 1836, when he resigned in consequence of a painful illness that finally caused his death. He published, besides his translation of Lacroix's Arithmetic, translations of the elementary portions of Euler's and Lacroix's Algebras (1818); of Legendre's Geometry (1830); of Lacroix's Trigonometry (1820); of Bézout's Differential and Integral Calculus (1824), and of several other works.—A. M.

[1] I have a copy bound separately.—A. M.

1821. WARREN COLBURN.[1]

In 1821 Mr. Colburn published his First Lessons in Intellectual Arithmetic. In regard to this book he is said to have remarked that the pupils who were under his tuition made the book for him, and that he had only given attention to the questions they had asked. His Algebra upon the Inductive Method of Instruction appeared in 1825, and his Sequel to Intellectual Arithmetic in 1826.[2] He regarded the Sequel as a book of more merit and importance than the First Lessons.

The following paragraph (written in 1856) is from Barnard's Journal of Education:

"Thus the First Lessons worked its way gradually to notice and favor, a book which enjoyed a more enviable success than any other schoolbook ever published in this country, and the merits of which are now universally acknowledged to be equal to its success. It has been said to be 'the only faultless schoolbook that we have.' It has certainly wrought a great change in the manner of teaching arithmetic.

"Such a man as George B. Emerson, after twelve years' constant use of it, long ago pronounced it the most valuable schoolbook that has made its appearance in this country. And Thomas Sherwin, esq., of the Boston High School, calls it not only the best in this country, but the best in the world. Its use is believed to be nearly commensurate with that of the English language, and it has been translated into other tongues. About two millions of copies have been sold since its first publication in this country."

Warren Colburn was born March 1, 1793, in the part of Dedham, Mass., called Pond Plain. His father was a farmer and the son was taught to work on the farm. When quite young he showed a taste for arithmetic. From 1810 to 1818 he worked on machinery at Pawtucket, R. I., and Plymouth, Mass. What little schooling he had thus far received had been at the district school, principally in the winter. In the summer of 1815, at the age of 22½ years he began to fit himself for Harvard College, which he entered in 1817 and from which he graduated in 1820. He was considered by his classmates to be by far the best mathematician in the class. While in college he taught school during the winter months in Boston, Leominster, and Canton. From 1820 to 1823 he successfully taught a private school in Boston. In 1823 he was appointed superintendent of the Boston Manufacturing works at Waltham, Mass., one of the first establishments in the country for the manufacture of cotton goods. The mechanical genius which he here displayed in applying power to machinery, together with his great administrative ability, led to his appointment in 1824 as superintendent of the Lowell Merrimac Manufacturing Company at Lowell, Mass. For several years he delivered gratuitous lectures on the natural history of animals, light, electricity, the seasons, hydraulics, eclipses, etc. His knowledge of machinery enabled him admirably to illustrate these lectures by models of his own construction, and his successful experiments and simple teaching added much to the practical knowledge of his operatives. In May, 1827, he was elected a fellow of the American Academy of Sciences and several years was a member of the examining committee for mathematics at Harvard College. He was a member of the superintending school committee of Lowell, and so busy were he and his coworkers that they were repeatedly obliged to hold their meetings at 6 o'clock in the morning. Warren Colburn seems to have been ardently admired—almost revered—by the teachers who have understandingly used his First Lessons. The following is a good description of him: In personal appearance Mr. Colburn was decidedly pleasing. His height was 5 feet 10, and his figure was well proportioned. His face was one not to be forgotten; it indicated sweetness of disposition, benevolence, intelligence, and refinement. His mental operations were not rapid, and it was only by great patience and long continued thought that he achieved his objects. He was not fluent in conversation; his hesitancy of speech, however, was not so great when with friends as with strangers. The tendency of his mind was toward the practical in knowledge; his study was to simplify science and to make it accessible to common minds. He died September 13, 1833, at the age of 40 years.

The arithmetics by Colburn marked a great educational epoch in the world's teaching. He seems to have grasped the logical idea in teaching more firmly than any other one of his age. His books, up to the highest demands of the age, are now published in a carefully revised and enlarged edition by Messrs. Houghton, Mifflin & Co., Boston.

1822. NEWELL'S ARITHMETIC.

John Lyman Newell's New American Arithmetic, printed at Hartford, 1822, is a weak volume of 202 pages.

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[1] I have a copy of an edition of "First Lessons" translated into the Hawaiian language and published at Oahu in 1833, 16mo, pp. 64. Also one published at Boston, not dated, but it is apparently comparatively recent.—A. M.

[2] First edition was published at Boston in 1822.—A. M.

1822. STEVENS' ARITHMETIC.

Beriah Stevens' New and Concise System of Arithmetick, Containing Vulgar, Decimal, and Logarithmical Arithmetick. Printed for the author by G. M. Davison, at Saratoga Springs, in 1822. Pp. 423.

This book gives many demonstrations and examples. The title-page reads: "Measurement of artificer's work, board and timber, by calculation. The plain scale and sliding rule; measurement of inaccessible distances, heights, etc. All canceled and abridged. With other rules, too tedious to mention, and improvements on each."

1822. WILLIAM R. WEEKS.

The Missionary Arithmetic: or Arithmetic Made Easy, in a New Method: designed to Diminish the Labor of the Teacher, and Increase the Improvement of the Learner. Accommodated to the Present Era of Benevolent Enterprize, and adapted to the use of Lancasterian and other Schools. By William R. Weeks. Utica: Published by Merrell & Hastings, No. 40 Genesee Street.

18mo, pp. 239.—A. M.

1822. HENRY JACKSON.

The Arithmetical Catechism, Compiled from Various Authors, for the Use of Schools. Third Edition. With The addition of Examples and Practical Questions under each rule: The whole forming a Complete System of Arithmetic. By Henry Jackson. Portsmouth: Published by T. H. Miller, and H. Gray & Co. 1824. Copyright, 1822.

18mo, pp. 165.—A. M.

1822. JOHN JOSEPH REEKERS.

Decimal Tables of Interest, reduced to the Denary Scale of Notation. A Method Concise, Easy and Mathematically Accurate. By John Joseph Reekers. Stereotype Edition. Baltimore: Printed for the Author by William Wooddy. 1822.

8vo pp. 19.—A. M.

1822. RENE PAUL.

Elements of Arithmetic. By R. Paul. St. Louis: Printed at the Office of the Enquirer, by Ford & Orr. 1823.

18mo, pp. 160.—A. M.

1823. PEIRCE'S ARITHMETIC.

This book was published in Boston in 1823, by Lincoln & Edmunds for the author, Leonard Peirce. The title is: "Conversations on Arithmetic, with Demonstrations to each rule, in easy and familiar language: the whole of which is designed to render the study of Arithmetic pleasing and instructive to the pupil."

By conversations the author weaves in each topic. He puts fractions after the fundamental rules, and he closes the treatise with "Forms of notes, bonds, receipts, orders, and deeds." The work is a 12mo, of 156 pages.

1823. ABEEL SMITH.

An Arithmetic for Beginners; compiled for The Use of Schools: mostly in Dollars and Cents. "Teach Youth, and teach them aright." By Abeel Smith. New-York: Printed for, and sold by John S. Smith, No. 42 Fulton Street, first house above Pearl-street. 1823.

Small 18mo, 108 pp.—A. M.

1823. VICTOR VALUE.

Arithmetic, Theoretical and Practical; wherein the Fundamental Principles of that Science are Explained, in a New, Perspicuous and Familiar Manner, especially Numeration, Vulgar and Decimal Fractions, the Rule of Three both Single

and Compound, &c. Designed to assist both Instructors and Learners in communicating and acquiring a correct knowledge of the Theory and Practice of this Important Branch of Mathematics. Part I.

By Victor Value, Principal of Mantua Academy, near Philadelphia. Published by Kimber and Sharpless, Market Street. 1823.

18mo, pp. 168.—A. M.

1824. M. BEZOUT'S ARITHMETIC.

This is another translation and adaptation from the French work, arranged and edited by Nathaniel Haynes, of Hallowell, Me. The translator adapted the work to American schools. Pp. 220. Copyrighted in 1824.

1824. ENOCH LEWIS.

Enoch Lewis wrote the Arithmetical Expositor, which was published in Philadelphia in 1824.

The work is divided into two parts. The first part is a small 12mo of 167 pages, mostly problems. Part II contains the less useful practical rules, with their exemplifications, a general view of the theory, and indications of the modes by which the more difficult questions in the work are solved.

Small 12mo, pp. 80.

Enoch Lewis was born in Radnor, Delaware County, Pa., January 29, 1776; died in Philadelphia, June 14, 1856. He belonged to the Society of Friends, and at an early age exhibited a talent for mathematics; at the age of 14 years was usher in a county school, and at 15 became principal. In 1792 he removed to Philadelphia, studied mathematics, teaching half of each day to earn his support; in 1795 was engaged as a surveyor in laying out towns in western Pennsylvania. He had charge of the mathematical department in the Friends' Academy in Philadelphia, 1796-99; was subsequently mathematical tutor at the Westtown, Pa., school, and in 1808 opened a private school for mathematical students, which he successfully taught for several years. He edited an American edition of Thomas Simpson's Trigonometry, to which he added an appendix on spherical projections. He also edited several other mathematical works with notes, and published, besides his arithmetics, works of his own on algebra and plane and spherical trigonometry.—A. M.

1824. JOHN ARMSTRONG.

A Key to the Western Calculator, containing the Solution of all the Examples and Questions for Exercises, with reference to the pages where they stand. To which is added, Some Useful Rules. Designed chiefly to facilitate the labor of Teachers, and assist such as have not the opportunity of a Tutor's aid. By John Armstrong. Second Edition, revised and corrected. Pittsburgh: Printed and Published by Johnston & Stockton, Market Street. 1827.

Small 12mo, pp. 139. Copyright, 1824.—A. M.

1824. GEORGE CURTIS.

A Treatise on Gunter's Scale, and the Sliding Rule: together with a Description and Use, of the Sector, Protractor, Plain Scale, and Line of Chords; or an Easy Method of finding the Solid Contents of Bodies, especially that of Timber, by the Sliding Rule; and also of Guaging Casks, and Round Timber. To these are added Several Useful Logarithmick Tables, Tables of Latitude and Departure, and a Table of Natural Radii, not known to have been heretofore published: also a Table of Round, and Square Timber. By George Curtis, Math.

18mo, pp. 119.—A. M.

1824. LUTHER PRATT.

Pratt's Introduction to Arithmetic. The Juvenile Assistant; or, Practical Calculator: containing Rules in Arithmetic Sufficient for all Ordinary Transactions in Business: intended for the Use of Schools, and Young Persons in General. By Luther Pratt. New-York: Published by George C. Morgan, 353 Pearl-Street, and for sale by the principal Booksellers in the United States. Gray & Bunce, Print. 1824.

Small 18mo, pp. 108.—A. M.

1825. ROBINSON'S ARITHMETIC.

The American Arithmetic, by James Robinson, jr., is a book of 240 pages. Although published in 1825, it is remarkable chiefly on account of its scarcity.

BEZOUT'S ARITHMETIC.

Etienne Bezout, a distinguished French mathematician, was born at Nemours in 1730 and died in Paris in 1783. He wrote a complete course of mathematics, consisting of six volumes, for the use of the marine, the artillery, and the Polytechnic School. His treatise on "Theoretical and practical arithmetic, in which the principles of that science are clearly and fully explained," was translated from the French, improved, and adapted to the currency of the United States by Noble Heath. This translation was entered for copyright in 1825, and was published by Samuel Wood & Sons, New York, and by Samuel S. Wood & Co., Baltimore.

This book is a 12mo of 236 pages. It is a good specimen of French authorship on this subject. Principles and definitions are clearly and concisely stated; the explanations are simple, easy, and natural. Rules are avoided and but few problems are given. The style in which the work is written is graceful and flowing. The American arithmetic that more nearly approaches this translation in spirit is Bardwell's, which was published in 1878. The great difference between Bezout's Arithmetic and our present works is the omission of what we call "business arithmetic." For instance, the chapters that American authors devote to percentage and its applications are almost unknown in foreign works, which treat interest in a few pages and then drop the subject. In a sentence, this work discusses and explains principles. It includes all the subjects usually found in arithmetics of sixty years ago.

1825. THOMAS TOWN.

Russell's Companion to Every Treatise on Arithmetic, in the form of Question and Answer. In which the science is demonstrated in a clear and familiar manner, with the view of assisting the teacher, and rapidly advancing the progress of the pupil: to which is added an Appendix, containing useful tables and numerous Questions for exercise in leisure hours. First American Edition. Revised and adapted to the American School, by a Teacher. Baltimore: Published by John H. Naff, & Co. 1825.

Small 18mo, pp. 105. Copyrighted by Thomas Town, as proprietor, who was probably the reviser.—A. M.

1826. F. R. HASSLER'S ELEMENTS OF ARITHMETIC.

The first edition was published in 1826. A revised and corrected edition was published in New York in 1828.

This edition is a small 12mo of 216 pages, while the eighth[1] edition of 1832 has 4 additional pages. The work is somewhat novel in the arrangement of matter, being divided into 4 parts: (1) First elements and deductions of the four rules of arithmetic, divided into 6 chapters, which treat of the fundamental rules and fractions, including 80 pages; (2) practical applications of the four rules of arithmetic, 9 pages; (3) ratio and proportion, in 6 chapters of 30 pages; (4) extension of arithmetic to higher branches, and other practical applications, 4 chapters of 60 pages. The higher branches as enumerated are square and cube roots, series, compound interest and annuities, alligation, and miscellaneous problems and tables. Taken as a whole, the author places theory before practice, and illustrates with very few problems.

Ferdinand Rudolph Hassler, the celebrated surveyor, was born in Aarau, Switzerland, October 7, 1770; died in Philadelphia, Pa., November 20, 1843. He received a scientific education in Europe, and was for some time connected with the trigonometrical survey of Switzerland. Subsequently he emigrated to the United States, and through the influence of Albert Gallatin secured an appointment at the United States Military Academy as acting professor of mathematics, from 1807–1810. He was then selected to direct the United States Coast Survey, and sent on a mission to France and England for the purpose of securing the instruments and standards of measurement for beginning the work. He was detained in England as an alien enemy, and was not released till 1815. On his return he was formally appointed Superintendent of the Coast Survey, but did not begin his field work until 1817, and then the work was discontinued for fifteen years. He was also for many years chief of the bureau of weights and measures; was a

[1] The ninth edition was published in Washington City in 1843, and has 219 pages.—A. M.

member of the American Philosophical Society, and contributed papers to its Transactions pertaining to his work on the Coast Survey. He published a series of mathematical works, 1826-1842, including arithmetic, astronomy, geometry, logarithmic, and trigonometric tables and a trigonometry; also a system of the universe. (2 vols., New York, 1828.)

1826. MACURDY'S NATIONAL ARITHMETIC.

The Eagle, or National Arithmetic: containing an authentic, plain, and comprehensive exposition of the science of numbers, in Theory and Practice; with remarks, and familiar demonstrations of the principal rules. Adapted to the purposes of Arts and Commerce, in the United States. By D. Macurdy, Philomath. Baltimore: Published by Fielding Lucas, jr. Armstrong & Plaskitt, Cushing & Jewett, E. J. Coale, Samuel Young, William & Joseph Neal; and by P. Thompson, Washington, D. C. Wm. Woody, printer. 1826. D. pp. 208.

1826. DUDLEY LEAVITT.

Pike's System of Arithmetick Abridged: designed to facilitate the Study of the Science of Numbers. Comprehending the Most Perspicuous and Accurate Rules, Illustrated by Useful Examples. To which are added Appropriate Questions, for the Examination of Scholars; and a Short System of Book-Keeping. By Dudley Leavitt, Teacher of Mathematics and Natural Philosophy. Concord: Published by Jacob B. Moore. 1826.

8vo, pp. 200.—A. M.

1826. ZADOCK THOMPSON.

The Youth's Assistant in Theoretick and Practical Arithmetick. Designed for the use of Schools in The United States. By Zadock Thompson, A. M., Author of the Gazeteer of the State of Vermont. Second Edition, with corrections and Additions. Woodstock, Vt. Printed and sold by David Watson. 1826.

8vo, pp. 164.—A. M.

1826. SETH DAVIS.

The Pupil's Arithmetic. Whereby the Practical use of Figures is Demonstrated in a Series of Original Questions. Adapted to the Capacities of Youth. By Seth Davis. Boston: Printed by Lincoln & Edmands, for the Author, No. 59 Washington Street. 1826.

Small 18mo, pp. 183.—A. M.

1826. WILLIAM B. FOWLE.

The Child's Arithmetick, or the Elements of Calculation, in the Spirit of Pestalozzi's Method, for the Use of Children between the Ages of Three and Seven Years. By William B. Fowle, Instructor of the Monitorial School, Boston. Boston: Published by Thomas Wells, Union Street and Hanover Street. 1826. Howe & Norton, Printers.

36mo, pp. 104. I have a copy of an edition translated into the Hawaiian language and published at Oahu in 1832. Small 24mo.—A. M.

1827. ROSWELL C. SMITH'S ARITHMETICS.

Smith's Practical and Mental Arithmetic, on a New Plan, was published in 1827.

Roswell C. Smith was born in 1797, in Franklin, Conn., and died in Hartford, April 20, 1875. He was the author of a grammar, geography, arithmetics, and other works. The Practical and Mental Arithmetic is a volume of 282 pages. The arrangement of subjects does not differ materially from that in Ray and Davies, and the author claims to follow Pestalozzi in uniting mental and written arithmetic. Questions and answers characterize the book. In this respect it reminds one of the geographies of thirty years ago. There is a positiveness about the author's preface that is refreshing. This book was called in my country-school days "an easy arithmetic." The "Productive Arithmetic" was "entered according to act of Congress in 1841." In this series of arithmetics the author wrote in plain language, and pupils had no difficulty in understanding him. The exercises, while not difficult, were well graded, and I suppose this is one of the chief reasons why the books had a large circulation.

1827. JAMES RYAN.

An Elementary Treatise on Arithmetic, in Theory and Practice: adapted to the Instruction of Youth in Schools and Academies in the United States. By James Ryan, author of "An Elementary Treatise on Algebra," "The New American Grammar of Astronomy," &c., &c. New York: Published by Collins & Hannay. J. & J. Harper, Printers. 1827.

12mo, pp. 272.—A. M.

1827. MARTIN RUTER.

The Juvenile Arithmetick, and Scholar's Guide; wherein Theory and Practice are combined and adapted to the Capacities of Young Beginners; containing a due proportion of Examples in Federal Money; and the whole being Illustrated by Numerous Questions similar to those of Pestalozzi. By Martin Ruter, A. M. Cincinnati: Published and sold by N. & G. Guilford, at their Book Store, 14, Lower Market Street. W. M. & O. Farnsworth, Jun., Printers. 1827.

Small 18mo, pp. 215.—A. M.

Martin Ruter was born in Charlton, Worcester County, Mass., April 3, 1785; died in Washington, Tex., May 16, 1838. He received only a common-school education, but studied theology and in 1801 was admitted to the New York conference of the Methodist Episcopal Church. He preached in New Hampshire and Montreal, Canada; was made an elder at the age of 20; was stationed at Boston, Mass., Portland, Me., and other places; was principal for a time of Newmarket Academy, and in 1820–28 conducted the Book Concern in Cincinnati, Ohio; was president of Augusta College, Kentucky, from its establishment in 1828 till he resigned in 1832 to return to the ministry. He was the first Methodist clergyman in the United States to receive the degree of D. D., which was conferred on him by Transylvania University in 1820. Dr. Ruter was the author of many religious and theological works, and also of several educational text-books.—A. M.

1827. JOHN E. LOVELL.

Introductory Arithmetic; prepared for the Pupils of the Lancasterian School, New-Haven. Accompanied by a Key for the use of the Monitor. Part First. By John E. Lovell. New-Haven: Published by S. Wadsworth. 1827.

Small 18mo, pp. 228.—A. M.

1827. NATHAN GUILFORD.

The Juvenile Arithmetic, illustrated with Familiar Questions, and containing numerous examples in Federal Money; to which is added, a short system of Book Keeping. Revised and enlarged by Nathan Guilford. Cincinnati: Corey and Webster. 1836.

18mo, 179 pages. Recommendations are dated 1827.—A. M.

1828. THOMAS T. SMILEY.

In January, 1828, Philadelphia, Thomas T. Smiley completed The New Federal Calculator, which, in appearance, is a twin to Daboll's Arithmetic.

It is a volume of 180 pages, and the arrangement of topics differs but little from that of Adams, although the problems are more difficult. It is also an improvement upon Adams's Arithmetic in typographical work. He uses the decimal point in fractions, but not in writing United States money. He would write $23.746 thus, $23 74 cts. 6 mills, or

$	cts.	mills.
23	74	6.

I noticed one exception in the work, and that in the solution of a problem. At one time this work was extensively used in the common schools of the country, and almost exclusively in the West and South. Dr. Smiley published also: (1) Introduction to Geography, Philadelphia, 1828, 12mo; (2) Sacred Geography; (3) New Federal Calculator, 12mo; Key 12mo; (4) Arithmetical Rules and Tables, 18mo; Other Works. Before The New Federal Calculator was published, the manuscript had been submitted to quite a number of distinguished teachers and mathematicians. Letters as early as 1825, addressed to Mr. John Grigg, the publisher, speak of the merits of this little volume. The work was never revised. Its chief merit consists in its brevity and simplicity. It marks the transition from pounds, shillings, and pence to dollars, dimes, and cents. The topics usually presented in arithmetics of this date are all treated, or touched upon, in this arithmetic. It is still printed by J. B. Lippincott & Co.

1828. WILLIAM SLOCOMB.

The Federal Calculator, or, a Concise System of Practical Arithmetick; containing all the Rules necessary for transacting the common Business of life. Together with Questions for Examination, under each of the Rules; intended for the Use of Schools, and Young Men who may be desirous of obtaining further knowledge of this Science. To which is added, a Short System of Book-Keeping. By William Slocomb. Wheeling: Published by the Author. R. I. Curtis, Printer. 1828.

18mo, pp 137.—A. M.

1828. DANIEL PARKER.

The Improved Arithmetic, newly arranged and clearly illustrated, both Theoretically and Practically, to meet the exigencies of the student in the acquisition of the Nature and Science of Numbers; and also, to aid the Accountant in all Arithmetical Computations, relative to Business Transactions; designed for the use of Academies, Schools, and Counting-Houses. By Daniel Parker, A. M., late Principal of several distinguished Literary Institutions. New York: Printed and sold by J. & J. Harper, No. 82 Cliff Street. 1828.

18mo, pp. 345.—A. M.

1828. JOSHUA SHINN.

The New Ohio Arithmetic, or a New and Complete Calculator; adapted to the Juvenile Understanding, in which the use of Pounds, Shillings, and Pence, (except in the Rule of Exchange,) &c. is omitted, and others inserted in the room of them. The whole being designed to be a useful Book for Merchants, Schoolmasters, Farmers, and Mechanics of all descriptions, in The Western Country. By Joshua Shinn. He that in figures would improve, Must first with figures fall in love. New-Garden: Published by the Author. H. J. Howard, Printer, 1828.

18mo, pp. 251.—A. M.

1828. ZADOCK THOMPSON.

The Youth's Assistant in Theoretic and Practical Arithmetic: Designed for the Use of Schools in the United States. By Zadock Thompson, Author of History and Gazetteer of Vermont. Fourteenth Edition. Burlington: Chauncey Goodrich. 1848.

168 pages. Copyright 1823.—A. M.

Zadock Thompson was born in Bridgewater, Vt., May 23, 1796; died in Burlington, Vt., January 19, 1856. He was graduated at the University of Vermont in 1823, and became a tutor there in 1825. He published an almanac as early as 1819, and subsequently made the astronomical calculations for the Vermont Register, also for thirty-four years those of the Walton's Registers. He removed in 1833 to Hatley, Canada, and then to Sherbrooke, where he taught, and, after studying theology, was in 1835 made a deacon in the Protestant Episcopal Church. He returned to Burlington, Vt., in 1837, and was given a chair in the Vermont Episcopal Seminary. In 1845-48 he was State geologist of Vermont, and in 1851 was chosen professor of chemistry and natural history in the University of Vermont. Besides several text-books, Professor Thompson published Gazetteer of the State of Vermont (1824), and a number of historical and other works.—A. M.

1829. WILLIAM RUGER'S ARITHMETIC.

A New System of Arithmetick; in which the Rules are familiarly Demonstrated, and the Principles of the Science Clearly and fully explained, by showing the relation which the simple rules bear to each other, and reducing the more difficult parts back to those Rules. Pp. 253.

The introduction is dated at Watertown, N. Y., July 4, 1831, but the copyright is September 26, 1829. While the general arrangement is not materially different from that of other authors of this date, he gives the demonstration of a problem in each subject, and at the close of each topic is appended a long list of questions for the pupil to answer. In this respect his book is a marked improvement. The chapter on mensuration is a fair presentation of that subject, and is well illustrated. Taken as a whole, this is, in my opinion, the best treatise that had been published on the subject in this country. Yet I presume the work never had any extensive circulation. Pp. 253.

1829. JAMES RYAN.

The Pestalozzian System of Arithmetic. By James Ryan, New York, 1829. Pp. 144.

The author included all the simple rules and interest, commission, and brokerage, insurance, partnership, etc. It consists chiefly of questions.

1829. T. H. BABCOCK.

Babcock's Arithmetic, New York: G. & C. & H. Carvill, 1103 Broadway, 1829.

12mo, pp. 180.

This is one of the best of the earlier American arithmetics. The author had clearly defined notions of what he wanted to say and how it ought to be said. There is a precision in the definitions, an exactness in the statement of principles, and a simplicity in the rules and directions which indicate no ordinary mind. The arrangement of subjects is that now generally adopted in our latest works, and includes 139 pages, and in which all important topics are treated more or less fully and quite satisfactorily. The remainder, 41 pages, is devoted to miscellaneous matter, including chronological problems, gravity of bodies, falling bodies, mechanical powers, mensuration, a little algebra, trigonometry, and tables, and 8 pages of choice and quaint problems, several in rhyme. The general plan of the book was worked out in 1827.

1829. CONNOLLY'S ARITHMETIC.

James L. Connolly put about as much matter in The Ohio Accomptant as could be well crowded into 250 pages of a 12mo book. Problems, problems, characterize the production from beginning to end. The work was printed at Pittsburg in 1829.

1829. ROSE'S ARITHMETIC.

The United States Arithmetician, by John Rose, was published in Philadelphia in 1829. It is not different in many respects from Smiley's Arithmetic, published a few years previously.

1829. OSTRANDER'S ARITHMETIC.

The Elements of Numbers, or Easy Instruction in Practical Arithmetic, by Tobias Ostrander, was published at Canandaigua, N. Y., 1829.

It is divided into two parts, the first 193 pages, arithmetic proper, and the second, an exposition of mathematical principles, 168 pages. A curious compilation.

1830. FREDERICK A. P. BARNARD.

A Treatise on Arithmetic, designed particularly as a Text-Book for Classes, in which the Principles of the Science are Inductively Developed, and rendered simple by modes of Illustration, devised after careful observation and Actual Experiment in the School Room; combining Written Arithmetic with copious Mental Exercises, and containing a variety of Useful Practical Abbreviations in Calculation, not found in any similar work: adapted to the Federal Currency, and rendered entertaining to the Pupil, by a great variety of Amusing Problems, involving the Principles Illustrated: the whole constituting the most Complete System of Practical Arithmetic, now before the Public. By Frederick A. P. Barnard, A.B., Mathematical Instructor in the Hartford Grammar School. Hartford: Published by Packard & Butler. 1830.

12mo, pp. 288.

Professor Barnard published, besides his arithmetic, "Arithmetic Divested of its Difficulties. For the Use of Schools and Academies. Tuscaloosa, Alabama, 1843," "The Metric System of Weights and Measures" (second edition, New York, 1872), and edited several works, among which is an American edition of "Bridges Conic Sections" (New Haven, 1839). He also added "A Concise Treatise on Logarithms" to the seventh edition of "Flint's Surveying" (Hartford, 1833).—A. M.

1831. WILLIAM SLOCOMB.

The American Calculator; or a concise System of Practical Arithmetic; containing all the Rules necessary for transacting the common business of Life; together with Questions for Examination, under each of the Rules. By William Slocomb, Philadelphia; published by William Davis. 1831.

A 12mo volume of 180 pages; supplementary and 6 pages on bookkeeping. This is the second edition. A good companion to Smiley's Arthmetic.

1831. HUTTON'S ARITHMETIC.

Charles Hutton's Course of Mathematics was published in two large volumes in this country. The edition I have is "the fifth American, from the ninth London edition, with many corrections and improvements by Olinthus Gregory, LL. D., edited in this country by Dr. Robert Adrain, and published in New York by W. E. Dean, 1831.

The American edition is in part a reprint of the English edition, with such modifications as appeared calculated to increase the usefulness of the work, and to adapt it to the students of this country. The subject of arithmetic embraces 161 pages of the first volume. Each subject is briefly treated; the definitions are tersely expressed; explanations are simple and direct, and the exercises moderately copious. As was the custom, he places the "rule of three" before vulgar fractions. The table of squares, cubes, and roots of all numbers from 1 to 1,000 is a valuable feature. Progressions and single and double position are clearly presented. A good collection of miscellaneous problems closes the arithmetic, properly speaking; yet the last 16 pages are devoted to logarithms, their nature, properties, and uses. At one time Hutton's Mathematics were extensively used in the higher institutes of learning in this country.

1831. THOMSON RANDOLPH.

The Practical Teacher; being an easy and rational Introduction to Arithmetic designed for Beginners of Every Age, adapted to Every Mode of Instruction, and particularly the Monitorial. By Thomson Randolph. Third Edition, Carefully Revised and Corrected. Philadelphia: Uriah Hunt & Son, No. 44 North Fourth Street. 1845.

18mo, 192 pp. Copyrighted 1831.—A. M.

1831. THOMAS W. CONKLING.

The Young Arithmetician's Guide to a Knowledge of Numbers; being an Easy Practical System of Arithmetic, Explained and brought down to the capacity of the Learner; adapted to the Currency of the United States. By Thomas W. Conkling, Teacher. New York: Published by Ketcham & Aymar, 384 Pearl Street. T. B. Town & Co.. Printers. 1831.

12mo, pp. 288.—A. M.

1831. I. K. TORBERT.

The Farmer and Mechanic's Manual; or the Present Currency of the United States, concisely explained, by Rules entirely original, and applied to Practical Purposes, in a Manner not before published. Together with Mensuration, and an Appendix, containing Rules that are seldom used, but sometimes necessary. By I. K. Torbert. Harrisburg, F. Wyeth, Pr. 1831.

A small volume, pp. 142.—A. M.

1831. JAMES ROBINSON.

Elementary Lessons in Intellectual Arithmetic, Illustrated upon Analytic and Inductive Principles. By James Robinson, Instructor of Writing and Arithmetic, Bowdoin School, Boston. Boston: Hilliard, Gray, Little and Wilkins.

Small 18mo, 84 pp.—A. M.

1831. FRANCIS J. GRUND.

A Collection of Arithmetical and Algebraic Problems and Formulæ; by Mier Hirsch: Translated from the original German and adapted to the use of the American Student. By Francis J. Grund, Teacher of Mathematics. Boston: Carter, Hendee and Babcock. 1831.

12mo, pp. 340. The first 22 pages are devoted to arithmetic.—A. M.

1831. WANZER'S ARITHMETIC.

Ira Wanzer's Arithmetic is designed as an introduction to mathematics. It is a volume of 396 pages, published at Danbury, Conn., 1831.

1832. BEECHER'S ARITHMETIC.

This is a work prepared by Catherine E. Beecher, late principal of the Hartford Female Seminary, and was published at Hartford in 1832.

It is intended to supply a complete course of instruction in arithmetic by dividing the work into three parts: Part I for young children; Part II for older classes; Part III for students entering college. The book is a bulky 12mo. of 283 pages.

Catherine Esther Beecher was born in East Hampton, Long Island, September 6, 1800, and died in Elmira, N. Y., May 12, 1878. She was a sister of Henry Ward Beecher and Harriet Beecher Stowe. Her education was received in the seminary at Litchfield. She was betrothed to Professor Fisher, of Yale, who was lost with the *Albion* off the coast of Ireland, while on a voyage to Europe, and she never married. She devoted her life to the cause of the education of women, and published a number of works on educational, religious, and domestic subjects.—A. M.

1832. EMERSON'S ARITHMETICS.

The North American Arithmetic, in three parts, was published in Boston. Before me are parts second and third, in separate volumes. Part second was prepared in 1832, and is entitled "The North American Arithmetic. Part Second, uniting Oral and Written Exercises in Corresponding Chapters."

This book is divided into two parts, 87 pages to oral arithmetic, and 118 pages to written arithmetic. The answers are omitted. This book in 1834 displaced Colburn's First Lessons and Sequel in the Boston schools. Part third, for advanced scholars, followed two years later, pp. 288. The exercises are well selected, and taken as a whole it would be pronounced a strong book. Among other matters of importance is the French system of weights and measures. The answers are omitted, but a key for the use of teachers only is published separately.

Benjamin Dudley and Frederick Emerson, brothers, were natives of New Hampshire. The elder, Benjamin Dudley, was born at Hampstead, 1781, and died in Jamaica Plains, now a part of Boston, October 2, 1872. Frederick was born at Hampstead November 28, 1788, and died in Boston in 1857. Both were well-known teachers in Boston, and were also associated in the preparation and publication of school books. Frederick was at one time superintendent of the Boston schools.

1832. WESTERN CALCULATOR.

J. Stockton, Pittsburg, was the author of the Western Calculator, a little book of 203 pages, and in which the problems were well selected and grouped under eight different heads. It was published in Pittsburg in 1832,[1] and at one time had a somewhat extensive circulation.

1832. COBB'S ARITHMETIC.

Lyman Cobb's Arithmetic is a volume of 216 pages of rather pleasant arithmetical reading, much of which is in the form of questions and answers. As an arithmetic it does not amount to much. It was printed in Ithaca, N. Y., 1832.

Lyman Cobb was born in Massachusetts about 1800, and died in Colesburg, Potter County, Pa., October 26, 1864. He was one of the greatest educators of his time and was the author of numerous text-books besides his arithmetics.—A. M.

[1] There is a copy of the fourth edition in the Library of Congress which is dated 1826. The date of the copyright is 1819, which is probably the date of the first edition.—A. M.

1832. P. E. BATES BOTHAM.

The Common School Arithmetic: in which the Rules are Explained in the Plainest and most Concise Methods Extant, with many Important Improvements, containing Proofs in each Rule with Demonstrations from the most Simple and Evident Principles; together with Reasons for every Rule, accompanied with a Series of Questions on the Nature and Application of the Same. To which is added a Dictionary of Arithmetical Terms not found in any other Treatise. By P. E. Bates Botham. * * * Hartford, Conn. Published by Henry Benton. 1832.

12mo, pp. 228.—A. M.

1832. E. DAVIS,

The Franklin Intellectual Arithmetic: for The Use of Schools. By. E. Davis, A. M., Principal of Westfield Academy. Springfield: Published by G. & C. Merriam. 1832.

24mo, pp. 108.—A. M.

1832. OLIVER A. SHAW.

A Description of the Visible Numerator, with Instructions for its Use; Illustrated with Plates. Designed to impart to Learners a clear and an adequate knowledge of the Principles of Arithmetic, and to accompany the Apparatus. By Oliver A. Shaw. Boston: T. R. Marvin, Printer, 24, Congress Street. 1832.

8vo, pp. 95.—A. M.

1833. FRANCIS J. GRUND.

Exercises in Arithmetic. By Francis J. Grund. Published in 1833 by Carter, Hendee & Co. Pp. 182.

This book was not intended as a treatise, but only as a companion to other arithmetics, to enable pupils to practice on rules they may have learned. The lessons are divided into sections: (I) Questions in the simple rules; (II) weights and measures; (III) common fractions; (IV) decimals, and (V) exercises which would be needed for business and common purposes.

1833. BENJAMIN DEARBORN.

The Pupil's Guide, being a collection of the most useful rules in arithmetic, calculated for the benefit of schools. By Benjamin Dearborn, of Portsmouth. Reprinted in Boston by B. Edes & Sons, 1833.[1] Pp. 32.

There are no examples, demonstrations, or questions in the book; only the simple declarations. Space is made the most of, only a paragraph or two being given to each subject. All the simple rules, with the addition of the rule of three, commission and brokerage, interest, insurance, discount, equation of payments, fellowship, and barter, are treated briefly.

1833. S. G. GOODRICH.

Peter Parley's Method of Teaching Arithmetic to Children. With Numerous Engravings. Boston: Published by Carter and Hendee, 1833.

Square 16mo, pp. 144.—A. M.

1834. FOWLERS' ARITHMETIC.

The Federal Instructor, or Youth's Assistant.

The authors, Abijah and Josiah Fowler, were teachers of arithmetic, and the recommendations bear dates from 1834 to 1836, and are from educators in Virginia and Tennessee. There is no wasted space in this book of 192 pages. It contains upward of 1,300 problems. The rules are short, and the explanations shorter. Smiley's Federal Calculator must have been the guide the authors followed in the preparation of this book. The copy I have was revised by Mr. Gibson in 1868, and is now published by Mr. W. J. Duffie, Columbia, S. C.

[1] There is in the Library of Congress a copy of the "Pupil's Guide," by Benjamin Dearborn, containing 16 quarto pages, printed at Portsmouth in 1782.—A. M.

1834. JOHN PRESTON.

Every Man his Own Teacher. Being an Introduction to Arithmetic, whereby Persons who are ignorant of that Science, may of themselves, without a Teacher, obtain a sufficient degree of knowledge in Figures, for Common Business, and for operating in nearly all the Books extant on that Subject. By John Preston, Philo. Math. Second Edition—with additions. Albany. Printed by G. J. Loomis, 9 Washington Street, 1834.

12mo, pp. 300.—A. M.

1834. JOHN ROSE.

Rose's New Arithmetic. An Explanatory and Practical Arithmetic, adapted to the Business and Commerce of The United States; containing all the most useful Practical Rules of the Science. By John Rose. Philadelphia: Published by Denny & Walker, No. 28 North Third Street. 1836.

18mo, pp. 180. Copyright, 1834.—A. M.

1834. W. B. FOWLE ?.

The Child's Arithmetic in which its Most Easy and Simple Rules and Elements, are Brought Down to the Level of his Comprehension. Stereotype Edition. Washington: Printed and Published by Duff Green. 1834.

18mo, pp. 62.—A. M.

1835. CHARTA NA-HOLHTINA: OR CHOCTAW ARITHMETIC.

This book, written in the Indian tongue, was printed in Boston in 1835, for the American board of commissioners for foreign missions, by Crocker & Brewster.

It has only 72 pages, mostly problems. The figures are, of course, intelligible, but all else is in the Choctaw language. The numbers are written as: (1) Achefa, (2) tuklo, (3) tuchina, (4) ushta. (5) tahlapi, (6) hanali, (7) untuklo, (8) untuchina, (9) chakali.

1835. BENJAMIN GREENLEAF.

Mr. Greenleaf's first book, the National Arithmetic, was published by Robert S. Davis & Co., Boston, in 1835.

It soon became a favorite treatise with teachers who preferred sound attainments in this science. The first edition was exhausted within a year, and a second revised edition was published. Increased activity in education created a demand for more advanced books, and the author brought out an enlarged edition of 360 pages in 1847, and ten years later the author rewrote, revised, and enlarged the National again, and in this form we still have it. It contains 84 more pages than the edition of 1847. The general plan of the work was never changed.

The introduction to the National Arithmetic, or the Common School Arithmetic, was first issued in 1842, and revised in 1848 and 1856. The edition of 1848 contains 324 pages, being nearly 150 pages larger than the first edition. It is a smaller edition of the National, and is modeled after it closely.

Benjamin Greenleaf was born at Haverhill, Mass., September 25, 1786, and died in Bradford, Mass., October 9, 1864. He graduated from Dartmouth College in 1813, and from 1814 to 1836 was principal of Bradford Academy. From 1837 to 1839 he represented Bradford in the State legislature. In 1839 he took charge of the Bradford Teachers' Seminary, which position he occupied for 9 years.

1835. LYCEUM ARITHMETIC.

An experienced teacher of Boston prepared this volume of 248 pages for common schools, high schools, and academies. It was published in 1835.

1835. AMERICAN ARITHMETIC.

James Bennett, accountant, published his American arithmetic adapted to trade and commerce of the United States in 1835. It is an octavo of 104 pages, devoted to commercial and business transactions.

1836. FRANCIS WALKINGAME'S TUTOR'S ASSISTANT.[1]

Crosby's new edition was printed by and for Thomas Wilson & Sons, High-Ousegate, York, 1836.

This is a book of about 200 pages. The arithmetic is divided into 6 parts, viz: (1) Arithmetic in whole numbers; (2) vulgar fractions; (3) decimals, with the extractions of square, cube, and biquadrate roots; (4) duodecimals, or multiplication of feet and inches; (5) the mensuration of circles; (6) a collection of questions, set down promiscuously, for the greater trial of the foregoing rules. The whole is adapted either as a question book for school use or as a remembrancer or instructor to such as have some knowledge therein.

1836. MAHAN'S ARITHMETIC.

Jason M. Mahan's private instructor was published at Harrisburg, 1836. Besides what the author deemed important in arithmetic, he inserted bookkeeping, conveyancing, mensuration, etc.

This is a book of little value, 12mo., 304 pages.

1836. GEORGE WILLSON.

A Practical and Theoretical System of Arithmetic, containing several New Methods of Operation, and a New System of Proportion; with Theoretical Explanations of all the Principal Rules. Also, a Treatise on Mensuration, and a Brief Practical System of Book-Keeping. By George Willson. Canandaigua: Published and sold, wholesale and retail, by C. Morse. 1836.

18mo, pp. 192.—A. M.

1836. B. F. ELLS.

The Dialogue Arithmetic, or Book Instructor. Part I. By B. F. Ells, Author of "The Dialogue Grammar," "History of The Inquisition," etc. Dayton: Published by B. F. Ells, and E. M. Strong, and sold by E. M. Strong, Dayton, O. 1836.

Sm. 18mo. pp. 126.—A. M.

1836. S. R. HALL.

School Arithmetic: containing The Theory of the Science; Illustrations of The Rules, and Copious Examples for Practice. By S. R. Hall, Principal of Teachers' Seminary. Andover: Printed and Published by Gould and Newman. Waterville, Me.: E. Davis and Co. 1836.

18mo, pp. 312.—A. M.

1836. NATHAN DABOLL AND DAVID A. DABOLL.

Daboll's Complete Schoolmaster's Assistant: being a Plain Comprehensive System of Practical Arithmetick, adapted to the Use of Schools in the United States: Exemplified and Illustrated in a manner calculated to engage the Minds of Youth in their Study, and impart to them a Thorough Knowledge of Practical Arithmetick. By Nathan Daboll, A. M., and David A. Daboll. New-London: Published by W. & J. Bolles. New-York: Collins, Keese & Co. 1836.

18mo, pp. 235. A different book from the original Daboll's Schoolmaster's Assistant.—A. M.

Nathan Daboll, son of the Nathan Daboll who was author of the Schoolmaster's Assistant, was born in Groton, Conn., 1782, and died there in 1863. His son, David Austin Daboll, was born in Groton, Conn., in 1813. The second Nathan compiled the New England Almanac from his father's death, in 1818, until his own death, and it has been continued since by David Austin.—A. M.

1836. ROBERT RAMBLE. (JOHN FROST.)

Elements of Arithmetic, for Children: on a Plan Entirely New: adapted for Families and Preparatory Schools. Illustrated by cuts. Philadelphia: Desilver, Thomas & Co. 1836.

Small 18mo., pp. 108.—A. M.

[1] I think this is not an American publication.—A. M.

1837. LYMAN PRESTON.

The Book-Keeper's Diploma: or, a Full and Lucid Treatise on the Equation of Payments. By Lyman Preston, Author of "A Treatise on Book-Keeping," "Tables of Interest and Six and Seven per cent," &c., &c. New York: Stereotyped by Francis F. Ripley, Franklin Building. 1837.

8vo, pp. 32.—A. M.

1838. CHARLES DAVIES, LL. D.

The mathematician Charles Davies was born at Washington, Conn., January 28, 1798, and died at Fishkill Landing, on the Hudson, September 17, 1876. When he was a boy his father moved to St. Lawrence County, N. Y., then a new and unsettled portion of the State. Here he worked on the farm, meanwhile picking up such an irregular education as was then available in a new country till he entered the Military Academy, in December, 1813, and graduated in December, 1815, and was assigned to the light artillery. After a brief service in New England garrisons he was transferred to the Engineer Corps, in 1816, and ordered to duty at West Point, but resigned December 1, 1816, and became the principal assistant professor of mathematics and natural philosophy. This position he held till May 1, 1823, when he was made full professor, and this office he held till May 31, 1837, when he resigned on account of failing health. At this time he was engaged upon the series of text-books which soon became famous in this country. His health was so impaired that he made a trip to Europe, and upon his return accepted the chair of mathematics in Trinity College, Hartford, which he occupied from 1839 to 1841. His health again failing, he resigned and was appointed paymaster in the Regular Army with the staff rank of major. He served also as treasurer of the Military Academy at West Point from 1841 to 1846, and two years later was elected professor of mathematics and philosopy in the University of New York. The year following he moved to Fishkill Landing, on the Hudson, to complete his series of books. Next he taught mathematics in the Normal School, Albany, N. Y., and in 1857 was elected professor of the higher mathematics in Columbia College, New York, and in June, 1867, emeritus professor.

At present I am unable to determine the exact date at which Davies's arithmetics were first issued. A. S. Barnes & Co. established their firm in New York in 1838, and it was at this date that Mr. A. S. Barnes, then only 21 years old, joined Prof. Charles Davies for the purpose of publishing the mathematical works of the latter.

For two years after the formation of this partnership Mr. Barnes traveled through the country, canvassing schools and academies for the sale of these books, which were the first the firm published.

From Allibone the order of Davies's works is the following: (1) Primary Table Book; (2) First Lessons in Arithmetic; (3) Intellectual Arithmetic; (4) School Arithmetic; (5) Grammar of Arithmetic; (6) University Arithmetic, first edition, 1846; (7) Elementary Algebra, first edition, 1839; (8) Elementary Geometry and Trigonometry, first edition, 1840; (9) Practical Mathematics, 1852; (10) Bourdon's Algebra, first edition, 1834; (11) Legendre's Geometry, first edition, 1828; (12) Elements of Surveying, first edition, 1832; (13) Analytical Geometry; (14) Differential and Integral Calculus; (15) Descriptive Geometry, first edition, 1826; (16) Shades, Shadows, and Perspective; (17) Logic of Mathematics; Mathematical Dictionary, 1855, New York, 8vo. The dictionary was prepared by Mr. Davies and William G. Peck.

The earliest edition of Davies's "Arithmetic designed for academies and schools" that I have seen was copyrighted in 1838,[1] and published in Philadelphia by A. S. Barnes & Co., 21 Minor street, in 1842. This treatise is an enlarged and improved edition of the Common School Arithmetic published in 1833. Also a testimonial,

[1] I have a copy published by Alfred S. Barnes, Hartford, Conn., in 1838.—A. M.

dated Baltimore, August, 1842, shows that Davies's First Lessons in Arithmetic were adopted in the Philadelphia common schools.

The edition of 1838 is substantially the same as the edition of 1850, which is still printed and is marked (Davies's Old Edition). There are 20 pages more of matter in the 1850 edition. That of 1838 contains 340 pages.

Since Davies's arithmetics in some form are so widely known in this country, it is not worth while to give a minute analysis of them, yet it is proper to ascertain, if possible, what elements gave his arithmetics their great popularity among the people.

In the first place, Dr. Davies possessed in eminent degree the power of analysis and of assimilation. In translating from the French he acquired a clear, graceful, and elegant style. The clearness of the French, united with the practical character of the American, enabled him to produce better text-books than had previously been published in this country.

He always wrote to be easily understood, and his mind, being naturally logical, he arranged his thoughts according to a fixed plan. More than any previous writer he regarded arithmetic as a science and less as an art than had hitherto been done. With him arithmetic was an instrument to be used, but which depended upon certain definite conditions for its highest efficiency. On every page of his writings is seen the same care and precision which distinguished all his work. It is the instructor of the average mind that he always had in view. At no time does it appear that he wrote for geniuses, but, on the contrary, for common minds. Truthfully can it be said that the arithmetic that he prepared forty years ago can be used advantageously in the schools of to-day.

FIRST LESSONS.

This is a neat little volume of 198 pages, combining the oral method with slate exercises, in two parts. Part first is designed for beginners and corresponds to the simplest exercises in our primary books. The second part, which embraces 107 pages, is properly mental work, and is designed to perfect the pupil in rapid and accurate work.

The first edition of this book I have not examined.

INTELLECTUAL ARITHMETIC.

This contains 178 pages. The scope of the book is "an analysis of the science of numbers with special reference to mental training and development." The edition that I have before me is copyrighted in 1854, and it is said to be essentially different from the one which preceded it. The principle underlying it is that every operation in arithmetic has reference to the unit *1*. The problems are well graded, and are just difficult enough not to discourage the pupil.

THE UNIVERSITY ARITHMETIC.

The finishing work of the series of arithmetics is Davies's University Arithmetic. The Primary, Intellectual, and Practical or Common School Arithmetic, were prepared for specific purposes, each being part of a whole system. The University Arithmetic is designed to answer to another purpose, namely, to present the subject as a science from a scientific standpoint. The same logical connection is observed in treating the subject as a series of dependent, but closely connected, propositions. From the idea of the unit the author developed the science as a beautiful structure, symmetrical in all its parts. Owing to the simplicity of the science, it was the most natural thing for Dr. Davies to advocate the adoption of the metric system of weights and measures, and thus discard the varying scales which have but one merit—that of age.

The University Arithmetic, under its present revised form, is one of the very best text-books in the language. For fifty years these books have been in the foremost place. Merit has kept them there. Whenever the discovery of new methods of presentation demanded a revision, the publishers and author at once complied.

The title of the book, "University Arithmetic, Embracing the Science of Numbers and General Rules for their Application," indicates its object. It is a 12mo volume of 466 pages, well printed, and substantially bound in muslin. The general divisions of the subjects are: (1) First five rules; (2) common fractions; (3) duodecimals; (4) decimal fractions; (5) continued fractions; (6) ratio and proportion; (7) percentage; (8) applications; (9) powers and roots; (10) arithmetical progression; (11) geometrical progression; (12) analysis; (13) mensuration; (14) appendix.

In the arithmetic published in 1838 the divisions are: (1) First five rules; (2) denominate numbers; (3) vulgar or common fractions; (4) decimal fractions; (5) ratio and proportion; (6)

practice; (7) percentage; (8) applications to business; (9) duodecimals; (10) involution; (11) evolution; (12) arithmetical progression; (13) geometrical progression; (14) mensuration; (15) gauging, etc.

The influence of Dr. Davies's writings on subsequent authors in this country can hardly be overestimated. It may be very properly regarded as the beginning of a revolution in school book making. Simplicity and extreme clearness became the leading ideas in the minds of authors, who studied how to be understood by children and young people.

1834. JOSEPH RAY, M. D.

Joseph Ray, whose arithmetics have been more extensively used than those of any other American author, was born in western Virginia, in 1807, and died in Cincinnati in 1855. The following sketch of his life appeared in the Cincinnati Gazette at the time of his death:

Dr. Ray was studious even in boyhood. At 16 years of age he commenced teaching to procure the means of acquiring a better education, all the while pursuing his studies under difficulties that would have discouraged one not so inspired with a genuine love of knowledge. He went a long distance on foot, carrying with him his books, to enter Washington College, Pennsylvania. Afterwards he left that institution, and again taught. Subsequently he entered college at Athens, Ohio, and again took up and pursued with success the collegiate course. In 1828 he came to Cincinnati and immediately commenced the study of medicine at the Ohio Medical College, where he graduated as a doctor of medicines, and soon became a surgeon in the Commercial Hospital. In October, 1831, he became a teacher of the Woodward College, in the preparatory department. In 1834 he became the professor of mathematics in that institution, in which position he remained till the Woodward College gave place to our present Woodward High School, over which he was elected to preside in September, 1851. This institution bears the impress of his genius and character.

For the last five or six years of his life he was president of the board of directors of the House of Refuge, a reformatory institution for boys and girls, to which, as to everything in which he was engaged, he gave unremitting attention, and his good influence will not soon be forgotten by the friends and managers of that institution.

As early as the year of 1834, he commenced the preparation of his mathematical works for publication, and from time to time wrote and published three treatises on arithmetic and two on algebra, and at his death he had in complete preparation for publication another and higher work on arithmetic. His published works have had a wide circulation, and their usefulness has long been appreciated and gratefully acknowledged by teachers and pupils throughout the country.

Professor Ray has long borne a high and useful part in the promotion of science and education in the West. With a mind quick and of great earnestness and power and indomitable perseverance he mastered what he attempted and infused his own energy into others with whom he was connected. His death will awaken sorrow in the hearts of many now in high and honorable positions whose minds have received their tone and much of their power from him.

If it be mark of a great mind to be able to give form, direction, and force to other minds and prepare his pupils for great actions, then was Professor Ray a great man; and if to have devoted a lifetime of energy and incessant labor all to purposes most useful to his age and country denote a good man, then was Professor Ray a good man, and entitled to be remembered with affection and regard by his contemporaries and by those who are to come after him.

His high intellectual worth, the urbanity of his manners, and his devotion to the cause of education, in the promotion of which his life has been spent, are widely known; but the amiableness of his disposition, the purity of his heart, the blamelessness of his life, and the sincerity and depth of his piety were best known to his most intimate associates.

A price list of Messrs. Truman & Smith, publishers of the Eclectic Series, Cincinnati, 1838, has this announcement:

Ray's Eclectic Arithmetic, 50 cents, single.
Ray's Little Arithmetic, 19 cents, single.
Ray's Rules and Tables, 6 cents, single.
So far as is known, only one set of these books is in existence at present.

The Eclectic Arithmetic has as a title, Ray's Arithmetic: Part Third, being the Author's Eclectic Arithmetic on the Inductive and Analytic Methods of Instruction; designed for Common Schools and Academies. Thoroughly Revised, Enlarged, and Improved. By Joseph Ray, M. D., Professor of Mathematics in Woodward College.

The publisher was Winthrop B. Smith, Cincinnati. It is copyrighted in 1844, but the preface bears date 1837. The outside paper cover bears the title, Ray's Eclectic Arithmetic, without any reference to part third, and has the imprint, "Cincinnati, published by Truman & Smith."

A little arithmetic, marked in ink "First edition," has for its title, "Introduction to Ray's Eclectic Arithmetic. The Little Arithmetic. Elementary Lessons in Intellectual Arithmetic on the Analytic and Inductive Method of Instruction. Being an Introduction to the Author's Eclectic Arithmetic—By Joseph Ray, M. D. Professor in Woodward High School, Cincinnati. Cincinnati. Published by Truman, Smith & Co. No. 150 Main Street. Stereotyped by J. A. James. 1834."

It was entered for copyright in 1834, and contains 71 printed pages, the last page being an advertisement of the Eclectic Arithmetic. Another copy of the same date, title, etc., except that the name of the stereotyper and the date 1834 is left off—is probably of later print; it contains only 76 pages. In 1843 the Little Arithmetic became a subordinate title, the chief title then being Ray's Arithmetic, part second. This was published by Winthrop B. Smith, and the preface is dated Woodward College, November, 1843. Ninety-six pages of this book treat of intellectual arithmetic; pages 97 to 144 treat of practical arithmetic. The book includes a brief treatment of interest and is really quite a modern book. There was a revision of this book in 1849, another in 1853, in 1857, 1860, and 1877. There was no essential change from 1857 to 1877.

The Tables is a very small primer of about 48 pages. In the early history of these books revisions were very frequent. The title, "part third," was first used probably in the editions of 1844.

The smaller book was issued in 1834. In 1844 it was remodeled with the others and became Part First. It was revised in 1853, again in 1857, and in 1877.

The Part Third, as described above, was revised in 1844, 1849, and in 1853, when the title Practical was used with Part Third. Revised again in 1857, and lastly in 1877.

The Higher Arithmetic was first issued in 1856. The New Higher in 1880. Some of the above copyrights have been renewed for the additional term, as the law requires.

RAY'S HIGHER ARITHMETIC.

During Dr. Ray's last illness he expressed the wish that Prof. Charles A. Matthews, A. M., should complete and edit the Higher Arithmetic. The task was ably performed. In 1880 the publishers decided to revise the edition prepared by Professor Matthews. The writer revised the arithmetic as it now appears, with the exception of a few of the miscellaneous problems which were proposed by Dr. U. Jesse Knisely.

To many it has appeared strange why Ray's arithmetics have such a hold on the popular mind. The reason is, I think, obvious. Dr. Ray was, in a large sense, a self-made mathematician and a self-made teacher. He had learned well the lesson of self-help, and in the preparation of his books he always kept before himself all the difficulties he had experienced in mastering each topic. No one knew better just when and where and how to bear down on certain points. In an eminent degree he possessed that rare combination of assimilation and clear presentation. He knew how to make the subjects stick.

1838. WILLIAM B. WEDGWOOD.

Wedgwood's Science of Numbers. Containing Rules for the Application of the Mind in Acquiring Knowledge. A Complete System of Arithmetic, embracing New and Important Rules and Explanations. A Complete System of Book-Keeping, by Double Entry, prefaced by Questions and Answers illustrating its Importance. Also, an Introduction to Algebra, sufficient to give the Pupil a Knowledge of Simple Equations. Designed greatly to facilitate the acquirement of Mathematical Knowledge. By Wm. B. Wedgwood, a Graduate of the New-York University, New-York City. New-York: Published by the American Common School Union, 128 Fulton Street. 1838.

16mo, pp. 216.—A. M.

1838. KEITH'S ARITHMETIC.

Keith's Arithmetic, Practical and Self-Explanatory, in which the Mental and Didactic Plans are combined, so as to form a completely Plain System for all Practical Purposes, and at the same time forming a Thorough Foundation for the Study of the more Advanced Branches of the Mathematics. The whole reconstructed on the Basis of the Original Work. Revised and adapted to American Currency, and Use in American Schools, by an Experienced Teacher of Mathe-

matics. To which are added, a Comprehensive Treatise on Mensuration; and an Original and Perspicuous System of Book-Keeping. Philadelphia: Thomas, Cowperthwait, & Co. 1839.

18mo, boards, 290 pages. An American edition of an English work, probably by Thomas Keith, though the author's first name is not mentioned.—A. M.

1839. URIAH PARKE'S ARITHMETIC.

All the reference books I have had access to are strangely silent in regard to the author, Uriah Parke. The arithmetic of his in my possession is Stewart's New Edition of Parke's Farmers', Merchants', and Mechanics' Practical Arithmetic, twentieth edition. It was printed in 1847 by William Stewart, New York.

An extract from the preface to the third edition is dated Zanesville, Ohio, July 1839. In this extract the author recommends that the work be used as a reading book till the learners can promptly read the numbers and signs; and also in some cases the learner should be required to measure boards, scantling, etc., as well as to draw diagrams of his work. The author had a practical, measuring, business turn of mind, and consequently the arithmetic is a departure in more senses than one. It is a savage attempt in 179 pages to compress farmers', merchants', and mechanics' arithmetical calculations into one small volume and still keep it a practical arithmetic after the process of condensation is completed. The chapter on mensuration and kindred topics is particularly strong.

Philosophy of Arithmetic is the fourth number of his series, the first number being a familiar introduction to mental arithmetic, while the third is a key to the practical arithmetic. The Philosophy is designed "more especially for such as desire to look into the philosophy, 'the why and wherefore,' of the subject."

On the title page is: "Lectures on the Philosophy of Numbers, and the adaptation of Arithmetic to the Business Purposes of Life; With numerous Problems, curious and useful, solved by various modes; with explanations designed to make the study and Application of Arithmetic pleasant and profitable to such as have not the aid of a living teacher; as well as to exercise Advanced Classes in Schools."

By Uriah Parke. "What man has done, man may do." "I will try." Zanesville, Ohio: Printed and Published by U. P. Bennett. 1842. Pp. 339.

This is a volume of twenty lectures: (1) The study of arithmetic, its history, etc.; (2) comparative view of the rules of arithmetic; (3) principles of numbering; (4) on the properties of numbers: (5) properties of numbers; (6) properties of fractional numbers; (7) proportion; (8) involution, or the raising of powers; (9) properties of numbers concluded; (10) modes of solving problems; (11) interest; (12) properties among lines, surfaces, and solids; (13) proofs, contractions, and mental calculations; (14) solution of problems, resumed; (15) solution of problems, concluded; (16) theory of wheel carriages; (17) on the uses to which a knowledge of arithmetic is applied; (18) one hundred exercise problems; (19) a collection of rules; (20) pursuit of knowledge under difficulties.

This is a scrappy book, containing much valuable heterogeneous information. The author knew a great deal, doubtless, but his mind must have been a sort of fermenting vat. It is a good reference book for all teachers of arithmetic at the present time. A new edition ought to be printed. There is nothing like it elsewhere.

1839. OLNEY'S ARITHMETIC.

The author, Jesse Olney, is known chiefly by his other series of schoolbooks rather than as a writer of arithmetic. The copy of the arithmetic that I possess was prepared in 1839, and is a volume of 312 pages. In the arrangement of topics, the plan does not vary much from that now in common use. Even at this date it is a good common-school arithmetic. It contains several neat arithmetical problems.

Jesse Olney was born in Union, Tolland County, Conn., October 12, 1798; died in Stratford, Conn., July 31, 1872. He was educated at Whitesboro, N. Y., became a teacher at Whitesboro and Binghamton, and was for twelve years principal of the Stone School, Hartford, Conn., resigning in 1831. In 1828, when in his thirtieth year, he published A Geograpy and Atlas, which was at once accepted as a standard work, and for thirty years was used in almost every public and private school in the United States. Mr. Olney is much better known by his Geography than by his Arithmetic, which never attained any considerable popularity.—A. M.

1839. GEORGE LEONARD, JR.

A Practical Treatise on Arithmetic, wherein every Principle Taught is Explained in a Simple and Obvious Manner; containing Numerous Questions, and combining the Useful Properties of former Works with the Modern Improvements. Being a Complete System. To which is added, a Descripton of Book-Keeping, with Examples for Practice. By George Leonard, Jr. Boston: George W. Light, 1 Cornhill. New York:—126 Fulton Street. 1839.

16mo, boards, 347 pages.—A. M.

1840. RICHARD W. GREEN.

Green's New Arithmetic. An Arithmetical Guide; in which the Principles of Numbers are Inductively Explained: and also Familiarly Applied to the Every-Day Business of Life. For Schools and Academies. By Richard W. Green, A. M., Author of "Little Reckoner," "Inductive Algebra," &c. Fourth Edition, enlarged and improved. Philadelphia: Henry Perkins, 134 Chestnut Street. Boston: Ives and Dennet, 114 Washington Street. 1840.

18mo, pp. 238.—A. M.

1840. C. TRACY.

A New System of Arithmetic; in which is explained and applied to practical purposes, in addition to the ordinary rules of operation, the Principle of Canceling, being an abbreviated mode of Arithmethical Solution. Designed for Schools and Academies. By C. Tracy, A. M., Principal of Norwich Academy. Second Edition. New Haven: Published by Durrie and Peck. Philadelphia: Smith and Peck. 1842.

12mo, pp. 288. Copyright. 1840.—A. M.

1840. ELLIOT VALENTINE.

Mental Arithmetic, for Common Schools; designed to prepare the Mind for the Use of the Slate. By Elliot Valentine. Bangor: E. F. Duren. Portland, William Hyde. 1840.

Small 18mo, pp. 80.—A. M.

1841. THE WESTERN PRACTICAL ARITHMETIC.

Accidentally I picked up a copy of this arithmetic, which was compiled by John L. Talbott. In the preface the publishers, Messrs. F. Morgan & Co., Cincinnati, state that this is a revised, enlarged, and improved work, and the date affixed to this announcement is February, 1841. It is bound in boards, and is almost an exact transcript of Smiley's Western Calculator of an earlier date, but it is somewhat larger, containing 250 pages. The arithmetic proper consists of 192 pages, the remainder constituting an appendix, the most important section of which is Section IV, in which the author treats "Cause and effect" in a very satisfactory manner.

So far I have learned nothing of the author himself.

1841. PORTER'S ARITHMETIC.

This is a new system of arithmetic, in which the author condenses the science and art of numbers into the small space of 240 pages. Piercy & Reed printed the volume in New York in 1841. It is a book of problems, containing a few general rules for their solution. The author, James H. Porter, was a teacher of mathematics.

1841. GEORGE ROBERTS PERKINS, LL. D.

George R. Perkins was a mathematician of marked ability. He was born in Otsego County, N. Y., May 3, 1812, and died August 22, 1876, at New Hartford, N. Y. He was self-educated, and at the early age of 18 was employed on the

slack-water survey of the Susquehanna River. From 1831 to 1838 he taught mathematics in the Liberal Institute, Clinton, N. Y., and then he assumed control of Utica Academy. When the State Normal School was opened at Albany under David Page in 1844, Professor Perkins was chosen teacher of mathematics, and four years later, when Mr. Page died, was elected principal, which position he resigned in 1852 to superintend the erection of the Dudley Observatory. In 1858 he was appointed deputy engineer and surveyor of the State of New York. Hamilton College conferred upon him in 1852 the degree of LL. D.

As a mathematician, few of our countrymen outrank Professor Perkins. He was a contributor to many mathematical and scientific journals. He is the author of a series of mathematics, including arithmetics, algebras, geometries, and trigonometry.

The arithmetics are: (1) Primary, 1850, 18mo; in Spanish, 1855; new edition, 1859. (2) Elementary, 1844, 12mo; revised edition, 1849; new edition, 1859. (3) Practical, 1851, 18mo; new edition, 1859. (4) Key to No. 3, 1854; new edition, 1857. (5) Higher Arithmetic, 1841, 12mo; revised edition, 1848; new edition, 1859.

These arithmetics were published by the well-known firm of Messrs. D. Appleton & Co., New York. The Elementary Arithmetic contains 347 pages. The author in the preface says: "My object has been to be concise, yet lucid; to reach the radical relations of numbers; and to present fundamental principles in analyses and examples, that shall leave nothing obscure, yet shall not embarrass by multiplied processes or enfeeble by minute details. I hold to the idea that a sufficiency of illustration to lay open thoroughly the subject treated is all that is desired, and whatever is redundant impairs the force of what is essential."

In this and subsequent volumes the author carries out the views here expressed. His definitions are clear, his explanations and solutions are as plain and simple as possible, while the problems are sufficiently numerous to illustrate all the principles of the science.

The Practical Arithmetic covers very nearly the same ground as the Elementary, differing from it in containing a much greater number of problems, numbering 3,926. All the problems are of a practical character. Many of them are made up of important statistics and valuable facts in history and philosophy. The book is admirably bound, and printed in clear, bold type, and has 356 pages.

Higher Arithmetic is a finishing book for those wishing a thorough course. The book is divided into two parts, the arithmetic proper and the appendix. The first contains 282 pages and the appendix 60 pages.

I regard this as the best arithmetic that had been published in this country at that time. The edition I have is that of 1844. The first edition I never saw.[1]

1841. W. F. WALKER.

Arithmetic; as taught in the Troy Episcopal Institute; By W. F. Walker, A. M., Principal. Troy, N. Y.: Elias Gates, 225 River-Street. New York: Collins, Keese and Company, 254 Pearl-Street. 1841.

8vo, pp. 231.—A. M.

1841. REV. WILLIAM F. WALKER.

Arithmetic, on the Principle of Hassler and Lacroix. By Rev. William F. Walker, A. M., late principal of the Troy Episcopal Institute. New York: Alexander V. Blake, 54 Gold Street, corner of Fulton. 1841.

8vo, pp. 231. This book is exactly the same as the above, except the title-page. It seems that after severing his connection with the Troy Episcopal Institute the author changed the title-page of his book.—A. M.

1841. JOSIAH F. BUMSTEAD.

The Black Board in the Primary School. A Manual for Teachers, to illustrate some Valuable Methods of Interesting and Instructing Young Children. By the Author of 'My Little Primer,' 'My First School-Book,' and 'Spelling and Thinking Combined.' Boston: Perkins & Marvin. 1841.

18mo, pp. 71.—A. M.

[1] I have a copy of the first edition, published by Bennett, Backus, & Hawley, Utica, N. Y., in 1841; also, a copy of the first edition of the Practical Arithmetic, published by D. Appleton & Co., New York, in 1851.—A. M.

1841. JAMES H. AND REUBEN PORTER, JR.

Porters' New System of Mathematics: with the addition of a Complete Ready Reckoner. For the Use of Farmers and Mechanics. By J. H. and R. Porter, Jun., Teachers of Mathematics and Natural Philosophy. Third Edition. Hartford: Printed by John G. Wells. 1843.

12mo, pp. 72. Copyright, 1841.—A. M.

1841. CHARLES G. BURNHAM.

A New System of Arithmetic, on the Cancelling Plan: Embracing the Rules of Three, Single and Double, Direct and Inverse; Barter; Loss and Gain; Reduction; Multiplication and Division of Fractions; Exchange of Currencies; Interest: and all Proportional Questions in one Rule applicable to the whole. The process greatly simplified and abridged. By Charles G. Burnham, A. M. Second Edition. Boston. Benjamin B. Mussey, 29 Cornhill, Concord. John F. Brown. 1841.

12mo, pp. 312. I have not seen the first edition, which was published in 1837. I have a copy of an edition dated 1859 and copyrighted in 1857, containing 324 pages, called "Burnham's Arithmetic, Revised," at the top of the title-page, and in the title appear the words "on an improved plan," instead of "on the cancelling plan," published at Boston by John P. Jewett & Co.—A. M.

1841. JOHN M'NEVIN.

The United States Calculator; or, Arithmetic Simplified, in Dollars and Cents, Adapted to the Commerce of the United States, in its Foreign and Demestic Relations, Abbreviated, Simplified, and Arranged on a New System, in a Series of Lectures, comprising the Analytical and Synthetical Methods of Demonstration, Designed for Schools and Academies. By John M'Nevin, Teacher of English and Mathematics. Baltimore: Published by Fielding Lucas, Jr., No. 138 Market Street. Printed by James Young. 1848.

12mo, pp. 280.—A. M.

1841. CHARLES WATERHOUSE.

Tyro's Spyglass, Arithmetical Lexicon, and School Teacher's Assistant, consisting of very Important Arithmetical Problems, and of the Solution of all the Most Intricate Questions to be found in all Works on Arithmetic. By Charles Waterhouse. Durham, Me. Published by Thomas Waterhouse. 1841.

16mo, pp. 95.—A. M.

1841. ALMON TICKNOR'S ARITHMETIC.

Almon Ticknor, the author of the Columbian Calculator, was born at Salisbury, Conn., 1793. He wrote the following works: (1) Accountant's Assistant, &c. (2) Mathematical and Logarithmetic Tables. (3) Youth's Columbian Calculator, Phil., 12mo; Key, 12mo. (4) Columbian Calculator, 12mo; Key, 12mo. (5) Columbian Spelling Book, 12mo. (6) Arithmetical Tables. (7) Mensuration, or Square and Triangle, 12mo.

Ticknor's Arithmetical Tables is a little primer of 32 pages, designed for the use of younger classes in the district schools of the United States. It was published in 1848 by J. B. Lippincott & Co., Philadelphia. The contents are the tables of the four fundamental rules, covering 20 pages; then follow the tables of value, weight, measure, time, miscellaneous tables, tables of foreign gold and silver coins, the names of the States and Territories, time tables showing the number of days from any one day in a month to any other day of the year, and lastly, abbreviations used in writing and printing. There are no problems to be worked by the pupil.

The Columbian Calculator was entered for copyright in 1846 by the author. The copy that I have is a revised one furnished by the publishers, J. B. Lippincott & Co. It is called a practical and concise system of decimal arithmetic, adapted to the use of schools in the United States.

This is a volume of 264 pages, plainly printed, and attractive in appearance. In the arrangement of matter the author places decimal fractions immediately after the four fundamental rules, but he reserves common fractions for a place after proportion. There are 2,200 problems in the book. The author's plan of treatment of a subject is: (1) Definition; (2) rules; (3) exercises; (4) questions for review.

1842. POST'S ARITHMETIC.

In 1842, at Hartford, John D. Post published a theoretical and practical arithmetic on the plan of Dr Lardner. Within the compass of 347 pages the author endeavors to encourage the pupils to ask "why" certain processes are performed.

1842. CHARLES WATERHOUSE.

Arithmetical Spyglass and Teacher's Assistant, intended as a Key and Supplement to the different works on Arithmetic. For the use of Schools and Academies. By Charles Waterhouse, Teacher of Mathematics. Second edition, revised and enlarged. Portland. Waterhouse & Co.—Wm. Hyde.—R. H. Sherburne.—Day, Lyon & Co.—H. J. Little & Co.—S. H. Colesworthy. 1842.

12mo, pp. 166. Contains on pp. 140–41 an erroneous solution of the problem "Required, the length of a thread, winding spirally, once round the height of every 3 feet of a cone, which is 50 feet in height and 3 feet in diameter at the base."—A. M.

1842. OSMAN CALL.

Call's Decimal Arithmetic, on a New and Improved Plan throughout, comprising several New Methods of Computing Simple Interest, Duodecimals, and a Great Improvement in Multiplication and Division, not found in any other work extant. By Osman Call, L. A. Fletcher, Hancock Factory, N. H. 1842.

18mo, pp. 192.—A. M.

1843. ELISHA L. BAGGS.

Common School Interrogator and Expositor; or, Teachers' Ready Friend. In which the Scholar is not only rigidly examined in Theory, but becomes able to apply his Theory to Practice. To which is added, a New and Concise Rule for solving the Thirteenth Question, page 147, Flint's Surveying, stereotype edition. By Elisha L. Baggs, Teacher of Mathematics and Natural Philosophy. Providence: B. Cranston & Co., Printers.

Pp. 48.—A. M.

1844. HILL'S ARITHMETIC.

An Elementary Treatise on Arithmetic, by Thomas Hill, is one of the most singular, as well as one of the most interesting, arithmetics ever published in the English language. This work is designed as an introduction to Peirce's Course of Pure Mathematics, used in the New England high schools. In the preface the author states that "It is not the design of this treatise to make arithmetic easy, nor to give such practical skill as may be useful in business." But, upon the other hand, the object of the work is to teach the learner how to think, and how to handle the ideas of number as in more advanced mathematics, the ideas of space, time, and motion are considered and investigated.

The contents are embraced under two heads: (1) Pure arithmetic, which occupies 20 pages of the book; (2) arithmetic in its application to quantity, 58 pages.

This is not a book of problems, but it is an original and intelligent discussion of principles underlying the theory of the science. The definitions are precise, striking, and unique.

To examine this little volume, the work of a master, amply repays me for all the time I have devoted to a comparison of American treatises.

This work, a 12mo of 85 pages, was written by Dr. Thomas Hill when he was 26 years old. It was published by Messrs. James Munroe & Co., Boston, 1845.

Thomas Hill was born, New Brunswick, N. J., January 7, 1818; graduated at Harvard College 1843; settled in the ministry at Waltham, Mass., in 1845; succeeded Horace Mann at Antioch College, Ohio, in September, 1859; he was elected president of Harvard College October, 1862, resigned from ill health October, 1868; and recovering health settled in Portland, Me., February, 1873, where he still resides.

In 1843 Mr. Hill received the gold medal of the Franklin Institute, Philadelphia, for a machine to calculate eclipses by and of the moon. In 1876 he patented the Nautrigon, a skeleton globe for solving spherical triangles. In 1845 he published an arithmetic, which for many years was specifically required for admission to Harvard College. In 1848 he published a set of Puzzles to Teach Geometry. He has also published two text-books on geometry for schools, and made

numerous communications concerning higher mathematics to scientific bodies, and to mathematical and astronomical journals. His joint labor with Prof. G. A. Wentworth on a practical arithmetic was published in 1882, the preparation for it being his very earnest and successful labors on the school committee of Waltham, 1846-1859, in which he gave special attention to arithmetic.

In addition to his mathematical publications he has printed many sermons, addresses, poems, and magazine articles on literary, philosophical, and religious subjects, and his Geometry and Faith has passed through three editions with successive expansions and additions.

1844. WILLIAM B. YOUNG.

An Arithmetical Dictionary, or Book of Reference: comprising a System of Practical Tables, made by a Compound of Decimal and Vulgar Fractions, or rather a Series of Arithmetical Progression, and so arranged as to give the cost of any number of articles at any given price (in dollars and cents), frome one sixteenth of one cent to ten thousand dollars. Also, giving the Interest, Insurance, Commission, Brokerage, &c., of any Sum of Money at any per cent whatever. Likewise embracing a System of Practical Arithmetic, containing a few of the most important and convenient Rules for stating and working Proportion, or the Rule of Three, Practice, &c., with numerous examples, showing the Use of the Tables to serve as a Guide to Practical Business. Fifty-Ninth Edition. By William B. Young. New York: Casper C. Childs, 80 Vesey Street. 1856.

8vo, pp. 220. Copyright 1844.—A. M.

1844. DAVID RING.

Three Thousand Exercises in Arithmetic. By David Ring, Principal of the Female Public High School, Front Street, Baltimore. New Edition—Revised and Corrected. With an Appendix By W. J. Lewis. Philadelphia: W. S. Fortescue & Co., Successors to E. C. & J. Biddle, 811 Arch Street. 1880.

Small 18mo, pp. 77.—A. M.

1844. ROBERT L. McLALLEN.

A New and Interesting Arithmetic, in which is explained the Method that Zerah Colburn must have pursued in Answering the very Difficult Questions proposed to him by a Rapid Calculation of the Head. The explanation is brought down to the capacity of the youth of our country, and exhibits a curious method of Calculating by the head and pen never before known to the Public. This work embraces a plain and comprehensive Arithmetic, with improvements never before published. To which is added, the Surveyor's Art—Abridged; whereby the Contents and Mensuration of Land is made without the use of Trigonometry. By Robert L. McLallen. North Adams, (Mass.) John Riggs, Jr., Printer. 1844.

12mo, pp. 212.—A. M.

1844. M. BALLARD HOBART.

Arithmetical Calculator; containing a variety of Abridged Methods for Computing Numbers. Designed for the Use of Teachers, Merchants, Farmers, Mechanics, etc. By M. Ballard Hobart. New York: Published by the Author. 1844.

18mo, pp. 96.—A. M.

1844. JOHN H. WILLARD.

The Primary Arithmetic; commencing with the simplest combination of Numbers, and including all that is requisite to a thorough Business Knowledge of the Subject. Mainly designed, however, as Preparatory to Larger Arithmetics. By John H. Willard, late Principal of the Episcopal Academy, Pawtucket, R. I., and formerly Associate Principal of Union High School, Providence, R. I. Providence: Burnett & Blodget. 1843.

18mo, pp. 176.—A. M.

1845. VOGDES' ARITHMETICS.

The United States Arithmetic, by William Vogdes, A. M., is a 12mo of 264 pages, and was published by E. C. & J. Biddle, Philadelphia, 1845.

The book is a little peculiar in these respects: 1. Each question is followed by its answer; 2. There are no answers to the problems; 3. Definitions are first given, followed by the rule, proof, demonstration, and examples. Perhaps the most noteworthy article is the one on "Arithmetical symbols," pages 209–213. This is an excellent contribution, and one which if it had been generally known to subsequent writers would have saved a great deal of unnecessary confusion in the interpretation of the signs. The concluding chapter of 20 pages on mensuration is quite full.

On the cover of this book it is announced that the author had published (1) The United States Primary Arithmetic; (2) The first part of the United States Arithmetic; (3) The United States Arithmetic and Key; (4) An Elementary Treatise on Mensuration and Practical Geometry, and Key.

It is also announced that the author is professor of mathematics in the Central High School, Philadelphia.

William Vogdes was born in Philadelphia, Pa., December 29, 1802; died there January 29, 1886. He began life as a teacher, but studied law in Philadelphia and was admitted to the bar in 1832. In 1838 he was appointed professor of mathematics in the Central High School, Philadelphia, which position he retained until he resumed his law practice in 1861. He published, besides his arithmetics, Elementary Treatise on Mensuration and Practical Geometry.—A. M.

1845. THOMSON'S ARITHMETICS.

The arithmetics of James B. Thomson were published in the following order: (1) Practical Arithmetic in 1845; (2) Mental Arithmetic in 1846; (3) Higher Arithmetic in 1847;[1] (4) Table Book in 1848; (5) Rudiments of Arithmetic in 1852; (6) Arithmetical Analysis in 1854. New editions of these books have appeared from time to time, and at present there is a complete three-book series. These arithmetics were first published by Messrs. Ivison, Phinney & Co., but later by Clark & Maynard.

The Practical Arithmetic is a 12mo volume of 384 pages, and the later editions contain an appendix of 16 pages on the metric system. This is one of the best arithmetics ever offered to the public. It combines in a rare degree all the elements of strength. The author's experience among teachers enabled him to guard well the vulnerable points in arithmetical instruction.

The Mental Arithmetic as it originally appeared was an easy book for little beginners. More than 150 editions of it were issued. It is a neat little volume of 120 pages, but not difficult enough for a mental arithmetic proper.

On the title page of the Higher Arithmetic is this:

"Day and Thomson's Series. | Higher Arithmetic; or the | Science and Application of Numbers; | Combining the Analytic and Synthetic Modes of Instruction. | One hundred and twentieth edition."

The work is complete in itself, containing 422 pages. The definitions, solutions, rules, and directions to teachers are clear, concise, exact, and comprehensive. It is said by Allibone that "Ivison & Phinney circulate 100,000 copies of Thomson's arithmetical works yearly, and pay Mr. Thomson the sum of $10,000 yearly." (Trübner's Bibliographical Guide to Amer. Literature, ed. 1859, LXXXVI, LXXXIX.)

In 1882 Messrs. Clark and Maynard, New York, brought out Thomson's Arithmetical series, in two books, entitled, First Lessons in Arithmetic, Oral and Written, and the Complete Graded Arithmetic, Oral and Written.

The first is divided into 6 sections, and each section into 20 lessons each. These sections cover the arithmetical work for pupils in the primary grades of city schools. The book is handsomely bound, admirably printed, and beautifully illustrated. It contains 144 pages.

In the preparation of the Complete Arithmetic the author kept two objects clearly in view: (1) To develop the intellectual faculties of the pupil; (2) to prepare him for the actual business of life. The explanations are simple, the steps in the reasoning short and logical, and the definitions and rules brief, clear, and comprehensive.

This is one of the best text-books ever issued on the subject. In point of workmanship it is equal to the other volume.

Taking the two volumes as a course, there appears to be too great a gap between them.

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[1] Thomson's Higher Arithmetic was translated into the Hawaiian language by C. J. Laiana, and published at Honolulu in 1870. 8vo, pp. 414+14 and a page of errata. I have a copy.—A. M.

The Commercial Arithmetic was issued in 1884. It is what the title indicates. A large amount of valuable business and commercial information is presented in a concise manner and it is easily understood. Short methods of solving problems are employed; a great variety of business forms are introduced and explained; the metric system is given great prominence throughout the volume.

The work is practical, direct, and comprehensive. Excellent judgment is shown in the selection of matter as well as in the exclusion of that which is not deemed absolutely essential. Perhaps no other arithmetic of 331 pages ever contained more useful and practical, business, everyday information.

In 1867 Messrs. Clark & Maynard purchased from Messrs. Ivison, Phinney & Co., Thomson's arithmetics, and in 1872 they published the "New Graded Series," and the "Two Book Series" in 1882.

James Bates Thomson was born May 21, 1803, at Springfield, Vt., and died June 22, 1883, in New York. He spent his early life at work on his father's farm, attending the district school during the winter months. After spending a few weeks at an academy, he began teaching a country school the winter after he was 16 years old. For several years he worked in the summer, taught school during the winter, or attended an academy. Owing to a severe affection of the eyes he gave up study for four years, but he was able to teach some in Boston and Brighton. At the age of 27 he entered Yale, and graduated in 1834. In the following autumn he took charge of an academy at Nantucket, Mass., where he remained till 1842, when he, on account of ill health, resigned, and located in Auburn, N. Y. At the request of President Day, of Yale College, he abridged Day's Treatise on Algebra so as to adapt it to the schools and academies of the country. He now took an active interest in conducting teachers' institutes in the State of New York. In 1846 he removed to New York City, when he occupied his time in mathematical and scientific pursuits, publishing in the meantime a series of mathematical text-books in ten volumes, including arithmetics, algebra, and geometry.

Later he prepared a second series, a part of which were published prior to his death.

His spare time was divided between mathematics and natural history, which he pursued with great enthusiasm. The degree of LL. D. was conferred upon him by Hamilton College, 1853.

1845. HENRY JACKSON.

Arithmetical Foundation: Comprising Mental and Written Exercises in the Four Simple Rules, prepared for the Primary Schools of Portland, at the request of the School Committee. By Henry Jackson, Principal of the Grammar School for Boys, No. 1. Tenth Thousand. Published by Francis Blake: Portland. 1858.

18mo, pp. 72. Copyright, 1845.—A. M.

1845. FRANCIS H. SMITH AND R. T. W. DUKE.

Smith and Duke's American Statistical Arithmetic; designed for Academies and Schools. By Francis H. Smith, A. M., and R. T. W. Duke, Assistant Professor of Mathematics in Virginia Military Institute. Third Edition. Baltimore: Kelley & Piet, 174 Baltimore Street. Woodhouse & Parham, Richmond, Va. Charles Desilver, Philadelphia. 1867.

18mo, pp. 282. Not copyrighted. Preface dated 1845.—A. M.

Francis Henney Smith was born in Norfolk, Va., October 18, 1812. He was graduated at the United States Military Academy in 1833, and was assistant professor there in 1834, but resigned in 1836; was professor of mathematics at Hampden-Sidney College in 1837-1839. On the organization of the Virginia Military Institute, in 1839, he was chosen its superintendent and professor of mathematics and moral and political philosophy. William and Mary College gave him the degree of LL. D. in 1878. Besides his arithmetics in connection with Robert M. T. Duke, he has published a series of algebras and translated Biot's Analytical Geometry.—A. M.

1845. ISAAC HARRINGTON.

A Key to Illustrations of Arithmetic. By Isaac Harrington, late Principal of Newark Academy. New-York: Published by Baker, Crane & Day, 158 & 374 Pearl Street. 1845.

Small 18mo, pp. 157.—A. M.

1846. ARITHMETICAL PRIMER.

D. C. Underhill is the author of the Arithmetical Primer, published in 1846 by Collins & Bro., New York. Pp. 36.

The author had a turn for rhyming, which he employs now and then to enliven the pages of the manual.

1846. J. S. RUSSELL.

The Rational Arithmetic, in which the Science is fully developed, the Art clearly explained, and both combined in numerous illustrations; adapted to Learners of Every Capacity. The whole enforced by a great variety of Interesting and Practical Problems. To which is appended a Key, containing The Answers to the Problems. By J. S. Russell, Teacher of Mathematics in the Lowell High School. Lowell: Published by Thomas Billings. Boston: B. B. Mussey. 1846.

12mo, pp. 336.—A. M.

1846. H. A. ORAM.

Examples in Arithmetic Systematically Arranged, in Four Parts, for the Use of Schools. By the Rev. H. A. Oram, B. A., St. John's College, Cambridge, England. Adapted to the Currency of the United States, with the addition of an article upon Federal Money, &c. By S. Edwards, and J. Parton, Principals of an English and Classical School, Philadelphia. Part I.—Integers. Pupil's Copy. First American from the Third London Edition. Philadelphia: Henry Longstreth, No. 347 Market Street. 1846.

12mo, pp. 144.—A. M.

1846. ISAAC A. CLARK.

The Prussian Calculator: by which all Business Calculations are Performed by One Rule. With an Appendix. By I. A. Clark, Professor and Teacher of Mathematics, and Author of the Prussian Series of School Arithmetics, Revolving Calculator, Key, &c. Fifth Edition, enlarged and improved. Rochester, N. Y.: Power Press of E. Shepard, 20½ State Street. 1846.

16mo, pp. 192. "The universal rule is increase and decrease." "The author has confined himself to this principle."—A. M.

1846. FRANCIS H. SMITH.

An Introduction to Smith and Duke's American Statistical Arithmetic. By Francis H. Smith, A. M., Superintendent and Professor of Mathematics in the Virginia Military Institute, Late Professor of Mathematics in Hampden-Sidney College, and formerly Assistant Professor in the U. S. Military Academy at West Point. Baltimore: Kelly & Piet, 174 Baltimore Street. Woodhouse & Parham, Richmond, Va. Charles Desilver, Philadelphia. 1867.

18mo, pp. 93.—A. M.

1846. M. K. HARD.

A New System of Practical Arithmetic: Designed for Farmers, Mechanics and Business Men, having one General Process of Solution for All Business Sums. By M. K. Hard. Wooster: Printed by Carney & Sheridan. 1846.

18mo, pp. 88.—A. M.

1847. JACOB AND CHARLES E. ABBOTT'S ARITHMETICS.

The Abbott brothers prepared the Mount Vernon Arithmetic in two parts. Part I.—Elementary, including the fundamental rules, which are unfolded in a very clear and gradual manner; illustrated by a large collection of examples. Part II treats particularly of vulgar and common fractions. They were published by Robert B. Collins, New York, 1847.

All the exercises are well adapted to the learner of average ability and require but little aid from the teacher in the way of explanation or suggestion. A novel feature of these books consists in a series of exercises for teaching the art of adding up a column of figures with rapidity and correctness.

Notwithstanding the reputation of the authors, the books had a very limited circulation.

1847. JAMES ROBINSON'S ARITHMETIC.

Robinson's American Arithmetic, in which the principles of numbers are explained and illustrated by a great variety of practical questions. By James Robinson, principal of the mathematical department of the Bowdoin School, Boston. Published by John P. Jewett & Co., Boston, 1847.

A medium-sized book of nearly 300 pages, containing about all the rules in arithmetic. It embraces the principles of life and health insurance; also geometrical definitions, illustrated by diagrams; mensuration of surfaces and solids; strength of materials; mechanical powers; specific gravity of bodies; a table of all the gold and silver coins in circulation, showing their real value in dollars and cents; forms of bills of exchange, drafts, promissory notes, orders, and receipts.

The article on specific gravities was copied from Ingram's Mathematics and the articles on the mechanical powers and strength of materials were selected partly from the Library of Use ful Knowledge and the Mechanic's Calculator.

1847. J. COGSWELL.

Intellectual Arithmetic, in Three Parts. Being a Plain, Practical System, adapted to the use of the Merchant, Mechanic, and Farmer, on an Improved Plan. By J. Cogswell. Montrose, Pa. Fuller & Hempstead, Printers. 1847.

Small 18mo, pp. 55.—A. M.

1847. CALISTA CUMINGS.

Rules of Arithmetic in Verse. Designed for Children in any place, but of Special Importance in Schools, where they should be recited in concert, together with the tables contained in this work. By Calista Cumings. Akron, O.: Dewey & Elkins, Printers. 1847.

Small 18mo, pp. 16.—A. M.

1848. THE AMERICAN EQUATER.

Rev. Conley Plotts is the author of the arithmetic bearing the above title. He uses equations as a substitute for proportion. In this book the author simply uses the equation as the medium through which relations must be expressed. This is a book of analyses and no rules. It is a sort of equational gymnastics, and is well worth the time anyone may give to it. William Ryan, Philadelphia, published the work in 1848. 12mo, pp. 264.

1848. CROZET'S ARITHMETIC.

I succeeded in getting a second-hand copy of this book in Richmond, Va. The title is: "An Arithmetic for Colleges and Schools. Improved Edition. By Claudius Crozet. Richmond, Va.: Published by A. Morris, Philadelphia: E. H. Butler & Co. 1858."

On the next page is "Entered according to the act of Congress, in the year 1848, by Claudius Crozet."

The preface contains the author's views on teaching arithmetic. He makes a clear distinction between the practical application of the rules of arithmetic and the science of reasoning upon which it depends. The child should not begin arithmetic—that is, the science—too early, but at 12 or 15 he can then learn it in a few months. The unbroken thread of reasoning will enable him to perform his solutions neatly and in the easiest way. "My object," the author says, "has been to secure the knowledge of this science in a short, and, above all, in a permanent way, and to make the transition from it to algebra simple and natural."

This book is remarkable for its lucid statements of principles. In the arrangement of subjects decimal fractions follow long division. The book is a 12 mo, 314 pages. Reading it through carefully, like Oliver Twist, I say, "More." Crozet is the clearest writer on this subject I ever read.

Claudius Crozet was a native of France. He was educated at the Polytechnic School in Paris and became an officer in the artillery under Napoleon. In 1816 he came to the United States, and on the 1st of October of that year was appointed assistant professor of engineering at West Point, the United States Military Academy, and on the 6th of March, 1817, professor. He resigned this position in 1823 and devoted the remainder of his life to engineering and teaching.

He was president of Jefferson College, Louisiana, and also State engineer for a time of Louisiana, and later of Virginia. In the construction of the Baltimore and Ohio Railroad he was the chief engineer. He was principal of the Richmond Academy, Virginia, for many years. His death occurred in 1863.

1848. FREDERICK A. ADAMS'S ARITHMETIC.

This arithmetic is a common and high school arithmetic. It is a 12mo volume published by Thomas, Cowperthwait & Co., Philadelphia, in 1848.[1] It is a revised and improved edition, divided into two parts. Part first, Advanced Lessons in Mental Arithmetic, and Part second, Rules and Examples for Practice in Written Arithmetic.

Part I contains 146 pages and Part II 152 pages. It is a work of no great merit, but printed in good type. The first edition must have been published in 1846. I have not found anything concerning the author's life.

1848. AN AMERICAN PROFESSOR.

Something New in the Science of Numbers. Containing the Art of Multiplying, Dividing, and Casting Interest, with One Fourth of the Figures commonly used, and in One Tenth of the Time generally occupied. By an American Professor. New York: 1848.

18mo, pp. 24. Copyrighted by John Chester—probably the author.—A. M.

1848. AUSTIN BALDWIN.

A Table-Book and Primary Arithmetic, compiled and arranged for the Introductory Department of the New York Grammar Schools. By Austin Baldwin. New York: George R. Lockwood, (late Roe Lockwood & Son,) 411 Broadway.

Small 18mo, pp. 72. Copyright, 1848.—A. M.

1848. DAVID PRICE.

A Complete Table-Book and Elementary Arithmetic. In Four Parts. Prepared by a Practical Teacher of Seventeen Years' Experience. Revised and Improved by David Price, Author of the English Speller. Adapted to every Method of Instruction. New York: Published by Clark, Austin & Smith, 205 Broadway. 1848.

Small 18mo, pp. 120. It appears from a recommendation on the verso of the title-page that the work was originally composed by Richard Roe.—A. M.

1849. DANA P. COLBURN.

Dana Pond Colburn, the first principal of the State Normal School of Rhode Island, was born in West Dedham, Mass., September 29, 1823. December 15, 1859, in Providence, R. I., he was thrown from a carriage, dragged several rods over the frozen ground, and was disentangled frightfully mangled and lifeless.

Mr. Colburn is a member of the numerous class of mathematicians who have been self-made men. From a toiling farmer's boy, by energy, perseverance, and skill he rose rapidly in the profession to which he devoted his life.

Dana P. Colburn's Arithmetics. Interest, Discount, Equations of Payments.—This is a 12mo of 90 pages, published in 1853, by Messrs. Benjamin B. Mussey & Co., Boston. It is a collection of problems on percentage. Answers are not given to any of the exercises, but to the more difficult ones suggestive hints are inserted.

Arithmetic and its Applications.—This is designed as a text-book for common and high schools and academies. It bears strong evidence of careful and systematic preparation in the arrangement and presentation of the subjects. It is a very suggestive book to pupil and teacher. Answers to problems are omitted. In point of mechanical execution, it is an excellent specimen of the publisher's art. The volume is a 12mo of 336 pages, published in 1855 by Messrs. Cowperthwaite & Co., Philadelphia.

[1] I have a copy dated 1847, containing 224 pages. Sixth thousand. Lowell: Published by Daniel Bixby.—A. M.

Common School Arithmetic.—This title indicates the contents of the book. It contains the leading principles of the science and illustrates their applications. The subject-matter is logically arranged, and principles are clearly illustrated, or rigidly demonstrated that the pupil may have a firm grasp on the subject. Throughout this, as well as in the author's other volumes, he has endeavored to develop logical habits of mind and correct methods of study.

The answers are not printed in this book. 12mo, 276 pages, published in 1858, by Messrs. Cowperthwaite & Co., Philadelphia.

Intellectual Arithmetic.—This was published by the same house in 1859. It is a 12mo of 144 pages. The same plan runs through this book that is found in the previous arithmetics. Each new step is an easy advance on a logical deduction from what precedes, and the connection is never broken. Here the author seeks to cultivate the intellectual powers and to form mathematical habits of reasoning. The problems are selected and arranged with reference to these two educational principles.

The Child's Book of Arithmetic.—This little volume of 72 pages was published in 1859 to complete the series. It is after the plan of the "First Steps in Numbers," published by George A. Walton and Dana P. Colburn in 1849. It could be used by the teacher as a handbook for drilling pupils during the first and second years of their school life, if properly supplemented.

1849. JOHN F. STODDARD, A. M.

This eminent teacher, and author of a series of mathematical text-books, was born in Greenfield, Ulster County, N. Y., July 20, 1825, and died at Kearney, N. J., August 6, 1873, aged 48 years. His early life was spent on a farm with limited opportunities for obtaining even a common-school education. The desire to become a good scholar stimulated him to great effort, and he attended an academy for a short time; but his means being limited, he began teaching at the age of 18. Later he entered the State Normal School at Albany, and graduated in 1847 and entered upon his life work with energy and enthusiasm. A close student of mathematics and possessing great clearness in methods of presentation, he at once aroused the deepest interest in the minds of those who studied under him. When lecturing before his classes he set forth with great earnestness the high and exalted character of the teacher's work.

The popularity of his text-books is attested by the fact that up to 1869, 1,500,000 copies had been issued, and the annual sales exceeded 200,000.

The following is a list of the works by Professor Stoddard: (1) Juvenile Mental Arithmetic, 1850; (2) American Intellectual Arithmetic. 1849; (3) Practical Arithmetic, 1852; (4) Keys to Nos. 2 and 3, 1856. With Prof. W. D. Henkle, of Ohio, S. W. Normal School: (5) Elementary Algebra, 1859; (6) Key to No. 5, 1859; (7) University Algebra, 1857; (8) Key to No. 7, 1861. Also, he published Ready Reckoner, 1851; Philosophical Arithmetic, 1853; School Arithmetic in 1869.

These arithmetics were published by Messrs. Sheldon & Co., New York, by whom they are still issued in their present revised forms, and under the following titles: (1) Pictorial Primary Arithmetic; (2) Juvenile Mental Arithmetic; (3) American Mental Arithmetic; (4) Methods and Key; (5) Rudiments of Arithmetic; (6) New Practical; (7) Key; (8) Complete Arithmetic; (9) Key; (10) Old Practical Arithmetic; (11) Key; (12) School Arithmetic.

In the Juvenile Mental Arithmetic of 1850, the author says: "Youth is certainly the time to lay the foundation for a thorough education. The habits of reasoning then acquired will exert their influence, either favorably or unfavorably, to the future advancement of the individual."

He also recommends that the lesson should be assigned previous to recitation; that the use of the book by the pupil should be strictly prohibited; that pupils should be called upon promiscuously; that no question should be read more than once; that the pupils should take an erect position, and that their language should be accurate in construction and articulation.

The arithmetic is a little thin volume of 71 pages, and is an introduction to the American Intellectual Arithmetic.

Again, in the American Intellectual Arithmetic, the author says: "The rule which I have observed in preparing this work is 'tell but one thing at a time and that in its proper place.'"

The New Intellectual Arithmetic, published 17 years later, is not materially different from the first edition. This book is one of the very best mental arithmetics published. The first edition contains 164 pages, and the edition of 1866, 176 pages.

The New Practical Arithmetic was revised in 1868. It is a book of great merit. The author in this volume as well as in all the others which he prepared, wrote to make good arithmeticians.

His Intellectual and New Practical arithmetics constitute a choice course for common schools. These books make independent thinkers who are sure of their positions.

Combining Rudiments with the Intellectual and New Practical, they form an exceptionally strong course for graded schools.

Analyzing the strong points in this series of arithmetics, I think it may be summed up thus: *Professor Stoddard had something to say, and he knew how to say it.*

1849. VANDERBILT'S ARITHMETIC.

Vanderbilt's Arithmetic was revised by David Price in 1849, and published by Houghton & Savage, New York. Pp. 252.

1849. KERNEY'S ARITHMETIC.

The Columbian Arithmetic, by M. J. Kerney, was published in Baltimore in 1849, and passed through several editions. The twenty-eighth revised edition is a well-printed book of 241 pages.

Martin Joseph Kerney was born in Lewiston, Frederick County, Md., August, 1819; died in Baltimore, Md., March 16, 1861. He was graduated at Mount St. Mary College, Emmittsburg, Md., in 1835. He established and conducted a successful academy in Baltimore and devoted his spare time to the composition of text-books which came into general use in Roman Catholic schools throughout the United States. He published numerous text-books besides the Columbian Arithmetic.—A. M.

1849. SAFFELL'S ARITHMETIC.

W. T. R. Saffell published a small arithmetic at Winchester, Va., 1849. He adapted the work to the easy comprehension of small children, forming a volume of 192 pages.

1849. GOODWIN MITCHELL.

The Teacher's Aid, containing the Solution of a variety of the most difficult Questions, which are inserted in a number of the various Arithmetics now in common use. Also, containing a solution of all the Questions not illustrated in the Promiscuous Examples contained in the Arithmetics of Ostrander, Parke, Smith, Smiley, Adams, Daboll, Ray and Stockton; to which are added an Interest Table, and a variety of useful rules, designed chiefly to aid the teacher in his laborious vocation, and others who are not favored with the assistance of a tutor. By Goodwin Mitchell. Columbus, O.: Thrall & Reed, Printers. 1849.

12mo, pp. 211.—A. M.

1849. AUGUSTUS R. M'CORD.

Willetts' Mental and Practical Arithmetic: Revised, and the Principles Explained. By Augustus R. M'Cord, late County Superintendent of Schools in Dutchess County. Fourth Edition. Poughkeepsie, N. Y.: Published by William Wilson. New York: J. S. Redfield, Clinton Hall. 1854.

16mo. pp. 324. Copyright, 1849.—A. M.

1849. NELSON M. HOLBROOK.

The Child's First Book in Arithmetic. By Nelson M. Holbrook, a Practical Teacher. Portland. Published by Sanborn & Carter. 1854.

18mo, pp. 112. Copyright, 1849.—A. M.

1849. THOMAS RAINEY.

Rainey's Improved Abacus: An Explanatory Treatise on the Theory and Practice of Arithmetic and Mensuration: in which the General Principles involved in Practical Calculations are Thoroughly Elucidated and Illustrated by Numerous Analytic and Abbreviated Examples. By Thomas Rainey. Energy is the Price of Success. Cincinnati: Printed by J. A. & U. P. James. 1849.

16mo, pp. 96. Another copy, pp. 316, published by E. D. Truman, 111 Main street. 1849.—A. M.

1849. RUFUS PUTNAM.

The American Common-School Arithmetic; in which the Principles of the Science are Fully Explained, and Applied to the Solution of a Great Variety of Practical Examples. Designed for the Use of Common Schools and Academies. By Rufus Putnam, Principal of the Bowditch (English High) School, Salem, Mass. Boston: Tappan, Whittemore & Mason. 1849.

12mo, pp. 234.—A. M.

1849. CHARLES H. MATTOON.

Analytic Series, No. 2. Common Arithmetic, upon the Analytical Method of Instruction. Also: the Principles of Cancelation, and other Modern Improvements. Illustrated and Applied. The whole made simple and easy by numerous practical examples. Designed for the Use of Schools. By Charles H. Mattoon. "There's nothing so hard, but search will find it out." Steam Press of S. Medary. 1850.

12mo, pp. 335.—A. M.

1850. ARITHMETICS BY HORACE MANN AND PLINY E. CHASE.

In 1850 was issued by Messrs. E. H. Butler & Co., Philadelphia, one of the most singular as well as one of the most interesting series of text-books that ever came from the press. Horace Mann, whose name is a household word in the educational world, and Pliny E. Chase, the scholar and mathematician, prepared a series of arithmetics containing four books, namely, Elements of Arithmetic, part first; Elements of Arithmetic, part second; Common School Arithmetic (Pliny E. Chase), and Arithmetic Practically Applied.

The fourth volume is the one that will be described, because it embodies to the fullest extent the ideas both authors entertained upon the subject. The book is a 12mo of 384 pages of excellent workmanship. Contents: (1) Symbols; (2) test questions; (3) fundamental rules; (4) measures, weights, and currencies; (5) the farm; (6) the garden; (7) the household; (8) artificers' work; (9) strength of materials; (10) specific gravity; (11) the road; (12) the engineer; (13) the laboratory; (14) general analysis; (15) the counting house; (16) statistics; (17) permutation and combination; (18) involution and evolution; (19) progression and series; (20) position; (21) approximation; (22) properties of numbers; (23) miscellaneous problems.

Without explaining each division in detail, the plan of the work is well expressed by Mr. Mann when he says: "It derives its examples from biography, geography, chronology, and history; from educational, financial, commercial, and civil statistics; from the laws of light and electricity, of sound and motion, of chemistry and astronomy, and others of the exact sciences. Trades, handicrafts, and whatever pertains to the useful arts, or so far as they are the subject of numerical statements, and their facts possess arithmetical relations, together with all the ascertained and determinate results of economical or political knowledge and of scientific discoveries, are laid under contribution and are made to supply appropriate elements for the questions on which the youthful learner may exercise his arithmetical faculties."

The authors proposed to treat the science of numbers in the most rigorous method, and at the same time the learner should be acquiring useful and valuable information.

The information composing the problems is drawn from at least a hundred sources. It is highly instructive as well as eminently practical. A good title to the book would be "Useful and Scientific Information Treated Arithmetically." A revised edition ought to be in the hands of every teacher. It has never been properly appreciated and few copies are in existence; even the publishers do not have a copy.

Pliny Earle Chase, LL. D., was born at Worcester, Mass., August 18, 1820, and graduated from Harvard University in 1839. For many years he was a teacher in Philadelphia, and later he was engaged in mercantile pursuits. In 1871 he was elected professor of philosophy and logic in Haverford College, near Philadelphia, and after, acting president of the institution. Much of his time was devoted to scientific investigations, and he was a member of several learned societies of this country and also of Europe. His writings are mostly contributions to scientific publications. He died at Haverford, Pa., December 17, 1886. Professor Chase published Elements of Meteorology (1884).

1850. LEACH AND SWAN'S ARITHMETICS.

This series is composed of two books, published in 1850 by Messrs. Thomas, Cowperthwaite & Co., Philadelphia.

The first book is a primary arithmetic of 72 pages. The authors, Daniel Leach and Samuel D. Swan, selected easy exercises for the learners, hardly difficult enough perhaps.

The Theoretical and Practical Arithmetic is a good book, and it appears strange that it never came into more general use. A volume of 275 pages, and plainly printed. Both are 12mos.

1850. DAVID PRICE'S ARITHMETIC.

The North American Practical Arithmetic, by David Price, was published in New York in 1850. A good practical treatise of 252 pages, with copious exercises.

1850. GEORGE WILLSON.

Practical System of Arithmetic, Enlarged and Improved; containing a New System of Proportion, and a New Method of Solving Questions in Proportion without Statement; together with Explanations of Theoretical Principles, and of the Method of Cancellation. By George Willson. Fourteenth Edition. New York: George F. Cooledge & Brother. Canandaigua: George W. Bemis. 1850.

12mo, pp. 264.—A. M.

1850. JAMES L. ENOS.

The Normal Series. An Intellectual and Practical Arithmetic, or, First Lessons in Arithmetical Analysis, Intended as an Introduction to Dodd's Arithmetic. By James L. Enos. New-York: Pratt, Woodford & Co., No. 4 Cortland Street. 1850.

Small 18mo, pp. 114.—A. M.

1850. H. S. SCHELL.

The Young Pupil's Mental and Written Arithmetic, designed as an Introduction to the More Advanced Works in General Use. Containing an Extensive Collection of Mental Questions, together with a Large Number of Operations to be performed on the Slate. New York: Published by Pratt, Woodford & Co. 1850.

18mo, pp. 72.—A. M.

1850. JOHN MARQUART.

United States Key for Mathematical Self Instruction on the Mechanical Sliding Rule, commonly called the Carpenter's Rule. By John Marquart, of Reading, Pennsylvania. Philadelphia: C. Sherman, Printer. 1850.

63 pages. A small book in which the operations of arithmetic are performed by means of the "Carpenter's sliding rule." A description of the instrument is given on pages 9 and 10. The author says in his preface, "With the carpenter's sliding rule all questions may be solved that may be wanted in the common course of business, by merchants, machinists, mechanics, farmers, or any other tradesmen."—A. M.

1850. JOHN W. BEDFORD.

The American Arithmetical Investigator; in which the Rudiments of Numerical Calculations are Clearly Exhibited, and Rules Educed: Also several Arithmetical and Geometrical Demonstrations Peculiar to this Work. The whole made Familiar by the Most Practical Examples and a Critical Review of the Several Principles. Designed for the Use of Schools; and Persons wishing to become acquainted with the Science of Arithmetic. By John W. Bedford. Syracuse: Published by Stoddard & Babcock. 1850.

18mo, pp. 239.—A. M.

1851. TRACY'S ARITHMETICS.

Calvin Tracy, A. M., was principal of the Classical Institute, New York, and he wrote the following works on arithmetic: (1) Child's Primary Arithmetic, 12mo; (2) Elementary Arithmetic, 12mo; (3) Scientific and Practical Arithmetic, 12mo; (4) Commercial and Mechanical Arithmetic, 12mo; (5) Key to Commercial and Mechanical Arithmetic, 12mo.

I have succeeded in getting the Commercial and Mechanical Arithmetic and Key. This arithmetic is designed for high-school classes and for business men generally. It presupposes a good

practical and theoretical knowledge of the subject. After the necessary preliminary definitions the author launches at once into the subject of commercial computation under the various forms of percentage and exchange.

After these follow involution and evolution, mensuration, strength of materials, gauging, specific gravity, measuring land, leveling, and miscellaneous exercises. Each subject is ably treated. The book is a well-printed volume of 384 pages. It was published by Messrs. Lippincott, Grambo & Co., Philadelphia, 1851.

The key contains 130 pages.

1851. EDWIN ARNOLD.

Arithmetical Questions on a New Plan: intended to answer the double purpose of Arithmetical Instruction and Miscellaneous Information. Designed for the use of Public and Private Schools. By Edwin Arnold, LL. D., Principal of the Harford Co. Academy, Bel-Air, Maryland. Revised and enlarged. New York: Published by Daniel Burgess & Co., 60 John Street. 1853.

Pp. 163.—A. M.

1851. CORNELL MOREY.

Morey's Practical Arithmetic, in which The Explanations of the Principles are given on a New Plan. By Cornell Morey. Teacher of Mathematics in Macedon Academy. Stereotype Edition. Rochester: Published by Erastus Darrow & Brother, corner of Main and St. Paul Streets. 1859.

12mo, pp. 192.—A. M.

1851. WILLIAM WATSON.

Watson's Mental Arithmetic, upon the Induction Plan. Designed for Schools and Academies. By William Watson. Rochester: Wanzer, Beardsley & Co. Auburn: Alden, Beardsley & Co.

18mo, pp. 160.—A. M.

1851. JAMES ROBINSON.

The American Primary School Arithmetic: designed for the Use of Pupils in Primary and Intermediate Schools. By James Robinson, Author of the American Arithmetic. Boston: Published by John P. Jewett & Co. 1851.

18mo, pp. 96.—A. M.

1851. JOSIAH F. BUMSTEAD.

My First Arithmetic in the Primary School. "Arithmetic, when properly taught, is not the dullest of all dull things." Boston: Published by T. R. Marvin. 1851.

18mo, pp. 108.—A. M.

1852. JAMES B. DODD.

It is somewhat remarkable how many mathematicians have been self-made men. President James B. Dodd, the author of a series of text-books, is one of that number. He was born in Virginia in 1807, and at the age of 34 was chosen, on account of his mathematical skill, professor of mathematics, natural philosophy, and astronomy in Centenary College, Mississippi, and five years later was elected to a similar position in Transylvania University, Kentucky.

From 1849-1855 he was president pro tem. of that institution. It was during this period that he published his arithmetics, algebras, geometry, and trigonometry. President Dodd died at Greensburg, Ky., March 27, 1872.

The Elementary and Practical Arithmetic is a work of 291 pages, and was published in 1852 by Pratt, Oakley & Co., New York.

The author attempts various improvements in arrangement and nomenclature and in the means of thorough discipline in the principles and the application of the science.

The Higher Arithmetic contains the same matter as the Elementary for 261 pages. The last 30 pages of the Elementary contain geometrical definitions and rules for measuring geometrical figures, while the last 75 pages of the Higher are devoted to progressions, compound interest, annuities, permutation, etc. These were good text-books.

1852. A COMMON SCHOOL ARITHMETIC.

A committee of practical teachers, A. Doxsee, H. M. Jones, and I. C. Jones, and approved by the Common School Association of the county of Suffolk, State of New York, prepared this arithmetic for the common schools in the United States of America. It was published by George Savage, No. 22 John street, New York, 1852.

It challenges attention by its peculiar features, namely (1) its arrangement; (2) the brevity of its definitions and the conciseness of its explanations; (3) the selection of its examples; (4) the selection of its matter; (5) the manner in which it is intended to be used, theoretically, practically, and analytically.

These committeemen divided the book into two distinct parts. The first is theoretical arithmetic in the abstract. The opening section fairly bristles with abstract definitions and observations, and this general abstract method of presentation is extended to the one hundred and twenty-seventh page. All definitions, principles, demonstrations, tables, etc., are contained in the first division. The second, 154 pages, is composed of problems, amounting to nearly 2,800, classified under proper heads. No answers or explanations are included in this part of the book, except an occasional reference. A glossary of mathematical terms in which their derivations from the Latin and Greek languages are given concludes this treatise. If the committee had mixed their work properly it would have been a much better book for the schoolroom.

1852. EDWIN ARNOLD.

A. N. Girault. Éléments d'Arithmétique, sur un plan nouveau: où l'on s'est proposé, non seulement d'enseigner l'arithmétique à l'élève, mais aussi de lui graver dans la mémoire un grand nombre de faits importants.

Par E. Arnold, LL. D. Traduit de l'Anglais, a l'usage des étudiants de la langue Française, par A. N. Girault, Professeur Français à l'École Navale des États-Unis. New York: Published by Cady and Burgess, 60 John Street. 1852.

Pp. 171. A French translation of Arnold's Arithmetical Questions on a New Plan.—A. M.

1852. M. C. TRACY AND D. H. CRUTTENDEN.

Tracy and Cruttenden's Mathematical Series, No. II. With Answers. A Mental and Practical Arithmetic; containing every combination of every Figure so arranged as to Explain in Figures the Essential Operations, the Signs, and the Terms, used in Arithmetic. By M. C. Tracy and D. H. Cruttenden, A. M. New York: Tracy and Cruttenden, 415 Broadway. 1852.

18mo, pp. 128.—A. M.

1852. CLEMENT A. WILSON.

The Teacher's Assistant, or a System of Practical Arithmetic; wherein the Several Rules of that Useful Science are illustrated by a variety of Examples. By Stephen Pike. To which is appended a Short System of Book-keeping. Revised, Corrected, Enlarged, and made more conformable to the Modern Usages of the United States of America. By Clement A. Wilson. Author of "Wilson's Book-keeping for Beginners" and Principal of the Philadelphia Mercantile Institute. Philadelphia: Published by Clark and Hesser, No. 18 South Fourth Street. 1853.

18mo, pp. 273. Copyright 1852.—A. M.

1852. ORLANDO BLANCHARD.

Theoretical and Practical Arithmetic: in which the Principles of the Science are Demonstrated Analytically, and Applied to a great variety of Examples. With a Supplement, containing Demonstrations of the Higher Principles and Properties of Numbers; Mensuration; Philosophical and Chronological Problems. By Orlando Blanchard, A. M., formerly Professor of Mathematics in the Oneida Conference Seminary, and in Fairfield Academy. Second Edition. Cazenovia: Crandall and Mosely.

12mo, pp. 348. Contains on pp. 239–40 a simple proof of the celebrated Pythagorean proposition. I have another copy, Fifteenth Thousand, 360 + pp.—A. M.

1853. FARRAR'S ARITHMETICAL PROBLEMS.

This is a book of problems prepared by W. H. Farrar, A. M., principal of the Woonsocket High School, Rhode Island, and published by Messrs. Brewer & Tileston, Boston, 1853. There are 1,000 problems in the book. They were so selected that they touch all subjects falling under ordinary arithmetical work. It is a well-bound volume of 154 pages.

1853. EDWARD HINKLEY.

New Methods for Multiplication and Division, with Ease, Accuracy and Despatch, by means of a Table of Nine Hundred and Ninety-Nine Multiples of the Nine Digits; to which are annexed Other Useful Tables. By Edward Hinkley, A. M. Baltimore: Printed for the Author. 1853.

8vo, pp. 70.—A. M.

1853. EDWARD HINKLEY.

Tables of the Prime Numbers, and Prime Factors of the Composite Numbers, from 1 to 100,000; with the Methods of their Construction, and Examples of their Use. By Edward Hinkley, A. M. Baltimore: Printed for the Author. 1853.

8vo, pp. 216.—A. M.

1853. DANA P. COLBURN.

The Pestalozzian Series of School Arithmetics.—Part II. The Decimal System of Numbers; Illustrated and Practically Applied in a Series of Systematic and Progressive Exercises. By Dana P. Colburn, Principal of the Mathematical Department of the New England Normal Institute, Lancaster, Mass.; Author of "Interest, Discount and Equation of Payments;" and Co-Author of "First Steps in Numbers." Boston: Benjamin B. Mussey & Co., 29 Cornhill. 1853.

12mo, pp. 210.—A. M.

1853. NATHANIEL DUNN.

Prog ressive Examples in the Simple Rules of Arithmetic. Part I. By Nathanie Dunn, A. M., Principal of the Irving Grammar School, New York. New York: Clark, Austin & Smith, 3 Park Row and 3 Ann-Street. 1853.

Small 18mo, pp. 58.—A. M.

1853. A. P. STONE.

A Key to Chase's Common School Arithmetic, with Explanations and Remarks upon the Peculiar Features of the Work, and Operations of the More Difficult Examples. By A. P. Stone. Worcester: Published by A. Hutchinson. 1853.

12mo, pp. 96.—A. M.

1854. MARVIN'S INTELLECTUAL ARITHMETIC.

James Marvin, A. B., was professor of mathematics in Alfred Academy when this work was published in 1854 by Messrs. D. Appleton & Co., New York. It was intended for American youth. The work is well arranged, somewhat after the plan of Colburn's. The author was a practical teacher and his object in preparing the work was to make rapid and accurate computers.

1854. THOMAS H. PALMER'S ARITHMETIC.

Arithmetic, Written and Oral, Practically Applied by Means of Suggestive Questions, is the work of Thomas H. Palmer, published in 1854 by Crocker & Brewster, pp. 348.

It is printed in small type, and after a short perusal becomes intensely dazzling to the eyes. It is a book of questions, with considerable repetition throughout.

It is divided into two great parts, viz: Oral and written arithmetic, with a supplement of contracted multiplication and division of decimal fractions. Five chapters are included under both the heads of oral and written arithmetic.

Palmer was author of the prize essay on education entitled The Teacher's Manual, The Moral Instructor, etc.

1854. DOCHARTY'S ARITHMETIC.

The title of this book is: A Practical and Commercial Arithmetic: Containing Definitions of Terms, and Rules of Operations, with numerous examples. The whole forming a complete treatise for the use of schools and academies, by Gerardus Beekman Docharty, LL. D., professor of mathemathics in the New York Free Academy, and author of "The Institutes of Algebra." Harper & Brothers, 1854, 12mo, pp. 266.

In the preface the author makes these statements: "In order to make good arithmeticians, it is necessary that the following propositions be rigidly enforced by the instructors: (1) The principles must be well understood. (2) The definitions must be concise and explicit, and the rules thoroughly committed to memory. (3) Neat methods of working must be adopted, and a facility of expressing the principles, and the reasoning upon which the rules are established, be acquired by the pupil."

At the time of its publication it was one of the best arithmetics that had appeared in this country. Professor Docharty in his arithmetic, algebra, geometry and calculus has the happy faculty of expressing himself clearly and concisely.

1854. HORATIO N. ROBINSON, LL. D.

Horatio N. Robinson died January 19, 1867, aged 61 years. He was born at Elbridge, N. Y., and received during his childhood the merest rudiments of an education. At the age of 16 he made the astronomical calculations for an almanac, which attracted the attention of a wealthy gentleman, who sent him to Princeton to be educated; but at the age of 19 he was elected professor of mathematics in the Navy, which position he filled for ten years, visiting many parts of the globe, and performing his duties very acceptably. In 1835 he took charge of the academy at Canandaigua, N. Y., and afterwards at Genesee. Owing to impaired health he removed to Cincinnati in 1844, where he published his University Algebra. This work was so favorably received that he wrote other works, which were published by Jacob Ernst, Cincinnati. Next, he left Cincinnati in 1850, and went to Syracuse, N. Y., and in 1854 to Elbridge, where he resided till his death. The publication of his books was changed from Cincinnati to New York in 1858, and some of the ablest talent of the country was now employed in assisting him in the further preparation of his works.

During the last years of Professor Robinson's life he was a constant sufferer and confined to his room a greater portion of the time; yet he was constantly employed in developing some new thought in his favorite science, and when unable to use the pen he would dictate to another while suffering the most acute pain. He worked thus till his death.

Allibone gives the following works: (1) Arithmetic, Theoretical and Practical, 1864, 18mo; (2) Elementary Algebra, 1847, 12mo; (3) University Algebra, 1847, 12mo; (4) Natural Philosophy, 1848, 12mo; (5) Elementary Astronomy, 1849, 12mo; (6) University Astronomy, 1849, 8vo; (7) Geometry Containing Trigonometry and Conic Sections, 1850, 8vo; (8) Surveying and Navigation, 1852, 8vo; (9) Concise Mathematical Operations: A Practical Sequel to Mathematics and Astronomy, 1854, 8vo.

All the above, with the exception of Nos. 5 and 9 (published by Messrs. E. H. Pease & Co., Albany), were published by Jacob Ernst, at Cincinnati; but all the volumes composing Robinson's Series are now issued by Messrs. Ivison, Blakeman, Taylor & Co., New York. The complete series at this time includes 35 different books. Herewith are given the arithmetics, with date of copyright: (1) Progressive Primary, 1858, 12mo; 1863, 16mo; edited by D. W. Fish, A. M., 1866, 12mo; (2) Progressive Intellectual, 1858, 12mo; 1863, 16mo; (3) Progressive Practical, 1858, 12mo; 1863, 16mo; edited by D. W. Fish, 1865, 12mo; (4) Key to Progressive Practical, 1859, 12mo; 1863, 16 mo; (5) Progressive Higher, 1860, 12mo; 1863, 12mo; 1875, 12mo; (6) Key to Progressive Higher, 1860, 12mo; 1863, 12mo; (7) Progressive Table Book, 1862, 16mo; 1862, 12mo; edited by D. W. Fish, A. M.; (8) Rudiments

of Written Arithmetic, 1858, 16mo; 1863, 12mo; (9) First Lessons in Mental and Written Arithmetic, 1870, 12mo; edited by Samuel D. Barr; (10) Junior Class Arithmetic, 1874, 12mo; edited by D. W. Fish, A. M.; (11) Elements of Arithmetic, Oral and Written, 1877, 12mo; edited by D. W. Fish, A. M.; (12) New Table Book, 1880, 12mo; by D. W. Fish, A. M. Robinson's Shorter Course: (13) First Book, 1874, 12mo; D. W. Fish, A. M.; (14) Beginner's Book, 1886, 12mo; (15) Complete Arithmetic, 1874, 12mo; D. W. Fish, A. M.; (16) First Book (special edition), 1884, 12mo.

The Primary is a little book of 80 pages. Processes are represented first pictorially that the children may be taught to think in numbers through the relation of things. The exercises are simple and are designed to stimulate the reasoning powers in the right line rather than in severe efforts at grouping number relations.

The Progressive Table Book is a floral tribute of 72 pages to the Primary. While the matter is different, the plan is the same and is not on a higher plane.

The Intellectual Arithmetic is the best lower grade book of the series. It is an excellent drill book, and pupils who master it thoroughly understand mental arithmetic. The last edition contains 176 pages.

The Progressive Practical is an arithmetic of genuine merit. As a common school text-book, it is thorough, complete, and satisfactory. Every one of the 360 pages bears the impress of a master workman.

Progressive Higher Arithmetic deservedly takes its place with the advanced works of Brooks, Ray, and Greenleaf. In every respect it is a first-class book. It is one of the arithmetics that every teacher ought to have for constant reference. The Intellectual, Practical, and Higher furnish an excellent course for all who wish to study the subject thoroughly. The last edition has 456 pages.

The Rudiments hardly has a place in the series. It was prepared to furnish a small and simple book for pupils in graded schools. The last edition was entered for copyright in 1877. It is a neat volume of 200 pages.

Supplementary volumes: First Lessons, Junior Class Arithmetic, Elements of Arithmetic, and New Table Book are supplementary books designed to round out the series when and where the original books are not adapted to special localities. First Lessons in Mental and Written Arithmetic, pp. 180. Junior Class Arithmetic is one of the best intermediate arithmetics published for graded schools, pp. 318. Elements of Arithmetic is a compilation from other books and a few drill problems. It is a drill and review book for graded schools, pp. 208. New Table Book was prepared to fill a supposed want in city schools. With other books in the series covering the same ground it is not very easy to see an actual place for this book. Some of it is too hard for little children and too simple for larger ones. The tables and exercises fill 96 pages.

Shorter Course: The books in this course consist of Beginner's Book and the Complete Arithmetic. The Complete is bound also in two parts for those who prefer it. Also an alternative book for the Beginner's is presented in the First Book in Arithmetic. The Beginner's Book is an excellent manual of 223 pages, while the First Lessons is better adapted to smaller children, and the problems are more carefully graded. It contains 168 pages. The Complete is the practical arithmetic adapted to the present needs of graded schools. In some respects it is a better class-book than the old Practical. Robinson's Intellectual and the Complete furnish a good course for either graded or ungraded schools. The Practical, Intellectual, and Complete, and Higher are the important books of the series. The books composing the shorter course are superb specimens of the publisher's art. They are durable and beautiful. There are 514 pages in the Complete Arithmetic. There is a special edition of the First Book for the St. Louis public schools. It was published in 1884, pp. 80.

1854. DE WITT CLINTON BENJAMIN.

Theoretical and Practical Arithmetic: Being a Complete System, containing Mental Exercises, the Canceling Principle, a Short Method of Multiplying, and other Improvements, adapted to interest the Pupil and render him thoroughly acquainted with the Science. Also, Book-keeping and Business Items. "Labor conquers all things." Designed for Public Schools, Academies, and Private Learners. By Rev. D. Clinton Benjamin. Published by the Author. Sold by J. C. Riker, New York. 1854.

18mo, pp. 240.—A. M.

1854. W. W. NEWMAN.

A Primary Mental Arithmetic; or the Arabic Arithmetical Alphabet, and the Elementary Numerical Tables: designed to make Beginners in Arithmetic Rapid

and Accurate Operators in the Notation, Numeration, Addition, Subtraction, Multiplication and Division of Small, Simple Numbers, Compound Numbers and Common Fractions: containing, generally, in the same Lesson, on the same page, Concrete and Abstract Numbers, a Common Table Improved, an Outline Table, a Test Table, Slate Exercises, &c. By W. W. Newman, A. B. New York: D. Appleton and Company, 346 and 348 Broadway. 1855.

18mo. pp. 84.—A. M.

1854. WILLIAM H. REUCK.

Practical Examples in Arithmetic. By William H. Reuck, Principal of Ward School No. 7, and Professor of Mathematics in the Male Normal School of New York. New York: Published by A. S. Barnes & Co., 51 John Street. 1854.

12mo, pp. 276.—A. M.

1854. JOHN J. ANDERSON.

Exercises in the Fundamental Rules of Arithmetic, for Schools and Academies. By John J. Anderson, Principal of Ward School No. XXXI., city of New York. New York: Lewis H. Embree, Publisher, 134 Bowery. 1854.—A. M.

1855. HEATH'S ARITHMETIC.

A | Treatise on Arithmetic, | through which | the Entire Science can be More Expeditiously and Perfectly Learned, | without the Aid of a Teacher, | designed for the Use of Schools and Private Students. | By Noble Heath. | Philadelphia: | T. Ellwood Chapman, No. 1 S. Fifth St. | 1855. |

The claim is not made good throughout this volume.

1855. LAWRENCE'S ARITHMETIC.

A Practical and Theoretical Arithmetic by Charles D. Lawrence was published in Auburn and Rochester by Messrs. Alden & Beardsley, and in New York by J. C. Derby, 119 Nassau street, in 1855.[1]

This is a substantial volume of 317 pages and is filled with choice matter.

1855. JOSEPH C. KIMBALL.

Kimball's New Method of Teaching Arithmetic. By Jos. C. Kimball, Principal of Nashua High School. Manchester, N. H.: Printed by Abbott, Jenks & Co. 1855.

18mo, pp. 71.—A. M.

1855. WILLIAM H. REUCK.

Practical Examples in Simple and Denominate Numbers. By William H. Reuck, Author of Practical Examples in Arithmetic. New York: A. S. Barnes & Co., 51 & 55 John-Street. Cincinnati:—H. W. Derby. 1855.

12mo, pp. 74.—A. M.

1856. CHARLES STEWART'S ARITHMETIC.

The title of this work is: An Analytical Arithmetic for the use of Schools and Colleges: in which the principles of the science of numbers are demonstrated by Analysis and worked out by cancellation.

Two features are very pronounced in this treatise. The aim of the author is: "To present the science in such a manner that it may be comprehended and assimilated in a much shorter time than is usually devoted to that study; to lead to the investigation of arithmetic by the exercise of the power of analysis." The author dispenses with rules, and gives only a very few formal definitions, and very properly his book falls under the title it bears.

It is a book of classified problems, and the solutions that are given indicate the "cipherer" rather than the systematic, logical arithmetician. As a drill manual it would answer the purpose very well. Three editions have been issued, 1856, 1863, 1874.

[1] I have a copy published at Peoria, Ill., by S. H. & G. Burnett, in 1853.—A. M.

There is a sort of independence about the work that is refreshing. For instance: "Incompetent or indolent persons who have undertaken to teach will find some other arithmetic to suit them better than this." The third edition is a 12mo, 181 pages. Southwestern Book and Publishing Company, St. Louis.

1856. THE MARYLAND PRIMARY ARITHMETIC.

This book, by J. N. McJilton, A. M., was printed by James Young, Baltimore, 1856. It is a diminutive 18mo of 72 pages. Verily it is a primary arithmetic.

1856. ELIAS LOOMIS, LL. D.

Professor Loomis is the author of a complete series of mathematical text-books, published as follows: Plane and Spherical Trigonometry, 1848; Recent Progress in Astronomy, 1850 and 1856; Analytical Geometry, Calculus, Elements of Algebra, 1851; Elements of Geometry and Conic Sections, 1851 and 1871; Tables of Logarithms, 1855; Treatise on Arithmetic, 1856; Natural Philosophy, 1858; Practical Astronomy, 1855 and 1865; Elements of Arithmetic, 1863; Elements of Astronomy, 1869.

Besides the above, he is the author of a Treatise on Meteorology, published in 1838, and the Descendants of Joseph Loomis, which appeared in 1870.

The Treatise on Arithmetic is a 12mo of 332 pages. The object of this volume is to develop every principle in its natural order, to demonstrate every rule briefly and rigorously, and to accustom the pupil to think clearly and to express his ideas with precision. Every principle is illustrated by an extensive collection of examples, designed to impress the principles permanently upon the mind and to impart facility in their application.

The Elements of Arithmetic is for children who have had no previous knowledge of the subject. What is presented in this volume is intended to prepare the pupil for a more advanced treatise. Little effort is required for children to master this book. It is a 16mo of 166 pages.

Elias Loomis, the physicist, was born in Wellington, Conn., August 7, 1811; he resides in New Haven, Conn. He was fitted for Yale College by his father, graduated in 1830, and was tutor in that institution from 1833 to 1836. During this period he commenced making observations in astronomy, magnetism, and meteorology, which he still pursues with great diligence. In 1836-37 he went to France, attending there the lectures of Arago, Biot, Dulong, Poisson, Pouillet, and others. Upon his return to this country he became professor of natural philosophy in the Western Reserve College, Ohio. In 1844 he was elected to the chair of natural philosophy in the University of the City of New York, and to Yale College in 1860 as professor of natural philosophy and astronomy. He has published more than one hundred papers on scientific subjects, which have appeared both in this country and in Europe. Professor Loomis is a member of several learned societies. At present he is revising his papers and still further verifying his former researches in dynamic meteorology.

1857. ERNST'S ARITHMETIC.

Ernst's Arithmetic is a treatise on commercial calculations, and is one of those singular books in which "Commercial calculations on entirely new principles, abridged and reduced to their utmost simplicity, adapted to practical use," are set forth in the briefest possible manner.

The author, Henry Ernst, offers to the mercantile community a collection of simple rules for all business transactions, by which calculations will be materially shortened. He further holds that errors in solving problems are avoided in proportion as the number of figures used is diminished. It is a slashing book, in which problems are fearfully cut right and left. Short methods of multiplication, division, interest, discount, theory of accounts, exchange, the chain rule, etc., are presented and disposed of in bewildering rapidity. The book is an 8vo, 88 pages, published at the Picayune office, New Orleans, 1857.

1857. E. THEOD. PLATE.

First Book in Arithmetic for Elementary Schools, by the Illustrating Method with an Exposition of its Principles and Manner of Illustrating. By E. Theod. Plate. St. Louis, Mo., F. Saler, Publisher. 1857.

18mo, pp. 88.—A. M.

1857. D. H. CRUTTENDEN.

D. H. Cruttenden's Mathematical Series. No. III. Theoretical and Practical Systematic Arithmetic; or, Arithmetic arranged in its Natural Order. Being

adapted to assist the Teacher in training Pupils of all ages to habits of strict and careful Analysis. By D. H. Cruttenden, A. M. Improved Edition. New York: Kiggins & Kellogg. No date. Copyright 1857.

12mo, pp. 316.—A. M.

Daniel Henry Cruttenden was born in Galway, N. Y., February 27, 1816; died in Castleton, N. Y., June 21, 1874. He was graduated at Union in 1841, and became principal of the School of the Mechanics' Institute in New York City. Besides his arithmetics he published The Philosophy of Language (1870), and a rhetorical grammar, the second edition of which appeared in 1861.—A. M.

1857. JOHN H. FELTON.

The Decimal System: an Argument for American Consistency in the Extension of the Decimal Scale to Weights and Measures in harmony with the National Currency. By John H. Felton. New York: D. Appleton and Company, 346 & 348 Broadway. 1857.

12mo, pp. 189.—A. M.

1858. PETER ULIC BURKE.

The American Practical Arithmetic. With New Analytical Methods for the Solution of Arithmetical Problems. Designed for the Pupils of the Brothers of the Christian Schools. By Peter Ulic Burke, M. D. E. New York: D. J. Sadlier & Co., 164 William Street. Boston:—128 Federal Street. Montreal:—Cor. Notre Dame and Francis Xavier Streets. 1858.

18mo, pp. 378.—A. M.

1858. SIMON KERL.

A System of Arithmetic on an Original Plan, designed as an Improvement on the Systems in Common Use. By Simon Kerl, A. M., Washington University, St. Louis, Mo. Philadelphia: Charles Desilver, No. 714 Chestnut St. (opposite Masonic Hall). Keen & Lee, 148 Lake Street, Chicago. 1858.

16mo, pp. 162.—A. M.

1858. BURNHAM'S ARITHMETICS.

Charles G. Burnham wrote two arithmetics, a Mental Arithmetic of 188 pages, and a Written Arithmetic. He calls it a "New system" of arithmetic on an improved plan, which professes "to commence where the child commences and proceeds as the child proceeds."

John P. Jewett & Co., Boston, and Henry P. B. Jewett, Cleveland, published these books in 1858.

In the Mental Arithmetic, half the book is in the form of a dialogue between the teacher and pupil. The remainder consists of very simple exercises for which the pupil is already prepared.

The Written Arithmetic is an attempt to reduce all operations to the fewest principles. Great stress is given to cancellation. Fractions are treated as whole numbers.

1858. NORMAL ARITHMETIC.

The Normal Arithmetic, by Silas L. Loomis, a book of 300 pages, was published in Philadelphia, by J. B. Lippincott, in 1858. The treatise is divided into six parts: (1) Decimal numbers; (2) denominate numbers; (3) percentage; (4) proportion; (5) powers, roots, series; (6) miscellaneous subjects. A very fair work.

1859. JILLSON'S ARITHMETIC.

This little pocket volume was published in 1859, and it is designed to facilitate arithmetical computations by the use of the "slide rule." The book might very properly be called instrumental or mechanical arithmetic. This handy little manual was prepared by Arnold Jillson, Woonsocket, R. I.

1859. RICHARD NELSON.

Nelson's Mercantile Arithmetic, for Schools and Colleges: a Handbook for Merchants, Professional Men, Mechanics, Farmers, and Household use. Embracing all the more useful calculations in Banking, Commerce, Manufacturing, Building, etc., explained on scientific principles, and performed by the simple application of the Four Fundamental Rules. Short methods of Calculation, Business Forms, Useful Information never before published, regarding Banking, Commerce, Bricklaying, Carpentry, etc., etc.; Farming, Road Making, Mensuration, etc.; it also contains a Business Vocabulary of the most useful terms; Contractions used in Business, with Tables of Weights and Measures, etc., revised to suit the improvements of the day. By Richard Nelson, Principal of Western Commercial College, Cincinnati, O. Cincinnati: Published by Nelson, Kizer & Co., Cor. Court St. and Western Row. 1859.

16mo, pp. 264.

Nelson's Merchantile Arithmetic for Book-keepers, Schools & Colleges. By Richard Nelson. Cincinnati. 1888. Copyright 1859.

16mo, pp. 360.—A. M.

1859. SILAS L. LOOMIS.

Analytical Arithmetic: An Introduction to Normal Arithmetic. Designed for Beginners. By Silas L. Loomis, A.M., M.D., Author of "Normal Arithmetic." Philadelphia: J. B. Lippincott & Co. 1860.

18mo, pp. 200. Copyright 1859.—A. M.

Silas Laureace Loomis was born in Coventry, Conn., May 22, 1822; was graduated at Wesleyan University in 1844, after teaching mathematics and natural sciences in Holliston Academy, Massachusetts. In 1855 was principal of the Western Academy in Washington, D. C.; graduated from the medical department of Georgetown College in 1856, and was professor of physiology in that department in 1859-60. He was astronomer to the United States Coast Survey in 1857, and in 1860 special instructor in mathematics to the United States naval cadets while on a cruise. Dr. Loomis was surgeon on Gen. George B. McClellan's staff in 1862-63. He has made improvements in various instruments of precision.—A. M.

1860. JAMES STEWART EATON.

James Stewart Eaton was born in Fitchburg, Mass., November 13, 1816, and died in Andover, Mass., October 10, 1865. Although his early life was spent upon a farm, he had little taste for farm work or even for childish sports; he found especial delight in books. Until he was 19 years old he enjoyed only the privileges of education which his native town afforded. At that time he became a pupil in the Teachers' Seminary connected with Phillips Academy, Andover, Mass. He was graduated, as the valedictorian of his class, in 1839. He taught one year on Cape Cod and then became principal of the English department of Bacon Academy, Colchester, Conn. Seven years later, in 1847, he was appointed principal of the English department in Phillips Academy, Andover, Mass., which position he filled till his death.

He was a man capable of severe mental labor; as a child he was frail, but as a man he was possessed of a vigorous constitution.

During twenty-five years he taught with no interruption, except the ordinary vacations, and, in addition to the arduous labors of the schoolroom, much time was given during the last ten years of his life to work upon his series of mathematical works.

He was modest in his tastes and scholarly and retiring in disposition and consequently he filled but few positions of public responsibility. At one time he was president of the Essex County Teachers' Association. His mind was preeminently mathematical, and he loved a clear demonstration.

All his statements were concise and to the point. This led him to feel that an improvement could be made upon the existing mathematical books, and the marked success following his efforts proved the correctness of his belief.

As a teacher he was conscientious and eminently successful. He won the respect and love of his pupils because of his sympathy for them and interest in their progress. He had a rare power of presenting the truth clearly. In the schoolroom he was gentle, but firm. Although he did not enjoy the advantages of a collegiate education, he endeavored to supply this want in every way that he could, and Yale College conferred upon him the degree of M. A.

Eaton's High-School Arithmetic.—The High-School Arithmetic, published in 1857, is an excellent treatise. The author in the preface indicates the outline as his guiding principle: (1) To be clear; (2) to be brief; (3) to be accurate; (4) to be logical. The examination of the book shows how duly he adhered to his plan.

In addition to the subject-matter found in all first-class treatises, the author inserted a good chapter on permutations, arrangements, and combinations. The miscellaneous examples on pages 266 to 273 are especially interesting; also, the "calendar and chronological problems" have a historic value of great importance to the student. Application of arithmetic to geometry forms a useful and valuable feature, while the philosophical exercises are of great practical utility. Perhaps no other arithmetic of 373 pages contains more necessary and entertaining information than this one by Professor Eaton.

Eaton's Primary Arithmetic.—This arithmetic was published by Messrs. Brown & Taggard in 1860. It is a 16mo, 101 pages, handsomely illustrated. The object-lesson method in primary instruction is very prominent in this book. The engravings represent the objects with which the child is familiar. The aim of the author is to lead the young pupil to a knowledge of the rudiments of numbers by the use of sensible objects rather by uninterrupted drill on the tables. The book is simple in language, progressive in arrangement, and well adapted to elementary instruction.

Eaton's Common-School Arithmetic.—This work was published by Messrs. Taggard & Thompson, successors to Messrs. Brown & Taggard, in 1863. It is a 12mo, 327 pages. It was designed to meet the wants of the ordinary grades of common and grammar schools. The same plan is pursued in the main as in the High-School Arithmetic, but greater prominence is given to percentage and its application to the different phases of business life, and very great care was exercised to have all the examples practical and business like in their character. A history of the metric system of weights and measures with tables, examples for practice, and illustrative figures, form 12 pages of the Appendix, prepared by Prof. H. A. Newton, of Yale College.

Eaton's Intellectual Arithmetic.—This book was printed in 1864 by Messrs. Taggard & Thompson, Boston. It is modeled upon the inductive method. As a text-book it is simple, and not quite difficult enough to get first-class work out of pupils. The best chapter in the book is "Suggestions to teachers." It is quite well adapted to younger classes pursuing this subject, and doubtless it was prepared for such chiefly. It is a 16mo, contains 176 pages, the last 12 pages being devoted to written arithmetic.

Eaton's Elements of Arithmetic.—This book was published in 1868 by Messrs. Taggard & Thompson, 168 pages, 16mo. It was designed for those pupils who do not have time to complete a larger work. The last work of the author was done on this book, and it was completed by his son, Prof. James H. Eaton, assisted by Mr. J. P. Payson, master of the Williams School, Chelsea, Mass.

In addition to the fundamental rules, it treats of denominate numbers and reduction, common and decimal fractions, United States money, compound numbers, percentage, interest, and the metric system.

Bradbury's Eaton's Practical Arithmetic.—Messrs. Thompson, Brown & Co., successors to Messrs. Taggard & Thompson, published this arithmetic in 1879. It contains oral and written examples and is adapted to grammar-school use. Decimals, as far only as thousandths, the place of mills, in United States currency, are introduced with integral numbers at the beginning of the book. The decimal or metric system of weights and measures has been treated as a part of decimals and independently of any other system of weights and measures. Some of the definitions and explanations of the Eaton's Arithmetic are retained, where from the simplicity, brevity, and clearness they could not be improved. Otherwise the whole treatment of the subject s new. Circulating decimals, annual interest, foreign exchange, custom-house business, arithmetical and geometrical progression, alligation, and many tables, mainly useful for reference, are placed in an appendix.

In the processes of commission, interest, banking, equation of payments, etc., business men and bankers have been consulted, and those methods adopted that exper.ence has proved to be the simplest and best.

All the subjects have been made as practical as possible, and obsolete and useless matter omitted. The examples represent actual transactions from everyday life, and are varied and well graded. In addition to those in the main book there are 700 extra examples in the Appendix.

Bradbury's Eaton's Elementary.—This book serves as an excellent introduction to the larger work. It was published by Messrs. Thompson, Brown & Co. It is a 16mo, and is in two parts.

Part I, Primary, 92 pages, beautifully illustrated, consisting largely of oral work, but with slate exercises adapted to the young pupil. It is happily fitted to interest the child in numbers and to teach the first principles of the subject.

Part II, designed for intermediate schools or the lowest grammar grades. Like the practical it combines mental and written work, but makes use of small numbers. Only those topics are

included that are deemed fundamental to give the pupil the arithmetical knowledge absolutely needed for matters of everyday life.

1860. WILLIAM FROTHINGHAM BRADBURY.

William Frothingham Bradbury, A. M., the present head master of the Cambridge Latin School, was born in Westminster, Mass., in 1829. His early education was obtained in the district schools and academy of his native town. He taught his first school during the winter of 1848-49 in Slab City, Princeton, on the rocky side of Mount Wachusett, at a salary of $18 per month and board. In 1852 he entered Amherst, and, after working his passage by his personal exertions, graduated in 1856, being the valedictorian of his class. His brother, E. E. Bradbury, was salutatorian of the same class, a remarkable instance, says the Journal of Education, of two brothers taking the highest honors of one college class. In his graduating year Mr. Bradbury was placed in charge of the department of physics and mathematics in the high school of the city of Cambridge, Mass., and upon the death of Head Master Osgoode Johnson, in April of the same year, he assumed the vacant position for the remainder of the year. In 1864 he was made Hopkins classical master, which position he has held for twenty-four years. In 1868 he was chosen the head master of the high school as a direct successor of William J. Rolfe. In 1886, at the division of the high school into the Latin School and the English High School, he was made head master of the Latin School.

Mr. Bradbury is widely known throughout the country as a successful and valuable instructor, while perhaps many are best acquainted with his name as an author. His series of mathematical works, embracing arithmetic, algebra, geometry, trigonometry, and surveying are very popular. In addition to his work as a teacher and text-book writer he has also written educational papers, the chief of which have related to the metric system and the spelling reform. He is also the inventor of an ingenious piece of apparatus for illustrating the simplicity of the metric system. This apparatus, like his book, is extensively used in teaching the system. Mr. Bradbury has filled many important positions in different teachers' associations. His most important work in arithmetic is the revision of the series of Eaton's Arithmetics.

1860. AARON SCHUYLER, LL. D.

Dr. Schuyler is the author of the following excellent text-books, which have had a gratifying reception by the public: (1) Higher Arithmetic, 1860; (2) Principles of Logic, 1869; (3) Complete Algebra, 1870; (4) Treatise on Trigonometry, Surveying, and Navigation, 1872; (5) Elements of Geometry, 1875; (6) Empirical and Rational Psychology, 1881.

All his works except the Higher Arithmetic are published in Cincinnati by Messrs. Van Antwerp, Bragg & Co.

Schuyler's Higher Arithmetic.—This arithmetic was published by Messrs. Sheldon & Co., New York, in 1860. It is the most logical, concise, clear, and accurate treatise I have ever read. The author avoiding the dogmatic method on one side and the exclusively analytic on the other, generalizes all essential elements, carefully distinguishing the accidental from the necessary elements in each process. For those who have mastered elementary algebra the work is easily enough understood, but otherwise it is too difficult. The author has the happy faculty of logical arrangement as well as that of logical analysis, hence this volume is invaluable to the student of mathematics in showing him how to classify his knowledge for ready use. No subject is evaded because it presents difficulties, and everything is included that the author deemed essential to render the book complete. It is a 12mo of 476 pages.

A revision of this work, containing an appendix, was published in 1862.

Aaron Schuyler was born in Seneca County, N. Y., February 7, 1828. When 8 years of age he removed with his father's family to Ohio and lived in Seneca County till he was 21. At the Seneca County Academy, Republic, Ohio, Mr. Schuyler was for several years a pupil, afterwards an assistant teacher, and succeeded Mr. Harvey as principal of that institution. This position he filled for twelve years, during which time the academy was in a flourishing condition. In 1862 he received the degree of A. M. from the Ohio Wesleyan University, Delaware, Ohio, and in 1873 the degree of LL. D. from Otterbein University. From 1862 to 1872 he was professor of mathematics in Baldwin University, Berea, Ohio, when he was elected president of the university, which position he held ten years. In 1886 he was elected professor of mathematics in Kansas Wesleyan University, Salina, Kans., which position he now holds.

Dr. Schuyler is an untiring worker. He wrote his books while engaged in teaching from four to six classes a day in college.

1860. DEAN'S ARITHMETICS.

Dean's arithmetics are: (1) Primary Arithmetic, 12mo, 108 pages, 1860; (2) Intellectual Arithmetic, revised, 12mo. 192 pages, 1874; (3) Elementary Arith-

metic, 12mo, 176 pages, 1868; (4) Intermediate Arithmetic, 12mo, 334 pages, 1865; (5) High School Arithmetic, 12mo, 454 pages, 1874. These books were formerly published by Messrs. A. H. English & Co., Pittsburg, but are now published by Messrs. Taintor Bros. & Co., New York.

Philotus Dean, A. M., was principal and professor of natural science in the Pittsburg Central High School and director of the Allegheny Observatory.

This is a very vigorous series of arithmetics. The author had definite information to convey, and he did his part remarkably well.

Primary Arithmetic.—Although this volume was written nearly thirty years ago, it is a good primary arithmetic at the present time. It takes the pupil through the four rules, dips into fractions, and supplies him with the tables of money, weights, and measures.

Intermediate Arithmetic.—This book occupies an intermediate place between the primary and higher arithmetics, and it conveys definite instruction with drill exercises in those things most needed to make quick, accurate, thoughtful computers. It is quite a complete treatise in the range of topics adapted to the affairs of practical life, and yet simple enough to discipline the mind and to strengthen its powers. All subjects embraced in a common-school arithmetic are found in this one, very fully and clearly treated. The definitions, processes, and analyses are models which any teacher may pursue with profit. Very properly the book might have been entitled a "Common School Arithmetic."

Elementary Arithmetic.—In presenting this book to the public the author designed it for that large class of pupils in graded schools that have not time to take a fuller course. The pupil is conducted through all essential processes of numbers as far as the simpler applications of percentage to business. In the presentation of each topic the author gives one method for the pupil to learn and to practice.

Intellectual Arithmetic.—This is one of the best mental arithmetics ever published. It stands with Brook's Normal Mental and with Robinson's Intellectual. The pupil who thoroughly masters it has little need of rules for solving arithmetical problems.

High School Arithmetic.—Mr. J. P. Cameron edited this book, the manuscript being unfinished at the time of Professor Dean's death. Its object is to furnish to advanced pupils and private students a full and comprehensive treatise on the subject in all its various applications. It is a work of genuine merit.

1860. E. E. WHITE, J. B. MERRIAM, H. B. BRYANT, AND H. D. STRATTON.

Bryant and Stratton's Commercial Arithmetic. In two Parts. Designed for the Counting Room, Commercial and Agricultural Colleges, Normal and High Schools, Academies, and Universities. By E. E. White, A. M., Supt. Public Schools, Portsmouth, Ohio; J. B. Merriam, A. M., Cashier City Bank, Cleveland, Ohio; and H. B. Bryant, and H. D. Stratton, Founders and Proprietors of the "National Chain of Mercantile Colleges," located at New York, Philadelphia, Albany, Buffalo, Cleveland, Detroit, Chicago, and St. Louis. New York: Phinney, Blakeman and Mason, 61 Walker Street. Buffalo: Breed, Butler & Co., 188 Main Street. 1861.

8vo, pp. 313. School edition.—A. M.

1860. MARTIN M. ROHRER.

Practical Calculator: a Pocket Manual of Plain Rules and Calculations for Business Operations. By Martin M. Rohrer, Surveyor and Conveyancer. Carefully Revised by Rev. Theo. A. Hopkins, A. M., Principal of the Yeates Institute, Lancaster, Pa. New Edition, with Additions and Improvements. Philadelphia: J. B. Lippincott & Co. 1860.

18mo, pp. 204.—A. M.

1860. THEORIES OF ARITHMETIC.

Theories of Arithmetic, collected from the works of various authors, and arranged for the use of the Students of Sodus Academy. Lyons, N. Y. Printed by W. T. Tinsley, Republican Office. 1860.

Author not given.—A. M.

1860. M. P. GRAND.

Compendio de Aritmética Elemental, para la Instruccion Primaria. Por M. P. Grand. Nueva York: D. Appleton y Compañía, 443 y 445 Broadway. 1860.

12mo, pp. 60.—A. M.

1860. ARITMÉTICA PRÁTICA, 1ª PARTE.

Sumar, Restar, Multiplicar i Dividir Enteros i Quebrados. Publicado por órden del Jefe del Departamento de Escuelas del Estado de Buenos Ayres, S. D. Domingo F. Sarmiento. Nueva York: D. Appleton y Compañía, 346 y 348 Broadway. 1860.

Pp. 144.—A. M.

CHAPTER XVIII.

THE TEACHING OF ASTRONOMY IN THE PRIMARY AND SECONDARY SCHOOLS AND IN THE UNIVERSITY.

By Edward S. Holden, M. A., Sc. D., LL. D., Sometime Director of the Lick Observatory.

I. THE TEACHING OF ASTRONOMY IN THE PRIMARY SCHOOLS.

The earliest teaching of astronomy must be closely joined to the teaching of geography. What is already known about the earth will serve as a stepping-stone to a knowledge of the planets. Conversely, the little that is known of the planets serves to throw light upon the constitution of the earth, and especially upon its past and future history. Any child old enough to study geography is not too young to begin to observe simple astronomical phenomena and to grasp astronomical ideas. Prof. Edward Gardnier Howe, in his Manual of Systematic Science Teaching,[1] has given a useful and intelligent scheme according to which astronomy may be taught during the early years of a child's school life. Reference should be made to this scheme by teachers of science in the primary schools, although it ought not by any means to be followed slavishly.

The lessons of the first years are necessarily extremely simple. The child must first be led to make an inventory of the visible universe—sun, moon, and stars. Among the stars the brighter planets (Venus, Mars, Jupiter) may be pointed out; and it will be easy to direct attention to the constellations—the Great Bear (the Dipper), Orion, the Pleiades. During the whole school life of the child the naming of the constellations may go on. It is not necessary to learn the designations of any of the fainter stars, nor even the names of more than a dozen of the bright ones. But it is desirable that the names of the principal constellations should be associated with the star groups. A very little time given to this matter will do wonders. A child's fresh memory is readily impressed. A few of the stars which are closely double to the naked eye (Epsilon Lyræ, etc.) may be pointed out, as well as the nebula of Andromeda and the star clusters of Scorpio and the Præsepe. The course of the Milky Way must be traced and the Zodiacal Light rediscovered.

Very many children will take a lively interest in the identification of stars (and planets), and a clever teacher can inspire them to do such work on their own account, and at home. The delight of discovery is hardly less poignant to the child who has really observed for the first time that the stars in their courses move from east to west, or that the planets really move among the stars, than to an astronomer who makes some real step to advance his science.

Early in the child's life the study of the moon's face and of her motions should be commenced. There is really no end to it during the whole of the pupil's school life. After the unassisted eye has done its part the use of a common field glass opens a new world. Galileo was not better equipped. The opera glass, a watch,

[1] International Education Series, Vol. XXVII, 1894.

a compass, a straight stick for a gnomon, or for testing the allineations of stars (or planets); bits of colored glass for looking at the sun (care must be exercised in this matter); a terrestial and a celestial globe—if possible a blank slate globe on which drawings can be made with chalk; a rude sundial, which can be made by the pupils themselves (not by theory, but by making its indications agree approximately with those of a watch); possibly a simple spyglass on a firm support, or at least a straight pointer or stick mounted like an equatorial; these are the pieces of apparatus which should be successively utilized by the teacher. It is very important to introduce these aids slowly and one by one. The eye should be faithfully employed before the opera glass is used. Thoroughness is a scientific (and a moral) virtue which the child may begin to learn from his earliest days; and these simple beginnings of astronomical acquirement can be used to impress the habit on the pupil.

The observation of the morning and evening stars will serve as an introduction to the mapping of the apparent path of a planet among the stars, and the revolutions of the moon will suggest the origin of the month, and thus introduce some consideration of the calendar—a knotty subject. The child who lives on the seacoast may already know something of the tides. The nature of solar time and its relation to sidereal time can be introduced with the study of the sun's motions. The apparent motions of the moon and planets lead to investigations of the real motions of both planets and earth. Spherical bodies are illuminated in a special manner by the central sun, and cast shadows of a particular size and shape. Thus eclipses may occur, and the conditions for an eclipse may be perfectly well comprehended, even by young pupils. A school experiment on a sunny day, with two globes and with a smoky atmosphere (artificially produced) in the room, will exhibit the essentials of the phenomenon. Latitude, longitude, time, pendulum clocks, telescopes, the sun's heat received by the earth, the seasons, twilight, etc., may be taken up in order, as occasion serves.

Everything depends on the teacher. It is essential that he should thoroughly understand the subject if he is to present it vividly to young minds. It is important that the children should be given ample time to grasp novel doctrines and not be hurried. At the same time it is almost equally essential that they should be led onward and not merely revolve for days about a single topic. Nothing exhibits the skill of an instructor more convincingly than his power to display a given subject in many and various lights. A topic that has been thoroughly studied in one aspect gains a new freshness and interest by a presentation from a novel point of view. The power of conceiving in the sky the circles of the sphere—the meridian, the equator, the ecliptic—must be steadily cultivated. The circles exist first of all in the heavens, and the text-book or the school globe only exists because the circles are there. The ground idea of an eclipse is very simple if it is studied out of doors by experiments with real shadows. Afterwards the drawings in the text-books become intelligible. The power to conceive geometric relations of the sort can be wonderfully cultivated even in young children. Just as descriptive geometry gives the very best training to more advanced students of mathematical form, so this habit of representing geometric relations in the mind is of prime importance to the beginner.

No special consideration of the manner of instructing children of the primary grades in astronomy need be given here. The teaching should, in general, be directed chiefly to training their eyes and mind to observation of natural phenomena rather than to instruction in the elements of the particular science of astronomy. What they learn of astronomy is of comparatively little account. The real matter is to use the solar system so as to train each small mind to observe, register, and reflect. Later on, in the secondary schools, astronomy may be studied not only for its educative effect, but also as an information-study. In

the general college courses its chief value is to give an idea of the methods of this particular science, and thus of all science.

For primary pupils the main point is to open the eyes and mind, and the sun and stars are convenient for the purpose. A detailed scheme for such instruction during the earliest years of the school life of the child is given in the book of Professor Howe, already mentioned. This programme, modified as necessary and convenient, will serve as a guide to the teacher of primary pupils in astronomy. The manner of teaching this science in secondary schools and in colleges will next be treated with all necessary fullness.

II. TEACHING OF ASTRONOMY IN THE SECONDARY SCHOOLS.

The committee on secondary school studies, which was appointed at the meeting of the National Educational Association in 1892, considered the whole question of high-school courses of study and made a report,[1] whose conclusions have been accepted on nearly all hands as satisfactory, and in the present state of instruction in the country as final. With a better instructed force of teachers we may look for higher requirements. The committee (known as the Committee of Ten) was composed of the president of Harvard University, the United States Commissioner of Education, the president of the University of Michigan, the headmaster of the Girls' High School of Boston, the president of Vassar College, the principal of the High School of Albany, the president of the University of Colorado, the president of the University of Missouri, the headmaster of the Lawrenceville School of New Jersey, and a professor of Oberlin College. It was thus representative of the whole country geographically, and of the best in the country pedagogically. The Committee of Ten was aided in its work by nine other committees ("conferences"), each composed of ten experts.

The conferences considered the following studies or groups of studies: (1) Latin; (2) Greek; (3) English; (4) other modern languages; (5) mathematics; (6) physics, astronomy, and chemistry; (7) natural history (biology, including botany, zoölogy, and physiology); (8) history, civil government, and political economy; (9) geography (physical geography, geology, and meteorology). The ninety members of the conferences were divided as follows: Forty-seven were in the service of colleges or universities, forty-two were in the service of schools. Many of the men in the service of the colleges had had previous service in schools. The discussions of the several conferences were "frank, earnest, and thorough," but "in every conference an extraordinary unity of opinion was arrived at." "The unanimity developed is very striking and should carry great weight." The conference reports were comprehensively discussed by the Committee of Ten and "a cordial agreement as to both the form and substance" of the printed report just cited was arrived at.[2]

These facts, which will be in the memories of most of the readers of this chapter, are here set down in order to emphasize the authoritative nature of the report of the Committee of Ten. Their conclusions, as hereafter quoted, must be taken as carrying the greatest weight. A differing judgment will require to be fully discussed.

The following paragraphs from the report of the Committee of Ten are quoted here for convenience of reference:

Anyone who reads these nine reports [of the conferences] consecutively will be struck with the fact that all these bodies of experts desire to have the elements of their subjects taught earlier than they now are, and that the conferences on all the subjects, except the languages, desire to have given in the elementary schools

[1] Publications of the United States Bureau of Education, No. 205, 1893.

[2] With a very few exceptions printed in a minority report from the president of the University of Colorado.

what may be called perspective views or broad surveys of their respective subjects, expecting that in later years of the school course parts of these same subjects will be taken up with more amplitude and detail. * * * The conference on physics, chemistry, and astronomy urge that nature studies should constitute an important part of the elementary school course from the very beginning. * * *

Finally, the conference on geography recommend that the earlier course treat broadly of the earth, its environment and inhabitants, extending freely into fields which in later years of study are recognized as belonging to separate sciences.

* * * * * * *

In thus claiming entrance for their subjects into the earlier years of school attendance, the conferences are only seeking an advantage which the oldest subjects [language, arithmetic, geography] have long possessed. * * * As things now are, the high-school teacher finds in the pupils fresh from the grammar schools no foundation of elementary mathematical conceptions outside of arithmetic, no acquaintance with algebraic language, and no accurate knowledge of geometrical forms. As to [physics, astronomy, etc.] the minds of pupils entering the high school are ordinarily a blank. When college professors endeavor to teach [astronomy] to persons of 18 or 20 years of age they discover that in most instances new habits of observing, reflecting, and recording have to be painfully acquired by the students—habits which they should have acquired in early childhood. The college teacher * * * finds that his subject has never taken any serious hold on the minds of pupils fresh from the secondary schools. * * * It is inevitable, therefore, that specialists in any one of the subjects which are pursued in the high schools or colleges should earnestly desire that the minds of young children be stored with some of the elementary facts and principles of their subject, and that all the mental habits, which the adult student will surely need, begin to be formed in the child's mind before the age of 14. * * * The changes recommended are all in the direction of increasing simultaneously the interest and the substantial training quality of primary and grammar school studies. * * *

On one very important question of general policy * * * the committee of ten and all the conferences are absolutely unanimous. * * * Ninety-eight teachers, intimately concerned either with the actual work of American secondary schools, or with the results of that work as they appear in students who come to college, unanimously declare that every subject which is taught at all in a secondary school should be taught in the same way and to the same extent to every pupil so long as he pursues it, no matter what the probable destination of the pupil may be, or at what point his education is to cease. * * * Not that all the students should pursue every subject for the same number of years; but so long as they do pursue it, they should all be treated alike.

All the conferences on scientific subjects dwell on laboratory work by the pupils as the best means of instruction * * * and they all protest that teachers of science need at least as thorough a special training as teachers of languages. * * *

SUMMARY OF THE REPORT OF THE CONFERENCE ON PHYSICS, CHEMISTRY, AND ASTRONOMY.

The conference was urgent that the study of simple natural phenomena be introduced into elementary schools. * * * Apparently the conference entertained the opinion that the present teachers in elementary schools are ill-prepared to teach children how to observe simple natural phenomena, for its second recommendation was that special science teachers be appointed to instruct the teachers of elementary schools in the methods of teaching. The conference was clearly of opinion that from the beginning this study should be pursued by the pupil chiefly, though not exclusively, by means of experiments and by practice in the use of simple instruments for making physical measurements. * * * At the same time the report points out that laboratory work must be conjoined with the study of a text-book and with attendance at lectures or demonstrations. * * *

It already appears that the nine conferences have * * * discussed fully the proper limits of the several subjects of instruction in secondary schools, the best methods of instruction, and the best methods of testing pupils' attainments. The conferences were equally faithful in discussing * * * the most desirable allotment of time for each subject and the requirements for entering college.

The foregoing subjects are fully examined by the committee of ten in its report, and before making recommendations this committee has exhibited the suggestions of the conferences in tabular form. The suggestions of the conference on physics, chemistry, and astronomy are as follows:

For the elementary grades, primary and grammar schools (covering eight school years; pupils' age from 6 to 14 years): Study of natural phenomena five portions (units of time) a week during the first eight years, by experiments, including physical measurements. This study is to be coordinated with work in natural history (two portions, of not less than thirty minutes each, per week) and with work in geography (including astronomy, meteorology, etc.).

For the high-school grades (four school years; pupil's age from 14 to 18 years): Astronomy is to be elective and the time allotted to it is to be five portions per week for twelve weeks during the first two years; the third year of the high-school course is to be given to chemistry and the fourth to physics; meteorology or physiography is to be studied during the first two years; and meteorology (elective) during half of the third year, with geology or physiography (elective) for half of the fourth year.

The foregoing represents the suggestions of the conferences on astronomy, etc. It is not a programme, but the material from which a programme can be made. It has been studied in all its bearings by the committee of ten, which has constructed from it four tentative programmes, as given below.

All four programmes conform to the general recommendation of the conferences—that is, they treat each subject in the same way for all pupils, with trifling exceptions; they give time enough to each subject to win from it the kind of mental training it is fitted to supply; they put the different subjects on an approximate equality so far as time allotment is concerned; they omit all short information courses, and they make sufficiently continuous the instructions in each of the main lines, namely, language, science, history, and mathematics. With slight modifications they would prepare the pupils for admission into any American college; * * * and they would meet the new college requirements which are suggested below.

CLASSICAL COURSE.

[Three foreign languages, one modern.]

First year:	Portions.
Latin	5
English	4
Algebra	4
History	4
Physical geography	3
	20

Second year:	
Latin	5
English	2
German (or French) begun	4
Geometry	3
Physics	3
History	3
	20

Third year:	
Latin	4
Greek	5
English	3
German (or French)	4
Mathematics (algebra 2, geometry 2)	4
	20

Fourth year:

Latin	4
Greek	5
English	2
German (or French)	3
Chemistry	3
Trigonometry and higher algebra or history	3
	20

LATIN—SCIENTIFIC COURSE.

[Two foreign languages, one modern.]

First year:

Latin	5
English	4
Algebra	4
History	4
Physical geography	3
	20

Second year:

Latin	5
English	2
German (or French) begun	4
Geometry	3
Physics	3
Botany or zoology	3
	20

Third year:

Latin	4
English	3
German (or French)	4
Mathematics (algebra 2, geometry 2)	4
Astronomy, one-half year; meteorology, one-half year	3
History	2
	20

Fourth year:

Latin	4
English	4
German (or French)	3
Chemistry	3
Trigonometry and higher algebra or history	3
Geology or physiography, one-half year; anatomy, physiology, and hygiene, one-half year	3
	20

MODERN-LANGUAGE COURSE.

[Two foreign languages, both modern.]

First year:

French (or German) begun	5
English	4
Algebra	4
History	4
Physical geography	3
	20

Second year:

French (or German)	4
English	2
German (or French) begun	5
Geometry	3
Physics	3
Botany or zoology	3
	20

Third year:

French (or German)	4
English	3
German (or French)	4
Mathematics (algebra, 2; geometry, 2)	4
Astronomy one-half year, meteorology one-half year	3
History	2
	20

Fourth year:

French (or German)	3
English	4
German (or French)	4
Chemistry	3
Trigonometry and higher algebra or history	3
Geology or physiography, one-half year; anatomy, physiology, and hygiene, one-half year	3
	20

ENGLISH COURSE.

[One foreign language, ancient or modern.]

First year:

Latin or German or French	5
English	4
Algebra	4
History	4
Physical geography	3
	20

Second year:

Latin or German or French	[1]5
English	[1]3
Geometry	3
Physics	3
History	3
Botany or zoology	3
	20

Third year:

Latin or German or French	4
English	5
Mathematics (algebra, 2; geometry, 2)	4
Astronomy, one-half year; meteorology, one-half year	3
History	4
	20

[1] Or 4.

Fourth year:

Latin or German or French	4
English	4
Chemistry	3
Trigonometry and higher algebra	3
History	3
Geology or physiography, one-half year; and anatomy, physiology, and hygiene, one-half year	3
	20

These admirable programmes have been reprinted in full in this chapter in order to exhibit in the clearest manner the nature of the choice which may be made by the high-school student. If he is intending to continue his Greek studies in college (and not otherwise), he should follow the classical programme. Two years of Greek in the high school will fit him for entrance to college; but if he is to go no further in this direction, the time spent upon it can, without doubt, be better bestowed.

The remaining three courses can be considered with reference to two classes of pupils—(*a*) those whose tuition is to end with the high-school course and (*b*) those who propose to follow a college curriculum.

It does not concern us here to discuss the pupils of the first class. The last three courses all devote the same time to astronomy. Those students who propose to enter college may know whether they do or do not intend to pursue the study of astronomy during their college course. If they do, it is of immense importance that they should lay the widest possible foundations for their scientific knowledge and avoid too narrow and special a view of the world. On every account, it is desirable that they should follow what is here called the Latin-scientific course.

The grounds for such a choice will be more obvious later on; it is here sufficient to say that it can be advocated for purely utilitarian reasons. Every working astronomer should be able to read the writings of those masters of the science who have written in Latin, and he must be familiar with both German and French. One of these modern languages he may acquire in the high school. It is indispensable to devote the requisite time to acquiring the other during his college course. In the last section of this chapter treating of the training of an astronomer in the college and the university it is shown that the best disposition of a young student's time is that which gives him the broadest possible foundation for his subsequent special studies. He should comprehend the methods of all the sciences, not merely the method of his own science. The methods of the different sciences are different though their spirit is the same. Hence if it is known that a pupil in the high school intends to follow astronomy as a profession he should be encouraged to study the other sciences in his high-school course rather than astronomy. There will be plenty of time for that; and it is to his best interest to broaden all his sympathies and to widen his scientific interests. On the other hand, if it is not known what his future course is to be (as it generally will not be so early in his career), he should by all means choose astronomy as one of the group of scientific studies. In the construction of these programmes the committee of ten has adopted as the unit of time a "period." Its length in minutes is not here defined. The committee remarks that its maximum of twenty "periods" per week is subject to two qualifications, namely, at least five of the twenty periods should be given to unprepared work, and laboratory subjects should have double periods whenever this prolongation is possible.

The committee notes the omission of certain subjects from these programmes—music, drawing, elocution, etc.—and remarks that it is left to school authorities to determine how these subjects should be introduced into the programmes "in addition to the subjects laid down by the conferences."

It is the fixed opinion of the writer, and it is confirmed, I think, by the experience of teachers all over the world, that a place should be made for drawing in these programmes, even if the time for it must be subtracted from the hours allotted to the other subjects. This judgment can be defended on many and very various grounds. In this place it may be sufficient to point out that the power to represent with the pencil what he sees (in the telescope, in the microscope, with the naked eye) is absolutely indispensible to the man of science. It is not possible to teach young persons to observe natural phenomena critically unless they are likewise taught to record their observations promptly and accurately. For this reason—not to speak of other reasons—it appears to be essential to introduce drawing as a fixed part of the instruction in every course which has to do with natural phenomena. If the exigencies of the programmes demand it the necessary time should be taken from the hours allotted to science. It is exactly true that science can not be properly taught, that observations can not be properly made, unless the student is trained to record his work graphically at the time, in order that he may study and compare it at leisure later on.

These considerations are discussed by the various conferences and they are insisted on by the committee of ten in what follows:

Drawing does not appear as a separate subject in the specimen programmes, but the careful reader of the conference reports will notice that drawing, both mechanical and free-hand, is to be used in the study of history, botany, zoology, astronomy, meteorology, physics, geography, and physiography, and that the kind of drawing recommended by the conferences is of the most useful kind, namely, that which is applied to recording, describing, and discussing observations. * * *

The committee of ten think much would be gained if, in addition to the usual programme hours, a portion of Saturday morning should be regularly used for laboratory work in the scientific subjects. * * * The committee venture to suggest further that, in addition to the regular school sessions in the morning, one afternoon in every week should be used for out-of-door instruction in geography, botany, zoology, and geology, * * * [meteorology, astronomy, by day or night, as necessary]. At the beginning the pupil will need a large amount of individual instruction in the manipulation of specimens, the use of instruments, and the prompt recording of observations.

The paragraphs of the report of the committee of ten that refer to the matter of the requirements for entrance to colleges relate to the topics treated in the present chapter in a very direct manner. They need not, however, be quoted here. It is sufficient to refer to pages 51 and 52 of their printed report. Again, every one who has had to do with education recognizes the great need of better-trained teachers (especially of science) in American secondary schools. The recommendations of the committee of ten in this regard also are most important (their report, p. 52), and they rightly point out that an enlargement of sympathies and a broadening of interests are quite as much needed as improvements in apparatus and appliances. These general subjects, which are treated by the committee in a broad and general manner, have specific relations to the special subject treated in this chapter. When once the general principles laid down by them are comprehended and admitted it is a mere matter of detail to apply the principles to a particular case, to the teaching of the sciences, or to the teaching of any special science, as astronomy.

REPORT OF THE CONFERENCE ON PHYSICS, CHEMISTRY, AND ASTRONOMY.

From the report of this conference a few paragraphs are selected in order to emphasize certain conclusions of the committee of ten. A few comments are interspersed in brackets. The conference recommended:

That the study of simple natural phenomena be introduced into the elementary schools, and that this study, so far as practicable, be pursued by means of experi-

ments carried on by the pupil; also that in connection therewith, in the upper grades of these schools, practice be given in the use of simple instruments for making physical measurements.

That at least two hundred hours be devoted to the study of physics in the high school.

That at least two hundred hours be devoted to the study of chemistry in the high school.[1] (The study of chemistry to precede that of physics.)

That both physics and chemistry be required for admission to college [of all students?].

That astronomy be not so required.

That when the high-school course is four years, an elective in astronomy be offered. Time: Five recitations per week during a period of twelve weeks.

That there should be no difference in the treatment of physics, chemistry, and astronomy for those going to college or scientific school and those going to neither.

That the study of astronomy should be by observation as well as by class-room instruction.

That, in the opinion of this conference, it is better to study one subject as well as possible during the whole year than to study two or more superficially during the same time. [The form of this resolution appears to be scarcely happy. As it stands it expresses a judgment from which no teacher of science could differ. No one would be content with superficial teaching. It is probable that the conference intended to emphasize their desire for thoroughness. All teachers would agree that scientific instruction in high schools to be useful must be thorough. The conference probably further intended to convey a warning that our received ideas of thoroughness were none too high, and to insist on thoroughgoing work.]

That in the instruction in physics and chemistry it should not be the aim of the student to make a so-called rediscovery of the laws of these sciences. [In astronomy there could not be better instruction than to put the student in the position occupied by the great discoverers at the instant before their discovery was made and to make it inevitable that the student should himself take the last step. This can occasionally be done in some topics, and with clever pupils, and when it has been done a great step has been gained. As a method to be followed in all topics it is rightly condemned. It has relations, however, with the method of teaching science by reviewing its history, by connecting the successive steps in discovery with the lives and actions of special scientific men, and there is little doubt that the historic method of expounding science has wide applications. The resolution of the conference is one that all men of science can agree to. On the other hand, such an agreement must not be allowed to limit the scope of good teaching. This is undoubtedly the view of the conference itself, whose words in explanation of this resolution are: "The pupils may, to be sure, become imperfectly acquainted with the methods of work which have led to the discovery of laws and they will, no doubt, come to see more and more clearly the relations between the facts and the laws, but the conference is clearly of the opinion that it is wrong to speak of the work of the pupils as leading to the discovery of laws."]

One word may be added here on the outside reading of scientific books by high-school pupils. The student in the secondary schools who shows a taste for any particular study, as astronomy, should be encouraged to read books on the subject, even if the books are somewhat above his full comprehension. The biographies of great astronomers may be of intense interest to a clever lad. He certainly can not understand the details of their discoveries, nor comprehend the methods which they invented and employed. But their persistence, single-mindedness, and devotion, their moral qualities, will impress him deeply and may lead him to follow their path or another no less worthy. The creation of a generous enthusiasm in the growing boy is no small matter. The teacher himself will gain inspiration from the reading of such books as the biographies of scientific men, written by Arago for the French Academy of Sciences (an English translation exists), and the like, and this inspiration may be transferred to the pupils. A real enthusiasm is contagious. To give a young mind a model that can be sincerely admired is a great gift.

[1] The writer of this chapter fully agrees with the minority report to the conference which would assign not more than one hundred and fifty hours to chemistry, since physics has only two hundred.

APPARATUS—INSTRUMENTS.

It is best to have a simple set of appliances for students in the secondary schools. A large part of the apparatus should be made by the pupils themselves, but their time should not be wasted in the fabrication of telescopes, either refractors or reflectors, as is recommended by some instructors. An object glass or a speculum is a very delicate contrivance, and it requires much time to construct even a passable one. The construction of a poor one teaches no lesson, except, perhaps, that it had better not have been attempted. Nearly every school can afford to own a powerful field glass, or, better, a spyglass, magnifying 8 diameters or more. The students themselves can construct a simple equatorial mounting (stand) for such a spyglass, with large wooden circles divided to 5 degrees in declination and, say, to 20 minutes in right ascension. A simple pointer, moving with the telescope, will enable the pupil to point the instrument with some accuracy, which will be a great convenience. If a spyglass can not be had, a mounting of the sort should be constructed, nevertheless, and a straight rod, some 2 or 3 feet long, fastened to it as a pointer (as if the rod were a telescope). All kinds of problems can be solved or illustrated by a device of this sort.

A straightedge, some 3 feet long, should also be provided. By holding it in the hand, so that the edge passes through three stars (or through two fixed stars and a planet) the relative position of the stars is fixed with considerable accuracy. The daily motions of planets can be studied in this way. Two cheap watches may easily be obtained as a part of the permanent apparatus of the school. One of them should be regulated to mean solar the other to sidereal time.

A terrestrial globe and a celestial globe can be used in very many ways. "The use of the globes" comprises most of the problems of spherical astronomy. The larger they are the better, since angles can be measured on them with more accuracy.

It is a great convenience to have a globe (the larger the better) made of slate and blank, so that circles and points can be drawn on the surface with chalk. All kinds of uses will be found for such a globe, and whenever possible it should be taken out of doors and the lines on the globe compared with the circles in the sky.

If a celestial globe is not available a set of star maps can be had for a small sum. (Proctor's Half-Hours with the Stars, G. P. Putnam's Sons, New York, is as convenient as any of the cheaper atlases. McClure's Edition of Klein's Star Atlas, S. D. U. K. Co., New York, is fuller and in some respects more satisfactory.)

A small compass will be found useful in fixing the (approximate) position of the meridian or, better, a meridian line can be established near the school building once for all. To lay out such a line will be a good exercise for the students.

A sundial can be constructed empirically or by theory; and a straight stick for a gnomon will serve to elucidate many problems. (Equal altitudes of the sun, morning and afternoon; the sun's maximum altitude; the date of the solstices, etc.)

The school should gradually acquire a little library of astronomical books. Besides the atlases already named, it should own Serviss' Astronomy with an Opera Glass, Webb's Celestial Objects, and popular elementary books, by Sir Robert Ball, Flammarion, Proctor, and others, and the text-books of Howe, Newcomb, Holden, Young, and others. It is not necessary to give a list of these. The teacher can make a selection after examination.

It would be easy to suggest more elaborate appliances and to give the titles of books for an adequate library of reference and for reading; but it is desired to emphasize the fact that while expensive apparatus can be very well utilized, it is not essential.

III. COURSES OF INSTRUCTION IN ASTRONOMY OFFERED BY SOME AMERICAN UNIVERSITIES AND COLLEGES.

From the annual catalogues of various universities I have taken the following paragraphs, which exhibit, briefly, the instruction offered to students in astronomy. An examination of these programmes will exhibit the present state of instruction in astronomy in American colleges in a very satisfactory manner.

HARVARD UNIVERSITY.

Undergraduate courses in astronomy.

Descriptive astronomy three times a week for first half year.

Practical astronomy (use of instruments and applications to navigation and surveying); lectures and laboratory work three times a week for second half year. (This course is intended primarily for students of civil engineering. It requires a working knowledge of trigonometry and of solid geometry.)

Practical astronomy (determination of time, latitude, and longitude); use of the sextant and astronomical transit; lectures, instrumental work and computations, three times per week for one year. (This course requires a working knowledge of trigonometry and of solid geometry. It may be taken as a whole instead of the two courses just given.)

HARVARD COLLEGE OBSERVATORY.

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Instruction in astronomy is not given at the observatory, either by lectures or recitations. Facilities are freely offered to astronomers for making use of the library, buildings, grounds, and instruments of the observatory so far as this can be done without interfering with regular work. Similar opportunities are sometimes offered to special students in astronomy, but the constant employment of the principal instruments greatly limits the use that can be made of them for this purpose. Such students may apply for admission to the director, with whom the fees for the privileges offered may be agreed upon. In some cases a part or the whole of the fees may be remitted in consideration of services rendered in computation.

YALE UNIVERSITY.

Graduate courses.

Geodesy and practical astronomy, one half year. (Methods of observation, based on measurements, triangulation, field work, theory of least squares, adjustment of observations, computation of geodetic latitude, longitude, and azimuth. The study of practical astronomy embraces the use of the sextant and engineer's transit * * * for determining time, latitude, azimuth, and needle variation.)

Descriptive astronomy. (Three hours per week for a half year.) This is an undergraduate course. Text-book: Young's Elements of Astronomy.

Navigation and nautical astronomy. (Two hours per week for one year.) This is also an undergraduate course which treats mostly of nautical astronomy, with practice in the use of the sextant.

Practical astronomy (two hours per week for one year). This also is an undergraduate course. (It consists of observatory work with astronomical transit and chronograph for determination of sidereal and standard time, and with sextant and theodolite for determination of latitude and azimuth, numerical computations for reduction of observations, derivation of formulæ, and recitations from Loomis's Practical Astronomy.)

YALE UNIVERSITY OBSERVATORY.

In the official announcements regarding the observatory of Yale University no mention whatever is made of its relation to students. It is there described as an

institution devoted entirely to research. It is known, however, that special students of promise have been received somewhat on the footing of assistants, and the higher degrees may be taken by students in astronomy who may make practical astronomy a part of their regular work.

COLUMBIA UNIVERSITY.

General astronomy (historical and descriptive). Elective for juniors and seniors in the college. Two hours per week for one year. Reference books: Young's General Astronomy, Clerke's History of Astronomy and System of the Stars, Grant's History of Physical Astronomy.

Spherical and practical astronomy (use of the sextant and transit). Reference book: Campbell's Practical Astronomy. Two hours' lecture and two hours' observatory work throughout the year. Elective for seniors.

Advanced spherical and practical astronomy. Reference books: Chauvenet's Astronomy, Doolittle's Astronomy. Two hours' lectures and four hours' observatory work for two years. This is essentially a course for graduates.

Theoretical astronomy (theory of cometic orbits). Reference books: Klinkerfues's Theoretische Astronomie, and Oppolzer's Bahnbestimmung, one hour per week, supplemented by computations for two years. A graduate course.

Theory and methods of reduction of photographic star plates, one hour per week, supplemented by computations for two years. A graduate course. The university possesses an observatory fully equipped for teaching. Instruction in geodesy is also offered.

UNIVERSITY OF MICHIGAN.

Undergraduate courses.

General astronomy, three hours per week for one term.

Spherical astronomy, three hours per week for one term.

Practical exercises in computing, three hours per week for one term.

Theory and computation of parabolic orbits, five hours per week for one term.

Elementary practical course, one hour per week for one term.

Practical astronomy (use of the sextant and transit), three hours per week for one term.

Extended practical course (as specially arranged).

Theory and computation of elliptic orbits, special perturbations, five hours per week for one term.

Spherical astronomy continued, three hours per week for one term.

Lectures on the recent progress of astronomy, one hour per week for one term.

Mathematical theories of planetary motions, three hours per week for one term.

In the engineering department there are two other courses, viz, practical exercises in computing, three hours a week for one term, and practical astronomy (use of the portable transit), three hours a week for one term.

The university possesses two observatories, viz, the astronomical observatory proper and a students' observatory, for instruction only. It is a noteworthy fact that no other American university has sent forth so many working astronomers as Ann Arbor.

PRINCETON UNIVERSITY.

Undergraduate courses.

Elementary astronomy. Lectures, text-book. Junior elective, first term, two hours per week. Text-book, Young's General Astronomy.

General astronomy, extended course. Astronomical instruments and methods, astronomical constants, undisturbed planetary motion, spectroscopic astronomy.

Lectures and recitations. Senior elective, first term, two hours per week. Text-book, Young's General Astronomy.

Practical astronomy. Determination of time, latitude, azimuth, and the positions of planets and comets. Spectroscopic observation of the sun. Recitations and observatory work. Senior elective, one year, two hours per week. Text-books, Campbell's Practical Astronomy, Chauvenet's Practical Astronomy.

Theoretical astronomy. Theory and calculation of orbits. Graduate course, one year, one hour per week. Text-books, Watson's Theoretical Astronomy. Oppolzer's Bahnbestimmung, Klinkerfues's Theoretische Astronomie.

The foregoing courses are open to all students, and some of them are required in the school of science. The extended courses of theoretical and practical astronomy (with additional work) are designed for graduate students also. The school of science offers instruction in higher geodesy also. The university possesses two observatories, namely, the Halstead observatory, which is appropriated to scientific work, chiefly in the department of astronomical physics, and an observatory for instruction.

This [latter] establishment is devoted entirely to the use of students, and is fully equipped for its purpose. It possesses an equatorial (by Clark) of 9½ inches aperture, with a full complement of spectroscopic and other accessories. It has also a 9-inch reflector, a meridian circle, * * * two transit instruments, * * * a prime-vertical transit, * * * etc. There are also a number of sextants, and all the other subsidiary apparatus required for carrying out the work involved in the courses on practical astronomy.

UNIVERSITY OF VIRGINIA.

Undergraduate course.

A course of general astronomy is given. Text-books: Howe's Elements of Descriptive Astronomy, Barlow's and Bryan's Elementary Mathematical Astronomy, Young's General Astronomy.

Graduate courses.

During the year 1897-98 the following courses are offered: (1) The history of astronomy; (2) motions of the solar system; (3) least squares; (4) the lunar theory.

Systematic training is also given in numerical computation and in the use of astronomical instruments, and students are encouraged to engage in such original work as their time and attainments may permit.

Students have the use of certain instruments in the observatory also.

AMHERST COLLEGE.

Undergraduate courses.

There are two courses, both elective, as follows:

First term, four hours per week; Young's General Astronomy, with lectures on the history of astronomy.

Second term, four hours a week; practical astronomy (text-books of Loomis and Souchon); theoretical astronomy (Watson's Theoretical Astronomy); observatory work.

BROWN UNIVERSITY.

Undergraduate courses.

General astronomy; one year, three hours per week; elective for juniors and seniors.

Practical astronomy; two-thirds of a year, three hours per week. Elective. The application of astronomy in navigation and geodesy; theory and use of instru-

ments; astrophysics; solar and stellar spectroscopy; astronomical photography; infra-red radiations; history of astronomy. One year, three hours per week; elective for senior and graduate students. The well-equipped observatory is available to students.

WILLIAMS COLLEGE.

Undergraduate courses.

Elementary astronomy: the art of computation; descriptive astronomy; the history of astronomy; practical exercises with instruments. Junior elective course, three hours per week for one year.

Exercises in practical astronomy. "The object of the course is to give additional practical knowledge of the subject and facility in handling instruments and using formulæ;" computation of comet orbits. Senior elective course; three hours per week for one year.

Graduate course.

A course of instruction in practical astronomy is offered to graduates or persons qualified to pursue it. It will include the following subjects: Theory and use of instruments; the art of computation; the method of least squares; reduction, criticism, and discussion of observations; computation of the orbits of comets and planets; special and general perturbations; higher geodesy. The (two) observatories of the college are fully available for the work of instruction.

UNIVERSITY OF WISCONSIN.

Undergraduate courses.

General astronomy, half a year, three hours a week. Text book: Young's General Astronomy, with collateral reading.

General astronomy. A continuation of the foregoing course, with special reference to modern developments in astronomical physics, together with observatory work five times a week during the spring for two hours a day (night). Full study throughout the year.

Theoretical astronomy. Integration of the equations of motion and the computation of ephemerides; determination of the elements of an orbit; special perturbations.

Graduate courses.

Graduate students and others will be received into the Washburn Observatory as assistants, and will take part in the regular observations of the astronomers, at the same time continuing their theoretical studies. Facilities for original work are given, and such work from students, if worthy, is printed in the regular publications of the observatory.

Besides the Washburn Observatory, the university possesses a special student's observatory designed by Professor Watson.

JOHNS HOPKINS UNIVERSITY.

Undergraduate courses.

A course in general astronomy is offered as an elective for third-year students. The course embraces an historical sketch of the development of the science and an outline of the present state of our knowledge of the constitution and motion of the celestial bodies. The use of the principal instruments is explained and some practice is had with the equatorial.

Graduate courses.

For those students who wish to take astronomy as a subordinate subject, a general outline course is given each year. This course is intended to familiarize the student with the most important problems of spherical and practical astronomy, with the principles and general methods of gravitational astronomy and with the

history and literature of the subject. There is also given every year a more advanced course. * * * Among the subjects treated of in this course are the theories of precession and nutation, the computation and the correction of orbits, and the methods of computing special perturbations. The advanced courses vary from year to year. Such courses embrace the method of least squares, the theory of measuring instruments, celestial mechanics generally, * * * and the various methods of treating and integrating the equations of planetary motion.

The foregoing statement gives a general idea of the design of the courses given by the university. For details reference should be made to the circulars of the university.

UNIVERSITY OF PENNSYLVANIA.

Undergraduate courses.

General astronomy; text-book, Young's General Astronomy, three hours a week for one term. Prescribed course for juniors and seniors in certain courses.

Practical astronomy; text-book, Doolittle's Practical Astronomy, three hours a week for one term. Prescribed for juniors and seniors in certain courses. This course includes practical work with the sextant, transit, etc.

Practical astronomy (*continued*), with the theory of eclipses, precession, etc., least squares. Prescribed for certain seniors. Three hours per week [for one year].

Theoretical astronomy; text-books, Watson and Oppolzer. Prescribed for certain seniors. Two hours per week [for one year]. "Graduate students are instructed in the details of observatory practice, and participate in the regular work" of the astronomers of the Flower Observatory.

UNIVERSITY OF CHICAGO.

[The elaborate programme of the University of Chicago is given nearly in full, as it is very instructive in several respects.]

Courses of instruction for undergraduates and for graduates.

[M=Minor course—a single course for six weeks. DM=Double minor course—a double course (two hours daily) for six weeks. Mj=Major course—a single course for twelve weeks. DMj=Double major course—a double course for twelve weeks.]

AT THE UNIVERSITY.

I. Elementary (senior college) courses (1–20).

1. Popular lectures.

2. History of astronomy: Introduction. The apparent motions of the heavenly bodies as explained by the ancient astronomers. The system of Copernicus. Newton's general law of gravitation, modern astronomy. M. First term, summer quarter; 9.30 a. m. Mj. Winter quarter; 9.30 a. m.
Prerequisite: Algebra and the elements of physics.

3. General astronomy: An elementary course dealing with fundamental facts, principles, and methods. Mj. Autumn quarter; 11 a. m.
Prerequisite: Algebra, trigonometry, and the elements of physics.

4. Introduction to physical astronomy: The action of central forces; Laplace's demonstration of the law of gravitation; equations of motion; elements of the orbits; planetary integrals; invariable plane; perturbations; applications to the motion of the moon, planets, and satellites; rotation of the planets, precession, and nutation. Mj. Winter quarter; 11 a. m.
Prerequisite: Differential calculus.

6, 7. Spherical and practical astronomy: Part I. Introduction: The principal theorems of spherical trigonometry, interpolation:
I. The different systems of polar coordinates used in astronomy. The measurement of time.
II. Changes of the fundamental planes of reference; (1) precession; (2) nutation.
III. Theory of the corrections of observations due to (1) parallax; (2) refraction; (3) aberration.
IV. Star catalogues and their use.
To be followed by 7.
Mj. Winter quarter; 9.30 a. m.

7. Part II. With practical work in the students' observatory. Theory of the astronomical instruments. Determination of time and latitude, of absolute right ascensions and declinations of stars. Determination of longitude. To be preceded by 3. Mj. Spring quarter; 9.30 a. m.
Prerequisite: General astronomy and differential and integral calculus.

8. Determination of latitude and longitude, with practical work in the observatory. Transformation of the different systems of coordinates; sidereal and mean solar time. Theory of the universal instrument; determination of its errors from observations. Determination of time and latitude by observation; theory of the determination of longitude. Mj.
Prerequisite: General astronomy and differential and integral calculus.

9. Observatory work. Practice with the equatorial and with the universal instrument in the students' observatory. Mj. Spring quarter.

11. Determination of the parabolic orbit of a comet. Integration of the differential equations for the problem of two bodies. Relation between several places in the orbit; determination of the position of the orbit in space; corrections to be applied to the observed places and deduction of the elements of the orbit. Computation of an ephemeris. The theory will be applied to a special case to be selected from the list of comets recently discovered. Mj. Spring quarter; 11 a. m.
Prerequisite: Differential and integral calculus and general astronomy.

12. Determination of an elliptic orbit from three complete observations. The general theory is very similar to that of (5) except that is the case of an elliptic orbit, six elements are to be determined instead of the five of a parabolic orbit. Application of the theory to the orbit of one of the small planets. Mj. Summer quarter; 8.30 a. m.
Prerequisite: Differential and integral calculus and general astronomy.

13. Determination of the orbit of a double star: Historical sketch of the different methods used. Kowalsky's method, modification proposed by Glasenapp. Graphical method of Klinkerfues. M. Second term, summer quarter; 9.30 a. m.
Prerequisite: Analytical geometry.

14. Theory of probability and method of least squares. Mj.
Prerequisite: Differential and integral calculus.

II. Advanced (graduate) courses (21–50).

21, 22. Analytical mechanics. 21. Statics (Part 1): Composition and equilibrium of forces applied at a point. The center of gravity of lines, surfaces, and volumes. Attraction of bodies upon a point. Kinematics: Acceleration. the rectilinear and the curvilinear motion of a material point and the forces that produce them. To be followed by 22. Mj. Autumn quarter; 8.30 a. m.

22. Statics (Part 2): Composition and equilibrium of forces applied to an invariable system; principle of virtual velocities. Dynamics: Principle of d'Alembert, moments of inertia; rotation of a body around an axis; general motion of a system of bodies. Rotation of a body around a point. To be preceded by 21. Mj. Winter quarter; 8.30 a. m.
Prerequisite: Differential and integral calculus and differetial equations.

23. Spherical harmonics.
I. Spherical harmonics with one variable—general theory; development of functions in spherical harmonics; spherical harmonics of the second kind and associated functions.
II. Spherical harmonics with several variables—general theory; development and properties of the functions C and S. Mj.

24. The problem of three bodies. Introduction: (*a*) The integrals of the differential equations of a system of n bodies; (*b*) the integrals for $n=2$:
I. Lagrange's investigations. Œuvres complètes. VI, pp. 229–334.
II. Jacobi's investigations. Gesammelte Werke, IV. pp. 295–314.
III. The investigations of modern mathematicians and astronomers. Mj.
Prerequisite: Advanced integral calculus.

25. Dynamics of a system of bodies based upon the lectures of Jacobi. Differential equations of the motion of a system of material points: dynamical principles of; conservation of the motion of the center of gravity; conservation of vis viva; conservation of areas: principle of least action; Lagrange's multipliers; Hamilton's form of the differential equations; theorems of Jacobi. Applications of the method of Hamilton and Jacobi to mechanical problems. The theory of the variation of constants; introduction to the perturbing function. Mj.
Prerequisite: Differential and integral calculus, and analytical mechanics.

31. The motion of a heavenly body in a resisting medium. Mj. Autumn quarter; 9.30 a. m.
Prerequisite: Differential and integral calculus.
32. Special perturbations. Numerical differentiation and integration; development of the differential equations for perturbations in rectangular and polar coordinates; variation of constants. Mj.
Prerequisite: Differential and integral calculus, and elements of the theory of orbits.
33. Theory of absolute perturbations based on the methods of Laplace. The differential equations for undisturbed motion, elements of the orbit; differential equations for disturbed motion; integration by successive approximation, determination of the perturbations in the radius vector, longitude and latitude. Development of these expressions in series adapted to the formation of planetary tables. Mj.
34. Theory of absolute perturbations: Lagrange's theory of variation of elements. Approximate integration of the differential equations of motion. Secular values of the elements; the periodical terms of the elements. The stability of the planetary system. Long-period inequalities arising from the near approach to commensurability in the mean motions. Short history of the theories of perturbations. Mj. Summer quarter; 7.30 a. m.
Prerequisite: Differential and integral calculus, and theory of orbits.
35. Gauss's method of determining secular variations, with numerical application to the action of the earth on Mercury. Derivation of the formulæ for the variation of the elements; substitution of a certain form of elliptical ring which will give the same mean action as the moving planet; determination of the mutual action of two such rings by means of elliptic integrals of the first and second kinds; development of the formulas for the secular variations of the elements as given by Hill; application of the method of Gauss to the action of Neptune on Uranus; comparison of results with those found by Leverrier from the series expanded in powers of the eccentricities and mutual inclination of the planes of the orbits. Mj. Spring quarter; 9.30 a. m.
Prerequisite: Elements of the theory of perturbations and of elliptic integrals.
36. Selected chapters of Poincaré's: Les méthodes nouvelles de la mécanique céleste. Mj.
Prerequisite: Course 17.
41. Theory of the attractions and figures of the heavenly bodies.
I. Determination of the attractions of homogeneous sphere, spherical shell, heterogeneous sphere made up of layers of uniform density, homogenous ellipsoid, spheroid of revolution differing but little from a sphere. Development of the attraction of an oblate planet in a series of spherical harmonics, following the method of Laplace.
II. Figures of equilibrium of sphere, spheroid, Jacobi's ellipsoid of three unequal axes, figures of Poincaré and Darwin. Application of the theory of the equilibrium of a fluid mass endowed with a rotary motion to the figures of the planets. Mj. Spring quarter; 8.30 a. m.
42. Theory of a rotating body. (*a*) Euler's equations for undisturbed motion; equations of Poisson and Serret for disturbed motion, with a development of the perturbing function; precession and nutation. (*b*) Rotatory motion of a body of variable form. Mj. Spring quarter; 8.30 a. m.
Prerequisite: Differential and integral calculus, and analytical mechanics.
50. Astronomical seminar. ½Mj. Summer quarter; Sat., 8.30–10.30 a. m.

AT THE YERKES OBSERVATORY.

In the work at the Yerkes Observatory the advanced student is made familiar with modern methods of research in various branches of astronomy and astrophysics. In general, the work in progress during the year 1897–98 will probably include: Researches in solar physics with the spectroscope, spectroheliograph, photoheliograph and bolometer; micrometric observations of double stars, planets, satellites, nebulæ, and comets; studies of stellar spectra; researches on the infrared spectra of the elements; special astrophysical investigations. On account of the unfinished condition of the observatory and the nature of the work, it is possible that the subjoined outline of courses will require some modification.

GRADUATE COURSES.

51, 52, 53. Solar physics. Visual and photographic study of the solar photosphere, spots, and faculæ. Use of the photoheliograph. DMj. Autumn quarter.

Spectroscopic observations of sun-spots, including systematic study of widened lines and detailed investigations of particular lines. DMj. Winter quarter.

Visual and photographic observations of the chromosphere, prominences and faculæ, with the solar spectroscope and spectroheliograph. Systematic records of areas; researches on special problems; measurements and reductions of photographs. DMj. Spring quarter.

Prerequisite: Practical astronomy, advanced physics and laboratory practice, spectrum analysis.

54. Bolometric investigations. Mj. Summer quarter.

55. Stellar spectroscopy. Including measurement of motion in the line of sight and detailed studies of peculiar spectra. DMj. Autumn quarter.

Prerequisite: Solar physics.

56. Radiometric work. Mj. Summer quarter.

57. Instrument design and construction. Mj. Summer quarter.

58. Researches in solar physics. Mj. Summer quarter.

59, 60, 61. Astrophysical research. Character and prerequisites will be announced later. DMj. Autumn quarter. DMj. Winter quarter. DMj. Spring quarter.

62. Special research. Mj. Summer quarter.

WESTERN UNIVERSITY OF PENNSYLVANIA.

Post-graduate course of instruction in astronomy and astro-physics.

Instruction is given by means of lectures, recitations, and examinations, and by the practical use of instruments in observation and measurement. A knowledge of mathematics equivalent to that given in the undergraduate department of this university is requisite for admission to the course, which will extend over a term of two years.

While instruction in astro-physics has been regarded as of chief importance in arranging the course, no student will be allowed to graduate without a good knowledge of the facts and principles of general astronomy and the methods of practical astronomy. The student who completes the entire course and passes successfully the prescribed examinations, and in addition presents a thesis embodying the results of his own original investigations, will receive the degree of Ph. D. in course. An outline of the subjects treated, and a list of books which will be used either as text-books or as works of reference is given below:

1. The facts and principles of general astronomy; problems, projection of eclipses, etc. Young's General Astronomy.

2. The chief operations of practical astronomy, and use of instruments.

The sextant, and artificial horizon. Latitude by circum-meridian altitudes of the sun. Latitude by Polaris. Time by single altitudes and by equal altitudes of the sun.

The transit instrument. Adjustment and determination of constants. Observation for time by eye and ear and by chronograph. Determination of right ascensions. Reduction of time observations by the method of least squares. Method of determining longitudes by the electric telegraph.

The equatorial. Adjustment. Use of filar and ring micrometers. Power of eyepieces. Polarizing eyepiece for solar observations. Longitude by occultations.

Books of reference: Chauvenet's Spherical and Practical Astronomy, Doolittle's Practical Astronomy, Campbell's Practical Astronomy.

3. The theory and use of the spectroscope. Construction and adjustment of various forms of the instrument. Gratings, flat and concave. Measurement of wave lengths. Construction of interpolating curves for prismatic spectroscopes.

Observation of solar prominences. Observation of the spectra of stars and nebulæ. Determination of the color curve of an objective. Study of the instruments used in the principal observatories, and of special instruments in course of construction at Brashear's optical works.

Scheiner's Spectralanalyse der Gestirne; Von Konkoly's Handbuch für Spectroscopiker; Parkinson's Geometrical Optics; Preston's Theory of Light; Lord Rayleigh's Papers on the Spectroscope.

4. Astro-physics and celestial spectroscopy. Lockyer's Chemistry of the Sun; Miss Clerke's History of Astronomy in the Nineteenth Century; Miss Clerke's System of the Stars; Schellen's Spectrum Analysis; Scheiner's Spectralanalyse der Gestirne; Huggins's Papers on Stellar and Nebular Spectra; Langley's Papers on Solar Physics and on Atmospheric Absorption.

5. Astronomical photography. (Instruction will begin with ordinary photographic processes, in case the student is not already acquainted with them.)

Photographic objectives. Study of methods in use at the principal observatories. Methods of the Astro-Photographic Congress. Practice with the telescope.

Instruction in general astronomy is given to the members of the senior class by the professor of mathematics, the class rooms being in Science Hall. Some opportunity for practical observation is given them at the observatory.

The director of the Allegheny Observatory also gives 10 to 12 lectures to undergraduates each year on elementary practical astronomy. These lectures are addressed to juniors in college and to engineering students.

UNIVERSITY OF CALIFORNIA.

Courses in astronomy, at Berkeley.

1. Modern astronomy. (*a*) An introductory course during the first term. General facts and principles underlying the science of astronomy in all its branches. (*b*) Second term. Progress in astronomy through modern methods, especially spectroscopic and photographic. Two hours, throughout the year.

Open to all students. For observatory work in connection with this course, students will ordinarily elect Course 2; but may, instead, take Course 4A, or Course 4B, subject to the prerequisites announced.

2. Supplement to Course 1. Practice in observing. One or two evenings a week in the observatory. Three hours, or six hours, throughout the year (as the student may elect).

Open to students who are taking or have taken Course 1 or Course 3.

3. General astronomy. Young s General Astronomy. Three hours, first half.

Prerequisite: At least Junior standing; a knowledge of general physics. Prescribed, Junior year, in the course in astronomy and geodesy, college of civil engineering. For observatory work in connection with this course, students other than those in the course in astronomy and geodesy may elect Course 2, Course 4A, or Course 4B, subject to the prerequisites announced.

4A. Practical astronomy. Lectures and observatory work. Campbell's Astronomy. Clarke's Geodesy. Navigation and nautical astronomy. Practical work in the observatory. Six hours, observatory, first half. Three hours lecture and six hours observatory, second half.

Prerequisite: Either Course 1 or Course 3 in astronomy. The course should also be preceded by the course in differential and integral calculus, etc. Prescribed, Junior year, in the course in astronomy and geodesy, college of civil engineering.

4B. Practical astronomy. The subject-matter of Course 4A more briefly presented, and adapted to the needs of civil engineers. Second half. Usually given as one lecture and two observatory periods per week.

Prerequisite: As for 4A. Prescribed, senior year, in the course in railroad engineering.

5. History of Astronomy. Three hours, first half.

Prerequisite: Course 1 or Course 3. Prescribed, Senior year, in the course in astronomy and geodesy, college of civil engineering.

6. Theoretical astronomy. Four hours, throughout the year.

Prerequisite: Courses 3 and 4, etc. Prescribed, Senior year, in the course in astronomy and geodesy, college of civil engineering.

7. Method of least squares. The fundamental principles and processes of the method of least squares, and their application to the problems involved in the reduction of astronomical and physical observations. Two hours, first half.

Prerequisite: Working knowledge of the differential and integral calculus. Prescribed, Senior year, in the course in astronomy and geodesy. Elective in the college of mechanics, and in the course in railroad engineering, college of civil engineering.

[1] 8. Mechanical quadratures. Development of the formulæ of numerical differentiation and integration, and their application in the construction of tables. Three hours, second half.

Prescribed, Junior or Senior year, in the course in astronomy and geodesy, college of civil engineering.

[1] 9. Interpolation and the use of tables. The more useful formulæ of interpola-

[1] Courses 8 and 9 are offered in alternate years.

tion, and their application in the use of astronomical and other tables. Practice in extensive numerical computations by means of tables, with special aim at rapidity and exactness. Three hours, second half.

Prescribed, Senior or Junior year, in the course in astronomy and geodesy, college of civil engineering.

10. Summer school. A continuation of Course 3. Four weeks during the summer vacation. In 1896, the students determined the latitude of the students' observatory, by the method of Talcott.

11. Advanced practical astronomy. Chauvenet's Spherical and Practical Astronomy. One hour, throughout the year.

Prerequisite: Course 4. Prescribed, Senior year, in the course in astronomy and geodesy.

12. Graduate course in theoretical astronomy. Two hours, throughout the year.

Prerequisite: Course 6.

REGULATIONS REGARDING STUDENTS AT THE LICK OBSERVATORY.

The regular course of undergraduate work in astronomy in the university is given at Berkeley. Students who are graduates of the University of California, or of a university or college of like standing, are received at the Lick Observatory to pursue a higher course of instruction in astronomy, provided that, after examination, they show themselves competent. Such students may become candidates for the higher degrees of the university, or they may be received as special students merely. Quarters at Mount Hamilton may be assigned to them during that portion of the year occupied in their work with the instruments, and in return for such quarters they will be required to execute such computations as are assigned to them.

Application for admission to graduate courses at the Lick Observatory may be made at any time to the recorder of the faculties, at Berkeley; and students will be admitted on the recommendation of the director, approved by the graduate council of the university.

Students at the Lick Observatory may either be (*a*) candidates for one of the higher degrees of the university, or (*b*) special students. The higher degrees offered are Master of Arts, Master of Science, and Doctor of Philosophy. All candidates for a master's degree must reside at Mount Hamilton at least four months, and all candidates for a doctor's degree at least eight months. It is expected that students will choose their time of residence at the observatory in the period from June to November.

Special students are received (usually during the favorable observing weather, June to November), and every facility, consistent with the scientific work of the establishment, will be given to them. They will be required to follow out some line of work to the satisfaction of the director, and they will usually be assigned as assistants to some one of the astronomers.

IV. PRINCIPLES WHICH SHOULD GUIDE IN FORMING COURSES OF UNDERGRADUATE AND GRADUATE INSTRUCTION IN ASTRONOMY IN UNIVERSITIES—RELATION OF A UNIVERSITY OBSERVATORY TO THE TEACHING OF GRADUATE STUDENTS.

In the year 1895 I made a report to the regents of the University of California on the subjects named under the title given above. I venture to reprint a part of it here, as it represents my matured views. It is necessary to recollect that the University of California has its seat in the town of Berkeley; that the Lick Observatory is situated on Mount Hamilton, some 90 miles distant; that this observatory, with its staff of astronomers, is mainly devoted to the advancement of science; that the university at Berkeley possesses an excellently equipped students' observatory, and that the services of several professors and instructors at Berkeley are available for teaching practical and theoretical astronomy.

UNDERGRADUATE INSTRUCTION AT BERKELEY.

There are four classes of undergraduates whose wants must be considered.

First. Students who wish to study elementary and descriptive astronomy as an information study to make themselves familiar with the principal methods and

discoveries. The preparation required is algebra, geometry, and elementary physics. A short course of three hours per week for one term is ample for this purpose, as I know from personal experience. For the convenience of the many students who will wish to take this course, it should be given in the first term and, if necessary, repeated in the second term of each year. I regard this course as indispensably necessary. It must be remembered that the larger part of the students at Berkeley are college, not university students. The course can be prescribed by those faculties which desire so to do, but it should be open by election to students of all the colleges. It will be very largely attended and will be very useful.

Second. Students of the scientific colleges (chiefly of the college of civil engineering) who do not intend to pursue the study beyond their senior year, but who wish to be practically familiar with astronomical instruments (particularly the sextant, theodolite, and transit), and their use in determining local time, azimuth, latitude and longitude, and with the discussion of observations by the method of least squares. From any suitable programme of undergraduate instruction the faculty of the college of civil engineering will have no difficulty in selecting the special courses which provide for these wants. I do not myself see that courses in theoretical astronomy (determination of orbits, etc.) or in the history of astronomy should be prescribed for engineering students, though such students should be free to elect them. I would suggest that all students of this class should attend the summer school at Berkeley and assist the director of it when necessary.

Third. Students who desire an extended undergraduate course in astronomy, but who do not propose to carry on their studies after graduation. The courses provided for students of classes first and second above, together with theoretical astronomy, optics, spectroscopy, and such higher mathematics and physics as they have time for will probably satisfy this class of students. A very large proportion of their work should be elective.

Fourth. Students who wish to prepare themselves as undergraduates for graduate work at Mount Hamilton [or elsewhere]. The work of this class of students should be prescribed in part, with a large measure of group and free electives. A part of the prescription should be English, French, and German, if for no higher reason than a practical one. It is absolutely indispensable to a student of higher mathematics, physics, or astronomy that he should have at least an accurate reading knowledge of French and German. If he ever obtains results of importance he will wish to publish them, and to this end he should have practice in English composition under competent instructors. The main part of his professional study will be in the three branches of mathematics, physics, and astronomy. The very best undergraduate preparation for graduate work in astronomy is not so much astronomy itself as a sound and sufficient training in the higher mathematics and thorough and long-continued work in the physical laboratory. Astronomy is but a branch of physics. Its observations are similar to though often less refined than the physical measurements, etc., of the laboratory. They must be discussed by the mathematical theory of probabilities in both cases. The true training for an astronomer in his undergraduate years is thus a training in the methods of physical manipulation (whether in heat, light, electrics, magnetics makes little difference, as the underlying principles are the same) and a thorough training in the mathematical processes by which the most probable results are obtained from a mass of observations. A theoretical discussion of the orbit of a molecule is an admirable preparation for the subsequent determination of the orbit of a planet. Theoretical and practical optics is especially well fitted as a training for students of this class. Some of the practical work in optics might well be done with the instruments at Mount Hamilton, according to a plan laid down by the professor of physics [at Berkeley] and to his satisfaction. The manipulations that are learned in the physical laboratory ought to be the best preparation for the observations of the practical astronomer.

The above principles I believe to be true in a general sense and that they should govern in every programme of studies.

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The value to the student of a training in any science is measured not by the number of results placed at his immediate disposition, but by the degree in which he has mastered the spirit of the methods of that particular science; not by the inventory of new things which he sees just about him, but by the acquired power to discover for himself more distant and less obvious ones. In so far as he has acquired this power, in so far is he "educated" in the particular science. His vision is more intense, though as yet only directed to one side. Each science—mathematics, physics, astronomy, geology, biology, etc.—has its own particular methods. For the symmetrical development of a man of science it is very neces-

sary that he should be able to see on more than one side. For this reason it is important that the comparative leisure of the undergraduate years should be devoted to laying really broad foundations—to acquiring the spirit of the methods of more than one science. It is a practical question how much time the student can spare for broadening the basis on which he is to build, when we remember how much work must be done to acquire mastery in even a single science. But I think it will be necessary, in arranging the details of the longer courses in astronomy, to inquire whether it may not be well to prescribe some work in other sciences whose methods are different from its own—in geology, for example, or in logic, formal and otherwise.

I imagine that the foregoing principles are generally accepted. If so, the arrangement of the particular courses designed to carry them out will take but little time.

GRADUATE INSTRUCTION AT THE LICK OBSERVATORY.

It is probably not necessary to give much space to the discussion of the details of courses of graduate instruction at Mount Hamilton. Students who are suitably prepared should be received here—

(*a*) As special students.

(*b*) As candidates for the master's degree (M. A. or M. S.). (A two years' course.)

(*c*) As candidates for the doctor's degree (Ph. D.). (A three years' course.)

* * * * * * *

Graduate students at the Lick Observatory are received very much on the footing of assistants. Their theoretical studies are laid out for them and they are expected to prosecute them without any great amount of assistance, but with proper supervision. For their practical work they are assigned as aids to the astronomers in charge of the various instruments. In carrying out their duties as aids they actually perform the very operations which they will have to execute independently at a later day. The 4-inch transit, the 6½-inch equatorial, the alt-azimuth instrument are available for their exclusive use. In order to illustrate the advantages to the student and to the university to be derived from graduate work at Mount Hamilton, I quote below from the annual report of the director of the observatory to the president of the university for the year 1891. In one form or another these paragraphs have appeared in all my annual reports, 1888–1894:

"It is very important that some steps should be taken to make it easy for advanced students to take a special course at the Lick Observatory for the following reasons: The observatory can hardly render a better service to astronomy and to science in general than by receiving students here who have already finished their college courses and who are desirous of perfecting themselves in practical and theoretical astronomy and in astronomical physics (as spectroscopy, photography, photometry, etc.). No institution in the world is better fitted to give such instruction, and there is a special impetus to be gained in an observatory which is regularly pursuing work of discovery and research. The student comes directly into the current and learns far more by observation of the methods of others than by the study of text-books. He can take part in the regular work of the astronomers also.

"The department of mathematics at Berkeley stands ready (1891) to give instruction in the higher branches of mathematical astronomy, and the Lick Observatory is fortunate in counting among its own astronomers several of great experience and ability as teachers. The advantage to the student is obvious. It is a great advantage to the university as a whole to count among its members a considerable number of active and ambitious young men who are able to work with some independence to advance science and not merely to acquire what is already known. They set a standard of scholarship to all the undergraduates. Such students can take a useful part in the actual observations of every day as assistants, and after some practice they become valuable aids in our work of computation and observation and supplement the permanent force of the observatory in an important degree. If a number of such gentlemen can be provided for here it will not be necessary to ask the regents for an increase in the observing force."

RELATION OF A UNIVERSITY OBSERVATORY TO THE TEACHING OF STUDENTS.

* * * * * * *

It is clear from what has gone before that the whole time of the observers at Mount Hamilton is needed here in order that the astronomical work expected of them shall be properly done; and that no other serious duties can be laid upon them without materially injuring the scientific efficiency of the establishment.

Should the number of astronomers here be largely increased more time could be spared from the strictly observational work.

At the same time it is unquestionably desirable that the members of the astronomical staff at the Lick Observatory should have some direct connection with the undergraduate students of the university, as I pointed out in 1887. The important point is to bring about this direct connection and at the same time not to interrupt the progress of work at Mount Hamilton. I understand that it is the opinion of [the] committee [of the regents] that this could be satisfactorily accomplished by arranging to have the astronomers of the observatory deliver lectures before the whole university at intervals throughout the academic year. If such lectures are given I think that attendance upon them should be optional on the part of the students. The number and dates of such lectures could be arranged by the president each year.

It appears that it is not advisable to require more than this from the astronomers of the Lick Observatory, because their number is not large and their time is fully occupied; and because their highest use to the university consists, and always will consist, in their work with the instruments of the observatory. The observatory is about to receive another great telescope, and our duties at Mount Hamilton will be materially increased on this account. By leaving the programme of astronomical lectures under the control of the president they can be arranged so as to fulfill all wants at Berkeley and at the same time not to interfere with the work at Mount Hamilton.

The principles formulated in what precedes appear to be of general validity. They are easy of application to any particular case. The section of this chapter which gives the courses of instruction at various American colleges will enable any competent teacher to select the particular courses of study to meet the special demands of his students. These courses are, it must be remembered, the result of long experience, and they have been arranged by teachers of the first rank, many of whom are investigators of distinction.

It is likely that a student intending to devote himself exclusively to astronomy will be able to spend at least three years in graduate work and to take his doctor's degree. It is obvious from an inspection of the foregoing programmes that such a student can find ample opportunities at any one of a number of American colleges, and that it is no longer necessary to go abroad to obtain the highest grade of instruction. On the other hand, each college possesses certain special and peculiar facilities, and each observatory works in a particular direction or line. It is much to the advantage of the student to become more or less familiar with different methods of work and with various instruments. It follows, therefore, that his three years of graduate work should be spent at more than one college when such a course is practicable. If he has passed his undergraduate years of study in one college it will often be desirable for him to select another for the first two years of his graduate course, and to spend the third year at still another, at home or abroad. The advice of his immediate instructors should, of course, always be sought before making a choice; and it should be remembered that it is the influence and guidance of accomplished astronomers and men that is to be sought rather than the mere facilities afforded by great establishments.

The pupils of a Bessel or of an Argelander lived in the midst of the highest intellectual activity and breathed their methods in, as it were, insensibly. The largest instrumental facilities will not make up for the lack of the spirit of research, which is the sole important matter.

CHAPTER XIX.

DIGEST OF LAWS RELATING TO TEXT-BOOKS, THEIR SELECTION AND SUPPLY.[1]

[The digest of the public school laws of the States of the Union, Report of the Commissioner of Education for 1893-94, pp. 1063-1300, contained laws upon text-books to that time, but not separate from other laws.]

The attention devoted to text-books in the laws of the various States varies greatly. An implied control by local boards under their responsibility for the general welfare of the schools is all that appears in the laws of Alabama. In several States the authority of selection and the mode of supply occupy pages of law, and heavy penalties are pronounced for those who use books or methods of supply not duly appointed.

California publishes a series of text-books whose use is obligatory in primary and grammar schools.

The law in Indiana contemplated an optional course—to contract with publishers of existing books; to purchase and publish prepared manuscripts; to employ authors to prepare manuscripts and publish them. The first plan was followed.

A clause in the law of South Dakota, requiring a limiting statement in every contract, anticipates a time when the State will publish books and the contract for any book corresponding to a State publication is to become void.

The twenty-fifth legislature of Texas (1897) provided for a report to the twenty-sixth legislature upon the feasibility of State publication of common-school-text-books.

A careful distinction is to be made in the uses of the word contract in the various laws. It is used in certain cases to mean an agreement to sell the books to individuals at specified rates when public authorities do not buy for general use. In certain other cases it is used for the mutual obligation assumed where public authorities purchase the books, of which purchase there are two groups of conditions: In one, public authorities buy to make sure of the supply to the patrons to whom the books are ultimately sold; in the other, the books remain public property and go into the hands of pupils for their free use.

The official title of the chief officers of the public schools in particular States varies in form, and for brevity the name State superintendent is sometimes used without regard to the variations in official words.

Many States require guaranties from publishers to furnish books of stated character at stipulated wholesale, retail, introduction, exchange prices—part or all—which may be indicated in a general way as publishers' guaranties.

The term temperance lessons, when herein used, is an abbreviation for "instruction in physiology and hygiene with special reference to the nature of alcoholic drinks and narcotics and their effect upon the human system," or a kindred expression.

[1] By James H. Blodgett.

The mode of choice of the principal school officers is here indicated in parenthesis when it is plainly stated in the published school law.

In certain States the use of books is regularly furnished free to pupils. These, with the units bearing the expense, are: Delaware (district); District of Columbia (below high schools); Idaho (district); Maine (town); Maryland (county); Massachusetts (town); Nebraska (district); New Hampshire (town); New Jersey (school corporation); Pennsylvania (school corporation); Rhode Island (town).

In New York (rural) district boards furnish indigent pupils; (Union school district) boards of education are authorized to furnish books "to pupils out of any money provided for the purpose," but no mode of providing money is indicated.

In the following States, where books are usually individual property, local authorities have legal sanction for supplying the use of books free to indigent pupils, obligatory in all except Illinois and Missouri, where it is permissive: California (district); Illinois (district); Indiana (township); Kentucky (county); Missouri (district); Montana (district); Nevada (district); New Mexico (district); Virginia (district); Washington (district).

In certain States free text-books are furnished irregularly on local popular vote—local option, as it might be called. These are: Colorado (district); Connecticut (town); Iowa (district); Kansas (district); Michigan (district); Minnesota (district); North Dakota (district); South Dakota (district); Vermont (town); Wisconsin (district).

In the following, contracts bind publishers to furnish books to patrons at stipulated prices: Arizona, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Oregon, Texas, Utah, Virginia, Washington, Wyoming.

Boards of education are authorized to purchase the books and sell to individuals in the following: New Mexico, Ohio, South Carolina, West Virginia.

The student of laws needs continually to bear in mind that in many States special charters have conferred local authority not shown in the general laws.

Particulars for the States individually are more fully stated below.

Those States are first presented in which the books become private property.

The number against the name of each State shows the year of the latest available edition of its school laws.

STATES IN WHICH SCHOOL BOOKS BECOME PRIVATE PROPERTY.

Alabama, 1895.—The general law does not specifically fix authority for selection of text-books. In special charters the authority is given to the boards of education. In one case (Decatur) the law requires the board to "provide the text-books."

Arizona, 1897.—It is the duty of the Territorial board of education "to prescribe and enforce the use of a uniform series of text-books in the public schools," such series not to be changed during four years following adoption. The publishers' guaranty is required. Trustees refusing or neglecting to enforce the use of prescribed books or using other books in the prescribed studies are subject to a fine not exceeding $100, or by imprisonment not to exceed three months and removal from office.

Arkansas, 1897.—The (elected) State superintendent of public instruction is required to "prepare, for the benefit of the common schools of the State, a list of such text-books on orthography, reading in English, mental and written arithmetic, penmanship, English grammar, modern geography, and history of the United States as are best adapted to the wants of the learner and as have been prepared with reference to the most philosophical methods of teaching those branches, and shall recommend the said text-books to teachers and to directors throughout the State." (Sec. 6975.)

"The directors of each school district * * * shall adopt and cause to be used * * * one series of text-books in each branch or science taught in the public schools of their respective districts, and no change in these books shall be made for a period of three years, unless it be by a petition of a majority of the voters of the district." (Sec. 7046.)

Directors are limited to the list recommended by the State superintendent. (Opinion of attorney-general). Penalty: Any person failing in his duty under Sec. 7046 shall be fined not less than $10 nor more than $50, payable into the county treasury. (Sec. 7070.)

California, 1895.—By law of 1885 and authorization of later laws, the State board of education, consisting of the governor, State superintendent, and principals of State normal schools, has compiled or caused to be compiled for the common schools these text-books: Readers, spellers, arithmetics, grammars, United States histories, geographies, physiology and hygiene, including a system of gymnastic exercises, and special instructions as to the nature of alcoholic drinks and narcotics and their effect upon the human system.

"Whenever any one or more of the State series of school text-books shall have been compiled and adopted, the State board of education shall issue an order requiring the uniform use of said book or books in the common schools of the State, * * * and no school board or other school authority in this State shall have the power to authorize the use of any * * * books as text-books other than those directed to be used by the order aforesaid of such State board, except books on such subjects as are not provided for by text-books published by the State. The superintendent of public instruction must withhold from any city, city and county,[1] county, or from any school district in this State using schoolbooks in violation of the provisions of this act and section all school money to which it may be entitled until it comply with the requirements of this section; and any moneys so withheld must be apportioned by the superintendent at the next annual apportionment in the same manner as other school moneys in the treasury." (Law of 1891.)

The printing of these text-books is done under the supervision of the superintendent of State printing at the State printing office.

All orders for text-books are to be made on the superintendent of public instruction, accompanied by cash in payment at the price fixed by the State board of education as the cost price at Sacramento, and the cost of postage if to be shipped by mail.

The following persons are entitled to order books:

(1) County superintendents of schools, for the use of teachers, parents, and pupils in their counties only.

(2) Principals of State normal schools, for their own [use] and for the use of the pupils in their respective schools only.

(3) The secretary or clerk of any school district in the State, for the use of the pupils in such district only; but no books ordered by the county superintendents, or clerks of district boards of trustees, or principals of normal schools shall be sold at a price exceeding the cost price at Sacramento, with the actual cost of freight and cartage added.

(4) Any retail dealer who first transmits to the State superintendent of public instruction an affidavit pledging himself not to sell the books to be sold again, or to any person beyond the limits of the State, or at a price exceeding the price to the pupil fixed by the State board of education.

The boards of supervisors of the counties are required to provide a revolving fund to enable the county superintendent to purchase the State text-books; all moneys taken therefrom to be replaced by the moneys received from the sale of books by himself, teachers, or clerks of boards.

All schoolbooks compiled by the State must be furnished to the public-school children of the State at the cost of printing, publishing, and distributing the same, the cost of distribution taken to be the cost of postage required for mailing each book. (Act of 1887.)

[1] City and county governments may be merged and consolidated into one municipal government with one set of officers. (Const., Art. XI, sec. 7, amend. of 1894.) The city of San Francisco and the county of San Francisco are merged and consolidated, and are known in the law as a city and county.

School boards must furnish books for children unable to purchase them, the books remaining district property, and kept in the district library when not in use.

The high schools of California are maintained at the expense of the county, city, incorporated town, or school district in which they are respectively situated, receiving no aid from State funds, which are exclusively applied to the payment of teachers of primary and grammar schools. The courses of study and the text-books for high schools are prescribed by their respective boards, and, except in cities and incorporated towns, subject to approval by the county boards. The use of the State series of text-books is required in grades and classes for which they may be adapted, but the penalty of loss of State moneys, laid upon the common schools for use of other books, can not affect the high schools.

Florida, 1897.—Text-books are not specifically mentioned. Each county board, in consultation with prominent teachers, prescribes a course of study. (Sec. 40.)

Georgia, 1897.—"The county board of education shall prescribe, from time to time, what text-books and books of reference shall be used in the common schools of the county: *Provided*, That the Bible shall not be excluded from the common or public schools of the State. * * * When such books are prescribed they shall not be changed for five years thereafter, except by a three-fourths vote of all the board. * * * County boards shall not be permitted to introduce into the schools any text or miscellaneous book of a sectarian or sectional character. No teacher shall receive pay for any pupil who is allowed to use any other than the prescribed text-books."

In Georgia public schools are partially supported by tuition, which gives force to the penalty for use of unauthorized books.

Illinois, 1897.—The district directors determine what branches of study shall be taught and what text-books shall be used and they are required to enforce uniformity, and permit no change oftener than once in four years. They have power to purchase, at the expense of the district, text-books to supply indigent children by loan.

Indiana, 1897.—The State board of education, consisting of the governor, State superintendent, presidents of the State university, Purdue University, the State normal school, and superintendents of schools of the three largest cities, was authorized in 1889 to invite proposals: (1) From publishers for furnishing books to the school trustees of the State for a term of five years; (2) from authors who have unpublished manuscripts; (3) from parties ready to undertake the compilation of the required books.

The subjects prescribed were: Spelling, reading, arithmetic, geography, English grammar, physiology, history of the United States, and a graded series of writing books.

Books are supplied under contracts with publishers. The State is expressly protected from any liability to the contractors, who receive their pay solely from the proceeds of sales upon a plan as follows: Every school corporation certifies to the county superintendent (appointed by township trustees of the several townships) the number of the respective books required in its schools. The county superintendent makes requisition upon the (elected) State superintendent, who makes requisition upon the contractor, who within ninety days ships the books to the county superintendent. The latter notifies the local trustees, who take the books certified by them as needed and furnish them to the school patrons or school children of the corporation at the contract price for cash only, except that the corporation furnishes necessary books to indigent children, who would otherwise be unable to attend school. Any child 6 to 21 years of age, and any parent, guardian, or teacher of such child, may buy at contract price from the county superintendent, who makes separate requisition on the contractor for these books.

Every three months each school trustee receiving books makes a report and pays over cash received from sales to the county superintendent. If after ten days this duty has been neglected, the county superintendent is required to enter suit within

fifteen days. Ten days after the quarterly report of the trustees the county superintendent makes a detailed report, accompanied by cash from sales, to the contractor, to be enforced in case of failure by suit against the superintendent and his sureties. In this and the preceding case judgment is to include a fee for the attorney prosecuting.

Books may be sold by the trustees to dealers, who are prohibited from selling above the price fixed in the contract between the State and the contractor. To compensate dealers for their trouble, the books are furnished to them at 10 per cent deduction from contract price, one-half the deduction being borne by the school corporation, one-half by the contractor.

The penalties for embezzlement and failure of duty in regard to the money involved are heavy fines and imprisonment.

Kentucky, 1896.—The county board of examiners, consisting of the county superintendent and two persons of high specified qualifications, appointed by the county superintendent in each county, fixes a list, with publishers' guaranty, not to be changed for five years. Penalty for accepting anything of value for influencing choice, fine of $500 and removal from office; for offering it, fine of $500.

The (elected) county superintendent ascertains from trustees and teachers and otherwise the number and cost of text-books in each branch needed by indigent children in the county, and on his report to the county judge the latter is required to purchase them from an allowance, not to exceed $100 per annum in any county, and turn them over to the county superintendent for distribution.

Louisiana, 1894.—"The State board of education shall strictly enforce a uniformity of text-books in all the public schools, and shall adopt a list thereof, which shall remain unchanged for four years after such adoption. For satisfactory reasons shown to said board it may change said list or adopt a list generally preferred by teachers or parents in certain localities, maintaining, as far as possible, a uniformity of text-books, and without placing parents and guardians to further expense. The adoption of such a list and apparatus shall be by contract to the lowest bidder, subject to the change aforesaid, and to the best advantage as to cost to pupils."

Mississippi, 1896.—The county school board adopts a series of books for five years on publishers' guaranty. Penalty: Pupils without the prescribed books in any branch are not to receive instruction in that branch.

Missouri, 1897.—The State auditor, attorney-general, (elected) superintendent of public instruction, president of the State normal school at Kirksville, and one practical public-school teacher, appointed by the governor, constitute a schoolbook commission. This commission, upon bids submitted, made contracts for books to be supplied for five years, from September 1, 1897, to be used exclusively after September 1, 1898. The books are furnished through dealers or by mail at guaranteed prices: (1) contract; (2) retail; (3) mailing.

Any director or board of directors permitting any other text-book to be used in the same branches and the same grades as the contract list is deemed guilty of a misdemeanor, and is subject to a fine of $5 to $25 for each offense; but supplementary reading may be used when furnished without expense to pupils and without displacing any contract book. Districts furnish indigent children from the contingent fund. The act does not apply to cities having a population of 50,000 or over.

Montana, 1895.—The State board of education, consisting of the governor, (elected) State superintendent of public instruction, attorney-general, ex officio members, and eight appointed by the governor, recommends to the legislature a uniform series of text-books to be used in the public schools below the high schools.

The State superintendent prepares lists of publications suitable for school libraries, with prices. He prescribes a course of study for all public schools.

Local school boards provide books for indigent children; require all pupils to be furnished with suitable books as a condition of membership in school; determine what branches shall be taught additional to those required by law, subject to approval by the (elected) county superintendent.

Nevada, 1897.—The State board of education, consisting of the governor, (elected) superintendent of public instruction, and president of the University, prescribes a uniform series of text-books in the principal studies pursued in the public schools, including temperance lessons, not to be changed oftener than once in four years. Text-books in algebra, geometry, drawing, natural history and philosophy, astronomy, and elements of bookkeeping are prescribed, as well as those for common English branches.

Penalty for failure to use the books of the list, forfeiture of the district's share of public-school moneys.

The boards of school trustees furnish indigent children, holding the books as district property.

New Mexico, 1895.—The Territorial board of education, consisting of the governor and the presidents of the University at Albuquerque and the Agricultural College at Las Cruces, is empowered to adopt a system of schoolbooks for exclusive use in the public schools of the Territory. It has power to contract with publishers, through the superintendent of public instruction (appointed by the governor, by and with the advice and consent of the council), for purchase and delivery of books.

The books purchased in the name of the Territory shall be sold to the counties for cash only, at cost and freight, with 5 per cent added for necessary expenses. Accounts are settled by the superintendent of public instruction on the tenth of each month, and a full settlement is made between the Territory and the contractors semiannually, March 1 and September 1. No change is to be made for four years from adoption. Penalty: Any teacher, school officer, or county superintendent violating the rules of the board is deemed guilty of a misdemeanor, and is subject to a fine of from $10 to $100. Indigents are furnished with books by district boards.

North Carolina, 1895.—County boards adopt series of text-books for their respective counties for three years, excluding sectarian and political books, and fixing prices for the term of adoption.

Ohio, 1897.—A commission, consisting of the governor, secretary of State, and (elected) State commissioner of common schools, fixes maximum prices on books offered through proposals filed in the office of the commissioner of common schools and confirmed by agreement for five years. It is unlawful for any board of education to adopt or cause to be used any book not filed as above.

Publishers failing to maintain the supply as provided are to have the book in question permanently rejected, and to pay $500 for each failure, to go to the common-school fund of the State.

The State commissioner of common schools in the first half of June, annually, notifies boards of education regarding the publishers whose guaranties are filed. On the third Monday of August, or at an adjourned meeting within two weeks, each board elects the studies to be pursued, and the books to be used in the schools under its control. No text-book so adopted is to be changed, nor any part altered or revised, nor any other text-book substituted for five years from adoption without consent of three-fourths of the members elected, given at a regular meeting.

Each board at regular meetings in April and August is to determine the kind and number of books required in its schools for the next six months, and cause an order to be drawn for the amount in favor of the clerk of the board; the clerk then orders the books from the publisher, the board paying transportation charges from the contingent fund.

The board has authority to arrange for the care and sale of the books to pupils of school age at not exceeding 10 per cent advance on the cost. The board may contract with local dealers to furnish books at rates above indicated, the board being responsible to the publishers for all books purchased by the board. When pupils remove from any district to a district using other books, and wish to dispose of their books, the board of the district from which they remove is authorized to purchase their books at a fair valuation and resell them. The local board furnishes indigent pupils by loan.

Oklahoma, 1897.—By law of March 12, 1897, the Territorial superintendent of public instruction (appointed by the governor, by and with the advice and consent of the council) was required to ascertain within sixty days what text-books were in most general use, and later enter into contracts for five years with the publishers of said books for supplying the public schools, securing a guaranty in a bond of $20,000 that the books shall be supplied at the lowest prices accepted anywhere in the United States; that the prices shall not be advanced, and that purchasers in Oklahoma shall have the benefit of any reduction made anywhere in the United States.

On the completion of the above transactions with publishers the Territorial superintendent was required to notify all county superintendents and local boards of education and school districts regarding the same in full detail. Existing contracts in any town or city were to be unaffected by this law. Any school officer or employed teacher receiving any gift or reward for his influence in behalf of any publisher or dealer is deemed guilty of a misdemeanor, liable to a fine of from $50 to $500, with or without imprisonment in the county jail not less than six months.

Oregon, 1893.—The (elected) State superintendent, by law of 1893, under direction of the board of education, consisting of the governor, secretary of State, and State superintendent, issued a circular to each (elected) county superintendent and each member of the State board of examiners, containing a list of the studies required to be taught in the public schools, with the wholesale, retail, exchange, and introductory prices of all books in the list. On return by the persons addressed as above of the circulars fully answered by indication of their preferences, the circulars were laid before the State board of education, and the book or series in any branch receiving the majority of circular votes became the authorized book or series in its branch for six years, from October 1, 1895. The publishers furnished prescribed bonds before adoption, and those whose books were adopted placed price-list cards in every schoolhouse.

In school districts, with 1,000 or more, between the ages of 4 and 20 years, the district board is authorized to select text-books for the high schools only, but must make no changes oftener than once in six years.

The State board of education may order the State superintendent to issue special circulars for selection of books on account of exorbitant prices, the better character of more recent publications, or any good and sufficient cause. The action on these circulars is the same as on the regular circulars, and the book or books selected must be introduced within six months under the standard penalty.

Penalty: Any district neglecting to provide for the introduction of the authorized books forfeits its share of the school fund for the succeeding year and until all the authorized books are introduced.

South Carolina, 1897.—The (elected) State superintendent of education is required, in connection with the State board of education, consisting of the governor, State superintendent, and not exceeding seven others appointed by the governor, to secure uniformity in the use of text-books throughout the State, as far as practicable, and to forbid the use of sectarian or partisan books and instruction.

The State board of education is required to make agreements with publishers as to supply and prices, and may require them to establish a depository in each county under bonds for fulfillment of agreement of not over $5,000, with a penalty of $25 for each violation, the books not to be changed for five years. It is unlawful for any teacher to use any book not prescribed without written consent of the board.

A law of 1897 authorizes a county board to use a sum, not exceeding $500, as a fund for providing pupils of the county with schoolbooks at cost or exchange prices.

Tennessee, 1895.—The county superintendent (chosen by the county court) is required "to keep himself informed as to the merits of text-books and to suggest to the district directors such changes as may from time to time be advisable, with a view to securing uniformity in the course of study throughout the county, when it can be done without increased expense to the parent."

A text-book on "The elementary principles of scientific agriculture" was prepared for the public schools by Prof. N. T. Lupton under a commission to secure such a book without cost to the State or to the school fund.

Texas, 1897.—The State board of education, consisting of the governor, secretary of State, and comptroller, together with the (elected) State superintendent of public instruction, the president of the Sam Houston Normal Institute, and the attorney-general, constitute a State text-book board to select and adopt a uniform system of text-books for the use of the public free schools. This board was required to appoint a commission of five teachers or superintendents, not more than one from any Congressional district, to examine in executive session all books submitted as samples, and report upon their merits irrespective of price. The board, in adopting books, is required to regard the report in connection with the bids, none of which are to be for a longer term than five years. With bids, invited by advertisement, are to be deposited $500 to $2,500, according to number of books the bidder proposes to supply, as a forfeit for failure to file bond and contract, deposits being returned to those whose bids are not accepted. All books in use are to be exchanged and a contract is to be executed under a good and sufficient bond of not less than $10,000.

The board, meeting as designated in advertising for bids, decides the acceptance of proposals and the necessary bonds. The contract price is to be plainly printed on the back of each book by the contractor, not above the lowest price at which it is furnished elsewhere in the United States.

The State is not to be liable to the contractor for any sum whatever, but the contractor must depend solely upon proceeds of sales, and the State reserves the right to terminate the contract on any change in the law making it desirable.

The contractor must maintain a depository designated by the board, and one or more agencies in every county of 500 pupils or more.

Authority is given to secure publication of text-books for branches not adequately represented in proposals. The law took effect ninety days after the adjournment of the legislature on May 21, 1897. The books adopted are to be exclusively used, except that supplementary books, not at the cost of patrons, are permitted.

Every teacher or trustee who violates the act is guilty of a misdemeanor and finable $10 to $50. Any county, city, or town may fulfill existing contracts, and cities of 10,000 population come under provisions of the act only by their voluntary choice.

The board is required to submit to the governor, before the twenty-sixth legislature, a report discussing the feasibility and the cost of State publication.

Virginia, 1892.—"Uniformity of text-books and the furnishing of schoolhouses with such apparatus and library as may be necessary shall be provided for on some gradual system by the [State] board of education. The two works of John Esten Cooke, entitled, respectively, Virginia; A History of her People, and Stories of the Old Dominion, shall be included in the list of text-books."

The State board of education, consisting of the governor, superintendent of public instruction (elected by the general assembly), and attorney-general, made contracts with publishers by which a series of books became established for four years from August 1, 1894. The board prescribed that counties and cities could change during the four years from other books in use, but must keep the newly-adopted books four years from adoption, if continued so long on the list of the board. Every pupil is required to be supplied with proper books before admission to any public school. City and county superintendents (appointed by the State board of education and confirmed by the senate) are charged with securing arrangements for having supplies of the adopted books within easy reach at stipulated prices.

School districts provide books for indigent pupils.

Washington, 1893.—The State board of education, consisting of four suitable persons, two being teachers in the common schools, appointed by the governor, by and with the advice and consent of the senate, together with the superintendent of public

instruction—is authorized to adopt a uniform series of books for the common schools, not to be changed for five years, except on failure of publishers to comply with their contract.

During June, 1895, the State board of education made contracts and prepared a list of books to stand for five years, with publishers' guaranty.

City boards of education may adopt books additional to those prescribed by the State board, but make no changes within five years of adoption, and they provide books for indigent children.

All children are required to be supplied with the prescribed books as a condition of membership in the schools.

Any district using text-books other than those prescribed or failing to comply with the course of study prescribed by the board of education forfeits 25 per cent of its school fund for that year.

West Virginia, 1897.—A list of text-books, with prices, obligatory for five years from July 1, 1896, is part of the law, no revision to be allowed during the contract, except that geographies may be modified to conform to the changes occurring in political divisions and through new knowledge. The State superintendent was charged with the duty of making contracts with publishers, and a State schoolbook board of three persons, not more than two of the same political party, to be appointed by the governor, was provided to fill out any needed selections. Contracts were not made for certain text-books named in the law, and the governor appointed a board as above September 9, 1895.

The board of education of every district is required to appoint a depositary under approved bond of double the value of books likely to be on hand at any time. The depositaries from time to time make lists of books deemed necessary to keep a sufficient supply on hand, which, on approval of the board, are signed by the president and secretary and forwarded to the publishers, who forward the books to the depositary with duplicate bills—one for the depositary and one for the secretary of the board of education. Each sixty days, or oftener if required, the depositary pays to the sheriff of the county cash received from sales since previous payment, less his commission. The sheriff gives duplicate receipts, one going to the secretary of the board, that he may duly keep the account. The sheriff accounts for his receipts in his annual settlement with the board, whose orders he also pays when he has funds, with interest from presentation, if not then in funds. The accounts of moneys paid for books and amounts received from sales of books are kept with the building fund of the district. The depositary is allowed 12 per cent on sales, out of which he is to pay all charges of transportation.

Penalty on teacher who disregards directions to use adopted books—forfeiture of $10 of his salary. Any publisher, school officer, teacher, or other person violating any provision of the act is deemed guilty of a misdemeanor, finable $10 to $50. By the succeeding law the fine is $3 to $10.

By law of February 19, 1897, a county schoolbook board, composed of the county superintendent, the secretary of the board, and eight other citizens and taxpayers, not more than five of one political party, at least four freeholders and not teachers, at least three teachers, appointed by the county court, was established in each county.

The details of the law are generally similar to those of the law for a State school board, except in transferring the power of selection to county authority. All contracts existing are to stand till their due expiration.

The boards allow depositaries not exceeding 15 per cent on sales and pay the cost of books and the charges for transportation. The permanent retail price established by the local board is not to exceed 25 per cent advance on contract price.

Boards are authorized to buy, at a fair valuation, books of scholars about to remove into a county where different books are adopted, and through the depositary superseded books are taken up.

Wyoming, 1895.—The constitution provides that "neither the legislature nor the superintendent of public instruction[1] shall have power to prescribe text-books to be used in the public schools."

By a law of 1888, at the expiration of the period of five years, for which the books now in use are adopted, the county superintendents[2] and city superintendents of schools in the Territory shall meet at a call of the Territorial superintendent of public instruction to adopt a series of text-books, and the books thus adopted shall be the only legal text-books to be used in the public schools of the Territory for the ensuing five years. In the change to a State the law continued in force.

STATES IN WHICH SCHOOLBOOKS ARE, OR MAY BE, PUBLIC PROPERTY.

In the following States provision is made, obligatory or permissive, for furnishing the use of text-books free to pupils, for sake of brevity called free text-books.

Colorado, 1893.—"Each school board * * * shall have power, and it shall be their duty, * * * to fix the course of study, the exercises, and the kind of text-books to be used: *Provided*, That but one kind of text-book of the same grade or branch of study shall be used in the same department of a school, and that after the adoption of any book it shall not be changed in less than four years, unless the price thereof shall be unwarrantably advanced or the mechanical quality lowered or the supply stopped. * * *

"To provide books for indigent children on the written statement of the teachers that the parents of such children are not able to purchase them, and to furnish free text-books for the use of all pupils when authorized to do so by a majority vote of the district as expressed at any regular or special meeting.

"To require all pupils to be furnished with the proper and suitable books as a condition of membership in school."

Connecticut, 1895.—The State board of education, consisting of the governor, lieutenant-governor, and four persons appointed by the general assembly, "may direct what books shall be used in all its [State] schools, but shall not direct any book to be changed oftener than once in five years." (Sec. 10.)

"Any town, at its annual meeting, may direct its school visitors or board of education, or town committee, to purchase, at the expense of said town, the text-books and other school supplies used in the public schools of said town, and said text-books and supplies shall be loaned to the pupils of said public schools free of charge." (Sec. 53.)

"Each board of school visitors * * * shall prescribe, * * * subject to the control of the State board of education, the text-books to be used." (Sec. 71.)

"The board of education of any district or the board of school visitors or town school committee of any town may, in addition to the provisions of section 71, prescribe the use of other series of books to be used as text-books in reading: *Provided*, Such additional series are purchased by the district or town and the use thereof furnished free to the scholars." (Sec. 74.)

Delaware, 1893.—By the law of 1885 the State board of education, now composed of the governor, secretary of state, and the three superintendents of the counties, appointed by the governor, meets every five years "to determine what changes shall be made in the text-books to be used in the said free schools, * * * and * * * no change shall be made in any text-books to be used in the said free schools, except at the meetings to be held every five years as directed by this act."

By act of 1891, "on and after the first Saturday in April, A. D. 1891, the school commissioners or trustees of each school district or districts in the State shall furnish the necessary text-books free to all the pupils enrolled in the free schools of the State in the manner hereinafter provided.

"SEC. 2. The school commissioners or trustees shall order from the publisher or publishers the books which have been adopted by the State board of education

[1] Elected man or woman.

[2] Elected men or women.

* * * at the net contract prices at which the publishers have agreed to supply the same, as follows: There shall be a blank order book prepared by the State treasurer for the use of the commissioners, which shall contain duplicate order blanks with a printed list of the books * * * adopted * * * and the net contract prices. * * *

"Duplicate orders shall be filled out and signed; * * * one * * * shall be forwarded to the State treasurer to be forwarded to the publisher or publishers, and the other shall be kept as a stub in the order book as a voucher.

"The State treasurer, on receipt of an order, * * * shall make entry of the amount of the order * * * against the district * * * in a book kept for that purpose, and shall forward the order at once to the publisher or publishers, requesting them * * * to ship the books as directed * * * and send duplicate invoices, * * * one to the State treasurer, the other to the district clerk of the school district. * * *

"The State treasurer shall pay * * * out of the school fund of the State for books thus supplied * * * and deduct the same from the amount to which such district * * * may be entitled under the school laws * * * : *Provided*, * * * the State treasurer shall pay no bill for at least thirty days from the time it is rendered, in order that he may be notified by the school commissioners of any error or failure on the part of the publisher. * * *

"SEC. 3. It shall be the duty of the clerk of each school district * * * to distribute the books received * * * to the scholars * * * or their parents, guardians, or other person, as they desire, upon receipt for the same. The clerk * * * shall be responsible for the safe-keeping of the books furnished him, * * * and also for prices of books sold. * * *

"SEC. 4. It shall be the duty of the school commissioners to provide for the safe-keeping and care of the books * * * returned by the pupils at the close of the annual term to the clerk. * * * The school commissioners may furnish books at cost to pupils who wish to replace books lost or willfully destroyed, or who may wish to own their books; and shall turn the proceeds * * * into the school fund of the district. * * *

"SEC. 5. It shall be the duty of every teacher * * * to hand to the commissioners of the district, at the end of each quarter, * * * an inventory of the books in the school belonging to the district, stating by whom such books are held, their condition, and the number of and by whom books have been destroyed. Until such report shall have been made it shall not be lawful * * * to pay such teacher his or her salary. * * *

"SEC. 7. The text-books for the colored schools of the State shall be ordered by the county superintendents of the respective counties through the county treasurer of each county."

The duties of the county superintendent and the teachers of the colored schools relating to books correspond to the duties of clerks of boards and teachers of white schools regarding books.

District of Columbia, 1898.—In recent years books have been supplied by loan, free, to pupils below the high schools, through specific appropriations made by Congress, upon which the District depends for its legislation.

Idaho, 1897.—A State board of text-book commissioners, consisting of the president of the university, the State superintendent of public instruction, and three others engaged in educational work, appointed by the governor, after proposals for furnishing books free on board cars were received for a term of six years from September 1, 1893, selected a series of books for exclusive use in the State.

The chairman of each board of trustees in a county forwards to the (elected) county superintendent a list of the books needed. The county superintendent makes the necessary orders to the State superintendent, who orders from the contracting publishers, and on receipt distributes to the county superintendents. All payments

to county superintendents are forwarded to the State treasurer, who is charged with settlement of bills of contractors.

By amendatory act of 1897, the trustees purchase at the expense of the district all text-books used in the public schools to be either loaned to the pupils free of charge, or sold at cost to any pupils of the district for cash only. The clerk is custodian and must monthly deposit a detailed statement of accounts and of conditions of books.

Iowa, 1897.—"The board of directors of each * * * school corporation * * * is * * * empowered to adopt text-books for the teaching of all branches * * * taught * * * and to contract for and buy said books * * * and to sell the same to the pupils of their respective districts at cost. * * * The board * * * may select one or more persons within the county to keep said books * * * for sale" under bond. "All the books * * * purchased under the provisions of this chapter shall be paid for out of the contingent fund."

The books are selected after advertisement for proposals. Contracts are made for five years; the publishing contractors give bonds.

The (elected) county superintendent, the county auditor, and the members of the board of supervisors constitute a county board of education. On petition of one-half the school directors of a county, outside the cities and towns, asking for a uniform series of text-books in the county, the board provides for submitting the question of county uniformity of text-books to the electors at the next annual meeting. If a majority of the electors voting vote affirmatively the county board selects the text-books for the entire county and contracts for the same. The list adopted is obligatory upon all public schools of the county except in the cities and towns, which may adopt the same books if they so choose. The board of education may arrange for depositories and pay for the books out of county funds, to which proceeds of sales are returned. On petition of one-third or more of the legal voters in any school corporation the question of providing free text-books is submitted to the voters at the annual meeting, notice thereof being in the call for the meeting.

If a majority of the legal voters present and voting favor it, the board procures the books, by selection and contract as above, and loans them to pupils, who are held responsible for damage or loss, but are permitted to buy any text-books used in the school at cost. The electors, by like steps, can secure the discontinuance of loaning text-books to pupils.

District boards may furnish school books to indigent children when they are likely to be deprived of the proper benefits of school unless so aided.

Kansas, 1897.—A school text-book commission of eight members, appointed by the governor, by and with the consent of the senate, not more than three from any political party, with the State superintendent ex officio chairman, for four years from the first Monday in April, 1897, was authorized to select and adopt a uniform series of school text-books for use in the public schools in the following-named branches: Spelling, reading, arithmetic, geography, English grammar, physiology and hygiene, History of the United States, civil government, elements of algebra, and physical geography, elements of natural philosophy, bookkeeping, and a graded series of writing books.

Bids were invited from publishers for furnishing books for five years from September 1, 1897; also from authors of unpublished manuscript; also from persons willing to compile books. The law defines the maximum prices and provides for exchanges to secure uniformity.

The State is in no case to be liable for any sum of money, but the contractors must obtain their recompense wholly from the sales as provided for. Any contractor must arrange with at least one dealer or agent at each county seat to handle, sell, and exchange the books, such agent being allowed to charge an advance not exceeding 10 per cent on the contract price; also furnish to any citizen or school district at the same price and on the same terms as to dealers or agents in cash

orders of not less than $10, delivered at any railroad station in Kansas named in the order.

After the annual school meeting each clerk is required to transmit an estimate of books required to the county superintendent, who sends a requisition on the publishers for books needed for the county. By a two-thirds majority of the legal electors any board may buy the necessary books from the incidental funds, retain the ownership, and furnish the use free to pupils.

The contracts stand five years, excluding all other text-books on their subjects, except that other text-books may be used as reference books, and allowing previous contracts to expire before the present law takes effect in localities under such contracts.

Any person who receives more than the legally authorized value, any member of a school board, or any teacher permitting the use of any text-book other than those provided for in the act is deemed guilty of a misdemeanor, finable $25 to $100, with or without imprisonment in the county jail not to exceed 90 days.

If the State superintendent or any county superintendent accepts anything as an inducement to recommend or introduce any book, he shall be found guilty of a misdemeanor, finable $1,000 to $5,000, with or without imprisonment in the penitentiary for one to five years.

Maine, 1895.—"Towns shall provide schoolbooks for the use of the pupils in the public schools at the expense of said town. * * * Provided, however, that any parent or guardian of any pupil in the public schools may, at his own expense, procure for the separate and exclusive use of such pupil the text-books required to be used in such schools."

In every town a superintending school committee is required to "direct the general course of instruction and select a uniform system of text-books. * * * Any text-book thus introduced shall not be changed for five years, unless by a vote of the town."

Penalty upon any person violating the provision, a forfeit not exceeding $500, to be recovered in an action of debt by any school officer or person aggrieved.

Maryland, 1896.—"Schoolbooks shall contain nothing of a sectarian or partisan character.

"The board of public school commissioners of Baltimore city and each board of county school commissioners shall adopt and purchase text-books for use in the public schools of said city and of the several counties in the State, as such new text-books are required, and when so procured, the necessary text-books shall be furnished free of cost for use in the public schools of the State, subject to the order of said boards, * * * but said boards shall have the right at any time to change any series of text-books already in use or hereafter adopted; provided, that text-books shall be furnished under the provisions of this act to the several grades in the public schools successively, beginning with the first grade; and provided, that said boards shall not be required to expend during any school year for said text-books more than the several amounts of money received by said boards, respectively, under the provisions of this act; and provided, that indigent pupils of all grades shall receive text-books free of cost, as provided under the provisions of existing laws; and provided, the said respective boards shall adopt such means for the purchase of text-books by competitive bidding, as far as is practicable, and at the lowest possible price; and provided, that parents or pupils may purchase their own text-books when they think proper." The details of titles, publishers, and prices are reported to the State board of education and set forth in full in its annual report.

"The said several boards * * * shall provide for the issuing, safekeeping, care, and return of the same. * * *

"The said several boards shall keep an account of all moneys expended under the provisions of this act * * * and no money so received by them shall ever be used for any other purpose than for the purchase of schoolbooks. * * *"

In 1896 the sum of $150,000 was made an annual appropriation to be expended, or

so much thereof as necessary, for the purchase of text-books, the whole to be apportioned in each July to the counties and the city of Baltimore.

Massachusetts, 1895.—Chapter 103 of the acts of 1884 provides that the school committee of every city and town shall purchase, at the expense of such city or town, text-books and supplies used in the public schools; and said text-books and supplies shall be loaned to the pupils of said public schools free of charge, subject to rules of the committee.

The school committee directs what books shall be used, and prescribes, as far as practicable, a course of studies and exercises.

The committee must require the daily reading of some portion of the Bible, without written note or oral comment. It is recognized as fulfilling the requirement of law that the teacher shall read the Bible as part of the morning devotional service without requiring every pupil to do so. (Pub. stat. rel. to pub. inst., 1892, with annot. and expl., p. 46.)

Michigan, 1893.—The district board specifies the studies to be pursued in its schools and selects the text-books, including those with the temperance lessons, approved by the State board of education. Text-books adopted are not to be changed for five years except by consent of a majority of the qualified voters present at an annual meeting or a special meeting called for the purpose.

The district board is authorized to purchase, at district expense, books necessary to supply indigent pupils.

On a majority vote, at an annual meeting with specified previous notice of the vote, the district board shall purchase the necessary books, to be the property of the district and loaned to pupils, providing that individuals may buy their books from the board and that the question of free text-books may be revived at later annual meetings. The books are bought after proposals through contracts.

Officers neglecting to proceed after vote of the district for free text-books are deemed guilty of misdemeanor and liable to a fine not more than $50, with or without imprisonment in the county jail not exceeding thirty days.

Districts in cities under special charters are exempt from the provisions of the act, but may proceed under it if authorized by a majority vote of their district boards.

Minnesota, 1897.—"The board of trustees or board of education of each and every school district * * * is empowered to select, adopt, or contract for the text-books needful for the use of the school or schools under its charge; and the said board * * * shall have power to purchase the text-books selected or contracted for, and provide for the loan, free of charge, or sale at cost of such text-books to the pupils." * * *

No adoption or contract must be for less than three nor more than five years, within which the text-books shall not be changed.

Publishers, prior to any contract, are to file lists of their books with prices and samples with the State superintendent of public instruction, who furnishes certified copies of the lists and prices to the clerk of each school district.

Whenever five or more legal voters of any district petition the board of school trustees to submit to vote the question of free text-books, it is the duty of the trustees to call a meeting with ten days' notice. The question may come up at an annual meeting with like notice. If favored by a majority vote, the trustees shall provide free text-books out of the school funds.

The temperance lessons are obligatory, and the superintendent of public instruction and the presidents of the normal schools are directed to recommend a suitable text-book and furnish it at cost to the several school districts.

Nebraska, 1897.—It is made the duty of school boards to purchase all text-books necessary for the schools, and they are authorized to make contracts with publishers for terms not exceeding five years at prices not exceeding those for any individual or corporation in the United States, and with guaranty of any reduction made anywhere during life of the contract.

Publishers are to file price lists and bonds of $2,000 to $20,000 with the State super-

intendent of public instruction, who prepares copies of the lists, and sends them, as well as forms of contracts, through the (elected) county superintendents to all districts.

All text-books purchased by district boards are held as the property of the district and loaned to pupils free of charge, the pupils being held responsible for any damage, loss, or failure to return the books in due time, and to the person designated by the board.

Any parent or pupil may purchase from the board necessary books at cost price. The board may designate a local dealer to handle the books for the district, with such increase above contract price to pay cost of transportation and handling as may be agreed upon.

New Hampshire, 1898.—Each town constitutes a single district for school purposes. The school board prescribes the studies. The board is required to purchase text-books at the expense of the city or town, and loan them to the pupils free of charge, under such rules as it prescribes, making provision for sale at cost to such pupils as wish to purchase them for their own use.

New Jersey, 1895.—Each township constitutes a school district; each city, borough, and incorporated town constitutes a school district separate and distinct from the township school district.

It is the duty of the local board of education to provide text-books and loan the same free to all the pupils, subject to orders and regulations of the board. The purchase is made from a free text-book fund raised by special school tax.

Any school officer accepting any consideration for promoting the sale of any books, or violating the provisions of the act, is deemed guilty of a misdemeanor, punishable by removal from office.

New York, 1898.—In common school districts the inhabitants at an annual or special school district meeting may appropriate money for the purchase of free text-books for indigent pupils. This is the extent of their power, and even this is rarely exercised. There are about 12,000 common-school districts.

The inhabitants of union free-school districts are authorized by statute to appropriate money for the purchase of free text-books for all the pupils residing in their districts. The proposition to be submitted to the meeting must be given and served upon every inhabitant prior to the meeting. This power is rarely exercised. There are about 700 union free-school districts and probably scarce 100 of them provide free text-books for all pupils.

The cities of the State by their charters are authorized to provide free text-books for all resident pupils. The books are loaned to be returned at the end of the term. No reports on the subject are made to the State department by districts or cities, but the belief is that about one-half the cities avail themselves of the provisions of their charters for free text-books.[1]

North Dakota, 1895.—The school board of any city, town, or district is empowered to select, adopt or contract for text-books, also to purchase them and provide for the loan, free of charge, or sale at cost to the pupils.

On petition of a majority of the qualified electors the board must submit the question of providing free text-books to the next annual meeting, and on a majority vote it is the duty of the board so to provide.

Pennsylvania, 1897.—Immediately after the annual election of teachers in each school district and before the opening of the next term there must be a meeting of the directors and teachers of each district, at which the directors decide upon a series of schoolbooks for exclusive use for the year. The school directors or controllers purchase text-books as required out of the school fund and furnish them free of cost for use in the schools, subject to the orders and provisions of the directors or controllers. No change in text-books must be made more than once in three years.

[1] The statement regarding New York is partly of items not in the law, but it rests upon a letter of the State superintendent, June 13, 1898.

"The Scriptures come under the head of text-books and they should not be omitted from the list." (Page 146.)

It is unlawful for anyone officially connected with the school system to promote the sale of any book or have an interest in such sale, under penalty of fine or imprisonment.

Rhode Island, 1896.—The school committee of each town prescribes the studies and purchases the text-books to be loaned to the pupils free of charge, subject to rules of the committee. A change may be made in the schoolbooks in any town by a two-thirds vote of the whole committee, and, in the city of Providence, by a majority vote, provided that no change shall be made oftener than once in three years, unless by consent of the State board of education.

South Dakota, 1897.—The county board of education—consisting of the (elected) county superintendent, the superintendents of cities or towns, the county state's attorney, the board of county commissioners, and one person from each commissioner's district, selected by the school board of such district—selects and adopts all text-books for a term of five years, after receiving proposals and guaranties from publishers. The board of county commissioners contracts with publishers, designating a depository in the county where books shall be sold at not more than 10 per cent advance on cost. A provision is inserted in the contract that it becomes void as to any book when the State has published a corresponding book. Each depositary is put under bond and must make returns to the county auditor monthly.

On a written petition of the electors of any school corporation the board shall arrange to furnish free use of books. A safe bookcase is required. The books are to be the property of the school corporation, used only on order of the board.

No school officer must have any interest in supplies.

Utah, 1896.—The State superintendent of schools, county superintendents, and the principal of the State normal school, or a majority of them in convention, decide what text-books shall be used, except in cities of the first or second class, not to be changed for five years, except for sufficient cause, to be decided at a special convention called for that purpose.

Proposals are invited and contracts for furnishing books are made with bonds.

In cities of the first or second class the board of education decides upon text-books.

The mode of procedure is essentially the same in cities and in the State at large.

In cities of the first and the second class the boards of education have power to furnish and loan to pupils all text-books used by them.

The refusal or neglect of the trustees of any district, or the board of education of any city to enforce the use of the books adopted is deemed a misdemeanor on the part of any trustee so refusing or neglecting, punishable by a fine not exceeding $100, and removal from office.

Vermont, 1893.—The text-books are selected by county authority, publishers contracting to furnish them for sale in the towns. The chairman of the board is required to arrange with one or more persons in each town to keep the books for sale, to receive not more than freight and express charges and 10 per cent advance on contract prices. The use of other books, if furnished without expense to pupils, is tolerated.

Any town or district may purchase and hold text-books for use in its schools, if it so votes in a meeting named for that purpose.

Any school official receiving anything for promoting use or sale of any book is finable $20 to $100.

Wisconsin, 1897.—At the annual meeting of every school district the question of providing free text-books must be submitted to popular vote.

The boards are required to determine what books shall be used in their respective districts.

No change in text-books shall be made for three years, and then only by majority vote at an annual meeting duly notified of the vote on a change.

Every member of a board, where a list has been lawfully adopted, who shall order a change within three years shall forfeit the sum of $50.

The districts and cities furnishing free text-books are not subject to the time limit and the law as to changes.

CHAPTER XX.

EDUCATION IN CUBA, PORTO RICO, AND THE PHILIPPINES.

By R. L. Packard.

I. Cuba and Porto Rico.

The statistics of the institutions of public instruction, and those of private elementary schools, in Cuba, taken from official and other authentic sources, are placed at the beginning of the following compilation for the convenience of those who already know the history and understand the general social condition of affairs in the island. To others they can have, however, little significance without knowledge of the colonial history and of the kind of instruction which is given in the institutions represented. To supply this information the statistical review is followed by a historical sketch of the relations between the colonies and Spain—the origin and growth of the separatist tendency—which is taken from a German authority, and this is followed by a history of the educational, literary, and scientific movement in Cuba, from a Cuban source, together with plans of studies in the university and other institutions; then the testimony of competent judges as to the condition of education in the island at different periods from Humboldt's time down to 1890 is given, and a summary of the whole evidence concludes the paper.

The educational system of the Spanish colonies has always been a subordinate part of that of the Peninsula, the same laws governing both, and the royal orders and decrees have so coordinated the two that the professorate in both has come to form essentially one body. The universities of the colonies were modeled upon the famous ones of Spain, and, until recently, education retained its aristocratic or university character, no attention being paid to the general and public education of the masses.

The educational system of Cuba consisted of the University of Havana and institutes of secondary instruction (colleges and seminaries) in the capitals of the provinces and in Porto Rico. The rector of the university was the immediate head of this system under the Captain-General of the island, as representative of the King. Royal orders and

decrees regulated the conduct of education, appointed teachers, created or changed the plan of studies, and managed all the other details of the institutions of public instruction, which alone could grant degrees. The degrees of the private institutions (colleges of the religious orders) required verification before they could be accepted as valid and identified with those of the public institutions. Degrees of the University of Havana were valid in Spain, and the degrees of bachelor of the secondary institutions in Cuba and Porto Rico were sanctioned by the university.

STATISTICS OF SUPERIOR AND SECONDARY INSTRUCTION.

The university.—According to the annual report for 1888–89 the Royal University had 1,046 students for that year, of whom 167 were inscribed in the faculty of philosophy and letters; 187 in that of the natural sciences; 240 each in the law and medical faculties, and 214 in pharmacy. In the three following years there were 1,009, 1,059, and 1,083, respectively, showing little change. The expenditures for the first-named year were 126,859 pesos,[1] of which 121,209 pesos were for salaries and 5,650 pesos were for material. The income, largely from fees, was 77,638 pesos, leaving a deficit of 49,221 pesos. A full account of the university will be given below.

By the law of 1880 an institute of secondary instruction was established in the capital of each province, each of which comprises a number of colleges and seminaries in the vicinity. Thus the Institute of Havana has 28 colleges incorporated under it; that of Matanzas, 8; that of Puerto Principe, 1; that of Santa Clara, 18; that of Pinar del Rio, 3, and that of Santiago de Cuba, 12.

The following tables will show the details of attendance at these institutes by provinces.[2] The plan of studies will be given later on.

Institute of Havana.

Year.	Students.	Bachelor degrees.	Year.	Students.	Bachelor degrees.
1863	663	.....	1887–88	1,752	204
1864–65	764	.....	1889–90	1,774	209
1865–66	541	.....	1890–91	1,956	243
1866–67	683	.....	1891–92	1,853	253
1886–87	1,804	186			

The superior normal school for male teachers, created in 1890, had 40 students the first year and 42 in 1891–92; that for females had 85 students the first year and 173 in 1891–92. The "professional" school of the island of Cuba (founded in 1855) had 43 students in 1890–91 and 51

[1] According to Department Circular No. 54, issued by the U. S. Treasury April 1, 1898, the Cuban peso = $0.926.

[2] From La primera enseñanza en la isla de Cuba. Por José Estebán Liras, Secretario de la Junta Provincial de Instrucción Pública de la Habana. Habana, 1893.

the next year. It gives business degrees to superintendents or overseers and surveyors. The professional school of painting and sculpture of Havana had an attendance as follows:

1867	75
1887–88	502
1890–91	431
1891–92	400

The plan of studies of this well-known school will be found in another place. The provincial school for artisans had 115 students in the day school and 316 in the night school in 1890–91.

A large number of "colleges of primary instruction" for boys and girls is given for the province of Havana by Señor Liras, but without statistics, and several charity schools are also mentioned.

Nine Sunday schools for poor girls and servant girls, conducted by women, were established in 1882–1884, and have been attended by over 5,000 young women since they were started, and have an attendance of from 30 to 100.

Province of Matanzas.—The colleges in this province have been established for the most part since 1850, but the statistics for some of them ceased with 1868, the year of the insurrection.

The institute of Matanzas was created in 1863. The attendance and degrees have been as follows:

Year.	Students.	Bachelor degrees.	Year.	Students.	Bachelor degrees.
1865–66	257	.....	1890–91	367	51
1866–67	238	.....	1891–92	396	43
1867–68	308	.....	1892–93	371	40
1887–88	226	.....	1893–94	422	47

The expenditures were 13,650 pesos for salaries and 1,000 for material in the latter year; total, 14,650 pesos. There were 16 periodicals and newspapers in the province in 1894.

Province of Santa Clara.—The institute was founded in 1882. Its activity is shown as follows:

Year.	Students.	Bachelor degrees.	Year.	Students.	Bachelor degrees.
1886–87	334	56	1891–92	331	33
1887–88	590	34	1892–93	331	36
1889–90	329	29	1893–94	339	.....
1890–91	326	26			

The expenditures were 15,900 pesos, 14,900 for salaries and 1,000 for material. There were 30 periodicals, ranging from a medical and scientific journal down to newspapers, in the province.

Province of Puerto Principe.—Besides several private colleges of secondary instruction, the institute proper was founded in 1863, and was supported by the State until recently, but is now maintained by the provincial authorities.

Its recent history is shown by the following table:

Year.	Students.	Bachelor degrees.	Year.	Students.	Bachelor degrees.
1886–87	113	17	1890–91	144	19
1887–88	121	14	1891–92	169	18
1889–90	143	27			

The institutes of Pinar del Rio and Santiago de Cuba had 145 and 255 students, respectively, in 1889–90—the last date of which we have official reports. The bachelor degrees were 12 and 11 for that year. The institute of Porto Rico the same year had 6 bachelor degrees confirmed by the university.

PRIMARY EDUCATION.

The following statistics are taken from the pamphlets upon primary education in Cuba by José Estebán Liras, secretary of the provincial junta of public instruction of Havana. Each pamphlet is devoted to a separate province, and gives the history of each school in the province, with statistics down to 1894, thus showing the development of elementary education.

The public schools have, for the most part, been established since the middle of this century, after the law of 1842 came into effect, which provided for inspection, and created provincial committees. In 1833 the schools which had been established in the whole island, mainly through the efforts of the Sociedad Económica, were 210 for whites and 12 for colored, with an attendance of 8,460 whites and 486 colored, 8,946 in all. Of the white schools, 129 were for boys and 81 for giris, while the schools for the colored were equally divided. The total amount allotted for public instruction was 40.499 pesos. Normal schools were established after 1850, and by 1858 the appropriation from municipal funds for primary instruction was 156,910 pesos. In 1867 there were 752 public and 532 private schools, with an attendance of 27,780. The public schools cost then 596,922 pesos. The insurrection of 1868 interfered seriously with education, and a great number of schools were closed.

It will be seen from the preceding tables relating to secondary education, and also from those that follow relating to elementary schools, that there is a hiatus from 1867 to 1887, the former date just preceding the ten-year insurrection.

The totals showing the population, the number of primary schools, and the attendance, together with an analysis of the census figures showing the percentage of whites and the illiteracy, are here given. For details of statistics by provinces the reader is referred to the tables below. In 1894 the population, total number of public and private schools, and their attendance, in the four provinces of Havana, Matan-

zas, Puerto Principe, and Santa Clara were as follows (the figures for Havana were those of 1893):

Population	1,175,000
Public and private schools	1,255
Attendance	47,752

There was an increase from 1887 to 1894, as the following will show:

	1887.	1894.
Population	1,100,222	1,175,000
Number of schools	963	1,255
Attendance	36,467	47,752

In the province of Havana in 1893 74.55 per cent of the population were white and 5.83 per cent of the entire population were receiving elementary instruction.

In the province of Matanzas in 1887, the latest date for which there are available figures, the whites were 55 per cent of the population, and 60 per cent of the white and 93 per cent of the colored population could neither read nor write.

In the province of Puerto Principe the whites formed 80 per cent of the population in 1887. Over 50 per cent of the white and 70 per cent of the colored population could not read nor write in 1894.

In the province of Santa Clara 69 per cent of the population was white in 1887, and about 72 per cent of the whites and 90 per cent of the blacks could neither read nor write.

The following statistical tables of primary instruction in the different provinces are taken from the authority referred to above (Liras):

Province of Havana, population in 1893.

	Male.	Female.	Total.
White (native)	191,758	149,094	340,852
Colored	50,960	55,693	106,653
Chinese	5,543	41	5,584
Foreigners	2,448	1,587	4,035
Total	250,709	206,415	457,124

It results from this that 74.55 per cent of the population in 1893 were white, 23.36 per cent colored, 1.23 per cent Chinese, and 0.86 per cent foreigners. Also 54 per cent were males, but a larger proportion of the native whites were males (56 per cent) than the blacks (47 per cent), while 99 per cent of the Chinese and 61 per cent of the foreigners were of that sex, they being away from their natural habitats.

The statistics of primary schools show as regards number:

	Public schools.			Private schools.			Public and private.		
	1867.	1887.	1893.	1867.	1887.	1893.	1867.	1887.	1893.
For boys	74	107	107	50	125	140	124	232	247
For girls	66	82	91	78	83	190	144	165	281
For both sexes	.....	.....	11	2	21	16	2	21	27
Total	140	189	209	130	229	346	270	418	555

There was, therefore, one school to every 1,455 inhabitants in 1867, one to 1,080 in 1887, and one to 824 in 1893.

There were 214 teachers in the public schools, 113 being males and 101 females. Seven were under 20 years of age; 97 were between 20 and 40; 88 between 40 and 60, and 22 were over 65, and they received salaries varying from 1,500 to 300 pesos, only 2 receiving the former and 42 the latter.

The attendance was as follows:

	Public schools.			Private schools.		
	1867.	1887.	1893.	1867.	1887.	1893.
White:						
Boys	5,083	3,995	4,336	2,497	2,987	4,614
Girls	2,945	2,891	3,036	1,291	2,628	5,790
Colored:						
Boys	.....	1,023	1,003	186	722	1,152
Girls	.....	810	1,080	120	660	1,401
Total	8,028	8,719	9,455	4,094	6,997	12,957

These tables show that the total number of pupils in 1893 in the public and private schools of the province was 22,412. It also appears that there was 1 pupil to every 32 inhabitants in 1867; 1 to every 28 in 1887, and 1 to every 20 in 1893. But in the public schools alone there was 1 pupil to 48 inhabitants in 1867; 1 to 51 in 1887, and 1 to 48 in 1893. The tables show also that 2.07 per cent of the population of the province attended the primary public schools and 2.83 per cent the private, and that 4.90 per cent of the population received primary instruction. A school census of children up to 10 years for 1893 shows that the white boys were more numerous than the girls, being 23,326 to 21,844, while the colored were 8,121 boys to 8,266 girls.

The total expense for public primary education in 1893 was 207,666 pesos, which was at the rate of about 22 pesos per pupil.

A general summary of primary instruction for the province of Havana is shown in this table:

	1867.	1887.	1893.
Population	392,975	451,528	457,124
Number of schools	270	418	555
Pupils	12,122	15,716	a 26,732
Expenses (pesos)	.....	179,097	207,666

a Includes 4,320 domestic pupils.

Province of Matanzas—Population.

1867	194,595
1887	259,508
1894	265,025

In 1877 the whites were 49 per cent and in 1887 55 per cent of the population, and the males were 57 per cent. In 1887 5 per cent of the whites could read only, and 35 per cent could both read and write. Of the colored population 1 per cent could read only, and 6 per cent could both read and write; so that 60 per cent of the white and 93 per cent of the colored could neither read nor write.

The following table gives the number of schools in 1887 and 1894.

	Public schools.		Private schools.		Both public and private.	
	1887.	1894.	1887.	1894.	1887.	1894.
Boys	69	75	44	25	123	112
Girls	49	53	71	34	129	99
Both sexes	19	24	1	58	1	58
Total	137	152	116	117	253	269

There were 156 teachers for the 152 public schools, with salaries ranging from 1,200 pesos to 150 pesos. There were 5,652 pupils in the public schools—3,442 boys and 2,210 girls—and 4,416 pupils in the 117 private schools—2,236 boys and 2,180 girls—making 10,068 in both. This makes 1 public school to 1,743 people, and 1 private school to 2,265 people. There was 1 pupil in the public schools to 47 inhabitants.

SUMMARY.

	1887.	1894.
Population	259,508	265,025
Number of schools	253	269
Pupils	9,075	10,068
Expenses (pesos)	110,262	133,514

Province of Puerto Principe—Population.

	1867.	1877.	1887.	1894.
Whites	38,556	56,781	54,231	.....
Colored	23,871	12,464	13,558	.....
Total	62,427	69,245	67,789	69,061

The whites were 61 per cent of the population in 1867, 82 per cent in 1877, and 80 per cent in 1887. The males predominated, being 55 per cent in 1867, 63 per cent in 1877, and 53 per cent in 1887.

The public elementary schools were as follows:

	1867.	1887.	1894.
Boys	17	17	20
Girls	8	15	17
Both sexes	.....	.....	4
Total	25	32	41

Or 1 public school to 2,501 people in 1867; 1 to 2,118 in 1887; 1 to 1,684 in 1894.

The private schools at the same periods were:

	1867.	1887.	1894.
Boys	12	6	2
Girls	9	1	7
Both sexes	.....	27	26
Total	21	34	35

Or 1 private school to 1,359 people in 1867; 1 to 1,027 in 1887; 1 to 908 in 1894.

There were 42 teachers for the 41 public schools in 1894, with salaries from 1,500 pesos (1 teacher) down to 300 pesos (with 16 teachers).

The attendance was:

	1867.	1887.	1894.
Boys	1,095	1,032	986
Girls	277	158	801
Total	1,372	1,190	1,787

Or 1 pupil to 45 inhabitants in 1867; 1 to 56 in 1887; 1 to 37 in 1894.

The private schools were as follows:

	1867.	1887.	1894.
Boys	397	277	281
Girls	148	320	507
Total	545	597	788

Or 1 private school pupil to 114 people in 1867; 1 to 113 in 1887; 1 to 86 in 1894.

In 1894 the attendance was:

In the public schools	1,787
In the private schools	788
Total	2,575

Therefore 2.58 per cent of the population were educated in the public and 1.14 per cent in the private schools—3.72 per cent in all. Over 90 per cent of the white and 70 per cent of the colored population can neither read nor write. The expenses of the public schools in 1894 were 33,548 pesos, so that each pupil cost 18 pesos, and each school 818 pesos.

The summary shows as follows:

	1867.	1887.	1894.
Population	62,527	67,789	69,061
Number of schools	46	66	76
Pupils	1,917	1,787	2,575
Expenses (pesos)	.....	27,829	33,548

Province of Santa Clara.

The history of primary education in this province may be said to have begun as soon as Velasquez founded the cities of Sancti Spiritus and Trinidad, because Bartolomé de las Casas took part in the founding of Trinidad, and he was among the first to instruct the young Indians. But the church instruction was a different thing from secular education, the beginning of which may be put at 1712 in this province, as will be related in its place.

Population.

	1867.	1877.	1887.	1894.
Whites	186,297	205,694	244,344	.....
Colored	102,830	115,703	109,778	.....
Total	289,127	321,397	354,122	383,790

In 1867 64 per cent of the population were white; in 1877, 64 per cent, and in 1887, 69 per cent. The males were 56, 57, and 55 per cent for the same years. In 1887 2 per cent of the whites and 1.65 per cent of the blacks could read only, and 27.75 per cent of the whites and 10.52 per cent of the blacks could both read and write.

Public schools.

	1867.	1887.	1894.
Boys	50	123	121
Girls	23	54	72
Both sexes	.....	.....	21
Total	73	177	214

There was, therefore, 1 public school to 3,960 inhabitants in 1867, 1 to 3,026 in 1887, 1 to 1,793 in 1894.

Private schools.

	1867.	1887.	1894.
Boys	16	37	53
Girls	12	52	68
Both sexes	.....	3	20
Total	28	92	141

There was 1 private school to 10,290 persons in 1867, 1 to 3,824 in 1887, 1 to 2,721 in 1894.

Public and private schools.

	1867.	1887.	1894.
Boys	66	158	174
Girls	35	108	140
Both sexes	.....	3	41
Total	101	269	355

There were 215 teachers for the 214 public schools, 132 male and 83 female, and their salaries ranged from 1,200 to 300 pesos. The public schools were attended by 4,694 boys and 3,395 girls, 8,089 in all, and the private by 2,279 boys and 2,329 girls, 4,608 in all, making a total attendance of 12,697 pupils. This makes 1 pupil in the public schools to 47 persons, and in the private 1 to 83 persons. The total expenses for the public schools were 150,644 pesos, so that each pupil cost 19 pesos, and each inhabitant was indebted 2.50 pesos for the public schools.

SUMMARY—PUBLIC SCHOOLS.

	1887.	1894.
Population	354,122	383,790
Number of schools	226	355
Attendance	9,889	12,697
Expenditures (pesos)	127,431	150,644

The only statistics available for the two remaining provinces, Pinar del Rio and Santiago de Cuba, are from the Anuario of the Real Universidad, and are for the year 1888–89. They are as follows:

	Total population.	Schools.			Attendance.			Total expenditures.
		Public.	Private.	Total.	Public.	Private.	Total.	
								Pesos.
Santiago de Cuba	271,010	110	76	186	6,031	1,837	7,868	82,596
Pinar del Rio	229,761	134	26	160	3,565	732	4,297	77,636

PORTO RICO.

Education of all kinds was greatly neglected in Porto Rico until 1837, many of the towns being without even a primary school, but since the institution of the provincial committees on primary instruction in that year (incorporated in the Royal Academy of Belles Lettres in 1851) much progress has been made. In 1861 there was a public school in every town, besides private ones in those of the first and second class. The city of San Juan had in 1861 six public and four private schools, four of the first for girls and two for boys, and of the last, two for each sex, besides a seminary, founded in 1831, with three professorships proper to the institution, and those of the French and English languages, mathematics, and design, which are supported by the Sociedad Económica de Amigos de Pais. According to a statement of the academy in 1852, the schools of the island were attended by 2,981 scholars. A large number of the boys were (1861) sent to Europe and the United States for education. The young creoles are exceedingly apt scholars, and very few attain manhood without a knowledge of reading, writing, and arithmetic, as, unfortunately, despising mechanical pursuits, their great aim is to qualify themselves for clerkships. The education of the females was, until 1861, much less attended to, and many could not write.[1] But in 1878–79 only 5,200 pesos were in the estimates for public instruction in the island, and in 1887 only about 14 per cent of the population could read and write. In 1890 the population was 810,394, with 350,000 whites.

We are fortunate in being able to secure the following more recent information from Mr. F. A. Ober, a gentleman who has made a study of the West Indies, and whose writings, giving the results of his ethnological and historical studies, are well known.

From a text-book upon the geography of the island, by Don Manuel Quiniana y Corton, 1879, he quotes that there were in that year 363 primary schools in the island, attended by 12,144 pupils of both sexes, 256 of which were for boys and 107 for girls. (The population was then about 700,000, more than half of whom were white.) Education was compulsory and gratuitous for poor children, who were supplied with

[1] The Spanish West Indies, Cuba and Porto Rico, from the Spanish of Don J. M. de la Torre (Porto Rico, by J. T. O'Neill), by Richard Swaynson Fisher. [New York, 1861.]

books, etc. From a work by a Spanish officer, Don Manuel Ubeda y Delgado, upon the history, geography, and statistics of the island, published in 1878 in Porto Rico, he takes the estimate for that year, which was 5,200 pesos out of 287,522 pesos for public works (fomento), and then quotes as follows:

The advantages of Porto Rico (as to education) are not equal to those offered elsewhere in countries more civilized, because we lack colleges and institutions of instruction of higher grade. The total lack of universities, institutes, and academies obliges fathers who desire to give their sons an education (daughters not considered) to send them to the Peninsula (Spain) and foreign countries, not that there are not good professors here of mathematics, languages, music, etc., but they are not numerous; still, by means of periodicals, standard works, etc., one may acquire a great deal that is attainable in more popular centers.

There is at present in construction a building in which will be installed the college of secondary instruction, directed by the Jesuit professors. This establishment is the only one of its class in the island, but fortunately it has given excellent results since (according to one of the professors) those who obtain its degree of bachelor of arts may rank with the best of those who enter the universities. The studies are distributed in five courses, or years, as follows:

First course.—Latin and Spanish grammar; Christian doctrine and sacred history; principles of and exercises in arithmetic.

Second course.—Latin and Spanish grammar; notions of descriptive geography; principles of and exercises in geometry.

Third course.—Exercises in analyzing and Latin translation; rudiments of Greek; notions of general history; arithmetic and algebra.

Fourth course.—Elements of rhetoric and poetry, with exercises in comparison of select pieces, Latin and Spanish, and in Latin and Spanish composition; exercises in Greek translation; history of Spain; elements of geometry and plane trigonometry.

Fifth course.—Psychology, logic, moral philosophy; elements of physics and chemistry; outlines of natural history.

Having completed these prescribed studies, including a course in French, in whatever year desired, students obtain the degree of bachelor of arts.

There is also a preparatory course for students of the first year. The average number of pupils examined for entrance is 173, of which number about 123 are approved and 50 rejected. The average number of graduates with the degree of bachelor is 15. About one-third the students, more or less, are residents and two-thirds from the outside. The Jesuits also conduct a seminary, with an average attendance of 8 scholars.

There is also an athenaeum, which occasionally holds public debates, scientific and literary, with gratuitous classes for its members.

There are also in the capital (San Juan) 23 schools, with an average attendance of 1,107 pupils, divided as follows: One superior for boys and 1 for girls; 4 elementary for boys and 4 for girls; 3 private for boys and 3 for girls, and 1 for adults; 2 primary schools [besides 6 in the suburbs. The estimates were 18,244 pesos in 1878].

In the capital also we find several charitable institutions where gratuitous instruction is given, notably (1) the Casa de Beneficencia, constructed in 1841–1847 with donations from the people of the province, and which gives asylum to an average number of 140 boys and 120 girls, who are given primary instruction as well as taught music, and for whom there are workshops in which they are taught shoemaking, carpenter work, tailoring, and cigar making for boys, and needle work, washing, etc., for the girls, under the direction of eighteen Sisters of Charity.

(2) The College of San Ildefonso, erected by the charitable efforts of benevolent bodies, occupies a vast edifice, in which poor girls to the number of 36 are educated up to the age of 20 years, and there is room for 24 boarders besides outside scholars,

all under the direction of the Sisters of Charity. Under their guidance also is the school for infants, in which an average number of 150 children of both sexes are instructed, the age limit being from three to seven years.

There is also a military school with the Captain General as director, and the chief of battalion occupying the barracks as subdirector.

In 1879 eleven papers were published in the island. The island is divided into seven departments besides the capital, and the total number of schools for these in 1878 was 274 for boys and 103 for girls—the attendance is not given—with an allowance in the estimates of 30,882 pesos.

There is a scientific and literary society in Ponce and another in Mayagüez, where there is a public library of 756 volumes. Mr. Ober gives estimates for education for 1894–95 and 1896–97, which included the institute, normal school, the atheneum of Porto Rico and lyceum of Mayagüez, amounting to 63,966 pesos in the former year and 69,776 in the latter, but primary education does not appear in the list.

Elementary instruction in Porto Rico.—The latest statistics of the elementary schools of Porto Rico are those for 1898, prepared by Dr. Carbonell, secretary of "Fomento," of the island, and obtained through the kindness of Prof. Mark W. Harrington.[1]

These statistics are as follows:

	Number of schools.
Northern district:	
Public schools	258
Private schools	28
Southern district:	
Public schools	252
Private schools	16
Total	554

[1] The same gentleman has furnished the Bureau of Education with a proposed plan of studies which was submitted to the "representative of public instruction of the United States in Porto Rico" by Señor Miguel Rodrig Sierra, the argument for which sets forth the previous deplorable condition of the schools and teachers in that island. The latter had no due respect or social position and were not free agents to develop their schools. The government was tyrannical and the administration torpid. The teachers were without protection, the schools without supervision, without books and scientific material suited to their needs. The preamble contains this curious appeal: "And we, the teachers of all periods; we who have consecrated our youth to the service of the great cause of teaching; we who have lost our time in dedicating it to great things under a corrupt system; we, in short, who, for love of our neighbor and solely for the country which gave us birth, have succeeded in supplementing by our earnestness the deficiencies of the system, are worthy and deserve, if the new Government wishes to do justly, to be conceded liberty in the teachers' chair and to be permitted to teach from texts selected by us freely. The American Government should concede to us all that is necessary, as directors of childhood and youth in Porto Rico, to form citizens worthy of the respect of the sons of Washington, among whom we now number ourselves."

Attendance.

Northern district:	
Boys	9,942
Girls	6,457
Southern district:	
Boys	9,132
Girls	4,207
Total attendance	27,936

Cost.

	Pesos.
Northern district	167,347
Southern district	164,020
Total, in Porto Rican money	[1]331,367

Children of school age.

Northern district:	
Boys	31,141
Girls	29,649
Southern district:	
Boys	34,224
Girls	30,681
Total of school age	125,695
Total attendance	27,938
Children without schools	93,757

The following interesting table shows the growth of elementary instruction in Porto Rico from 1864 to 1881, and is taken from the report of the secretary of the governor-general to the minister, made in the latter year, which is published in the Compilación Legislativa de Primera Enseñanza de la Isla de Puerto Rico, by D. Juan Macho Moreno (Madrid, 1895), a work which contains everything relating to the laws, regulations, programmes, forms, etc., of elementary education in the island.

It will appear from these statistics that the increase in the number of schools was insignificant from 1867 to 1878, but from that date to 1881 it was rapid.

Date.	Public schools.			Attendance.			Expenditures.		
	Boys'.	Girls'.	Total.	Boys.	Girls.	Total.	Personal.	Material.	Total.
							Pesos.	*Pesos.*	*Pesos.*
1864	74	48	122	2,396	1,092	3,488	35,542	1,535	36,857
1867	240	56	296	7,543	1,929	9,472	90,834	.....	90,834
1869	246	67	313	6,192	1,937	8,129	88,133	.....	88,133
1878	238	91	329	7,523	3,474	11,097	103,078	26,378	129,456
1880	328	104	432	10,736	4,482	15,218	142,454	48,704	191,158
June, 1881	372	112	484	18,025	6,095	24,120	181,334	70,621	256,955
July, 1881	384	117	501	18,025	6,095	24,120	191,424	71,245	262,669

From the same work we take a few specimens of subjects of examination programmes for teachers of elementary schools, to show the quality

[1] The Porto Rican peso is equal to 65 cents in United States money.

and scope of the preparation required. Passing over the programme on Christian doctrine and sacred history, those upon pedagogics, grammar, geography, arithmetic, history and physics, agriculture, industry and commerce, calligraphy, and orthology are all very full. For example, in morals instruction is to be given in the following subjects. Only a very few examples are taken out of many:

20. Obligations of man to his body and person; self-defense; immorality of suicide.
21. Obligations of man to work; evils of idleness. What are temperance, sobriety, chastity, and the opposite vices?
22. Duties of men to each other; obedience; benevolence.
23. Obligations to one's equals: urbanity, gratitude, fulfillment of promises.
25. Obligations to aid our fellow-creatures.
27. The duty of pardoning injuries; immorality of hate and vengeance.

In pedagogics the teacher is examined, among other things, as to—

10. Importance of attention; methods of awakening and maintaining it. The will, freedom, moral sentiments, moral science. Instincts, passions, good habits; pernicious effects of scandal upon the pupils.

There are several sections upon methods.

In algebra the subjects embrace equations of second degree, proportion, roots, logarithms, etc.

In the applications of geometry are surveying and surveying instruments.

In drawing there is the use of the scale, and many examples in the different orders of architecture, and in physics such subjects as—

11. Gases; atmospheric air: its physical properties; how it is shown to have weight; the barometer; Magdeburg hemispheres.
14. Molecular adhesion of solids and liquids; capillarity; the more common phenomena due to capillarity; endosmosis and exosmosis.
20. Light: hypotheses for explaining its nature; propagation, velocity, and intensity of light; photometers.
21. Refraction of light; its laws; phenomena dependent upon it; prisms and lenses; division of lenses by their curvature, and effects they produce with the luminous body in different positions.
29. Object of chemistry; chemical classification of bodies; analysis and synthesis; reagents; combinations and mixtures; affinity; composition of the air; Lavoisier's experiments on air.
30. Extraction of gold and silver.

These examples are sufficient to show the grade of questions asked. The programmes were published as late as 1893.

HISTORICAL SKETCH.

The preceding figures, as remarked at the outset, are unintelligible unless we know the social and political condition of the country as an outgrowth of its history, and we proceed to give the latter.

The same men who conquered Mexico and Peru settled Cuba and Porto Rico. Indeed, Cortes engaged his men in Cuba and took ship there for the mainland, and that island "has," as Humboldt says, "a

charm that is wanting to the greater part of the New World. It presents remembrances linked with the greatest names of the Spanish monarchy, those of Christopher Columbus and Hernando Cortes." It is curious to inquire what manner of men they were who, although a mere handful, ventured almost without hesitation to explore and conquer vast unknown countries. We observe the contrast between the Spanish conquistadores, the utterly bold, determined, large-minded adventurers, and the English and Dutch colonists of the next century on the northern seaboard. These latter had little of the conquering spirit about them. They left their native country to better themselves in a quiet way and to trade, and their ideas were principally limited to the unambitious parts they had to play. Their natural leaders stayed at home to attend to the promoting and financiering of the colonial interests instead of leading exploring parties in the wilderness. This contrast crops out in many ways. Governor Winthrop wanders three or four miles away from his companions and passes an anxious night alone in the hut of a friendly Indian. A hundred years before, a Spanish monk thought nothing of undertaking an expedition of a thousand miles in a wild country abounding in savages, and the English never undertook any such expedition as Coronado's march. They were not explorers but settlers, and only moved inland, as time went on, by a process of extrusion—by the same *vis a tergo* which drove them from Europe—so it came about that all the southwestern part of the United States received Spanish names as the Northwest was named by the other exploring nation, the French. After three centuries the requirements of a political situation stirred up the descendants of the British colonists to conquest, and they promptly dispossessed the Mexicans of their broad territories, and then the discovery of gold in California awakened the *auri sacra fames* which led them in hordes to the Pacific coast in the congenial search for sudden wealth. There was, however, one point of resemblance between the Spaniards of the sixteenth century and the English of the seventeenth. Both felt a responsibility for the lost souls they fancied they had found, and were zealous for the conversion and, incidentally, the education of the Indians. Wherever the Spaniards went they carried the university with them. No matter how narrow and perverted the education of the monks may have been, there was still in it a reminiscence of the humanities, if in nothing else than the monkish Latin they used, and some of the conquistadores themselves were imbued with letters. Even the private soldier Bernal Diaz was able to write his recollections of the mighty deeds he had witnessed, and he left an account which historians have used as an authoritative document. Like superiority of birth, superior education gave (as it still gives) an intellectual superiority of view, which was due to the European university, whose root fibers, when traced, will be found to penetrate that buried civilization from which all modern civilization has sprung, which once dominated the world with grandeur and

magnificence, and yet filled it with beauty and taste. The humanities give a culture for which no modern innovation, such as exclusively scientific studies, which are purely objective and mechanical in their essence, and therefore not tending to culture, can ever be a substitute; and it is perversion to regard such an abstraction as "science" as a new Muse, instead of the laborious handmaid of civilization, which she really is. So wherever the Spaniards came they brought culture, and it is interesting to note that to them this continent owes its first universities and first printing presses. Printing was done in Mexico a century before it was introduced into New England, and even in far-off Manila a history of the martyrdom of certain missionaries was printed at the College of San Tomas in 1634, six years before the printing press was set up at Harvard. The university at Lima is eighty years older than Harvard. This culture, corrupted as it was by monkish narrowness, resulted in time, after the institutions had become multiplied, in turning out scholars, historians, poets, statesmen, generals, and presidents of republics, of the native races, besides scientific writers who have made original investigations of the geology, botany, and mineralogy of their countries. The English, too, in the next century, brought the university with them, and English Cambridge supplied a hierarchy of culture which kept the colony out of barbarism. The university redeemed the English colonies, and the democratizing and equalizing public-school systems came later. The most original work of the seventeenth century in New England, Eliot's Indian Bible, was a child of Cambridge, and its existence was due to the same missionary spirit that actuated the Spanish monks and the Spanish kings, whose peremptory orders to the settlers to care tenderly for the Indians, treat them kindly, educate them, and convert them to the Catholic faith reappear in royal letter after letter. The English, like the Spaniards, showed a solicitude for the welfare of the souls of the natives, but it was manifested on a smaller scale, corresponding with the difference in magnitude between the Spanish conquest and the early English emigration.

As was remarked at the outset, it is important to know the antecedents of a population in which an educational system is established, and it is therefore worth while to give a summary of the political history of the Spanish colonies, and so obtain an idea of the character of the colonists, in order to understand the material upon which education has had to work. A summary of the kind desired is given by Ferd. Blumentritt, the German ethnologist, in an article upon the history of the separatist tendency (Separatismus) in the Spanish colonies, in the Deutsche Rundschau for July, 1898, which is of especial interest, as it gives particulars of the character and motives of the earliest emigrants to the Spanish colonies which are not brought out in the commonly known histories of the conquest. The article was written

before the events of 1898 deprived Spain of the last of her colonies; and the author says:

The names of Columbus, Balboa, Cortez, Pizarro, and Magellan are well known to all. Who of us when a boy did not read of the adventures and heroic deeds of the conquistadores and also of the cruelties they inflicted upon the natives of the New World? From these youthful recollections, and from the influence of the newspapers—often partisan and often misinformed—comes the judgment of the educated portion of our people upon the Spanish colonial relations, a judgment that amounts more or less to this: That the Spaniards, by their "devilish cruelty," have brought the inhabitants of their colonies to despair and revolt. Others see in the financial exploiting of the colonies by the mother country, or in the rapacity and dishonesty of the Spanish officials, the ground and inducement for a war of separation. Much in these views is erroneous, but one feature of them, even if not directly expressed, is true, namely, that only the Spaniards themselves are to blame for the efforts of the colonists to become independent of the mother kingdom. If one is inclined to regard this severe charge against Spain as unjust, let him answer the question: Why is it that it is only in Spanish colonies that separation finds so many supporters? And this further question: How is it that the desire for independence is found in such widely separated countries with such different organizations and populations as New Spain, South America, the Antilles, and the Philippines, manifesting itself in the suicidal fanaticism of white, yellow, brown, and black insurgents all over the Spanish colonial empire from the earliest times until now? The various colonies never had the same social organization, nor were they in the same economical or political conditions. In Mexico, Peru, and New Granada there were Indian farmers in the highlands and negroes on the coast. In Venezuela there were the region of plantations, where negroes predominated, and the llanos where the mixed race of the Llaneros ruled the steppes. The La Plata country had its Gauchos; the Antilles were the best representatives of the plantation system; while the Philippines had their Malay and Chinese mixed bloods, governed by Spanish religious orders—a variegated picture of different races and social organizations—and yet from all has come the same cry: "Out with the Spaniards! Freedom from Spain!" It is therefore clear that the seed of separation was carried from Spain to her colonies, and that not recently either, but more than three hundred years ago. For it was not the example of the Declaration of Independence of the United States of America that started the idea of separation among the Spanish colonies, although this example of the Anglo-Americans was a powerful aid, but the idea was already present. Spanish separation is not the result of the wicked example of the Yankees, but is the consequence of a process continuing through several hundred years, which we will trace from its beginning in the following sketch:

When the Spaniards settled the Greater Antilles and also established colonies on the mainland, in 1493–1520, the Government had only drawn the outlines of the relations between the new settlements and the mother country, allowing the settlers themselves the greatest liberty. Spanish cities were founded on American soil by Spanish citizens, who transplanted to the New World the free municipal constitutions of their native land. The citizens elected their representative city governments and officers (alcaldes, mayores), just as they had done in Spain, and their privileges as independent cities were confirmed by the King. A feudal nobility arose in the midst of the plains, where the Indian villages were divided among the conquerors as fiefs (encomiendas), and a title of nobility often went with these fiefs like, e. g., that of Marqués del Valle, which was given to Cortez, the conqueror of Mexico. By the great emigration to the New World the population of Spain was notably decreased, although not to so great an extent as is stated in some works, and yet the Government of Castile made no objection to the principle of emigration. I speak of the

Government of Castile because the crowns of the two Spanish empires, Castile and Aragon, were not united upon one head (that of the Emperor Charles V) until 1516. The Castilian Government took the position that only subjects of Castile should be allowed to settle in the New World, and even this permission had exceptions, for emigration was strictly forbidden to converts from Judaism and Mohammedanism and to all persons who had been punished by the Inquisition and their descendants. All these restrictions, however, were more or less evaded, for we find foreigners in the lists of the conquerors, who must, therefore, either have been naturalized as Castilian citizens (as was the case with Magellan, for example) or they were permitted to go by the Government, which, indeed, sometimes took them into its own service, of which there are numerous instances. Neither could the emigration of baptized Jews and Moors and their children—the so-called "new Christians"—or of those under the displeasure of the Inquisition be prevented. On the contrary, these two classes formed the main contingent of the emigrants, at least in the first half century of Spanish colonization, in spite of the combined vigilance of the church and the Inquisition. It is difficult for us now to imagine how those unfortunates, who were seeking an asylum in the New World, could have succeeded in escaping the sharp watch of the Holy Office and have reached the shores of America unmolested, for there were spies of the Inquisition on every ship. Yet not hundreds, but thousands, of those poor people made their escape, and we will cite two facts in proof of the statement, although many more could be given. When Hernando Cortez was summoned from New Spain the Government wished to enforce the prohibition of the emigration of new Christians. Accordingly an enumeration of them was taken throughout the whole viceroyalty as a preliminary to returning them to Spain, but the matter went no further, because the number of new Christians and of those under the ban of the Inquisition was found to be so astonishingly large that the decree of removal to Spain was not carried out through fear of a revolt. There were still more of these suspected subjects in Peru, a fact which should not excite our wonder, because Peru was the most remote of all the Spanish colonies in America, and it was natural for these marked men to endeavor to get as far as possible from the mother country, although even in that *Ultima Thule* of Spanish America freedom of opinion was not tolerated, and the Holy Office was represented in Lima by a tribunal of the Inquisition as early as 1570. So to Peru flocked crowds of Portuguese New Christians, either directly from Portugal or from Brazil, where converted Jews and Moors and their children were held in slavery. These Portuguese "New Christians" were especially the objects of the zealous care of the Holy Inquisition, because, on account of their business talents and their enterprise in mining, they soon acquired more wealth than the Spanish "Old Christians." We meet these Portuguese Jews (or "Judaizing Portuguese") in all the *auto da fés* of Lima, and, notably, on the occasion of the great ceremony of January 23, 1639, which was conducted with the customary pomp. Seven of the accused appeared upon white horses and with palm branches in their hands. They were the fortunate ones who had succeeded in proving their innocence. Fifty were condemned to wear the garment of disgrace, the symbol of heresy, the "*San benito.*" Among those condemned to death was Don Manuel Bautista Perez, who was noted for his wealth. He owned the house still known in Lima as "Pilate's house." The silver mines of Huarochiré, celebrated for their productiveness, belonged to him, besides two large plantations. He was found guilty of Judaism, and was condemned on that account and as a leader of the Judaizing Christians. With him were burned eight wealthy merchants and one of the best physicians of his time and country, Don Francisco Maldonado, a native of Tucuman (now Argentine), all being condemned for heresy and Judaizing. At the *auto da fé* of November 17, 1641, fourteen Judaizing Portuguese figured, and the Inquisition applied to the audiencia of Lima to expel the Portuguese, who were all more or less suspected of Judaizing, from the colony. Accordingly, the viceroy, Don Pedro de Toledo y Loira, Marquis de Mancera, required all the Portuguese in the colony to report to the authorities to obtain passes and go to Brazil or elsewhere

out of the colony. Six thousand of these people reported in accordance with this order, but by a large bribe they obtained a repeal of the decree and remained thenceforward in the country. The complaints of Judaizing decreased every year; yet in 1745 a wealthy landowner named Don Juan de Loyola died in the prison of the Inquisition, his servant having charged him with the offense of Judaizing.

There was, therefore, a class of men among the first emigrants who had no feeling of attachment or of grateful remembrance for the Spanish home they had left; but on the contrary felt only fear for every thing that came from Spain—her officials, her heresy judges, and her laws. These New Christians transmitted their aversion to Spain to their children, and as the latter became incorporated with the Old Christian emigrants and the Indians a caste was formed which, prominent by its numbers, intellectual activity, and wealth, would have become a dangerous ferment even if left to itself, but which was reenforced by a second emigration of dissatisfied masses.

This second wave of Spanish emigration was a consequence of the fall of Spanish liberty. Before the period under consideration the Spanish States possessed extraordinarily liberal constitutions (the Fueros), which far surpassed the English system of the time in respect of popular rights. We, in middle Europe, have given the nickname of "Spanish" to the stiff Burgundian etiquette introduced by Philip the Fair and Charles V into Spain, and by this rebaptism have got the false idea that this court etiquette was a national peculiarity of the Spanish people. As a matter of fact, however, before the entrance of the Hapsburgers into the Government, a tone of familiarity prevailed in the intercourse between the King and his subjects in Spain. In the sessions of the Cortes the deputies of the "third estate" criticised the King and his court with a freedom that would make the hair of a president of the Reichsrath of the present day stand on end with fright; yet neither the presidents nor the speakers of those days who expressed their opinions of their princes so openly were in danger of being accused of treason, and even Isabella the Catholic and her crafty husband never made any attempts to curtail the popular rights or even to trench upon them. This was reserved for the following emperor, Charles V.

Charles had inherited the crown of Castile in 1506, when he was 6 years old, and in 1516, after the death of his maternal grandfather, Aragon also became his. Born and brought up in Flanders, he first visited Spain in 1518, where at every step he and his Burgundian followers succeeded in wounding the national pride of the Spaniards at the same time that they broke the customs of the two realms. Then followed oppressive taxes, which were called for by Charles's contest for the Roman-German imperial throne. The discontent became general and broke out in a revolt which is generally called the revolt of the comuneros, a name taken from the great confederation of the cities known as the Junta Santa, or Comunidad, which was formed on July 29, 1520, at Avila. This confederation was the work of the "third estate," but at its head was a nobleman, Don Pedro Lase de la Vega, and the army of the federation was commanded by another noble, Don Pedro de Giron, and a high church dignitary, the bishop of Zamora, played a conspicuous and unexpected rôle in a military capacity. There is no doubt that the whole nobility and clergy would have ranged themselves on the side of the comuneros of the junta had it not, in its petition of right of October 20, 1520, presented to the Emperor an amendment to the constitution, together with other petitions and complaints, which proposed to remove the nobility from the whole machinery of the Government and hand over all Government affairs to the "third estate." The author of this radical-democratic constitution was, it should be said in passing, the aristocratic president of the junta himself. In answer to this attack upon their privileges the high nobility and clergy placed their property and power at the disposal of the Emperor, and the comuneros were defeated in the battle of Villalar on April 23, 1521. From this time on Charles began to rule despotically in Castile, which, with Aragon, had possessed the freest constitution in Europe up to that time. The Cortes were, indeed, summoned as before, but they played nearly the same part as the Senate in the time of the Roman emperors.

The first consequence of the fall of Spanish liberty upon trans-Atlantic possessions was an emigration in great numbers of malcontents and compromised persons to the new gold fields. Thus another element hostile to the mother country was added to the New Christians, which brought to the New World only bitter recollections of the home left behind, recollections that were handed down to the latest descendants, so that, for example, when a revolt against new monopolies occurred in Socorro, New Granada, in 1781, the insurgents took the name of comuneros. Therefore, in the first three or four decades of Spanish colonization, streams of emigrants reached America who had no special attachment to the old country, and who cherished only the animosity of malcontents toward the actual Government and the form of government itself. Besides these revolutionary constituents, the Spanish population of the New World was composed also of a great number of adventurers who had left Spain only out of ambition and avarice.

Long before Castilian liberty was buried on the battlefield of Villalar, Ferdinand, King of Aragon, who was carrying on the government in Castile for his uncle Charles, had taken care that the conquerors of the New World should not use the prestige of their achievements for establishing their own sway. Isabella the Catholic never had the remotest idea that it was possible for Columbus to create a kingdom for himself across the ocean by breaking away from Spain. The suspicious Ferdinand, who respected nothing except his religion, scented treason and defection everywhere, and he directed his efforts to removing the conquistadores from the possessions which they had conquered with their own strength and at their own expense and danger, and replacing them by mere officials who would be subservient servants of the Crown. The King was displeased when the conquerors of a district ruled it as governors, and every pretext was seized upon to withdraw the patents that had been granted, or, if that was impossible, by the subdivision of the whole districts, to restrict the governorship of the conquistadores at least in area. These latter tactics were followed in the case of the family of Columbus, whose inherited domain was much diminished by dividing Cuba. In the case of Vasco Nuñez de Balboa, the famous discoverer of the Pacific, the Crown listened to the complaints of dissatisfied colonists and used them to displace Balboa. But this was not enough. Balboa was still too dangerous as a private man, and so he had to die by the hand of the executioner. Everyone remembers what kind of thanks Cortez received for the conquest of Mexico.

Nor did the storm of royal displeasure smite only the lofty trees to the ground. The removal of the conquistadores from the offices which they had acquired on the strength of their patents as conquerors became reduced to a system that reached high and low indifferently. So that there was not only no sentiment of attachment to the old country among the conquistadores, but they cherished feelings of resentment which reminds one decidedly of the modern separatist sentiments of the Cubans, so strong were the feelings of the conquerors against their thankless fatherland. Thus all three of the elements which constituted the white population of the Spanish colonies were not well disposed toward Spain. The conquistadores, the new Christians, and the comuneros were all alike disposed, in the first decades of Spanish colonial rule, to sever from her the lands they had conquered for Spain.

The first undoubted illustration of this condition of affairs is afforded by the history of New Spain in the year 1526. Cortez had been summoned to Spain after experiencing a series of petty annoyances from the officials who had been sent over by Charles V. He obeyed the summons and journeyed from the city of Mexico to the coast to take ship at Vera Cruz for Europe. Before his departure from the capital, deputations from the cities he had founded in New Spain had come to him and urged him to resume the government of the colony. He refused to accede to this request, and on his journey from Mexico to Vera Cruz he had to receive deputations at every stopping place, from the feudal lords and citizens, who reiterated the request, and some even went so far as to urge him to allow himself to be proclaimed king of New Spain, but he remained true to his allegiance.

These same ideas of independence are met again twenty years later in the camp of Gonzalo Pizarro in Peru. When that brave brother of the conqueror of the Incas was urged by the colonists to make armed resistance against the officials whom Charles V had sent to Peru, he had no idea of renouncing his King. He wanted to draw his sword against the government and its representatives because, in his own view and that of his companions, the home Government had acted illegally and arbitrarily against the colony. But at the outset one of his best officers, Francisco de Carvajal, advised him to direct the revolt not simply against the viceroy but the King of Spain himself, "for" said he, "if you once take arms against either king, you can never lay them down again." Carvajal was no common adventurer, but had been a major in the royal army and had taken a conspicuous part in the battle of Pavia. How bitter must have been the feeling among the Spaniards in the colony when the resentment at oppression could drive a royal officer to high treason of the worst kind! In the course of the civil war that ensued the separatist tendency became more firmly established, and at the same time Carvajal found an ally in the Councilor Cepeda, a man who could say, "The power of all kings comes from tyranny and usurpation," a very striking remark for those times. Carvajal added, "I would like to see Adam's will, so as to know if Charles V and the Queen of Castile are set down in it as rulers of Peru." Pizarro decided at the last moment to separate entirely from the King, but it was too late; he fell in battle, and his head was struck off as that of a rebel.

So, too, in La Plata a revolt of the conquistadores against the royal officers broke out, which was subdued with difficulty. More noteworthy was the rising of Lope de Aguirre (1559–1562), whose letter of renunciation to Philip II was published by Humboldt in his Travels Through the Equinoctial Regions. In it occurs the following passage, which is often quoted by modern separatists: "Christian King, you have been ungrateful to me and my comrades. I believe that everything that is reported to you from here deceives you, because the distance is so great; but I counsel you to be more just to the faithful vassals whom you have here, because I and my comrades are weary of seeing the injustice and violence which your governors and officers commit in your name. We have decided to obey you no longer and *no longer regard ourselves as Spaniards.* We are fighting with all our might against you because we will not submit to the tyranny of your officers, who dispose of our property and honor as they please in order to provide places for their sons."

The preceding examples show how little love there was for the mother country existing in the first Spanish colonists, and others could easily be added in support of them, and the feeling thus early engendered served as a guide for the succeeding generations, and all the more because immigration from Spain fell off after the end of the sixteenth century, so that the discontent of the first emigrants became the common property of the Spaniards who were born in the land—the creoles. It would doubtless have disappeared in time if the Spanish Government had not, by its colonial policy, set up a dividing wall between the European and the American Spaniards, and thereby produced those unpleasant relations between creoles and Spaniards that greatly promoted the desire for independence on the part of the Spanish Americans.

It is not necessary to say that at first there was no difference between Spaniards born in America and those who were natives of Spain, either in social intercourse or political positions, but the way in which the home Government took to itself the conduct of all public affairs of the colonies by sending over the higher officials to take charge must alone have led to the feeling that European Spaniards were something more than the American, a view that in course of time became a dogma with the European Spaniards, in which the most intelligent of them have come to believe. Every European Spaniard regards himself as the representative of the nation when he visits the colonies, and looks upon the native-born Spaniards or creoles as a lower caste which he is called upon to govern. This idea that the European Spaniards

were to exert an unassailable supremacy over the creoles is hardly a thing of national origin, but first arose through the continuous influence of the governmental system and then became an integral constituent of the Spanish national character. That this is so is shown by the example of the Canary Islands. These African islands were settled by the Spaniards just before the time of Ferdinand, and when the colonization of America began the Canaries were already regarded as part of European Spain, as they are to-day, and so it has come that the Canary Islanders have always regarded themselves as Spaniards, and a separatist there would be regarded as insane or be a laughingstock.

There is no doubt that if America had been discovered and taken possession of by the Spaniards about 1420–1440, the impassable gulf between Spaniards and creoles, which sooner or later was to lead to a bloody separation, would never have existed. The first colonists, and even Isabella the Catholic, never expected that the transmarine kingdom would come to be a possession of the Spanish Crown and a charitable institution for European officials. As has already been remarked, the first Spanish colonists carried to America all the liberties they had enjoyed in their Castilian fatherland. They bore to the new world not only their language, their manners, and their religion, but also all the political organizations of their European home. They had no intention of becoming the living portion of a Spanish estate, but were engaged in founding sister provinces. Above everything else their civic autonomy and constitutional form of government were sacred to them, and to renounce these rights seemed to them like an insult to their Spanish name. Without doubt they would have eventually created conditions like those of the English colonies of North America, i. e., colonies with their own constitutions. That there were tendencies in this direction is shown by the fact that up to 1550 we often hear of procuradores (deputies from the cities) meeting to discuss affairs of public importance, especially petitions and complaints to the King, so that the individual colonies had their cortes like those of Castile and Aragon, with the difference that in the colonies only the third estate was represented (a circumstance that throws a clear light upon the democratic tendencies of the first emigrants) and that this assembly did not take the name of cortes perhaps because the two other estates were not, as such, represented in it.

Against this spirit of independence the Spanish Government directed all its powers, after the death of Isabella the Catholic, whose ideas were strongly constitutional. It will be, perhaps, objected that her conduct toward Columbus was not entirely free from the ingratitude which her husband and successor showed to the great discoverers and conquerors. It must not be forgotten, however, in passing judgment upon these circumstances, that the privileges which had been granted to the discoverer of America not only limited the rights of the Crown very materially, but often were opposed to the spirit of Castilian liberty. The encroachments of Isabella upon the patented rights of Admiral Columbus were all for the benefit of the settlers and colonies, like, for example, the edict of April 10, 1495, which allowed all Castilians to settle in the newly discovered lands. Also, the governor which she sent to Santo Domingo, Don Nicolas de Ovando, acted in a spirit of liberty when he granted to all the cities of that island the royal privileges of the commoners of Castile, which Columbus had withheld from them.

Ferdinand's regency altered fundamentally this policy of liberty. At his instigation a board called the *Casa de Contración* was created at Seville, which at first only was to supervise the trade and shipping to and from the New World, but which gradually assumed control of all colonial affairs to the exclusion of all other Castilian officials, depriving the Cortes also of any opportunity of participating in the affairs of the Indies (the colonies). After the battle of Villalar the Council of the Indies became the supreme authority in regard to all Spanish estates. Through this Council the throne exercised its absolute power over the colonies, even though the Castilian Cortes still retained some of their ancient rights. The Council of the Indies labored to undermine the liberties of the Spanish-American communes and to

make the government of the colonies more and more bureaucratic. This undertaking would probably have been foiled by the resistance of the colonists if the white population had been as stable at first as it was later. But since the seizure of those immense territories which constituted the Spanish colonial empire was effected in from sixty to one hundred years, while the direct immigration from Spain between the years 1550 and 1860 shows a rapidly decreasing annual list, it came to pass that upon the discovery or conquest of a new region a rapid emigration took place from colonies already settled. Thus the greater part of the colonists of Santo Domingo went to Cuba, Jamaica, and *terra firma;* those of Cuba flocked to Mexico, while the Mexican settlers went to Peru and the Philippines, etc. In this way is to be explained how it was that, in spite of the hostile feelings of the colonists toward Spain, only isolated risings, but never a universal, common, serious resistance to the Spanish Crown took place.

Meanwhile, it should be said that the Crown and the Council of the Indies showed great wisdom in the selection of the officers for America all through the sixteenth century. Nor were the offices then sinecures for the favorites and parasites of the Madrid Government. The seventeenth century, however, is for Spanish America one long, starless night. The policy of Philip II now began to bear its fruit in the mother country as well as in the colonies. Spanish absolutism had gradually accustomed the Spaniards to rely entirely upon the church and state for their very existence, and no longer to venture and act by their own initiative and at their own danger and expense. To be an officeholder or a priest was the only alternative for those who had any aspirations; and since there were not enough official positions and preferments in state and church in Spain to supply the demand, America was called upon to take care of the excess. These officials knew nothing of fidelity to their trust or zeal for duty, but regarded their positions as a means of enriching themselves at the expense of the state, or rather, at the expense of the natives, for the colonies were not maintained by contributions from the mother country.

Even in the first half of the seventeenth century the creoles manifested a deep hatred against the Spaniards. The Irish Dominican Gage, who lived in Spanish America a long time, wrote in 1625: "It would be very easy to arouse the creoles to make common cause with an enemy of Spain, for they are harshly treated; and whenever they have cases in court the judges are always on the side of the European Spaniards and against them. They regard this condition as intolerable, and to such an extent that I have often heard them say that they would rather serve any other prince than the King of Spain." These hostile feelings broke out in an insurrection in Mexico in 1624; the viceroy was taken prisoner, and it was only through the intervention of the native-born clergy that the creoles were prevented from declaring their independence. This contemptuous slight bore heaviest upon the descendants of the old conquerors, and it was moreover unlawful, since under the law they were to be preferred in filling all offices. The same Gage who was quoted above says: "In Lima there are descendants of Pizarro, in Mexico and Oajaca is the family of the Marquis del Valle (Cortez), and there are besides families belonging to the noble houses of the Girons, the Alvarados, and Guzmans, or collateral lines of the highest nobility of Spain, but no member of any of these families holds any office of honor or any high position. They are rather treated with contempt by the European Spaniards, as if they were not capable of self-government; and are looked down upon as inferiors, barbarians, or Indians." This language is heard to-day from the Philippine islanders. The Spaniards usually answer charges of this kind by saying that so and so many creoles have occupied such and such civil, military, or clerical offices. It ought to be said, however, that these creoles, although born in America, had lived and studied a long time in Spain, and so had ceased to be regarded by the Spaniards as real creoles. Such, for example, was the minister of war in the last administration of Canova del Castillo, General Azcarraga, who was a Philippine islander, but had been in Spain from his youth up, and so was it with other creoles who held high offices in Spanish America; either they were "Americans only by

accident," or they united themselves closely to the European Spaniards and sought to hide their birthmark by unadulterated Spanish principles. The Bourbons indeed introduced a better government into the colonies, and endeavored to restrict the plundering of the Indians and creoles; but the increasing number of official positions brought over an always increasing number of Spanish office seekers just at the time the creoles were awakening from the long spiritual torpor in which they had lain from 1570 to 1720.

The earliest Spanish emigrants must have been an intellectually active set of people. This is an inference from the fact that, as above mentioned, it was for the most part political refugees or malcontents who founded the cities with Spanish names in the countries they conquered and plundered. But we have another proof of the fact in the rich literature of the Conquest. We read with astonishment the reports of plain, common soldiers and merchants, and find in their presentations clearness of expression and a sharp lookout for everything worth noting. Later there was a reaction, the creoles lived at ease in their city houses or on their haciendas, while ignorance and idleness were forced upon them by the Spaniards. The small attendance at the colleges also speaks for their intellectual indolence at the period mentioned, although their ignorance probably was not so great as would be indicated by a story told by the often quoted Gage, who relates that a prominent creole at Chiapas once asked him if the same sun shone in England as in America. Spanish Americans of the present day defend this mental inactivity of their ancestors by pointing out that they were excluded from all offices, and they were wise to lead an indifferent and idle life rather than pursue studies which would only subject them to the suspicion of the governing caste, as is to-day the case in the Philippines, where the educated natives are regarded as suspicious characters.

The revival in culture and knowledge which the creoles underwent in the eighteenth century is not to be credited to the mother country, but is a consequence of foreign influence. The Spanish Government had taken every precaution to guard its colonies against foreigners, but the force of circumstances proved too strong. The numerous wars which Spain was always carrying on frequently interrupted the relations between the mother country and the colonies; and since the latter, thanks to Spanish colonial policy, had no domestic industries of their own, but were obliged to depend on Spain for many things that might easily have been produced at home, the home government found itself compelled in war times to grant individual colonies permission to relieve their most pressing needs by trading abroad. Although this permission was only granted as cases arose, yet it was sufficient to establish friendly relations between the colonies and other countries, according as Spain was in alliance with England, Holland, or France, and these relations were continued, after normal conditions were resumed, under the form of an extensive smuggling. This smuggling is of importance not only in the history of the trade of Spanish America, but because the creoles, by the intercourse thus established with other countries, came to learn foreign languages (especially English and French), and their intellectual horizon was widened by contact with foreign literatures, and all this happened just at the time when the quality of the officials who were sent to the colonies from Spain was deteriorating. Zabala says of them: "Most of them came from the provinces of Spain with no other property than a coat, a pair of breeches, and three shirts. Many of them could hardly read, and had no other knowledge of the world and affairs than what they had picked up on the voyage. * * * Many of them believed that there was no other king but the King of Spain, and no other language than Spanish." This description is evidently colored by the hatred of a Mexican for Spaniards, but Spaniards themselves like the Duke of Almodovar, Don Tomas de Comyn, Fray Augustin de Santa María, and the Jesuit P. Vicente Aleman, say even worse things of the King's officials than Zabala.

It can now easily be seen how dangerous it must have been for the Spanish régime which was only founded upon authority, when the rich creoles not only regarded the representatives of the motherland with the hatred of the oppressed toward the

oppressors, but also looked down upon them from a consciousness of their own intellectual superiority. Their fate seemed to them all the more pitiful and their lot the more unworthy when they heard the Spaniards boasting of their own superiority and the inferiority of the Americans. The administration of the King's favorite, Godoy, contributed especially to bring the Spanish rule in America into equal hatred and contempt, for this upstart sent to the colonies the worst of all office-holders—men who openly declared with utter cynicism that their own enriching was the only object they had in view in taking office. * * *

I have hitherto spoken only of creoles, and that because the war of independence in all the Spanish colonies was only carried on by white natives, the insurrection of Father Hidalgo excepted. This latter insurrection, of colored men alone, was, however, not successful, nor did the separatist movement meet with a successful issue until the creoles declared their independence of Spain. The Indian farmers of Central America and the region of the Andes were so indolent that they could hardly be induced to take part in the war of independence. They had not, it is true, been too well treated by the creoles, but for the most part they stood to them in much the same relation as the peasants of La Vendée sustained to their seigneurs, and were, therefore, inclined to take the part of their lords, even if they had no very clear idea of the cause of their quarrel. The Spaniards had prepared, it is true, a most admirable code of laws for the protection of the Indians, but the officials paid no attention to legal requirements and simply regarded the Indians as objects of plunder, like that corregidor who compelled the Indians under his authority to buy from him thousands of pairs of spectacles. No reasonable Spaniard could expect love and gratitude from people who had first been robbed of their liberty by his people and then condemned to everlasting servitude. Also, Spanish absolutism caused the Indians to lay all the blame for their sufferings upon the Government, although the creoles were occasionally the immediate cause. In vain had Spain founded her sway upon caste, envy, and the ancient principle *divide et impera*. At the very moment when this system ought to have withstood the supreme trial it failed completely. The common oppression which was shared by the white, the yellow, the brown, and the black man alike produced a reaction to which the Spanish dominion succumbed.

The negroes (speaking now of the eighteenth century) played only an insignificant part in the war of independence; they only appear in any force in Venezuela. The Spaniards armed them against the rebels, but they finally joined the latter. As they were mostly slaves and freedmen, without education or knowledge, they simply furnished food for powder for both parties. It is different nowadays in Cuba, when a small fraction of the negroes have raised themselves from the condition of laborers by virtue of a certain degree of education, mostly of a political character, which gives them a great influence over their fellows, an influence which is devoted to the dissemination of an unyielding and uncompromising separatist sentiment. These educated negroes, especially the mulattoes and all mixed bloods, said to themselves, as soon as they had eaten of the tree of political knowledge, that they could only attain to influence and position in the land of their birth when the colonies had become independent. In fact, it is hardly conceivable that the European Spaniards, who regard even the creoles as inferiors, would ever have intrusted either high or medium offices to negroes and other people of color, for that would infringe the unwritten law of the Spanish national pride. The Spaniards even regarded it as impossible that the creoles should ever subordinate themselves to colored men, and yet during the war of independence of their colonies on the mainland they lived to see creole nobles under the command of colored generals and chieftains, so powerfully had the hatred of the Spanish oligarchy fostered a spirit of comradeship among the Spanish Americans; and as soon as these colonies became independent States the spectacle was seen of an Indian, Don Benito Juarez, becoming President of the Republic of Mexico. If Mexico had remained a Spanish colony, Juarez could never have

risen above the position of some subordinate office, even if he could have obtained that. From the nature of the Spanish colonial system, and the narrow-mindedness of the Spanish national character, it was the demand of self-respect for intelligent and educated colored men to strive with all their might for the severance of their native land from Spain. The Spaniards can not understand this attitude of the colored races. They complain of their ingratitude, showing how they had brought Christianity and European civilization to the Indians and negroes and always treated them kindly, far differently from the English, who erect an impassable barrier between themselves and the natives and do not concern themselves about either their salvation or education. Foreign writers, too, even those who have lived a long time in Spanish colonies, speak in the same way, and point out that in Cuba, Porto Rico, and the Philippines the colored races live in an idyllic condition compared with the natives of English or Dutch colonies. But all these encomiasts forget that the whole Spanish colonial system signifies a policy which makes great promises and awakens ambition, but does not keep its promises and disappoints the aroused ambition. The man of color in the Antilles who is satisfied with the condition of a peasant and laborer can always enjoy an idyllic existence, but if he betakes himself to study and is ambitious to play a political part in his home, or aspires to a higher office than that of a clerk, he will find his career completely closed. Why do the Spaniards take so much trouble to raise the colored people to the level of their civilization, only to exclude them from office and honors, and even represent them in the press as intellectually deficient? People who are so thrust aside and subjected to such contemptuous treatment can not be expected to exhibit much regard for the Spaniards, for the rule of the latter means for them only humiliation and slavery, a perpetual helotism, which at most is ameliorated by kindly personal relations between the two races.

* * * In the days of her sovereignty upon the Continent Spain did everything to hinder any mercantile or industrial advance of the colonies by a shortsighted guardianship. The number of ships for the carrying trade between the mother country and the colonies was strictly fixed. So, too, strict rules were established which restricted the free cultivation of all plants which could flourish in the colonies, so that in many regions only certain products could be exported. This was still more true of industries, although it must be said that certain flourishing industries in Spain itself (such as the silk culture of Valencia) were ruined by foolish legislation. The Americans endeavored to recoup themselves for the damages inflicted upon them by the mother country by an extensive system of smuggling with foreign countries. In this way they became accustomed to procure all the products of industry from abroad, and busied themselves only with agriculture and cattle raising. The first Spanish immigrants had brought with them their home industries, but these as well as those of the natives, became disused, not from the indolence of the Americans, but from the force of circumstances, which, in this case, was the colonial system of the Spanish Government.

The smuggling system was fateful for the Spanish rule, for it brought not only wares, but new ideas, into the land, particularly the reflection that the foreigners were wiser and better people than the Spaniards, who had, up to that time, been considered the first nation of the world. The great profits that the plantation owners made by smuggling created the desire to have their external trade regulated by law, and this wish was fulfilled by the really glorious Government of Charles III. Unfortunately, the relief of trade was combined with the introduction of monopolies, the most oppressive of which was that of tobacco, and Humboldt has shown in several places how the tobacco monopoly was one of the measures that extended the discontent with the Spanish rule into circles which would otherwise not have cared whether they were subjects of Spain or citizens of a free state. The restriction of agriculture and free trade by monopolies not only produced discontent in the colonies, but it suggested to England, which was interested in both the legitimate and

the smuggling trade with them, the policy of fomenting this discontent, with a view either to acquire the colonies herself or convert them into free states. The younger Pitt followed this plan, which his successors did not allow to fall into neglect.

The Spanish colonies, therefore, even by the middle of the eighteenth century had become revolutionary in sentiment, but many of the discontented still adhered to the dynasty and were reluctant to sever all the bonds that united them with the mother country, while the radicals were in doubt what should be done with the colonies in case of separation; they thought of creating empires and kingdoms, but could not decide whence to derive the emperors and kings. The revolt of the present United States finally pointed out the way they ought to follow. The treaty between Spain and the Yankees, too, taught them that it could not be an unpardonable sin—a *crimen nefandum*—for a colony to rebel against the oppressions of the mother country. The example of the English colonies also showed them—and this was the most important lesson of all—the form of government which is best suited for independent colonies. In this way all anxiety as to who should rule in the free states was removed. Spain could still have retained her hold upon her colonies if the constitution of 1812 had remained, but the reaction which Ferdinand VII introduced into Spain upon his restoration in 1814 took away from the Spanish-Americans all confidence in the permanence of the liberties that had been granted them, and they preferred independence to an uncertain future. The Spaniards, however, learned nothing from the rebellion of their continental colonies. The refusal of political rights in Cuba remained, as before, the rule of their colonial policy; political reforms were granted only when they were forcibly extorted by insurrections—that is to say, when they were too late—and produced in the minds of the natives the ineradicable conviction of the ill will and envy of the mother country. Among foreigners the separatist sentiment of the Spanish Americans is explained as being due to the plundering of the colonies by Spain, a statement which is only true in a slight degree. In the first place only a few of the colonies have had an excess of income over expenditures, and in the second place even this did not all go to Spain, but was applied to making good the deficit of less fortunate colonies, just as to-day the expenses of the Spanish Guinea islands are defrayed out of the budget for the Philippines. For many decades Spain has had no income from either Cuba or Porto Rico. In the nineteenth century the Spanish colonies have been plundered in the fullest sense of the word, not by Spain, but by Spanish officials. These officials in the two centuries preceding the present were more or less permanent, a condition that has changed since the introduction of the constitutional system in Spain. Every new ministry now dismisses the higher and most of the lower officers of the former régime and replaces them with its own partisans. As ministries change frequently in Spain there is a constant going and coming of officials in the colonies, whereby the interests of the mother country are seriously affected. The officials are consequently induced more than ever to lay up something for a rainy day, and they never have time enough to acquire a thorough knowledge of either the colonial lands or peoples. As the Roman provinces were made to pay the debts of the aristocratic proconsuls and propraetors, so have the Spanish colonies served to provide places for the faithful adherents of the changing parties in Madrid and their parasites. It is this peculiarity of Spanish political life that makes useful reforms so difficult, if not impossible. The noble and conscientious colonial minister, Don Segismundo Moret, was compelled to yield to the storm of odium which he aroused because the reforms which he inaugurated in Cuba were real reforms. The Spanish officials in the colonies are the most extreme reactionaries even when they are the wildest radicals at home, because they know that every reform must check their abuses; so that the maintenance of the old colonial system is for them a question of existence.

Every effort at reform was represented by them as a separatist movement in disguise, so that an unfavorable prejudice against reforms and reformers was created in Spain, and the latter were as much harrassed in their native country as the "dema-

gogues" and liberals once were in Germany. It seems never to have occurred to the Spaniards that such proceedings would only intensify anti-Spanish and separatist feelings, else they would never have forced such a loyal people as the natives of the Philippines have always been to an insurrection.

All that is said in the preceding article might be repeated, word for word, in describing the history of Cuba alone in the present century, after enlightenment had become diffused. The intolerable nature of the oppression and contemptuous treatment of the Cubans by the Government officials led to insurrection after insurrection. In 1860 Anthony Trollope remarked that the Cubans had lost all their rights save that of being taxed. Before this century began, or rather before the English occupation of Havana in 1762, there is little of event in the history of Cuba for the present purpose. The population was small, not exceeding 170,000 even as late as the middle of the last century. The attacks of French, Dutch, and English pirates, buccaneers, and naval expeditions against Cuba and Porto Rico continued at intervals from Drake's time down to the end of the last century. The industry and commerce of the islands were of little importance until after the English occupation, after which date the cultivation of sugar, tobacco, and, later, coffee, became sources of wealth, and with free trade there was a general awakening.

In the aristocratic slave-holding community arose a growing interest in the intellectual movement in Europe, which was prompted everywhere by the French revolution and its consequences. Cuban literature and culture took a patriotic form, and the leading men in the intellectual movement of the island took a practical part in endeavoring to regenerate a community which had no education for the common people, and where, consequently, a most undesirable and dangerous condition of life and morals prevailed.[1]

HISTORICAL SKETCH OF EDUCATION IN CUBA.

We are able to give an outline of the history of Cuban education from the work of Aurelio Mitjanes[2] upon the development of literature and science in Cuba down to 1868. The work is mainly devoted to the literature and particularly the poetry of the island; but, as the author justly remarks, some account of the state of education of the country is essential to understand the beginnings of its intellectual activity. He divides the history of the intellectual movement in Cuba into two epochs, separated by the memorable government of Gen. Luis de las Casas, which began in 1790. Before that period there was no constant

[1] Before the strict rule of Governor General Tacon the streets of Havana were very unsafe from highwaymen, who were assassins as well as in the way of business. When one of the preceding governors was appealed to for police protection, he replied, "You should do as I do; never go out after dark."

[2] This author was a wealthy young Cuban gentleman, who, after graduating at the University of Havana, passed several years in Spain, where he devoted himself to literature. He returned to Cuba and died there, of consumption, before reaching his thirtieth year. The present work is posthumous.

and regular development of culture, but the investigator only finds isolated instances of educational efforts scattered through three centuries, during which time neither the Government nor the municipalities founded a single free school for the common people. After the administration of Las Casas, however, to which, as in this work of Mitjanes, all Cuban writers refer as an epoch-making one, and especially after the foundation of the Sociedad Económica, the conditions changed and real development began, always, however, by private initiative.

That there were no elementary public schools in Cuba up to the end of the last century is not surprising, however, when we compare the condition of other countries in this respect with that of Cuba. Thus President Ezra Stiles, of Yale, records in his diary under date of July 17, 1794:

> This day I was visited by M. Talleyrand Perigord, bishop of Autun, etc., and M. Beaumez, member for the district of Arras. The bishop has written a piece on education, and originated the bill or act in the National Assembly for setting up schools all over France for diffusing education and letters among the plebeians. I desired them to estimate the proportion of those who could not read in France. M. Beaumez said of 25,000,000 he judged 20,000,000 could not read. The bishop corrected it and said 18,000,000.

At that same time, it should be remembered, intellectual activity, literary, philosophical, and scientific, the outgrowth of superior education, was at one of the high culminating points of its history in France.

Even in Havana, up to the beginning of the last century, there were no public elementary schools, and the need of them became so evident that by the munificence of a citizen (Caraballo) the Bethlehemite fathers opened a school where reading, writing, and arithmetic were taught, which was attended by 200 pupils. In Villa Clara a school was in existence since the foundation of the town in 1689. In 1712 the philanthropic Don Juan Conyedo, of Remedios, opened a free school there, and another in 1757 at Carmen. Another was opened at Arriaga in 1759; but on the death of Conyedo these schools were closed. Don Juan Felix de Moya reopened that at Carmen, and the municipality in 1775 voted *twenty-five dollars a year* for the support of the other; but both ceased to operate definitely in 1787. In 1771 Matanzas, seventy-eight years after its foundation, authorized its governor to engage a school-teacher in Havana.

Nor were secondary studies of a high character in the last century. Then, and subsequently, too, as the historian Bachiller, quoted by Mitjanes, remarks, more attention was paid to the pretentious form than the substance, and the title of academy or institute was given to institutions which were hardly more than primary schools, which held out inducements of a speedy preparation for the university. At that time, it should be remembered, the natural sciences had not reached the importance they subsequently attained, and the study of philosophy required the royal permission, so that secondary instruction was reduced to a superficial study of the humanities, especially Latin, which occu-

pied the leading place on account of its use in fitting for the university, and because teachers of Latin were easily found among the clergy, who were the principal factors of education at that period. All this may be said without detracting from the praiseworthy efforts and antiquity of some institutions like the Chapter of Havana, which, in 1603, convinced of the need of a teacher of grammar, voted a hundred ducats for the support of one who should teach Latin, but as the plan did not meet with the royal approbation they were obliged to drop the project, only to revive it afterwards with a larger salary. In the same year the municipality provided for continuing classes in grammar by a monk of the convent, which had been suspended. In 1607 Bishop Juan de las Cabezas Altamirano founded the Tridentine Seminary, the citizens offering to pay part of the expenses annually. The secular clergy also gave lessons in Latin and morals, as Conyedo did, who prepared students for the priesthood in Villa Clara, and later Fr. Antonio Perez de Corcho, who gave lectures on philosophy in the monastery of his order. By the bull of Adrian VI, of April 28, 1522, the Scholatria was established at Santiago de Cuba for giving instruction in Latin, and by his will, dated May 15, 1571, Capt. Francisco de Paradas left a considerable sum for the foundation of a school in Bayamo, which, in 1720, was intrusted to the charge of two monks of San Domingo, in whose hands the estate increased. In 1689 the College of San Ambrosio was established in Havana with twelve bursarships, for the purpose of preparing young men for the church, but it did not fulfill its purpose, and subsequently received the severe censure of Bishop Hechavarria Yelgueza on account of its defective education, which had become reduced to Latin and singing. Fr. José María Penelvar opened a chair of eloquence and literature in the convent of La Merced in 1788, which also was not a success.

After these attempts the foundation of a Jesuit college in Havana gave a new impulse to education. From the first, according to the historian Arrete, quoted by Mitjanes, the priests of this order had observed the inclination of the inhabitants of Havana toward education, and Pezuela states in his History of Cuba that the municipality in 1656 wished to establish a college of the order, but the differences between the Jesuits and the prelates in the other colonies had been so frequent that the bishops and priests in Havana opposed the plan. But as the population increased the demands for the college multiplied, and in 1717 a citizen of Havana, Don Gregorio Diaz Angel, contributed $40,000 in funds for the support of the college. The necessary license was obtained in 1721; three more years were spent in selecting and purchasing the ground, when the institution was opened under the name of the College of San Ignacio. The old college of San Ambrosio, which had been under the direction of the Jesuits since its establishment in 1689, was then united with it, although the old college still retained its distinctive character as a foundation school for the church.

As early as 1688 the ayuntamiento (or city council) of Havana applied to the Royal Government to establish a university in the city, in order that young men desirous of study might not be compelled to go to the mainland or Spain. This request was furthered by Bishop Valdés, and finally, by a letter of Innocent XIII of September 12, 1721, the fathers of the convent of S. Juan Latran were authorized to found the institution desired, and after some years of preparation it was opened in 1728, but the chairs of morals, philosophy, and canon law were filled previously by the Dominicans even before the funds were available. The university, by the order received, was to have been modeled upon that of Santo Domingo, but finally the task of preparing the regulations for the new university was intrusted to the fathers above mentioned by a royal letter in 1732, and they were approved by the university authorities, the Captain-General, and in Spain by the Council of the Indies, on June 27, 1734. The rectors, vice-rectors, counselors, and secretaries were to be Dominicans, a condition that produced innumerable rivalries and disputes until 1842. The first professors were appointed to their positions without limit of time. Afterwards they obtained their places by competition and for a term of six years only. The first rector, Fr. Tomás de Linares, was appointed by the King in 1728, but his successors were elected by the university authorities and were renewed annually. Among the early rectors were Bishop Morell, of Santa Cruz, and the renowned Cuban orator, Rafael del Castillo. Unfortunately, for a century the university was an insignificant element of culture and was only useful as a subject of boasting on the part of Spain that she had introduced her civilization on this side of the water and on that of the Cubans that they were advancing in sciences and arts. Several causes tended to restrict the value of the university. In the first place, it was modeled on a sixteenth century pattern. The Aristotelian system prevailed in its entirety. The professor of mathematics was to teach, besides practical arithmetic, which consisted of the first four rules with the *aurea*, elementary geometry, trigonometry, and astronomy and its "deductions for the use of our lord the King." There were polemical and civil architecture, geography, the sphere, mechanics, optics, etc. These subjects should have been included in the course of philosophy, and there were few students, even of the four rules and the *aurea*. The philosophical system was the scholastic, with its eternal *sumulas* and involved system of logic and its defective ideas of physics. The course lasted three years, the first two of which were occupied with logic and the Aristotelian philosophy. But the university would not have benefited much more if it had been modeled upon a Spanish university of the eighteenth century, because the mother country was on the low scientific level to which the deadly politics of the Austrians had reduced her. When Charles III urged the rectors of universities in Spain to reform education he was told that it was impossible to depart from the Aristotelian system or follow the innovations of Galileo and Newton,

because they were not in accord with inviolable tradition. Furthermore, it was not always possible to find suitable teachers in Cuba. For this reason the chair of mathematics was vacant for a long time. Sometimes the Government refused to adopt very useful ideas on behalf of the university, either by negligence or ignorance, or for economical reasons. Thus the rector, in 1761, petitioned for the erection of a chair of experimental physics, which was refused, and two of mathematics, only one of which was granted. A new plan of study was drawn up, in view of the pressing need of reform, but was allowed to lie unnoticed. In 1795 Don José Augustin Caballero made an address in the section of science and arts of the Sociedad Económica, in which he deplored the backward condition of education, which, he said, retarded and embarrassed the progress of the arts and sciences, without, however, any fault on the part of the teachers, who could only obey and execute their instructions. On motion of Señor Caballero a representation was made to the King, by a committee of the society, of the necessity of reforming education in the island, beginning with the university. The committee declared, among other things, that no mathematics was taught, nor chemistry, nor practical anatomy. General Las Casas supported this motion, but the Government took no action. The same indifference, or worse, was manifested by the Spanish Government in other parts of America. It refused to permit the foundation of academies, or universities, or chairs of mathematics, law or pilot schools (the latter being pure luxuries, the decree said). The cacique Don Juan Cirillo de Castilla endeavored during thirty years to obtain permission to establish a college for Indians in his native country, but died finally in Madrid without obtaining it. The archbishop of Guatemala left money by his will for establishing a chair of moral philosophy, but the minister directed the money to be sent to Spain, it having been improperly devised, as he declared. Charles IV prohibited the establishment of the University of Merida in Maracaibo on the ground that he did not deem it expedient that enlightenment should become general in America. There were other instances of the same policy in Chile and Peru; and yet, notwithstanding all these restrictions, Humboldt observed "a great intellectual movement and a youth endowed with a rare faculty for learning the sciences—a sure sign of the political and moral revolution that was in preparation."

In Santiago de Cuba the seminary of San Basilio Magno was founded by Bishop Francisco Gerónimo Valdés in 1722, for ecclesiastical studies, with an endowment of 12,000 pesos. This establishment, however, did not come into operation until the latter part of the last century. More important was the foundation of the college and seminary of San Carlos and San Ambrosio in Havana in 1773, which was not destined exclusively for the education of ecclesiastics, but included three courses of philosophy and letters preparatory to, and besides, the higher faculties of theology, law, and mathematics, the last two of which, however, were not opened until the beginning of the present century.

Education being in such an unsatisfactory condition, it is not to be expected that literature and science should have received much encouragement in the three centuries preceding the present. Mitjanes, however, shows that printing was introduced in Santiago de Cuba in 1698, but was soon discontinued, not to reappear for a century. In Havana practically no printing was done until 1720, and then only on an insignificant scale. Poetry appeared in the sixteenth century in the form of a comedy with the strange title "The good in heaven and the wicked on earth," which was presented on St. John's day and was long remembered for other reasons than the merits of the play. The names of several versifiers, with the subjects of their poems and criticisms of their styles, are given in Mitjanes's work, from which it appears that they suffered from the pedantry, mysticism, and affectation with which readers of some of the English poetry of the seventeenth century are familiar, and they were imitators of Spanish writers of the period. The attacks of the buccaneers upon Cuban towns were frequent in the seventeenth century and the conflicts with them formed the subject of some of these early poems, while earthquakes furnished an occasional theme in the following century, which was sometimes humorously treated. But about the middle of the last century more serious literary work begins to appear with the account by Bishop Morell of the English attempts in America and his history of the island and the church of Cuba, which work is lost, and Arrate's history of Cuba, which remained in manuscript until 1830, when it was published by the Sociedad Económica. It gives the history of the island down to 1761, but is not now of importance. The work of two other historians, Urratia and Valdés, are criticised by Mitjanes, who closes his review of this period with notices of certain preachers who were celebrated for their eloquence. In 1789 there was printed at Havana a work on natural history by Don Antonio Parra which was illustrated by drawings, there being no good engravers in the island at that time. The work appears to have been of no great merit, but its account of the fishes gave it value. The author was commissioned by the Government and the botanical garden of Madrid to make collections for the cabinet of natural history at Madrid.

The second epoch in the intellectual history of Cuba began with the administration of Don Luis de las Casas, whose name is held in grateful remembrance by Cubans, and who inaugurated a new era by his zealous and noble enthusiasm in promoting intellectual and educational activity. He founded the first literary periodical and the Sociedad Económica (sometimes called Patriótica) de Habana, which has been the first mover in all the advances in the material interests and education in the island. With him cooperated an eminent physician, Dr. Romay; Arango, the distinguished writer on economics; Caballero; Penalver, archbishop of Guatemala; and many others. The Sociedad Económica was charged by a royal order with the care of education in

Cuba. An inventory was taken of the primary schools in 1793 and a deplorable state of affairs was found. In Havana there were only 39 schools, 32 of which were for girls, and the instruction was of the worst, nothing but reading being taught in many of them which were in charge of colored women. The society then founded two free schools for the poor of both sexes. The society met with much opposition, in part from Bishop Trespalacios, who was envious of Las Casas, but it succeeded in founding schools with the help of the religious orders, particularly the school of the Beneficencia in 1799 and the Ursulines in 1803. It endeavored to establish members of the order of San Sulpicio, which had met with such success in education in New Orleans, but without result. Outside the capital, gratuitous instruction for the people did not exist except in isolated cases, due to individual efforts, principally of the clergy. In 1801 the sociedad took another school census and found the number of schools in the city to be 71, with 2,000 pupils, most of which were not under the Government and were taught by ignorant colored women who had neither method nor order. Recognizing these fatal defects, the society endeavored to induce the Government to issue regulations reforming the schools and providing faithful, competent, and interested teachers, but without result. In 1816 the section of education was formed and the Government granted $32,000 for primary instruction, and at this time some improvement in the condition of this branch was made. But notwithstanding the efforts of individuals, the funds were insufficient for the growing needs, and some of the new schools had only an ephemeral existence.

Secondary and superior education.—The society also devoted its energies to opening new branches of study in higher education. In 1793 it was proposed to found a chair of chemistry, and a subscription of $24,615 was immediately raised, but owing to the difficulty of finding a professor in Europe the chair was not filled until 1819. The apparatus was brought from Europe, and after some delay quarters for a laboratory were found in the hospital of San Ambrosio. The first professor was Don José Tasso.

The society in 1794 formed a plan of secondary instruction which included mathematics, drawing, physics, chemistry, natural history, botany, and anatomy. (The date and scope of this plan are noteworthy. Its spirit is quite modern.) The creation of a botanic garden was proposed in 1795, but the plan did not meet with such enthusiasm as the chemical laboratory, which, it was hoped, might be of use to the sugar industry. The course of anatomy was opened in 1797. In this same year a real revolution took place in the instruction in philosophy at the Colegio Seminario de San Carlos, the old Aristotelian philosophy becoming replaced by modern methods in the lectures on logic of Caballero. But in 1811, when Felix Varela took the chair of philosophy, the old system received its death blow, the names of modern thinkers became familiar in the schools, and their doctrines were freely exam-

ined. The students were taught to use their reason as a guide, and to ignore all the useless quibbles and confused terminology of the scholastic philosophy. One of his pupils, afterwards well known in Cuba, Don José de La Luz, said of this teacher, "He was the first who taught us to think." He also used Spanish instead of Latin in his lectures, retaining the latter only one day in the week, in order that its use might not be forgotten. Part of his Institutions of Eclectic Philosophy were published in Spanish. In physics Varela was also an esteemed professor, but later on this chair at the college was filled by José Antonio Saco, who followed in brilliant lectures, day by day, the most recent discoveries made in Europe. The Government having ordered in 1813 that political economy should be taught in the universities, the Sociedad Económica established a chair of this subject in San Carlos in 1818, which was supported by voluntary subscriptions. The new spirit was shown further by a change in the law course from an excessive devotion to the study of the Roman digests to the fuller study of Spanish law. At this period medicine, which, as we shall see, received such preeminent attention at a later period, was far behind the age. Until 1824 there was no chair of surgery, and chemistry and philosophy were twenty years behind the times. The promoters of superior instruction in the beginning of the new epoch, which Mitjanes puts between 1790 and 1820, were Las Casas, Bishop Espado, and the intendent Ramirez, who was mainly instrumental in organizing the instruction in chemistry and other scientific branches, with the constant cooperation of the Sociedad Ecomómica. The results of the education of these thirty years could hardly be expected to show until after the close of that period. During this time a large number of newspapers and periodicals appeared, owing to the liberty granted to the press, and in some of these appeared important critical and historical papers by men of information and ability. The names of Romay, Caballero, and Arango appear as essayists, and the historian Valdés published a part of his history in 1813, which Mitjanes criticises somewhat severely. These periodicals, and particularly the one published under the auspices of the society, furnished a medium for the budding poets of the new era to display themselves, and the drama received new editions. Many of the poets of this period, whose gifts and utterances Mitjanes discusses with apparent discrimination, it can be seen are well worthy of note, and they bring a real culture to aid their native talent. It would hardly be worth while to give a bare list of their names and poems. Mitjanes's criticisms, besides, are quite technical, and bear upon versification and other literary features of the poems.

In the second period of the new epoch—from 1820 to 1842—the Sociedad Económica, always in the vanguard of the intellectual movement, began to find the fruits of its earlier efforts in the works of the younger men who had profited by them, and in 1830 a committee on history was formed and another on literature. The Government was now in far

other hands than those of Las Casas and did its best in the person of General Tacon to suppress the new political and economical views, mainly, it is true, on account of articles which appeared in the journals published under the auspices of the society. Still, in 1833, by virtue of a royal order, the committee on literature constituted itself an independent academy which encouraged or founded literary periodicals. Its sessions were the place of meeting for all the leading men in Cuba who were interested in letters and new ideas, and it collected a valuable library. In this period appeared the first really great Cuban poet, Heredia, whose genius was recognized in Europe, and one of whose poems, "Niagara," was translated into English by Bryant. His life was a curious comment on the Spanish rule in Cuba. He was born at Santiago de Cuba in 1803. At 8 years of age his teacher, the Dominican Francisco Javier Caro, pronounced him to be a good Latinist and an excellent translator of Horace, and at 10 he had written poems which attracted the attention of literary men. He went to Havana for the first time in 1817 and to Mexico in 1819, whence he returned to Havana upon the death of his father, in 1820. He took there the degree of bachelor of law, and in 1823 was an advocate in Puerto Principe. Thence he removed to Matanzas where he became involved with the revolutionary agents of Spanish America, and, falling under suspicion, was obliged to leave Cuba. He passed three years in the United States and the rest of his life in Mexico, where he was appointed assistant secretary of state, and afterwards was a judge of the supreme court and member of the Senate. His lyrical poems, published in New York in 1825, when he was only 22 years old, which have been republished in Philadelphia, New York, London, Paris, Hamburg, Madrid, and Barcelona, and admired in all the civilized countries of the world, placed him at once among the noted poets of the century.

Passing over other lyric poets of less note—Milanes, Ramon de Palma, and others whose works Mitjanes discusses—the next most noted name in the Cuban poetry of this period is that of Placido, whose fame, perhaps, is partly due to the circumstances of his origin and his tragic death. It was the opinion, however, of some critics that Placido was the most gifted of all the Cuban poets, but the misfortunes of his defective education, and his birth in a despised class, which condemned him to live in a social sphere far beneath that which was the due of his intellectual superiority, were sufficient to dull his inspiration. His poverty, too, compelled him often to write without other incentive, and the political oppression, which was a constant menace to everyone, was a double weight upon him until he fell a martyr to it in 1844. Placido was a mulatto, and no one born out of a slave-holding country, where color is the badge of slavery and marks the social pariah, can understand how that circumstance placed at once an impassable barrier between the unhappy victim of it and all those who would otherwise have been intellectually congenial to him. An article by Mr. W. H.

Hurlbut, in the North American Review for January, 1849, upon the "Poetry of Spanish-America," written when the memory of Heredia and Placido was still fresh, and Milanes was still alive, describes contemporary Cuba as follows:

> All the avenues to the public mind are guarded with unrelaxing watchfulness, and the patriotism of Cuba, denied any enlarged and popular field of action, is compelled to pour itself into the heart of the people through strains of stirring poetry from the lips of men prepared for the martyrdom as well as for the championship of freedom. And imprisonment, exile, and death have, indeed, been the meeds of these hero bards, who speak always earnestly and from their hearts, in the words of brave men who have counted the cost of their devotion. It is strange, indeed, that so little should be known among us of an intellectual and spiritual life so nearly allied to the best thought and feeling of our own country.

The author speaks sympathetically of the career of Heredia, who as a man was held in honorable remembrance for the integrity, generosity, and amiability of his character, and whose sufferings testified more loudly than his words to the depth and strength of affection with which he clung to the best hopes of his country. Thoughts of sorrow or of hope for Cuba underlie almost all his poems, translations of passages from which are given in the article referred to. Placido, whose name was Gabriel de la Concepción Valdés, was born at Matanzas in 1809. "His education was of the rudest kind; nearly all the learning that he acquired he owed to the impulses of his own mind, followed out with all the energy of an indomitable will," and he had established his reputation when he was called upon to play the higher parts of a hero and a martyr. An insurrection broke out among the slaves in 1844, and Placido was accused of being the organ of communication between the insurgents and the British consul, who was suspected of favoring them. The insurrection was suppressed with a savage ferocity which was fresh in the minds of the readers of the article in the North American. Placido was condemned to death, and he awaited his fate with entire composure. "In the intervals of the duties which crowded upon his shortening life he poured out the emotions and aspirations of his soul in poetry; and these death songs, full of undying truth, have written themselves deeply and forever on the hearts of his countrymen. One of them, especially, his 'Prayer to God,' composed the day before his execution, was eagerly learned and recited by the young men of Matanzas, and has been universally considered his finest production." A translation of the poem is then given, of which the translator says that "it is difficult to convey into English words the fire and force of expression of this noble poem." The night before his execution Placido addressed a farewell letter to his wife and a "farewell," in poetry, to his mother, and the next morning passed through the streets with his fellow-victims "with a serene face and an unwavering step and chanting his 'Prayer' with a calm, clear voice"—a spectacle which, in other times and countries, would have furnished inspiration for heroic verse. Prone as we of English descent are to suspect the contrary, Placido's

conduct at this supreme moment was undoubtedly sincere and not theatrical. His ignoble birth, as well as the political subjection of the island, harrowed his soul, as is evident in the extracts given in this article we have used, e. g., in the "Sonnet to Greece," and the "Hymn to Liberty," written on the morning of his execution, which is thus rendered in the spirited translation by an anonymous writer:

O Liberty! I wait for thee
To break this chain and dungeon bar;
I hear thy spirit calling me
Deep in the frozen North, afar,
With voice like God's, and visage like a star.

Long cradled by the mountain wind,
Thy mates the eagle and the storm,
Arise! and from thy brow unbind
The wreath that gives its starry form,
And smite the strength that would thy grace deform!

Yes, Liberty! thy dawning light,
Obscured by dungeon bars, shall cast
Its splendor on the breaking night,
And tyrants, fleeing pale and fast,
Shall tremble at thy gaze and stand aghast![1]

Placido's poetry is of ethnological interest, as he was partly of African descent, although it is impossible to know of what tribe. Some of the slaves who were brought to Cuba at an earlier period came from a region where they had become mixed with Arabs, and could read and write.

The article continues:

The works of Placido were suppressed by a vice-regal edict, and his name was covered with official infamy; but by the inhabitants of Cuba the memory of this true son of the people will always be gratefully cherished. Never have the rights of man found a more heroic martyr than in this despised and humble laborer, this pariah of society, bearing in his natural form and color the badge of disgrace and servitude. Surely his death has not been in vain. It is by the fall of such victims that men's thoughts are turned against tyrants and their tyranny. Hundreds and thousands of human beings droop and die in dumb, vulgar misery, and the world's slumbers are unbroken; but let one hero be led out from among them to sacrifice, and his voice penetrates to the four corners of the earth. Yet a few years and it will be seen that Placido, like the greater Toussaint, fell not obscurely or alone, but encompassed by the most faithful and unforgetting friends, beheld and remembered by "great allies,"

— "By exultations, agonies,
And love, and man's unconquerable mind."

We have been thus lengthy in this digression because of the date of the article (1849), the prophetic feelings of its author (who was a

[1] Tennyson's ode to liberty, beginning "Of old sat Freedom on the heights," was written some dozen years before Placido's death. There is a resemblance between the ideas in each poem, but one has the academic polish while the other is the natural cry of genius. It is impossible to imagine that Tennyson, an English gentleman, accustomed to write in the midst of quiet and scholarly surroundings, could have written his ode if he had known that he was to be publicly executed a few hours afterwards.

South Carolinian), and because the episode of Placido's death marks an antiquated phase of history which has now disappeared from this side of the Atlantic.

In other chapters of his interesting history Mitjanes gives a discriminating account of the dramatic writers, novelists, and narrative poetry from 1820 to 1842, which must be passed over to note activity in other directions. In history Ramón de la Sagras and Pezuela's works appeared in 1831 and 1842, respectively, the former being rather of a political-economical character, while the latter takes up the history of the island from the beginning, using the early authorities, and the Sociedad Económica published many memoirs upon historical as well as upon philosophical, medical, chemical, and botanical subjects. A noticeable feature of this period was the appearance of a large number of periodicals which manifested a new political and intellectual activity.

The political changes of 1820 in Spain had their effect upon education. Upon the suppression of the convents the Government gave the chapel of one of the Augustine orders to the Sociedad Económica for establishing a normal school, and established a chair of constitutional law in the seminary of San Carlos, and in the university, but both the normal school and the new chairs were soon after suppressed by another political change in 1824, and the $32,000 which the section of education had received from the municipality for elementary education was also reduced, soon after which that section received its deathblow by the royal order of February 8, 1825, withdrawing the funds which had been allotted to it, in consequence of which it was no longer possible to maintain the new free schools. It is to be observed that during the reign of Ferdinand VII the university, which was more directly connected with the Madrid Government, suffered more than San Carlos, which was protected by the Sociedad Económica and the diocesan bishop, and it remained in a backward state until the Government commissioned Francisco de Arango to examine and report upon the condition of the institution, which task he accomplished, with the aid of those most interested in the needed reforms. His report, in 1827, led to the reforms embodied in the plan of 1842. The medical faculty meanwhile was reorganized and modernized, and philosophy also, in the hands of the new teachers, became a living force, the French school (Cousin) being represented in the period from 1840 to 1856.

In primary and secondary education a great advance was made in the private colleges. From 1827 to 1830 the convenient distinction was drawn between elementary and superior instruction and new colleges were established (five in number), in which the instruction was so excellent that it was said in 1830 that there was no longer any need to send young men abroad for their education. The professors in these colleges were well-known men of letters.

As to free primary instruction, outside of Havana and Matanzas it

was in an exceedingly backward state. The census of 1833 showed that there were only 9,082 pupils registered in the schools of the whole island, and this figure is far above the number of those actually attending. There were then 190,000 or 200,000 inhabitants under 15 years of age. The provinces of Puerto Principe and Santiago, with 250,000 or 300,000 inhabitants each, had 1,408 and 991 pupils in school in 1840, respectively. In Villa Clara there was only one school from 1821 to 1834.

The period from 1842 to 1868, the date of the beginning of the obstinate insurrection that lasted ten years, was prolific in poets and dramatists, whose works Mitjanes criticises with discrimination, and we are astonished at the number of names, especially when we reflect that the entire population of Cuba was only 1,400,000 in 1868, of which 800,000 were white. Let anyone compare the literary activity in Havana with that of any city of equal size in the United States and he can judge of the singular intellectual activity manifested in the island. Upon scientific education and the sciences Mitjanes says nothing, but we can supplement this historical sketch by the official list of royal decrees and orders reorganizing public instruction, the origin of which, we have seen in the foregoing, was always due to the remonstrances or memorials or suggestions of the islanders, and never proceeded from the Government itself.

Secondary and superior instruction.[1]—The royal decrees concerning secondary and superior instruction in Cuba and Porto Rico during the first half of the century provided principally for making valid in Spain the titles of licentiate or doctor obtained in Cuba and Porto Rico. In 1863 a general reform of public instruction was effected, by virtue of which it was divided into primary, secondary, superior, and professional branches. In 1871 a decree provides that professors of the University of Havana are eligible for professorships in Spain, which was followed in 1878 by a decree making the professorate in the colonies and the peninsula one body.

In 1880, at the close of the ten-year insurrection, special schools, which had been called for by circumstances, such as the dental college of Havana, were created, besides societies of agriculture, industry, and commerce. In this year the minister for the colonies drew up a memorial of the unsatisfactory condition of public education in Cuba and Porto Rico, especially in regard to the university and institute of Havana. It recites that the first step toward secularizing education and assimilating it with that of Spain in that respect was taken in 1842, and that the assimilation was nearly complete by 1863 as far as legislation and form were concerned. But Cuba, he adds, was not then prepared for so vast and centralized an organization, and many obstacles and delays arose that checked the proposed reform. The insurrection of 1868 interfered with education very seriously, inter-

[1] From the Diccionario de Legislación de Instrucción Pública. Eduardo Orbanejo. Valladolid, 1893.

rupting the studies and so making it difficult or impossible for students to finish their courses, which, again, unfitted them to become teachers in the secondary schools which were soon after established all over the island. This state of things also interfered with the habilitation in the Peninsula of studies followed in Cuba, and so tended to separate the two countries in that respect. All these considerations led to the decree of June 18, 1880, regulating superior and secondary instruction, and coordinating those branches in Cuba with the same grades in Spain established by the decrees of 1874 and order of 1875. One of the principal features of this decree was the article authorizing the establishment of a secondary institution in the capital of each Cuban province at the expense of the province or municipality, with a subvention from the Governor-General from the estimates for the island. In capitals where there were no public secondary institutes colleges of the religious orders might be substituted by the Governor-General, with the advice of the council. But the degrees granted by these private institutions were to be verified, as only the degrees of public institutions were recognized. In accordance with this decree an institute of secondary education was established in Porto Rico in 1882, there being already several in Cuba; an agricultural commission was organized in Cuba, and in 1885 a professional school was established in Porto Rico like those in Havana, where there were a nautical school, a professional school proper, fitting its students to practice chemistry and the mechanic arts, and an art school. In 1886 the following plan of studies was drawn up for the law faculty of the University of Havana, which we give here for the sake of showing the scope of the studies in that department. There are two sections, one of the candidates for the licentiate and the other for the doctor's degree.

Section of the licentiate.

Metaphysics.
General and Spanish literature.
Critical history of Spain
Elements of law.
Political economy and statistics.
General history of Spanish law.
Principles of Roman law.
Spanish law, civil, common, and statute.
Criminal law.
Mercantile law of Spain and of the principal countries of Europe and America.
Principals of canon law.
Political and administrative law.
Elements of finance.
Public international law.
Private international law.
Proceedings in civil, criminal, canon, and administrative law, and theory and practice of briefing public instruments.

Section of the doctorate.

Philosophy of law.
Higher course of Roman law.
Church history and discipline.
Public ecclesiastical law.
History and critical examination of the principal treaties between Spain and other powers.
Principles of public law of ancient and modern peoples.
History of private law of ancient and modern peoples.
Law literature, principally Spanish.

A similar reform was effected in the faculties of medicine and pharmacy of the University of Havana in 1887 by a royal decree which brought that faculty upon the level of a Spanish university. The plan of studies was as follows:

Preparatory course.—Physics, advanced course; general chemistry; mineralogy and botany; zoology.

These subjects were to be studied in the faculty of sciences and natural history.

Section of licentiates.—Descriptive anatomy and embryology; normal histology and histo-chemistry; technical anatomy, practice in dissection, in histology and histo-chemistry; human physiology, theoretical and experimental; private hygiene; general pathology, with clinics and clinical preliminaries; therapeutics, materia medica, with writing prescriptions, and hydrology, hydrotherapeutics, and electrotherapeutics; pathological anatomy; surgical pathology; topographic anatomy; practice of medicine, with clinics; clinical surgery, medical pathology, clinical medicine; obstetrics and gynecology, with clinics; special course on the diseases of children, with clinics; public hygiene, with medical statistics and sanitary legislation; legal and toxicological medicine.

Course for doctorate.—Critical history of medicine; public hygiene, advanced course, including a historical and geographical course of endemics and epidemics; biological chemistry with analysis; chemical analysis, especially of poisons.

Lectures upon some of the above studies are appointed to be had every day during the course, others daily for a certain time, and others twice a week, according to the importance of the subject.

The plan of studies for pharmacy included the preparatory course above given. Then follows:

Course for licentiates.—Study of physical instruments and apparatus as applied to pharmacy, with exercises for practice; descriptive botany, with determination of medical plants; mineralogy and zoology applied to pharmacy, with the corresponding pharmaceutical material; inorganic chemistry applied to pharmacy, with exercises; vegetable materia pharmaceutica; exercises in animal, vegetable, and mineral materia pharmaceutica; organic chemistry applied to pharmacy, with exercises; chemical analysis, particularly of foods, medicines, and poisons, with exercises; practical pharmacy and sanitary legislation.

Course for doctors' degree.—Biological chemistry, with analysis; critical history of pharmacy and pharmaceutical bibliography.

The decree specifies in what way the programme is to be carried out.

This programme is essentially the same as that of a European university.

As showing a disposition to adopt new features, it is important to note that the same decree that contains the above programme also directs that a chair of industrial mechanics and applied chemistry shall be created in the Havana Institute. This institute already possessed a

chair of experimental physics, while practical chemistry and mechanics were taught in the professional school.

We give also the plan of studies of the faculties of philosophy and letters and of sciences of the university as prescribed by royal order of 1887, together with the attendance in 1888–89. As these studies are of a general nature they are not designed to fit students for professions like the special subjects in the law and medical faculties. The list shows the interest shown in such subjects.

Programme of the Royal University of Havana, 1888–89.

FACULTY OF PHILOSOPHY AND LETTERS.	Number of students.
General and Spanish literature	119
General literature	7
Spanish literature	15
Greek, first course	19
Greek, second course	10
Greek and Latin literature	12
General history, first course	19
General history, second course	25
Metaphysics, first course	132
Metaphysics, second course	12
Critical history of Spain	124
Hebrew	1
Arabic	8
Æsthetics	4
History of philosophy	4
Critical history of Spanish literature	5
Sanscrit	5

NOTE.—At the same time 24 students were classified in this faculty from private instruction, having passed their examinations, i. e., their degrees having been verified, as explained in the decrees. Of these 24, 5 were examined in Porto Rico.

FACULTY OF SCIENCES.	
General studies:	
Mathematical analysis, first course	19
Mathematical analysis, second course	7
Geometry	19
Analytical geometry	6
Cosmography and physics of the globe	8
Advanced physics	137
General chemistry	141
General zoology	138
Mineralogy and botany	138
Lineal drawing	9
Physico-mathematical sciences:	
Differential and integral calculus	2
Theoretical mechanics	1
Descriptive geometry	1
Advanced experimental physics	6
Higher physics, first course	1
Higher physics, second course	2
Higher physics, experimental, first course	1
Higher physics, experimental, second course	2
Geodesy	1
Mathematical physics	3
Theoretical and practical astronomy	3

	Number of students.
Physics and chemistry:	
Inorganic chemistry	4
Experimental chemistry	4
Organic chemistry, and experimental	8
Drawing applied to physico-chemical science	3

Natural sciences, including anatomy and animal and vegetable physiology, mineralogy, zoography of vertebrates, articulates, mollusks, and zoophytes, phytography and botanical geography, drawing applied to natural history, comparative anatomy, and stratigraphic paleontology, 27 students in all.

We give the programme of the Institute of Havana to illustrate the grade or scope of this class of instruction in Cuba. The programmes of the other provincial institutes are essentially similar to it, some of the commercial subjects being dropped or changed.

Latin and Spanish (two courses).
Rhetoric and poetry.
Geography.
Spanish history.
General history.
Psychology, logic, and ethics.
Arithmetic and algebra.
Geometry and trigonometry.
Physics.
Chemistry.
Natural history.
Physiology and hygiene.
Agriculture.
Mercantile arithmetic and bookkeeping.
Geography and commercial statistics.
Political economy.
Practical commercial exercises.
Chemistry applied to the arts.
Industrial mechanics.
French, English, and German (two courses each).

This, it will be seen, is a very "practical" course.

The preparatory course of the professional school of the island of Cuba comprised arithmetic, algebra, linear drawing, geometry, trigonometry, and ornamental drawing, while the professional course proper embraced topography, theoretical and practical surveying, topographical drawing, descriptive geometry, the mechanics of construction, strength of materials, construction of all kinds, building and architectural drawing, international mercantile law, history of commerce, the materials of commerce, cosmography, pilotage, and hand work.

The school of painting and sculpture of Havana had 454 students. The programme included elementary drawing, drawing from the antique, sculpture, landscapes in lead pencil, carbon, and oil, both copies and from nature; color drawing, claro-obscuro, copies of pictures; drawing from nature, from the living model, and original compositions.

The programmes given above are too general to enable one to judge of the quality of the instruction. For instance, Greek might cover Xenophon, or lectures on the tragic poets, or Homer, and geometry might include anything from elementary geometry up to that of three dimensions. The inaugural addresses, 1888–89, however, before the university, allow us to form an opinion. Thus the inaugural address in 1890 of Dr. Don Juan Vilaro y Diaz is a very able paper upon some points in evolution, which are supported by a large number of references to observations by the author himself and other persons. They range, as usual, in the full exposition of the argument, from paleontological data down

to variations in living species, and the essay is in support of natural selection. The programmes at hand, while containing a plentiful amount of theoretical, mathematical, and physical subjects, have less applied science, such as electrical and mechanical engineering, than is found in the technological schools elsewhere, where manufactures and various industries make a demand for them.

To complete this part of the subject we give the plan of studies of elementary schools taken from the Resumen de la legislación de primera enseñanza virgente en la isla de Cuba. Habana, 1895. Por José Estebán Liras.

This plan is as follows for the lower grade: (1) Christian doctrine and sacred history adapted for children; (2) reading; (3) writing; (4) elementary Spanish grammar and orthography; (5) elementary arithmetic, including weights and measures; (6) elements of agriculture, industry, and commerce, to be varied according to locality.

Primary superior instruction embraces, besides an amplification of the foregoing: (1) Elements of geometry, linear drawing and surveying; (2) rudiments of history and geography, especially Spanish; (3) elements of physics and natural history adapted to the more common necessities of life. In schools for girls of corresponding grades, articles 6 of the elementary, and 1 and 3 of the primary superior, are replaced by (1) women's work; (2) elements of drawing applicable to the same, and (3) elements of domestic hygiene.

The same authority gives the following brief sketch of the history of public elementary education in Spain and the colonies:

Primary instruction.—The laws and royal orders and decrees in accordance therewith affecting elementary education in the colonies are substantially those regulating education in Spain. Up to 1821 public primary education was not a function of the State and was not regulated by any general law in Spain.

On June 20 of that year the Cortes decreed that public primary instruction should be free and that a school of that character should be established in every town of 100 inhabitants, and that there should be one school for every 500 inhabitants in cities [thus antedating the passage of the similar law in France by twelve years]. Following this was the plan of February 16, 1825, the provisional plan of July 21, 1838, and the royal decree of September 23, 1847. On September 9, 1857, was promulgated the law which still prevails. Besides the foregoing, the royal decree of February 23, 1883, made primary education obligatory. Primary education is obligatory for all Spaniards. The fathers and guardians, or others having charge of children, shall send them to the public schools from their sixth to their ninth year of age unless they furnish the same grade of instruction at home or in some private school. (Plan of studies of December 7, 1880.) The Spanish Cortes in 1813 proposed to make reading and writing a condition of citizenship, a measure which excited Jefferson's admiration.

In Cuba four general dispositions affecting public instruction have been promulgated, following the law of the Peninsula. These are the general plan of 1842, the plan of studies of 1863, the organic regulation of primary instruction of 1871, and the plan of 1880, which now prevails. The plan of 1842, for Cuba and Porto Rico, was based on the peninsula law of 1838, and the later ones on that of 1857. The plan of studies of December 7, 1880, is that which prevails now on general points. In 1890 normal schools were created, in 1891 the secretaryships of the provincial committees for education were provided, and in 1892 special school deposits for primary instruction were established.

As everyone knows, it is impossible to form a correct idea of the real condition of education from royal orders and decrees, and plans of studies which make, or may make, a deceptive appearance, and we therefore present the testimony of competent witnesses who have had opportunities of observing the condition of education in Cuba from about 1800 down to the most recent years.

Humboldt, in his personal narrative, says of the Cubans of his time that intellectual cultivation was almost entirely restricted to the class of the whites and was as unequally distributed as the population.

> The first society of the Havanah resembles, in ease and politeness of manners, the society of Cadiz and of the richest commercial towns of Europe; but quitting the capital, or the neighboring plantations inhabited by rich proprietors, a striking contrast to this state of partial and local civilization presents itself in the simplicity of manners that prevails in the insulated farms and small towns. The Havaneros were the first among the rich inhabitants of the Spanish colonies who visited Spain, France, and Italy, and at the Havanah the people were the best informed of the politics of Europe and the springs put in movement in courts to sustain or overthrow a ministry.[1]

And of the educational institutions he says:

> At the Havanah the university, with its chairs of theology, jurisprudence, medicine, and mathematics, established since 1728; the chair of political economy, founded in 1818; that of agriculture and botany; the museum and the school of descriptive anatomy, due to the enlightened zeal of Don Alexander Ramirez; the puplic library; the free school of drawing and painting; the national school; the Lancasterian schools, and the botanic gardens are institutions partly new and partly old.

The Countess Merlin, who was a native of Havana, but had been absent in Paris many years, returned there and published three volumes of letters, with the title "La Havane," in 1844. She says of education in Havana at that period that it produced two contradictory impressions—a consciousness of undeniable progress, which was increasing, and a lively sense of relative inferiority. There were extreme eagerness for knowledge, quick intelligence, minds well prepared to receive it, and every ray of light from Europe was greeted with enthusiasm. With all this there were great imperfections, *lacunæ*, in the organization of public instruction and in the tendencies of pri-

[1] Vol. XII, p. 157, of Miss Williams's translation, 1829.

vate education, and the neglect and indifference of the Government was an obstacle to progress. The Cubans kept themselves informed of everything educational and scientific that was going on in Europe, and on the death of Ferdinand VII, when aristocratic Spain endeavored to imitate the culture and civilization of France and England, some Havanese, profiting by the movement in the mother country, obtained permission to form a literary "Académie," a name which, perhaps, was not the best title that could be found, but which promised a better intellectual future. But the Captain-General saw in this institution a germ of political reform and danger, and it was dissolved. More than once educated young men have asked permission to found and maintain chairs of literature and science, but in vain; the same fear prompted the Government to withhold its consent. In the absence of satisfactory means of education at home many fathers of families sent their sons abroad for their education. As soon as this was known at Madrid a royal order came directing the parents to recall their sons and forbidding them to send them abroad in the future. This order eventually fell into desuetude. Enterprising men then obtained permission to found colleges and maintain them at their own expense. The lower classes, however, were entirely without elementary instruction, and the Government refused to establish a single school at its own expense. When the sons of wealthy families could only obtain an education with difficulty, and at great expense, how could the children of the poor obtain any education whatever without public schools and teachers maintained by the Government?

This situation, which was better suited to produce assassins and bandits than citizens, aroused the interest of some of the Cuban patriots, who formed a society called the Society of the Friends of the Country, which, having no funds but the individual subscriptions of the members, could accomplish little. Primary schools, therefore, were still few in 1814. In 1836, with a population of 417,545 free (colored and white) persons in the Province of Havana, only 9,082 attended school. Of that population there were 99,599 children from 5 to 15 years of age. In a previous period there was even less instruction, and in 1836 there were 90,517 children absolutely without education. In 1844 there were still more, because the population had increased and the primary schools, being always without resources, could not keep up with it. As nothing could be obtained from the Government, the Cubans resorted to theaters and masked balls to raise money for founding schools. The Sociedad Patriótica, or Económica, which was founded in 1793 by Governor Las Casas, who gave liberally of his own fortune for founding schools, began now to bear fruit and the situation was improving. The countess mentions a museum of natural history as existing in 1844, and the school of design, which was established in 1815 by Ramirez, and adds that there were no attempts at intellectual development which did not meet an active and disinterested sympathy among the creoles. Every one

of their sons brought back from his foreign travels something to advance civilization in the island. The number of able and distinguished men was then larger than could have been expected, and included savants and writers on political economy who kept abreast of all European progress. Besides literary men, including poets, she gives the names of Saco, José de la Luz, and Del Mante, and concludes by saying that one curious consequence of the absence of primary instruction simultaneously with the advanced condition of higher education was to be seen in the juxtaposition, in strange contrast, of the oldest traditions and a modern college, and journals written in elegant style, published in a city where the old Castilian language of Cervantes and Lope de Vega was still spoken.

In 1855 J. J. Ampère (son of the French physicist whose name is given to a "law" in electro-magnetism) published an account of his travels in America, in the course of which he visited Havana and says of the library of the university that it contained the recent French scientific treatises, the works of Cousin, etc. There was at that time no great literary and scientific movement at Havana; nevertheless, there was a marked progress in the number of students in the schools. He speaks of a school of mechanic arts with 240 students, and 15 foundations for the orphans of officers and families who had emigrated from the mainland. The governor, General Concha, did much for this school.

In 1859 Mr. Richard H. Dana visited Havana and wrote as follows about education as he saw it. His opinion is the more valuable, as his observations were made during a vacation trip, and he must have had Harvard in mind while making comparisons:

> As to education, I have no doubt that a good education in medicine and a respectable course of instruction in Roman and Spanish law and in the natural sciences can be obtained at the University of Havana, and that a fair collegiate education, after the manner of the Latin races, can be obtained at the Jesuit College, the Seminario, and other institutions in Havana and in the other large cities; and the Sisters of the Sacred Heart have a flourishing school for girls at Havana, but the general elementary education of the people is in a very low state. The scattered life of planters is unfavorable to public day schools, nay, almost inconsistent with their existence. The richer inhabitants send their children abroad or to Havana, but the middle and lower classes of whites can not do this. The tables show that of the free white children not more than 1 in 63 attend any school, while in the British West India islands the proportion is 1 in the 10 or 20.

The life in the country, the free, careless monteros or guijaros who hardly need to work, whose principal occupation is cock-fighting and who can see no need of schools, doubtless had much to do, as Mr. Dana noticed, with the low number of elementary schools.

But Havana, which at that time had a population of 150,000, was admirably equipped for secondary and university studies, and a writer in the National Quarterly Review for 1866 (vol. 14) said of it:

> Far from being behind the age in the provision which it made for education, there is not one of our cities, not even the modern Athens, which excels it in that respect. Boston, Philadelphia, New York, and one or two other American cities have,

indeed, better public schools than Havana. They afford better facilities for the education of the poor. But the higher educational institutions of Havana are on an extensive and liberal scale. We must admit, on due examination, that we have no institutions that are equal to their free school of design and painting, or their free school of mathematics. The professors in each of these schools have been selected for their superior qualifications in different countries of Europe, a large proportion of them being Germans, French, and Italians. If it still seems incredible that Havana has some educational institutions which are superior to those of Boston or New York, we ask is the fact more incredible that the same city has a fine botanical garden in which botany is taught in all its branches by professors who have graduated at the famous Jardin des Plantes, in Paris, and other similar schools, while we have no botanical garden worthy of the name? The capital of Cuba has also a first-class university, one which may be compared to that of the city of New York, and which has separate chairs for jurisprudence, medicine, chemistry, theology, comparative anatomy, and agricultural botany.

In 1887 Professor Froude, the historian, visited Cuba, and gives the following interesting and appreciative account of the well-known Jesuit College at Havana, which has been especially famous as the seat where the celebrated meteorological observations of Father Viñez were made. He says of the Jesuits:

They alone among the Catholic clergy, though they live poorly and have no endowment, exert themselves to provide a tolerable education for the middle and upper classes. * * * Their college had been an enormous monastery. * * * The Jesuits have taken possession of the largest convents much as a soldier crab becomes the vigorous tenant of the shell of some lazy sea snail. They have a college there where there are 400 lads and young men who pay for their education; some hundreds more are taken out of charity. The Jesuits conduct the whole, and do it all unaided, on their own resources. And this is far from all that they do. They keep on a level with the age; they are men of learning; they are men of science; they are the royal society of Cuba. They have an observatory in the college, and the Father Viñez, of whom I have spoken, is in charge of it. His name is familiar to students of meteorological science, and he has supplemented and corrected the accepted law of storms by careful observation of West India hurricanes. The libraries were well furnished, but the books were chiefly secular and scientific. The sleeping gallery was divided into cells, open at the top for ventilation, with bed, table, chest of drawers, and washing apparatus, all scrupulously clean. Everything was good of its kind down to the gymnastic courts and swimming bath. The cost of the whole establishment was defrayed out of the payments of the richer students managed economically for the benefit of the rest. From the courtyard we turned into a narrow staircase, up which we climbed until we reached the roof on and under which the father had his lodgings and his observing machinery. Cases stood around the wall containing self-registering instruments of the most advanced modern type, each with its paper band unrolling slowly under clockwork, while a pencil noted upon it the temperature, the ozone, the electricity. He took us out to a shed among the roof tiles, where he kept his large telescope, his equatorial and his transit instruments, not on the great scale of State-supported observatories, but with everything which was really essential. He had a laboratory, too, and workshop, with all the recent appliances. He was a practical optician and mechanic. He managed and repaired his own machinery, observed, made his notes, and made his reports to the societies with which he was in correspondence, all by himself.

At my companion's suggestion he gave me a copy of his book on hurricanes. It contains a record of laborious journeys which he made to the scene of the devastations of the last ten years. The scientific value of the father's work is recognized

by the highest authorities, though I can not venture even to attempt to explain what he has done. * * * As we took leave the marquis kissed his old master's brown hand. I rather envied him the privilege.

Mr. R. H. Dana's visit to the Belen (Bethlehem) was in 1859. He described it as a group of buildings of the usual yellow or tawny color, covering a good deal of ground, and of a thoroughly monastic character.

It was first a Franciscan monastery, then a barrack, and now (1859) has been given by the Government to the Jesuits. * * * These perform every office from the highest scientific investigations and instruction down to the lowest menial office in the care of the children. It is only three years since they established themselves in Havana, but in that time they have formed a school of 200 boarders and 100 day scholars, built dormitories and a commons hall, restored the church and made it the most fully attended in the city. Father Antonio Cabre, a very young man of a spare frame and intellectual countenance, with hands so white and so thin and eyes so bright and cheeks so pale, is at the head of the department of mathematics and astronomy. He took us to his laboratory, his observatory, and his apparatus of philosophical instruments. These, I am told, are according to the latest inventions and in the best style of French and German workmanship. There was a cabinet of shells, the beginning of a museum of natural history, already enriched with most of the birds of Cuba, and a cabinet of the woods of the island in small blocks, each piece being polished on one side and rough on the other.

The recent condition of elementary education in Cuba is ably discussed by Señor Manuel Valdés Rodriguez in a pamphlet with the title La Educación Popular en Cuba, which is a lecture of the course given by the Real Sociedad Económica in 1891, a society which has such an honored name in the intellectual history of the island. This work is published together with another by the same author on The Problem of Education, which consists mainly of articles contributed to El Pais and the Revista Cubana, reviewing the work of the international congress of education and the educational exhibition at Paris in 1889.

In this review the author presents to his fellow-countrymen the results brought out by the discussions and exhibits at Paris and indicates how the Cuban elementary school system could be made to profit by them. He points out certain essential differences between the Cuban social life and that of other countries and that such differences should be taken into account in reorganizing the Cuban schools. He takes up different countries—Germany, France, the United States, etc.—and gives a summary of their elementary instruction, the material of instruction, and statistics. He is particularly impressed with the union between the common schools and the domestic and political life of the United States, whereby the school is not an interruption of, but a factor in, both, and he pointed out the antagonism that often exists in Cuba between the elementary school and the home, and between the unfortunate school teachers and the alcalde.

In the second paper Señor Rodriguez, who is a teacher by profession, but is also a man of reading and well informed in modern philosophical

and pedagogical ideas, proceeds to discuss the actual condition of elementary instruction in Cuba. He first calls particular attention to the precocity of Cuban children, whose faculties ripen early but soon lose their freshness, and then gives a pedagogical and psychological discussion of intellectual, moral, and social education, in which he notices the views of various writers—Herbert Spencer, Herbart, Pestalozzi, the criticisms of Tolstoi—and in the section upon social education he takes occasion again to call attention to the close union between the elementary school and private and public life in the United States, but at the same time he refers to the crying evil of bad literature which the public school children of the United States are led to read. He quotes from the report of the association of teachers in New York in 1889 in which is a quotation from one of the most distinguished pedagogues of America, to the effect that many American boys would be better off morally and physically if they never had learned to read, and he comments upon certain similar evils in Cuba. He then speaks of the actual condition of primary schools in Cuba, and says that there are practically none. The number of them has increased, he says, but the principal fact in connection with them is their creation and insertion in the budget. They are neglected by the Government, which provides no inspectors; by the local juntas, whose members often do not know where they are; by the fathers of families, who do not believe in the gratuitous service, and by the teachers themselves, who have often to go unpaid.

In 1869 the Government closed 64 schools in Havana, and only in 1872 did it reopen 32 of them. Four more were afterwards established, besides 8 for colored people.

But the conditions of these schools were deplorable. The buildings could not accommodate the pupils allotted to them; some had no class rooms, so that the attendance in some cases was not over 20. The civil governor, Señor Rodriguez Batista, did his best to increase the attendance, but, as many teachers remarked, neither the limited accommodations of the buildings, nor the absolute want of teaching material, nor the general conditions of elementary instruction, warranted the attendance of the required number of pupils. It would be a great injustice to impute such a lamentable state of things to the conduct of the teachers. On the contrary, they manifest an exceptional and sincere disposition corresponding to the lofty ends of their mission, but they are extremely poor, and some are in danger of starving. In this same year, 1891, Señor Dionisio Vega, by authority of the teachers of the capital, appealed to the press on behalf of the teachers in the rural districts, to whom arrears amounting to $117,957.50 in gold were owing, a deficit which had been accumulating since 1887. It would be unjust not to speak of the generous efforts of the present civil governor to ameliorate the situation, but it still remains an anomaly, and the larger part of the teachers have been obliged to sell their vouchers at

an enormous discount in order to live. "To my mind, however," continues Señor Rodriguez, "the saddest and most dangerous feature of this state of things consists in the strange apathy of our public and their ignorance of the real state of things, which I can only explain by the profound intellectual lethargy and prostration of the lower classes, who are plunged in the heavy sleep of ignorance, while we take no heed of their dangerous situation. This indifference is unjustifiable, for, better or worse, we shall have to form our people out of this contingent, and unless we can raise them from the slavery of ignorance, now that they have been freed from bodily servitude, our country will soon resemble a nation of some primitive people. An odious distinction has come to exist in our system of education between the rich or powerful and those who have been disinherited by fortune. For the first class there are the university and the institutes in the various provincial capitals; for the second, a situation has grown up which renders education nearly impossible. The son of the rich or well-to do family has the incentive of a future to spur him on to acquire an education, while the child of poor parents has neither this incentive nor any means of attaining an education. It is true that the education of the better classes is profoundly utilitarian and egotistic, frankly calculated to further personal interests, the door to higher aims, which should animate our country, being closed; but the situation of the plebeian classes is lamentable, as every notion of school, teacher, pupil, moral influence, and instruction is gradually becoming extinct. It may be said that within a short time our entire elementary education will consist of the most rudimentary ideas of mechanical reading and writing. Reading and writing imply a deep signification when they are combined with the development of the mind and conscience; otherwise, they are dead things. Formerly the rich and poor child went to school together for a certain period, a circumstance which had inestimable advantages both for the general social conditions of the country and because it opened the way for talent. Many of our men of letters came from the lower classes."

The present law provides that the government shall have the direction of the schools, including their morals, hygiene, and instruction, text-books, and everything affecting them, while the city authorities are to pay for their support without any participation in the management. Such a system is likely to produce real antagonism between the municipal corporation and the government, because the former are not eager to pay for services which they can not control. This explains the constant struggle with the town authorities to pay the teachers' salaries. But in order to manage the schools properly, which the local authorities have to support, the government needs skilled persons who understand the problems and necessities of education in its technical aspect, who are called inspectors, and who form an intermediary between the government and the schools. But in point of fact, so profound is

the neglect of the elementary schools, there have been no inspectors, either provincial or general, for many years; so that the government is absolutely ignorant of the inner life of the schools, their needs, their regular operation, and the more insignificant matters that affect their life.

The only activity in promoting the welfare of the schools is manifested by the diligence of the teachers. The slight influence which the provincial deputies can exert is shown by the failure to create recently a normal school at Havana, notwithstanding the efforts of Don José María Carbonell, senator from the university. To make some amends for such deficiencies, the law has created local and provincial juntas, the former of which exercise the right of visiting the schools, fixing the examination days, and seeing that the schools are in operation regularly, and in short, are a kind of intermediary between the teachers and the heads of families. But as the government appoints the persons who, in the minds of the heads of families, are an integral part of this machinery, it results that such appointments, in the midst of the prevalent profound indifference and atony in educational affairs, are without influence upon the real and effective life of the schools. The darkness of the situation becomes intense when we reflect that elementary education has had no regulation for years which should direct and arouse to practical life the force naturally inherent in the institutions. Organization, system, method, all are absolutely neglected or ignored.

Señor Rodriguez asks what remedy can be found for this condition of things, and finds it in an increased political activity and the press. By political life he means particularly a greater initiative on the part of the municipalities, and an amplification of their functions, or greater decentralization.

As the municipalities are poor, and irregular in their payment of teachers' salaries, he thinks that both this misfortune and the want of activity and interest can be cured by the action of political parties in the better sense of the word; and this political activity, he says, has had a great influence upon the elementary schools in France, in Spain, and in Italy particularly, where the principles of the French revolution have penetrated. The school, he continues, when well organized acts spontaneously in forming upright minds, guiding the conscience, preparing men for the work of life, nourishing the mental faculties, and assisting the individual development, cultivating, in short, these three aspects of the individual, viz, the man, the citizen, and the productive agent. There is, he concludes, no other alternative; but either the care of producing these results must be left entirely to the government or the people must take the initiative and assume the charge of such importance themselves. Every civilized country must necessarily choose the latter course. In that case, with the desire or ambition to accomplish this purpose, the political party to effect it will

rise, whose activity is inseparably connected with everything affecting the general interest of the people. A political party, once formed, the promotion of the elementary schools should be included in its programme, and the whole ayuntamiento, or council, with its alcalde, and the corporations connected with it, should be asked for their profession of faith. And an enlightened press should advance these interests and be their safeguard. The paper closes with a reference to the public-spirited men and women in Cuba who have devoted themselves to establishing schools or improving education, as has already been noticed.

In an appendix Señor Rodriguez gives the law regulating primary instruction, with his own observations, showing deficiencies in the various articles. The date of the law is not given. The articles are as follows:

ART. 2. Elementary instruction shall comprise Christian doctrine and sacred history, reading, writing, principles of grammar with exercises in orthography. Elementary arithmetic, including coins, weights, and measures. Elementary lessons in agriculture, industry, and commerce suited to the locality.

ART. 3. Instruction which does not include all these subjects shall be regarded as incomplete for the purposes of this plan of studies.

ART. 125. In every town of 500 souls there shall be a public elementary school for boys and another for girls, even if incomplete. Incomplete schools for boys shall be allowed only in smaller towns.

ART. 126. In towns of 2,000 souls there shall be two complete schools for boys and two for girls; in towns of 4,000 there shall be three, and so on, increasing the schools by one for each sex for every 2,000 inhabitants, including private schools; but one-third of the whole shall always be public schools.

ART. 127. In the provincial capitals and towns of a population of 10,000 one of the public schools shall be a high school.

ART. 131. The governor-general shall provide infant schools in the department capitals and towns of 10,000 inhabitants.

ART. 133. In towns of 10,000 inhabitants there shall be a night school or a Sunday school for adults, and besides, a class in linear drawing and ornamental drawing, with application to the mechanic arts.

ART. 134. The supreme government will promote the education of the deaf, dumb, and blind by providing at least one school for them in Havana.

ART. 137. In order that those who intend to devote themselves to primary education may obtain the necessary instruction, there shall be one normal school in the capital of each province.

ART. 141. The general government will promote the establishment of normal schools for female teachers for improving the instruction of girls, and will establish model schools where it is convenient, under certain requirements which the regulations will determine.

Upon the foregoing Señor Rodriguez remarks that no provision is made in the appropriations for carrying out the requirements of the law. There was in 1890 only one high school for boys and another for girls in Havana, one for boys in Guanabacoa, one in Matanzas, one in Puerto Principe, and one in Santiago de Cuba, six in all, the law requiring that there should be one for every 10,000 inhabitants. There was not one infant school in the island, under the law, but one under the auspices of the Real Casa de Beneficencia y Maternidad de Habana had been successfully conducted for several years. Neither was there

a night school nor a drawing school founded by the municipalities, but the Real Sociedad Económica established that kind of instruction in 1878 for adult whites and blacks. There is also a school of mechanical arts in Havana. As to normal schools, there is also no provision for them in the appropriations, yet since the twenty-two years during which the normal school of the Æsculapian fathers has been closed, which turned out accomplished teachers, the State has established two such schools in Havana, one for male and the other for female teachers, but none of the provinces have one. It is the glory of the Sociedad Económica to have installed a preparatory night school for male and female teachers which is free, and is supported by different members of the Society of Friends of the country. We give the summary of Señor Rodriguez:

Province.	Population.	Number of schools incomplete.	Number of private schools.	Elementary schools.	Elementary schools required by law.	Elementary schools to be established.
Havana	452,028	80	354	112	524	412
Pinar del Rio	229,761	99	26	35	274	239
Matanzas	259,754	74	112	69	300	231
Santa Clara	351,265	95	93	79	404	325
Puerto Principe	68,881	11	35	22	74	52
Santiago de Cuba	271,010	72	76	38	294	256
Total	1,632,699	431	696	355	1,870	1,515

This table shows that in a population of 1,432,199[1] there were 355 elementary schools in 1891, and that 1,515 were still to be established to conform with the requirements of the law, which calls for 1,870. These figures show also that there was one elementary school to 4,036 inhabitants.

We take, at the risk of some repetition, the following additional notes on public elementary education in Cuba from the translation of a book by Raimond Cabrera, with the title, Cuba and the Cubans. The author says, "Until the last century was far advanced the Cubans had not a single public institution where they could have their children taught to read and write. The first school was that of the Bethlehemite Fathers, in Havana, and was established through the generosity of Don Juan F. Carballo. He was, according to some authorities, a native of Seville, and according to others, of the Canary Islands. He repaid thus generously the debt of gratitude he owed the country where he had acquired his wealth. Already, in the sixteenth century, a philanthropist of Santiago de Cuba, Francisco Paradas, had afforded a like good example by bequeathing a large estate for the purpose of teaching Latin linguistics and Christian morals. The legacy was eventually made of avail by the Dominican Friars, who administered it, but when the convents were abolished it was swallowed by the royal treasury, and thus the beneficent intentions of the founders were frustrated, to

[1] The figures in the column "Population" add up to 1,632,699, but as Señor Rodriguez uses 1,432,699 in his discussion, the error can not be determined.

the permanent danger of the unfortunate country. Only these two institutions, due entirely to individual initiative, are recorded in our scholastic annals during the three first centuries of the colony. The thirst and scent for gold reigned supreme. The sons of wealthy families, in the absence of learning at home, sought schools and colleges in foreign parts (in this century). On their return, with the patriotic zeal natural to cultured men, they endeavored to better the intellectual condition of their compatriots. This enforced emigration of Cubans in quest of learning was fought against by our government. The children of Cuban families were forbidden to be educated in foreign countries. This despotic measure was adopted without any honest effort being made to establish schools for instructing the children of a population already numbering nearly 500,000 souls.

"The Sociedad Económica was founded in 1793, during the time of Las Casas, whose name has always been venerated among Cubans. Then, as now, the members of this association were the most talented men of the country, and their best efforts were directed toward promoting public instruction. It gave impulse and organization to the school system in Cuba; it established inspections, collected statistics, and founded a newspaper to promote instruction and devoted its profits to this cause; it raised funds and labored with such zeal and enthusiasm that it finally secured the assistance of the colonial government and obtained an appropriation, though but of small amount, for the benefit of popular instruction.

"In 1793 there were only 7 schools for boys in the capital of Cuba, in which 408 white and 144 free colored children could be educated. From this privilege the slaves were debarred. The seven schools referred to, besides a number of seminaries for girls, afforded a means of livelihood for a number of free mulattoes and some whites. The schools were private undertakings paid for by the parents. Only one, that of the reverend Father Senor, of Havana, was a free school. Reading, writing, and arithmetic were taught in these schools. Lorrenzo Lendez, a mulatto of Havana, was the only one who taught Spanish grammar. The poor of the free colored classes were on a par with the slaves. The Sociedad Económica founded two free schools, one for each sex. The bishop, Felix José de Tres Palacios, nullified the laudable efforts of the country's wellwishers by maintaining that it was unnecessary to establish more schools. From 1793 to 1893 the society was unable to accomphish even a part of its noble purpose—it was found impossible to obtain an official sanction of popular education. In 1817 there were 90 schools in the rest of the island—19 districts—all, or nearly all, founded by private individuals. In 1816 the section of education of the Sociedad Económica was established. It afforded a powerful impulse to the cause of education, thanks to the influential support of the governor, Don Aliquando Ramirez. The schools improved, the boys and girls, both white and black, were

taught separately, literary contests were opened, annual examinations were made obligatory, prizes were distributed, and a powerful incentive was created among all classes for the cause of education. But the concessions attained for the society by the influence of Ramirez were revoked by royal order of February, 1824. In this year the municipality of Havana loaned the Sociedad Patriótica $100 for schools.

"In 1826 there were only 140 schools in the island, of which 16 were free, and in 1827 the society obtained $8,000 per annum for the establishment and maintenance of new schools. In 1836 there were only 9,082 children receiving elementary instruction in the whole island. In 1860 the number of schools had increased to 283 for whites and 2 for colored, yet the attendance was proportionately less than in 1836, owing to the increase in population. Popular instruction was neglected or despised by deputy governors (military).

"The reformed course of studies of 1863 did not improve the condition of the schools, and the secretary of the governor made recommendations that virtually tended to keep the population in ignorance in order to keep it Spanish. In 1883 the schools numbered as follows:

Province.	Public.	Private.	Vacant.
Havana	173	101	8
Matanzas	95	22	13
Pinar del Rio	82	18	25
Santa Clara	103	18	3
Puerto Principe	24	4	3
Santiago de Cuba	58	21	15
Total	535	184	67

"But the teachers were not paid and public instruction was neglected."

This work gives a list of names of wealthy Cubans, both men and women, who have founded colleges and schools, and of societies which have the promotion of education for their object. The author adds that the clergy are indifferent in this matter. There is not one parish which supports a free or endowed school.

The preamble of a decree reforming education in Cuba was published in the Official Gazette of Havana November 17, 1871, and a translation of it is given in an appendix in the work just quoted. On account of its historical interest we give a summary of a portion of the preamble. It states that the insurrection of 1868 was due to the bad system of education; that while the old methods were slow the new are prompted by eagerness for hurry, and the child is taught a number of things, whereas its mind is unable to comprehend many things at a time. A number of subjects should therefore be suppressed. Balmés is quoted as the authority for the psychology and pedagogy of the preamble. The latter goes on to say that this haste to teach many things has made religious instruction secondary to that of the arts and sciences, a fatal error which has produced fatal consequences. It refers to statistics to

show that crime has increased with education, and states that Aimé Martin found the remedy for this evil in educating instead of merely instructing. But as there were many religious sects, Martin unfortunately selected an irreligious religion as the means of educating, and consequently there was no decrease in crime. Señor Lasagra is quoted to prove that suicides are more numerous in Protestant than in Catholic countries, and more so in the capitals than elsewhere. This is due to too great individual freedom of thought and consequent changes in social and economic conditions, which have produced dissatisfaction, despair, and suicide. Philosophical and religious sects have multiplied, and the multiplicity of these has always and everywhere produced doubt and skepticism, which in their turn have engendered a materialism whose only offspring is disbelief in virtue and morality. Under its influence some are tortured with unhappiness, without hope of the future, while others are filled with envy. Religious instruction had been too much neglected or too carelessly performed, and the real remedy would consist in Christianizing or Catholicizing education, by putting the government and municipal machinery of education in the hands of the religious teaching orders, when the evil would disappear. It goes on to say, with severe condemnation of the schools where they had taught, that many of the insurgents had been teachers, and mentions particularly the school formerly conducted by José de la Luz. Instruction must be supplemented by moral and religious education, and great care should be taken to prevent access to (politically) evil literature. Even in text-books of elementary geography, it declares, have wicked doctrines been inserted. In one of them we read that the greatest event of the present century in America was the revolt of Bolivar. "See under what seductive forms the minds of children are predisposed to treason." The preamble concludes by recommending a greater scope to religious instruction, the suppression of private teaching, and placing the plans of studies under the Catholic clergy.

There is a number of learned societies in Havana, and Mr. A. P. C. Griffin, of the Library of Congress, has published a list of 33 whose publications are received in Washington. By means of these publications and separate works, like the History of Pezuela and the Natural History of Sagra, the history of Cuba, its natural history (land and marine fauna, mineralogy, and botany), ethnology, and geology have been made known, while the meteorology of the region has been investigated by the observatory, whose work is known all over the scientific world. The number of medical journals is noticeable, and Vol. XXXIV (August and September, 1897) of the Anales de la Real Sociedad de Ciencias Médicas, Físicas y Naturales (the only specimen at hand), contains four articles on medical subjects, viz, a criticism by Dr. Santos Fernandez upon certain experiments with the X-rays upon a blind person, another upon the bacillus of the tuberculosis of Koch, and the two others are experimental studies connected with typhoid fever. The

remaining article of the number is a long and masterly account of the discovery of argon and prediction of helium, by Dr. Gaston Alenso Cuadrado. The Revista Cubana contains able articles upon general philosophical, historical, and other subjects, besides those of especial interest on Cuba. The paper upon elementary education by Señor Rodriguez, which we have used, was published in that review. Judging from the titles of the periodicals we should say that there is little of mechanical or electrical engineering or "applied science" in them, for which there is probably no demand in Cuba, while the exhaustive mathematical treatment of such subjects (especially that which was "made in Germany," like much recent "American science") has been imported into the United States in the last twenty-five or thirty years, where there is a field and demand for it. But for a population of 200,000 souls, including many blacks, the number of scientific, educational, and literary periodicals in Havana is remarkable, and they contain valuable original articles.

To sum up, therefore, the educational condition in Cuba, the evidence shows that the higher education is of a superior character; the study of the humanities has borne its usual fruit in literary taste and culture, and Cuba has given birth to poets who have attracted attention and won the praise of European critics. In recent years the sciences, with such technical applications as are adapted to the needs of a community which is not a manufacturing one, have been cultivated, and the enlightened part of the public has been kept informed of European philosophy and progress—all this with scant aid from, and sometimes despite the opposition of, the government. Elementary public instruction, on the other hand, has been and is in a very backward state, partly on account of the social condition of the island, but principally on account of the apathy and often the actual hostility of the government toward any serious attempts at improvement.

II.—THE PHILIPPINES.

The character of the population of the Philippine archipelago is vastly different from that of Cuba and Porto Rico. In the latter colonies the aboriginal inhabitants had become extinct by the end of the first century of Spanish occupancy, and their place as laborers was taken by negro slaves, whose supply was replenished from time to time, but particularly between 1762, the period of the English occupation of Havana, and the middle of this century. The whites, however, form the majority of the population in Cuba, while in the Philippines the vast majority of the population is composed of the native races, the Spaniards and other whites forming only an insignificant proportion of the whole. The population of the group is given at a little over 7,000,000, while the total civilian Spanish population, including creoles, amounts to less than 10,000. The native population is composed of two grand divisions, the Tagales and the Visayas, who are of Malay stock, and a small number of Negritos who, it is agreed upon all hands, were the original inhabitants of the islands. But the mingling of the different Malay tribes with the Negritos and with each other, in the long course of centuries, has produced innumerable varieties of dialects and customs, character and form, to which the Chinese, who, aside from their mestizos, now number 100,000 souls, have contributed their share, until a large number of tribes is now recognized with distinct languages, which run into dialects so subdivided that among the wild tribes of the Negritos and other mountain men, isolated family groups have been found with a dialect of their own. Jagor (Reisen in den Philippinen), following a Spanish authority, gives a list of over thirty languages and dialects spoken in the different islands.[1] The Tagales and Visayas, who are Christianized, are all called Indians by

[1] In the Historia General de Filipinas, Tome III, p. 535, Señor Montero y Vidal gives the following interesting table of the Philippine dialects and the number of natives using them, published in 1869. But there is necessarily much difficulty in obtaining such statistics, and different authors give different figures:

Dialects.	Number of natives.	Dialects.	Number of natives.
Visaya	2,024,409	Tinguian	7,059
Tagalo	1,216,508	Suffin	5,928
Cebuano	385,806	Chamorro	5,360
Ilocano	354,378	Mandaya	4,104
Vical (Bicol)	312,554	Ilongote	3,932
Pangasinan	263,000	Ibilao	3,845
Pampango	193,424	Manobo	3,103
Zambal	68,936	Malangue	2,893
Panayano	67,092	Calamino	2,744
Ibanag	57,500	Agutaino	1,961
Ifugao	22,961	Dadaya	1,846
Aeta (Negritos)	13,272	Igorrote del Abra	1,071
Coyuvo	12,999	Igorrote de la Gran Cordillera	644
Igorrote	10,325	Carolino	589
Itaves	9,686		
Gaddan	9,337	Total	5,075,680
Benguetano	8,363		

the Spaniards. There are, besides, Mohammedans in the Sulu archipelago and in Mindanao, who have been the inveterate enemies of both Spanairds and "Indians" ever since the discovery of the islands. They are called "Moros" by the Spaniards, a name given them when the memory of the wars with the Moors in Spain was still fresh.

A writer in the Catholic World for August, 1898, divides the population as follows, as regards their religion: Nominally under the order of the Augustines, 2,082,131; of the Recollects, 1,175,156; of the Franciscans, 1,010,753; of the Dominicans, 699,851; of the Jesuits, 213,065; and those under the secular clergy, 967,294, a total of 6,158,250 Christianized Indians, leaving a million or more for the wild tribes and the few Negritos.

The conquest of this population by a few hundred Spaniards in the sixteenth century was remarkable for the ease with which it was accomplished and the means which really effected it, for it was the monks rather than the soldiers who won the islands for Spain, and they have retained the spiritual and intellectual control of them ever since. Long before the Spaniards discovered the group the natives had acquired the social constitution which they still retain in a measure and which is thus described by Mallat (Les Philippines, Paris, 1846): The Philippine islanders, says that author, had no kings, properly speaking, but in each village there were certain individuals more powerful and influential than the others, who were distinguished either by birth or by personal qualities. They could make war and had the title of rajah, which was hereditary. They were a kind of petty feudal chiefs who looked out for the interests of their subordinates and the latter, in their turn, followed the rajah to war or to sea, or worked for him in the field, in fishing, etc. There were also chiefs, or governors, of larger territories. Slavery existed at the time of the conquest, all captives being reduced to that condition, and the Spaniards endeavored to abolish it. There were, therefore, three classes among the natives—nobles, plebs, and slaves. The natives were deeply superstitious, but without any formulated religious beliefs; they feared and worshiped any objects in nature which they imagined could injure them—the sun and moon, lightning and thunder, rocks on which they might be wrecked, certain birds, etc.—in short, their religion was a fetichism, but they had no priesthood like the Buddhists, for example. They lived as they do now, on fish and fruit, both of which are in profusion, cultivated rice, and had trade with China and Japan. The military conquest was easy because there was no national life, no conscious unity of race or government. As Semper (Die Philippinen und ihre Bewohner) explains, as soon the Spaniards had achieved a few victories over the village chiefs the followers of the latter yielded their homage to the conquerors as they had been accustomed to do to the native victors, the Spanish officer merely taking the place of the conquering petty chief, and they came to receive his commands. On the other

hand, the ceremonial of the monks appealed for several reasons to the imagination of the natives and they were eager to adopt or assimilate the religion which it represented. With comparatively few exceptions they have never understood the symbolism but have remained half Christian and half pagan to this day. They merely regard the Christian prayers and texts as superior "medicine" (as an American Indian would say), to their own, and Semper states that the priests complained to him that the same men would be devout Christians one day and the next would pray to their "Anitos" for a good harvest. Ancestor worship was and still is practiced among the wild tribes, and as to education the "Indians" of the different islands had alphabets of their own when the Spaniards arrived and could read and write, as they can and do to this day. Semper remarks that up to the beginning of this century the Spanish priests in Mindanao made use of the native alphabet even in their official business. The natives had no literature, however, and therefore no history, and no tradition as to their origin, which has been worked out by ethnologists by the natural-history method. They were not in the "stone age" like the American Indians, but had iron-pointed spears and arrows and smelted copper, an art which is still practiced, not by the more civilized agricultural Tagales and Visayas, but by the mountain tribes in Luzon. The tobacco and coffee culture was introduced by the monks, and the former now forms a great source of wealth to the religious houses. The Negritos and the wild tribes, who are described as remontados, i. e., peoples who refused to stay in the plains, cultivate the soil, and pay tribute to the Spaniards, but took to the mountains, still use the poisoned arrows of their ancestors. They are intractable, make raids upon the settled "Indians," and are perpetually at war with each other. They are miners in a primitive way, and bring in the gold which eventually finds its way to the Chinese merchants in Manila and on the other islands. After the partial military subjugation of the country there was a second and more complete conquest of the tractable imitative "Indians" by the monks, whose intellectual or spiritual superiority the natives speedily recognized and acknowledged, and they soon came to take the place of the original "dattos" or petty chiefs, a position they retain to this day, the hereditary possessors of that authority still appearing in the political capacity of "gobernadorcillos," or petty governors, while the padre is the real center of the village community, its spiritual head, counselor, and adviser, as well as the collector of spiritual fees of all kinds.

The history of the Philippines from the time of the first conquest is not remarkable for its political interest. It consists of contests with the piratical "Moros," the successful repulse of the great Chinese pirate invasion in 1575, attacks by the Dutch, who were carrying the revolt of the Netherlands against Philip II wherever there were Spanish colonies upon which to wreak revenge; an occasional capture by the English of the ships that made annual trips to Acapulco from Manila (one

English ship sailed up the Thames with sails of damask, and her cargo brought several hundred thousand dollars, all from the plunder of this Manila fleet); earthquakes and volcanic eruptions, and insurrections among the natives, which make up the story until 1762. In that year Manila, like Havana, was taken by the English and held for a year, until the declaration of peace restored the city to the Spaniards. The significant events were the insurrections. The Spanish colonial policy began its work early. In 1581 the "encomienda" system was practiced in the islands as it had been in America, but the natives refused to be enslaved wholesale, or to submit to practices which were alien to their ancient village or clan system, and revolted. The opposition of the clergy, too, was so active that news of the contention reached the ears of the King, who issued orders abating the "encomienda" system and strongly favoring the natives. The protest of the religious orders was so earnest that they petitioned to be allowed to return to new Spain rather than witness the extortion of the officials. The King, with the knowledge of what had happened in America and the old protests of Las Casas in mind, and with the general outcry of Europe against the enormity of the Spanish practice ringing in his ears, was prompt to suppress the repetition of an outrage that had brought the Spanish name into disgrace. The later insurrections were not serious until we come to the present century, when the causes which have been pointed out in the article by Blumentritt given above had come into full operation. It is very noteworthy, however, that a widespread insurrection took place when the English captured Manila, both among the "Indians" and the Chinese. In the early part of this century serious insurrections broke out from time to time, and in 1872 the revolt of the native troops at Cavite was the most dangerous of all until the final outbreak of 1896.

Of the intellectual capabilities of the Indians of the Philippines (i. e., the Christianized natives), Blumentritt, the German ethnologist, who has studied them, has a high opinion. He says, in the article before quoted, that they are distinguished by a higher capacity for education than the so-called civilized Indians of Central America and the Andes region. The number of Philippine Indians who attend the secondary schools and the university is relatively very large and from them have come politicians (he gives the names of Dr. Rizal, Marcelo H. Del Pilar, and Mariano Ponce); artists like the painter Juan Luna y Novicio, whose picture "Spoliarium" was brought out in the Leipzig Illustrirte Zeitung; ethnographers like Isabelo de los Reyos y Florentino; and linguists like Pedro Serrano Laktar, who are all known outside of their own country.[1]

[1] Among the suspected persons in the insurrection of 1896 was the artist Luna (a mestizo), whose large historical paintings (such as that which shows the dragging out of the bodies of dead gladiators from the arena of the Colosseum, and bloody scenes from Spanish history) were much admired at Madrid. The Dr. Rizal men-

The Chinese mestizos have played a conspicuous part in the colonies on account of their wealth and inherited business enterprise and talent, which make them one of the most progressive elements of the population. There are no red-skins in the islands, but pure-blooded Malays and their mestizos, who resemble the Japanese, with whom they are allied by race, not only in their physical appearance, but in their mental characteristics. A Tagale said, "We are Japanese with a dash of Spanish blood and of the Catholic faith; we represent progress; the Spaniards are only *laudatores temporis acti*—the backward element."

Another competent observer of the Tagal character was Jacobo Zobel de Zangroniz, a biographical notice of whom appeared in the Deutsche Rundschau in 1897. He was born in Manila, of a wealthy German father and Spanish mother, received his education in Germany and Spain, where he took his university degree, and became interested in archeological pursuits. He spent several years in Europe, following his favorite studies and attracting favorable notice by his publications, before returning to Manila. He was active there in promoting the literary and scientific as well as commercial movements after 1870, which brought him into conflict with the monks, and he was imprisoned. He owed his release to the personal intervention of the German minister for foreign affairs. He remarks that the numerous other Malay tribes of the archipelago are inferior to the Tagales both physically and mentally. Two-thirds of the Tagales can read and about half of them can write. They are a cheerful, peaceable people, are disposed to enjoyment, and have an eye rather to pleasures and things that are beautiful and attractive than to the useful and profitable, in which they are totally unlike their Chinese neighbors. They work enough to supply their needs—an easy task, because of the superabundance of rice and fish—and are willing to work just a little more, to provide brilliant-colored clothes, festivities, etc. Art, especially music, is their passion. The village vagabond will sit all day over his violin or flute, and even the meanest village has one or more bands of 20 or 30 pieces, and they will play much better than the regimental bands of the surrounding English colonies. They like the *dolce far niente*, revery, melancholy, but are also eager to hear stirring tales of adventure, new discoveries and inventions, mythological and ghost stories. Their

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tioned in the text, who was a savant and known both for his scientific and literary attainments, also belonged to the insurrectionary party. His novel Noli me Tangere, Novela Tagala (with a motto from Schiller) was printed at Berlin in 1886. It is described as presenting, although in an exaggerated way, the misery of the natives in the islands, their harsh treatment in the Spanish prisons, and the pernicious influence of the priesthood upon them, especially the women. There was for a long time uncertainty as to Rizal's fate. One rumor was that he had died on shipboard, while another had it that he had been appointed surgeon to the Spanish troops in Cuba. The truth is, however, that he was shot in Manila by the military authorities, his fate thus recalling that of Placido, in Cuba, fifty years before.

superstition is rather practical than religious, by which is meant that they believe less in spirits than in the magical action of healing herbs, in the laying on of hands in disease, etc., and therefore they were early attracted by the Catholic Church. Unfortunately they know very little of Spanish, so that they have no means of improving themselves by reading, their material in this respect being almost exclusively prayer books, a few stories about the saints, etc. Whenever any other kind of reading in their language comes in their way, such as tales of chivalry and enchantment—even quack advertisements and the like—they devour them greedily. In another passage in his letters, Zobel, speaking of the relation of the natives to the monks and the tobacco monopoly, says that the latter were attempting to represent both to the colonial and the home governments that they alone can offer a sure support to the Government, since they can keep the mass of the natives in check by their moral influence without other aid. This claim, he continues, was only true to the extent that the natives, timid, indifferent, and lazy as they are, fear the white monks and pay them a superstitious obedience, but do not love them. In the provinces where tobacco is grown the natives are not allowed to cultivate anything else. The State sells it for cash, but pays the farmers in paper which is not redeemable for two, three, or even four years, so that they are compelled to sell their certificates to the Chinese or Spanish usurers at a great discount. Even this is borne patiently by the easy-going people. But religious fanaticism, which is not rare among the lower native priests (who are excluded from all higher spiritual dignities), sometimes leads to dangerous revolts of the natives (as in 1842), whose customary mildness and indolence are liable occasionally to change into blind fury.

As has been said, the monks played a conspicuous part in the acquisition of the islands for Spain. They came as missionaries with the conquistadores and soon became the leaders of the natives, and have remained ever since in possession of nearly all the parishes. As in the other colonies, so in the Philippines, they brought with them the educational system with which they had been familiar, and very soon after the settlement of Manila they founded colleges and other educational and charitable institutions, which have survived until now and to which is due the literary and scientific activity, which, beginning with a history of the islands, accounts of the "martyrdoms" of missionaries, etc., has produced works on the natural history of the islands, their ethnology and history, including dictionaries and grammars of the native languages. The latest fruit of the scientific activity of the Jesuit fathers and the most important and best-known scientific institution in the Philippines, and perhaps in the whole East, is the famous meteorological observatory of Manila, which was founded in 1865, and now has one of the most complete equipments for meteorological observations in the world. An important practical service which

the observatory renders shipping is the warning of approaching hurricanes, which it is enabled to give by means of its branch stations at different points in several of the islands. The Jesuit Father Faura, who is so well known for his meteorological work and has been for a long time in charge of the observatory, began forecasting the weather as early as 1879. Expeditions have been made under his direction all over the archipelago, with a view to making magnetic and other observations. A report upon the terrestrial magnetism in the Philippines was prepared by P. Ricardo Cirera, S. J., the director of the magnetic section of the observatory, to be presented to the meteorological congress at Chicago. It contains, besides, some historical matter and a mathematical discussion of methods, tables and charts showing the isogonal and isoclinal lines, magnetic meridians, isodynamic lines, and diagrams showing the magnetic variation at Manila, and the perturbations. The college of Santo Tomás was founded by the Dominicans in 1611 and was formally opened in 1619. Pope Innocent X conferred the title of university upon it in 1645 with the two faculties of theology and arts, which were subsequently enlarged by Clement XII by the addition of the faculty of law in 1734. The King became the protector of the university in 1680, and it received the additional title of "royal" in 1785. Its courses and faculties were reorganized in 1870 with the title of University of the Philippines.[1] It had 581 students in 1845 and nearly 1,000 in 1858, at the time of Sir John Bowring's visit. Since the reorganization in 1870 and the separation of secondary instruction from the university the attendance has become subdivided, but no statistics are available to show the attendance in the last few years. The representative in Washington of Aguinaldo, the insurgent leader in the Philippines, who is himself a graduate of the university, says that the total number of graduates is 11,000. Although the university is the most important institution, it is not the oldest in Manila. In 1585 the King ordered that a college should be established in which the sons of the Spaniards of the archipelago could be educated under the direction of the Jesuits, but the institution—the college of San José—was not opened until 1601. Its first students were sons or relations of the early authorities of the country. In 1630 the college of San Juan Latran was founded by a charitable individual for the orphans of Spaniards. The founder became a Dominican and the institution remained in charge of that order. Besides the inmates, a large number of boarders, both "Indians" and mestizos, received instruction there until both it and the college of San José were included in the institute in 1870. In

[1] These historical notes on the educational institutions in the Philippines are taken from the Historia General de Filipinas desde el descubrimiento de dichas islas hasta nuestros dias, por D. José Montero y Vidal, Madrid, 1887; Mallat, Les Philippines, Paris, 1846; Semper, Die Philippinen und ihre Bewohner, Würzburg, 1869; Jagor, Reisen in den Philippinen, Berlin, 1873; Memoria sobre Filipinas y Jolo, por el Excmo. Señor D. Patricio de la Escosura; edited by D. Francisco Canamaque, Madrid, 1882.

1632 the college of San Isabel, for Spanish orphan girls, was founded, and is now in charge of the sisters of charity. Not only were colleges and schools established in Manila, but in other islands. Thus the Jesuit Sanvitores established schools in the Ladrone Islands, and a seminary for the education of the sons of the natives in 1669, in support of which the Queen, Marianna of Austria, contributed 3,000 pesos annually, for which act of charity the name of the islands was changed from the Ladrones to the Mariannes, which they bear now.

It was not only the Government and the Spaniards who founded educational institutions, however, for in 1694, as Montero's chronicle states, a mestiza named Ignacia del Espíritu Santo founded the beaterio de la compañía, which still exists, and which was soon attended by many Indian girls and mestizas; other beaterios were in existence later, and the oldest convent school, that of Santa Potenciana, was founded in 1589.

In 1767, when the Jesuits were expelled from the Philippines, they had 4 colleges in Manila and in Cavite, 1 in the island of Cebu, 1 in Iloilo, 1 in the island of Mindanao, and 2 in the Marianne Islands, 10 in all. (Montero, II, 183.)

In 1770 a royal decree began the effort, which has been repeated ever since without effect, to make Spanish the common official speech of the islands, and in 1781 the Sociedad Económica was established, having for its object improvements in the industry and commerce of the country and incidentally of the schools. The first paper or periodical appeared in 1811, which contained principally translations of articles in English papers concerning the war in Spain against the French, the courage of the Spaniards, etc. The next periodical appeared in 1821, which had only a short life, while the Sociedad Económica founded a mercantile paper in 1824 that lived for ten years. In 1837 the Flora de Filipinas segun el sistema sexual de Linneo, by Fr. Manuel Blanco, was published in Manila, which is described as an important contribution to the natural history of the islands. In 1842 the periodical Seminario Filipino began its existence, and contained European and Asiatic news, besides local and mercantile notes, and a daily paper was started in 1846, which lived four years. In 1852 the Jesuits were reinstated, and sisters of charity were directed by royal order to go to the Philippines and take charge of the beaterios there. They arrived in 1862, and have charge of a dozen "colleges" and charitable schools for girls in Manila with (in 1885) 1,030 pupils. At the same time the fathers of St. Vincent de Paul came to the islands, and now have 4 colleges and seminaries in Luzon, Cebu, and Iloilo, with a total attendance (in 1885) of 1,580 male and 40 female pupils.

In 1855 a commission was appointed by royal order to draw up regulations for primary education, in accord, as far as possible, with the Spanish law of 1838, and to report upon the expediency of establishing a normal school at Manila. In 1861 a school of botany and agriculture

was established at Manila under the inspection of the Sociedad Económica. In 1863 plans of primary instruction which had been approved for Cuba were sent to the governor of the Philippines for his examination. The plans proposed by the minister for the colonies for secularizing the University of Manila met with the most violent opposition from the religious order which had had charge of it, and its opposition was seconded by other persons, so that the plans as contemplated could not be carried out. It is important, however, to show what changes were intended, and a summary is here given of the preamble and plans of study proposed, which are taken from the Diccionario de legislación de instrucción pública, por Eduardo Orbaneja.

The minister for the colonies, under date of October 2, 1870, proposed that instruction should be given at the University of Madrid in Tagalog and other studies which would give information about the Philippines and the English and Dutch East India possessions and their methods of government, especially for the benefit of those who intended to enter the colonial service. A decree of the same date established the plan proposed. On November 6 a royal decree established an institute of public secondary instruction in Manila with the title of Philippine Institute. The plan of studies was—

Spanish and Latin grammar.
Elements of rhetoric and poetry.
Elements of physical geography.
Elements of descriptive geography in general and of Spain and the Philippines in particular.
Universal history—History of Spain and the Philippine Islands.
Arithmetic and algebra.
Geometry and plane trigonometry.
Elements of physics and chemistry and of natural history.
Psychology, logic, and moral philosophy.
General outline of anatomy, physiology, and hygiene.

The same provision was made here as in Cuba for the verification of degrees from private institutions.

The studies which fit for the industrial professions in the same institution included—

Mercantile arithmetic.
Bookkeeping and accounts.
Political economy and mercantile and industrial legislation.
Geography and commercial statistics.
French, English, Tagalog, and Visayog.
Surveying.
Spherical trigonometry.
Cosmography, pilotage, and maneuvers.
Theoretical and applied mechanics.
Physics and chemistry applied to the arts.
Topographical drawing and hydrography.
Lineal and ornamental drawing—landscape, figures, and painting.

This institute absorbed the college of San José and municipal atheneum, college of San Juan Latran, nautical academy, and academy of drawing, painting, bookkeeping, and languages. On the same date the decree changed the title of the old University of Santo Tomás at Manila to that of the University of the Philippines. The faculties of

law and medicine were reorganized, the latter containing the following studies:

Descriptive and general anatomy, two courses.
Exercises in osteology and dissection, two courses.
Physiology, one course.
Public and private hygiene, one course.
General pathology, with clinics and pathological anatomy, one course.
Therapeutics, materia medica, and writing recipes, one course.
Surgical pathology, with operations, bandaging, etc., one course.
Medical-pathology, one course.
Obstetrics and special pathology of women and children, with clinics, one course.
Medical and surgical clinics, two courses.
Legal and toxicological medicine, one course.

The pharmaceutical course was also reorganized.

On December 5, 1870, the minister for the colonies drew up a long exposition of the history, condition, and needs of public instruction in the Philippines, which recites the early activity of the Augustines, Dominicans, and Jesuits in education, especially in founding the college of Santo Tomás in 1611 and of San José in 1601, but points out that by the process of absorption by the religious orders education became concentrated in their hands. That while every acknowledgment should be made of their services in earlier times, their narrow, exclusively religious system of education, and their imperviousness to modern or external ideas and influences, which every day became more and more evident, rendered secularization of instruction necessary. He cites the attempts in this direction made since 1835, which had been only partly successful, on account mainly of want of persistence in following them up and the political changes of the times in Spain. He goes back to 1785, when the first classification of studies was made in the archipelago, and when secondary instruction included a very modest amount of the humanities, consisting for the most part of tedious Latin taught with great prolixity, some scholastic philosophy, mostly intended to prepare for the study of casuistic theology, and some extremely rudimentary mathematics.

While this part of education remained in the hands of the clerical element, the laity, especially the association called the Sociedad Económica, established the nautical and accountant schools, the school of drawing and painting, and other no less valuable institutions, which were at first maintained by private funds, although subsequently by the State. (These were all united in the institute.) The university instruction was entirely insufficient. There was no faculty of medicine or pharmacy, very little natural science, and less of history, philology, and linguistics. This is now corrected. The minister remarks that it would be entirely Utopian to attempt to give the Government charge of all the education, because of the social condition in the Philippines and the supremacy and power of the monks.

On October 29, 1875, a royal order was issued regulating the courses in the university and prescribing plans of study.

The faculty of law was much enlarged to cover, besides the Roman and canon, civil, mercantile, and criminal law, political economy, statistics, and general and Spanish literature.

How many of these reforms were carried out eventually can not be decided from any evidence now available. The minister who succeeded the author of the above sensible proposition had the order revoked as far as secularizing was concerned.

As to primary instruction, it has been shown that the Philippine islanders could read and write their own languages when the Spaniards arrived. According to a table in the book of M. Alfred Marche (Luçon et Palaouan. Six années de voyages aux Philippines. Paris, 1887), there are five alphabets in use in the archipelago. All travelers state that there are schools in every village, which are under the control of the priests. Good observers have noticed the aptitude of the natives for instruction. Thus, Mallat states that the children begin very early to make their letters in the sand or on leaves. Some of them, he goes on to say (he was writing in 1842), become distinguished calligraphers, and can imitate all kinds of writing, drawing, and printed characters. He relates a story of a missal which was copied by an "Indian" and sent to the King of Spain. It was so well done that it was impossible to distinguish it from the original. They copy maps, also, with great exactness. It follows that instruction among the Indians was far from being backward when compared with that of the lower classes in Europe. Nearly all the Tagales can read and write. However, the sciences, properly so called, have made little progress among the Philippine islanders. A few of the mestizos have a slight tincture of them, and those of the Indians who have taken orders know Latin. The best educated are without doubt those who, having studied at the university of Santo Tomás, have become lawyers. Among them can be found advocates worthy to be compared with the most celebrated in Spain. As to literature, there is a Tagale grammar and a dictionary and a combined grammar of the Tagale, Bicol, Visaya, and Isinay languages. These are all published by the monks at the Santo Tomás press. There are several public printing offices in Manila. The literary works proper consist mostly of poems and tragedies in Tagale. The former are sometimes on very grave subjects, such as the Passion, and the tragedies are very long.[1] There are also short poems and songs, of which both words and music are national, and the Indians can write the music with wonderful ability. They are all musicians, and some of them can play five or six instruments. There is not a village, however small, where the mass is not accompanied by music. The choice of airs is not always the most edifying, and one sometimes hears waltzes and airs from the French opera bouffe in the churches.[2]

The military music of the garrison at Manila and the large towns

[1] M. Marche, forty years after, relates that a tragedy which was performed in a village where he was staying lasted two or three days.

[2] M. Marche heard airs from La Fille de Madame Angot played at a funeral.

of the provinces is carried to an astonishing degree of perfection, so that there is nothing better of the kind in Madrid. The Indians play from memory the overtures of Rossini and Meyerbeer. Semper, writing in 1869, says of education among the natives: "The Christian Spaniard has not been able to exert much more influence of a spiritual than of a political nature upon the character of the natives. Popular instruction was formerly and is now entirely in the hands of the priests. Excepting the professors of common and Roman law, all the chairs of the university of Santo Tomás in Manila are in the hands of the priests, who naturally arrange not only the theological lectures, but those upon metaphysics, physics, and logic as well, according to the principles of the Catholic Church. In the provinces every village has its public school, in which instruction is obligatory; but, besides reading and writing, only Christian doctrine and church music are taught. This instruction, moreover, is by no means generally given in Spanish; at least, the general introduction of Spanish as a school language is still so recent that it will be long before the Spanish officials will be able to converse even with their subordinates in Spanish. On the east coast of Mindanao, one of the oldest and most settled provinces, the native dialect was exclusively used until forty or fifty years ago, and, the priests used the old Malay alphabet until the beginning of the century even in their official business. The number of natives—the Spaniards call them 'Indians'—who can read and write is tolerably large; but owing to the total unreliability of all statistics on the subject nothing accurate can be said. In 1863 the Government attempted to make an enumeration of the population and, incidentally, to note the number of those who could read and write. The fact that the result was never published seems to confirm the opinion that an unsatisfactory condition of things was found.

"The surprising facility with which Christianity spread over the islands, even in the beginning of the conquest, leads one to suspect that it only served as a cloak for the ancient religious customs, and, indeed, partly amalgamated with them. Trustworthy monks still complain that the same men go to church one day to pray to their Christian God and the next offer sacrifices to their heathen idols or 'Anitos' for a good harvest. In some places there has even been a backsliding into the old heathen times."

Jagor, another competent observer, says of the natives in the Camarines, a province of Luzon, that they have schools in every village. The teacher is paid by the Government and usually receives $2 a month without board or lodging. In large towns the salary rises to $3.50 a month, but then an assistant must be paid. The schools are under the supervision of the local priests. Reading and writing are taught, the copies being set in Spanish. The teacher is required, it is true, to teach his pupils Spanish, but he does not understand it himself, while the officials do not know the native language, a condition of things which the priests have no power or inclination to change, because it increases

their power. Only those Indians know Spanish who have been in the service of Europeans. At first a kind of religious primer is read in the native language, and later Christian doctrine is taught. On the average, about half of all the children go to school, ordinarily from their seventh to their tenth year. They learn to read and some learn to write a little, but soon forget it. Only those who become clerks can write a running hand, but they usually have a very good hand. Some priests do not allow boys and girls to attend the same school, and they pay a special female teacher $1 a month. The natives learn counting with difficulty and use shells or stones as a help, piling them in little heaps, and then counting them out.

In 1890, according to the Gran diccionario geográfico, estadístico, é histórico de España y sus provincias de Cuba, Puerto Rico, Filipinas, etc., edited by Rafael del Castillo, there were 1,016 schools for boys and 592 for girls in the archipelago, with an attendance of 98,761 boys and 78,352 girls.

For the following additional information we are indebted to a brief account of the educational facilities of the Philippine Islands by Mr. Alex. A. Webb, United States consul at Manila, which was written in 1891: Mr. Webb states that the general government appropriated $404,731.50 for schools in 1890, of which sum the normal schools received $10,520. The salaries of the teachers were, $800 for the director; professors, $800; teachers of drawing, $600; teachers of ordinary branches, $400, and assistants, $120. The two directors of the school of drawing and painting, which was established in 1875, were paid $1,200 each by the government. By royal decree of October 1, 1890, the School of Arts and Sciences was established at Manila. Here are taught languages, bookkeeping, higher mathematics, chemistry, natural history, mechanics, political economy, mercantile and industrial legislation, drawing, modeling, engraving, wood carving and all the trades.

A school of agriculture was established at Manila July 2, 1889, for the purpose of giving those natives who had acquired a common school education a theoretical and practical education in agriculture and horticulture. It opened with 82 students and last year (1890) had 50, but it is hoped and expected that there will be an increase in interest among the natives as soon as the work of the school can be extended. Similar schools have been established in the provinces of Isabela de Luzon, Ilocos, Albay, Cebu, Iloilo, Mindanao, Leyte, and Jalo. They are supported entirely by the government and managed by the priests.

Mr. Webb mentions the Royal Society of Friends of the country, which was founded in 1813 for the purpose of encouraging the interest in the arts, sciences, commerce, and industries, and says: "It is claimed on its behalf that it has accomplished a vast amount of good, but there is not that degree of energy and activity manifested in its work to be seen in similar organizations in some other countries." It has accumulated a library of about 2,000 volumes on the arts and sciences, natural history, and agriculture.

On the 17th of August, 1887, a Royal decree was issued establishing a public museum and library in Manila, under the management of a board of civil and military officers to be appointed by the governor-general of the islands. Work has been commenced upon the project and it bids fair to develop into a very creditable institution in a few years.

This review of the educational condition of the Philippines would not be complete without some fuller account of the monks, whose power and position in the islands is an anachronism, recalling the middle ages. The complaints which are now apparently with justice urged against them should not cause us to forget their early services to the natives and to civilization. We are accustomed to hear of travelers and scientific men venturing everywhere in furtherance of fads or impelled by curiosity, or the vice of competition, and risking their lives from these purely selfish motives, but the motives which urged Catholic priests in the sixteenth century to go all over the world and encounter death everywhere, from the woods of Canada to the remotest parts of China, were self-sacrifice and devotion for what they believed to be the spiritual welfare of savages and heathen. In the historical paper before cited Blumentritt says of the monks in the Philippines:

> They won for themselves, in early times, great gratitude from the natives by protecting them from the government officials, which was increased by admitting them to religious orders. But this happy condition was changed in the present century, for when the orders were abolished in Spain, the Philippines offered an asylum to the crowd of European novices whose numbers soon closed further admission to the natives. Since that time, the Philippine monks have been European Spaniards, who are often the only white men in the country districts, and who, being the only representatives of the ruling race, have made use of that position, in fact if not with right, and constituted themselves the rulers of the land. In the fear that a liberal government might deprive them of their last refuge, the Philippines, by handing the parishes over to the (native) secular clergy, the Spanish monks began to pose as the only reliable support of Spanish rule in the archipelago and to throw the suspicion of independence upon the secular clergy. So great is the ignorance of the Spaniards of the affairs of the archipelago that this suggestion was easily entertained, although all insurrections had been suppressed, not by the monks but by the government. Their power was further increased by the money they circulated in Spain and the fear of the Spanish Government that they might place their wealth at the disposal of the Carlists.
>
> These monks have been the enemies of every administrative reform which the colonial ministers have promised or effected from 1868 until the present time, and they have consequently and naturally appeared as the enemies of all progress and improvement in their country, not only to the secular clergy, but also to all the other inhabitants of the islands. At their instigations all natives of superior intellectual attainments who would not play the hypocrite were persecuted and transported, so that there was a fearful sense of insecurity all through the country. What kind of a spirit actuated them is best shown by the fact that they accused the Jesuits, who are highly esteemed, of liberalism and so brought suspicion and distrust upon the teachers who were educated in the Jesuit teachers' seminary.
>
> The Filipinos started a journal in Madrid, called La Solidaridad, which contended for constitutional reforms. But the undertaking was unsuccessful, because the mass of the Spanish nation showed absolutely no inclination to trouble itself about the affairs of its Asiatic colonies, and the monks were able to purchase enough

newspapers to combat or render ridiculous the efforts of the Filipinos. Indeed, the latter were told that political rights are not obtained by begging, but by fighting, to which their leader, Marcelo H. del Pilar, answered that the day when the Filipinos, no longer trusting the justice of Spain, should take up arms, would be a day of sorrow for the Spanish nation, for it would no longer be a question of the granting of political reforms, but of breaking away entirely from the obstinate and deaf mother country. This prophecy was soon fulfilled. Up to the present time only the educated and rich inhabitants of the islands had taken part in the efforts at reform, while the mass of the people stood aloof. The greed of the monks, however, who had acquired immense landed estates, induced them to raise their rents until their tenants and the small farmers, in despair, rose in the revolt of August, 1896, which was directed less against the Spanish Government than the monks themselves.

The conclusion, which is obvious from the observations and history which have been presented, is that the few Spaniards in the Philippines, while they have not made a radical or decided change in the customs and habits of thought of the natives, have nevertheless imposed their religion upon them to a considerable extent, have taxed them successfully, and have them under military control. The humanities, under the conduct of the priests, have borne their usual fruit in civilizing the comparatively few natives or mestizos who have been brought under their influence, until they have produced statesmen, artists, and literary men who have become known in Europe by their merits. It is clear, also, that while the natives of the archipelago have a greater power of resistance to alien influences than those of the American continent, the greater portion of them show decided and superior intellectual capabilities.

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CHAPTER XXI.

EXPERIMENTAL STUDY OF CHILDREN,

INCLUDING

ANTHROPOMETRICAL AND PSYCHO-PHYSICAL MEASUREMENTS OF WASHINGTON SCHOOL CHILDREN.

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CHAPTER XXI.

EXPERIMENTAL STUDY OF CHILDREN, INCLUDING ANTHROPOMETRICAL AND PSYCHO-PHYSICAL MEASUREMENTS OF WASHINGTON SCHOOL CHILDREN.

I. INTRODUCTION.

Before entering upon the introduction proper, the author may be allowed a few remarks. The original part of this work is chiefly a study of Washington school children; the rest is, in the main, an endeavor to present results of the principal investigations on school children up to the present time.

As to the original part of this study the reader will remember that all such work is in its infancy and must therefore be necessarily incomplete.

Many seemingly unimportant details are given, but, as remarked later on, to present too many details is less of a mistake than to present too few.

It is hoped that this, with the work of others, may aid in a more thorough study of children, on whom the future civilization depends.

ANTHROPOMETRY.

Anatomical measurement of children is one of the chief branches of anthropometry. Anthropometry is the measurement of the human body in general. It is a branch of anthropology, but independent in its purpose and methods.

ARTISTS THE FIRST ANTHROPOMETRISTS.

In early times measurements of the body were made in the service of art. It is in comparatively recent times that anthropometry has taken a scientific direction. The artist was interested almost wholly in the form and proportion of the human body, and so measured those only who were well-formed. The empirical investigator is interested in the measurements of all persons. The founder of this latter branch of study is the Belgian statistician, Quetelet. His purpose was to find what is typical in man, at the same time making note of the variations due to sex, age, race, and social position.

PRACTICAL NATURE OF ANTHROPOMETRY.

One of the practical aims of measurements of living men is to identify personality. It is to give to each individual a "positive, permanent, and invariable personality." Thus when a life-insurance policy or a certificate of death is to be drawn up, or when it is desired to identify some insane person or some one disfigured by sudden or violent death, by shipwreck or combat, it would be serviceable had those persons had their measurements recorded so that they could be identified with certainty. Banks and associations for mutual benefit could not be so easily swindled by the assertion of the death of a policy holder; impersonation of a pensioner or of an heir would be difficult, and "those who died in battle would not have a nameless grave."

BERTILLON SYSTEM OF MEASUREMENT.[1]

This is an extension of the idea of the Bertillon system of measurements for criminals—a system which aids in lessening crime. Crime is encouraged from the difficulty of distinguishing one person from another, so that habitual and professional criminals escape punishment.

This system, although intended primarily for a practical end, can be made of scientific value as far as it goes. Its measurements are length and width of head, distance between zygomatic arches, length of left foot, of left middle finger, left little finger, left forearm, and length and width of ear. There is a descriptive part including observation of the bodily shape and movements. Deformities, peculiar marks on the surface of the body resulting from disease or accident, and other signs, as moles, warts, scars, tattooings, etc., are noted. Experience has shown that absolute certainty of identity is possible by the Bertillon system. But the full benefits of a practical system of identification can not be reached unless applied to all individuals. There might be at first sentimental objections, as has happened in things subsequently of great utility to society. No one who intended to be an honorable citizen would have anything to fear; but, on the contrary, it would afford protection to humanity in enabling society to find its enemies. This certainty of identification would discourage dishonest voting, assist in recognizing deserters from the Army, in enforcing laws, and in facilitating many business matters.

IMPORTANCE OF MEASUREMENTS OF CHILDREN.

In the investigation of normal modern civilized man, the most important branch is probably the study of children. The importance of taking physical measurements of children in school lies in the fact that such measurements may be considered as a test for systems of physical culture. As pupils are examined periodically to test their

[1] See Part V, Instruments of Precision, page 1141.

mental growth and improvement, it is just as necessary for their welfare that their physical condition and development be ascertained, so that progress may be gained in body as well as in mind. But there must be some standard by which we can measure physical development and growth. This can only be ascertained by taking measurements of a large number of children of all school ages. Although the physical conditions upon which the activity of mind depends are so complex, and so much is still unknown, yet it can be said with almost a certainty that at those ages in which children grow rapidly there should be a corresponding reduction in the amount of study required, and this should be done even if the pupil is mentally capable of doing more, for no pupil should be developed in mind to the detriment of bodily conditions. The bright scholar, whom parents are too often inclined to push, needs it the least, especially if his physical condition is inferior to his mental. The saying that apples which ripen slowest last the longest is as true as it is homely. The systematic collection, then, of physical statistics in the public schools will furnish valuable facts for the hygienist and the educator.

NORMAL MAN SHOULD BE STUDIED.

Students of anthropology have confined their attention largely to uncivilized and prehistoric man, and consequently there is very little knowledge of modern civilized man, as compared with his less-worthy predecessors or contemporaries. We know more about rocks and brutes than about modern man. We have made sciences of the two former, but a science of the latter hardly exists. The men who have begun lately to study modern man have given the abnormal types, such as criminals, the insane, inebriates, paupers, etc., the advantage of their investigations. It is time that similar investigations should be made upon average normal men, who are the foundation of every community.

Also men of talent, great talent or genius, should be studied; for if it is important to study the criminal in order to find the causes of crime, and thereby prevent or lessen it, it is perhaps more needful to investigate the man of talent or genius, in order to learn those conditions and characteristics that lead to success in life.[1]

OBJECTIONS TO PSYCHO-PHYSICAL METHODS.

Objections are frequently made to the present psycho-physical methods of studying man. It is said that too much importance is attached to the physical side of man, as though the soul and mind could be measured by an instrument of precision. It is not intended here to enter upon a special discussion of this subject, about which there may be difference of opinion. The measurements made are measurements of the body or of physical effects in the body arising from either physical or mental causes or from both causes.

When, for instance, an instrument to measure pain, as a temporal

[1] See article on "Emile Zola" by author, Open Court, Aug., 1898.

algometer,[1] is pressed against the temple with gradually increasing force, and the subject tells as soon as the increasing pressure becomes in the least disagreeable—we will say that when the pressure reaches 2,000 grams it begins to feel disagreeable—the question arises as to what does this 2,000 grams pressure measure. It is not true to say that this is wholly a physical measurement, much less to say that it is wholly a mental or emotional measurement. It seems to be simply an approximate measurement of the combination of these three elements. In the present state of knowledge it would be hazardous to say which element enters most into the measurement.

The impression is sometimes formed from reading descriptions of instruments and details of long series of experiments, that psychophysical study ignores introspection; but this is a misconception.

It is natural that most investigation in comparatively new lines should take up the more elementary phenomena. Introspectional states of consciousness are perhaps the most complex, and it would have been premature to enter into their consideration before the simpler states had been thoroughly studied. There should be extensive investigation of introspection; it should be considered experimentally under definite conditions, etc. Speaking of the common error which makes experimental psychology a mere study of sensation and reaction time, Münsterberg says:

> Association and attention, memory and judgment, space and time, feelings and will, etc., these are the problems of study where the future of experimental psychology lies.

TRUTH FOR ITS OWN SAKE.

Notwithstanding the practical utility of anthropometry, which we have stated above,[2] objection is sometimes made that it, as well as other phases of scientific investigation, can not always be of immediate use.

The question is often asked as to the utility of experiments of this nature. The commercial or utilitarian spirit does not yield the best results, though it sometimes brings quick and paying returns. But in all experimental work much is done that subsequently is seen to have been unnecessary. This is mainly because the real significance of any initial truth can not be known until the discovery of other truths has been made. The purely practical point of view sometimes assumes that we ought to know beforehand what an experiment is going to prove, as though the investigation were but an interesting pastime, for, of of course, there would then be no necessity for the experiment.

In an empirical investigation new lines of study require much more detail. As a rule, it is better to have too many data than too few; for to assume in a preliminary inquiry what material is important and what not important is premature. To exclude material on theoretical grounds at the outset is to allow presuppositions undue influence. A

[1] See Part V, Instruments of Precision. [2] See page 990.

laboratory inquiry may be continued a year or more, and often the result of all the labor may be stated in one page or one sentence; or there may be only a negative conclusion, but this is no reason that an investigation should not be undertaken. Negative results may be useful for future study in indicating what methods or material to avoid.

Certain objections are sometimes made to new and necessarily incomplete lines of work. The type of objections referred to would hardly be made by investigators. Thus, it is sometimes said that unrelated facts, like a pile of bricks, do not make a house; but the answer is, you can not build a house or form a science without these separate facts; they are the material itself. It may be asked what is the use of knowing, for instance, that one group of children are more sensitive to heat than another group. We think there is some use, but we will waive that. The point of view suggested by these and similar objections overlooks the fact that such objections would have applied to all sciences in their early stages. If, for instance, individual facts about children, even if their immediate use is unknown, are not important, what is important in life? Many such objections would involve a discussion of points of view of life which it would be out of place to consider now. But it may be said, in general, that the primary object of science has always been *truth for its own sake*, and under the inspiration of this ideal many discoveries of the greatest utility to humanity have been made.

METHODS OF STUDY.

To establish the measure of work according to the strength of the individual is fundamental to the economy of health. This is especially true of children, but the difficulties here are greater than in adults, owing to the changes caused by growth. Overtaxing of the powers here leaves its mark generally throughout the whole future life of the child. No question, then, can be more important for the school, according to Combe, than:

(*a*) What is the maximum work suitable to a child in the different periods of development in its school life?

(*b*) Can this maximum be injurious at certain times, when all the vital force may be required for growth?

We must first know the physiology of normal growth, whether it is regular and when it increases or decreases in rate, and what influences this increase and decrease. There are two methods of pursuing such an investigation—the collective method and the individual method.

The collective method consists in measuring large numbers of children of every age, and obtaining the average or mean for each age, the value of which is in proportion to the number measured. Quetelet, of Brussels, was one of the first to use this method, but he only measured ten of each sex, which is too small a number to give any certainty to the results. Of much more importance are, for instance, Dr. Bowditch's measurements of 24,000 Boston school children. This method

was employed by Alex. Hertel in Denmark, who measured 28,384 children in the different public schools. Axel Key in Sweden measured 15,000, most of whom were in the high schools; Erismann gives results from 3,000 children in Moscow, Pagliani for 2,016 in Turin. Kotelmann in Hamburg made very careful and extensive measurements, but on a limited number.

The individual method was employed by Liharzik in Vienna, who investigated 200 from 8 to 14 years of age, measuring them each year.

The results of both methods are not always exact. Most authors have, for example, considered children as being 9 years of age who were anywhere between the ages of 9 and 10. Others have more correctly recorded them at their *nearest age*. The result is that the averages of different authors are not for exactly the same years of age. Louis Roux, of Switzerland, employed a new and much more exact method, which consisted in following the month of birth, instead of the year, so that there were twelve groups. Thus, it was found that children born in summer were larger than those born in winter, a fact that may prove to be of some significance.

WHAT IS A NORMALLY DEVELOPED CHILD?

This question might be answered, but only within certain limits, owing to the variation and complexity of the human species. A method of inquiry would be to seek out the positively abnormal children and find what characteristics are peculiar to them. The remaining children in a general way might be called normal.

At present the desire is to find the norm, the average, the type or types of the great mass of children. This can be done only by measurements on large numbers, these measurements to be summarized according to the statistical method.

It is a common saying that "almost anything" can be proved by statistics. This may be true with their wrong interpretation. Yet without statistics there is little or no basis for opinion or conclusion. Every additional observation through counting, measuring, or weighing, every repetition of an experiment, when applied to large numbers, lessens the amount of error, giving a closer approximation to truth, against which preconceived ideas or theories have little weight.

According to Hasse, one of the aims of anthropometry is to find the normal relation between mental and physical development. The close relation of anthropometrical measurements of school children to hygiene will be evident when it is asked within what general limits shall growth in height, weight, strength, etc., be considered as representing a healthy normal child. In our present state of knowledge it would be hazardous to define a normally developed child.

ANTHROPOMETRY AND ABNORMALITIES.

There is doubtless in the early periods of life, up to adult age, a certain relation of bodily organs to one another. A want of such relation may produce abnormalities, which in turn may give a lack of grace, symmetry, or beauty to the human body. If such a relation is to be generally established, so that we may know within certain limits what can be considered the proper bodily proportions, measurements of large numbers of children at different ages and stages of growth must be made. Hence the only way to a definite knowledge as to the development of the human body will be through long and painstaking investigations. Thus the causes of homeliness, lack of beauty, deformities, and the like may be more definitely ascertained. This in turn may help in their prevention. Such abnormalities affect not only beauty, but, what is more important, health. When abnormalities are discovered early in youth there is more opportunity of avoiding their evil effects. The relation of these body abnormalities to disease may prove of practical importance. Thus Hildebrand, an experienced investigator, remarks that delicate slender people are much more subject to typhoid fever than to consumption; another says of the same class that they are much more inclined to nervous troubles than other people. Another physician of large experience asserts that where chest and trunk remain undeveloped the head and extremities are much more developed.

Beneke in Marburg has shown that the relation between the size of the heart and the circumference of the arteries is gradually changed during the growth of the body, and that there is a consequent variation in blood pressure. This is specially true at puberty, when the heart increases very fast in volume; for the arteries increase much in length with the increase of length of body, but their diameter is relatively little increased, so that much more work is required of the heart. Thus the growth in the length of body can be of the greatest importance to the development of the heart. Should this growth be irregular or abnormally fast, serious difficulties may arise, and Beneke has endeavored to show that herein lies the cause of the development of consumption at puberty. The importance, therefore, of determining the normal rate of growth is evident.

We have mentioned these general *opinions* of experienced physicians and specialists as an indication of the utility of the anthropometry of the future.

The following is a measurement blank being used by the author in the study of children:

No. ———.

Name, ——— ———; date, ———; school grade, ———; name of observer, ———; sex, ———; date of birth, ———; age in years and months, ———; color of hair, ———; of eyes, ———; of skin, ———; first born, ———; second born, ———; later born, ———.

ANTHROPOMETRICAL.

Weight, ———; lung capacity, ———; depth of chest, ———; width of chest, ———; circumference of chest, ———; height, ———; sitting height, ———; strength of lift, ———; of arms, ———; of right-hand grasp, ———; of left-hand grasp, ———; total strength, ———; is the subject left-handed? ———; maximum length of head, ———; maximum width of head, ———; cephalic index, ———; distance between zygomatic arches, ———; between external edges of orbits, ———; between corners of eyes, ———; length of nose, ———; width of nose, ———; height of nose, ———; nasal index, ———; length of ears, right, ———; left, ———; length of hands, right, ———; left, ———; width of mouth, ———; thickness of lips, ———.

PSYCHO-PHYSIOLOGICAL.

Least sensibility to locality, right wrist, ———; left wrist, ———; least sensibility to heat, right wrist, ———; left wrist, ———; least sensibility to contact on the skin, ———; least sensibility to pain by pressure of two points, ———; least sensibility to pain by pressure, right temporal muscle, ———; left temporal muscle, ———; least sensibility to smell, right nostril, ———; left nostril, ———; least sensibility of muscle sense to weight, right hand, ———; left hand, ———; pulse, ———; respiration, ———.

SOCIOLOGICAL.

Nationality of father, ———; nationality of mother, ———; nationality of grandfather, father's side, ———; mother's side, ———; nationality of grandmother, father's side, ———; mother's side, ———; occupation of parents, ———; education of parents, ———.

ABILITY IN STUDIES.

Bright, dull, or average, in general, ———; in arithmetic, ———; algebra, ———; grammar, ———; drawing, ———; geography, ———; history, ———; music, ———; reading, ———; spelling, ———; penmanship, ———; German, ———; French, ———; Latin, ———; Greek, ———; geometry, ———; physics, ———; science, ———; manual labor, ———; etc., ———.

(Answer after each study and for other studies not mentioned. When in doubt as to brightness or dullness, mark person average.)

ABNORMAL OR PATHOLOGICAL.

If abnormal or peculiar, name in what way, ———; unruly, ———; sickly, ———; defects in speech, ———; defects in sight, ———; defects in hearing, ———.

Palate, ———; aural asymmetry, ———; cephalic, ———; palpebral fissures, ———; frontals, ———; expression, ———; hand balance, ———; nutrition, ———; pigmentation, ———; ptosis, ———; rachitism, ———; epilepsy, ———; lordosis, ———; kyphosis, ———; scoliosis, ———; other defects, ———.

Remarks: ———

II. WASHINGTON SCHOOL CHILDREN.

Washington is a residential city with comparatively few foreigners. The well-to do and poorer classes among the whites are more equally divided than in most cities. There is a very general representation from all States among the residents. For these reasons a study and measurement of the school children of Washington may be capable of more general application to Americans as a whole.

In the study of the Washington school children several lines of inves-

tigation have been followed. One is a special study of 1,074 children, which considers cephalic index and sensibility to heat and locality upon the skin, with relation to sex, mental ability, and sociological condition. It is based upon measurements by the author.

Another is an anthropometrical and sociological study of all the school children, based upon measurements by the teachers.

A third is a purely psychological inquiry as to comparative mental ability in the different school studies as reported by the teachers.

A fourth is a study of the abnormal children in the schools as reported by the teachers.

TEACHERS OF WASHINGTON SCHOOLS.

Through the kindness and interest of the Superintendent of the schools of Washington, and of the teachers under his supervision, this study of the school children was made possible.

As to the value of such work, we can do no better than give the opinion of the celebrated anthropologist Virchow. In speaking of the teachers of Germany, who assisted in the investigation of the school children, Virchow says that those teachers were following out the end for which the schools strive—that is, self-knowledge; for such investigations aid in the question as to the origin of a people, that a nation may know itself.

CONCLUSIONS AS TO WASHINGTON SCHOOL CHILDREN.

For the convenience of those who may not go further into this inquiry, we give below the conclusions from our investigations of the Washington school children:

CONCLUSIONS AS TO 1,074 CHILDREN SPECIALLY STUDIED.

1. Dolichocephaly, or long-headedness, increases in children as ability decreases. A high percentage of dolichocephaly seems to be a concomitant of mental dullness.

2. Children are more sensitive to locality and heat on the skin before puberty than after.

3. Boys are less sensitive to locality and more sensitive to heat than girls.

4. Children of the nonlaboring classes are more sensitive to locality and heat than children of the laboring classes.

5. Colored children are much more sensitive to heat than white children. This probably means that their power of discrimination is much better, and not that they suffer more from heat.

CONCLUSIONS AS TO ALL THE SCHOOL CHILDREN.

6. As circumference of head increases mental ability increases.[1]

7. Children of the nonlaboring classes have a larger circumference of head than children of the laboring classes.

[1] It being understood that the race is the same.

8. The head circumference of boys is larger than that of girls, but in colored children the girls slightly excel the boys in circumference of head.

9. Colored girls have larger circumference of head at all ages than white girls.

10. An important fact already discovered by others is that for a certain period of time before and after puberty girls are taller and heavier than boys, but at no other time.

11. White children not only have a greater standing height than colored children, but their sitting height is still greater; yet colored children have a greater weight than white children—that is, white children, relatively to their height, are longer bodied than colored children.

12. Bright boys are in general taller and heavier than dull boys. This confirms the results of Porter.

13. While the bright colored boys excel the dull colored boys in height, the dull excel the bright in sitting height. This seems to indicate a relation or concomitancy of dullness and longbodiedness for colored boys.

14. The pubertal period of superiority of girls in height, sitting height, and weight is nearly a year longer in the laboring classes than in the nonlaboring classes.

15. Children of the nonlaboring classes have, in general, greater height, sitting height, and weight than children of the laboring classes. This confirms the results of investigations by Roberts, Baxter, and Bowditch.

16. Girls are superior to boys in their studies (but see conclusion 19).

17. Children of the nonlaboring classes show greater ability in their studies than children of the laboring classes. This confirms the results of others.

18. Mixture of nationalities seems to be unfavorable to the development of mental ability.

19. Girls show higher percentages of average ability in their studies than boys, and therefore less variability. This is interpreted by some to be a defect from an evolutionary point of view, but see conclusion 16.

20. As age increases brightness decreases in most studies, but dullness increases except in drawing, manual labor, and penmanship; that is, in the more mechanical studies.

21. In colored children brightness increases with age, the reverse of what is true in white children.

CONCLUSIONS AS TO CHILDREN WITH ABNORMALITIES.

22. Boys of the nonlaboring classes show a much higher percentage of sickliness than boys of the laboring classes.

23. Defects of speech are much more frequent in boys than in girls.

24. Boys show a much greater percentage of unruliness and laziness than girls.

25. The dull boys have the highest per cent of unruliness.

26. Abnormalities in children are most frequent at dentition and puberty.

27. Children with abnormalities are inferior in height, sitting height, weight, and circumference of head to children in general.

Section A.

A SPECIAL STUDY OF 1,074 SCHOOL CHILDREN, CONSIDERING CEPHALIC INDEX AND SENSIBILITY TO HEAT, AND LOCALITY ON THE SKIN, WITH RELATION TO MENTAL ABILITY, SOCIOLOGICAL CONDITION, SEX, AND PUBERTY.

All the measurements of this part of the investigation were made by the writer. There were in all more than 1,000 pupils specially studied, 526 boys and 548 girls.

The representative or typical schools were visited, and a room was set apart for making the measurements. It required about twenty minutes to measure each pupil. There were generally four pupils in the room, so that each one saw three measured before his or her turn came. The endeavor was to make all the conditions, as far as possible, similar for each pupil. Experiments were made upon the right hand or wrist first, then upon the left hand or wrist.

The pupils were selected according as it was convenient to send them in, so as to interfere as little as possible with their regular school duties.

After the measurements had all been made the teachers were requested to mark the pupils bright, dull, or average in general, and also to mark them in those special studies in which they were bright, dull, or average; and when in doubt to mark them average, so that there might be less liability to error in regard to the bright and dull, which are the two classes we specially desire to compare in all these investigations.

It may be objected that the teachers would tend to select the bright rather than the dull. After careful inquiry, we do not think this was the fact. But admitting it for the sake of argument, the teachers then might place more of the dull than of the bright under the head of average. But even in this case our main purpose would be served, which is to compare the bright and dull.

As an illustration, we give one of the detailed tables made by copying from the original cards or slips. Each number in column 1 of the specimen table that follows stands for one pupil.

Complete summaries of all the detailed tables are called "tables of anthropometrical measurements," which are given in section E, pages 1052–1094.

SPECIMEN TABLE.

Bright boys, with parents of nonlaboring classes.

[NOTE.—The experiments in pressure (column 8) were unsatisfactory; (b) indicates bright; (a) average; (d) dull.]

Number.	Grade.	Age.	Craniological.			Physiological.							Educational.																								Nationality.				
			Maximum length of head.	Maximum width of head.	Cephalic index.	Least sensibility to locality (æsthesiometer).		Strength of grasp (dynamometer).		Least sensibility to heat (thermæsthesiometer).		Least sensibility to pressure right wrist (baræsthesiometer).	All studies.	Algebra.	Arithmetic.	Bookkeeping.	Chemistry.	Composition.	Drawing.	Geography.	Geometry.	German.	Grammar.	Greek.	History.	Language and English.	Latin.	Manual labor, or sewing.	Mathematics.	Music.	No studies.	Penmanship.	Phonics and sounding.	Physical culture.	Physics.	Physiology.	Political economy.	Reading.	Science—botany.	Spelling.	American nationality.	American mixed.	German.	Irish.	Other nationalities.
						Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.																																	
1	2	3	4	4 *a*	4 *b*	5	5 *a*	6	6 *a*	7	7 *a*	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
		Y. Mo.				*Mm*	*Mm*	*Kg.*	*Kg.*	○*R.*	○*R.*																																			
1	1	6 0	180	149	82.7	14	14	8	11	5.75	4	2	....	....	b	....	....	....	....	....	....	....	....	....	....	b	....	b	....	....	....	....	....	....	....	....	....	....	....	×	....	....	....	....
2	1	6 5	170	134	78.6	23	27	4	7	.75	2	10	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	b	....	....	....	....	....	....	....	b	....	....	×	....	....	....	....
3	1	6 5	170	136	80	15	15	7	7	4	5	10	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	b	....	....	....	....	....	....	....	b	....	....	×	....	....	....	....
4	1	6 6	170	134	78.6	15	13	7	7	1.50	2	5	....	....	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	b	....	....	....	....	b	b	....	×	....	....	....	....
5	1	6 10	181	138	76.2	12	11	10	9	3.50	2	2	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	b	....	....	....	....	....	....	....	b	....	....	×	....	....	....	....
6	2	7	170	137	80.5	....	14	10	11	4.50	1	10	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
7	2	7 9	176	133	75.5	13	15	11	11	.75	2	2	....	....	d	....	....	....	a	....	....	....	....	....	....	b	....	....	b	....	....	....	....	....	....	....	b	....	....	×	....	....	....	....
8	3	8	178	140	78.6	12	10	9	9	5	4.50	2	....	....	b	....	....	b	b	....	....	....	....	....	....	....	....	....	....	....	a	....	....	....	....	b	....	....	....	....	×	....	....	....
9	3	8 1	175	145	82.9	14	16	10	9	1.50	1.25	1	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	b	....	....	....	....	....	....	....	b	....	....	....	....	....	....	....
10	3	8 3	175	139	79.4	12	17	11	10	1	2	5	....	....	b	....	....	....	b	....	b	....	....	....	....	....	....	....	....	....	b	....	b	....	....	....	....	....	b	....	×	....	....	....	....
11	1	8 4	177	130	73.4	10	12	8	8	2.50	1.25	2	....	....	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	b	....	....	....	....	....	b	b	....	×	×	....	....	....
12	3	8 5	184	146	79.3	15	12	9	9	5	3	2	....	....	b	....	....	....	b	....	b	....	....	....	....	....	....	....	....	....	b	....	....	....	....	....	....	b	....	×	×	....	....	....
13	1	8 7	171	143	83.5	27	20	8	7	2	.....	12	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	....	....	b	....	....	....	....	....	....	....	....	×	×	....	....	....
14	2	8 9	181	150	82.8	11	12	12	11	4	5	10	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	....	....	b	....	....	....	....	....	....	....	....	×	×	....	....	....
15	1	8 10	185	139	75.1	20	20	15	12	.50	1	1	....	....	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	b	....	....	....	....	....	b	b	....	×	×	....	....	....
16	3	8 11	180	141	78.3	12	9	15	14	1.50	2	1	....	....	b	....	....	....	a	b	....	....	....	....	....	b	....	....	....	a	....	a	....	....	....	....	b	....	b	×	×	....	....	....
17	3	9	174	138	79.3	22	18	10	11	7.50	7.50	5	....	....	b	....	....	b	b	....	....	....	....	....	....	....	....	....	....	....	b	....	....	....	....	....	a	....	a	×	×	....	....	....
18	3	9	188	148	78.6	15	15	16	14	4.50	3	2	....	....	b	....	....	b	a	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	b	....	b	×	×	....	....	....
19	3	9	173	141	81.5	15	19	13	12	5	1	3	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	....	....	b	....	....	....	....	....	b	....	....	....	×	....	....	....
20	4	9	173	141	81.5	17	13	12	13	3.50	1.50	8	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
21	3	9	178	143	80.3	23	19	14	11	1	2	2	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	....	....	b	....	....	....	....	....	....	b	....	....	×	....	....	....	....
22	2	9 1	172	134	77.9	20	15	16	14	2	2	1	b	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	×	×	....	....	....
23	2	9 3	186	136	73.1	10	9	11	10	.12	.12	1	....	....	b	....	....	....	b	....	....	....	....	....	....	....	....	....	....	....	b	....	....	....	....	....	b	....	b	×	×	....	....	....
24	3	9 4	180	140	77.7	15	13	13	11	3	3.50	1	....	....	b	....	....	....	b	....	....	....	....	....	....	b	....	....	....	....	b	....	....	....	....	....	b	....	....	....	×	....	....	....	....
25	2	9 7	176	143	81.2	16	15	11	10	3	3	50-58	....	....	b	....	....	....	a	....	....	....	....	....	....	....	....	....	....	....	b	....	a	....	....	....	a	b	b	....	En	....	....	....

26	4	9	8	170	146	85.8	10	6	12	10	4	1	1	...	...	b	...	...	a	...	b	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	b	b	a	×	...	...	...	...
27	4	9	9	176	141	80.1	15	14	14	14	5	2	1	...	...	b	...	...	b	...	b	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	b	...	b	×	...	...	...	...
28	3	9	10	190	143	75.2	16	12	16	15	4	4	50–53	...	...	b	...	...	...	b	b	...	...	...	...	...	b	...	...	...	b	...	b	...	...	...	...	...	b	...	b	×	...	...	...	...
29	1	9	11	180	142	78.8	9	8	15	15	2	5	4	...	...	b	...	...	...	b	...	...	...	...	...	...	b	...	...	...	b	...	...	...	...	...	...	...	b	...	...	×	...	...	...	...
30	3	9	11	174	144	82.7	14	15	14	15	1.50	2	50–55	...	...	b	...	...	...	b	...	...	...	...	...	...	b	...	...	...	b	...	...	...	...	...	...	...	b	...	b	...	Gr	...	...	...
31	4	10		172	136	79	17	17	14	15	4.50	3.50	10	...	...	b	...	...	...	b	b	...	...	...	...	...	b	...	...	...	a	...	a	...	...	...	...	...	b	...	b	×	...	...	...	...
32	5	10		178	138	77.5	12	10	10	11	7	7	1	...	...	b	...	...	...	a	b	...	...	...	...	b	b	...	...	...	...	...	d	...	...	...	...	...	...	...	d	×	...	...	...	...
33	3	10		177	137	77.4	18	18	15	13	6.50	4.50	10	...	...	b	...	...	b	a	...	...	...	...	...	...	...	...	...	...	...	...	b	...	...	...	...	...	b	...	a	×	...	...	...	...
34	5	10		179	142	79.3	18	13	15	14	4	3.75	2	...	...	b	...	...	...	b	b	...	...	...	...	b	b	...	...	...	a	...	b	...	...	...	...	...	...	...	a	×	...	...	...	...
35	2	10		174	138	79.3	15	15	15	12	3	2.50	2	...	...	b	...	...	b	...	...	...	...	...	...	...	...	...	b	...	...	...	...	...	...	...	...	...	b	...	a	×	...	...	...	...
36	3	10	2	175	145	82.9	6	11	13	12	1	1.50	200–220	...	...	b	...	...	...	b	...	...	...	...	...	...	b	...	...	...	b	...	...	...	...	...	...	...	b	...	...	×	...	...	...	...

MEASUREMENTS OF THE CRANIUM.

The measurements of the cranium are perhaps the most important, as it incases the brain. It is also probable, for the same reason, that defects of the cranium are more significant than those in other portions of the body. It is sometimes said that in general the nearer a physical defect is to the brain, the more significant it is. In this connection it may be mentioned that a high palate is a frequent accompaniment of mental feebleness—a sign of congenital defect.

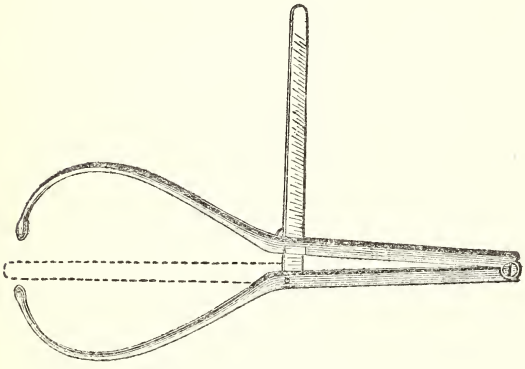


FIG. 1. Callipers (Broca).

The two most common measurements of the head are its maximum length and maximum width. In order to compare the length and breadth conveniently the width is multiplied by 100 and divided by the length, giving the cephalic index, which is one of the most important measurements in anthropology. When this index is 75 or less the person is considered long headed or dolichocephalic; when it is more than 75 and less than 80 the head is called medium or mesocephalic, and when the index is from 80 to 85, inclusive, the individual is said to be broad headed or brachycephalic.

The instrument used to measure the head is the callipers, represented in fig. 1.

SENSIBILITY TO HEAT.

There have been found on the body what are called *temperature spots* (Goldscheider and Blix). They are arranged in lines or in chains; thus in fig. 2 are represented the cold and warm spots of the upper side of the forearm.

The temperature sense seems to have special cold nerves and warm nerves which blend with the nerve of touch; thus specific cold and warm sensations are felt at points or areas on the skin which correspond to the ends of the temperature nerves. This extends the doctrine of the specific energy of the senses.

The least sensibility to heat was determined by the thermæsthesiometer of Eulenburg (fig. 3).

This is an instrument consisting of two thermometers fastened together, as seen in the figure. The electrical arrangement for changing the temperature of the instrument was not employed. The left-hand thermometer (A) was heated until it registered about 10° higher temperature than the right-hand thermometer (B); then the two thermometers were placed on the palmar surface of the wrist in a line at

right angles to the length of the wrist; the subject was asked which was the warmer, and on replying correctly the thermometers were held on the skin until the subject could not tell which was the warmer; at this instant the difference in degrees between the thermometers was read. This difference must be regarded only as a *relative* indication of the least sensibility to heat. Distinguishing small differences of temperature indicates acuteness of sensibility to heat; or, on the other hand, the greater the difference of temperature required to be perceived by the subject, the greater the obtuseness to heat. Thus if C can not tell the difference between the two thermometers after their difference is less than 3° and D after it is less than 2°, D is more acute to heat by 1° than C.

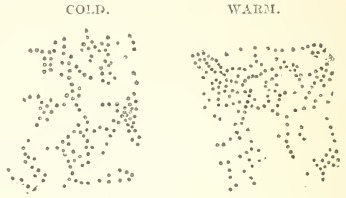


FIG. 2. Temperature spots (Eulenburg).

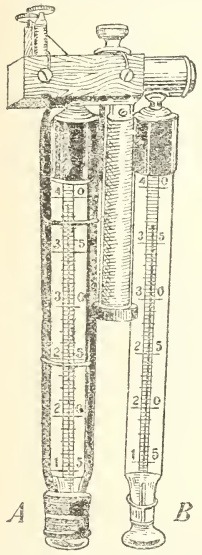


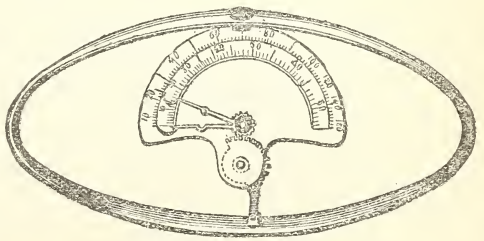
FIG. 3. Thermæsthesiometer.

STRENGTH OF HAND GRASP.

The strength of hand grasp is measured by the dynamometer. This instrument (fig. 4) is squeezed in the hand while the arm is held out horizontally from the side of the body. The strength of the right hand was generally taken first. The dynamometer is to some extent a sociological instrument, in distinguishing those who do manual labor from those who do not by the greater strength of hand in the former.

SENSIBILITY TO LOCALITY ON THE PALMAR SURFACE OF THE WRIST.

The capacity of distinguishing points on the body by the sense of touch is called the sense of locality. The palmar surface of the wrist was the part of the body chosen, owing to its convenience for making the experiment. The sense of locality on the skin varies in acuteness according to the mobility of the part, increasing in the extremities toward the fingers and toes.


FIG. 4. Dynamometer.

The instrument used in determining the least sensibility to locality is the æsthesiometer (fig. 5).

The two points, as seen in the figure, were drawn 15 millimeters apart. The pupil closed his eyes, and the two points were made to

touch simultaneously the skin on the palmar surface of the wrist. He was asked if he felt one or two points. In case he felt only one point, the instrument was raised and the points were moved farther apart. If he felt the two points, they were moved closer together. Just as soon as he became uncertain in either case, as to whether there were one or two points touching the skin, the distance between the points

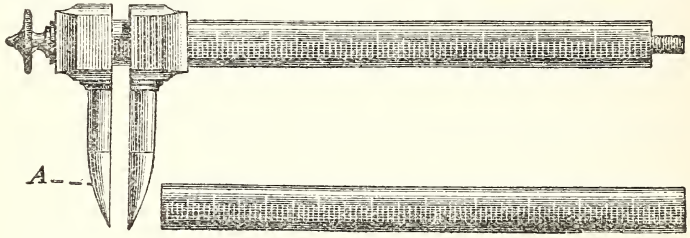


FIG. 5.—Æsthesiometer.

was read in millimeters as recorded by the scale on the rod. It takes more acuteness to distinguish two points on the skin the closer the points are together. The distance of the two points from each other, when the pupil is in doubt, is taken as a measure of his sense of locality. The less the distance the more acute is his sense, and the greater the distance the more obtuse his sense of locality.

RESULTS OF INVESTIGATION.

It is a general principle in new lines of inquiry to regard the results as more or less tentative according to the number of experiments made. In this work the results depend upon averages, which are valuable according to the whole numbers from which the averages are made. The conclusions, therefore, will be more trustworthy the larger the numbers measured. In many instances those numbers are not as large as we would desire; but we hope this will induce some investigator to make experiments upon larger numbers.

TABLE A.—*Boys.*

["Boys" means white boys. When colored children are meant, it is so stated.]

Class.	Number of cases.	Average age. *a*	Cephalic index.	Least sensibility to locality. *b*		Strength of grasp. *b*		Least sensibility to heat. *b*		Long-headed (dolichocephalic).	Medium (mesocephalic).	Broad-headed (brachycephalic).
				Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.			
		Y. M.		*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	°*R.*	°*R.*	*P. ct.*	*P. ct.*	*P. ct.*
Bright...	237	12 4	Dolicho. 20 Meso ... 121 Brachy . 96	3,791 16.1	3,559 15	4,687 19.9	4,331 18.3	900.49 3.80	828.09 3.51	8	51	41
Dull	137	13 1	Dolicho. 21 Meso ... 56 Brachy . 59	2,222 16.2	2,133 15.6	3,369.5 24.6	3,161 23.1	597.50 4.36	551.25 4.05	15	41	44
Average.	142	12 1	Dolicho. 17 Meso ... 58 Brachy . 67	2,426 17.1	2,315 16.3	2,644 18.6	2,501.5 17.7	646.25 4.62	603.75 4.34	11	40	49
Unruly *c*.	10	14 5	Dolicho. 4 Meso ... 3 Brachy . 3	150 15	145 14.5	291 29.1	277 27.7	42.50 4.25	44.00 4.40	40	30	30
Total ...	526	.....	Dolicho. 62 Meso ...238 Brachy .225	8,589	8,152	10,991.5	10,270.5	2,186.74	2,027.09	.....	.....	.....
Average	....	12 9	.....	16.4	15.5	20.9	19.6	4.17	3.89	11	45	44

a Average age only is given, as the number is too small for divisions according to age.
b In columns for locality, strength, and heat both totals and averages are given.
c Only 10 boys were reported unruly; no girls of the 548 (table 13) were reported unruly.

Shape of head.—It will be seen from Table A that a large proportion of the boys are broad-headed rather than long-headed. Long-headedness, or dolichocephaly, seems to be an unfavorable sign, for the bright show the smallest percentage, the average next, and the dull the largest percentage; the unruly boys have a large percentage of long heads.

Sensibility to heat.—The bright boys are the most sensitive to heat; but there is no further parallelism between sensitiveness to heat and mental ability, for the average boys are less sensitive than the dull boys.

Strength of hand grasp.[1]—There seems to be no relation between strength of hand and mental ability. Strength of hand depends more upon sociological conditions; that is, those children who through force of circumstances are compelled to work outside of school hours and are sometimes kept out of school for this purpose, naturally develop their strength. The percentage of dullness among such children is liable to be large, and this may account for the dull boys having comparatively greater strength of hand grasp.

Sensibility to locality.—Comparing girls with boys, the girls are more sensitive than the boys. In general, both boys and girls are more sensitive to locality and heat in the left hand than in the right.

TABLE B.—*Girls.*

Class.	Number of cases.	Average age.	Cephalic index.	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.		Long-headed (dolichocephalic).	Medium (mesocephalic).	Broad-headed (brachycephalic).
				Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.			
		Y. M.		*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	°*R.*	°*R.*	*P. ct.*	*P. ct.*	*P. ct.*
Bright...	269	12 10	Dolicho. 33 Meso ...137 Brachy . 98	3, 892 14. 5	3, 667 5 13. 7	4, 529. 2 16. 9	4, 204 15. 7	1, 122. 11 4. 19	1, 023. 73 3. 82	12	51	37
Dull.....	149	13 8	Dolicho. 11 Meso ... 70 Brachy . 67	2, 252 15. 4	2, 068 14. 2	2, 517 17. 1	2, 419. 2 16. 5	684. 00 4. 62	631. 25 4. 27	8	47	45
Average.	130	13 0	Dolicho. 15 Meso ... 58 Brachy . 56	1, 968 15. 3	1, 838 14. 2	2, 096. 5 16. 3	1, 974. 5 15. 3	612. 25 4. 71	561. 99 4. 32	13	44	43
Total...	548	.....	Dolicho. 59 Meso ...265 Brachy .221	8, 112	7, 573. 5	9, 142. 7	8, 597. 7	2, 418. 36	2, 216. 97	.....	.....	.....
Average....		13 1	.....	14. 9	13. 9	16. 8	15. 8	4. 43	4. 06	12	48	40

In making conclusions from Table B we will compare the results with those of Table A.

Shape of head.—Bright girls have a larger percentage of long-headedness than dull girls. The reverse is the case with boys.

Sensibility to heat.—The bright girls are most sensitive to heat. Compared with the boys, the girls are less sensitive to heat.

[1] There is objection to comparing strength of hand grasp according to average age; but as remarked before, the numbers are too small for division according to ages. Yet we have thought best to give these comparisons of hand grasp.

TABLE C.—*Relation of sensibility to ability in different studies.*

[Pupils reported by the teachers as bright, average, or dull in arithmetic, language, and drawing.]

Divisions according to ability in different studies.	Number of line.	Number of individuals.	Average age.		Long-headed (dolichocephalic).	Medium-headed (mesocephalic).	Broad-headed (brachycephalic).	Least sensibility to locality.		Strength of hand grasp.		Least sensibility to heat.	
								Right wrist	Left wrist	Right hand	Left hand	Right wrist.	Left wrist.
Boys:			*Yr*	*Mo*	*P ct.*	*P ct*	*P ct*	*Mm*	*Mm*	*Kilos.*	*Kilos*	° *R.*	° *R.*
Bright in arithmetic	1	108	10		7	49	44	15.5	14.6	13.8	13.2	3.35	3.00
Dull in arithmetic	2	45	12	0	17	45	38	15.0	15.4	16.3	15.9	3.56	3.27
Average in arithmetic	3	48	10	8	13	37	50	16.3	15.6	14.5	13.9	4.22	4.03
Bright in language	4	56	10	11	4	50	46	16.5	15.2	15.5	14.7	3.54	3.70
Dull in language	5	28	13	3	23	40	37	15.9	16.2	21.9	21.3	4.40	3.99
Average in language	6	50	11	6	14	30	56	16.6	15.8	16.8	16.8	4.25	4.17
Bright in drawing	7	57	10	7	4	54	42	16.4	14.6	14.2	13.4	3.18	3.25
Dull in drawing	8	23	11	9	6	54	40	15.5	15.6	15.6	15.5	3.92	3.32
Average in drawing	9	26	10	10	10	45	45	15.9	15.3	14.6	13.8	3.59	3.75
Girls:													
Bright in arithmetic	10	73	10	10	20	51	29	14.5	13.4	12.7	11.8	3.97	3.39
Dull in arithmetic	11	34	12	6	9	47	44	17.1	14.8	13.9	13.7	4.15	4.03
Average in arithmetic	12	16	10	4	7	50	43	13.2	12.9	11.5	11.0	4.20	3.78
Bright in language	13	73	13	11	9	61	30	14.4	13.5	20.0	18.3	3.88	3.86
Dull in language	14	44	15	8	10	59	31	14.6	13.9	20.2	19.2	4.44	3.99
Average in language	15	25	14	4	8	52	40	14.2	13.0	19.7	18.3	3.48	3.32
Bright in drawing	16	30	12	7	8	55	37	13.7	12.7	16.3	14.9	3.77	3.15
Dull in drawing	17	18	12	9	17	22	61	17.4	14.6	15.1	14.7	3.96	3.85
Average in drawing	18	13	12	0	9	30	61	13.1	12.8	13.8	12.7	3.96	3.87

In Table C we desire to find what relation, if any, may exist between the sensibilities, cephalic index, and degrees of ability in different lines of study.

The arithmetical faculty is most strikingly developed, if we consider as an indication the comparatively large number of bright pupils. This number is more than double in many instances the number of bright in other studies. The exception is with the girls, where the same number are bright in both language and arithmetic.

It is striking to notice that, in general, the per cent of dolichocephaly or long-headedness increases as ability decreases. This applies to the different studies. The striking exception is with the girls bright in arithmetic. This is the more difficult to explain, because the girls, as a whole, have about the same percentage of dolichocephaly as the boys (Tables A and B). Comparing this table with the others a relatively high per cent of dolichocephaly is found to be to a certain extent a characteristic of dullness.

The average age of boys increases as we approach the dull boys. This is true of the girls, if we compare only the bright and the dull, the average age of the latter being higher than that of the former. This may be due in the main to the fact that the dull have not been promoted in due course, and hence are found associated in the different grades with pupils younger than themselves, who have advanced by regular stages. They stay out or are kept out of school very often on account of the difficulties they meet in their studies. Many dull children become discouraged and embrace every opportunity to remain away from school.

It will be seen from the table that, with few exceptions, the bright have the least strength of hand grasp, which increases in the average and reaches its maximum in the dull. One reason for this may be of a sociological nature. For, as just mentioned, the dull may be absent from school more, and work more with their hands.

In examining Table D it becomes evident that both boys and girls are more sensitive to locality and heat before puberty than after. But the boys, however, show a greater difference between these periods of life than the girls. It may be noted incidentally that, in the pubertal division, the girls still maintain their superiority in sensitiveness to locality. This superiority is greater after puberty. After puberty the boys grow relatively stronger in hand grasp as compared with the girls.

Among the boys the percentage of long heads is much greater after puberty than before, except in the case of the average boys. As the pupils were all originally selected simply from the point of view of bright, dull, or average in mental ability, the relatively high percentage of long heads could hardly be accidental. In the case of the girls, on the other hand, the percentage of long heads is the same before and after puberty. But if we look at the subclasses, the average girls seem to be an exception, just as the average boys were above.

If we look under the columns for dolichocephaly and brachycephaly, we find in the case of all the boys that as the percentage of long heads increases after puberty the percentage of broad heads decreases. This last part is common to both girls and boys; that is, there is about 10 per cent less of broad heads after puberty among the 1,074 children measured.

TABLE D.—*Puberty in relation to cephalic index, strength, and sensibility.*

[The legal ages for puberty are followed here, age 12 for girls, and age 14 for boys.]

Divisions according to puberty and mental ability	Number of line.	Number of individuals	Average age.		Long-headed (dolichocephalic).	Medium-headed (mesocephalic).	Broad-headed (brachycephalic).	Least sensibility to locality.		Strength of hand grasp.		Least sensibility to heat.	
								Right wrist.	Left wrist	Right hand.	Left hand.	Right wrist.	Left wrist.
All boys:			*Yr*	*Mo.*	*Pr ct.*	*P ct.*	*P ct.*	*Mm.*	*Mm*	*Kilos.*	*Kilos.*	° *R.*	° *R.*
Before puberty	1	315	10	7	8	44	48	15.7	14.9	14.0	13.4	3.89	3.62
After puberty	2	201	15	11	16	48	36	17.4	16.5	31.3	28.7	4.57	4.20
All girls:													
Before puberty	3	186	9	7	11	41	48	14.5	13.8	10.6	10.0	4.35	3.89
After puberty	4	362	14	11	11	51	38	15.0	13.8	19.8	18.6	4.45	4.13
All bright boys:													
Before puberty	5	168	10	11	6	51	43	15.7	14.8	14.3	13.6	3.65	3.40
After puberty	6	69	15	11	13	54	33	16.8	15.4	33.1	29.7	4.17	3.71
All dull boys:													
Before puberty	7	49	9	11	6	35	59	15.1	14.5	13.0	12.8	3.94	3.46
After puberty	8	88	16	1	21	45	34	16.9	16.2	31.1	28.8	4.59	4.34
All average boys:													
Before puberty	9	98	10	6	13	38	49	16.1	15.2	14.0	13.4	4.28	4.07
After puberty	10	44	15	8	9	48	43	19.4	18.7	29.0	27.0	5.15	4.66
All bright girls:													
Before puberty	11	105	9	6	12	45	43	14.3	13.6	10.6	9.9	4.19	3.68
After puberty	12	164	14	11	12	55	33	14.6	13.7	20.8	19.3	4.16	3.89
All dull girls:													
Before puberty	13	35	9	1	9	28	63	15.4	14.4	10.4	9.9	4.01	3.94
After puberty	14	114	15	1	7	53	40	15.0	13.7	18.9	18.2	4.77	4.33
All average girls:													
Before puberty	15	46	9	9	9	43	48	14.4	13.7	10.6	10.1	4.95	4.32
After puberty	16	84	14	10	14	45	41	15.5	14.4	19.2	18.0	4.58	4.32
All boys	17	526	12	9	11	45	44	16.4	15.5	20.9	19.6	4.17	3.89
All girls	18	548	13	1	12	48	40	14.9	13.9	16.8	15.8	4.43	4.06

SOCIOLOGICAL CONDITION IN RELATION TO MENTAL ABILITY AND SENSIBILITY.

It is desirable to know whether occupation of parents or sociological conditions have any effect upon the mental and sensitive condition of children.

Any classification of parents as to occupation must be more or less open to criticism; but the schedules of Drs. Baxter and Bowditch, given below, will perhaps serve as well as any. We have followed Dr. Bowditch in making only two divisions: Nonlaboring classes, including the professional and mercantile classes; and laboring classes, embracing all others, to wit, skilled laborers and unskilled laborers.

Classification of occupations by Baxter and Bowditch.[1]

Nonlaboring classes.		Laboring classes.		
Professional.	Mercantile.	Skilled labor.		Unskilled labor.
1. Architects.	1. Agents.	1. Bakers.	26. Papermakers and hangers.	1. Barkeepers.
2. Clergymen.	2. Brokers.	2. Barbers.	27. Photographers.	2. Boatmen.
3. Dentists.	3. Clerks.	3. Blacksmiths.	28. Plasterers.	3. Carters and drivers.
4. Druggists.	4. Grocers.	4. Bookbinders.	29. Plumbers.	4. Factory hands.
5. Editors.	5. Innkeepers.	5. Brickmakers.	30. Printers.	5. Farmers.
6. Lawyers.	6. Liquor dealers.	6. Butchers.	31. Sailmakers.	6. Firemen.
7. Musicians.	7. Merchants.	7. Cabinetmakers.	32. Shoemakers.	7. Fishermen.
8. Physicians.	8. Peddlers.	8. Carpenters.	33. Stonecutters.	8. Hostlers.
9. Public officers	9. Tobacconists.	9. Carriage makers.	34. Tailors.	9. Laborers.
10. Students.	(2)	10. Cooks.	35. Tanners and currers.	10. Lumbermen.
11. Teachers.	1. Bookkeepers.	11. Coppersmiths.	36. Telegraph operators.	11. Miners.
(2)	2. Caterers.	12. Distillers.	37. Tinsmiths.	12. Porters.
1. Actors.	3. Collectors.	13. Engineers.	38. Upholsterers.	13. Railroad men.[2]
2. Army or navy officers.	4. Contractors.	14. Engravers.	(2)	14. Sailors.
3. Civil engineers.	5. Cotton samplers.	15. Gun and lock smiths.	1. Bridge superintendents.	15. Soldiers.
4. Surveyors.	6. Detectives.	16. Harness makers.	2. Conductors.	16. Servants.
	7. Railroad superintendents.	17. Hatters.	3. Foremen.	17. Watchmen.
	8. Salesmen.	18. Iron workers.	4. Inspectors.	(2)
	9. Sea captains.	19. Jewellers.	5. Letter carriers.	1. Expressmen.
	10. Undertakers.	20. Machinists.	6. Molders.	2 Jobbers.
	11 Weighers.	21. Manufacturers.	7. Packers.	3. Pavers.
		22. Masons.	8. Policemen.	4. Puddlers.
		23. Mechanics.	9. Stable superintendents.	5. Whitewashers.
		24. Millers.		
		25. Painters.		

[1] Statistics, Medical and Anthropological, of the Provost-Marshal-General's Bureau, by J. H. Baxter, A. M., M. D., Washington, 1875. The second division in each column consists of occupations added by Dr. Bowditch.

[2] We have not followed this table strictly; for instance, many railroad men performed skilled labor.

Comparing the children whose parents belong to the laboring class and nonlaboring class, respectively, it will be seen from Table E that in the case of both boys and girls the children of the nonlaboring classes are more sensitive to locality and heat, but this difference is not great.

If the classification according to ability below line 6 is examined, the nonlaboring classes are found to be more acute in sensitiveness to locality and heat than the laboring classes, except in the case of dull boys of the nonlaboring classes (line 9), who are much less sensitive than the dull boys of the laboring classes (line 15). This striking exception may be taken in connection with the exceptionally large proportion of long heads in the dull boys of the nonlaboring classes, which is 28 per cent, while with the dull boys of the laboring classes it is 6 per cent.

TABLE E.—*Sociological condition in relation to mental ability, sensibility, etc.*

Divisions according to social classes and ability.	Number of individuals.	Average age in years and months.	Long-headed (dolichocephalic).	Medium-headed (mesocephalic).	Short-headed (brachycephalic).	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.	
						Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.
Nonlaboring classes:		Yrs. Mo.	Pr. ct.	Pr. ct.	Pr. ct.	Mm.	Mm.	Kilos.	Kilos.	° R.	° R.
All boys	205	12 6	13	51	36	16.1	15.2	19.4	18.3	4.03	3.85
All girls	183	13 10	11	51	38	14.4	13.6	18.8	17.5	3.92	3.52
Laboring classes:											
All boys	119	11 11	8	40	52	16.7	15.9	17.2	16.2	4.07	3.74
All girls	133	13 5	13	51	36	14.9	13.7	17.0	15.9	4.19	3.93
Not socially divided:											
All boys	117	14 2	11	47	42	16.8	15.9	28.9	25.8	4.40	3.98
All girls	199	12 2	9	45	46	15.3	14.2	14.7	14.1	5.06	4.60

TABLE E.—*Sociological condition in relation to mental ability, sensibility, etc.*—Cont'd.

Divisions according to social classes and ability.	Number of individuals.	Average age in years and months.	Long-headed (dolichocephalic.)	Medium-headed (mesocephalic).	Short-headed (brachycephalic)	Least sensibility to locality.		Strength of grasp.		Least Sensibility to heat.	
						Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.
Nonlaboring classes:		*Yrs. Mo*	*Pr. ct.*	*Pr. ct.*	*Pr. ct.*	*Mm.*	*Mm.*	*Kilos*	*Kilos.*	° *R.*	° *R.*
Bright boys	117	12	9	57	34	15.4	14.3	17.9	16.6	3.66	3.63
Bright girls	114	13 1	13	53	34	14.1	13.3	17.7	16.2	3.87	3.46
Dull boys	39	14 1	28	44	28	17.6	17.2	24.9	23.0	4.72	4.61
Dull girls	39	15 4	8	46	46	15.2	14.3	20.3	19.5	4.27	3.68
Average boys	49	12 6	12	43	45	16.9	16.0	18.9	18.7	4.44	4.09
Average girls	30	14 10	10	48	42	14.3	13.6	20.8	19.7	3.68	3.56
Laboring classes:											
Bright boys	53	12	8	32	60	16.7	15.5	17.9	16.9	3.86	3.46
Bright girls	62	13 2	14	60	26	14.8	13.8	17.6	16.2	3.93	3.62
Dull boys	34	12 7	6	38	56	15.9	15.8	18.2	17.5	3.48	3.09
Dull girls	34	13 9	12	44	44	15.3	13.6	16.9	16.2	4.49	4.32
Average boys	32	11 1	13	53	34	17.1	16.3	14.6	13.4	4.90	4.91
Average girls	37	13 7	11	43	46	15.3	14.6	16.4	15.5	4.36	4.10
Not socially divided:											
Bright boys	55	13 10	9	58	33	16.8	16.1	27.2	24.4	4.04	3.54
Bright girls	83	12 2	8	44	48	14.7	13.9	15.2	14.6	4.73	4.33

As compared with bright girls, the average girls of the same social classes are less sensitive and not so strong. As compared with dull girls of the same social classes, the average girls show less difference of sensibility. Sometimes they are more sensitive than the dull girls.

COMPARISON OF BOYS AND GIRLS OF THE SAME SOCIAL CLASSES.

Bright boys and girls (Table E).—Boys of nonlaboring classes are less sensitive to locality; boys of laboring classes are less sensitive both to locality and heat; boys not socially divided are less sensitive to locality, but more sensitive to heat. This last fact is what might be expected where there is no social division, for boys in general are more sensitive to heat than girls, but less sensitive to locality. (See Tables A and B.)

Dull boys and girls (Table E).—Boys of nonlaboring classes are much less sensitive to locality and slightly less sensitive to heat; boys of laboring classes and classes not socially divided are less sensitive to locality, but more sensitive to heat; boys unruly are much less sensitive to locality and slightly less sensitive to heat.

Average boys and girls (Table E).—Boys of both classes are less sensitive both to locality and heat.

These more detailed results from the special subdivisions of the tables confirm the more general conclusions from Tables A and B.

White boys; colored boys.—The percentage of long-headedness among the colored boys is more than double that of the white boys (Table F). This is doubtless due to racial influence.

The bright colored boys are more sensitive to heat than the dull colored boys (Table G).

In order to compare the white boys and colored boys further we give Table F, showing averages for all the white boys taken from Tables A, B, G, and H.

The colored boys are more sensitive to locality and much more sensitive to heat than the white boys. This is probably due to racial influence. It does not mean necessarily that colored children feel the heat more in the sense of disagreeableness, but that their power of discrimination of different degrees of heat is greater. Thus we have

found that women are more sensitive to pain by pressure on the temporal muscles than men,[1] but this does not necessarily mean that they suffer more from pain, or can not endure as much pain. They probably can endure more than men, owing to their greater idealizing power.

TABLE F.

Race in relation to cephalic index, sensibility, etc.	Number of persons.	Average age.	Dolichocephalic.	Mesocephalic.	Brachycephalic.	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.	
						Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.
All boys:		*Yr. Mo.*	*Pr. ct.*	*Pr. ct.*	*Pr. ct.*	*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	°*R.*	°*R.*
White	526	12 9	11	45	44	16.4	15.5	20.9	19.6	4.17	3.89
Colored	33	13 3	32	53	15	14.3	13.9	19.7	18.4	2.07	1.77
All girls:											
White	548	13 1	12	48	40	14.9	13.9	16.8	15.8	4.43	4.06
Colored	58	13 1	27	52	21	15.3	14.2	17.3	16.3	2.64	2.47

We regret that the number of colored children measured is so small. In making comparisons, therefore, due account must be taken of this fact.

TABLE G.—*Colored boys.*

Class.	Number of cases.	Average age.	Cephalic index.	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.		Long-headed (dolichocephalic).	Medium (mesocephalic).	Broad-headed (brachycephalic).
				Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.			
		Yr. Mo		*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	° *R.*	° *R.*	*Pr. ct.*	*Pr. ct.*	*Pr. ct.*
Bright	18	12 11	Dolicho.. 4 Meso .... 9 Brachy .. 4	240 14.1	229 13.5	351 19.5	325 18.1	35.25 1.96	32.00 1.78	23	52	25
Dull	10	13 2	Dolicho.. 4 Meso .... 5 Brachy .. 1	141 14.1	140 14.0	178 17.8	165 16 5	23.00 2.30	18.25 1.83	40	50	10
Average	5	14 5	Dolicho.. 2 Meso .... 3 Brachy .. 0	78 15.6	77 15.4	122 24.4	117 23.4	10.00 2.00	8.25 1.65	40	60	.....
Total	33	.....	Dolicho..10 Meso ....17 Brachy.. 5	459	446	651	607	68.25	58.50	.....	.....	.....
Average for all	....	13 3	.....	14.3	13.9	19.7	18.4	2.07	1.77	32	53	15
Unruly *a*	5	14 5	Dolicho.. 2 Meso .... 3 Brachy .. 0	78 15.6	77 15.4	122 24.4	117 23.4	10.00 2.00	8.25 1.65	40	60	.....

a The unruly are included among the bright, dull, or average; so they are placed alone.

[1] Psychological Review, March, 1895; March, 1896, and March, 1898.

TABLE H.—*Colored girls.*

Class.	Number of cases.	Average age.	Cephalic index.	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.		Long-headed (dolichocephalic).	Medium (mesocephalic).	Broad-headed (brachycephalic).
				Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.			
		Yr. Mo.		*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	° *R.*	° *R.*	*Pr. ct.*	*Pr. ct.*	*Pr. ct.*
Bright...	33	12 6	Dolicho.. 5 Meso ....20 Brachy .. 8	499 15.1	471 14.3	547 16.6	519 15.7	94.75 2.87	78.62 2.38	11	66	23
Dull.....	18	13 8	Dolicho.. 8 Meso .... 7 Brachy .. 3	289 16.1	261 14.5	321 17.8	302 16.8	46.00 2.56	51.00 2.83	46	38	16
Average.	3	15 6	Dolicho.. 0 Meso .... 2 Brachy .. 1	36 12.0	30 10.0	63 21.0	57 19.0	4.62 1.54	5.62 1.87	.....	.....	.....
Unruly ..	4	13 8	Dolicho.. 0 Meso .... 4 Brachy .. 0	62 15.5	60 15.0	72 18.0	68 17.0	7.75 1.94	8.25 2.06	.....	.....	.....
Total...	58	.....	Dolicho..13 Meso ....33 Brachy ..12	886	822	1,003	946	153.12	143.49	.....	.....	.....
Average....		13 1	.....	15.3	14.2	17.3	16.3	2.64	2.47	27	52	21

The bright colored girls are more sensitive to locality than the dull. The dull colored girls have a stronger hand grasp than the bright. Comparing the colored girls with the white girls, they are less sensitive to locality than the white girls, but much more sensitive to heat. Comparing the colored boys and girls, the boys are more sensitive both to locality and heat. Colored boys are remarkably sensitive to heat on the left wrist.

COLORED CHILDREN BEFORE AND AFTER PUBERTY.

While the number of colored children measured is comparatively small, yet it may be interesting to note some differences indicated in Table I:

Among the boys and girls the per cent of long heads is much greater after puberty than before. This is also true of the white boys, but not of the white girls. The colored boys are more sensitive to heat and locality after puberty than before. The reverse is true with the white boys, but the colored girls, like the white girls, are less sensitive after puberty.

TABLE I.—*Colored children before and after puberty.*

Divisions according to puberty and sex.	Number of cases.	Average age.	Dolichocephalic.	Mesocephalic.	Brachycephalic.	Least sensibility to locality.		Strength of grasp.		Least sensibility to heat.	
						Right wrist.	Left wrist.	Right hand.	Left hand.	Right wrist.	Left wrist.
All colored boys:		*Yr. Mo.*	*P. ct*	*P. ct*	*P. ct*	*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	° *R.*	° *R.*
Before puberty.....	22	12 2	27	55	18	14.1	13.6	19.0	17.9	2.42	2.00
After puberty.....	11	15 5	40	50	10	13.5	13.4	21.3	18.5	1.55	1.32
All colored girls:											
Before puberty.....	15	10 1	13	47	40	14.3	12.9	11.7	10.9	2.53	2.05
After puberty.....	36	14 2	31	55	14	15.9	15.0	19.3	18.3	2.85	2.75

CHILDREN IN THE NORTH CAROLINA MOUNTAINS.

We give, for sake of comparison, measurements of some 150 children in the North Carolina mountains. These people are principally of English and Scotch-Irish descent. They have lived somewhat in isolation, and for this reason, perhaps more than any other, are backward in civilization.

The measurements of these children were made under the direction of the author by Miss S. G. Chester, who was engaged in settlement work in the mountain district of North Carolina.

After summarizing these measurements and comparing them with those of the boys in the Washington schools, we find the schoolboys in the North Carolina mountains show a much larger (double) per cent of dolichocephaly and a much smaller per cent of brachycephaly. They are less acute to the sense of locality and stronger in their hand grasp than the Washington schoolboys.

Compared with the girls in the Washington schools, the girls in the North Carolina mountains show also a greater per cent of dolichocephaly and less acuteness to the sense of locality, but a greater strength in the hand grasp. The last may be accounted for by their doing more work that requires the use of arms and hands.

The relations of right wrist and left wrist as to sense of locality seem to be a little more variable than in Washington school children. The reason why there were so many more girls measured than boys is that many more of the latter were taken out of school to work.

The girls show an average smaller head, but are taller, heavier, and have a larger arm reach than the boys. If this should be true with larger numbers, it is somewhat striking.

TABLE J.—*Children in the North Carolina mountains.*

Divisions according to mental ability, sex, and puberty.	Number.	Average age.	Dolichocephalic.	Mesocephalic.	Brachycephalic.	Horizontal circumference of head.	Least sensibility to locality.		Strength of hand grasps.		Height.	Sitting height.	Arm reach.	Weight.
							Right wrist.	Left wrist.	Right.	Left.				
		Yr. mo.				*Mm.*	*Mm.*	*Mm.*	*Kilos.*	*Kilos.*	*Cm.*	*Cm.*	*Cm.*	*Lbs.*
Boys, bright:														
Before puberty	14	10 1	2	8	4	530	18.1	17.1	14.1	13	120.8	65.9	119.4	76
After puberty	6	17 11	1	3	2	549	15.4	14.7	35	33.3	167.4	84.4	161.5	131.7
All boys, bright	20	12 5	*a* 15	*a* 55	*a* 30	536	17.2	16.3	20.4	19.9	134.8	71.4	132	92.7
Boys, average:														
Before puberty	9	7 10	2	7	0	511	18.4	16.7	14.2	12.6	122.9	66	114.3	64
After puberty	3	17 4	2	1	0	562	16.3	18	46.7	46.3	173.3	87	173	140.7
All boys, average	12	10 2	*a* 34	*a* 66	0	524	17.9	17	22.3	21	135.6	71.3	129	83.2
Boys, dull:														
Before puberty	1	13 8	0	1	0	555	15	19	28	30	158.5	84	150	108
After puberty	1	15 4	1	0	1	530	17	13	14	12	145	75	139	125
All boys, dull	2	14 6	1	1	0	543	16	16	21	21	151.8	79.5	144.5	116.5
All boys	34	11 8	*a* 25	*a* 58	*a* 17	532	17.4	16.5	21.1	20.4	136.1	71.8	131.7	90.7
Girls, bright:														
Before puberty	30	9 1	2	10	18	498	15.8	14.8	11.6	11	123.2	66.8	119.6	69.7
After puberty	25	14 6	5	13	7	534	16.5	15.9	21.5	19.8	153.2	78.8	148.9	112.2
All girls, bright	55	11 5	*a* 14	*a* 41	*a* 45	515	16.1	15.3	16.1	15	136.8	72.3	132.9	89.1
Girls, average:														
Before puberty	12	11 4	4	4	4	493	16.4	16.4	14.5	11.3	130.5	68.1	127	75.3
After puberty	36	14 10	8	21	7	543	14.1	13.9	22.8	21.4	155.5	78.6	152.3	113.2
All girls, average	48	13 1	*a* 26	*a* 52	*a* 22	530	14.7	14.5	20.7	18.9	149.3	76.1	146	103.7
Girls, dull:														
Before puberty	2	10 4	1	1	0	532	15	18	16	17.5	121.5	73.5	118.5	67
After puberty	12	13 6	0	11	1	625	15.8	14.8	19.3	19.4	144.8	74.5	142.2	107.7
All girls, dull	14	13 1	1	12	1	526	15.6	15.2	18.8	19	141.4	74.4	138.8	101.8
All girls	117	12 3	*a* 18	*a* 51	*a* 31	522	15.5	15.1	18.3	17.1	142.5	74.1	139	96.6

a Per cent.

Section B.

ANTHROPOMETRICAL MEASUREMENTS IN RELATION TO SEX, SOCIOLOGICAL CONDITION, RACE, AND MENTAL ABILITY (16,473 WHITE CHILDREN AND 5,457 COLORED CHILDREN).

The measurements of which the results are given in this section (B) were made by the teachers in the different schools, under the direction of the author.

METHOD OF INVESTIGATION.

The data were obtained by having the teachers fill out cards or sets of observation, each card representing one pupil. Below is given as a specimen card, one actually filled out by a teacher.

[Specimen card.]

SINGLE SET OF OBSERVATIONS.

1. Name, L. R. C. 2. School, Gales.
3. Grade, second. 4. Sex, male. 5. Age, 7 yrs. 9 mos.
6. Height (without shoes), 4 ft. ½ in. 7. Sitting height, 2 ft. 2½ in.
8. Arm reach, 4 ft. 9. Weight (in ordinary indoor clothes), 55½ lbs.
10. Horizontal circumference of head, 20¼ in. 11. Bright, dull, or average (*in general*), bright.
12. Bright in (name studies), reading, numbers, spelling, composition.
13. Dull in (name studies).
14. Average in (name studies), drawing.
15. If abnormal or peculiar, name in what way.
16. Is pupil unruly? No. 17. Is pupil sickly? No. 18. Nationality of father, American; of mother, American. 19. Occupation of father, floor walker.
20. Remarks, ———.
21. Name of observer, M. K.

[Reverse Side of Card.]

The height is to be taken in an upright position without shoes, the feet being close to the measuring rod.

The sitting height is the vertical distance between the top of the head and the surface upon which the individual is seated; this should be a level inflexible surface.

The arm reach is the distance between the tips of the middle fingers, when the arms are extended horizontally, the breast and arms being in contact with a wall.

Horizontal circumference of head is to be measured with tape line in the plane of the eyebrows.

If not convenient to remove shoes, the height of heel can be measured, and subtracted from total height.

After all the cards were filled out, they were arranged in whatever order was desired, and then the figures were copied on sheets (see example below), added, and averages made, summaries of which constitute the tables given further on.

We give an example of a table made by copying the measurements and reports of the teachers from the original cards. As in the previous section (A) so here, it would require altogether too much space to give these tables in detail. The tables given in section E are simply summaries of these tables.

SCHOOLS OF WASHINGTON (SPECIMEN TABLE).

Statistics of bright (in general) boys of the same age belonging to nonlaboring classes and of American parentage.

[b = bright; d = dull; a = average.]

Number.	Grade.	Age.	Height.	Sitting height.	Weight in ordinary indoor clothes.	Horizontal circumference of head.	All studies.	Arithmetic.	Bookkeeping.	Composition.	Drawing.	Geography.	Language and English.	Manual labor and sewing.	Music.	None.	Penmanship.	Phonics.	Reading.	Science and botany.	Spelling.	Remarks.
		Yrs. Mos.	*Inches.*	*Inches.*	*Pounds.*	*Inches.*																
1	1	5 8	42.50	23.00	40.00	20.12	.....	a	.....	....	.....	....	b	....	.....	....	.....	....	b	.....	....	
2	1	6 0	44.00	24.50	47.50	20.25	.....	b	b	....	.....	....	.....	....	.....	....	a	....	b	a	b	
3	1	6 0	43.00	25.00	38.50	16.50	.....	b	.....	....	.....	....	b	....	b	d	b	....	b	a	b	
4	4	6 0	52.00	28.00	63.00	21.00	.....	b	.....	....	.....	....	b	....	.....	d	a	....	.....	.....	....	
5	1	6 1	44.00	27.00	42.50	20.75	.....	b	.....	....	.....	....	.....	....	.....	....	d	....	b	.....	....	Lisps; large head. Very intelligent.
6	1	6 3	42.00	24.00	43.25	20.62	.....	b	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	....	
7	1	6 3	44.00	24.50	50.00	20.25	b	.....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	....	
8	1	6 3	43.75	24.00	40.00	19.00	.....	b	.....	....	.....	....	.....	....	.....	....	d	....	.....	.....	....	Low voice.
9	1	6 4	46.50	26.75	45.00	20.50	.....	b	.....	a	.....	....	b	....	.....	....	a	....	b	b	....	
10	1	6 4	47.00	26.25	54.00	20.12	.....	b	.....	a	.....	....	b	....	b	....	a	....	b	.....	b	
11	1	6 4	40.50	23.06	38.00	19.87	.....	b	.....	a	.....	....	.....	....	a	....	b	....	b	.....	....	
12	1	6 5	46.00	25.75	46.00	21.00	.....	b	.....	....	.....	....	.....	....	.....	....	.....	....	b	.....	....	
13	1	6 5	47.37	25.37	50.00	20.50	.....	b	.....	....	.....	....	b	a	.....	....	.....	....	b	.....	....	
14	1	6 5	46.00	25.50	51.50	20.75	.....	b	.....	....	b	....	.....	a	.....	d	.....	....	.....	.....	....	
15	1	6 5	48.50	27.50	56.75	20.62	.....	b	.....	....	b	....	.....	....	b	....	.....	....	b	.....	....	Very nervous. Entered school late in year.
16	1	6 5	46.00	25.00	46.00	21.00	.....	a	.....	....	.....	....	.....	b	.....	....	.....	....	b	.....	....	
17	7	6 5	46.50	25.25	48.50	20.25	.....	a	.....	b	b	....	b	....	.....	....	b	....	b	.....	....	
18	1	6 5	44.75	24.25	44.50	20.00	.....	b	.....	....	b	....	b	b	.....	....	b	....	b	.....	....	
19	1	6 6	44.25	24.50	46.00	20.25	.....	b	.....	....	.....	....	.....	....	.....	....	b	....	b	b	....	Nervous and excitable.
20	1	6 6	46.62	25.00	46.50	20.00	.....	b	.....	....	.....	....	b	b	.....	....	.....	....	b	.....	....	
21	1	6 6	46.00	25.00	57.50	19.62	.....	b	.....	....	.....	....	b	....	a	....	.....	....	.....	.....	....	
22	1	6 6	43.62	24.62	42.00	19.12	.....	b	.....	....	.....	....	.....	....	.....	....	b	....	b	.....	....	
23	1	6 6	42.50	23.50	43.50	20.50	.....	b	.....	....	a	....	b	....	b	d	b	....	b	.....	....	
24	1	6 6	46.25	25.75	54.00	20.50	.....	b	.....	b	a	....	.....	....	.....	....	a	....	b	b	....	
25	1	6 6	44.75	24.50	42.75	20.75	.....	a	.....	....	.....	....	.....	....	.....	....	a	....	b	.....	....	
26	1	6 6	43.50	24.50	41.50	21.50	.....	b	.....	....	a	....	.....	b	d	....	.....	....	.....	b	....	
27	1	6 6	43.50	24.50	36.75	20.75	.....	b	.....	....	.....	d	.....	....	d	....	b	a	b	b	....	
Total.....		170 11	1,215.36	676.55	1,255.50	546.09	1 b	22 b 4 a	1 b	2 b 3 a	4 b 3 a	1 d	11 b	4 b 2 a	4 b 2 a 2 d	4 d	8 b 6 a 2 d	1 a	20 b	5 b 2 a	3 b	
Average .		6 4	45.01	25.06	46.50	20.23	.....	.....	.....	....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	

In reporting the pupils as bright, dull, or average, the teachers were told to mark them average whenever in doubt. In this way there was less liability to error in regard to the bright and dull, which are the classes we desired most to compare. The teachers reported upon those pupils whom they knew best. The pupils were marked after the measurements were made.

We do not agree with those who may think that teachers are not capable of judging of their pupils. While some may make mistakes, it is wholly improbable that those who do will all make mistakes the same way. Some may estimate ability too high and some too low, so that most of such errors will balance each other. It is very improbable that 100 teachers in judging of a thousand pupils (say one teacher judges as to ten pupils) will all estimate them too high or too low. When the numbers are larger, as in this section, the improbability of errors sufficient to be of consequence is very great.

It may seem to some unnecessary to mention the following objections, but as they might be made, the author has endeavored to anticipate them. It may be objected that there is no standard of mental ability. This is a fact, but the objection is weak, for a large number of investigations would be necessary to make a standard, and of course some of these measurements must be made before there could be any standard. But the objector may mean that there are no accurate measurements or exact divisions of children into bright, dull, and average,[1] and that such terms are too indefinite for statistical purposes. It might be said that many valuable statistics are only approximately true. But admitting the objections for the sake of argument, and saying that judgments as to brightness, dullness, etc., are mere matters of opinion, it may be said that the results are statistics of opinions of teachers. Then the real question is, What is the probable truth of the opinions of the teachers? The opinions of 100 teachers on 1,000 pupils, as before mentioned, and of 500 teachers on 20,000 pupils must be held as approximately true when there is any general agreement as to any division of the pupils, for so many different teachers could not make errors all the same way.

The diagrams which follow are based upon the tables in section E, pages 1052–1094. In these diagrams the age is given in years, and for convenience the months are omitted; but by referring to the tables the reader will see that age 8, for instance, means from 7 years 7 months to 8 years 6 months; that is, the nearest age.

In the previous section (A) the number measured was not large enough for division according to age, so the average age was given. But in this section (B), the numbers being large enough to make an average of value, the nearest age is given.

It is certain that anatomical measurements, such as height, sitting-height, circumference of head, etc., are influenced much by age, especially from birth till adult life. But physiological measurements, such

[1] We mention "average" last, as it is the bright and dull we wish especially to compare.

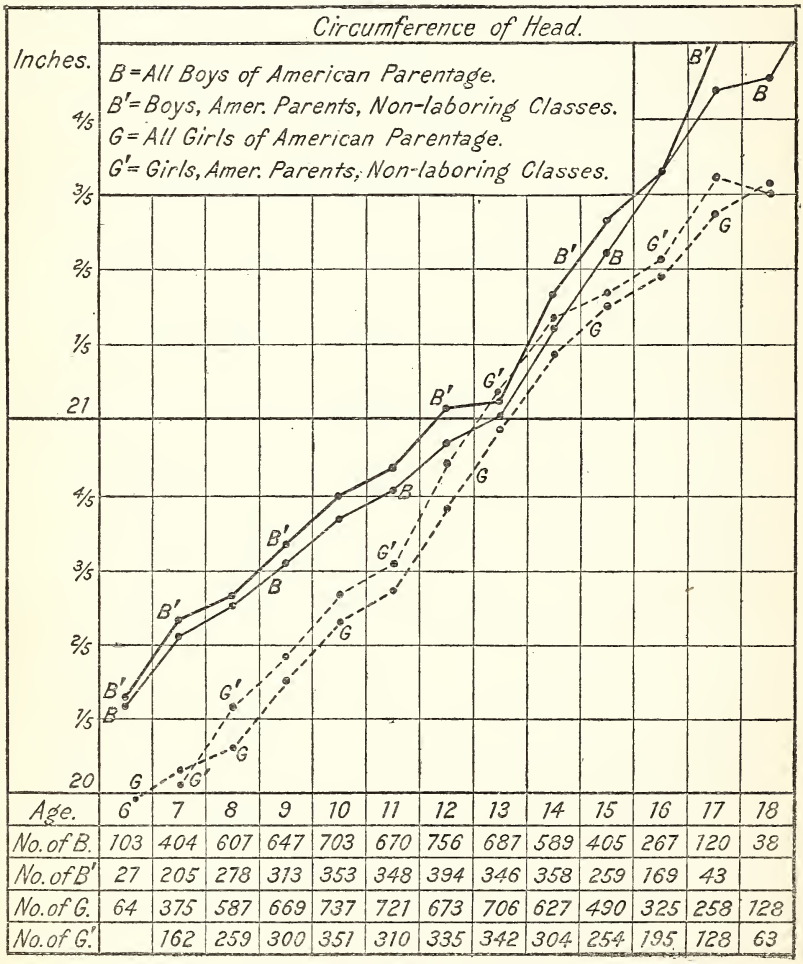
as tests of the senses (as in section A), do not seem to be influenced by age to any such degree as the anatomical.

We will now consider in detail the relations of the anthropometrical measurements to sex, sociological condition, race, and mental ability.

Circumference of head.—Circumference of head may be considered in relation to sex, sociological conditions, nativity, race, and mental ability.

Diagram I.

Diagram I of curves below is based upon the averages in Tables VIII, IX, XXXV, and XXXVI, section E.

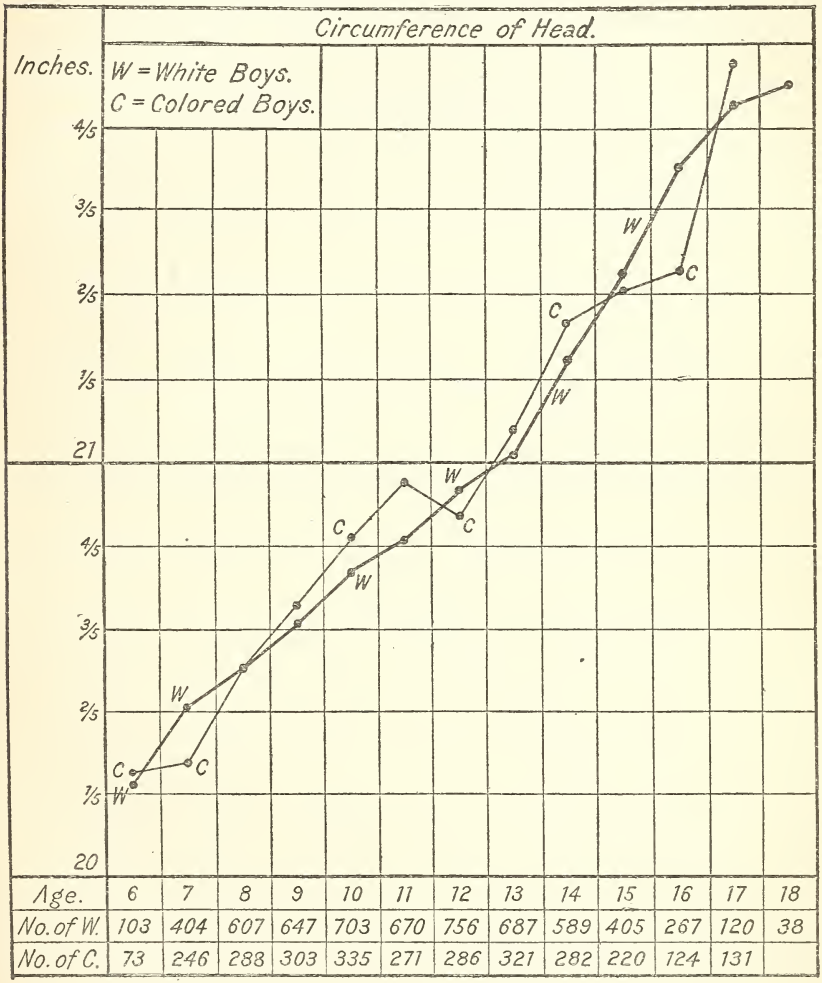


Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. of B.	103	404	607	647	703	670	756	687	589	405	267	120	38
No. of B'	27	205	278	313	353	348	394	346	358	259	169	43	
No. of G.	64	375	587	669	737	721	673	706	627	490	325	258	128
No. of G'.		162	259	300	351	310	335	342	304	254	195	128	63

Sex.—All the boys of American parentage have a larger average circumference of head than the girls of American parentage of the same age. The difference is greatest at the early ages, but the girls who gradually approach the boys, from 6 till 13, are nearest to them from 13 to 14, but at no age do they all equal the boys in circumference of head. This nearest approach of the girls in head circumference occurs at about the time when the girls always excel the boys most in height, weight, and sitting-height (Diagram VIII.)

If boys of the nonlaboring class (Table IX) are compared with girls of the nonlaboring class (Table XXXVI), eliminating sociological conditions, the boys still excel the girls, except at the age of 13 (Diagram I), when the girls have a little larger circumference of head. A somewhat similar relation exists when girls and boys of the laboring class (Tables X and XXXVII) are compared, except that the girls do not excel the boys at any age, but equal them at the age of 14.

DIAGRAM II (TABLES VIII AND LXI).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. of W.	103	404	607	647	703	670	756	687	589	405	267	120	38
No. of C.	73	246	288	303	335	271	286	321	282	220	124	131	

From Tables XII and XXXIX it will be seen that boys of foreign parents have larger circumference of head at all ages than the girls of like parentage, except at 14, when the girls excel the boys. When the boys are of mixed nationality[1] (Table XIII) they excel the girls (Table XL) of mixed nationality at all ages except at 6.[2] Thus, whatever divisions are made, the boys are found to have larger circumference of head than the girls.

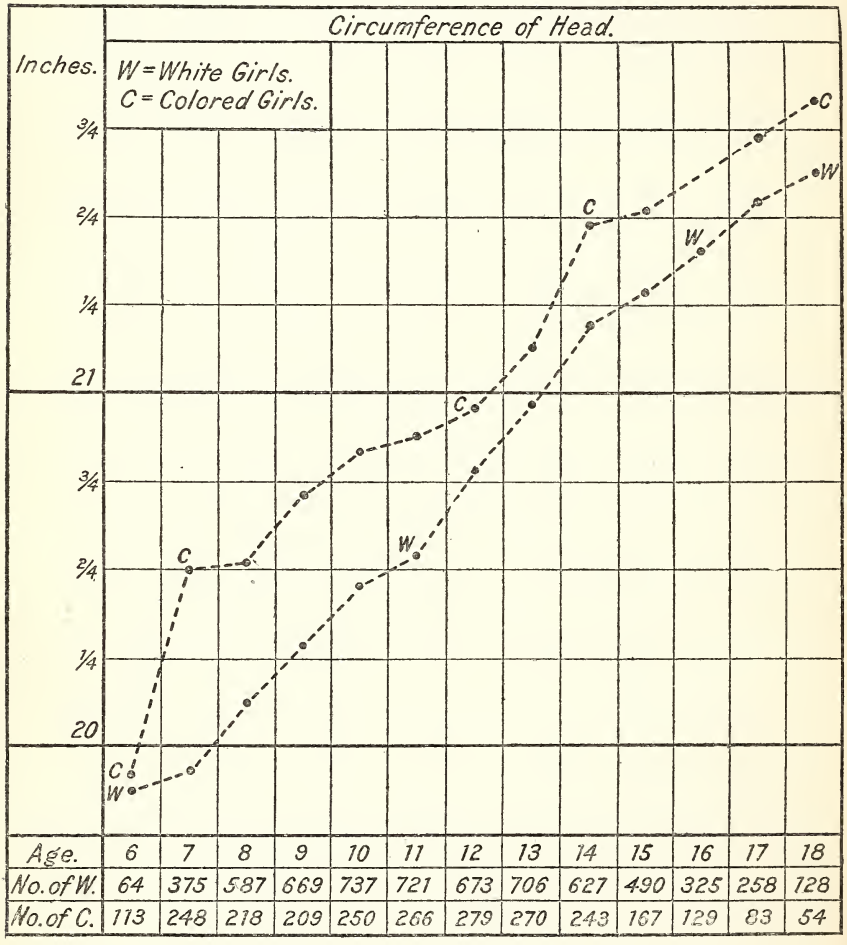
[1] Mixed nationality is synonymous with American and foreign parentage.

[2] In most of the tables the extreme early or late ages are averages based upon comparatively small numbers.

Sociological conditions.—If we compare all the boys of American parentage with those among them who belong to the nonlaboring class, this latter class have larger circumference of head at all ages except at 16, when they are equal (Diagram I). The boys of the laboring class have smaller circumference of head than all the boys in general and the nonlaboring class in particular. This is shown by examining Tables VII, IX, and X.

The same general statements are true in the case of the girls of the laboring and nonlaboring classes (Tables XXXIV, XXXVI, and XXXVII), but the difference is less variable than with the boys and is greater at the age of puberty.

DIAGRAM III (TABLES XXXV AND LXV).



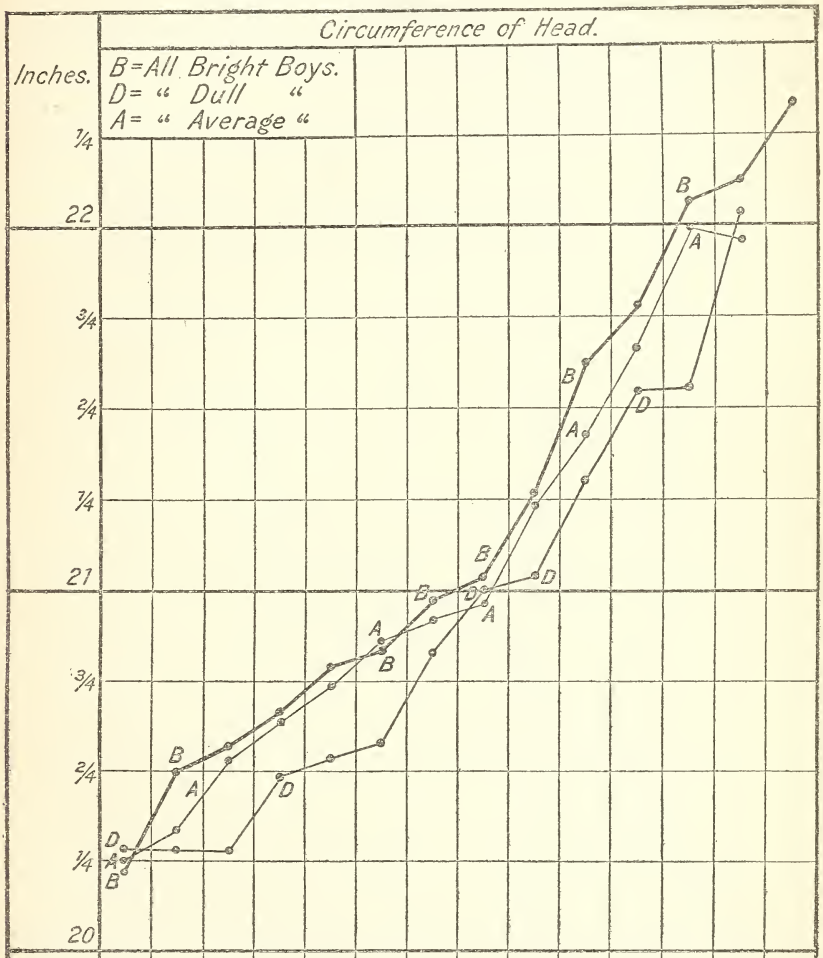
Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. of W.	64	375	587	669	737	721	673	706	627	490	325	258	128
No. of C.	113	248	218	209	250	266	279	270	243	167	129	83	54

Nationality.—In general, both boys and girls of foreign parentage (Tables XII and XXXIX) when compared with boys and girls of American parentage (Tables VIII and XXXV) show a slightly larger circumference of head; but a mixture of nationalities seems unfavorable to growth in circumference of heads, for both boys and girls of mixed nationalities (Tables XIII and XL, pp. 1056, 1071) have, at most ages, smaller circumference of head than boys and girls of American parentage.

Colored children.—In colored children the circumference of head (Table LXI) in the boys is superior to that of the girls (Table LXV) at ages 6 and 11, but inferior at other ages; that is, in general the girls excel the boys in head circumference.

White boys and colored boys.—Comparing the curves in Diagram II it will be seen that the white boys of American parentage have a larger head circumference than the colored boys from ages 6 to 8; again at about 12, and from 15 to 17; at other ages the colored boys excel. As the numbers compared are large this can hardly be accidental, yet we know of no reason for this alternate increase and decrease

DIAGRAM IV (TABLES XIV, XV, AND XVI).



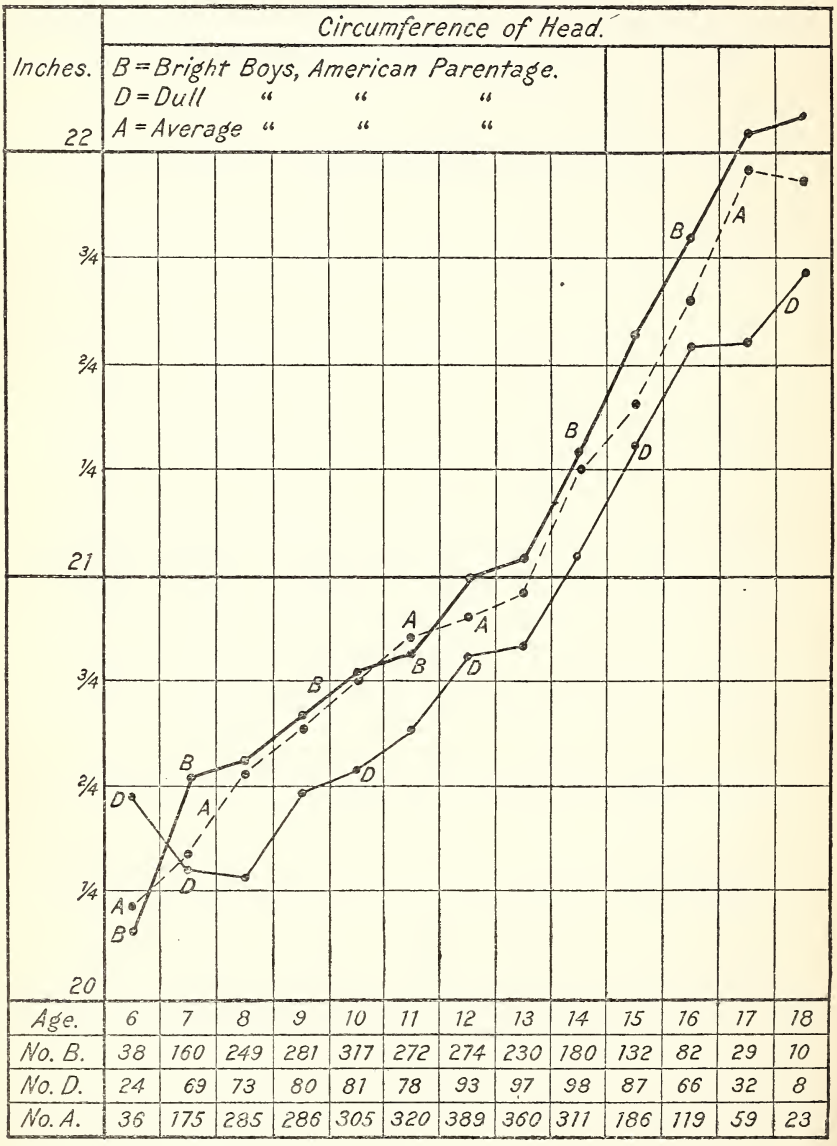
Age.	6	7	8	9	10	11	12	13	14	15	16	17	18	19
No. of B.	53	205	320	384	392	322	349	305	227	167	104	35	14	16
No. of D.	39	99	101	102	118	97	128	131	143	116	80	32	4	7
No. of A.	45	199	326	340	355	386	459	421	371	220	144	70	24	9

between the boys of two races, for in the case of the girls (Diagram III) there is no such alternation.

White girls and colored girls.—Comparing white girls of American parentage and colored girls as to circumference of head, the colored girls show quite a marked increase from about 6 to 10 and from 14 to 15. It may be noted here that these periods of marked increase correspond to the periods of increase of colored boys over

white boys in Diagram II; that is, from about 7 to 11 and 13 to 15. The colored girls excel the white girls in circumference of head at all ages. Comparing colored girls with all white girls (Tables XXXIV and LXV, Section E), the colored girls have a larger circumference of head at all ages except at 6.

DIAGRAM V (TABLES XVII, XVIII, AND XIX).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. B.	38	160	249	281	317	272	274	230	180	132	82	29	10
No. D.	24	69	73	80	81	78	93	97	98	87	66	32	8
No. A.	36	175	285	286	305	320	389	360	311	186	119	59	23

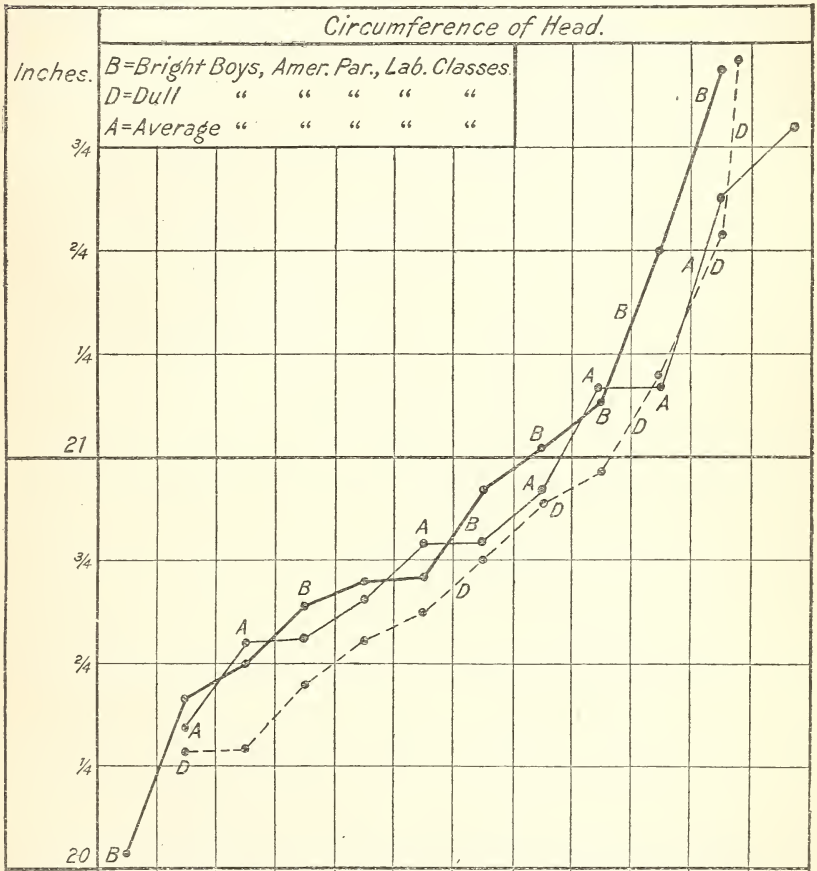
Mental ability.—Diagram IV, below, gives the curves of head circumference in relation to mental ability. There is almost a complete correspondence; that is, as ability increases the circumference of head increases. Thus the bright boys have the largest circumference of head at all ages except at 11. The average boys are next, except where they excel the bright boys at 11 and fall below the dull boys at 13.

The dull boys have the smallest circumference of head at all ages except 6, 13, and 15. It will be noted that the average boys are much nearer to the bright than to the dull in circumference of head.

If now we eliminate whatever influence nationality may have, and compare in Diagram V the boys of American parentage only, it still holds true in general that circumference of head increases with ability.

The relation of the curves is changed very little.

DIAGRAM VI (TABLES XXIII, XXIV, AND XXV).



Age.	6	7	8	9	10	11	12	13	14	15	16	17
No. B.	11	58	112	119	141	100	112	88	57	39	21	
No. D.		45	50	54	48	44	49	58	44	40	32	
No. A.		96	167	161	161	178	201	195	130	67	45	

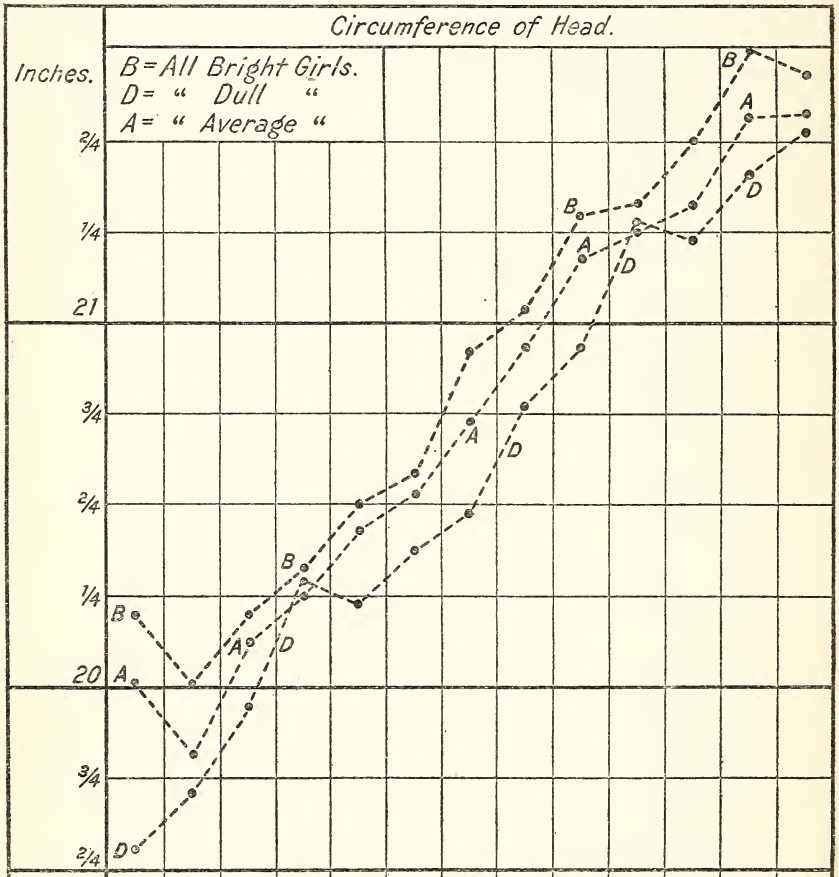
If we proceed still further and eliminate as far as possible sociological condition by dividing the boys of American parentage into laboring and nonlaboring classes (Diagram VI), the general principle still holds, except there is more variation in the curves, due probably to a lessening of the numbers by subdivision.

Girls.—From Tables XLI, XLII, and XLIII, Diagram VII (below) is made, showing the correspondence between all bright, dull, and average girls in head-circumference to be even more complete than in the case of the boys.

If, for instance, we eliminate nationality and sociological condition, comparing bright and dull girls of American parentage and laboring classes (Tables XLIX and L), the bright excel at all ages in head-circumference.

Colored children.—From Tables LXII and LXIII the bright colored boys show a larger circumference of head than the dull colored boys at all ages except 12 and from 16 on. The bright colored girls have larger circumference of head than the dull colored girls up to age of 12, after which it is variable (Tables LXVI and LXVII).

DIAGRAM VII (TABLES XLI, XLII, AND XLIII).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. of B.	37	236	364	403	404	388	328	338	285	204	142	45	45
No. of D.	40	41	68	62	62	86	82	113	101	112	55	60	25
No. of A.	49	231	322	418	473	457	465	515	447	339	253	165	109

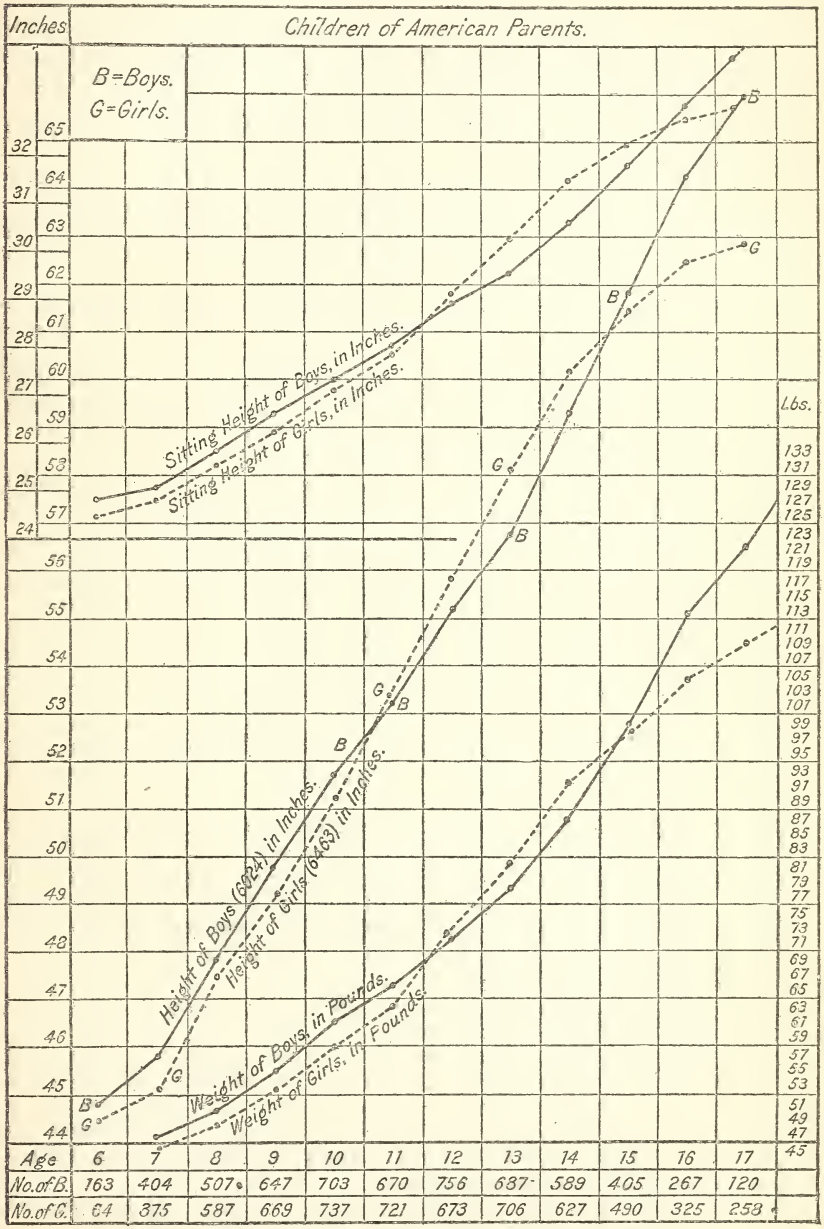
Height, sitting height, and weight.—We give below Diagram VIII (Tables VIII and XXXV), showing curves of height, sitting height, and weight of boys and girls of American parents.

Sex: The striking fact, already discovered by others, is confirmed that for a certain period of time before and after puberty girls are taller and heavier than boys, but at no other time.

This pubertal period (Diagram VIII) for height of Washington schoolgirls extends from about the age of 11, increases gradually until about 14, then decreases gradually and ends at 15.

For weight the period begins about eight months later than the height period, increasing gradually, then decreases gradually, ending about the same time as the height period (age 15).

DIAGRAM VIII (TABLES VIII AND XXXV).



NOTE.—The first column of figures (24, 25, etc.) is for sitting height.

For sitting height the pubertal period begins about eight months later than in the height period (age 11), and ends about eight months later; that is, girls continue growing in sitting height, or length of trunk, longer than in length of limbs

Sociological condition.—Comparing girls of the nonlaboring classes, American parents (Table XXXVI), with those of the laboring classes (Table XXXVII), the pubertal period of superiority of girls in height begins about three months later and ends about a year sooner than in the laboring classes. In sitting height this period begins at about 11 in both social classes, but ends about a year later in girls of the laboring classes. In weight the period begins about six months later and ends about a year later in the laboring classes than in the nonlaboring classes. That is, the period of superiority of girls in height, sitting height, and weight is about a year longer in the laboring classes than in the nonlaboring classes.

The effect of sociological condition upon height and sitting height is easily seen from Tables IX and X, Section E.

In all boys of American parents, those belonging to the nonlaboring classes have at all ages a greater height and sitting height than those of the laboring classes.

The girls of the nonlaboring class (Table XXXVI) have greater height and sitting height than those of the laboring class (Table XXXVII) at all ages except at 18; but the number measured at this age is comparatively small.

In weight the boys of the nonlaboring class (Table IX) are heavier at all ages except 7 than boys of the laboring class (Table X). This difference increases after the age of 13.

Girls of the nonlaboring class, American parents, are heavier than girls of the laboring class, American parents, from about the age of 8 till the age of 15, after which the girls of the laboring class are the heavier, but boys of the laboring class have less weight after 15 than boys of the nonlaboring class.

Nativity.—Boys of American parents (Table VIII) excel boys of foreign parentage (Table XII) in height except at ages 8, 10, and 13, and in sitting height except at ages 7 and 9, but are inferior to them in weight except at ages 6, 14, 15, and 16.

Boys of American parents (Table VIII) are inferior to boys of mixed nationalities (Table XIII) in height except at ages 9 and 14, and in sitting height except at ages 6, 9, 12, 13, and 15, but are superior in weight except from ages 6 to 9 and 15 to 17.

Girls of American parentage (Table XXXV) are superior to girls of foreign parents (Table XXXIX) in height except at ages 7, 14, 15, 16, and 17, but are inferior in sitting height except at ages 6, 8, 10, 13, and 16, and also in weight except at ages 6, 8, 10, 13, and 16.

Girls of American parents are inferior to girls of mixed nationalities (Table XL) in height except at age 6 and from ages 12 to 17, and in sitting height except at ages 6 and 8 and from ages 12 to 15, and at 16; but in weight they are superior except at ages 8 to 13 and at 17.

In general, the influence of nativity is not very marked, but only in certain particulars, as noted above. Thus, American boys excel foreign boys in height considerably, in sitting height less, but are inferior in weight. American girls, when compared with foreign-born girls, are superior in height, but inferior in sitting height and weight.

Boys of mixed nationalities excel American boys considerably in height, less in sitting height, but are inferior in weight—just the reverse of boys of foreign parents when compared with American boys.

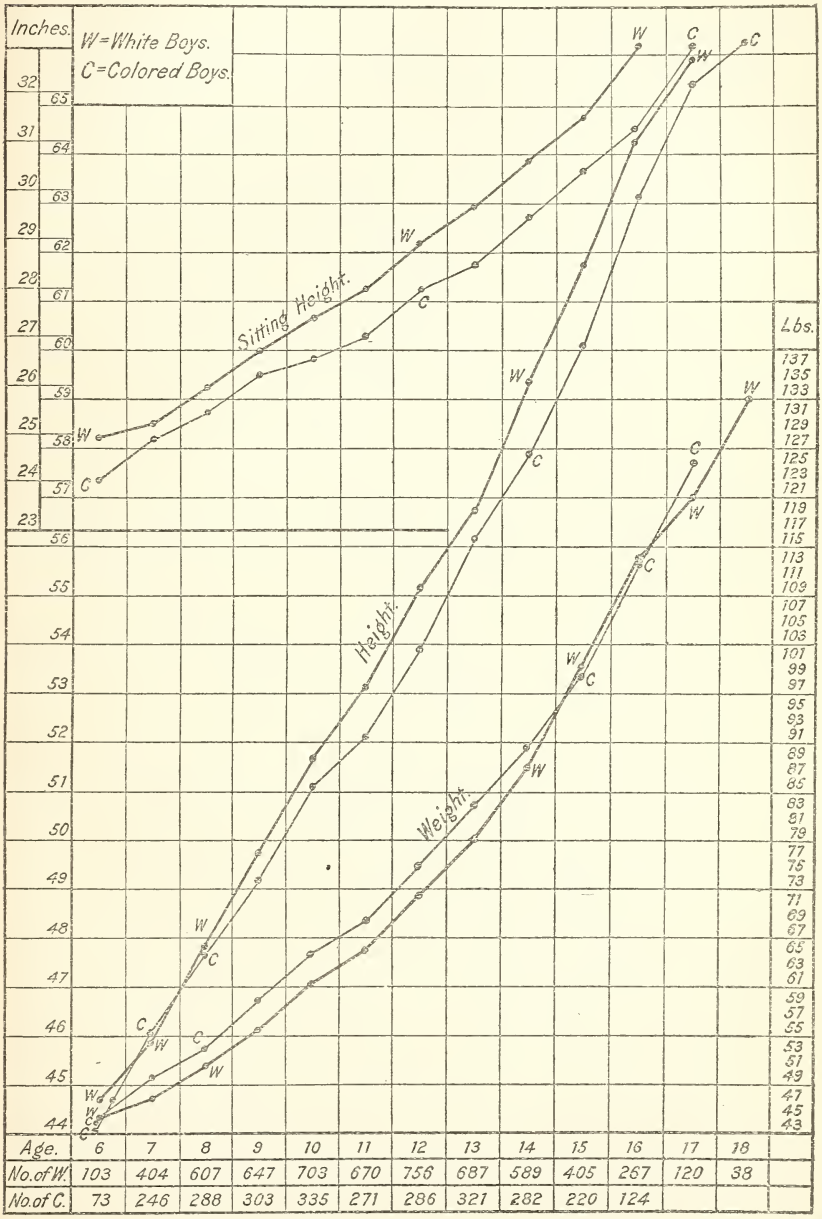
Girls of mixed nationalities are slightly superior to American girls in height and sitting height, but slightly inferior in weight.

Colored children.—The colored boys are taller than the colored girls (Tables LXI and LXV) at ages 6, 9, 10, 15 and on. At other ages the girls are taller. In sitting height the boys are taller until 10 and at 12. In weight colored boys are heavier, except from 11 to 16, when the difference between boys and girls is somewhat similar to that in white children, except that this pubertal period begins about a year later and ends a year later than in white children.

White boys and colored boys compared.—From Tables VIII and LXI is drawn Diagram IX, giving height, sitting height, and weight of white and colored boys.

The white boys are taller than the colored boys. In sitting height the difference is very striking, and it would seem to indicate that white boys have comparatively a greater length of trunk than length of legs as compared with colored boys.

DIAGRAM IX (TABLES VIII AND LXI).

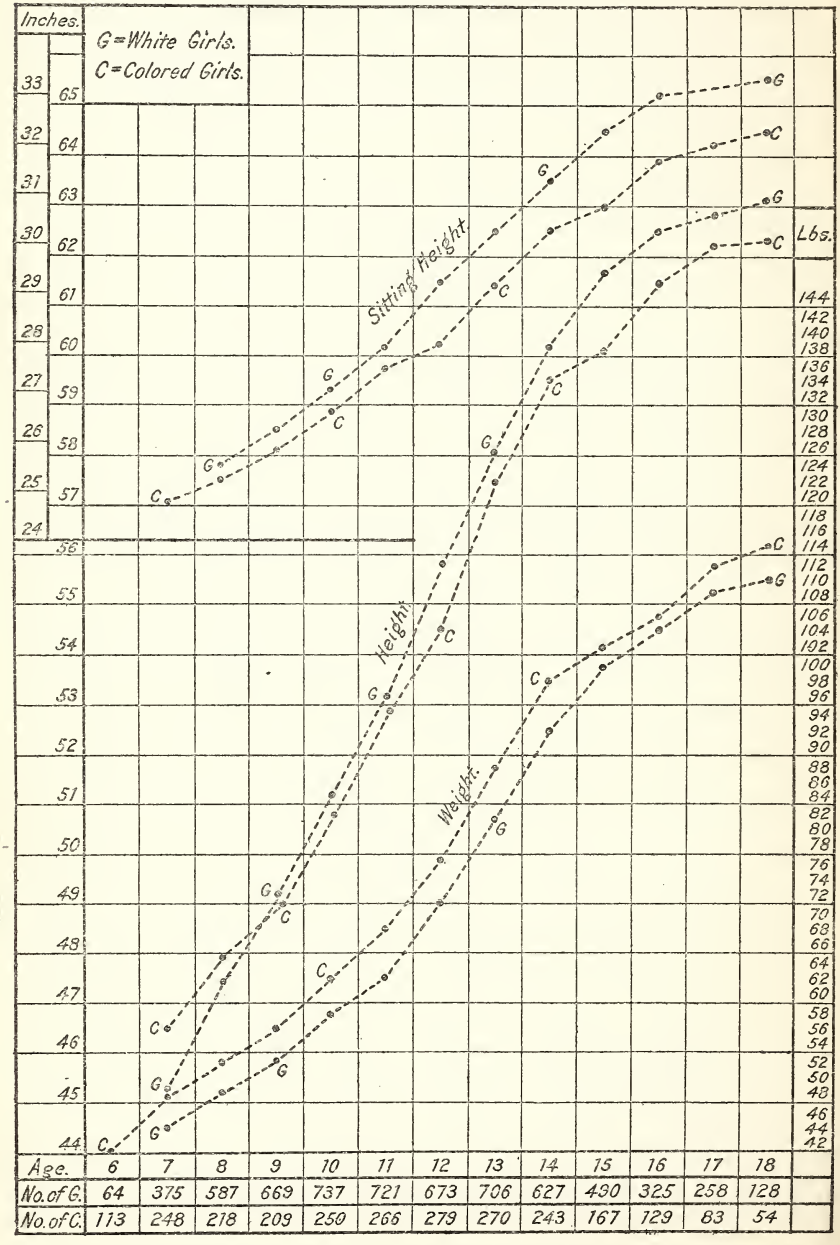


Age.	6	7	8	9	10	11	12	13	14	15	16	17	18	
No. of W.	103	404	607	647	703	670	756	687	589	405	267	120	38	
No. of C.	73	246	288	303	335	271	286	321	282	220	124			

The colored boys are heavier from age 6 to 15. From 15 to 16 the white boys are heavier.

White girls and colored girls.—Comparing Diagram X below with Diagram IX, giving the curves of white and colored boys, there is a general correspondence to those for white and colored girls. There is the same striking difference between

DIAGRAM X (TABLES XXXV AND LXV).

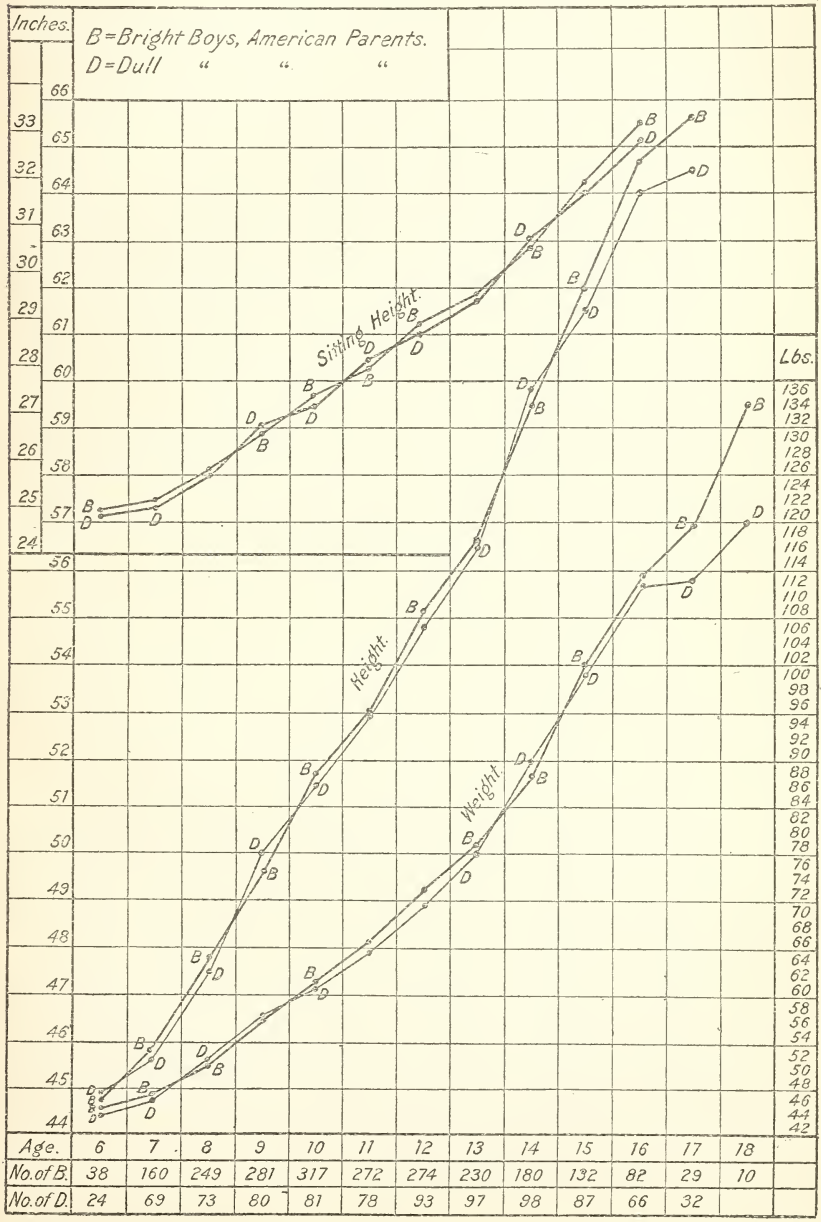


the sitting heights, showing in general that white children have much longer bodies than colored children, and are also taller, but the colored children are heavier.

MENTAL ABILITY.

We have seen that mental ability as reported by the teachers increases as the circumference of the head increases. But the relation of mental ability to height, sitting height, and weight is not so definite or so marked, yet in general the bright boys

DIAGRAM XI (TABLES XVII AND XVIII).



excel the dull boys in these dimensions. Thus, if we compare in Diagram XI the curves for the bright boys of American parentage with those for dull boys of like

parentage we find the bright boys excel in height at ages 7, 8, 10, 11, 12, 15, 16, 17; in sitting height at all ages except 9, 11, and 14; in weight at all ages except 8, 9, and 14.

SCHEDULE 1.—*All bright and dull American boys compared.*

Ages.	6	7	8	9	10	11	12	13	14	15	16	17	Balance.
Height	−	+	+	−	+	+	+	−	−	+	+	+	4+
Sitting height	+	+	+	−	+	−	+	+	−	+	+	+	6+
Weight	+	+	−	−	+	+	+	+	−	+	+	+	4+
Circumference of head	−	+	+	+	+	+	+	+	+	+	+	+	10+

The above schedule (1) illustrates this comparison, the plus sign meaning that the bright boys excel, the minus sign that the dull boys excel. In the last or balance line the bright boys have 4 points in their favor in height, 6 in sitting height, 4 in weight, and 10 in circumference of head; but this does not take into account the amount of excess of one over the other. It might therefore happen that although the bright boys excelled in points they would not if the amounts of excess were added and balanced. But an inspection of Diagram XI will show that this is not the case, for where the dull boys excel the distance between the curves is not so great as where the bright boys excel.

If we compare all bright boys with all dull boys, disregarding whatever influence sociological condition or foreign blood may have, we find from schedule 2, which is based upon Tables XIV and XV, that the bright boys excel in height at all ages except 13; in sitting height at all ages except 9, 11, 13, and 14, and in weight at all ages except 8, 12, 13, and 14; that is, in general the bright boys excel the dull boys in height, sitting height, weight, and circumference of head.

SCHEDULE 2.—*All bright boys compared with all dull boys.*

Ages.	6	7	8	9	10	11	12	13	14	15	16	17	Balance.
Height	+	+	+	+	+	+	+	−	+	+	+	+	10+
Sitting height	+	+	+	−	+	=	+	=	−	+	+	+	6+
Weight	+	+	−	+	+	+	−	−	−	+	+	+	4+
Circumference of head	−	+	+	+	+	+	−	+	−	+	+	+	6+

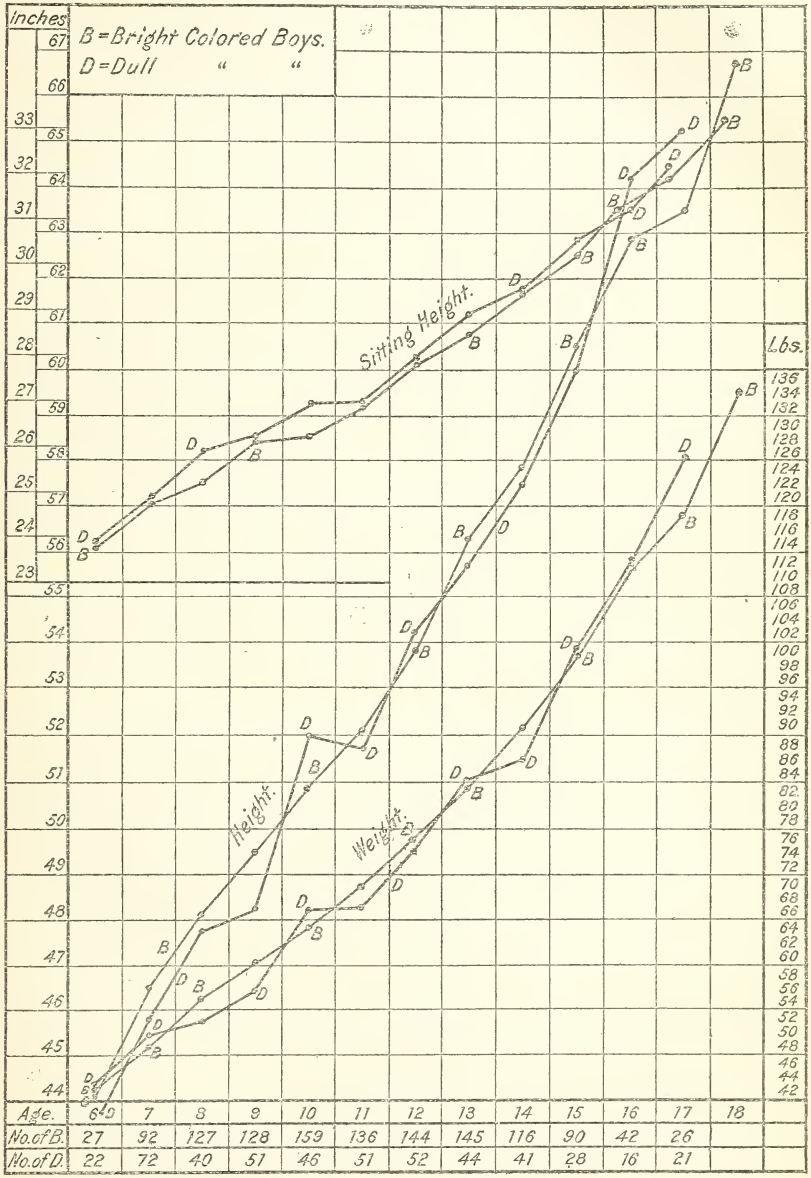
There is an exception to the general conclusion that increase in mental ability is accompanied with increase in height, sitting height, and weight. It is in the case of the bright and dull boys of the nonlaboring classes of American parentage. Here, as will be seen from Tables XX and XXI, the bright boys are in general inferior to the dull boys in height, sitting height, and weight. This may be due to special sociological conditions.

Colored children.—A comparison in diagram XII between bright and dull colored boys shows that in general the bright slightly excel in height, but what is most striking are inferior in sitting height at all ages except 16, and since the height includes the sitting height, and differences in sitting height between the divisions of pupils are generally smaller than in height, the inference in case of colored children (for the bright girls are inferior in sitting height) is that dullness and large sitting height are concomitants, if not closer related.

The dull colored boys also excel the bright in weight at 6, 7, 10, 13, and 15 on, and therefore excel them in general in weight.

The bright colored girls are superior to the dull colored girls in height, weight, and head circumference, but inferior in sitting height.

DIAGRAM XII (TABLES LXII AND LXIII.)



SECTION C.

CHILDREN WITH ABNORMALITIES.

The word abnormality is not used in any rigid sense, and refers here to children reported by the teachers as peculiar or defective. It is evident that had specialists examined the children for defects, the percentages would have been higher, but our purpose is to give only those defects or peculiarities observed by the teachers.

Table LXIX, section E, needs no extended explanation; it gives in general abnormalities or defects in relation to sex, mental ability, nationality, sociologic condition, and race.

SICKLINESS.

Running down the column for the sickly, we note that dull colored girls show the highest per cent (12.78) of sickliness.

Average boys of American and foreign parents, and boys of nonlaboring classes, show more than 7 per cent of sickliness.

The two lowest per cents of sickliness are with the boys and girls of foreign parentage (2.13 and 2.60.) Low per cents—that is, lower than 4 per cent—are shown in the case of bright boys, girls of American and foreign parents, and boys of laboring classes. The boys of nonlaboring classes almost double (7.37) in per cent of sickliness (3.72) the boys of the laboring classes.

NERVOUSNESS.

Taking the column of figures under "nervous," Table LXIX, the high per cents, or those above one and twenty-hundredths per cent, say, are shown by the dull boys (1.24), average boys (1.42), boys of American parents (1.28), boys of American and foreign parents (1.79), and boys of nonlaboring classes (2.03). The lowest per cents, say fifty-hundredths or less, are shown by the dull girls (0.33), girls and boys of foreign parents (0.19, 0.19), girls of American and foreign parents (0.29), bright and dull colored girls (0.23, 0.45), and average colored boys (0.26). The data are meager as to abnormalities in colored children, but their low per cent of nervousness is noticeable.

DEFECTS IN EYESIGHT, HEARING, AND SPEECH.

Eyesight.—The highest per cents of eye defects, say above 1.50 (Table LXIX), occur in average boys (1.63), girls of American parents (1.52), boys of American and foreign parents (1.57), girls of nonlaboring classes (1.73), and boys of nonlaboring classes (1.97).

Some of the lowest per cents, say 0.70 and less, are shown by girls and boys of foreign parents (0.38, 0.58), girls of American and foreign parents (0.59), and by all colored children reported.

Hearing.—High per cents of defective hearing, say above 1 per cent, occur in dull boys and boys of American and foreign parents. It may be that the apparent dullness of some children is due to defective hearing rather than mental defect.

The lowest per cents occur in bright girls (0.15), bright boys (0.45), girls and boys of foreign parents, girls of nonlaboring classes, and bright colored girls.

Speech.—A low per cent of defective speech occurs in all girls (0.28), while in all boys it is 1.11.

CONVULSIONS.

Convulsions are comparatively frequent in dull boys (0.16) and boys of nonlaboring classes (0.13), and very rare in girls (0.01).

LAZINESS.

While most all children, boys especially, are lazy at times, there are nevertheless a number of children who seem to be chronically lazy. The highest per cent of laziness is shown by the dull boys (2.97). Comparing all boys and girls (0.22), the boys are much more lazy (1.33).

While of course there is no standard for laziness, yet there are certain children whose excessive laziness is apparent to every teacher. The same is true in regard to unruly children.

UNRULY CHILDREN.

As we might expect, the boys (5.47) are very much more unruly than the girls (0.25). The highest per cent of unruliness is shown by the dull boys (9.80); that is, almost 10 per cent of the dull boys are unruly. The dull colored girls show the highest per cent of unruliness in colored children (4.75).

Comparing the laboring and nonlaboring classes, the girls of the nonlaboring class are less unruly, while the reverse is true in the case of the boys.

Comparing children of American and foreign parentage, the girls of American parentage are less unruly than those of foreign parentage. The difference in the case of the boys is small.

ABNORMALITIES IN RELATION TO AGE.

In Tables LXXI and LXXII are given the per cents of different abnormalities according to the nearest age.

Taking the time of second dentition or shedding of the teeth, which begins about the age of 6 or 7, and also the time of puberty, which occurs at about 12 years in girls and 14 years in boys, it will be interesting to see what relation these critical times in child development bear to the abnormalities as reported by the teachers.

In Tables LXXI and LXXII, which give percentages for age of boys and girls, it will be seen that there is, in general, an increase of abnormalities at dentition time and at the age of puberty.

If we examine Table LXXI for boys, we see that sickliness increases as we approach puberty; nervousness is high at dentition time and just before and at puberty; laziness is large at puberty (2.17), as is unruliness (8.16). Table LXXII, which gives the percentages for girls, shows a somewhat similar condition.

Table LXX gives a general survey of mental ability for both children in general and abnormal children in relation to sex, nationality, sociological position, etc. The first part of the table deals wholly with normal children or children in general. This touches upon some points already treated as to mental ability, but in an independent way.

MENTAL ABILITY AND SEX.

Beginning at the top of the table (LXX) and following downward, we note a few points. All boys and girls show about the same percentage of brightness, but in dullness the boys have a much higher percentage.

Abnormal boys show 10 per cent less brightness than abnormal girls, but they gain, as they show 1 per cent less of dullness. But if we take the percentages on the whole number of boys and girls the abnormal boys excel by about 4 per cent in brightness but by 13 per cent in dullness, so that the girls are some 9 per cent or points ahead.

Taking the percentages on the whole number, unruly children show a much higher per cent of dullness. Sickly boys and girls do not differ materially in mental ability, but in children otherwise defective than sickly and unruly, as nervous, lazy, etc., the boys are much behind the girls in mental ability.

Boys of American parentage are 6 per cent brighter than boys of foreign parentage and 1 per cent less dull. The girls of American parentage are still more superior to the girls of foreign parentage. Boys of laboring classes show about 10 per cent less brightness and 4 per cent more dullness than boys of nonlaboring classes; the girls of the laboring classes are still farther behind the girls of nonlaboring classes. In short, advantageous sociological conditions seem closely connected with mental brightness.

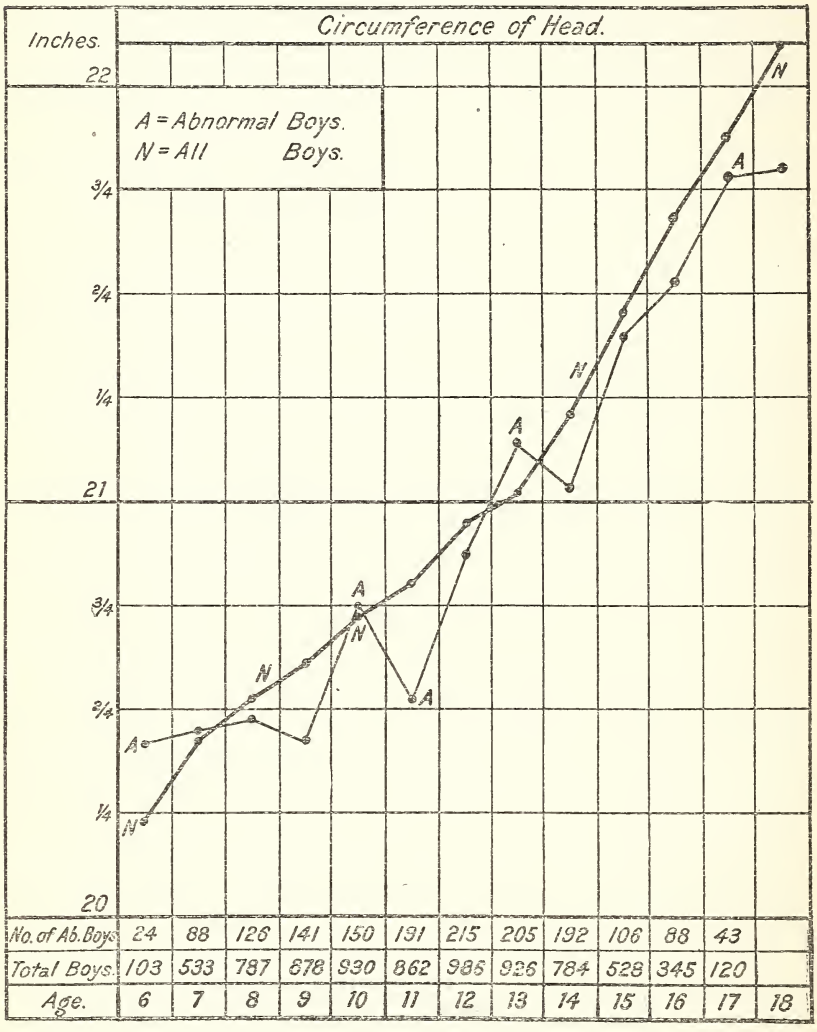
The colored boys show 25 per cent less brightness and 10 per cent less dullness than colored girls. They are therefore only 15 per cent behind, comparatively.

Abnormal colored girls show more dullness (15 per cent) than abnormal colored boys.

ANTHROPOMETRICAL MEASUREMENTS.

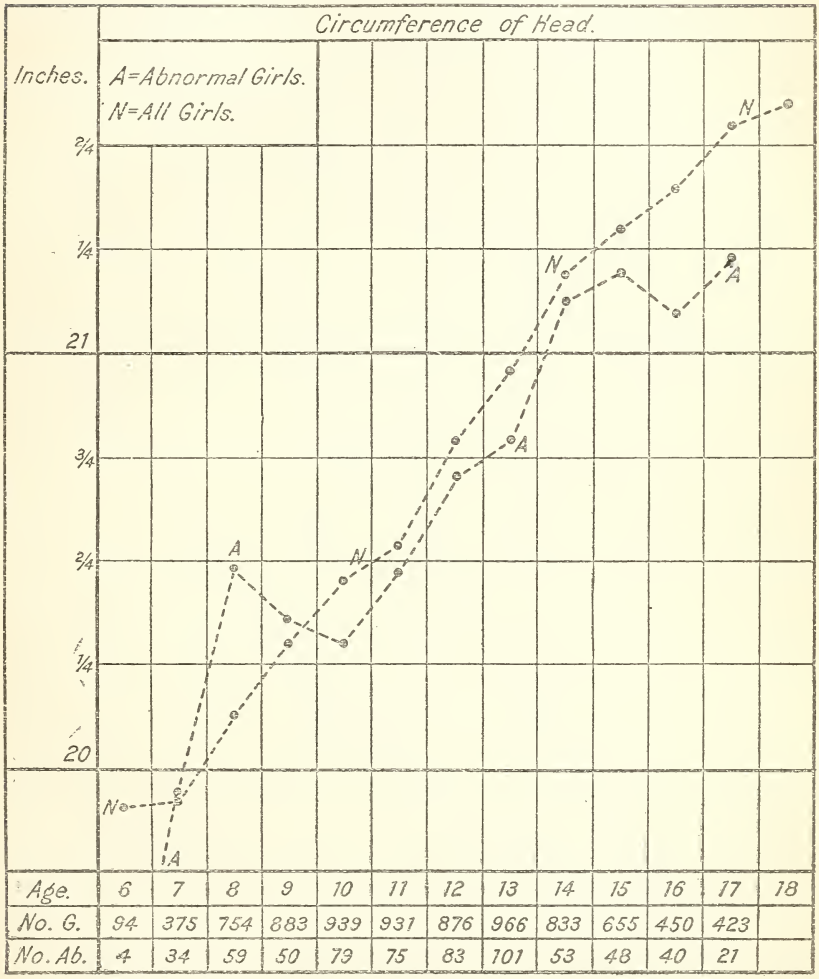
Diagram XIII, based upon Tables VII and LXXIII, indicates that boys in general have a larger head circumference than boys with abnormalities or defects. The same truth applies to the girls, as shown in Diagram XIV, taken from Tables XXXIV

DIAGRAM XIII (TABLES VII AND LXXIII).



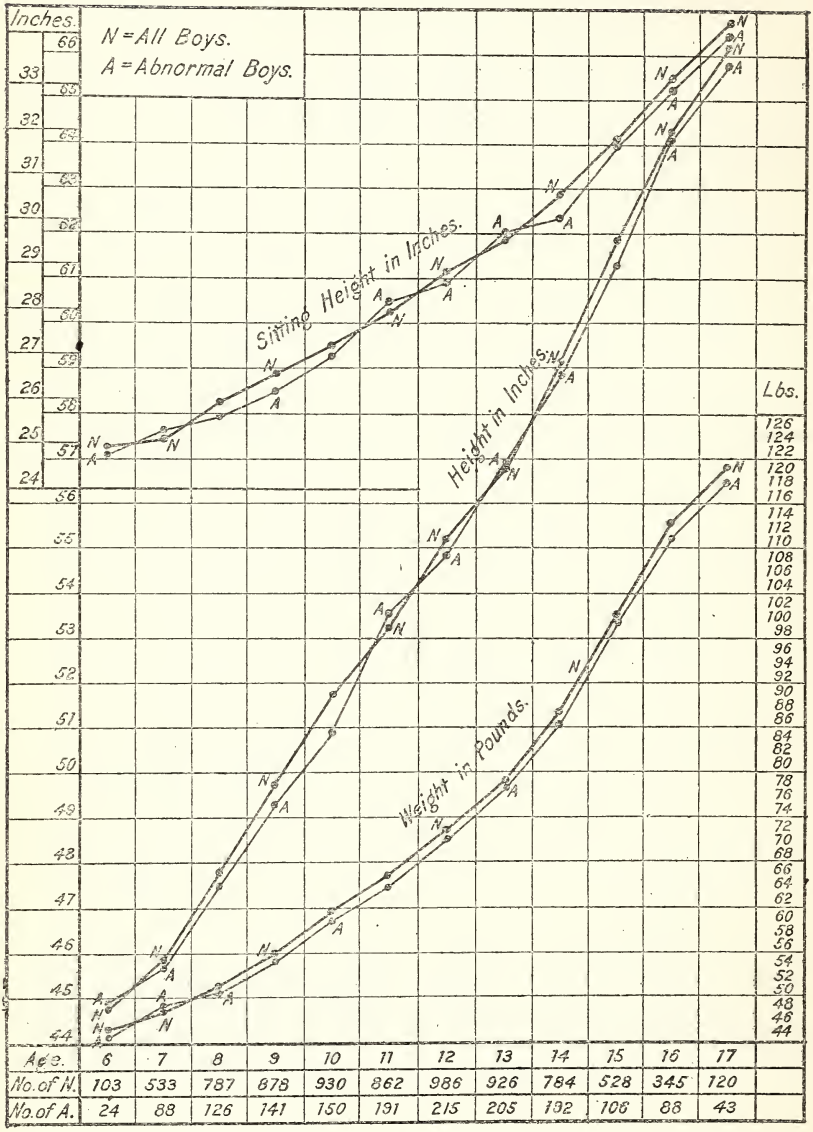
and LXXIV. Although the number of boys with abnormalities is over twice as large as that of girls with abnormalities, yet the curve for the boys is more variable. We have already seen that the boys also vary more in mental ability.

DIAGRAM XIV (TABLES XXXIV AND LXXIV).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18
No. G.	94	375	754	883	939	931	876	966	833	655	450	423	
No. Ab.	4	34	59	50	79	75	83	101	53	48	40	21	

DIAGRAM XV (TABLES VII AND LXXIII).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	
No. of N.	103	533	787	878	930	862	986	926	784	528	345	120	
No. of A.	24	88	126	141	150	191	215	205	192	106	88	43	

Diagram XV, based upon Tables VII and LXXIII, shows the boys with abnormalities to be inferior to normal boys, or boys in general, in height, sitting height, and weight. The inferiority is more constant in weight.

DIAGRAM XVI (TABLES XXXIV AND LXXIV).

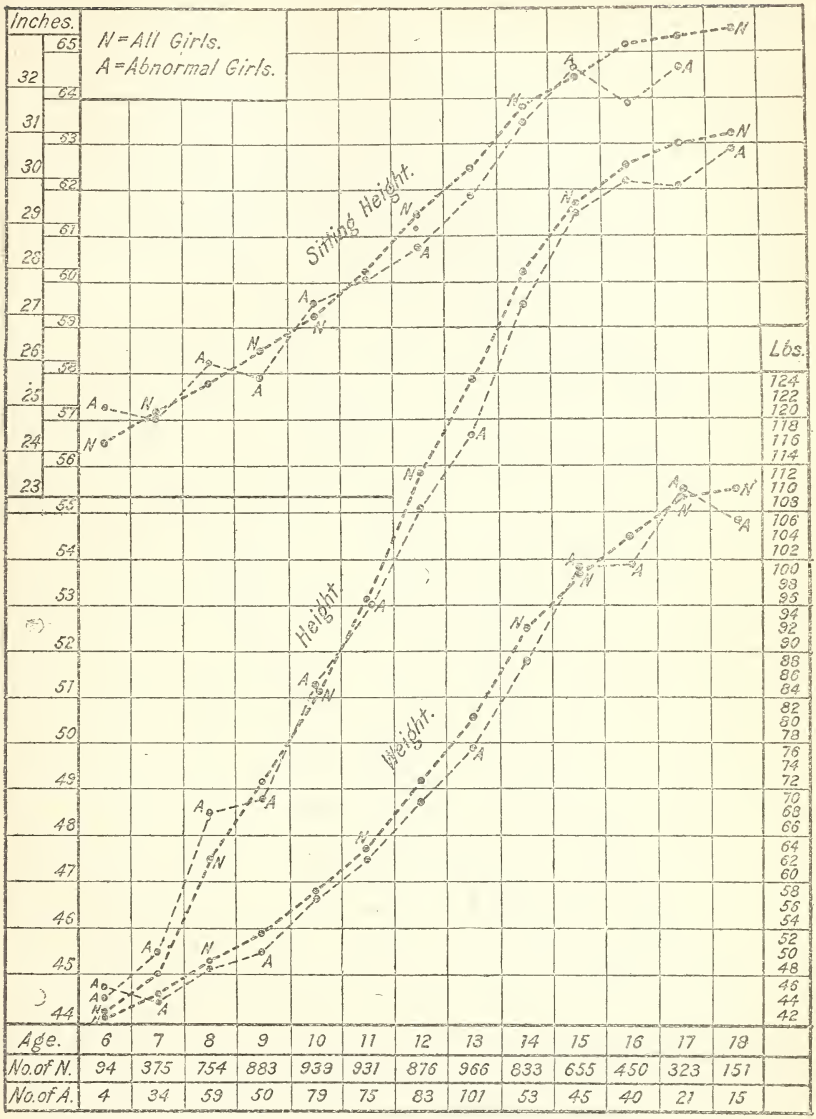
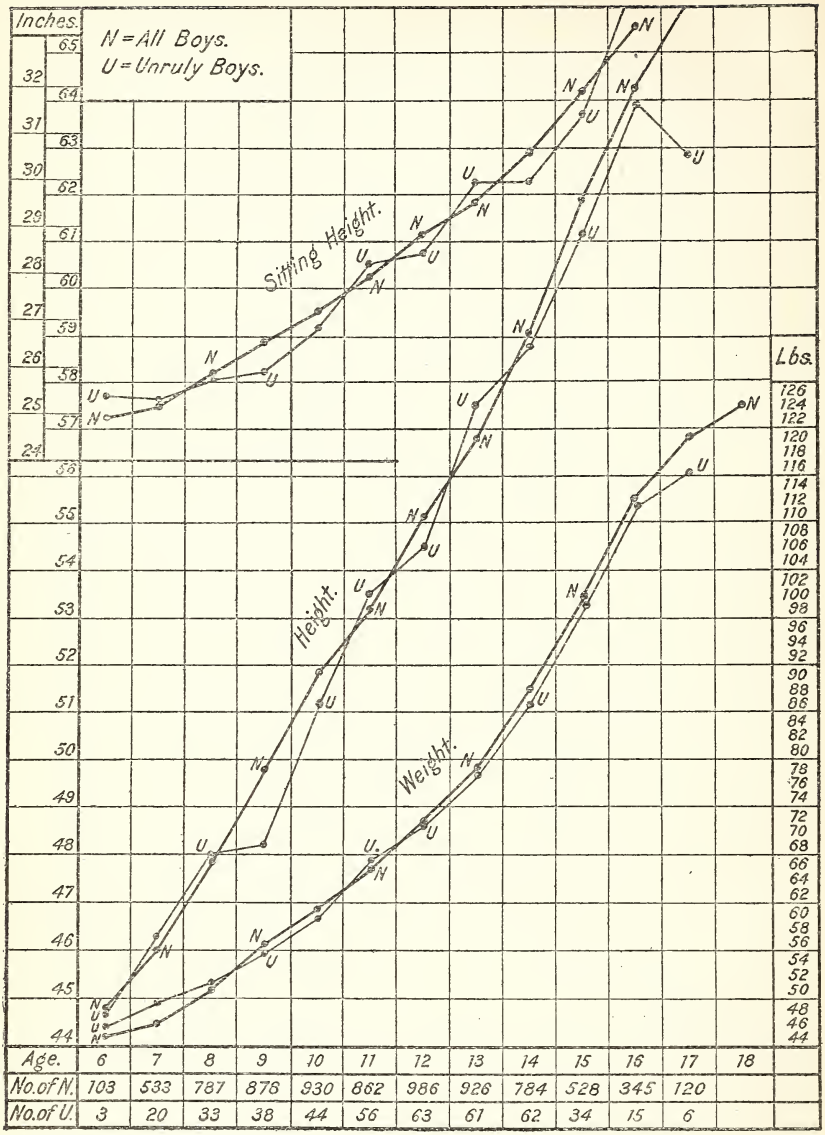


Diagram XVI, based upon Tables XXXIV and LXXIV, shows the girls with abnormalities to have less height, sitting height, and weight than girls in general, as is true in the case of boys, only the differences are more marked in the case of the girls.

UNRULY CHILDREN.

Comparing the unruly boys, Tables VII and LXXV, with boys in general, the unruly boys are inferior in head circumference.

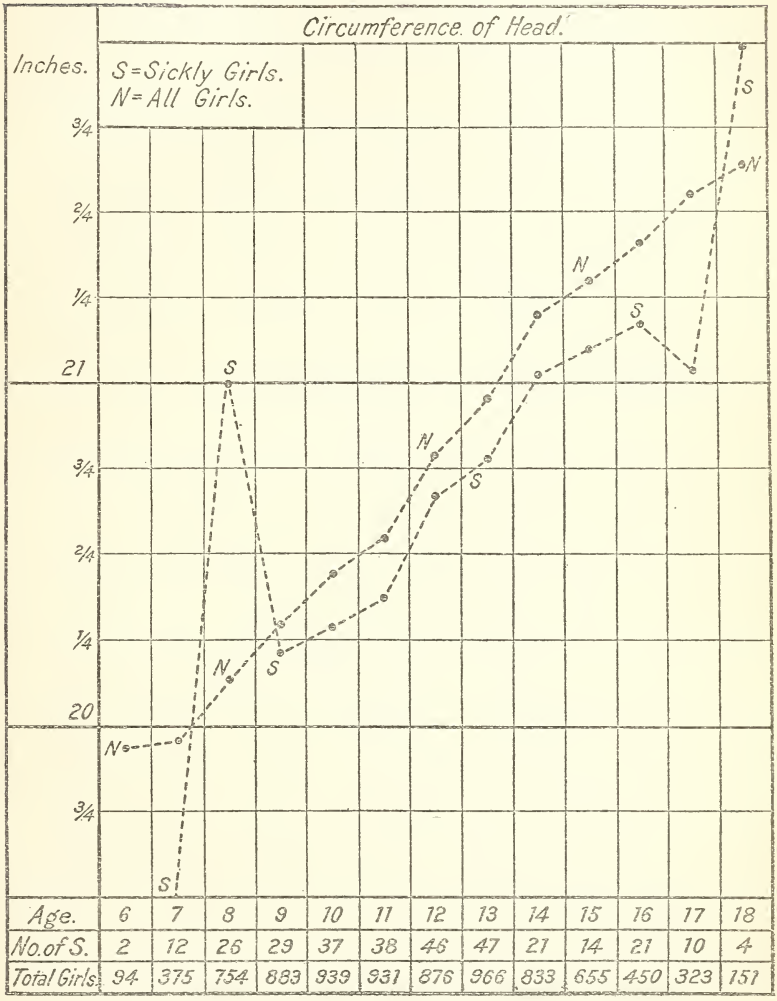
DIAGRAM XVII (TABLES VII AND LXXV).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18	
No. of N.	103	533	787	878	930	862	986	926	784	528	345	120		
No. of U.	3	20	33	38	44	56	63	61	62	34	15	6		

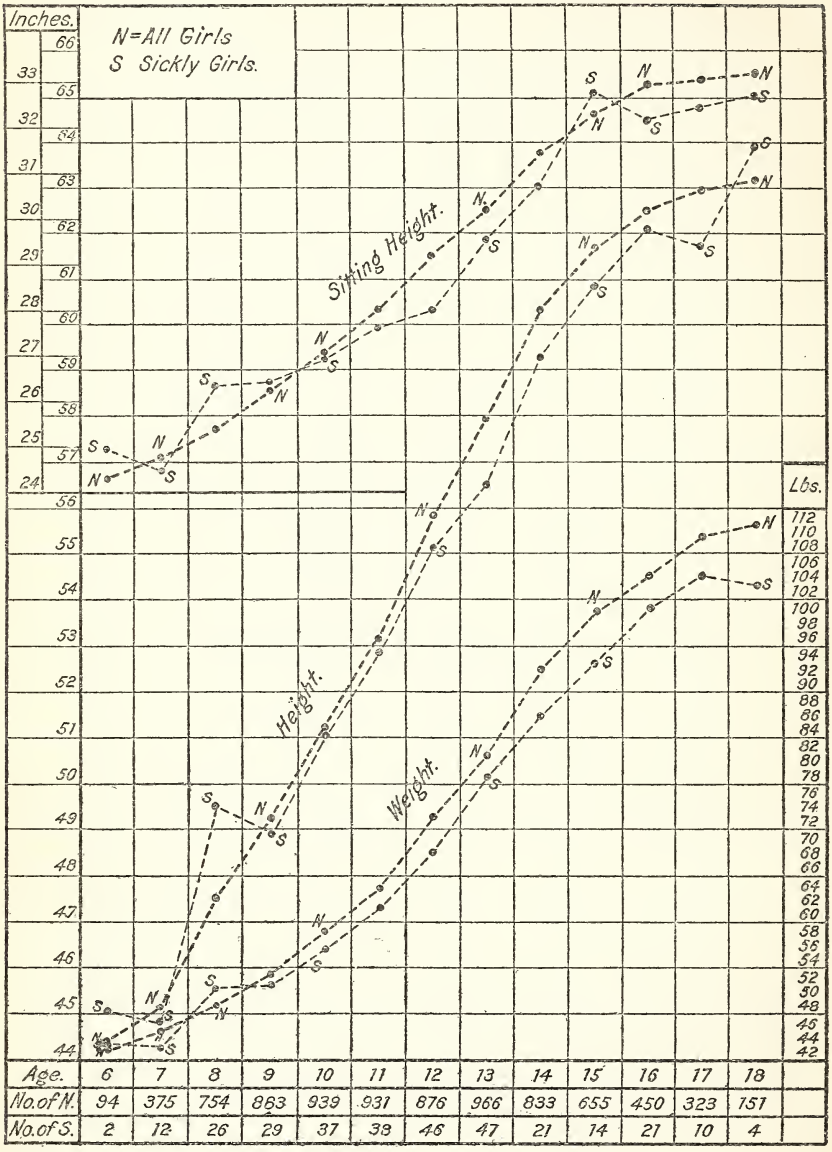
If we compare unruly boys with all boys, Diagram XVII, Tables VII and LXXV, we find the unruly boys to have less height, sitting height, and weight. There is considerable variation in the curves until age 14 in the height, and age 13 in the weight. Normal boys excel at later ages.

DIAGRAM XVIII (TABLES XXXIV AND LXXVI).



The sickly girls, Diagram XVIII (Tables XXXIV and LXXVI), have a smaller head circumference than girls in general, except from ages 7 to 9. The sickly boys being inferior in head circumference to the unruly boys (Diagram XXI), have still less circumference of head than boys in general.

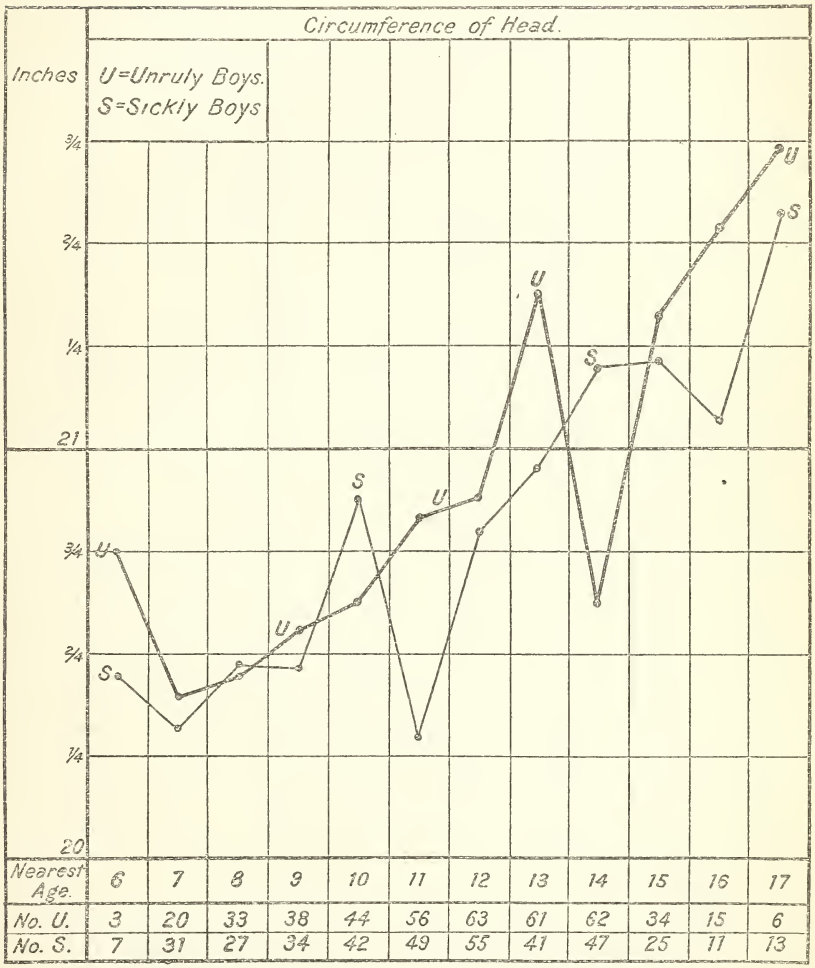
DIAGRAM XIX (TABLES XXXIV AND LXXVI).



From Diagram XIX (Tables XXXIV and LXXVI), sickly girls are seen to be still more inferior to normal girls in height, sitting height, and weight than are all abnormal girls. The difference in weight is the most marked.

DIAGRAM XX (TABLE LXXV).

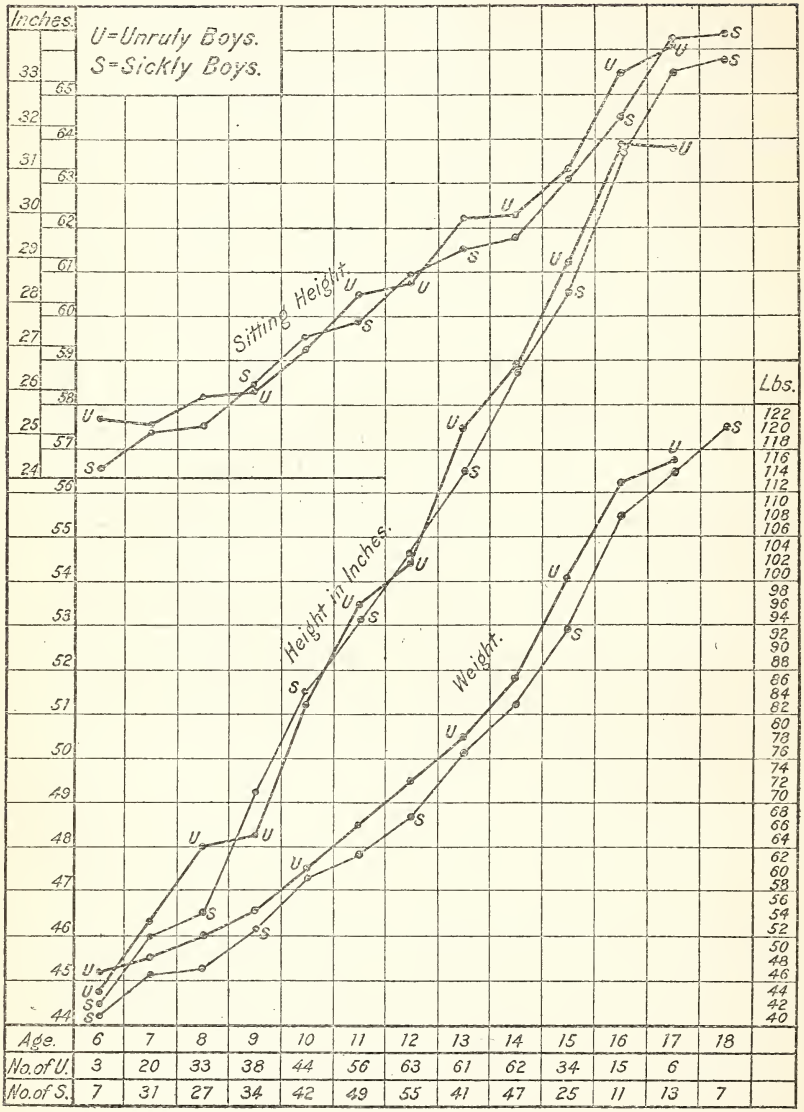
DIAGRAM XX (TABLES VII AND LXXV.)



Nearest Age.	6	7	8	9	10	11	12	13	14	15	16	17
No. U.	3	20	33	38	44	56	63	61	62	34	15	6
No. S.	7	31	27	34	42	49	55	41	47	25	11	13

Diagram XX (Table LXXV) shows that the unruly boys have in general a larger head circumference than the sickly boys. The unruly girls are so few in number (23) that their measurements could not be utilized.

DIAGRAM XXI (TABLE LXXV).



Age.	6	7	8	9	10	11	12	13	14	15	16	17	18	
No. of U.	3	20	33	38	44	56	63	61	62	34	15	6		
No. of S.	7	31	27	34	42	49	55	41	47	25	11	13	7	

Comparing unruly and sickly boys in Diagram XXI (Table LXXV), we find the unruly boys to excel in height, sitting height, and weight. The increase in weight is the most constant.

ABNORMAL COLORED CHILDREN.

Boys.—Comparing abnormal colored boys (Table LXXVII) with colored boys in general (Table LXI), we find the abnormal boys excel in circumference of head and sitting height, while the normal boys excel in height and weight.

Girls.—The abnormal colored girls (Table LXXVIII) are about equal in height to the normal, but are inferior to them in circumference of head, sitting height, and weight.

SECTION D.

COMPARATIVE ABILITY IN DIFFERENT STUDIES, IN CONNECTION WITH SEX, NATIONALITY, SOCIOLOGICAL CONDITION, AND RACE.

It is often said that school tests of ability are little guarantee of the superiority of a pupil in subsequent life. One reason for this belief is that too much is expected of school tests. A particularly bright pupil who does not succeed in after life is, by force of contrast, remembered longer than those bright ones who are expected to succeed and do.

SCHOOL CRITERION OF ABILITY.

We think it will be found that the majority of those who do well in school do well in after life; for quickness of insight combined with faithfulness and regularity in work are the main characteristics which contribute to success in school. These are also the characteristics which make life a success. It must be remembered that now and then there is a brilliant pupil who is only prematurely so; such brightness may have a pathological cause, and is not a favorable sign. Such pupils, who mature early, may after a certain age be no more than average or even below average. Then there are certain original or peculiar characters with great talents in one direction who will surely succeed in life, but who can not adapt themselves very well to the conditions of school, and hence have a poor school standing. But the success of exceptional personalities is usually in spite of early disadvantages. Early success unfortunately often causes one to feel less the need of educational advantages. The schools are not intended for the genius, but are planned for the great majority, who are the foundation of society.

METHOD OF INQUIRY.

The teachers were asked not only to mark each pupil bright, dull, or average, in general, but to specify the studies in which such pupil was bright, dull, or average. In this way a more complete judgment of the pupil's ability was obtained. Thus, some children generally bright are nevertheless dull or average in certain studies.

The difficulties of estimating intellectual ability in a quantitative way are well known, yet when there is an agreement in the reports of, say, more than ten teachers as to twenty or more pupils, there is a strong probability as to the general truth of the teachers' judgment. In questions where there is difference of opinion, the agreement of ten or

more teachers is more trustworthy than the opinion of any single individual who is liable to have some cherished theory. For it must be noted that pupils in the same category in the tables may come from any one of four different high schools, or from all; or from any one of fifty different grammar schools, or from all; that a large number of different teachers were engaged in marking the pupils, so that any agreement as to any category in the tables (say girls of the laboring classes, bright in language) would be wholly unknown in advance.

It may be objected, again, that there is no standard of ability in studies. There is not, nor is it probable that there ever will be, any absolute standard of ability. But this does not in the least hinder us from saying, for instance, and saying truthfully, that one pupil is bright and another dull in arithmetic.

TABLE I.—*Totals and percentages of ability in the main branches of study. a*

	Mental divisions.	9 *b*		10		11		15		16		21		22		24		25		26		28		34		35		36	
		All studies.		Algebra.		Arithmetic.		Drawing.		Geography.		History.		Language and English.		Manual labor—sewing.		Mathematics. *c*		Music.		Penmanship.		Reading.		Science—botany.		Spelling.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Boys of American parentage.	Bright..	232	51	38	36	2,170	44	498	34	387	35	396	44	1,332	38	661	29	155	50	237	24	449	28	1,079	43	166	44	398	33
	Dull....	64	14	20	19	912	18	327	22	143	13	134	15	675	19	475	21	48	16	286	29	424	27	509	21	44	12	297	24
	Average	161	35	48	45	1,862	38	624	44	572	52	370	41	1,493	43	1,113	50	103	34	475	47	722	45	900	36	167	44	526	43
Girls of American parentage.	Bright..	281	45	90	49	1,820	37	576	35	453	36	491	41	1,705	46	860	40	141	34	416	40	658	40	1,287	54	197	45	630	48
	Dull....	54	9	21	11	931	19	268	17	150	12	181	15	392	10	198	9	84	20	101	10	223	13	265	11	63	15	181	14
	Average	288	46	73	40	2,186	44	789	48	641	52	519	44	1,618	44	1,117	51	188	46	515	50	767	47	846	35	175	40	488	38
Boys of American parentage (nonlaboring classes).	Bright..	144	53	31	37	1,170	46	341	39	278	42	295	51	805	42	371	31	116	56	156	25	254	30	595	48	114	48	252	35
	Dull....	33	12	15	18	477	19	192	22	69	10	60	10	316	17	235	19	23	11	187	29	227	27	204	17	22	9	106	23
	Average	96	35	38	45	904	35	347	39	321	48	226	39	787	41	660	50	69	33	294	46	370	43	427	35	100	43	295	42
Girls of American parentage (nonlaboring classes).	Bright..	.....	....	61	50	966	42	358	41	288	46	344	50	1,002	53	488	45	97	36	265	45	359	45	684	64	128	50	372	58
	Dull....	.....	....	12	10	278	12	109	13	26	4	54	8	89	5	52	5	50	18	47	8	89	11	47	4	36	14	55	8
	Average	.....	....	48	40	1,037	46	402	46	311	50	287	42	791	42	545	50	123	46	275	47	358	44	338	32	90	36	219	34
Boys of American parentage (laboring classes).	Bright..	88	48	7	32	1,000	42	157	27	109	25	101	32	527	33	290	28	39	40	81	23	195	26	484	38	52	37	146	29
	Dull....	31	17	5	23	435	18	135	23	74	17	74	23	359	23	240	23	25	25	99	27	197	27	305	24	22	16	131	26
	Average	65	35	10	45	958	40	287	50	251	58	144	45	706	44	513	49	34	35	181	50	352	47	473	38	67	47	231	45
Girls of American parentage (laboring classes).	Bright..	116	40	29	46	854	32	218	28	165	27	147	29	703	38	372	34	44	31	151	34	299	35	603	45	69	38	258	40
	Dull....	54	19	9	14	653	25	159	21	124	20	127	25	303	17	146	13	34	24	54	12	134	16	218	17	27	15	126	19
	Average	119	41	25	40	1,149	43	387	51	330	53	232	46	827	45	572	53	65	45	240	54	409	49	508	38	85	47	269	41
Boys of foreign and mixed nationalities. *d*	Bright..	63	51	12	50	684	41	141	31	102	30	98	35	392	32	221	27	45	43	74	25	123	26	316	40	51	37	121	31
	Dull....	18	14	1	4	311	19	111	24	51	15	58	21	260	22	183	23	16	15	71	25	128	28	162	21	20	15	109	27
	Average	44	35	11	46	665	40	202	45	189	55	123	44	561	46	400	50	44	42	144	50	216	46	306	39	65	48	165	42
Girls of foreign and mixed nationalities.	Bright..	91	52	20	27	563	34	182	33	120	30	138	30	476	38	263	36	47	34	148	42	228	44	373	46	69	38	192	41
	Dull....	19	11	22	30	402	24	98	17	69	18	95	21	217	18	79	11	35	25	34	10	69	13	119	15	28	16	76	16
	Average	64	37	31	43	685	42	278	50	204	52	222	49	548	44	379	53	58	41	166	48	221	43	375	39	84	46	197	43
Colored boys	Bright..	358	46	30	61	1,033	54	153	47	212	45	141	51	448	42	.....	....	28	44	85	36	346	45	795	49	7	25	348	41
	Dull....	176	23	4	8	386	20	55	17	62	13	30	11	180	17	.....	....	20	31	45	19	135	17	361	22	12	43	189	23
	Average	236	31	15	31	501	26	119	36	201	42	104	38	429	41	.....	....	16	25	106	45	299	38	478	29	9	32	300	36
Colored girls	Bright..	429	69	37	65	948	60	73	40	250	62	159	64	568	63	.....	....	.....	....	82	49	367	54	928	17	17	31	416	59
	Dull....	174	28	11	19	459	29	46	25	100	25	56	22	201	22	.....	....	.....	....	23	14	134	19	294	21	6	11	164	23
	Average	22	3	9	16	173	11	65	35	52	13	35	14	140	15	.....	....	.....	....	62	37	184	27	157	62	32	58	128	18

a A great majority of the reports as to studies came from the grammar schools, but where there was a sufficient number reported from the high schools they were used.

b The numbers omitted here refer to studies on which the returns were not full enough to admit of use.

c Some of the teachers reported for "arithmetic" under the head of "mathematics." It was thought best not to combine these reports, for any agreement between them would tend to confirm the general correctness of the reports under each.

d The foreign and mixed nationalities were combined, as the number reported from each nationality singly was not large enough for comparison.

Under column 9, Table I, we have put all pupils reported bright, dull, or average in all studies; that is, those who are exceedingly bright or exceedingly dull, etc. Comparing boys and girls of American parentage, we find, from column 9, 51 per cent of the boys and 45 per cent of the girls bright in all studies, but only 9 per cent of the girls dull in all studies against 14 per cent of the boys; that is, there are 6 per cent more of the boys bright and 5 per cent more dull than in the case of the girls. Since an approximate valuation of ability is all that could be expected, the difference of 1 per cent in favor of the boys is too small to be considered. Where the difference is not more than 5 per cent in comparing dullness and brightness in each study, we have disregarded it, calling the classes compared approximately equal. In this way we have worked out Table II, which is based upon the percentages in Table I. Thus the minus sign in column 10, line 1, means that in algebra the boys of American parentage are more than 5 per cent inferior to the girls of American parentage. So the plus sign in column 11, line 1, Table II, signifies that the boys of American parentage are more than 5 per cent superior in arithmetic to the girls of American parentage. Reading line 1 in full, we find that boys of American parents are of about equal ability in "all studies," geography, history, and science, to girls of American parents, inferior to them in algebra, drawing, language, manual labor, music, penmanship, reading, and spelling, and superior to them in arithmetic and mathematics.

TABLE II.—*Comparative ability in different branches of study, according to sex, nationality, sociological condition, and race.*

Divisions according to sex, nationality, sociological condition, and race.	Number of line.	9 All studies.	10 Algebra.	11 Arithmetic.	15 Drawing.	16 Geography.	21 History.	22 Language and English.	24 Manual labor and sewing.
Boys, American parents, compared with girls, American parents	1	=	−	+	−	=	=	−	−
Boys, American parents, nonlaboring class, compared with girls, American parents, nonlaboring class	2	....	−	=	−	−	=	−	−
Boys, American parents, laboring class, compared with girls, American parents, laboring class	3	+	−	+	=	=	+	−	−
Boys of foreign and mixed nationalities compared with girls of foreign and mixed nationalities	4	=	+	+	−	=	=	−	−
Boys, American parents, nonlaboring class, compared with boys, American parents, laboring class	5	=	+	=	+	+	+	+	+
Boys of foreign and mixed nationalities compared with boys, American parentage	6	=	+	=	=	−	−	−	=
Girls, American parents, nonlaboring class, compared with girls, American parents, laboring class	7	....	+	+	+	+	+	+	+
Girls of foreign and mixed nationalities, compared with girls, American parentage	8	=	−	−	=	−	−	−	−
Colored boys compared with colored girls	9	−	+	=	+	=	=	−	....
Boys, American parents, compared with girls, American parents, as to average ability	10	−	+	−	−	=	−	−	−
Boys, American parents, nonlaboring class, compared with boys, American parents, laboring class	11	=	=	−	−	−	−	−	+
Girls, American parents, nonlaboring class, compared with girls, American parents, laboring class	12	....	=	+	−	−	−	−	−
Boys of foreign and mixed nationalities compared with boys, American parentage	13	=	+	+	+	+	+	+	=
Girls of foreign and mixed nationalities compared with girls, American parentage	14	−	+	−	+	=	+	=	+

TABLE II.—*Comparative ability in different branches of study, according to sex, etc.*—Cont'd.

Divisions according to sex, nationality, sociological condition, and race.	Number of line.	25 Mathematics.	26 Music.	28 Penmanship.	34 Reading.	35 Science and botany.	36 Spelling.	37 Total. Minus signs.	Total. Plus signs.	Total. Signs of equality.
Boys, American parents, compared with girls, American parents	1	+	—	—	—	=	—	8	2	4
Boys, American parents, nonlaboring class, compared with girls, American parents, nonlaboring class	2	+	—	—	—	=	—	9	1	3
Boys, American parents, laboring class, compared with girls, American parents, laboring class	3	+	—	—	—	=	—	7	4	3
Boys of foreign and mixed nationalities compared with girls of foreign and mixed nationalities	4	+	—	—	—	=	—	7	3	4
Boys, American parents, nonlaboring class, compared with boys, American parents, laboring class	5	+	=	=	=	+	+	0	9	5
Boys of foreign and mixed nationalities compared with boys, American parentage	6	—	=	=	=	—	=	5	1	8
Girls, American parents, nonlaboring class, compared with girls, American parents, laboring class	7	+	+	+	+	+	+	0	13	0
Girls of foreign and mixed nationalities compared with girls, American parentage	8	=	=	=	—	—	—	9	0	5
Colored boys compared with colored girls	9	....	—	....	—	—	—	6	2	3
Boys, American parents, compared with girls, American parents, as to average ability	10	—	—	—	+	+	+	9	4	1
Boys, American parents, nonlaboring class, compared with boys, American parents, laboring class	11	—	—	—	—	—	—	11	1	2
Girls, American parents, nonlaboring class, compared with girls, American parents, laboring class	12	+	—	—	—	—	—	10	2	1
Boys of foreign and mixed nationalities compared with boys, American parentage	13	+	+	+	+	+	—	1	11	2
Girls of foreign and mixed nationalities compared with girls, American parentage	14	—	—	+	+	+	+	4	8	2

INFLUENCE OF SEX ON ABILITY.

Comparing in general the boys and girls of American parentage, as summed up under "totals" in column 37, the boys are inferior to the girls in eight studies, superior in two, and equal in four.

If, now, we compare the boys of American parentage, nonlaboring class, with the girls of American parentage, nonlaboring class (line 2), eliminating as far as possible the influence of sociological conditions, we find (compare lines 2 and 1) that the girls excel the boys still more, being equal to them in arithmetic, where they (line 1) were inferior, and superior to the boys in geography, where they were formerly equal to them.

Comparing boys and girls of the laboring classes, American parentage (line 3), the boys gain some; they are superior in "all studies" and history, where in line 1 they were equal to the girls; they are equal in drawing, where in line 1 they are inferior to the girls.

Comparing boys and girls of mixed nationalities (line 4), the boys become superior in algebra, where they in line 1 are inferior. Thus whatever sociological or racial division is made the girls always excel in most of the branches of study.

INFLUENCE OF SOCIOLOGICAL CONDITIONS ON ABILITY.

If we compare boys of American parents, nonlaboring class, with boys of American parents, laboring class (line 5), the influence of sociological conditions will be found to be quite marked; thus the boys of American parentage, nonlaboring class, are equal to the boys of American parentage, laboring class, in five studies, superior in nine, and inferior in none. Sociological conditions affect the girls still more, as indicated in line 7, where the girls of American parentage, nonlaboring class, excel the girls of American parentage, laboring class, in all branches.

PROBABLE INFLUENCE OF FOREIGN AND MIXED NATIONALITIES ON ABILITY.

The probable influence of foreign and mixed nationalities on ability is seen by comparing boys and girls of foreign and mixed nationalities (lines 6 and 8) with boys and girls of American parentage. The boys of foreign and mixed nationalities are superior to the boys of American parentage in one study, equal in eight, and inferior in five (column 37, line 6); the girls of foreign mixed nationalities are inferior to the girls of American parentage in nine studies (column 37, line 8), superior in none, and equal in five. The influence of foreign and mixed nationalities seems unfavorable to the development of ability.

PUPILS OF AVERAGE ABILITY CONSIDERED AS TO SEX, SOCIOLOGICAL CONDITION, AND NATIVITY.

While the girls excel the boys in ability in most branches, they at the same time show higher percentages of average ability, and therefore less variability. Thus in line 10 under "totals" (column 37, Table II), we find the boys to be inferior in average ability to the girls in nine studies, superior in four studies, and equal in one study.

From this special point of view, boys might be considered superior to the girls, for, from an evolutionary point of view, the superior species varies the most, and therefore may adapt itself better to circumstances.

Comparing boys of the nonlaboring class with boys of the laboring class (line 11), the former are inferior to the latter in average ability in eleven studies, superior in one, and equal in two. The girls of the nonlaboring class (line 12) are inferior in average ability to the girls of the laboring class in ten studies, superior in two, and equal in one study.

Girls of the nonlaboring class compared with girls of the laboring class (line 12) are inferior in average ability in ten branches, superior in two, and equal in one.

From line 13, we find boys of foreign and mixed nationalities to be inferior in average ability in one study, superior in eleven studies, and equal in two to boys of American parentage.

From line 14, it will be seen that girls of foreign and mixed nationalities are inferior in average ability in four studies, superior in eight, and equal in two to girls of American parentage.

In general, therefore, unfavorable sociological conditions and foreign and mixed nationality seem to produce an increase of, or are concomitants of, average ability.

ABILITY IN RELATION TO AGE.

From Tables III and IV, it will be seen that in both boys and girls, as age increases, the percentage of brightness decreases in all the studies, except drawing, manual labor, and penmanship; that is, in the more mechanical studies. This would suggest that ability in mechanical studies depends more upon the practice and time given to them than is true of less mechanical branches.

As age increases the percentage of dullness increases in all the studies except in drawing, manual labor, penmanship, music, and science.

TABLE III.—*Percentage of ability in different studies computed on number reported.*

GIRLS—AMERICAN PARENTAGE.

Limit of age.					9	10	11	15	16	21	22	24	26	28	34	35	36
From—		To—		Mental divisions.	All studies.	Algebra.	Arithmetic.	Drawing.	Geography.	History.	Language and English.	Manual labor; sewing.	Music.	Penmanship.	Reading.	Science—botany.	Spelling.
Yrs.	*Mos.*	*Yrs.*	*Mos.*														
6	7	7	6	Bright ..	58	.....	44	43	.....	.....	53	31	54	38	58	41	50
				Dull	4	.....	17	20	.....	.....	11	17	16	17	9	9	9
				Average	38	.....	39	37	.....	.....	36	52	30	45	33	50	41
7	7	8	6	Bright ..	63	.....	46	33	70	.....	58	41	46	43	59	65	51
				Dull	9	.....	14	10	10	.....	9	9	13	15	10	6	15
				Average	28	.....	40	57	20	.....	33	50	41	42	31	29	34
8	7	9	6	Bright ..	58	.....	42	36	37	.....	55	41	50	45	58	63	60
				Dull	8	.....	15	12	10	.....	7	8	8	11	8	6	10
				Average	34	.....	43	52	53	.....	38	51	42	44	34	31	30
9	7	10	6	Bright ..	62	.....	38	30	37	.....	54	43	44	38	56	37	51
				Dull	4	.....	15	22	5	.....	5	9	10	12	11	37	11
				Average	34	.....	47	48	58	.....	41	48	46	50	33	26	38
10	7	11	6	Bright ..	56	.....	39	35	39	49	49	41	37	41	58	42	55
				Dull	11	.....	19	15	8	9	11	9	9	10	9	10	14
				Average	33	.....	42	50	53	42	40	50	54	49	33	48	31
11	7	12	6	Bright ..	47	.....	33	33	41	50	43	38	38	35	53	29	45
				Dull	7	.....	20	17	9	10	11	10	5	12	13	14	8
				Average	46	.....	47	50	50	40	46	52	57	53	34	57	47
12	7	13	6	Bright ..	39	67	35	34	36	42	43	39	35	37	45	21	46
				Dull	10	11	19	20	15	13	12	7	12	18	14	16	12
				Average	51	22	46	46	49	45	45	54	53	45	41	63	42
13	7	14	6	Bright ..	35	65	34	37	33	41	44	43	24	46	44	33	41
				Dull	7	9	23	15	12	13	14	8	7	13	14	7	18
				Average	58	26	43	48	55	46	42	49	69	41	42	60	41
14	7	15	6	Bright ..	35	56	30	37	29	35	37	35	36	33	27	22	29
				Dull	14	11	30	19	26	24	17	10	16	20	21	33	34
				Average	51	33	40	44	45	41	46	55	48	47	52	45	37
15	7	16	6	Bright ..	37	34	21	48	25	42	35	35	43	43	42	43	39
				Dull	14	11	22	14	25	17	12	9	10	19	8	14	22
				Average	49	55	57	38	50	41	53	56	47	38	50	43	39
16	7	17	6	Bright ..	.....	43	8	52	.....	36	30	31	.....	10	.....	50	....
				Dull	.....	9	32	5	.....	18	7	8	.....	20	.....	6	....
				Average	.....	48	60	43	.....	46	63	61	.....	70	.....	44	....
17	7	18	6	Bright ..	.....	.....	9	19	.....	19	17	40	.....	.....	.....	42	....
				Dull	.....	.....	18	12	.....	19	6	20	.....	.....	.....	5	....
				Average	.....	.....	73	69	.....	62	77	40	.....	.....	.....	53	....

Diagram I (Table III).

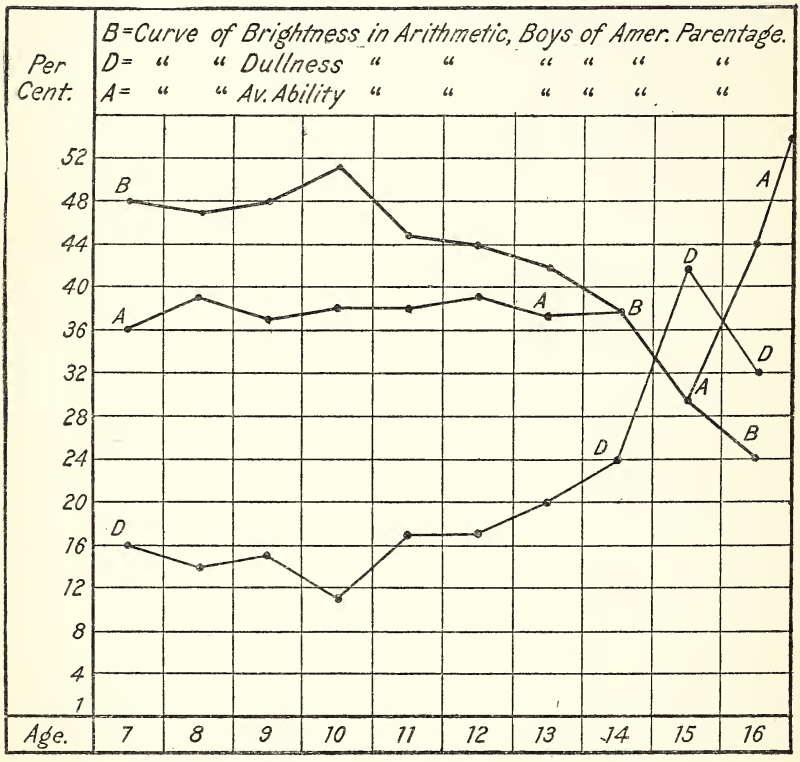


Diagram I illustrates how in arithmetic, for example, brightness decreases with age, while dullness increases.

TABLE IV.—*Percentage of ability in different studies computed on number reported.*

BOYS—AMERICAN PARENTAGE.

Limit of age.				9	10	11	15	16	21	22	24	26	28	34	35	36
From—		To—		Mental divisions.	All studies.	Algebra.	Arithmetic.	Drawing.	Geography.	History.	Language and English.	Manual labor, sewing.	Music.	Penmanship.	Reading.	Science—botany.	Spelling.
Yrs.	*Mos.*	*Yrs.*	*Mos.*														
6	7	7	6	Bright ..	43	.....	48	27	.....	.....	45	30	25	22	48	56	46
				Dull	7	.....	16	35	.....	.....	18	26	26	38	25	6	12
				Average	50	.....	36	38	.....	.....	37	44	49	40	27	38	42
7	7	8	6	Bright ..	64	.....	47	31	69	.....	39	31	35	33	50	51	37
				Dull	8	.....	14	15	8	.....	15	23	17	25	17	15	20
				Average	28	.....	39	54	23	.....	46	46	48	42	33	34	43
8	7	9	6	Bright ..	56	.....	48	33	.....	.....	48	28	37	34	49	53	45
				Dull	9	....	15	21	.....	.....	14	20	18	20	13	9	12
				Average	35	.....	37	46	.....	.....	38	52	45	46	38	38	43
9	7	10	6	Bright ..	65	.....	51	25	54	.....	48	29	26	27	51	37	37
				Dull	15	.....	11	28	5	.....	15	19	23	27	21	12	24
				Average	20	.....	38	47	41	.....	37	52	51	46	28	51	39
10	7	11	6	Bright ..	42	.....	45	31	48	56	41	27	23	29	46	35	32
				Dull	19	.....	17	19	10	11	16	26	22	23	20	13	21
				Average	39	.....	38	50	42	33	43	47	55	48	34	52	47
11	7	12	6	Bright ..	53	.....	44	35	36	54	37	28	20	23	39	47	30
				Dull	16	.....	17	24	11	11	17	20	33	29	22	11	25
				Average	31	.....	39	41	53	35	46	52	47	48	39	42	45
12	7	13	6	Bright ..	51	.....	42	37	29	45	32	22	21	29	29	44	26
				Dull	10	.....	20	16	12	8	25	23	33	27	21	17	24
				Average	39	.....	38	47	59	47	43	55	46	44	50	39	50
13	7	14	6	Bright ..	51	42	38	35	27	41	29	27	7	22	22	25	26
				Dull	12	11	24	26	17	18	24	21	44	31	22	12	33
				Average	37	47	38	39	56	41	47	52	49	47	56	63	41
14	7	15	6	Bright ..	38	43	29	51	19	42	29	40	20	27	23	30	19
				Dull	21	18	42	23	24	17	29	15	42	27	42	10	48
				Average	41	39	29	26	57	41	42	45	38	46	35	60	33
15	7	16	6	Bright ..	52	35	24	52	19	28	27	41	11	27	10	.....	29
				Dull	24	24	32	25	26	30	28	17	47	22	48	.....	33
				Average	24	41	44	23	55	42	45	42	42	51	42	.....	38
16	7	17	6	Bright ..	.....	11	24	43	14	26	12	43	.....	.....	.....	.....	60
				Dull	.....	22	14	14	14	18	24	14	.....	.....	.....	.....	20
				Average	.....	67	62	43	72	56	64	43	.....	.....	.....	.....	20

As age increases, the percentage of average ability increases in different studies in general, except in spelling.

The boys differ from the girls mainly in the relation of average ability to age. As age increases in the boys, average ability increases in all studies except in arithmetic, algebra, manual labor, and penmanship, while in girls average ability increases in all studies except in drawing, geography, history, penmanship, science, and spelling. Thus average ability in girls increases with age in more studies than in the case of boys.

COLORED CHILDREN.

Colored girls are superior to colored boys (line 9, Table II) in six branches, inferior in two, and equal in three.

In average ability the boys show a higher per cent in all studies except science, indicating less variability than the girls, which is the reverse of the case in white children.

ABILITY AND AGE IN COLORED CHILDREN.

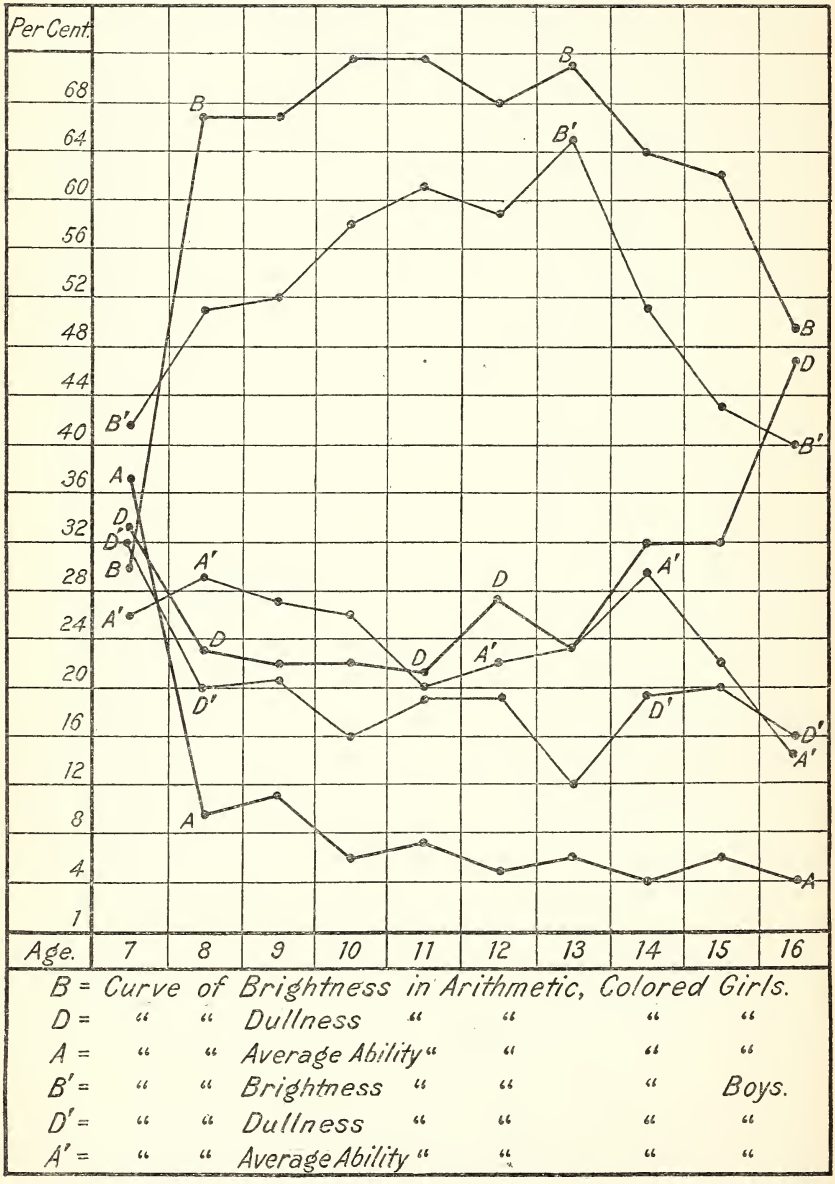
The relation of age to ability in colored children is quite variable, but from a general survey of Tables V and VI it may be said that the colored children generally increase in brightness as age increases, whereas the white children decrease in brightness as age increases. It would seem that the cause of this difference in the colored children is racial.

As age increases in girls, the percentage of average ability increases, except in drawing, geography, history, science, and spelling.

As age increases in boys, the percentage of average ability increases, except in arithmetic, algebra, manual labor, music, and penmanship.

There is a sudden increase and high percentage of brightness in all studies in colored girls at the age of 8, with a corresponding decrease in dullness and average ability, but much more marked in average ability. At this age the colored boys

DIAGRAM Iα (TABLES V AND VI).



also show an increase in brightness, but it is not so marked as in the case of the girls. The boys differ from the girls also at this age and afterwards in having a much higher percentage in average ability in most branches of study. To illustrate this we give the following diagram of curves for ability in arithmetic for boys and girls. The report on arithmetic is the most complete.

TABLE V.—*Percentage of ability in different studies, computed on number reported.*

COLORED GIRLS.

Limit of age.				Mental divisions.	11	15	16	21	22	26	28	34	36
From—		To—			Arithmetic.	Drawing.	Geography.	History.	Language and English.	Music.	Penmanship.	Reading.	Spelling.
Yrs.	*Mos.*	*Yrs.*	*Mos.*										
5	0	6	6	Bright	27	.....	.....	.....	43	31	27	41	42
				Dull	54	.....	.....	.....	33	15	40	41	37
				Average	19	.....	.....	.....	24	54	33	18	21
6	7	7	6	Bright	30	.....	.....	.....	28	27	34	54	35
				Dull	33	.....	.....	.....	36	18	33	29	24
				Average	37	.....	.....	.....	36	55	33	17	41
7	7	8	6	Bright	67	60	.....	.....	70	83	65	80	77
				Dull	23	10	.....	.....	18	9	19	17	14
				Average	10	30	.....	.....	12	8	16	3	9
8	7	9	6	Bright	67	40	.....	.....	70	45	62	84	67
				Dull	22	20	.....	.....	14	20	15	10	17
				Average	11	40	.....	.....	16	35	23	6	16
9	7	10	6	Bright	72	33	78	.....	77	50	65	74	62
				Dull	22	27	15	.....	13	12	14	16	16
				Average	6	40	7	.....	10	38	21	10	22
10	7	11	6	Bright	72	36	79	.....	71	47	63	76	64
				Dull	21	32	17	.....	21	16	13	16	25
				Average	7	32	4	.....	8	37	24	8	11
11	7	12	6	Bright	68	37	57	.....	74	70	64	66	56
				Dull	27	37	34	.....	16	12	16	23	30
				Average	5	26	9	.....	10	18	20	11	14
12	7	13	6	Bright	71	41	79	64	70	.....	65	67	69
				Dull	23	18	17	24	21	.....	3	25	21
				Average	6	41	4	12	9	.....	32	8	10
13	7	14	6	Bright	64	50	53	70	50	42	53	65	55
				Dull	32	31	31	24	41	16	15	21	23
				Average	4	19	16	6	9	42	32	14	22
14	7	15	6	Bright	62	40	60	63	60	13	48	53	51
				Dull	32	7	26	29	20	50	13	25	28
				Average	6	53	14	8	20	37	39	22	21
15	7	16	6	Bright	49	53	27	60	74	.....	38	41	38
				Dull	47	18	39	22	16	.....	6	18	24
				Average	4	29	34	18	10	.....	56	41	38
16	7	17	6	Bright	46	22	42	62	64	.....	.....	45	50
				Dull	50	11	32	19	18	.....	.....	22	20
				Average	4	67	26	19	18	.....	.....	33	30

TABLE VI.—*Percentage of ability in different studies, computed on number reported.*

(COLORED BOYS.)

Limit of age.				Mental divisions.	9	11	15	16	21	22	26	28	34	36
From—		To—			All studies.	Arithmetic.	Drawing.	Geography.	History.	Language and English.	Music.	Penmanship.	Reading.	Spelling.
Yrs.	*Mos.*	*Yrs.*	*Mos.*											
5	0	6	6	Bright	37	41	.....	.....	.....	39	64	22	50	39
				Dull	42	36	.....	.....	.....	25	9	31	26	22
				Average	21	23	.....	.....	.....	36	27	47	24	39
6	7	7	6	Bright	28	42	13	.....	.....	33	29	40	51	40
				Dull	48	32	37	.....	.....	33	18	29	25	17
				Average	24	26	50	.....	.....	34	53	31	24	43
7	7	8	6	Bright	46	51	25	34	.....	50	35	53	57	54
				Dull	20	20	17	33	.....	10	26	17	17	17
				Average	34	29	58	33	.....	40	39	30	26	29
8	7	9	6	Bright	52	52	35	59	.....	43	36	42	51	48
				Dull	20	21	26	6	.....	17	32	16	22	31
				Average	28	27	39	35	.....	40	32	42	27	21
9	7	10	6	Bright	46	58	32	53	14	48	40	44	51	48
				Dull	21	16	24	11	29	9	20	9	18	20
				Average	33	26	44	36	57	43	40	47	31	32

TABLE VI.—*Percentage of ability in different studies, etc.*—Continued.

(COLORED BOYS)—Continued.

Limit of age.				Mental division.	9	11	15	16	21	22	26	28	34	36
From—		To—			All studies.	Arithmetic.	Drawing.	Geography.	History.	Language and English.	Music.	Penmanship.	Reading.	Spelling.
Yrs.	*Mos.*	*Yrs.*	*Mos.*											
10	7	11	6	Bright	47	61	43	61	.....	44	26	52	53	42
				Dull	22	19	25	16	.....	18	11	15	24	24
				Average	31	20	32	23	.....	38	63	33	23	34
11	7	12	6	Bright	51	59	41	37	.....	41	29	44	46	38
				Dull	25	19	15	19	.....	21	12	10	27	29
				Average	24	22	44	44	.....	38	59	46	27	33
12	7	13	6	Bright	53	65	64	47	59	46	27	50	45	39
				Dull	18	12	12	11	13	12	18	7	24	16
				Average	29	23	24	42	28	42	55	43	31	45
13	7	14	6	Bright	51	51	54	42	43	45	26	36	39	39
				Dull	19	19	12	9	14	14	16	14	20	19
				Average	30	30	34	49	43	41	58	50	41	42
14	7	15	6	Bright	43	58	54	46	61	43	50	57	34	34
				Dull	16	20	12	14	11	16	30	24	28	28
				Average	41	22	34	40	28	41	20	19	38	38
15	7	16	6	Bright	40	48	54	26	45	28	50	47	41	24
				Dull	15	16	14	12	7	18	12	40	16	27
				Average	45	36	32	62	48	54	38	13	43	49
16	7	18	6	Bright	39	37	58	48	51	38	.....	35	29	31
				Dull	22	27	6	16	9	19	.....	20	12	23
				Average	39	36	36	36	40	43	.....	45	59	46

SECTION E.

TABLES OF ANTHROPOMETRICAL MEASUREMENTS.

In regard to the tables of anthropometrical measurements which follow, we desire to offer a few remarks, many of which are made as footnotes to the tables.

The tables are summaries from much larger tables which would have required too much space for insertion. A specimen of such a table is given in section B.

We have not compared or combined these tables as much as might be done. The totals and numbers omitted have been given, so that anyone desiring could make new comparisons and combinations between the tables.

The height, sitting height, and circumference of head are always given in inches. The arm reach, when given, is also in inches. The weight is always given in pounds. Arm reach is given in a number of tables, but the measurement is practically so difficult to get exact that we have not utilized it. The distance a person can stretch his arms is too much dependent upon his feeling and will power at the moment.

The heading "American parentage," or "American parents," refers to children whose parents were born in this country. The term "foreign parentage," or "foreign parents," refers to parents born in a foreign country. "American mixed nationality" refers to parents one of whom is American born and the other foreign born.

Children of foreign parentage, or of American mixed nationality, were not sociologically divided into laboring and nonlaboring classes, because the numbers were not large enough. The divisions also would have been too unequal in number for comparison.

The term "nonlaboring classes" refers to those children whose parents are engaged in mercantile and professional occupations, as distinguished from "the laboring classes," whose occupations come under the heads of skilled or unskilled labor. These divisions are of course only approximate.

A few odd and incomplete tables have been given, as it was deemed desirable to give all the results of the investigation.

"Average age" was worked out in a number of tables, but it was not continued, as the nearest age was considered sufficiently accurate. The nearest age—10, for instance—is considered to be from 9 years 7 months to 10 years 6 months, inclusive. Fractions of months were not asked for in inquiry as to the age of the children. The practical difficulties are obvious. The nearest age, however, will be seen to be quite near, and sometimes exactly equal to the average age, as in tables XX and XXI.

TABLE VII.—*All boys.* (*a*)

Limits of different ages.				Number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	3	6	6	103	1	4,557.99	b44.69	2	2,506.71	b24.82	3	4,523.75	b45.24	1	2,062.70	b20.22
6	0	6	6	44	1	1,924.22	44.75	..	1,068.36	24.28	1	1,948.25	45.31	0	892.10	20.28
6	7	7	6	533	13	23,904.47	45.97	13	13,053.92	25.10	9	24,993.24	47.70	8	10,710.06	20.45
7	7	8	6	787	6	37,357.35	47.83	5	20,243.53	25.89	6	40,201.32	51.47	5	16,039.09	20.51
8	7	9	6	878	9	43,222.10	49.74	11	23,061.99	26.60	6	48,975.24	56.16	10	17,893.58	20.61
9	7	10	6	930	6	47,775.15	51.70	11	25,037.25	27.24	5	56,926.14	61.54	10	19,070.43	20.73
10	7	11	6	862	11	45,267.48	53.19	10	23,810.77	27.95	6	56,717.49	66.26	5	17,842.41	20.82
11	7	12	6	986	10	53,816.63	55.14	16	27,898.35	28.76	4	71,419.22	72.73	6	20,517.84	20.94
12	7	13	6	926	14	51,761.94	56.76	24	26,556.26	29.44	9	72,791.57	79.38	7	19,309.62	21.01
13	7	14	6	784	7	45,953.11	59.14	27	23,128.02	30.55	6	68,672.06	88.27	13	16,356.53	21.21
14	7	15	6	528	4	32,379.07	61.79	15	16,277.61	31.73	4	52,897.12	100.95	8	11,155.10	21.45
15	7	16	6	345	4	21,934.63	64.32	11	11,042.51	33.06	5	38,662.23	113.71	4	7,388.43	21.67
16	7	17	6	120	1	7,850.06	65.97	5	3,920.30	34.09	1	14,420.55	121.18	1	2,602.38	21.87
16	7	18	6	32	1	2,059.86	66.45	0	1,096.61	34.27	1	3,850.50	124.21	1	685.99	22.13
16	7	18	10	22	0	1,474.74	67.03	0	763	34.68	0	2,708.30	123.10	1	464.61	22.12
17	7	18	6	38	0	2,548.10	67.06	2	1,257.27	34.92	0	5,015.50	131.99	0	832.72	21.91
18	7	19	6	7	0	481.12	68.73	0	244.50	34.93	0	925.75	132.25	0	157.37	22.48
18	7	21	7	28	0	1,894.35	67.66	0	975.86	34.85	1	3,660	135.56	0	625.49	22.34
				7,953	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a Tables I to VI are in the previous section D.

b Used in diagrams for age 6.

TABLE VIII.—*All boys of American parentage.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.*b*	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	3	6	6	103	1	4,557.99	44.69	2	2,506.71	24.82	3	4,523.75	45.24	1	2,062.70	20.22
6	7	7	6	404	7	18,232.54	45.93	8	9,936.09	25.09	7	18,919.87	47.66	5	8,143.28	20.41
7	7	8	6	607	4	28,831.82	47.81	3	15,609.27	25.84	2	31,107.87	51.42	2	12,411.12	20.51
8	7	9	6	647	7	31,844.05	49.76	4	17,107.62	26.61	4	36,123.87	56.18	9	13,157.73	20.62
9	7	10	6	703	5	36,058.60	51.66	9	18,911.26	27.25	2	43,157.27	61.57	7	14,433.02	20.74
10	7	11	6	670	10	35,102.26	53.19	7	18,532.97	27.95	5	43,982.87	66.14	2	13,901.94	20.81
11	7	12	6	756	10	41,141.91	55.15	9	21,510.88	28.80	4	54,668.85	72.70	5	15,716.64	20.93
12	7	13	6	687	10	38,372.77	56.68	20	19,645.50	29.45	8	53,870.70	79.34	4	14,346.49	21.01
13	7	14	6	589	3	34,758.69	59.32	18	17,493.95	30.64	6	51,741.19	88.75	7	12,365.71	21.25
14	7	15	6	405	2	24,925.78	61.85	9	12,579.64	31.77	4	40,464.37	100.91	7	8,532.97	21.44
15	7	16	6	267	4	16,912.46	64.31	10	8,507.92	33.10	3	30,051.87	113.83	4	5,698.80	21.67
16	7	17	6	120	1	7,850.06	65.97	5	3,920.30	34.09	1	14,420.55	121.18	1	2,602.33	21.87
17	7	18	6	38	0	2,548.10	67.06	2	1,257.27	34.92	0	5,015.50	131.99	0	832.72	21.91
18	7	21	7	28	0	1,894.35	67.66	0	975.86	34.85	1	3,660.00	135.56	0	625.49	22.34
				6,024	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a By "American parentage" is meant children of parents born in this country.
b The numbers omitted are given in case anyone should desire to make other combinations in the tables, and thus make other averages.

TABLE IX.—*Boys belonging to nonlaboring classes of American parentage.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	8	6	6	27	0	1,215.36	45.01	0	676.25	25.06	0	1,255.50	46.50	0	546.09	20.23
6	7	7	6	205	1	9,386.38	46.01	8	4,955.77	25.16	4	9,577.50	47.65	3	4,133.83	20.46
7	7	8	6	278	2	13,234.36	47.95	0	*7,200.86	25.90	1	14,202.00	51.27	0	5,707.05	20.53
8	7	9	6	313	2	15,538.51	49.96	2	8,310.43	26.72	1	17,683.00	56.68	5	6,368.25	20.68
9	7	10	6	353	1	18,317.30	52.04	5	9,536.94	27.41	1	21,820.75	61.99	2	7,300.27	20.80
10	7	11	6	348	1	18,585.40	53.56	5	9,645.39	28.12	5	22,907.01	66.78	1	7,243.73	20.88
11	7	12	6	394	5	21,545.31	55.39	6	11,238.36	28.96	1	28,691.50	73.01	2	8,240.48	21.02
12	7	13	6	346	6	19,354.16	56.92	13	9,820.91	29.49	4	27,283.37	79.78	2	7,242.16	21.05
13	7	14	6	358	2	21,258.69	59.72	9	10,762.69	30.84	4	31,780.57	89.78	5	7,528.42	21.33
14	7	15	6	259	2	16,053.27	62.46	6	8,112.81	32.07	4	26,450.62	103.73	5	5,470.38	21.54
15	7	16	6	169	1	10,914.12	64.97	3	5,543.92	33.40	2	19,288.75	115.50	1	3,640.82	21.67
16	7	17	6	43	0	2,890.22	67.21	0	1,493.84	34.74	0	5,520.25	128.38	0	945.91	22.00
				3,093	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a "Nonlaboring classes" refer to children whose parents are engaged in mercantile and professional occupations, as distinguished from those occupations under the head of skilled labor and unskilled labor. (See section A.)

TABLE X.—*Boys belonging to laboring classes of American parentage.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	8	6	6	11	0	485.37	44.12	0	268.37	24.40	0	487.25	44.30	0	220.49	20.04
6	7	7	6	199	6	8,846.16	45.84	0	4,980.32	25.03	3	9,342.37	47.67	2	4,009.45	20.35
7	7	8	6	329	2	15,597.46	47.70	3	8,408.41	25.79	1	16,905.87	51.54	2	6,704.07	20.50
8	7	9	6	334	5	16,305.54	49.56	2	8,797.19	26.50	3	18,440.87	55.71	4	6,789.48	20.57
9	7	10	6	350	4	17,741.30	51.28	4	9,374.32	27.09	1	21,336.52	61.14	5	7,132.75	20.67
10	7	11	6	322	9	16,516.86	52.77	2	8,887.58	27.77	0	21,075.86	65.45	1	6,658.21	20.74
11	7	12	6	362	5	19,596.60	54.89	3	10,272.52	28.61	3	25,977.35	72.36	3	7,476.16	20.82
12	7	13	6	341	4	19,018.61	56.44	7	9,824.59	29.41	4	26,587.33	78.89	2	7,104.33	20.96
13	7	14	6	231	1	13,500.00	58.70	9	6,731.26	30.32	2	19,960.62	87.16	2	4,837.29	21.12
14	7	15	6	146	0	8,872.51	60.77	3	4,466.83	31.24	0	14,013.75	95.98	2	3,062.59	21.27
15	7	16	6	98	3	5,998.34	63.14	7	2,964.00	32.57	1	10,763.12	110.96	3	2,057.97	21.66
16	7	17	6	16	0	1,053.99	65.87	1	507.49	33.83	0	1,909.30	119.33	0	348.75	21.80
				2,739	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a The term "laboring classes" refers to those children whose parents are engaged in occupations under the head of skilled and unskilled labor, as distinguished from occupations called mercantile and professional. (See section A.)

TABLE XI.—*Boys of American parents not socially divided.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	3	5	6	5	0	216.25	43.25	0	123.00	24.60	0	216.75	43.35	0	98.00	19.60
5	7	6	6	60	1	2,641.01	44.76	2	1,439.09	24.81	3	2,564.25	44.99	1	1,198.12	20.31
16	7	17	6	61	1	3,905.85	65.10	4	1,918.97	33.67	1	6,991.00	116.52	1	1,307.72	21.80
17	7	18	6	38	0	2,548.10	67.06	2	1,257.27	34.92	0	5,015.50	131.99	0	832.72	21.91
18	7	21	7	28	0	1,894.35	67.66	0	975.86	34.85	1	3,660.00	135.56	0	625.49	22.34
				192	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a In a number of instances the occupation of the American parents was not given, so that no sociological division could be made.

TABLE XII.—*Boys of foreign parents not socially divided.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Inches.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	25	0	1,104.36	44.17	0	599.49	23.98	0	1,124.25	44.97	0	507.24	20.29
6	7	7	6	67	4	2,883.46	45.85	3	1,606.32	25.10	1	3,164.25	47.94	1	1,341.94	20.33
7	7	8	6	100	2	4,688.05	47.84	2	2,539.92	25.92	2	5,060.37	51.64	3	1,988.25	20.50
8	7	9	6	116	1	5,728.83	49.82	4	2,990.19	26.70	1	6,537.00	56.84	1	2,368.46	20.60
9	7	10	6	104	0	5,413.68	52.05	1	2,790.06	27.09	2	6,357.87	62.33	2	2,111.42	20.70
10	7	11	6	102	1	5,355.77	53.03	2	2,784.84	27.85	0	6,856.87	67.22	1	2,105.74	20.85
11	7	12	6	127	0	6,987.27	55.02	1	3,604.39	28.61	0	9,283.50	73.10	0	2,669.18	21.02
12	7	13	6	123	2	6,867.11	56.75	3	3,526.33	29.39	0	9,817.25	79.82	3	2,531.67	21.10
13	7	14	6	115	3	6,516.66	58.18	7	3,241.81	30.02	0	9,959.12	86.60	2	2,378.28	21.05
14	7	15	6	73	0	4,471.82	61.26	5	2,143.98	31.53	0	7,309.25	100.13	1	1,548.25	21.50
15	7	16	6	45	0	2,886.20	64.14	0	1,472.60	32.72	1	4,894.49	111.24	0	979.22	21.76
16	7	18	6	32	1	2,059.86	66.45	0	1,096.61	34.27	1	3,850.50	124.21	1	685.99	22.13
18	7	19	6	7	0	481.12	68.73	0	244.50	34.93	0	925.75	132.25	0	157.37	22.48
				1,036	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a By "foreign parents" is meant parents born in a foreign country. The foreign parents were not sociologically divided, as the divisions would have been so unequal in number that comparisons would have been of little value.

TABLE XIII.—*Boys of American and foreign parentage not socially divided.* (*a*)

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	19	1	819.86	45.55	0	468.87	24.68	1	824.00	45.78	0	384.86	20.26
6	7	7	6	62	2	2,783.47	46.39	2	1,511.51	25.19	1	2,909.12	47.69	2	1,224.84	20.41
7	7	8	6	80	0	3,837.48	47.97	0	2,094.34	26.18	2	4,033.08	51.71	0	1,639.72	20.50
8	7	9	6	115	1	5,649.22	49.55	3	2,964.18	26.47	1	6,314.37	55.39	0	2,376.39	20.59
9	7	10	6	123	1	6,302.87	51.66	1	3,335.93	27.34	1	7,411.00	60.75	1	2,525.99	20.70
10	7	11	6	90	0	4,899.45	53.44	1	2,492.96	28.01	1	5,877.75	66.04	2	1,834.73	20.85
11	7	12	6	103	0	5,687.45	55.22	6	2,783.08	28.69	0	7,466.87	72.49	1	2,132.02	20.90
12	7	13	6	116	2	6,522.06	57.21	1	3,384.43	29.43	1	9,103.62	79.16	0	2,431.46	20.96
13	7	14	6	80	1	4,677.76	59.21	2	2,392.26	30.67	0	6,971.75	87.15	4	1,612.54	21.22
14	7	15	6	50	2	2,981.47	62.11	1	1,553.99	31.71	0	5,123.50	102.47	0	1,073.88	21.48
15	7	16	6	33	0	2,135.97	64.73	1	1,061.99	33.19	1	3,715.87	116.12	0	710.41	21.53
16	7	18	10	22	0	1,474.74	67.03	0	763.00	34.68	0	2,708.30	123.10	1	464.61	22.12
				893	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a "American and foreign parentage" refers to parents, one of whom is American born, the other foreign born. No sociological division is made here, as the numbers were comparatively small. The divisions, also, would have been quite unequal in numbers.

TABLE XIV.—*All bright boys.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	8	6	6	53	0	2,382.85	44.96	0	1,316.24	24.83	1	2,378.50	45.74	0	1,072.32	20.23
6	7	7	6	205	2	9,312.00	45.87	4	5,036.40	25.06	6	9,500.62	47.74	3	4,141.89	20.50
7	7	8	6	320	1	15,228.50	47.74	3	8,200.68	25.87	2	16,225.62	51.02	3	6,519.89	20.57
8	7	9	6	384	3	18,899.77	49.61	5	10,070.02	26.57	3	21,255.24	55.79	6	7,805.83	20.65
9	7	10	6	392	1	20,218.58	51.71	7	10,514.75	27.31	3	23,950.87	61.57	2	8,104.22	20.78
10	7	11	6	322	3	16,963.09	53.18	5	8,846.28	27.91	3	21,147.62	66.29	0	6,708.75	20.83
11	7	12	6	349	2	19,160.94	55.22	10	9,777.78	28.84	2	25,098.50	72.33	5	7,216.07	20.98
12	7	13	6	305	6	16,931.22	56.63	9	8,722.69	29.47	5	23,514.12	78.38	3	6,360.60	21.06
13	7	14	6	227	2	13,354.33	59.35	6	6,767.65	30.62	5	19,543.41	88.03	4	4,740.51	21.26
14	7	15	6	167	1	10,329.03	62.22	3	5,252.94	32.03	2	16,955.00	102.76	5	3,500.43	21.61
15	7	16	6	104	0	6,749.42	64.90	3	3,365.69	33.32	1	11,943.87	115.96	1	2,243.77	21.78
16	7	17	6	35	2	2,165.62	65.62	2	1,114.86	33.78	1	4,048.00	119.06	1	750.86	22.08
17	7	18	6	14	0	947.37	67.67	0	493.12	35.22	1	1,759.50	135.35	0	309.74	22.12
18	7	19	6	16	0	1,084.86	67.80	0	553.62	34.60	1	1,942.75	129.52	0	357.74	22.36
16	11	18	4	4	0	263.25	65.81	0	136.75	34.19	0	472.25	118.06	0	87.37	21.84
19	11	20	0	2	0	137.62	68.81	0	71.50	35.75	0	296.50	148.25	0	43.25	21.63
				2,899	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XV.—*All dull boys.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	3	5	6	5	0	216.25	43.25	0	123.00	24.60	0	216.75	43.35	0	98.00	19.60
5	7	6	6	39	1	1,694.65	44.60	1	928.99	24.45	2	1,656.50	44.77	1	770.96	20.29
6	7	7	6	99	4	4,327.56	45.55	3	2,402.29	25.02	2	4,564.50	47.06	1	1,988.01	20.29
7	7	8	6	101	2	4,708.94	47.57	0	2,603.02	25.77	2	5,076.08	51.27	2	2,008.96	20.29
8	7	9	6	102	3	4,959.03	50.09	2	2,701.59	27.02	2	5,696.75	56.97	1	2,068.13	20.48
9	7	10	6	118	2	5,961.45	51.39	2	3,153.06	27.18	0	7,214.50	61.14	5	2,319.33	20.53
10	7	11	6	97	3	4,978.15	52.96	2	2,651.08	27.91	1	6,224.75	64.84	1	1,977.04	20.59
11	7	12	6	128	1	6,980.22	54.96	4	3,564.58	28.75	2	9,222.72	73.20	1	2,648.58	20.85
12	7	13	6	131	2	7,332.00	56.84	1	3,831.57	29.47	0	10,426.83	79.59	2	2,710.07	21.01
13	7	14	6	143	3	8,339.17	59.57	8	4,136.52	30.64	1	12,673.87	89.25	3	2,950.10	21.07
14	7	15	6	116	2	6,987.18	61.29	5	3,510.22	31.62	1	11,506.25	100.05	1	2,451.64	21.32
15	7	16	6	80	3	4,923.84	63.95	5	2,456.09	32.75	1	8,783.87	111.19	2	1,680.55	21.55
16	7	17	6	32	0	2,061.23	64.41	2	1,002.36	33.41	0	3,630.00	113.44	0	689.98	21.56
16	9	17	9	4	0	264.62	66.16	0	142.25	35.56	0	521.50	130.38	0	88.12	22.03
16	10	18	1	7	0	462.37	66.05	0	239.74	34.25	0	848.25	121.18	0	152.37	21.77
17	7	18	2	8	0	520.37	65.05	1	237.99	34.00	0	967.50	120.94	0	173.62	21.70
18	11	20	9	4	0	267.25	66.81	0	138.62	34.66	0	546.00	136.50	0	89.00	22.25
				1,214	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XVI.—*All average boys.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	7	6	6	45	0	2,002.34	44.50	1	1,083.34	24.62	1	1,972.75	44.84	0	911.77	20.26
6	7	7	6	199	6	8,907.04	46.15	5	4,881.74	25.16	0	9,536.62	47.92	2	4,008.55	20.35
7	7	8	6	326	3	15,498.04	47.98	2	8,409.23	25.95	1	16,871.62	51.91	0	6,692.97	20.53
8	7	9	6	340	3	16,800.51	49.85	4	8,926.54	26.57	1	19,165.25	56.53	3	6,954.68	20.64
9	7	10	6	355	2	18,289.50	51.81	1	9,620.04	27.18	1	21,797.27	61.57	3	7,301.40	20.74
10	7	11	6	386	5	20,286.26	53.24	3	10,716.56	27.98	1	25,656.62	66.64	2	8,006.48	20.85
11	7	12	6	459	7	24,915.61	55.12	1	13,150.51	28.71	0	33,499.00	72.98	0	9,608.20	20.93
12	7	13	6	421	6	23,547.13	56.74	14	11,963.30	29.39	3	33,423.37	79.96	2	8,791.50	20.98
13	7	14	6	371	2	21,702.96	58.82	11	10,964.18	30.46	0	32,693.53	88.12	3	7,817.41	21.24
14	7	15	6	220	0	13,586.50	61.76	6	6,759.46	31.59	1	21,899.12	100.00	2	4,668.13	21.41
15	7	16	6	144	1	9,168.39	64.11	3	4,657.24	33.02	2	16,122.12	113.54	1	3,099.19	21.67
16	7	17	6	70	0	4,687.95	66.97	1	2,380.70	34.50	0	8,816.30	125.95	0	1,539.66	22.00
17	7	18	6	24	0	1,613.11	67.21	1	805.41	35.02	0	3,217.00	134.04	1	504.86	21.95
18	7	19	6	9	0	607.24	67.47	0	311.00	34.56	0	1,228.25	136.47	0	202.62	22.51
20	1	21	7	4	0	278.50	69.63	0	145.62	36.41	0	572.25	143.06	0	90.25	22.56
				3,373	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XVII.—*Bright boys, American parents.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	8	6	6	38	0	1,700.73	44.76	0	944.62	24.86	0	1,742.75	45.86	0	766.58	20.17
6	7	7	6	160	1	7,284.02	45.81	2	3,954.94	25.03	5	7,358.50	47.47	3	3,219.67	20.51
7	7	8	6	249	0	11,895.16	47.77	1	6,394.96	25.79	0	12,716.37	51.07	1	5,099.46	20.56
8	7	9	6	281	2	13,850.39	49.64	2	7,429.96	26.63	2	15,651.62	56.10	5	5,702.66	20.66
9	7	10	6	317	1	16,357.91	51.77	7	8,475.04	27.34	2	19,444.75	61.73	2	6,543.90	20.77
10	7	11	6	272	3	14,297.62	53.15	3	7,509.44	27.92	3	17,796.37	66.16	0	5,662.37	20.82
11	7	12	6	274	2	15,022.34	55.23	6	7,746.81	28.91	2	19,649.25	72.24	4	5,671.00	21.00
12	7	13	6	230	4	12,800.88	56.64	7	6,586.72	29.54	5	17,696.50	78.65	2	4,779.87	21.06
13	7	14	6	180	2	10,605.49	59.58	5	5,359.19	30.62	5	15,482.91	88.47	4	3,751.41	21.31
14	7	15	6	132	1	8,130.31	62.06	2	4,158.94	31.99	2	13,303.00	102.33	4	2,762.31	21.58
15	7	16	6	82	0	5,312.43	64.79	2	2,663.70	33.30	1	9,267.87	114.42	1	1,766.03	21.80
16	7	17	6	29	1	1,844.62	65.88	2	916.61	33.95	1	3,361.00	120.04	1	617.74	22.06
17	7	18	6	10	0	679.62	67.96	0	353.62	35.36	0	1,359.00	135.90	0	220.99	22.10
18	7	19	6	11	0	742.36	67.49	0	380.12	34.56	1	1,283.25	128.33	0	244.62	22.24
19	11	20	0	2	0	137.62	68.81	0	71.50	35.75	0	296.50	148.25	0	43.25	21.63
				2,267	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XVIII.—*Dull boys, American parents.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	3	5	6	5	0	216.25	43.25	0	123.00	24.60	0	216.75	43.35	0	98.00	19.60
5	7	6	6	24	1	1,034.04	44.96	1	569.49	24.76	2	988.75	44.94	1	470.72	20.47
6	7	7	6	69	2	3,060.33	45.68	2	1,674.38	24.99	2	3,149.75	47.01	1	1,381.91	20.32
7	7	8	6	73	2	3,365.47	47.40	0	1,873.05	25.66	2	3,640.00	51.27	1	1,459.61	20.27
8	7	9	6	80	2	3,902.59	50.03	1	2,111.85	26.73	1	4,465.00	56.52	1	1,618.10	20.48
9	7	10	6	81	2	4,057.22	51.36	2	2,145.40	27.16	0	4,976.75	61.44	3	1,603.18	20.55
10	7	11	6	78	3	3,981.79	53.09	2	2,126.59	27.98	1	5,005.75	65.01	1	1,588.68	20.63
11	7	12	6	93	1	5,045.12	54.84	3	2,583.22	28.70	2	6,550.35	71.98	1	1,914.66	20.81
12	7	13	6	97	1	5,438.30	56.65	1	2,830.08	29.48	0	7,636.33	78.73	0	2,020.72	20.83
13	7	14	6	98	0	5,866.19	59.86	4	2,894.29	30.79	1	8,740.62	90.11	1	2,042.97	21.06
14	7	15	6	87	1	5,297.69	61.60	3	2,663.22	31.71	1	8,692.75	101.08	1	1,833.43	21.32
15	7	16	6	66	3	4,035.48	64.06	5	2,002.84	32.83	1	7,298.75	112.29	2	1,379.05	21.55
16	7	17	6	32	0	2,061.23	64.41	2	1,002.36	33.41	0	3,630.00	113.44	0	689.98	21.56
17	7	18	2	8	0	520.37	65.05	1	237.99	34.00	0	967.50	120.94	0	173.62	21.70
18	11	20	9	4	0	267.25	66.81	0	138.62	34.66	0	546.00	136.50	0	89.00	22.25
				895	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XIX.—*Average boys, American parents.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Inch.*		*Inches.*	*Inch.*		*Pounds.*	*Lbs.*		*Inches.*	*Inch.*
5	7	6	6	36	0	1,606.97	44.64	1	869.60	24.85	1	1,575.50	45.01	..	727.40	20.21
6	7	7	6	175	4	7,888.19	46.13	4	4,306.77	25.19	0	8,411.62	48.07	1	3,541.70	20.35
7	7	8	6	285	2	13,571.19	47.95	2	7,341.26	25.94	0	14,751.50	51.76	0	5,852.05	20.53
8	7	9	6	286	3	14,091.07	49.79	1	7,565.81	26.55	1	16,007.25	56.17	3	5,836.97	20.63
9	7	10	6	305	2	15,643.47	51.63	0	8,290.82	27.18	0	18,735.77	61.43	2	6,285.94	20.75
10	7	11	6	320	4	16,822.85	53.24	2	8,896.94	27.98	1	21,180.75	66.40	1	6,650.89	20.85
11	7	12	6	389	7	21,074.45	55.17	0	11,180.85	28.74	0	28,469.25	73.19	0	8,130.98	20.90
12	7	13	6	360	5	20,133.62	56.71	12	10,228.70	29.39	3	28,537.87	79.94	0	7,545.90	20.96
13	7	14	6	311	1	18,287.01	58.99	9	9,240.47	30.60	0	27,517.66	88.48	2	6,571.33	21.27
14	7	15	6	186	0	11,497.78	61.82	4	5,757.48	31.63	1	18,468.62	99.83	2	3,937.23	21.40
15	7	16	6	119	1	7,564.55	64.11	3	3,841.38	33.12	1	13,485.25	114.28	1	2,553.72	21.64
16	7	17	6	59	0	3,944.21	66.85	1	2,001.33	34.51	0	7,429.55	125.92	0	1,294.66	21.94
17	7	18	5	20	0	1,348.11	67.41	1	665.66	35.03	0	2,689	134.45	0	438.11	21.91
18	9	19	4	7	0	468.62	66.95	0	240	34.29	0	962	137.43	0	158.37	22.62
20	1	21	7	4	0	278.50	69.63	0	145.62	36.41	0	572.25	143.06	0	90.25	22.56
				2,862	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XX.—*Bright boys belonging to nonlaboring classes, of American parentage.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.a	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	8	6	6	27	0	170 11	6 4	0	1,215.36	45.01	0	676.25	25.06
6	7	7	6	102	0	718 10	7 1	1	4,641.31	45.95	2	2,508.46	25.08
7	7	8	6	137	0	1,096 4	8 0	0	6,583.68	48.06	0	3,552.04	25.93
8	7	9	6	162	0	1,463 4	9 0	1	8,021.19	49.82	0	4,326.88	26.71
9	7	10	6	176	0	1,768 7	10 1	0	9,155.1	52.02	3	4,746.1	27.43
10	7	11	6	172	0	1,894 1	11 0	0	9,184.4	53.40	3	4,728.5	27.98
11	7	12	6	162	0	1,947 9	12 0	1	8,923.5	55.43	5	4,558.6	29.04
12	7	13	6	142	0	1,848 1	13 0	4	7,830.9	56,75	7	3,972.0	29.42
13	7	14	6	123	0	1,721 10	14 0	1	7,286.51	59.73	2	3,723.09	30.77
14	7	15	6	93	0	1,396 1	15 0	1	5,746.71	62.46	1	2,960.57	32.18
15	7	16	6	61	0	977 10	16 0	0	3,994.45	65.48	1	2,015.21	33.85
				1,357	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.b			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	8	6	6	0	1,197.98	44.37	0	1,255.50	46.50	0	546.09	20.23
6	7	7	6	2	4,552.60	45.53	3	4,718.25	47.66	2	2,055.70	20.56
7	7	8	6	3	6,379.73	47.61	0	7,026.75	51.29	0	2,824.19	20.61
8	7	9	6	0	8,049.42	49.69	1	9,130.00	56.71	3	3,287.16	20.67
9	7	10	6	3	8,975.9	51.88	1	10,785.00	61.63	1	3,644.00	20.82
10	7	11	6	2	9,089.6	53.47	3	11,217.00	66.37	0	3,590.2	20.87
11	7	12	6	0	8,971.3	55.38	1	11,587.00	71.97	2	3,369.2	21.06
12	7	13	6	0	8,133.5	57.28	4	10,772.00	78.06	2	2,950.2	21.07
13	7	14	6	5	7,153.48	60.62	4	10,633.41	89.36	3	2,567.20	21.39
14	7	15	6	1	5,822.11	63.28	2	9,432.25	103.65	3	1,945.33	21.61
15	7	16	6	0	4,075.87	66.82	1	6,995.25	116.59	1	1,305.42	21.76

a The average age is given in a number of tables.
b Arm reach is here given and in a number of tables; but the difficulty of getting this measurement exact is practically very great. We have given these measurements, although we have not utilized them.

TABLE XXI.—*Dull boys, American parents, nonlaboring classes.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	7	7	5	24	....	169 8	7 1	0	1,090.36	45.43	2	544.47	24.75
7	7	8	6	23	....	188 3	8 2	1	1,034.74	47.03	0	588.86	25.6
8	7	9	6	26	....	238 7	9 2	0	1,320.11	50.77	1	671.49	26.86
9	7	10	6	33	....	335 7	10 2	0	1,713.12	51.91	2	851.62	27.47
10	7	11	6	34	....	376 4	11 1	1	1,774.80	53.78	1	935.50	28.35
11	7	12	6	44	....	535 0	12 2	0	2,440.44	55.46	1	1,250.85	29.09
12	7	13	6	39	....	515 9	13 3	0	2,231.55	57.22	1	1,128.48	29.7
13	7	14	6	54	....	766 3	14 2	0	3,259.47	60.36	3	1,580.57	30.99
14	7	15	6	47	....	710 2	15 1	1	2,880.47	62.62	2	1,456.86	32.37
15	7	16	6	34	....	548 2	16 1	0	2,219.62	65.28	2	1,076.74	33.65
				358	....	.....	.....	....	.....	.....	....	.....	.....

TABLE XXI.—*Dull boys, American parents, nonlaboring classes*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	5	0	1,065.98	44.42	1	1,064.00	46.26	1	469.52	20.41
7	7	8	6	1	1,027.36	46.70	1	1,101.00	50.05	0	465.60	20.24
8	7	9	6	1	1,279.12	51.16	0	1,507.25	57.97	1	514.98	20.60
9	7	10	6	0	1,717.36	52.04	0	2,067.25	62.64	1	657.10	20.53
10	7	11	6	1	1,774.12	53.76	1	2,198.25	66.61	1	680.60	20.62
11	7	12	6	0	2,472.36	56.19	0	3,243.50	73.72	0	918.59	20.88
12	7	13	6	2	2,131.31	57.60	0	3,188.00	81.74	0	829.10	21.26
13	7	14	6	0	3,286.12	60.85	0	4,992.00	92.44	0	1,141.56	21.14
14	7	15	6	2	2,855.74	63.46	1	4,861.25	105.68	1	984.84	21.41
15	7	16	6	0	2,262.12	66.53	0	3,926.00	115.47	0	732.90	21.56

TABLE XXII.—*Average (in general) boys, nonlaboring classes, American parentage.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Arm reach.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Y.	*M.*	*Y.*	*M.*			*Inches.*	*In.*		*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	7	7	6	79	0	3,654.71	46.26	4	1,902.84	25.37	4	3,419.83	45.60	0	3,795.25	48.04	0	1,608.61	20.36
7	7	8	6	118	1	5,615.94	48.00	0	3,059.96	25.93	2	5,505.71	47.46	0	6,074.25	51.48	0	2,417.26	20.49
8	7	9	6	125	1	6,197.21	49.98	1	3,312.06	26.71	2	6,124.57	49.79	0	7,045.75	56.37	1	2,566.11	20.69
9	7	10	6	144	1	7,449.08	52.09	0	3,939.22	27.36	1	7,408.63	51.81	0	8,968.50	62.28	0	2,999.17	20.83
10	7	11	6	142	0	7,626.20	53.71	1	3,981.39	28.24	2	7,517.23	53.69	1	9,491.76	67.32	0	2,972.93	20.94
11	7	12	6	188	4	10,181.37	55.35	0	5,428.91	28.88	3	10,272.59	55.53	0	13,861.00	73.73	0	3,952.69	21.02
12	7	13	6	165	2	9,291.71	57.00	5	4,720.43	29.50	3	9,292.63	57.36	0	13,323.37	80.75	0	3,462.86	20.99
13	7	14	6	181	1	10,712.71	59.52	4	5,458.03	30.84	1	10,788.45	59.94	0	16,155.16	89.26	2	3,819.66	21.34
14	7	15	6	119	0	7,426.09	62.40	3	3,695.38	31.86	2	7,373.84	63.02	1	12,157.12	103.03	1	2,540.21	21.53
15	7	16	6	74	1	4,700.05	64.38	0	2,451.97	33.13	0	4,890.12	66.08	1	8,367.50	114.62	0	1,602.51	21.66
16	7	17	6	43	0	2,890.22	67.21	0	1,493.84	34.74	1	2,901.61	69.09	0	5,520.25	128.38	0	945.91	22.00
				1,378	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXIII.—*Bright boys, American parents, laboring classes.*

Limits of different ages.				Total number of pupils.	Age.				Height.			Sitting height.		
From—		To—			Number omitted.	Total.		Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.*	*Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	8	6	6	11	....	68	3	6 2	0	485.37	44.12	0	268.37	24.40
6	7	7	6	58	....	409	6	7 6	0	2,642.71	45.56	0	1,446.48	24.94
7	7	8	6	112	....	900	9	8 3	0	5,311.48	47.42	1	2,842.92	25.61
8	7	9	6	119	....	1,071	1	9 1	1	5,829.20	49.40	2	3,103.08	26.52
9	7	10	6	141	....	1,414	5	10 5	1	7,202.81	51.45	4	3,728.94	27.22
10	7	11	6	100	....	1,104	10	11 4	3	5,113.22	52.71	0	2,780.94	27.81
11	7	12	6	112	....	1,355	0	12 0	1	6,098.84	54.94	1	3,188.21	28.72
12	7	13	6	88	....	1,141	3	13 0	0	4,969.98	56.48	0	2,614.72	29.71
13	7	14	6	57	....	793	7	14 2	1	3,318.98	59.27	3	1,636.10	30.30
14	7	15	6	39	....	587	9	15 0	0	2,383.60	61.12	1	1,198.37	31.54
15	7	16	5	21	....	336	2	16 0	0	1,317.98	62.76	1	648.49	32.42
				858	....	.....		.....	....	.....	.....	....	.....	.....

TABLE XXIII.—*Bright boys, American parents, laboring classes*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	8	6	6	0	468.12	42.56	0	487.25	44.30	0	220.49	20.04
6	7	7	6	0	2,606.24	44.94	2	2,640.25	47.15	1	1,163.97	20.42
7	7	8	6	2	5,163.95	46.95	0	5,639.62	50.80	1	2,275.27	20.50
8	7	9	6	1	5,780.58	48.99	1	6,521.62	55.27	2	2,415.50	20.65
9	7	10	6	0	7,255.81	51.46	1	8,659.75	61.86	1	2,899.90	20.71
10	7	11	6	1	5,212.23	52.65	0	6,579.37	65.79	0	2,072.17	20.72
11	7	12	6	0	6,137.45	54.80	1	8,062.25	72.63	2	2,301.80	20.93
12	7	13	6	1	4,897.97	56.30	1	6,924.50	79.59	1	1,829.67	21.03
13	7	14	6	1	3,367.23	60.13	1	4,849.50	86.60	1	1,184.21	21.15
14	7	15	6	0	2,427.87	62.25	0	3,870.75	99.25	1	816.98	21.50
15	7	16	5	0	1,335.87	63.61	0	2,272.62	108.22	0	460.61	21.93

TABLE XXIV.—*Dull boys, American parents, laboring classes.*

Limits of different ages.				Total number of pupils.	Age.				Height.			Sitting height.		
From—		To—			Number omitted.	Total.		Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.*	*Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	7	7	6	45	....	319	9	7 1	2	1,969.97	45.81	0	1,129.91	25.11
7	7	8	6	50	....	402	5	8 0	1	2,330.73	47.57	0	1,284.19	25.68
8	7	9	6	54	....	488	5	9 0	2	2,582.48	49.66	0	1,440.36	26.67
9	7	10	6	48	....	482	11	10 4	2	2,344.10	50.96	0	1,293.78	26.95
10	7	11	6	44	....	490	6	11 1	2	2,206.99	52.55	1	1,191.09	27.70
11	7	12	6	49	....	595	3	12 1	1	2,604.68	54.26	2	1,332.37	28.35
12	7	13	6	58	....	769	2	13 2	1	3,206.72	56.26	0	1,701.60	29.34
13	7	14	6	44	....	625	0	14 2	0	2,606.72	59.24	1	1,313.72	30.55
14	8	15	6	40	....	605	3	15 1	0	2,417.22	60.43	1	1,206.36	30.93
15	7	16	6	32	....	512	7	16 0	3	1,815.86	62.62	3	926.10	31.93
				464	....									

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	6	0	2,042.12	45.38	1	2,085.75	47.40	0	912.39	20.28
7	7	8	6	1	2,320.74	47.36	1	2,539.00	51.82	1	994.01	20.29
8	7	9	6	1	2,605.09	49.15	1	2,957.75	55.81	0	1,103.12	20.43
9	7	10	6	2	2,412.23	52.44	0	2,909.50	60.61	2	946.08	20.57
10	7	11	6	1	2,238.16	52.05	0	2,807.50	63.81	0	908.08	20.64
11	7	12	6	1	2,606.24	54.30	2	3,306.85	70.36	1	996.07	20.75
12	7	13	6	1	3,207.70	56.28	0	4,448.33	76.70	1	1,191.62	20.91
13	7	14	6	0	2,592.11	58.91	1	3,748.62	87.18	1	901.41	20.96
14	8	15	6	2	2,343.37	61.67	0	3,831.50	95.79	0	848.59	21.21
15	7	16	6	3	1,851.99	63.86	1	3,372.75	108.80	2	646.15	21.54

TABLE XXV.—*Average boys (white) belonging to the laboring classes, American parentage.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	7	7	6	96	0	686 0	7 0	4	4,233.48	46.02	0	2,403.93	25.04
7	7	8	6	167	0	1367 4	8 1	1	7,955.25	47.92	2	4,281.30	25.95
8	7	9	6	161	0	1,473 2	9 1	2	7,893.86	49.65	0	4,253.75	26.42
9	7	10	6	161	0	1,626 0	10 0	1	8,194.39	51.21	0	4,351.60	27.03
10	7	11	6	178	0	1,983 2	11 1	4	9,196.65	52.85	1	4,915.55	27.77
11	7	12	6	201	0	2,444 0	12 1	3	10,893.08	55.02	0	5,751.94	28.62
12	7	13	6	195	0	2,555 6	13 1	3	10,841.91	56.47	7	5,508.27	29.30
13	7	14	6	130	0	1,837 8	14 1	0	7,574.30	58.26	5	3,781.44	30.25
14	7	15	6	67	0	1,001 2	15 0	0	4,071.69	60.77	1	2,062.10	31.24
15	7	16	6	45	0	721 4	16 0	0	2,864.50	63.66	3	1,389.41	33.08
16	7	17	6	16	0	272 1	17 0	0	1,053.99	65.87	1	507.49	33.83
				1,417	...	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	6	3	4,268.62	45.90	0	4,616.37	48.09	1	1,933.09	20.35
7	7	8	6	2	7,814.48	47.36	0	8,677.25	51.96	0	3,434.79	20.57
8	7	9	6	4	7,769.76	49.49	1	8,961.50	56.01	2	3,270.86	20.57
9	7	10	6	1	8,094.96	50.59	0	9,767.27	60.67	2	3,286.77	20.67
10	7	11	6	6	9,033.35	52.52	0	11,688.99	65.67	1	3,677.96	20.78
11	7	12	6	3	10,900.03	55.05	0	14,608.25	72.68	0	4,178.29	20.79
12	7	13	6	5	10,769.67	56.68	3	15,214.50	79.24	0	4,083.04	20.94
13	7	14	6	6	7,284.98	58.75	0	11,362.50	87.40	0	2,751.67	21.17
14	7	15	6	2	3,999.22	61.53	0	6,311.50	94.20	1	1,397.02	21.17
15	7	16	6	0	2,906.12	64.58	0	5,117.75	113.73	1	951.21	21.62
16	7	17	6	0	1,072.25	67.02	0	1,909.30	119.33	0	348.75	21.80

TABLE XXVI.—*Bright boys, not socially divided.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	0	6	6	6	....	37 05	6 02	0	271.25	45.02	0	147.56	24.58
6	8	7	6	22	....	153 08	7 02	0	1,013.50	46.06	1	527.74	25.13
7	8	8	6	43	....	348 07	8 01	1	1,939.35	47.06	1	1,039.35	25.46
8	7	9	6	53	....	495 00	9 03	0	2,622.65	49.46	0	1,394.84	26.31
9	7	10	6	39	....	392 00	10 00	0	1,985.53	50.91	0	1,050.85	26.94
10	7	11	6	26	....	291 05	11 02	0	1,366.74	52.56	0	721.35	27.74
11	7	12	6	37	....	445 07	12 04	0	2,045.12	55.27	0	1,062.24	28.07
12	7	13	6	45	....	589 01	13 00	0	2,536.48	56.36	0	1,313.86	29.19
13	7	14	6	29	....	408 08	14 00	0	1,624.85	56.02	0	889.10	30.60
14	7	15	6	23	....	347 02	15 00	0	1,443.36	63.18	0	773.25	33.61
15	7	16	5	11	....	176 09	16 00	0	715.12	65.01	0	369.49	33.59
16	7	17	5	6	....	102 03	17 00	0	374.25	62.37	0	198.25	33.04
17	7	18	6	4	....	72 1	18 00	0	267.75	66.94	0	139.50	34.88
18	7	19	5	5	....	95 0	19 00	0	342.50	68.05	0	173.50	34.69
				349	....	.....	.....	....	.....	.....	....	.....	.....

TABLE XXVI.—*Bright boys, not socially divided*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	0	6	6	0	269.00	44.83	0	272.50	45.41	0	123.12	20.52
6	8	7	6	1	956.00	45.52	1	1,049.50	49.97	0	451.36	20.51
7	8	8	6	1	1,991.37	47.41	1	2,121.75	50.51	2	842.84	20.55
8	7	9	6	0	2,610.23	49.24	0	2,927.50	55.23	1	1,067.33	20.52
9	7	10	6	0	2,002.98	51.35	0	2,364.87	60.63	0	806.97	20.69
10	7	11	6	0	1,378.98	53.03	0	1,725.75	66.37	0	544.78	20.95
11	7	12	6	0	2,061.62	55.71	0	2,742.75	74.12	0	773.72	20.91
12	7	13	6	0	2,542.74	56.05	0	3,545.90	78.79	0	950.96	21.13
13	7	14	6	0	1,725.87	59.51	0	2,541.75	87.64	0	608.49	20.98
14	7	15	6	0	1,478.12	64.26	0	2,424.00	105.39	1	477.50	21.07
15	7	16	5	0	723.62	65.78	0	1,332.50	121.13	0	240.65	21.87
16	7	17	5	0	381.50	63.58	0	687.00	114.05	0	133.12	22.18
17	7	18	6	0	276.75	69.18	1	400.50	133.50	0	88.75	22.19
18	7	19	5	0	360.75	72.15	0	659.50	131.09	0	113.12	22.62

TABLE XXVI A.—*Bright boys, American parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
16	7	17	6	29	0	495 4	17	1	1,844.62	65.88	2	916.61	33.95
17	7	18	6	10	0	180 1	18	0	679.62	67.96	0	353.62	35.36
18	7	19	5	6	0	113 2	19 2	0	399.86	66.64	0	206.62	34.44
18	7	19	5	5	0	95 0	19	0	342.50	68.50	0	173.50	34.70
19	11	20	0	2	0	.....	.....	0	137.62	68.81	0	71.50	35.75
				52	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
16	7	17	6	1	1,885.49	67.34	1	3,361.00	120.04	1	617.74	22.06
17	7	18	6	0	694.62	69.46	0	1,359.00	135.90	0	220.99	22.10
18	7	19	5	1	348.50	69.70	1	623.75	124.75	0	131.50	21.92
18	7	19	5	1	282.75	70.69	0	659.50	131.90	0	113.12	22.62
19	11	20	0	0	144.50	72.25	0	296.50	148.25	0	43.25	21.63

TABLE XXVII.—*Dull boys, American parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	3	5	6	5	0	216.25	43.25	0	123.00	24.60
5	7	6	6	24	1	1,034.04	44.96	1	569.49	24.76
16	7	17	5	32	0	2,061.23	64.41	2	1,002.36	33.41
17	7	18	2	8	0	520.37	65.05	1	237.99	34.00
18	11	20	9	4	0	267.25	66.81	0	138.62	34.66
				73	.....	.....	.....	.....	.....	.....

TABLE XXVII.—*Bright boys, American parents, not socially divided*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	3	5	6	2	137.00	45.67	0	216.75	43.35	0	98.00	19.60
5	7	6	6	2	980.48	44.57	2	988.75	44.94	1	470.72	20.47
16	7	17	5	0	2,101.00	65.66	0	3,630.00	113.44	0	689.98	21.56
17	7	18	2	0	524.62	65.58	0	967.50	120.94	0	173.62	21.70
18	11	20	9	0	275.50	68.88	0	546.00	136.50	0	89.00	22.25

TABLE XXVIII.—*Average boys, American parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	7	6	6	36	0	1,606.97	44.64	1	869.60	24.85
17	7	18	5	20	0	1,348.11	67.41	1	665.66	35.03
18	9	19	4	7	0	468.62	66.95	0	240.00	34.29
20	1	21	7	4	0	278.50	69.63	0	115.62	36.41
				67						

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	7	6	6	1	1,536.86	43.91	1	1,575.50	45.01	0	727.40	20.21
17	7	18	5	1	1,307.99	68.84	0	2,689.00	134.45	0	438.11	21.91
18	9	19	4	1	408.50	68.08	0	962.00	137.43	0	158.37	22.62
20	1	21	7	0	284.00	71.00	0	572.25	143.06	0	90.25	22.56

TABLE XXIX.—*Bright boys, foreign parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	6	0	271.25	45.21	0	147.50	24.58	0	272.50	45.42	0	124.12	20.69
6	8	7	6	22	0	1,013.50	46.07	1	527.74	25.13	1	1,049.50	49.98	0	451.36	20.52
7	7	8	6	43	1	1,999.35	47.60	2	1,056.35	25.76	1	2,121.75	50.52	2	842.84	20.56
8	7	9	6	53	0	2,622.65	49.48	0	1,394.84	26.32	0	2,907.50	54.86	1	1,067.33	20.53
9	7	10	6	39	0	1,985.53	50.91	0	1,050.85	26.94	0	2,364.87	60.64	0	806.97	20.69
10	7	11	6	26	0	1,366.74	52.57	1	688.35	27.53	0	1,725.75	66.38	0	544.78	20.95
11	7	12	6	37	0	2,045.12	55.27	0	1,062.24	28.71	0	2,742.75	74.13	0	773.72	20.91
12	7	13	6	45	0	2,536.48	56.37	1	1,287.86	29.27	0	3,546.00	78.80	0	950.96	21.13
13	7	14	6	29	0	1,694.85	58.44	1	854.10	30.50	0	2,541.75	87.65	0	608.49	20.98
14	7	15	6	23	0	1,444.36	62.80	1	709.75	32.26	0	2,424.00	105.39	1	477.50	21.70
15	7	16	6	11	0	715.12	65.01	0	369.49	33.59	0	1,332.50	121.14	0	240.75	21.89
16	7	17	6	6	1	321.00	64.20	0	198.25	33.04	0	768.00	114.50	0	133.12	22.19
17	7	18	6	4	0	267.75	66.94	0	139.50	34.88	1	400.50	133.50	0	88.75	22.19
18	7	19	6	5	0	342.50	68.50	0	173.50	34.70	0	659.50	131.90	0	113.12	22.62
				349												

TABLE XXX.—*Dull boys, foreign parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	0	6	6	10	....	63 0	6 3	0	437.74	43.77	0	238.25	23.83
6	7	7	6	21	....	150 6	7 1	2	856.11	44.11	1	503.61	25.18
7	7	8	6	16	....	131 3	8 2	0	761.85	47.62	0	415.60	25.98
8	7	9	4	9	....	82 9	9 2	1	396.74	49.59	1	234.62	29.33
9	7	10	6	15	....	152 0	10 1	0	782.12	52.14	0	409.99	27.33
10	10	11	6	10	....	112 4	11 2	0	525.62	52.56	0	276.87	27.69
11	7	12	6	20	....	243 6	12 1	0	1,100.99	55.05	0	572.49	28.62
12	8	13	6	17	....	224 4	13 2	1	917.12	57.32	0	503.87	29.64
13	7	14	5	26	....	366 4	14 0	2	1,405.86	58.58	4	664.00	30.18
14	7	15	4	16	....	239 6	14 9	0	938.74	58.67	2	432.25	30.88
15	8	16	6	9	....	145 3	16 1	0	567.24	63.03	0	287.25	31.92
16	10	18	1	7	....	122 4	17 4	0	462.37	66.05	0	239.74	34.25
				176	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	0	6	6	1	398.62	44.29	0	454.50	45.45	0	198.75	19.88
6	7	7	6	1	903.74	45.19	0	989.75	47.13	0	423.73	20.18
7	7	8	6	0	757.12	47.32	0	818.50	51.16	1	304.49	20.30
8	7	9	4	1	399.75	49.97	1	471.50	58.94	0	183.42	20.38
9	7	10	6	1	720.53	51.50	0	931.50	62.10	1	288.99	20.64
10	10	11	6	0	527.87	52.79	0	655.25	65.53	0	205.37	20.54
11	7	12	6	0	1,099.86	54.99	0	1,511.00	75.55	0	418.24	20.91
12	8	13	6	0	970.25	57.07	0	1,385.75	81.51	1	335.11	20.94
13	7	14	5	1	1,482.36	59.29	0	2,241.50	86.21	1	523.71	20.95
14	7	15	4	0	964.12	60.26	0	1,454.75	90.92	0	339.85	21.24
15	8	16	6	0	577.25	64.14	0	925.12	102.79	0	193.00	21.44
16	10	18	1	0	456 37	65.20	0	848.25	121.18	0	152.37	21.77

TABLE XXXI.—*Average boys, foreign parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Arm reach.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Y.	*M.*	*Y.*	*M.*			*Inches.*	*In.*		*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	9	0	395.37	43.93	0	213.74	23.75	0	389.00	43.22	0	397.25	44.14	0	184.37	20.49
6	7	7	6	24	2	1,018.85	46.31	1	574.97	25.00	1	1,058.87	46.04	0	1,125.00	46.88	1	466.85	20.30
7	8	8	6	41	1	1,926.85	48.17	0	1,067.97	26.05	1	1,909.73	47.74	1	2,120.12	53.00	0	840.92	20.51
8	7	9	6	54	0	2,709.44	50.17	3	1,360.73	26.68	0	2,705.24	50.10	0	3,158.00	58.48	0	1,117.71	20.70
9	7	10	6	50	0	2,646.03	52.92	1	1,329.22	27.13	2	2,501.29	52.11	1	3,061.50	62.48	1	1,015.46	20.72
10	7	11	6	66	1	3,463.41	53.28	1	1,819.62	27.99	2	3,377.60	52.78	0	4,475.87	67.82	1	1,355.59	20.86
11	7	12	6	70	0	3,841.16	54.87	1	1,969.66	28.55	1	3,813 80	55.27	0	5,029.75	71.85	0	1,477.22	21.10
12	7	13	6	61	1	3,413.51	56.89	2	1,734.60	29.40	2	3,378.87	57.27	0	4,885.50	80.09	2	1,245.60	21.11
13	7	14	6	60	1	3,415.95	57.90	2	1,723.71	29.72	0	3,536.49	58.94	0	5,175.87	86.26	1	1,246.08	21.12
14	7	15	6	34	0	2,088.72	61.43	2	1,001.98	31.31	2	1,983.99	62.00	0	3,430.50	100.90	0	730.90	21.50
15	7	16	6	25	0	1,603.84	64.15	0	815.86	32.63	0	1,646.05	65.84	1	2,636.87	109.87	0	545.47	21.82
16	9	17	6	11	0	743.74	67.61	0	379.37	34.49	0	763.00	69.36	0	1,386.75	126.07	0	245.00	22.27
17	7	17	9	4	0	265.00	66.25	0	139.75	34.94	0	266.82	66.71	0	528.00	132.00	1	66.75	22.25
18	7	19	3	2	0	138.62	69.31	0	71.00	35.50	0	141.75	70.88	0	266.25	133.13	0	44.25	22.13
				511	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXXII.—*Bright boys, American and foreign parentage, not socially divided.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 0	6 6	9	0	56 0	6 2	0	410.87	45.65	0	224.12	24.90
6 8	7 6	23	0	165 6	7 2	1	1,014.48	46.11	1	553.72	25.17
7 7	8 6	28	0	229 7	8 2	0	1,333.99	47.64	0	749.37	26.76
8 7	9 6	50	0	456 3	9 1	1	2,426.73	49.53	3	1,245.22	26.49
9 7	10 6	36	0	366 6	10 1	0	1,875.14	52.09	0	988.86	27.47
10 7	11 6	24	0	268 2	11 1	0	1,298.73	54.11	1	648.49	28.20
11 7	12 6	38	0	462 2	12 1	0	2,093.48	55.09	4	968.73	28.49
12 7	13 6	30	0	394 3	13 1	2	1,593.86	56.92	1	848.11	29.25
13 7	14 6	18	0	253 6	14 0	0	1,053.99	58.56	0	554.36	30.80
14 7	15 5	12	0	180 9	15 0	0	754.36	62.86	0	384.25	32.02
15 7	16 5	11	0	176 1	16 0	0	721.87	65.62	1	332.50	33.25
16 11	18 4	4	0	.....	.....	0	263.25	65.81	0	136.75	34.19
		283	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.		Arm reach.			Weight.			Circumference of head.		
From—	To—	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6 0	6 6	1	365.50	45.69	1	363.25	45.41	0	181.62	20.18
6 8	7 6	0	1,047.62	45.55	0	1,092.62	47.51	0	470.86	20.47
7 7	8 6	1	1,292.50	47.87	1	1,387.50	51.39	0	577.59	20.63
8 7	9 6	1	2,406.10	49.10	1	2,696.12	55.02	0	1,035.84	20.72
9 7	10 6	1	1,814.24	51.84	1	2,141.25	61.18	0	753.35	20.93
10 7	11 6	0	1,297.98	54.08	0	1,625.50	67.73	0	501.60	20.90
11 7	12 6	0	2,100.36	55.27	0	2,706.50	71.22	1	771.35	20.85
12 7	13 6	0	1,705.99	56.87	0	2,271.62	75.72	0	629.77	20.99
13 7	14 6	1	1,012.86	59.58	0	1,518.75	84.38	0	380.61	21.15
14 7	15 5	0	762.00	63.50	0	1,228.00	102.33	0	260.62	21.72
15 7	16 5	0	739.50	67.23	0	1,343.50	122.14	0	236.99	21.54
16 11	18 4	0	275.00	68.75	0	472.25	118.06	0	87.37	21.84

TABLE XXXIII.—*Dull boys, American and foreign parentage, not socially divided.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 1	6 6	5	....	31 09	6 3	0	222.87	44.57	0	121.25	24.25
6 8	7 6	9	....	64 03	7 1	0	411.12	45.68	0	224.30	24.92
7 7	8 5	12	....	98 01	8 1	0	581.62	48.47	0	314.37	26.20
8 9	9 6	13	....	119 08	9 2	0	659.75	50.75	0	355.12	27.32
9 7	10 6	22	....	222 08	10 1	0	1,122.11	51.01	0	597.67	27.17
10 7	11 6	9	....	100 04	11 1	0	470.74	52.30	0	247.62	27.51
11 7	12 5	15	....	183 00	12 2	0	834.11	55.61	1	408.87	29.21
12 8	13 5	17	....	223 09	13 1	0	976.61	57.45	0	497.62	29.27
13 7	14 5	19	....	266 04	14 0	1	1,067.12	59.28	0	578.23	30.43
14 7	15 6	13	....	198 04	15 2	1	750.75	62.56	0	414.75	31.90
15 8	16 5	5	....	80 07	16 1	0	321.12	64.22	0	166.00	33.20
16 9	17 9	4	....	69 02	.....	0	264.62	66.16	0	142.25	35.56
		143	....	.....	.....	....	.....	.....	....	.....	.....

TABLE XXXIII.—*Dull boys, American mixed nationalities, not socially divided*—Cont'd.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	1	6	6	0	220.75	44.15	0	213.25	42.65	0	101.49	20.29
6	8	7	6	0	415.75	46.19	0	425.00	47.22	0	182.37	20.26
7	7	8	5	0	572.37	47.70	0	617.58	51.47	0	244.86	20.41
8	9	9	6	1	602.37	50.20	0	760.25	58.48	0	266.61	20.51
9	7	10	6	0	1,126.12	51.19	0	1,306.25	59.38	1	427.66	20.36
10	7	11	6	0	464.62	51.62	0	563.75	62.64	0	182.99	20.33
11	7	12	5	0	839.49	55.97	0	1,161.37	77.42	0	315.68	21.05
12	8	13	5	0	983.75	57.87	0	1,404.75	82.63	0	354.24	20.84
13	7	14	5	0	1,136.99	59.84	0	1,691.75	89.04	1	383.42	21.30
14	7	15	6	0	828.37	63.72	0	1,358.75	104.52	0	278.36	21.41
15	8	16	5	0	325.75	65.15	0	560.00	112.00	0	108.50	21.70
16	9	17	9	0	272.50	68.13	0	521.50	130.38	0	88.12	22.03

TABLE XXXIV.—*All girls.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	4	6	6	94	5	3,936.59	a44.23	1	2,254.90	a24.25	2	3,986.00	a43.33	2	1,833.17	a19.93
5	5	6	11	37	3	1,495.12	43.97	2	835.62	23.87	1	1,544.25	42.90	0	747.27	20.20
6	5	7	6	375	3	16,774.08	a45.09	8	9,060.09	a24.69	0	17,151.50	a45.74	3	7,417.21	a19.94
6	7	7	6	133	1	5,992.81	45.40	1	3,269.78	24.77	1	5,935.75	44.97	0	2,650.02	19.92
7	7	8	6	754	9	35,339.85	47.44	10	18,943.92	25.46	8	36,884.67	49.44	8	15,022.17	20.14
8	7	9	6	883	4	43,187.44	49.13	11	22,871.80	26.23	9	46,906.12	53.67	9	17,752.73	20.29
9	7	10	6	939	6	47,766.27	51.20	10	25,060.86	26.98	4	54,744.69	58.55	9	19,004.26	20.43
10	7	11	6	931	12	48,832.69	53.14	11	25,598.61	27.82	2	59,631.24	64.19	12	18,877.92	20.54
11	7	12	6	876	10	48,301.87	55.78	21	24,839 42	29.05	10	63,390.00	73.20	7	18,054.72	20.78
12	7	13	6	966	14	55,133.34	57.91	24	28,379.47	30.13	8	78,407.67	81.85	11	20,004.75	20.95
13	7	14	6	833	12	49,456.03	60.24	32	25,181.28	31.44	1	77,388.86	93.02	14	17,349.14	21.18
14	7	15	6	655	2	40,257.25	61.65	19	20,515.61	32.26	1	65,651.27	100.38	8	13,770.70	21.28
15	7	16	6	450	4	27,828.56	62.40	17	14,208.34	32.81	6	46,702.77	105.19	8	9,448.03	21.38
16	7	17	6	323	2	20,221.38	62.99	9	10,373.61	33.04	2	35,313.62	110.01	5	6,853.70	21.55
17	7	18	6	151	1	9,473.19	63.15	1	4,975.80	33.17	1	16,725.00	111.50	3	3,196.70	21.60
17	7	23	6	41	0	2,579.36	62.91	1	1,314.28	32.86	0	4,556.75	111.14	0	885.78	21.60
18	7	19	9	13	0	836.25	64.33	0	438.11	33.70	1	1,355.50	112.96	1	263.75	21.98
18	7	20	8	66	0	4,158.87	63.01	0	2,193.84	33.24	0	7,307.74	110.72	0	1,430.60	21.68
				8,520	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

a Averages chosen for use in discussion and in diagrams.

TABLE XXXV.—*All girls of American parentage.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	4	6	6	64	2	2,756.86	44.47	..	1,558.78	24.36	1	2,741.50	43.52	1	1,252.63	19.88
5	5	6	11	37	3	1,495.12	43.97	2	835.62	23.87	1	1,544.25	42.90	0	747.27	20.20
6	5	7	6	375	3	16,774.08	45.09	8	9,060.09	24.69	0	17,151.50	45.74	3	7,417.21	19.94
7	7	8	6	587	7	27,506.58	47.43	8	14,758.37	25.49	7	28,613.37	49.33	7	11,676.27	20.13
8	7	9	6	669	2	32,819.90	49.21	7	17,338.82	26.19	8	35,343.12	53.47	7	13,434.06	20.29
9	7	10	6	737	5	37,494.71	51.22	10	19,629.07	27.00	4	42,904.24	58.53	6	14,950.99	20.45
10	7	11	6	721	9	37,843.14	53.15	8	19,828.93	27.81	1	46,067.74	63.98	10	14,611.10	20.55
11	7	12	6	673	7	37,163.96	55.81	14	19,152.36	29.06	8	48,432.00	72.83	6	13,857.12	20.78
12	7	13	6	706	9	40,457.98	58.05	17	20,814.66	30.21	5	57,774.72	82.42	6	14,680.03	20.97
13	7	14	6	627	11	37,116.88	60.25	28	18,824.07	31.43	0	58,284.36	92.96	9	13,091.34	21.18
14	7	15	6	490	1	30,143.75	61.64	17	15,245.94	32.23	0	49,339.00	100.69	6	10,305.52	21.29
15	7	16	6	325	4	20,069.50	62.52	13	10,254.88	32.87	3	34,055.27	105.76	7	6,799.46	21.38
16	7	17	6	258	2	16,119.03	62.96	8	8,252.25	33.01	1	28,230.37	109.85	4	5,474.84	21.55
17	7	18	6	128	1	8,004.32	63.03	1	4,211.43	33.16	1	14,087.00	110.92	1	2,744.34	21.61
18	7	20	8	66	0	4,158.87	63.01	0	2,193.84	33.24	0	7,307.74	110.72	0	1,430.60	21.68
				6,463	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXXVI.—*Girls belonging to nonlaboring classes, of American parentage.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	5	7	6	162	1	7,323.68	45.49	5	3,881.32	24.72	0	7,378.00	45.54	1	3,221.44	20.01
7	7	8	6	259	3	12,231.40	47.78	2	6,573.53	25.58	4	12,659.75	49.65	4	5,156.11	20.27
8	7	9	6	300	1	14,759.12	49.36	2	7,843.26	26.32	1	16,120.62	53.92	4	6,029.42	20.33
9	7	10	6	351	3	17,937.35	51.54	4	9,380.27	27.03	1	20,606.37	58.88	2	7,163.85	20.52
10	7	11	6	310	3	16,441.69	53.56	4	8,525.65	27.86	1	20,072.25	64.96	4	6,310.56	20.62
11	7	12	6	335	2	18,670.89	56.07	2	9,699.97	29.13	3	24,249.25	73.04	1	6,977.90	20.89
12	7	13	6	342	3	19,813.35	58.45	7	10,173.47	30.37	2	28,635.09	84.22	3	7,137.89	21.06
13	7	14	6	304	3	18,279.80	60.73	9	9,318.74	31.59	0	28,989.11	95.36	4	6,381.72	21.27
14	7	15	6	254	0	15,669.12	61.69	7	7,966.20	32.25	0	25,535.00	100.53	5	5,307.85	21.32
15	7	16	6	195	2	12,105.74	62.72	8	6,161.56	32.95	2	20,357.65	105.48	3	4,111.99	21.42
16	7	17	6	128	0	8,086.45	63.18	4	4,107.10	33.12	0	13,913.37	108.70	2	2,726.46	21.64
17	7	18	6	63	0	3,974.73	63.09	1	2,053.34	33.12	0	7,009.50	111.26	1	1,339.31	21.60
				3,003	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXXVII.—*Girls belonging to laboring classes, of American parentage.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	7	7	6	213	2	9,450.40	44.79	3	5,178.77	24.66	0	9,773.50	45.88	2	4,195.77	19.89
7	7	8	6	328	4	15,275.18	47.15	6	8,184.84	25.42	3	15,953.62	49.09	3	6,520.16	20.06
8	7	9	6	369	1	18,060.78	49.08	5	9,495.56	26.09	7	19,222.50	53.10	3	7,404.64	20.23
9	7	10	6	386	2	19,557.36	50.93	6	10,248.80	26.97	3	22,297.87	58.21	4	7,787.14	20.39
10	7	11	6	411	6	21,401.45	52.84	4	11,303.28	27.77	0	25,995.49	63.25	6	8,300.54	20.50
11	7	12	6	338	5	18,498.07	55.55	12	9,452.39	29.00	5	24,182.75	72.62	5	6,879.22	20.66
12	7	13	6	364	6	20,644.63	57.67	10	10,641.19	30.06	3	29,139.63	80.72	3	7,542.14	20.89
13	7	14	6	323	8	18,837.08	59.80	19	9,505.33	31.27	0	29,295.25	90.70	5	6,709.62	21.10
14	7	15	6	236	1	14,474.63	61.59	10	7,279.74	32.21	0	23,804.00	100.86	1	4,997.67	21.27
15	7	16	6	130	2	7,963.76	62.22	5	4,093.32	32.75	1	13,697.62	106.18	4	2,687.47	21.33
16	7	17	6	36	0	2,271.49	63.10	1	1,157.49	33.07	0	4,125.50	114.60	1	754.37	21.55
17	7	18	6	17	1	1,012.74	63.30	0	563.87	33.17	0	1,909.00	112.29	0	364.50	21.44
				3,151	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXXVIII.—*Girls of American parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	4	6	11	101	5	4,251.98	44.29	2	2,394.40	24.19	2	4,285.75	43.29	1	1,999.90	20.00
16	7	17	6	94	2	5,761.09	62.62	3	2,987.66	32.83	1	10,191.50	109.59	1	1,994.01	21.44
17	7	18	6	48	0	3,016.85	62.85	0	1,594.22	33.21	1	5,168.50	109.97	0	1,040.53	21.68
18	7	20	8	66	0	4,158.87	63.01	0	2,193.84	33.24	0	7,307.74	110.72	0	1,430.60	21.68
				309	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XXXIX.—*Girls of foreign parents, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	8	6	6	15	2	564.12	43.39	1	331.50	23.68	1	602.00	43.00	1	274.80	19.63
6	7	7	6	64	0	2,908.34	45.44	0	1,584.22	24.75	0	2,884.75	45.07	0	1,277.47	19.96
7	7	8	6	89	1	4,161.81	47.29	1	2,241.57	25.47	0	4,425.75	49.73	0	1,788.42	20.09
8	7	9	6	114	3	5,448.62	49.09	3	2,911.26	26.23	1	6,054.00	53.58	2	2,268.79	20.26
9	7	10	6	105	1	5,300.71	50.97	0	2,811.20	26.77	0	6,144.95	58.52	3	2,074.92	20.34
10	7	11	6	101	2	5,246.34	52.99	3	2,735.47	27.91	1	6,482.25	64.82	0	2,065.93	20.45
11	7	12	6	112	3	6,060.34	55.60	5	3,112.85	29.09	1	8,371.50	75.42	1	2,308.59	20.80
12	7	13	6	112	1	6,358.70	57.29	4	3,222.35	29.84	2	8,767.20	79.70	3	2,269.39	20.82
13	7	14	6	110	1	6,574.32	60.31	3	3,381.71	31.60	1	10,198.75	93.57	4	2,245.26	21.18
14	7	15	6	73	0	4,522.56	61.95	1	2,331.34	32.38	0	7,374.02	101.01	0	1,553.50	21.28
15	7	16	6	71	0	4,398.11	61.95	1	2,290.10	32.72	1	7,242.25	103.46	1	1,494.64	21.35
16	7	17	6	31	0	1,958.73	63.18	0	1,029.24	33.20	1	3,360.25	112.01	0	673.57	21.73
17	7	23	6	41	0	2,579.36	62.91	1	1,314.28	32.86	0	4,556.75	111.14	0	885.78	21.60
				1,038	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XL.—*Girls of American and foreign parentage, not socially divided.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	9	6	6	15	1	615.61	43.97	0	364.62	24.31	0	642.50	42.83	0	305.74	20.38
6	7	7	6	69	1	3,084.47	45.36	1	1,685.56	24.79	1	3,051.00	44.87	0	1,372.55	19.89
7	7	8	6	78	1	3,671.46	47.68	1	1,943.98	25.25	1	3,845.55	49.94	1	1,557.48	20.23
8	7	9	6	100	1	4,918.92	49.69	1	2,621.72	26.48	0	5,509.00	55.09	0	2,029.83	20.30
9	7	10	6	97	0	4,970.85	51.25	0	2,620.59	27.02	0	5,695.50	58.72	0	1,978.35	20.40
10	7	11	6	109	1	5,743.21	53.18	0	3,034.21	27.84	0	7,081.25	64.97	2	2,200.89	20.57
11	7	12	6	91	0	5,072.57	55.74	2	2,574.21	28.92	1	6,586.50	73.18	0	1,889.01	20.76
12	7	13	6	148	4	8,316.66	57.75	3	4,342.46	29.95	1	11,865.75	80.72	2	3,055.33	20.93
13	7	14	6	96	0	5,764.83	60.05	1	2,975.50	31.32	0	8,905.75	92.77	1	2,012.54	21.18
14	7	15	6	92	1	5,590.94	61.44	1	2,938.33	32.29	1	8,938.25	98.22	2	1,911.68	21.24
15	7	16	6	54	0	3,360.95	62.24	3	1,663.36	32.61	2	5,405.25	103.95	0	1,153.93	21.37
16	7	17	6	34	0	2,143.62	63.05	1	1,092.12	33.09	0	3,723.00	109.50	1	705.29	21.37
17	7	18	6	23	0	1,463.87	63.86	0	764.37	33.23	0	2,638.00	114.70	2	452.36	21.54
18	7	19	9	13	0	836.25	64.33	0	438.11	33.70	1	1,355.50	112.96	1	263.75	21.98
				1,019	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLI.—*All bright girls.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	5	6	11	37	3	1,495.12	43.97	2	835.62	23.87	1	1,544.25	42.90	0	747.27	20.20
6	0	6	6	5	1	174.37	43.59	0	124.00	24.80	0	209.00	41.80	0	106.37	21.27
6	7	7	6	236	3	10,605.02	45.52	6	5,699.88	24.78	0	10,848.50	45.97	2	4,685.20	20.02
7	7	8	6	364	5	17,060.23	47.52	5	9,112.99	25.38	5	17,695.00	49.29	3	7,292.77	20.20
8	7	9	6	403	4	19,627.74	49.19	7	10,353.36	26.14	2	21,308.25	53.14	4	8,110.10	20.33
9	7	10	6	404	3	20,542.31	51.23	5	10,748.78	26.94	2	23,582.32	58.66	5	8,178.57	20.50
10	7	11	6	388	2	20,505.64	53.12	4	10,677.53	27.81	0	24,904.12	64.19	4	7,907.98	20.59
11	7	12	6	328	2	18,206.10	55.85	5	9,384.74	29.05	1	23,882.50	73.04	1	6,836.14	20.91
12	7	13	6	338	4	19,335.72	57.89	8	9,949.79	30.15	3	27,288.95	81.46	3	7,044.93	21.03
13	7	14	6	285	3	17,050.45	60.46	13	8,561.54	31.48	0	26,488.61	92.94	7	5,917.50	21.29
14	7	15	6	204	0	12,549.98	61.52	6	6,354.98	32.10	0	20,295.02	99.49	3	4,288.63	21.34
15	7	16	6	142	2	8,764.19	62.60	7	4,436.47	32.86	0	15,129.75	106.55	1	3,031.26	21.50
16	7	17	6	45	0	2,848.36	63.30	3	1,380.99	32.88	0	4,931.50	109.59	1	957.48	21.76
16	7	16	11	24	0	1,490.65	62.11	0	779.02	32.46	1	2,425.00	105.43	1	493.42	21.45
17	0	17	6	29	0	1,851.23	63.84	2	901.86	33.40	0	3,242.25	111.80	0	624.24	21.53
17	7	18	6	45	0	2,859.98	63.56	1	1,475.48	33.53	0	5,019.50	111.54	0	976.47	21.70
18	7	23	6	19	0	1,200.12	63.16	0	634.10	33.37	0	2,101.00	110.58	0	412.49	21.71
				3,296	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLII.—*All dull girls.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	4	6	6	40	3	1,618.87	43.75	1	937.50	24.04	1	1,645.00	42.18	2	745.22	19.61
6	7	7	6	41	1	1,779.85	44.50	0	996.49	24.30	1	1,783.75	44.59	0	808.47	19.72
7	7	8	6	68	1	3,178.32	47.44	2	1,698.21	25.73	1	3,381.89	50.47	1	1,334.35	19.92
8	7	9	6	62	0	3,045.94	49.13	1	1,605.33	26.32	1	3,328.50	54.57	0	1,258.68	20.30
9	7	10	6	62	2	3,093.98	51.57	0	1,690.49	27.27	0	3,712.50	59.88	1	1,234.25	20.23
10	7	11	6	86	2	4,450.75	52.99	2	2,360.35	28.10	0	5,525.25	64.25	3	1,689.86	20.36
11	7	12	6	82	1	4,519.95	55.80	2	2,335.59	29.19	1	5,992.25	73.98	1	1,658.48	20.48
12	7	13	6	113	2	6,389.82	57.57	5	3,233.43	29.94	1	8,996.12	80.32	1	2,325.71	20.77
13	7	14	6	101	1	5,950.58	59.51	1	3,128.05	31.28	1	8,960.75	89.61	1	2,093.29	20.93
14	7	15	6	112	2	6,803.06	61.85	3	3,542.94	32.50	0	11,431.00	102.06	1	2,361.63	21.28
15	7	16	6	55	0	3,391.00	61.65	1	1,749.48	32.40	1	5,516.37	102.16	0	1,168.02	21.24
16	7	17	6	60	2	3,614.46	62.32	1	1,940.27	32.89	0	6,576.00	109.60	0	1,283.72	21.40
17	7	18	6	25	0	1,567.24	62.69	0	827.98	33.12	1	2,608.75	108.70	0	538.42	21.54
18	9	19	9	8	0	509.75	63.72	0	268.75	33.59	0	855.49	106.94	0	171.87	21.48
18	4	20	7	2	0	128.00	64.00	0	61.25	30.63	0	230.00	115.00	0	43.25	21.63
				917	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLIII.—*All average girls.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	6	6	6	49	1	2,143.35	44.65	0	1,193.40	24.36	1	2,132.00	44.42	0	981.58	20.03
6	7	7	6	231	0	10,382.02	44.94	3	5,633.50	24.71	0	10,455.00	45.26	1	4,573.56	19.89
7	7	8	6	322	3	15,101.30	47.34	3	8,132.72	25.49	2	15,807.87	49.40	4	6,395.05	20.11
8	7	9	6	418	2	20,513.76	49.31	3	10,913.11	26.30	6	22,269.37	54.05	5	8,363.95	20.25
9	7	10	6	473	1	24,129.98	51.12	5	12,621.59	26.97	2	27,449.87	58.28	3	9,591.44	20.41
10	7	11	6	457	8	23,876.30	53.18	5	12,560.73	27.79	2	29,201.87	64.18	5	9,280.08	20.53
11	7	12	6	465	7	25,514.32	55.71	14	13,087.59	29.02	8	33,419.75	73.13	5	9,539.10	20.74
12	7	13	6	515	8	29,407.80	58.00	11	15,196.25	30.15	4	42,122.60	82.43	7	10,634.11	20.93
13	7	14	6	447	8	26,455.00	60.26	18	13,491.69	31.45	0	41,939.50	93.82	6	9,338.35	21.18
14	7	15	6	339	0	20,904.21	61.66	10	10,617.69	32.27	1	33,925.25	100.37	4	7,120.44	21.26
15	7	16	6	253	2	15,673.37	62.44	9	8,022.39	32.88	5	26,056.65	105.07	7	5,248.75	21.34
16	7	17	6	165	0	10,416.68	63.13	3	5,371.47	33.16	1	18,138,87	110.60	3	3,494.84	21.57
17	7	18	6	109	1	6,821.46	63.16	1	3,567.70	33.03	0	12,263.00	112.50	3	2,287.56	21.58
18	7	19	10	52	0	3,287.50	63.22	0	1,730.65	33.28	1	5,698.75	111.74	1	1,107 78	21.72
19	7	20	8	9	0	555.62	61.74	0	295.62	32.85	0	970.00	107.78	0	195.99	21.78
				4,304	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLIV.—*Bright girls, American parents.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	5	6	11	37	3	1,495.12	43.97	2	835.62	23.87	1	1,544.25	42.90	0	747.27	20.20
6	7	7	6	171	3	7,648.80	45.53	5	4,115.44	24.79	0	7,899.25	46.19	2	3,380.27	20.00
7	7	8	6	291	4	13,641.12	47.53	5	7,275.52	25.44	4	14,124.50	49.21	3	5,816.70	20.20
8	7	9	6	307	2	15,003.76	49.19	5	7,887.89	26.12	1	16,262.75	53.15	4	6,167.70	20.36
9	7	10	6	320	3	16,252.96	51.27	5	8,491.75	26.96	2	18,624.62	58.57	3	6,499.63	20.50
10	7	11	6	308	1	16,318.79	53.16	2	8,504.05	27.79	0	19,770.12	64.19	3	6,285.04	20.61
11	7	12	6	253	1	14,084.52	55.89	3	7,260.26	29.04	1	18,299.25	72.62	1	5,266.27	20.90
12	7	13	6	262	2	15,087.01	58.03	4	7,797.14	30.22	0	21,431.00	81.80	2	5,474.42	21.06
13	7	14	6	230	3	13,701.47	60.36	13	6,824.06	31.45	0	21,216.86	92.25	5	4,789.12	21.28
14	7	15	6	157	0	9,669.29	61.59	6	4,852.51	32.14	0	15,716.50	100.11	2	3,307.03	21.34
15	7	16	6	109	2	6,708.95	62.70	6	3,390.85	32.92	0	11,689.75	107.25	1	2,319.31	21.48
16	7	17	6	89	0	5,632.25	63.28	5	2,768.62	32.96	1	9,637.00	109.51	2	1,881.40	21.63
17	7	18	6	30	0	1,896.98	63.23	0	1,002.11	33.40	0	3,347.25	111.58	0	652.85	21.76
18	7	19	10	14	0	877.50	62.68	0	466.11	33.29	0	1,559.00	111.36	0	302.74	21.62
				2,578	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLV.—*Dull girls, American parents.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	4	6	6	29	1	1,234.62	44.09	0	700.50	24.16	0	1,225.75	42.27	1	549.10	19.61
6	7	7	6	28	0	1,248.98	44.61	0	681.87	24.35	0	1,273.75	45.49	0	552.86	19.75
7	7	8	6	46	0	2,179.97	47.39	1	1,159.85	25.77	1	2,265.25	50.34	0	913.89	19.87
8	7	9	6	38	0	1,857.11	48.87	1	967.97	26.16	1	1,980.00	53.51	0	769.14	20.24
9	7	10	6	45	1	2,274.98	51.70	0	1,228.12	27.29	0	2,727.25	60.61	1	892.77	20.29
10	7	11	6	61	1	3,175.14	52.92	2	1,654.12	28.04	0	3,851.75	63.14	2	1,202.34	20.38
11	7	12	6	57	1	3,148.09	56.22	0	1,669.11	29.28	0	4,271.00	74.93	1	1,147.76	20.50
12	7	13	6	72	0	4,146.10	57.58	3	2,075.69	30.08	1	5,745.37	80.92	1	1,478.85	20.83
13	7	14	6	64	1	3,744.22	59.43	0	2,001.07	31.27	0	5,687.50	88.87	1	1,315.44	20.88
14	7	15	6	72	1	4,382.20	61.72	3	2,227.71	32.29	0	7,342.50	101.98	0	1,532.60	21.29
15	7	16	6	30	0	1,856.50	61.88	0	975.62	32.52	0	3,105.87	103.53	0	640.73	21.36
16	7	17	6	41	2	2,419.21	62.03	1	1,306.78	32.67	0	4,524.25	110.35	0	876.35	21.37
17	7	18	6	18	0	1,119.87	62.22	0	592.11	32.90	1	1,821.25	107.13	0	387.68	21.54
18	9	19	9	6	0	381.00	63.50	0	201.00	33.50	0	639.49	106.58	0	128.87	21.48
				607	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE XLVI.—*Average girls, American parents.*

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5 6	6 6	35	1	1,522.24	44.77	0	858.28	24.52	1	1,515.75	44.58	0	703.53	20.10
6 5	7 6	176	0	7,876.30	44.75	3	4,262.78	24.64	0	7,978.50	45.33	1	3,484.08	19.91
7 7	8 6	250	3	11,685.49	47.30	2	6,323.00	25.50	2	12,223.62	49.29	4	4,945.68	20.10
8 7	9 6	324	0	15,959.03	49.26	1	8,482.96	26.26	6	17,100.37	53.77	3	6,497.22	20.24
9 7	10 6	372	1	18,966.77	51.12	5	9,909.20	27.00	2	21,552.37	58.25	2	7,558.59	20.43
10 7	11 6	352	7	18,349.21	53.19	4	9,670.76	27.79	1	22,445.87	63.95	5	7,123.72	20.53
11 7	12 6	363	5	19,936.35	55.69	11	10,222.99	29.04	7	25,861.75	72.65	4	7,443.09	20.73
12 7	13 6	372	7	21,224.87	58.15	10	10,941.83	30.23	4	30,598.35	83.15	3	7,726.76	20.94
13 7	14 6	333	7	19,671.19	60.34	15	9,998.94	31.44	0	31,380.00	94.23	3	6,986.78	21.17
14 7	15 6	261	0	16,092.26	61.66	8	8,165.72	32.28	0	26,280.00	100.69	4	5,465.89	21.27
15 7	16 6	186	2	11,504.05	62.52	7	5,888.41	32.90	3	19,259.65	105.24	6	3,839.42	21.33
16 7	17 6	128	0	8,067.57	63.03	2	4,176.85	33.15	0	14,069.12	109.92	2	2,717.09	21.56
17 7	18 6	80	1	4,987.47	63.13	1	2,617.21	33.13	0	8,918.50	111.48	1	1,703.81	21.57
18 7	19 6	35	0	2,226.75	63.62	0	1,170.61	33.45	0	3,940.75	112.59	0	760.00	21.71
19 7	20 8	9	0	555.62	61.74	0	295.62	32.85	0	970.00	107.78	0	195.99	21.78
		3,276	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE XLVII.—*Bright girls of the nonlaboring classes, American parents.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 7	7 6	86	....	622 1	7 2	1	3,875.58	45.59	3	2,051.60	24.72
7 7	8 6	153	....	1,233 9	8 0	2	7,250.67	48.02	1	3,897.08	25.64
8 7	9 6	164	....	1,506 5	9 1	1	8,039.06	49.31	2	4,251.19	26.24
9 7	10 6	189	....	1,913 6	10 0	3	9,594.99	51.59	1	5,070.31	26.97
10 7	11 6	163	....	1,790 2	10 9	0	8,744.20	53.65	1	4,522.45	27.92
11 7	12 6	170	....	2,055 4	12 0	1	9,448.30	55.91	1	4,900.30	29.00
12 7	13 6	168	....	2,209 0	13 0	1	9,752.55	58.40	1	5,068.93	30.35
13 7	14 6	131	....	1,843 5	14 0	0	7,917.81	60.44	4	3,997.71	31.48
14 7	15 6	107	....	1,609 5	15 0	0	6,587.81	61.57	4	3,309.31	32.13
15 7	16 6	79	....	1,262 8	15 9	1	4,906.96	62.91	3	2,506.98	32.99
16 7	17 6	26	....	445 3	17 1	0	1,653.62	63.60	3	761.62	33.11
		1,436	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.		Arm reach.			Weight.			Circumference of head.		
From—	To—	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6 7	7 6	1	3,820.73	44.95	0	3,947.00	45.90	1	1,703.68	20.04
7 7	8 6	6	6,929.66	47.14	2	7,535.00	49.90	1	3,081.95	20.28
8 7	9 6	4	7,768.56	48.55	0	8,749.50	53.35	2	3,303.92	20.39
9 7	10 6	2	9,538.02	51.01	1	11,003.62	58.53	1	3,868.34	20.58
10 7	11 6	3	8,510.72	53.19	0	10,642.25	65.29	1	3,354.74	20.71
11 7	12 6	3	9,277.59	55.55	1	12,155.25	71.92	1	3,541.44	20.96
12 7	13 6	3	9,595.58	58.16	0	13,970.75	83.16	1	3,522.15	21.09
13 7	14 6	2	7,796.22	60.44	0	12,159.11	92.82	3	2,723.18	21.27
14 7	15 6	3	6,368.47	61.24	0	10,657.25	99.60	2	2,237.18	21.31
15 7	16 6	1	4,880.24	62.57	0	8,419.00	106.57	0	1,695.04	21.46
16 7	17 6	0	1,634.50	62.87	0	2,840.50	109.25	0	566.99	21.81

TABLE XLVIII.—*Average girls of the nonlaboring classes, American parentage.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	Y. M.		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 5	7 6	76	....	542 1	7 1	0	3,448.60	45.38	2	1,829.72	24.73
7 7	8 6	106	....	859 3	8 1	1	4,980.73	47.44	1	2,676.45	25.49
8 7	9 6	136	....	1,241 6	9 1	0	6,722.06	49.43	0	3,592.07	26.41
9 7	10 6	162	....	1,640	10 1	0	8,342.36	51.50	3	4,309.96	27.11
10 7	11 6	147	....	1,629 6	11 1	3	7,697.49	53.45	3	4,003.20	27.80
11 7	12 6	165	....	2,006 8	12 2	1	9,222.59	56.24	1	4,799.67	29.27
12 7	13 6	174	....	2,285 1	13 1	2	10,060.80	58.49	6	5,104.54	30.38
13 7	14 6	173	....	2,444	14 1	3	10,361.99	60.95	5	5,321.03	31.67
14 7	15 6	147	....	2,224	15 1	0	9,081.31	61.78	3	4,656.89	32.34
15 7	16 6	116	....	1,864 9	16 1	1	7,198.78	62.60	5	3,654.58	32.92
16 7	17 6	102	....	1,741 5	17 1	0	6,432.83	63.07	1	3,345.48	33.12
17 7	18 6	63	....	1,143	18 1	0	3,974.73	63.09	1	2,053.34	33.12
		1,567	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.		Arm reach.			Weight.			Circumference of head.		
From—	To—	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6 5	7 6	1	3,348.22	44.64	0	3,431.00	45.14	0	1,517.76	19.97
7 7	8 6	3	4,814.47	46.74	2	5,124.75	49.28	3	2,074.16	20.14
8 7	9 6	2	6,518.00	48.64	1	7,371.12	54.60	2	2,725.50	20.34
9 7	10 6	0	8,273.33	51.07	0	9,602.75	59.28	1	3,295.51	20.47
10 7	11 6	2	7,627.46	52.60	1	9,430.00	64.59	3	2,955.82	20.53
11 7	12 6	3	9,038.63	55.79	2	12,094.00	74.20	0	3,436.46	20.83
12 7	13 6	3	9,984.70	58.39	2	14,664.34	85.26	2	3,615.74	21.02
13 7	14 6	2	10,389.96	60.76	0	16,830.00	97.28	1	3,658.54	21.27
14 7	15 6	3	8,870.04	61.60	0	14,877.75	101.21	3	3,070.67	21.32
15 7	16 6	3	7,021.84	62.14	2	11,938.65	104.73	3	2,416.95	21.39
16 7	17 6	0	6,367.45	62.43	0	11,072.87	108.56	2	2,159.47	21.59
17 7	18 6	1	3,894.62	62.82	0	7,009.50	111.26	1	1,339.31	21.60

TABLE XLIX.—*Bright girls, laboring classes, American parents.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	Y. M.		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 7	7 6	85	....	607 3	7 1	2	3,773.72	45.47	2	2,063.84	24.87
7 7	8 6	138	....	1,125 5	8 1	2	6,390.45	46.99	4	3,378.44	25.21
8 7	9 6	143	....	1,307 5	9 1	1	6,966.70	49.06	3	3,636.70	25.98
9 7	10 6	131	....	1,326 1	10 1	0	6,657.97	50.82	4	3,421.44	26.94
10 7	11 6	145	....	1,579 4	10 8	1	7,574.59	52.60	1	3,981.60	27.65
11 7	12 6	83	....	1,009 8	12 1	0	4,636.22	55.86	2	2,359.96	29.14
12 7	13 6	94	....	1,231 9	13 1	1	5,334.46	57.36	3	2,728.21	29.98
13 7	14 6	99	....	1,398 5	14 1	3	5,783.66	60.25	9	2,826.35	31.40
14 7	15 6	50	....	759 1	15 1	0	3,081.48	61.63	2	1,543.20	32.15
15 7	16 6	30	....	482 5	16 0	1	1,801.99	62.14	3	883.87	32.74
16 8	17 6	10	....	171 5	17 1	0	636.75	63.68	0	326.12	32.61
		1,008	....	.....	.....	....	.....	.....	....	.....	.....

TABLE XLIX.—*Bright girls, laboring classes, American parents*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	6	1	3,767.62	44.85	0	3,952.25	46.50	1	1,676.59	19.96
7	7	8	6	6	6,090.84	46.14	2	6,589.50	48.45	2	2,734.75	20.11
8	7	9	6	0	6,927.22	48.44	1	7,513.25	52.91	2	2,863.78	20.31
9	7	10	6	3	6,416.72	50.13	1	7,621.00	58.62	2	2,631.29	20.40
10	7	11	6	3	7,398.12	52.10	0	9,127.87	62.95	2	2,930.30	20.49
11	7	12	6	1	4,546.85	55.45	0	6,144.00	74.02	0	1,724.83	20.78
12	7	13	6	3	5,200.26	57.15	0	7,460.25	79.36	1	1,952.27	20.99
13	7	14	6	3	5,778.20	60.19	0	9,057.75	91.49	2	2,065.94	21.30
11	7	15	6	0	3,081.25	61.63	0	5,059.25	101.19	0	1,069.85	21.40
15	7	16	6	1	1,798.00	62.00	0	3,270.75	109.03	1	624.27	21.53
16	8	17	6	0	633.75	63.38	0	1,129.25	112.93	1	196.75	21.86

TABLE L.—*Dull girls, laboring classes, American parents.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	7	7	5	28	....	198 8	7 1	0	1,248.98	44.61	0	681.87	24.35
7	7	8	6	46	....	375 3	8 1	0	2,179.97	47.39	1	1,159.85	25.77
8	7	9	6	38	....	344 7	9	0	1,857.11	48.87	1	967.97	26.16
9	7	10	6	45	....	457 2	10 1	1	2,274.98	51.70	0	1,228.12	27.29
10	7	11	6	61	....	680 2	11 1	1	3,175.14	52.92	2	1,654.12	28.04
11	7	12	6	57	....	694 1	12 1	1	3,148.09	56.22	0	1,669.11	29.28
12	7	13	6	72	....	940 6	13	0	4,146.10	57.58	3	2,075.69	30.08
13	7	14	6	64	....	904 9	14 1	1	3,744.22	59.43	0	2,001.07	31.27
14	7	15	6	72	....	1,089 5	15 1	1	4,382.20	61.72	3	2,227.71	32.29
15	7	16	6	30	....	485	16 1	0	1,856.50	61.88	0	975.62	32.52
				513	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	5	1	1,197.62	44.36	0	1,273.75	45.49	0	552.86	19.75
7	7	8	6	3	1,984.32	46.15	1	2,265.25	50.34	0	913.89	19.87
8	7	9	6	0	1,836.40	48.33	1	1,980.00	53.51	0	769.14	20.24
9	7	10	6	1	2,263.80	51.45	0	2,727.25	60.61	1	892.77	20.29
10	7	11	6	1	3,139.97	52.33	0	3,851.75	63.14	2	1,202.34	20.38
11	7	12	6	0	3,173.60	55.68	0	4,271.00	74.93	1	1,147.76	20.50
12	7	13	6	1	4,069.10	57.31	1	5,745.37	80.92	1	1,478.85	20.83
13	7	14	6	1	3,713.22	58.94	0	5,687.50	88.87	1	1,315.44	20.88
14	7	15	6	2	4,292.11	61.32	0	7,342.50	101.98	0	1,532.60	21.29
15	7	16	6	2	1,708.99	61.04	0	3,105.87	103.53	0	640.73	21.36

TABLE LI.—*Average girls, American parentage, laboring classes.*

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Arm reach.			Weight.			Circumference of head.		
From	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Y. M.	*Y. M.*			*Inches.*	*In.*		*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6 7	7 6	100	0	4,427.70	44.28	1	2,433.06	24.58	3	4,292.21	44.25	0	4,547.50	45.48	1	1,966.32	19.86
7 7	8 6	144	2	6,704.76	47.22	1	3,646.55	25.50	0	6,707.72	46.58	0	7,098.87	49.30	1	2,871.52	20.08
8 7	9 6	188	0	9,236.97	49.13	1	4,890.89	26.15	2	9,021.19	48.50	5	9,729.25	53.17	1	3,771.72	20.17
9 7	10 6	210	1	10,624.41	50.83	2	5,599.24	26.92	1	10,514.19	50.31	2	11,949.62	57.45	1	4,263.08	20.40
10 7	11 6	205	4	10,651.72	53.26	1	5,667.56	27.78	8	10,305.35	52.31	0	13,015.87	63.49	2	4,167.90	20.53
11 7	12 6	198	4	10,713.76	55.23	10	5,423.32	28.85	6	10,521.08	54.80	5	13,767.75	71.34	4	4,006.63	20.65
12 7	13 6	198	5	11,164.07	57.84	4	5,837.29	30.09	4	11,187.06	57.67	2	15,934.01	81.30	1	4,111.02	20.87
13 7	14 6	160	4	9,309.20	59.67	10	4,677.91	31.19	5	9,193.85	59.32	0	14,550.00	90.94	2	3,328.24	21.06
14 7	15 6	114	0	7,010.95	61.50	5	3,508.83	32.19	1	6,918.61	61.23	0	11,402.25	100.02	1	2,395.22	21.20
15 7	16 6	70	1	4,305.27	62.40	2	2,233.83	32.85	0	4,346.11	62.09	1	7,321.00	106.10	3	1,422.47	21.23
16 7	17 6	26	0	1,634.74	62.87	1	831.37	33.25	0	1,629.37	62.67	0	2,996.25	115.24	0	557.62	21.45
17 7	18 6	17	1	1,012.74	63.30	0	563.87	33.17	1	1,005.25	62.83	0	1,909.00	112.29	0	364.50	21.44
		1,630	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE LII.—*Dull girls, American parentage, not socially divided.*

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Arm reach.			Weight.			Circumference of head.		
From	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Y. M.	*Y. M.*			*Inches.*	*In.*		*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5 4	6 6	29	1	1,234.62	44.09	0	700.50	24.16	3	1,118.87	43.03	0	1,225.75	42.27	1	549.10	19.61
16 7	17 6	41	2	2,419.21	62.03	1	1,306.78	32.67	1	2,466.75	61.67	0	4,524.25	110.35	0	876.35	21.37
17 7	18 6	18	0	1,119.87	62.22	0	592.11	32.90	1	1,051.00	61.82	1	1,821.25	107.13	0	387.68	21.54
18 9	19 9	6	0	381.00	63.50	0	201.00	33.50	0	372.99	62.17	0	639.49	106.58	0	128.87	21.48
		94	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE LIII.—*Bright girls, American parents, not socially divided.*

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Arm reach.			Weight.			Circumference of head.		
From	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Y. M.	*Y. M.*			*Inches.*	*In.*		*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5 5	6 11	37	3	1,495.12	43.97	2	835.62	23.87	0	1,581.87	42.75	1	1,544.25	42.90	0	747.27	20.20
16 7	16 11	24	0	1,490.65	62.11	0	779.02	32.46	0	1,477.74	61.57	1	2,425.00	105.43	1	493.42	21.45
17 0	17 6	29	0	1,851.23	63.84	2	901.86	33.40	1	1,771.75	63.28	0	3,242.25	111.80	0	624.24	21.53
17 7	18 6	30	0	1,896.98	63.23	0	1,002.11	33.40	1	1,813.00	62.52	0	3,347.25	111.58	0	652.85	21.76
18 7	19 10	14	0	877.50	62.68	0	466.11	33.29	1	811.75	62.44	0	1,559.00	111.36	0	302.74	21.62
		134	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE LIV.—*Average girls, American parentage, not socially divided.*

Limits of different ages.				Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—		Total number of pupils.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	6	6	6	35	1	1,522.24	44.77	0	858.28	24.52	1	1,515.75	44.58	0	703.53	20.10
18	7	19	4	35	0	2,226.75	63.62	0	1,170.61	33.45	0	3,940.75	112.59	0	760.00	21.71
19	7	20	0	7	0	436.00	62.29	0	231.62	33.09	0	772.25	110.32	0	151.99	21.71
20	8	.....		2	0	119.62	59.81	0	64.00	32.00	0	197.75	98.88	0	44.00	22.00
				79	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE LV.—*Bright girls, foreign parentage, not socially divided.*

Limits of different ages.				Age.			Height.			Sitting height.		
From—		To—		Total number of pupils.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	7	7	6	29	....	208 8	7 2	0	1,318.24	45.46	0	716.23	24.70
7	7	8	6	35	....	285 7	8 1	1	1,604.99	47.21	0	891.23	25.46
8	7	9	6	43	....	392 6	9 1	1	2,041.00	48.60	1	1,089.49	25.94
9	7	10	6	41	....	418 1	10 1	0	2,089.11	50.95	0	1,096.29	26.74
10	7	11	6	40	....	444 4	11 1	1	2,053.98	52.67	2	1,058.74	27.86
11	7	12	6	42	....	512 7	12 2	1	2,268.73	55.33	1	1,184.99	28.90
12	7	13	5	29	....	379 5	13 0	0	1,662.48	57.33	2	805.90	29.85
13	7	14	6	25	....	354 9	14 1	0	1,543.24	61.73	0	801.11	32.04
14	7	15	6	22	....	336 7	15 3	0	1,361.46	61.88	0	710.24	32.28
15	7	16	5	16	....	256 9	16 0	0	998.75	62.42	0	530.50	33.16
16	7	16	9	3	....	50 4	16 8	0	187.12	62.37	0	96.75	32.25
17	7	17	11	6	....	107 2	17 8	0	379.75	63.29	1	166.25	33.25
18	1	18	5	2	....	.....	.....	0	125.50	62.75	0	67.62	33.81
18	9	23	6	2	....	.....	.....	0	123.12	61.56	0	65.12	32.56
				335	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	7	7	6	2	1,199.61	44.43	0	1,318.50	45.47	0	582.85	20.10
7	7	8	6	0	1,631.62	46.62	0	1,723.25	49.24	0	705.10	20.15
8	6	9	6	0	2,070.86	48.16	1	2,153.00	51.26	0	865.73	20.13
9	7	10	6	0	2,071.67	50.53	0	2,406.95	58.71	2	797.55	20.45
10	7	11	6	0	2,087.36	52.18	0	2,520.75	63.02	0	819.60	20.49
11	7	12	6	1	2,272.99	55.44	0	3,119.00	74.26	0	878.61	20.92
12	7	13	5	1	1,598.94	57.11	2	2,110.20	78.16	0	605.78	20.89
13	7	14	6	1	1,468.22	61.18	0	2,371.75	94.87	1	511.15	21.30
14	7	15	6	2	1,230.62	61.53	0	2,233.52	101.52	0	471.99	21.45
15	7	16	5	0	996.49	62.28	0	1,668.75	104.30	0	345,37	21.59
16	7	16	9	0	189.00	63.00	0	318.25	106.08	0	65.49	21.83
17	7	17	11	0	377.75	62.96	0	627.50	104.58	0	127.50	21.25
18	1	18	5	1	60.00	60.00	0	242.75	121.38	0	43.25	21.63
18	9	23	6	0	123.50	61.75	0	212.50	106.25	0	42.50	21.25

TABLE LVI.—*Dull girls, foreign parentage, not socially divided.*

Limits of different ages.				Age.			Height.			Sitting height.		
From—		To—		Total number of pupils.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	Y. M.		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	8	6	6	8	....	50 0	6 2	2	253.75	42.29	1	164.00	23.43
6	8	7	5	5	....	35 3	7 0	0	219.87	43.97	0	120.62	24.12
7	10	8	5	15	....	122 9	8 1	0	713.11	47.54	0	383.61	25.57
8	9	9	6	16	....	147 0	9 1	0	789.25	49.33	0	425.99	26.62
9	7	10	5	10	....	101 5	10 1	1	464.50	51.61	0	274.37	27.44
10	7	11	5	16	....	177 7	11 1	1	798.74	53.25	0	455.24	28.45
11	7	12	5	12	....	145 4	12 1	0	665.00	55.42	1	325.12	29.56
12	7	13	6	22	....	286 6	13 0	1	1,210.62	57.65	1	631.37	30.07
13	7	14	6	16	....	225 1	14 0	0	961.12	60.07	0	505.74	31.61
14	8	15	6	19	....	287 8	15 1	0	1,185.24	62.38	0	621.11	32.69
15	7	16	6	15	....	242 4	16 1	0	914.75	60.98	0	484.74	32.32
16	11	17	5	8	....	137 3	17 1	0	508.50	63.56	0	271.37	33.92
18	4	20	7	2	....	39 0	.....	0	128.00	64.00	0	61.25	30.63
				164	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	8	6	6	3	206.00	41.20	1	284.00	40.57	1	136.62	19.52
6	8	7	5	0	215.50	43.10	0	209.00	41.80	0	99.00	19.80
7	10	8	5	0	712.24	47.48	0	766.25	51.08	0	299.34	19.96
8	9	9	6	1	729.75	48.65	0	867.00	54.19	0	324.92	20.31
9	7	10	5	0	511.75	51.18	0	597.75	59.78	0	201.36	20.14
10	7	11	5	0	852.75	53.30	0	1,091.25	68.20	0	324.22	20.26
11	7	12	5	0	658.87	54.91	0	907.75	75.65	0	246.24	20.52
12	7	13	6	0	1,258.00	57.18	0	1,792.25	81.47	0	454.86	20.68
13	7	14	6	0	961.00	60.06	1	1,393.50	92.90	0	335.74	20.93
14	8	15	6	0	1,181.87	62.20	0	1,929.00	101.53	0	403.23	21.22
15	7	16	6	0	912.25	60.82	0	1,509.75	100.65	0	316.80	21.12
16	11	17	5	0	503.00	62.88	0	869.25	108.66	0	174.25	21.78
18	4	20	7	0	124.50	62.25	0	230.00	115.00	0	43.25	21.63

TABLE LVII.—*Average girls, foreign parentage, not socially divided.*

Limits of different ages.				Age.			Height.			Sitting height.		
From—		To—		Total number of pupils.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	Y. M.		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	0	6	6	7	....	44 3	6 3	0	310.37	44.34	0	167.50	23.93
6	8	7	6	30	....	180 4	7 2	0	1,370.23	45.67	0	747.37	24.91
7	7	8	6	39	....	269 9	8 1	0	1,843.71	47.27	1	966.73	25.44
8	7	9	6	55	....	358 1	9 1	2	2,618.37	49.40	2	1,395.78	26.34
9	7	10	6	54	....	476 7	10 1	0	2,747.10	50.87	0	1,440.54	26.68
10	7	11	6	45	....	667 1	11 1	0	2,393.62	53.19	1	1,221.49	27.76
11	7	12	6	57	....	546 3	12 1	2	3,065.11	55.73	3	1,571.24	29.10
12	7	13	6	61	....	1,075 6	13 1	0	3,485.60	57.14	1	1,785.08	29.75
13	7	14	6	69	....	636 0	14 1	1	4,069.96	59.85	3	2,074.86	31.44
14	7	15	6	32	....	700 3	15 2	0	1,975.86	61.75	1	999.99	32.26
15	7	16	5	40	....	435 1	16 1	0	2,484.61	62.12	1	1,274.86	32.69
16	7	17	6	20	....	294 1	17 1	0	1,263.11	63.16	0	661.12	33.06
17	7	18	6	20	....	163 8	18 2	0	1,270.24	63.51	0	661.49	33.07
18	8	19	10	9	....	125 8	19 1	0	552.75	61.42	0	292.55	32.51
				538	....	.....	.....	....	.....	.....	....	.....	.....

TABLE LVII.—*Average girls, foreign parentage, not socially divided*—Continued.

Limit of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	0	6	6	0	300.37	42.91	0	318.00	45.43	0	138.18	19.74
6	8	7	6	0	1,345.87	44.86	0	1,357.25	45.24	0	595.62	19.85
7	7	8	6	0	1,822.62	46.73	0	1,936.25	49.65	0	783.98	20.10
8	7	9	6	2	2,610.10	49.25	0	3,034.00	55.16	2	1,078.14	20.34
9	7	10	6	0	2,717.35	50.32	0	3,140.25	58.15	1	1,076.01	20.30
10	7	11	6	0	2,367.86	52.62	1	2,870.25	65.23	0	922.11	20.49
11	7	12	6	2	3,058.80	55.61	1	4,249.25	75.88	1	1,162.74	20.76
12	7	13	6	0	3,499.85	57.37	0	4,864.75	79.75	3	1,208.75	20.84
13	7	14	6	0	4,104.12	59.48	0	6,433.50	93.24	3	1,398.37	21.19
14	7	15	6	0	1,992.25	62.26	0	3,211.50	100.36	0	678.28	21.20
15	7	16	5	1	2,421.62	62.09	1	4,063.75	104.20	1	832.47	21.35
16	7	17	6	0	1,248.00	62.40	1	2,172.75	114.36	0	433.83	21.69
17	7	18	6	0	1,255.87	62.79	0	2,296.00	114.80	0	435.00	21.75
18	8	19	10	0	547.87	60.87	0	948.00	105.33	0	194.28	21.59

TABLE LVIII.—*Bright girls, American and foreign parentage, not socially divided.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6	0	6	6	5	....	32 1	6 4	1	174.37	43.59	0	124.00	24.80
6	7	7	6	36	....	257 9	7 1	0	1,637.98	45.50	1	868.21	24.81
7	7	8	6	38	....	309 4	8 1	0	1,814.12	47.74	0	946.24	25.57
8	7	9	6	53	....	480 8	9 0	1	2,582.98	49.67	1	1,375.98	26.46
9	7	10	6	43	....	435 3	10 1	0	2,200.24	51.17	0	1,160.74	26.99
10	7	11	5	40	....	444 1	11 1	0	2,132.87	53.32	0	1,114.74	27.87
11	7	12	6	33	....	399 2	12 0	0	1,852.85	56.15	1	939.49	29.36
12	7	13	6	47	....	617 9	13 1	2	2,586.23	57.47	2	1,346.75	29.93
15	7	14	6	30	....	423 6	14 1	0	1,805.74	60.19	0	936.37	31.21
14	7	15	6	25	....	375 9	15 0	0	1,519.23	60.77	0	792.23	31.69
15	7	16	6	17	....	274 0	16 1	0	1,056.49	62.15	1	515.12	32.20
16	7	17	1	6	....	101 6	16 9	0	370.87	61.81	0	196.50	32.75
17	7	18	5	7	....	126 0	18 0	0	457.75	65.39	0	239.50	34.21
18	7	18	9	2	....	.....	.....	0	134.50	67.25	0	69.37	34.69
19		.....		1	....	.....	.....	0	65.00	.....	0	33.50	.....
				383	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	6	6	6	0	212.87	42.57	0	209.00	41.80	0	106.37	21.27
6	7	7	6	0	1,613.87	44.83	0	1,630.75	45.30	0	722.08	20.06
7	7	8	6	0	1,714.37	46.33	1	1,847.25	49.93	0	770.97	20.29
8	7	9	6	1	2,529.35	48.64	0	2,892.50	54.58	0	1,076.67	20.31
9	7	10	6	1	2,150.14	51.19	0	2,550.75	59.32	0	881.39	20.50
10	7	11	5	0	2,113.23	52.83	0	2,613.25	65.33	1	803.34	20.60
11	7	12	6	0	1,831.62	55.50	0	2,464.25	74.67	0	691.26	20.95
12	7	13	6	1	2,621.99	57.00	1	3,747.75	81.47	1	964.73	20.97
13	7	14	6	1	1,747.50	60.26	0	2,900.00	96.67	1	617.23	21.28
14	7	15	6	0	1,520.48	60.82	0	2,345.00	93.80	1	509.61	21.23
15	7	16	6	0	1,065.00	62.65	0	1,771.25	104.19	0	366.58	21.56
16	7	17	1	0	365.75	60.96	0	643.50	107.25	0	128.25	21.38
17	7	18	5	0	452.00	64.57	0	802.00	114.57	0	152.87	21.84
18	7	18	9	0	134.50	67.25	0	222.50	111.25	0	45.25	22.63
19		.....		0	65.00	.....	0	107.00	.....	0	22.00	.....

TABLE LIX.—*Dull girls, American and foreign parentage, not socially divided.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5 11	6 5	3	....	19 1	.....	0	130.50	43.50	0	73.00	24.33
6 7	7 2	8	....	55 4	6 9	1	311.00	44.43	0	194.00	24.25
7 8	8 6	7	....	56 0	8 0	1	285.24	47.54	1	154.75	25.79
8 8	9 6	8	....	73 4	9 1	0	399.58	49.95	0	211.37	26.42
9 7	10 5	7	....	70 3	10 0	0	354.50	50.64	0	188.00	26.86
10 7	11 6	9	....	100 2	11 1	0	476.87	52.99	0	250.99	27.89
11 7	12 6	13	....	158 1	12 1	0	706.86	54.37	1	341.36	28.45
12 7	13 6	19	....	249 8	13 1	1	1,033.10	57.39	1	526.37	29.24
13 7	14 6	21	....	297 1	14 1	0	1,245.24	59.30	1	621.24	31.06
14 7	15 6	21	....	318 5	15 1	1	1,235.62	61.78	0	694.12	33.05
15 7	16 5	10	....	159 2	15 9	0	619.75	61.98	1	289.12	32.12
16 8	17 5	11	....	187 7	17 0	0	686.75	62.43	0	362.12	32.92
17 10	18 5	7	....	127 3	18 1	0	447.37	63.91	0	235.87	33.70
18 11	19 9	2	....	38 0	.....	0	128.75	64.38	0	67.75	33.88
		146	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.		Arm reach.			Weight.			Circumference of head.		
From—	To—	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5 11	6 5	0	136.37	45.46	0	135.25	45.08	0	59.50	19.83
6 7	7 2	1	312.00	44.57	1	301.00	43.00	0	156.61	19.58
7 8	8 6	2	235.50	47.10	0	350.30	50.04	1	121.12	20.19
8 8	9 6	1	345.75	49.39	0	481.50	60.19	0	164.62	20.58
9 7	10 5	0	347.12	49.59	0	387.50	55.36	0	140.12	20.02
10 7	11 6	1	422.50	52.81	0	582.25	64.69	1	163.30	20.41
11 7	12 6	1	638.87	53.24	1	813.50	67.79	0	264.48	20.34
12 7	13 6	0	1,089.74	57.35	0	1,458.50	76.76	0	392.00	20.63
13 7	14 6	0	1,244.37	59.26	0	1,879.75	89.51	0	442.11	21.05
14 7	15 6	0	1,283.25	61.11	0	2,159.50	102.83	1	425.80	21.29
15 7	16 5	0	614.87	61.49	1	900.75	100.08	0	210.49	21.05
16 8	17 5	0	685.75	62.34	0	1,182.50	107.50	0	233.12	21.19
17 10	18 5	0	443.75	63.39	0	787.50	112.50	0	150.74	21.53
18 11	19 9	0	128.00	64.00	0	216.00	108.00	0	43.00	21.50

TABLE LX.—*Average girls, American and foreign parentage, not socially divided.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5 9	6 6	7	....	44 7	6 3	0	310.74	44.39	0	167.62	23.95
6 10	7 6	25	....	227 0	7 5	0	1,135.49	45.42	0	623.35	24.93
7 8	8 6	33	....	320 9	8 2	0	1,572.10	47.64	0	842.99	25.55
8 7	9 6	39	....	502 2	9 1	0	1,936.36	49.65	0	1,034.37	26.52
9 7	10 6	47	....	548 3	10 1	0	2,416.11	51.41	0	1,271.85	27.06
10 7	11 6	60	....	499 0	11 0	1	3,133.47	53.11	0	1,668.48	27.81
11 7	12 6	45	....	693 0	12 1	0	2,512.86	55.84	0	1,293.36	28.74
12 7	13 6	82	....	800 7	13 1	1	4,697.33	57.99	0	2,469.34	30.11
13 7	14 6	45	....	975 0	14 1	0	2,713.85	60.31	0	1,417.89	31.51
14 7	15 6	46	....	485 3	15 1	0	2,836.09	61.65	1	1,451.98	32.27
15 7	16 6	27	....	642 4	16 0	0	1,684.71	62.40	1	859.12	33.04
16 7	17 6	17	....	341 5	17 0	0	1,086.00	63.88	1	533.50	33.34
17 9	18 6	9	....	362 0	18 1	0	563.75	62.64	0	289.00	32.11
18 6	19 5	8	....	171 7	19 0	0	508.00	63.50	0	267.49	33.44
		490	....	.....	.....	....	.....	.....	....	.....	.....

TABLE LX.—*Average girls, American and foreign parentage, not socially divided*—Cont'd.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	9	6	6	0	303.37	43.34	0	298.25	42.61	0	139.87	19.98
6	10	7	6	1	1,075.61	44.82	0	1,119.25	44.77	0	493.86	19.75
7	8	8	6	0	1,533.87	46.48	0	1,648.00	49.94	0	665.39	20.16
8	7	9	6	0	1,921.37	49.27	0	2,135.00	54.74	0	788.59	20.22
9	7	10	6	0	2,378.04	50.60	0	2,757.25	58.66	0	956.84	20.36
10	7	11	6	1	3,112.81	52.76	0	3,885.75	64.76	0	1,234.25	20.57
11	7	12	6	1	2,463.66	55.99	0	3,308.75	73.53	0	933.27	20.74
12	7	13	6	1	4,679.74	57.77	0	6,659.50	81.21	1	1,698.60	20.71
13	7	14	6	0	2,684.46	59.65	0	4,126.00	91.69	0	953.20	21.18
14	7	15	6	1	2,755.74	61.24	1	4,433.75	98.53	0	976.27	21.22
15	7	16	6	1	1,699.50	61.90	1	2,733.25	105.13	0	576.86	21.37
16	7	17	6	0	1,081.75	63.63	0	1,897.00	111.59	1	343.92	21.50
17	9	18	6	0	564.00	62.67	0	1,048.50	116.50	2	148.75	21.25
18	6	19	5	0	504.00	63.00	1	810.00	115.71	1	153.50	21.93

TABLE LXI.—*All colored boys.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Ins.*		*Inches.*	*Ins.*		*Pounds.*	*Lbs.*		*Inches.*	*Ins.*
5	0	6	6	73	0	3,224.50	44.17	1	1,731.00	24.04	4	2,997.50	43.44	2	1,436.99	20.24
6	7	7	6	246	0	11,335.66	46.08	6	5,934.25	24.73	20	11,321.75	50.10	6	4,867.23	20.28
7	7	8	6	288	8	13,367.37	47.74	11	7,018.12	25.34	12	14,902.00	53.99	9	5,722.36	20.51
8	7	9	6	303	9	14,483.66	49.26	15	7,528.26	26.14	16	16,943.25	59.04	23	5,787.73	20.67
9	7	10	6	335	2	17,023.12	51.14	7	8,695.63	26.51	7	21,375.36	65.17	10	6,764.60	20.81
10	7	11	6	271	3	13,962.25	52.10	4	7,182.12	26.90	1	18,748.50	69.44	4	5,592.62	20.95
11	7	12	6	286	3	15,265.75	53.94	6	7,838.12	27.99	8	21,218.75	75.97	8	5,803.23	20.87
12	7	13	6	321	3	17,834.75	56.08	2	9,078.61	28.46	4	26,470.00	83.50	8	6,595.11	21.07
13	7	14	6	282	2	16,233.25	57.98	5	8,133.70	29.36	7	24,996.50	90.90	2	5,967.42	21.31
14	7	15	6	220	2	13,098.62	60.09	9	6,408.75	30.37	5	21,374.75	99.42	3	4,645.84	21.41
15	7	16	6	124	0	7,828.53	63.13	4	3,750.12	31.25	3	13,728.00	113.45	0	2,659.69	21.45
16	7	18	6	131	3	8,367.73	65.37	11	3,938.87	32.82	2	16,179.75	125.42	0	2,875.71	21.95
18	7	22	11	19	0	1,257.12	66.16	7	353.00	29.42	1	2,371.50	131.75	0	421.00	22.16
				2,899	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....

TABLE LXII.—*Colored boys, bright.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	1	6	6	27	....	168 7	6 2	0	1,190.25	44.08	0	645.00	23.89
6	7	7	6	92	....	663 0	7 2	0	4,276.50	46.48	1	2,247.75	24.70
7	7	8	6	127	....	1,036 6	8 1	5	5,866.75	48.09	3	3,135.50	25.29
8	7	9	6	128	....	1,171 8	9 1	3	6,197.66	49.58	4	3,231.01	26.06
9	7	10	6	159	....	1,618 3	10 1	0	8,082.00	50.83	1	4,148.39	26.26
10	7	11	6	136	....	1,513 4	11 1	2	6,976.25	52.06	3	3,565.12	26.81
11	7	12	6	144	....	1,744 8	12 0	1	7,692.50	53.79	3	3,912.62	27.75
12	7	13	6	145	....	1,913 6	13 1	1	8,115.00	56.35	0	4,115.62	28.38
13	7	14	6	116	....	1,638 5	14 1	1	6,649.75	57.82	1	3,370.08	29.31
14	7	15	6	90	....	1,364 1	15 1	1	5,390.00	60.56	5	2,567.25	30.20
15	7	16	5	42	....	674 2	16 0	0	2,642.50	62.92	1	1,282.50	31.28
16	7	17	6	26	....	442 9	17 0	1	1,588.74	63.55	1	797.87	31.91
17	7	18	6	18	....	326 2	18 1	0	1,214.25	67.46	2	532.50	33.28
18	7	19	4	4	....	76 0	19 0	0	269.62	67.41	1	105.50	35.17
19	8	19	11	3	....	59 9	19 9	0	191.25	63.75	0	98.75	32.92
				1,257	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	1	6	6	1	1,156.25	44.47	3	1,022.00	42.58	1	528.99	20.35
6	7	7	6	0	4,329.99	47.07	11	4,044.00	49.93	5	1,769.37	20.34
7	7	8	6	4	5,982.48	48.64	8	6,584.50	55.33	6	2,500.62	20.67
8	7	9	6	4	6,246.08	50.37	5	7,397.75	60.14	10	2,452.25	20.78
9	7	10	6	1	8,218.43	52.02	4	10,124.62	65.32	4	3,236.11	20.88
10	7	11	6	3	7,092.12	53.32	0	9,432.00	70.39	3	2,779.75	20.90
11	7	12	6	3	7,757.62	55.02	5	10,586.75	76.16	4	2,917.74	20.84
12	7	13	6	0	8,386.50	57.84	0	12,168.50	83.92	5	2,958.37	21.13
13	7	14	6	4	6,677.00	59.62	1	10,507.00	91.37	1	2,453.57	21.34
14	7	15	6	5	5,331.25	62.72	2	8,846.00	100.52	3	1,859.61	21.37
15	7	16	5	1	2,687.75	65.55	1	4,599.50	112.18	0	902.12	21.48
16	7	17	6	2	1,581.00	65.88	1	2,996.25	119.85	0	573.24	22.05
17	7	18	6	0	1,254.00	69.67	0	2,423.00	134.61	0	400.99	22.28
18	7	19	4	0	271.25	67.81	1	409.59	136.50	0	89.00	22.25
19	8	19	11	0	195.50	65.17	0	374.00	124.67	0	64.50	21.50

TABLE LXIII.—*Colored boys, dull.*

Limits of different ages.				Total number of pupils	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	2	6	6	22	....	134 0	6 0	0	954.50	43.39	0	525.75	23.90
6	7	7	6	72	....	514 1	7 1	0	3,294.50	45.76	0	1,783.50	24.77
7	7	8	6	40	....	326 7	8 1	0	1,907.25	47.68	0	1,028.87	25.72
8	7	9	6	51	....	463 5	9 0	1	2,415.75	48.32	2	1,278.25	26.09
9	7	10	6	46	....	467 3	10 1	1	2,342.62	52.06	2	1,184.37	26.92
10	7	11	6	51	....	569 3	11 1	0	2,634.50	51.66	0	1,373.75	26.94
11	9	12	6	52	....	657 9	12 6	0	2,820.00	54.23	0	1,452.00	27.92
12	7	13	6	44	....	580 3	13 1	0	2,451.25	55.71	0	1,269.50	28.85
13	7	14	6	41	....	581 2	14 1	1	2,302.75	57.57	2	1,143.50	29.32
14	7	15	6	28	....	424 0	15 1	0	1,683.25	60.12	0	858.00	30.64
15	7	16	6	16	....	257 7	16 1	0	1,023.50	64.28	0	500.75	31.30
16	7	18	1	21	....	362 1	17 2	0	1,371.75	65.32	0	672.75	32.04
18	11	22	11	2	....	.....	.....	0	134.75	67.38	2	.....	.....
				486	....	.....	.....	....	.....	.....	....	.....	.....

TABLE LXIII.—*Colored boys, dull*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	2	6	6	0	986.12	44.82	1	909.00	43.29	0	438.00	19.91
6	7	7	6	1	3,322.50	46.80	6	3,391.50	51.39	0	1,453.36	20.19
7	7	8	6	0	1,953.00	48.83	2	1,983.00	52.18	0	820.50	20.51
8	7	9	6	0	2,509.50	49.21	3	2,719.00	56.65	4	950.11	20.22
9	7	10	6	1	2,383.12	52.96	2	2,954.50	67.15	2	906.62	20.61
10	7	11	6	0	2,702.62	52.99	0	3,465.00	67.94	1	1,042.37	20.85
11	9	12	6	0	2,894.00	55.65	0	3,941.00	75.79	0	1,095.00	21.06
12	7	13	6	1	2,457.50	57.15	1	3,616.50	84.10	1	898.62	20.90
13	7	14	6	1	2,405.12	60.13	2	3,387.00	86.85	0	871.37	21.25
14	7	15	6	0	1,761.50	62.91	0	2,717.00	100.61	0	596.37	21.30
15	7	16	6	1	966.25	64.42	1	1,707.50	113.83	0	348.58	21.79
16	7	18	1	0	1,388.75	66.13	0	2,649.00	126.14	0	459.75	21.89
18	11	22	11	0	138.50	69.25	0	302.00	151.00	0	44.50	22.25

TABLE LXIV.—*Colored boys, average.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.* *Mos.*	*Y.* *M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	0	6	6	24	....	148 9	6 2	0	1,079.75	44.99	1	560.25	24.36
6	7	7	6	82	....	587 5	7 1	0	3,764.66	45.91	5	1,903.00	24.71
7	7	8	6	121	....	.....	.....	3	5,593.37	47.40	8	2,853.75	25.25
8	7	9	6	124	....	1,131 4	9 1	5	5,870.25	49.33	9	3,019.00	26.25
9	7	10	6	130	....	1,308 5	10 0	1	6,603.50	51.19	4	3,362.87	26.69
10	7	11	6	84	....	934 0	11 1	1	4,351.50	52.43	1	2,243.25	27.03
11	7	12	6	90	....	1,092 4	12 1	2	4,753.25	54.01	3	2,473.50	28.43
12	7	13	6	132	....	1,738 6	13 1	2	7,268.50	55.91	2	3,693.49	28.41
13	7	14	6	125	....	1,766 8	14 1	0	7,280.75	58.25	2	3,620.12	29.43
14	7	15	6	102	....	1,541 7	15 1	1	6,025.37	59.66	4	2,983.50	30.44
15	7	16	6	66	....	1,063 7	16 1	0	4,157.53	62.99	3	1,966.87	31.22
16	7	17	6	41	....	702 8	17 1	1	2,591.74	64.79	3	1,253.50	32.99
17	7	18	5	25	....	451 2	18 0	1	1,601.25	66.72	5	682.25	34.11
18	7	19	5	5	....	95 0	19 0	0	332.00	66.40	3	68.00	34.00
19	7	20	6	5	....	100 3	20 0	0	329.50	65.90	3	80.75	40.38
				1,156	....	.....	.....	...	.....	.....	....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	0	6	6	1	1,048.00	45.57	0	1,066.50	44.44	1	470.00	20.43
6	7	7	6	2	3,664.62	45.81	3	3,886.25	49.19	1	1,644.50	20.30
7	7	8	6	2	5,753.91	48.35	2	6,334.50	53.23	3	2,401.24	20.35
8	7	9	6	6	5,975.62	50.64	8	6,826.50	58.85	9	2,385.37	20.74
9	7	10	6	8	6,377.74	52.28	1	8,296.24	64.31	4	2,621.87	20.81
10	7	11	6	1	4,452.25	53.64	1	5,851.50	70.50	0	1,770.50	21.08
11	7	12	6	4	4,837.25	56.25	3	6,691.00	76.91	4	1,790.49	20.82
12	7	13	6	4	7,366.75	57.55	3	10,685.00	82.83	2	2,738.12	21.06
13	7	14	6	7	7,138.00	60.49	4	11,102.50	91.76	1	2,612.48	21.31
14	7	15	6	7	5,918.00	62.29	3	9,811.75	99.11	0	2,189.86	21.47
15	7	16	6	8	3,831.45	66.06	1	7,421.00	114.17	0	1,408.99	21.35
16	7	17	6	1	2,685.00	67.13	0	4,986.00	121.61	0	898.24	21.91
17	7	18	5	2	1,587.37	69.02	1	3,125.50	130.23	0	543.49	21.74
18	7	19	5	1	275.00	68.75	0	645.00	129.00	0	111.00	22.20
19	7	20	6	0	336.25	67.25	0	641.00	128.20	0	112.00	22.40

TABLE LXV.—*All colored girls.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Lbs.*	*Lbs.*		*Inches.*	*In.*
5	10	6	6	113	5	4,732.00	43.81	4	2,585.50	23.72	8	4,473.75	42.61	2	2,211.12	19.92
6	7	7	6	248	8	11,187.25	46.61	9	5,903.20	24.70	14	11,380.25	48.63	9	4,900.04	20.50
7	7	8	6	218	2	10,349.25	47.91	2	5,446.25	25.21	7	11,188.25	53.02	0	4,471.99	20.51
8	7	9	6	209	3	10,098.62	49.02	7	5,199.75	25.74	8	11,434.50	56.89	6	4,206.98	20.72
9	7	10	6	250	1	12,661.25	50.85	7	6,451.25	26.55	12	14,967.50	62.89	10	5,001.62	20.84
10	7	11	6	266	8	13,658.62	52.94	7	7,084.86	27.35	8	17,773.00	68.89	14	5,260.36	20.87
11	7	12	6	279	12	14,542.00	54.46	14	7,397.86	27.92	11	20,784.25	77.55	8	5,678.10	20.95
12	7	13	6	270	9	14,986.35	57.42	9	7,591.24	29.09	12	22,806.50	88.40	9	5,517.11	21.14
13	7	14	6	243	13	13,699.87	59.56	14	6,923.87	30.24	5	23,446.75	98.52	7	5,068.61	21.48
14	7	15	6	167	8	9,550.12	60.06	9	4,856.99	30.74	7	16,495.25	103.10	1	3,570.84	21.51
15	7	16	6	129	3	7,745.49	61.47	8	3,819.61	31.57	0	13,798.50	106.97	2	2,730.99	21.50
16	7	17	6	83	0	5,166.74	62.25	5	2,488.87	31.91	3	9,036.50	112.96	2	1,760.87	21.74
17	7	18	6	54	1	3,300.49	62.27	2	1,677.99	32.27	0	6,216.25	115.12	1	1,158.49	21.86
18	7	19	6	20	1	1,191.87	62.73	3	564.61	33.21	0	2,355.00	117.75	0	435.62	21.78
19	7	29	11	9	0	544.00	60.44	0	283.25	31.47	0	984.00	109.33	0	199.25	22.14
				2,558												

TABLE LXVI.—*Bright girls—colored.*

Limits of different ages.				Total number of pupils.	Age.			Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Inches*	*Inches.*
6	0	6	6	30	....	185	2	6	2	1	1,281.75	44.20	3	637.00	23.59
6	7	7	6	94	....	662	2	7	0	2	4,325.00	47.01	2	2,263.00	24.60
7	7	8	6	166	....	1,339	3	8	0	2	7,866.25	47.96	2	4,134.25	25.21
8	7	9	6	172	....	1,556	6	9	2	3	8,294.12	49.08	6	4,276.00	25.76
9	7	10	6	196	....	1,974	4	10	1	0	9,972.75	50.88	7	5,011.75	26.52
10	7	11	6	206	....	2,379	5	11	5	6	10,596.12	52.98	6	5,469.50	27.35
11	7	12	6	210	....	2,522	3	12	1	8	11,007.00	54.49	9	5,588.36	27.80
12	7	13	6	216	....	2,819	5	13	0	5	12,108.12	57.38	5	6,119.74	29.00
13	7	14	6	164	....	2,300	8	14	0	8	9,305.12	59.65	8	4,683.62	30.02
14	7	15	6	110	....	1,654	1	15	0	4	6,403.12	60.41	4	3,242.74	30.59
15	7	16	6	81	....	1,323	5	16	4	1	4,907.25	61.34	5	2,396.74	31.54
16	7	17	6	51	....	885	4	17	4	0	3,184.12	62.43	4	1,512.00	32.17
17	7	18	6	37	....	664	5	18	1	1	2,241.49	62.26	1	1,172.62	32.57
18	7	19	4	12	....	227	0	19	0	0	764.87	63.74	2	332.62	33.26
19	10	20	4	3	....	60	1	20	0	0	186.25	62.08	0	97.00	32.33
20	9	21	0	3	....	62	9	20	11	0	188.75	62.92	0	100.25	33.42
				1,751	....			....			....			....	

TABLE LXVI.—*Bright girls—colored*—Continued.

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6	0	6	6	3	1,193.50	44.29	4	1,123.00	43.19	1	582.87	20.10
6	7	7	6	3	4,297.00	47.22	7	4,269.00	49.07	1	1,912.93	20.57
7	7	8	6	9	7,634.12	48.62	5	8,638.25	53.65	0	3,413.99	20.57
8	7	9	6	7	8,225.14	49.85	6	9,519.50	57.35	4	3,485.49	20.75
9	7	10	6	10	9,649.25	51.34	5	12,171.00	63.72	8	3,928.75	20.90
10	7	11	6	10	10,578.62	53.97	4	13,881.00	68.72	7	4,158.99	20.90
11	7	12	6	9	11,214.12	55.79	7	15,674.00	77.21	6	4,262.35	20.89
12	7	13	6	11	12,048.50	58.77	7	18,476.50	88.40	6	4,449.11	21.19
13	7	14	6	12	9,280.99	61.06	2	15,948.50	98.45	5	3,414.74	21.48
14	7	15	6	5	6,530.49	62.20	3	11,046.25	103.24	1	2,341.73	21.48
15	7	16	6	2	4,964.86	62.85	0	8,598.50	106.15	1	1,717.12	21.46
16	7	17	6	1	3,166.75	63.34	1	5,715.50	114.31	1	1,092.25	21.85
17	7	18	6	1	2,274.24	63.17	0	4,314.25	116.60	0	809.37	21.87
18	7	19	4	0	775.87	64.66	0	1,452.50	121.04	0	261.37	21.78
19	10	20	4	1	129.00	64.50	0	336.00	112.00	0	68.00	22.67
20	9	21	0	0	191.50	63.83	0	332.00	110.67	0	64.25	21.42

TABLE LXVII.—*Dull girls—colored.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.		
From—		To—			Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*Inches.*		*Inches.*	*Inches.*
5	10	6	6	46	3	1,874.75	43.60	0	1,095.00	23.80
6	7	7	6	57	2	2,503.50	45.52	3	1,321.95	24.48
7	8	8	6	52	0	2,483.00	47.75	0	1,312.00	25.23
8	7	9	6	37	0	1,804.50	48.77	1	923.75	25.66
9	7	10	6	54	1	2,688.50	50.73	0	1,439.50	26.66
10	7	11	6	60	2	3,062.50	52.80	1	1,615.36	27.38
11	7	12	6	69	4	3,535.00	54.38	5	1,809.50	28.27
12	7	13	6	54	4	2,878.23	57.56	4	1,471.50	29.43
13	7	14	6	79	5	4,394.75	59.39	6	2,240.25	30.69
14	7	15	6	57	4	3,147.00	59.38	5	1,614.25	31.04
15	7	16	6	48	2	2,838.24	61.70	3	1,422.87	31.62
16	7	17	6	32	0	1,982.62	61.96	1	976.87	31.51
17	7	18	5	17	0	1,059.00	62.29	1	505.37	31.59
18	7	19	6	8	1	427.00	61.00	1	231.99	33.14
19	7	29	11	3	0	169.00	56.33	0	86.00	28.67
				673	.....	.....	.....	.....	.....	.....

Limits of different ages.				Arm reach.			Weight.			Circumference of head.		
From—		To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
5	10	6	6	1	1,992.25	44.27	2	1,872.00	42.55	0	914.00	19.87
6	7	7	6	3	2,468.75	45.72	3	2,535.50	46.95	5	1,043.37	20.06
7	8	8	6	0	2,523.50	48.53	2	2,550.00	51.00	0	1,058.00	20.35
8	7	9	6	1	1,776.75	49.35	2	1,915.00	54.71	2	721.49	20.61
9	7	10	6	3	2,611.02	51.20	7	2,796.50	59.50	2	1,072.87	20.63
10	7	11	6	5	2,993.12	54.42	4	3,892.00	69.50	7	1,101.37	20.78
11	7	12	6	3	3,675.00	55.68	4	5,110.25	78.62	2	1,415.75	21.13
12	7	13	6	0	3,197.49	59.21	5	4,330.00	88.37	3	1,068.00	20.94
13	7	14	6	5	4,559.25	61.61	3	7,498.25	98.66	2	1,653.87	21.48
14	7	15	6	3	3,341.50	61.88	4	5,449.00	102.81	0	1,229.11	21.56
15	7	16	6	5	2,736.00	63.63	0	5,200.00	108.33	1	1,013.87	21.57
16	7	17	6	1	1,971.99	63.61	2	3,321.00	110.70	1	668.62	22.15
17	7	18	5	1	1,010.49	63.16	0	1,902.00	111.88	1	349.12	21.82
18	7	19	6	0	493.75	61.72	0	902.50	112.81	0	174.25	21.78
19	7	29	11	1	120.00	60.00	0	316.00	105.33	0	67.00	22.33

TABLE LXVIII.—*Average girls, colored.*

Limits of different ages.		Total number of pupils.	Age.			Height.			Sitting height.		
From—	To—		Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Yrs. Mos.*	*Y. M.*		*Inches.*	*Inches.*		*Inches.*	*Inches.*
6 0	6 6	37	....	227 2	6 2	1	1,575.50	43.76	1	853.50	23.71
6 7	7 6	97	....	705 9	7 2	4	4,358.75	46.87	4	2,318.25	24.93
		134	....	.....	.....	....	.....	.....	....	.....	.....

Limits of different ages.		Arm reach.			Weight.			Circumference of head.		
From—	To—	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.	Number omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*		*Inches.*	*Inches.*		*Pounds.*	*Pounds.*		*Inches.*	*Inches.*
6 0	6 6	2	1,542.00	44.06	2	1,478.75	42.25	1	714.25	19.84
6 7	7 6	5	4,352.12	47.31	4	4,575.75	49.20	3	1,943.74	20.68

TABLE LXIX.—*Abnormalities or defects in relation to sex, mental ability, nativity, sociologic condition, and race, as reported by the teachers.*

Divisions according to sex, mental ability, nationality, sociologic condition, and race.	Whole number.	Sickly.		Nervous.		Defective in—						Convulsions.		Lazy.		Unruly.	
						Eyesight.		Hearing.		Speech.							
	Total.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.	Total.	Per ct.
Bright girls	3,296	133	4.04	19	0.58	44	1.33	5	.15	5	0.15	1	0.03	7	0.21	1	0.03
Bright boys	2,899	111	3.83	32	1.10	31	1.07	13	.45	16	.55	1	.04	9	.31	43	1.48
Dull girls	917	57	6.22	3	.33	7	.76	6	.65	2	.22	....	....	3	.33	14	1.53
Dull boys	1,214	64	5.27	15	1.24	16	1.32	13	1.07	14	1.15	2	.16	36	2.97	119	9.80
Average girls	4,304	217	5.04	35	.81	57	1.32	20	.47	17	.40	....	....	9	.21	6	.14
Average boys	3,373	241	7.15	48	1.42	55	1.63	27	.80	58	1.72	2	.06	61	1.81	273	8.09
Girls, American parents	6,463	344	5.32	52	.80	98	1.52	26	.40	22	.34	1	.02	15	.23	7	.11
Boys, American parents	6,024	330	5.48	77	1.28	82	1.36	41	.68	67	1.11	5	.08	89	1.48	339	5.63
Girls, forcign parents	1,038	27	2.60	2	.19	4	.38	3	.29	....	....	....	....	1	.10	10	.96
Boys, foreign parents	1,036	22	2.13	2	.19	6	.58	2	.19	9	.87	....	....	6	.58	46	4.44
Girls, American and foreign parents	1,019	36	3.53	3	.29	6	.59	2	.20	2	.20	....	....	3	.29	4	.39
Boys, American and foreign parents	893	64	7.17	16	1.79	14	1.57	10	1.12	12	1.34	....	....	11	1.23	50	5.60
Girls, laboring classes	3,151	204	6.47	27	.86	46	1.46	18	.57	18	.57	....	....	6	.19	6	.19
Boys, laboring classes	2,739	102	3.72	14	.51	21	.77	12	.44	21	.77	1	.04	30	1.09	121	4.42
Girls, nonlaboring classes	3,003	140	4.66	25	.83	52	1.73	8	.27	4	.14	1	.04	9	.29	1	.03
Boys, nonlaboring classes	3,093	228	7.37	63	2.03	61	1.97	29	.94	46	1.49	4	.13	59	1.91	218	7.05
All girls	8,520	407	4.78	57	.67	108	1.27	31	.36	24	.28	1	.01	19	.22	21	.25
All boys	7,953	416	5.23	95	1.20	102	1.28	53	.67	88	1.11	5	.06	106	1.33	435	5.47
Bright boys, colored	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bright girls, colored	1,751	116	6.63	4	.23	4	.23	2	.11	3	.17	....	....	....	....	27	1.54
Dull boys, colored	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dull girls, colored	673	86	12.78	3	.45	4	.59	6	.89	5	.74	....	....	....	....	32	4.75
Average boys, colored	1,156	76	6.57	3	.26	5	.43	4	.25	8	.69	1	.09	....	....	28	2.42

TABLE LXX.—*Mental ability in relation to sex, nationality, sociological condition, abnormality, and race, as reported by the teachers.*

Divisions according to sex, nationality, sociologic condition, abnormality, and race.	Bright.		Dull.		Average.		Per cent of all.		
	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Bright.	Dull.	Average.
All boys	2,899	38.72	1,214	16.22	3,373	45.06	.....	.....	.....
All girls	3,296	38.70	917	10.77	4,304	50.53	.....	.....	.....
Boys, American parentage	2,267	37.63	895	14.86	2,862	47.51	.....	.....	.....
Girls, American parentage	2,578	39.90	607	9.40	3,276	50.70	.....	.....	.....
Boys, foreign parentage	349	33.69	176	16.99	511	49.32	.....	.....	.....
Girls, foreign parentage	335	32.30	164	15.82	538	51.88	.....	.....	.....
Boys, American and foreign parentage	283	31.69	143	16.01	467	52.30	.....	.....	.....
Girls, American and foreign parentage	383	37.58	146	14.33	490	48.09	.....	.....	.....
Boys, laboring classes	858	31.33	464	16.94	1,417	51.73	.....	.....	.....
Girls, laboring classes	1,008	31.99	513	16.28	1,630	51.73	.....	.....	.....
Boys, nonlaboring classes	1,357	43.87	358	11.58	1,378	44.55	.....	.....	.....
Girls, nonlaboring classes	1,436	47.82	.....	.....	1,567	52.18	.....	.....	.....
Abnormal boys	304	20.01	362	23.83	853	56.16	10.49	29.82	25.29
Abnormal girls	205	30.97	147	22.20	310	46.83	6.22	16.03	7.20
Unruly boys	51	11.83	97	22.51	283	65.66	1.76	7.99	8.39
Unruly girls	0	.....	18	78.26	5	21.74	.....	1.96	.11
Sickly boys	95	25.96	50	13.66	221	60.38	3.28	4.12	6.55
Sickly girls	107	34.85	49	15.96	151	49.19	3.25	5.34	3.51
Boys otherwise defective	158	21.88	215	29.78	349	48.34	5.45	17.71	10.35
Girls otherwise defective	98	29.52	80	24.10	154	46.38	2.97	8.73	3.58
All colored boys	1,257	43.36	486	16.76	1,156	39.88	.....	.....	.....
All colored girls	1,751	68.45	673	26.31	134	5.24	.....	.....	.....
Colored boys, abnormal	.....	.....	3	2.70	108	97.30	.....	.62	9.34
Colored girls, abnormal	128	51.20	110	44.00	12	4.80	7.31	16.34	8.96
Colored boys, sickly	.....	.....	.....	.....	72	100.00	.....	.....	2.48
Colored girls, sickly	103	54.79	75	39.89	10	5.32	5.88	11.14	7.47
Colored boys otherwise defective	.....	.....	3	7.69	36	92.31	.....	.62	3.11
Colored girls otherwise defective	25	40.32	35	56.45	2	3.23	1.43	5.20	1.49

TABLE LXXI.—*Per cent of different abnormalities according to age, computed on the total number of boys for each age.*

Nearest age.	Total number.	Sickly.		Nervous.		Defective in—						Convulsions.		Lazy.		Unruly.	
						Eyesight.		Hearing.		Speech.							
		Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.
Years.																	
6	147	7	4.76	3	2.04	.....	.....	.....	.....	4	2.72	.....	.....	1	0.68	4	2.72
7	533	28	5.25	3	.56	5	0.94	2	0.38	10	1.88	.....	.....	1	.19	18	3.38
8	787	28	3.56	11	1.40	4	.51	5	.64	12	1.52	1	0.13	2	.26	30	3.81
9	878	41	4.67	9	1.03	13	1.48	5	.57	8	.91	.....	.....	6	.68	40	4.56
10	930	44	4.73	14	1.51	15	1.61	3	.32	13	1.40	.....	.....	13	1.40	45	4.84
11	862	57	6.61	12	1.39	10	1.16	3	.35	9	1.04	.....	.....	13	1.51	59	6.84
12	986	61	6.19	16	1.62	17	1.72	8	.81	9	.91	2	.20	15	1.52	71	7.20
13	926	54	5.83	10	1.08	13	1.40	11	1.19	10	1.08	1	.11	16	1.73	62	6.70
14	784	48	6.12	9	1.15	7	.89	10	1.28	6	.77	.....	.....	17	2.17	64	8.16
15	528	31	5.87	5	.95	7	1.33	3	.57	2	.38	.....	.....	9	1.70	31	5.87
16 and over	592	17	2.87	3	.51	11	1.86	3	.51	5	.84	1	.17	13	2.20	11	1.86
All ages	7,953	416	5.23	95	1.19	102	1.28	53	.67	88	1.11	5	.06	106	1.33	435	5.47

TABLE LXXII.—*Per cent of different abnormalities according to age, computed on the total number of girls for each age.*

Nearest age.	Total number.	Sickly.		Nervous.		Defective in—						Convulsions.		Lazy.		Unruly.	
						Eyesight.		Hearing.		Speech.							
		Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.	Total.	Per cent.
Years.																	
6	131	....	.....	1	0.76	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	508	14	2.76	7	1.38	3	0.59	2	0.39	5	0.98	.....	.....	.....	.....	2	0.39
8	754	27	3.58	10	1.33	6	.80	1	.13	2	.26	.....	.....	3	0.39	1	.13
9	883	33	3.74	2	.23	15	1.70	2	.23	2	.23	.....	.....	1	.11	1	.11
10	939	51	5.43	5	.53	16	1.70	7	.75	3	.32	.....	.....	.....	.....	2	.21
11	931	49	5.26	6	.64	15	1.61	2	.21	5	.54	1	0.11	2	.21	4	.43
12	876	59	6.74	6	.68	16	1.83	8	.91	1	.11	.....	.....	3	.34	2	.23
13	966	67	6.94	7	.72	18	1.86	4	.41	4	.41	.....	.....	1	.10	3	.31
14	833	35	4.20	4	.48	11	1.32	.....	.....	1	.12	.....	.....	5	.60	1	.12
15	655	33	5.04	4	.61	3	.46	.....	.....	1	.15	.....	.....	4	.61	4	.61
16 and over	1,044	39	3.74	5	.48	5	.48	5	.48	.....	.....	.....	.....	.....	.....	1	.10
All ages	8,520	407	4.78	57	.67	108	1.27	31	.36	24	.28	1	.01	19	.22	21	.25

TABLE LXXIII.—*All boys with abnormalities.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	0	6	6	24	0	1,074	44.75	0	594	24.75	1	1,032	44.87	0	489.09	20.38
6	7	7	6	88	5	3,790	45.66	3	2,140	25.18	2	4,116	47.86	2	1,755.54	20.41
7	7	8	6	126	2	5,895	47.54	1	3,205	25.64	1	6,305	50.44	1	2,558.25	20.47
8	7	9	6	141	1	6,906	49.33	3	3,627	26.28	2	7,703	55.42	1	2,856.89	20.41
9	7	10	6	150	1	7,586	50.91	3	3,966	26.98	1	9,033	60.62	3	3,048.25	20.74
10	7	11	6	191	0	10,220	53.51	1	5,325	28.03	1	12,401	65.27	0	3,917.26	20.51
11	7	12	6	215	2	11,652	54.70	2	6,090	28.59	1	15,351	71.73	1	4,468.94	20.88
12	7	13	6	205	5	11,395	56.98	7	5,865	29.62	2	16,088	79.25	2	4,291.21	21.14
13	7	14	6	192	1	11,253	58.92	9	5,460	29.84	0	16,613	86.53	1	4,018.05	21.04
14	7	15	6	106	0	6,498	61.30	4	3,233	31.70	2	10,430	100.29	0	2,266.97	21.39
15	7	16	6	88	0	5,644	64.14	3	2,799	32.93	1	9,687	111.34	0	1,894.14	21.52
16	7	17	6	43	0	2,810	65.35	3	1,347	33.67	0	5,115	118.95	0	936.73	21.78
17	7	20	9	13	0	857	65.92	0	444	34.15	0	1,582	121.69	0	283.36	21.80
				1,582	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXIV.—*All girls with abnormalities.*

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Lbs.*	*Lbs.*		*Inches.*	*In.*
5	0	6	6	4	0	178	44.50	0	100	25.00	0	185	46.25	1	58	19.33
6	7	7	6	34	1	1,500	45.45	1	814	24.67	0	1,545	45.44	0	678.20	19.95
7	7	8	6	59	0	2,856	48.41	1	1,506	25.97	0	2,922	49.53	1	1,188.18	20.49
8	7	9	6	50	2	2,339	48.73	1	1,255	25.61	0	2,598	51.96	0	1,017.31	20.35
9	7	10	6	79	0	4,049	51.25	1	2,111	27.06	1	4,528	58.05	2	1,562.01	20.29
10	7	11	6	75	1	3,927	53.07	0	2,080	27.73	0	4,745	63.27	1	1,515.03	20.47
11	7	12	6	83	1	4,520	55.12	3	2,270	28.38	2	5,682	70.15	2	1,675.88	20.69
12	7	13	6	101	3	5,553	56.66	4	2,867	29.56	0	7,855	77.77	1	2,080.12	20.80
13	7	14	6	53	1	3,092	59.46	2	1,584	31.06	0	4,701	88.70	1	1,097.69	21.11
14	7	15	6	48	0	2,955	61.56	2	1,491	32.41	0	4,868	101.42	0	1,016.87	21.18
15	7	16	6	40	1	2,426	62.21	1	1,234	31.64	1	3,977	101.97	1	822.97	21.10
16	7	17	6	21	0	1,304	62.10	0	682	32.48	0	2,314	110.19	0	445.46	21.21
17	7	19	9	15	0	943	62.87	0	497	33.13	0	1,612	107.47	0	323.99	21.60
				662	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXV.—*Unruly, sickly, and otherwise defective boys.*

UNRULY BOYS.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Lbs.*	*Lbs.*		*Inches.*	*In.*
5	0	6	6	3	0	134	44.67	0	76	25.33	0	139	46.33	0	62.25	20.75
6	7	7	6	20	2	834	46.33	0	505	25.25	1	938	49.37	0	407.60	20.38
7	7	8	6	33	1	1,533	47.91	0	850	25.76	0	1,714	51.94	0	674.48	20.44
8	7	9	6	38	0	1,831	48.18	0	984	25.89	0	2,103	55.34	0	761.97	20.05
9	7	10	6	44	0	2,253	51.20	2	1,132	26.95	0	2,677	60.84	1	886.06	20.61
10	7	11	6	56	0	2,993	53.45	1	1,550	28.18	0	3,759	67.13	0	1,166.31	20.83
11	7	12	6	63	0	3,431	54.46	1	1,758	28.35	0	4,543	72.11	0	1,315.65	20.88
12	7	13	6	61	0	3,512	57.57	1	1,791	29.85	0	4,814	78.92	0	1,303.56	21.37
13	7	14	6	62	0	3,651	58.89	2	1,797	29.95	0	5,413	87.31	1	1,258.69	20.63
14	7	15	6	34	0	2,079	61.15	1	1,034	31.33	0	3,411	100.32	0	725.16	21.33
15	7	16	6	15	0	959	63.93	1	465	33.21	0	1,705	113.67	0	322.98	21.53
16	7	17	6	6	0	383	63.83	0	202	33.67	0	698	116.33	0	130.49	21.75
17	7	20	9	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
				435	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

SICKLY BOYS.

5	0	6	6	7	0	311	44.43	0	170	24.29	1	251	41.83	0	142.99	20.43
6	7	7	6	31	0	1,424	45.94	1	751	25.03	0	1,448	46.71	0	629.73	20.31
7	7	8	6	27	1	1,209	46.50	1	656	25.23	0	1,293	47.89	1	532.21	20.47
8	7	9	6	34	0	1,673	49.21	0	882	25.94	0	1,785	52.50	0	695.45	20.45
9	7	10	6	42	1	2,114	51.56	1	1,111	27.10	0	2,532	60.29	0	875.95	20.86
10	7	11	6	49	0	2,599	53.04	0	1,351	27.57	0	3,095	63.16	0	993.81	20.28
11	7	12	6	55	1	2,946	54.56	0	1,568	28.51	0	3,772	68.58	0	1,142.63	20.78
12	7	13	6	41	2	2,202	56.46	1	1,172	29.30	1	3,042	76.05	0	858.91	20.95
13	7	14	6	47	0	2,765	58.83	3	1,294	29.41	0	3,943	83.89	0	996.50	21.20
14	7	15	6	25	0	1,515	60.60	2	714	31.04	1	2,252	93.83	0	530.23	21.21
15	7	16	6	11	0	702	63.82	0	354	32.18	1	1,091	109.10	0	231.87	21.08
16	7	17	6	13	0	851	65.46	2	371	33.73	0	1,505	115.77	0	282.50	21.73
17	7	20	9	7	0	460	65.71	0	237	33.86	0	845	120.71	0	151.06	21.57
				389	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXV.—*Unruly, sickly, and otherwise defective boys*—Continued.

BOYS OTHERWISE DEFECTIVE, MENTALLY OR PHYSICALLY.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5	0	6	6	14	0	629	44.93	0	348	24.86	0	642	45.86	0	283.85	20.28
6	7	7	6	37	3	1,532	45.06	2	884	25.26	1	1,730	48.06	2	718.21	20.52
7	7	8	6	66	0	3,153	47.77	0	1,699	25.74	1	3,298	50.74	0	1,351.56	20.48
8	7	9	6	69	1	3,402	50.03	3	1,761	26.68	2	3,815	56.94	1	1,399.47	20.58
9	7	10	6	64	0	3,219	50.30	0	1,723	26.92	1	3,824	60.70	2	1,286.24	20.75
10	7	11	6	86	0	4,628	53.81	0	2,424	28.19	1	5,547	65.26	0	1,757.14	20.43
11	7	12	6	97	1	5,275	54.95	1	2,764	28.79	1	7,036	73.29	1	2,010.66	20.94
12	7	13	6	103	3	5,681	56.81	5	2,902	29.61	1	8,232	80.71	2	2,128.74	21.08
13	7	14	6	83	1	4,837	58.99	4	2,369	29.99	0	7,257	87.43	0	1,762.86	21.24
14	7	15	6	47	0	2,904	61.79	1	1,485	32.28	1	4,767	103.63	0	1,011.58	21.52
15	7	16	6	62	0	3,983	64.24	2	1,980	33.00	0	6,891	111.15	0	1,339.29	21.60
16	7	17	6	24	0	1,576	65.67	1	774	33.65	0	2,912	121.33	0	523.74	21.82
17	7	20	9	6	0	397	66.17	0	207	34.50	0	737	122.83	0	132.36	22.06
				758												

TABLE LXXVI.—*Unruly, sickly, and otherwise defective girls.*

UNRULY GIRLS.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Lbs.*	*Lbs.*		*Inches.*	*In.*
5	0	6	6	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
6	7	7	6	2	0	90	45.00	0	49	24.50	0	84	42.00	0	39.24	19.62
7	7	8	6	1	0	48	48.00	0	25	25.00	0	52	52.00	0	20.12	20.12
8	7	9	6	1	0	47	47.00	0	26	26.00	0	50	50.00	0	20.12	20.12
9	7	10	6	1	0	50	50.00	0	27	27.00	0	50	50.00	0	19.75	19.75
10	7	11	6	4	0	214	53.50	0	114	28.50	0	285	71.25	0	84.49	21.12
11	7	12	6	2	0	112	56.00	0	60	30.00	0	134	67.00	0	39.37	19.69
12	7	13	6	5	1	224	56.00	1	115	28.75	0	365	73.00	0	102.75	20.55
13	7	14	6	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
14	7	15	6	3	0	188	62.67	0	100	33.33	0	337	112.33	0	63.87	21.29
15	7	16	6	1	0	61	61.00	0	.....	.....	0	97	97.00	0	20.25	20.25
16	7	17	6	1	0	62	62.00	0	32	32.00	0	100	100.00	0	19.62	19.62
17	7	19	9	2	0	124	62.00	0	66	33.00	0	244	122.00	0	41.75	20.88
				23												

SICKLY GIRLS.

5	0	6	6	2	0	90	45.00	0	50	25.00	0	88	44.00	1	18.75	18.75
6	7	7	6	12	0	535	44.58	1	269	24.45	0	521	43.42	0	235.86	19.66
7	7	8	6	26	0	1,286	49.46	0	683	26.27	0	1,332	51.23	1	523.97	20.96
8	7	9	6	29	1	1,366	48.79	1	735	26.25	0	1,490	51.38	0	586.08	20.21
9	7	10	6	37	0	1,889	51.05	1	963	26.75	0	2,096	56.65	1	730.14	20.28
10	7	11	6	38	0	2,013	52.97	0	1,049	27.61	0	2,356	62.00	1	753.58	20.37
11	7	12	6	46	1	2,478	55.07	3	1,203	27.98	2	3,032	68.91	2	909.53	20.67
12	7	13	6	47	0	2,650	56.38	2	1,333	29.62	0	3,714	79.02	0	975.96	20.77
13	7	14	6	21	1	1,184	59.20	2	583	30.68	0	1,811	86.24	1	420.23	21.01
14	7	15	6	14	0	857	61.21	2	393	32.75	0	1,414	101.00	0	295.24	21.09
15	7	16	6	21	1	1,241	62.05	0	677	32.24	1	2,028	101.40	1	423.11	21.16
16	7	17	6	10	0	617	61.70	0	324	32.40	0	1,049	104.90	0	210.36	21.04
17	7	19	9	4	0	256	64.00	0	132	33.00	0	407	101.75	0	88.00	22.00
				307												

TABLE LXXVI.—*Unruly, sickly, and otherwise defective girls*—Continued.

GIRLS OTHERWISE DEFECTIVE, MENTALLY OR PHYSICALLY.

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
5 0	6 6	2	0	88	44.00	0	50	25.00	0	97	48.50	0	39.25	19.63
6 7	7 6	20	1	875	46.05	0	496	24.80	0	940	47.00	0	403.10	20.16
7 7	8 6	32	0	1,522	47.56	1	798	25.74	0	1,538	48.06	0	644.09	20.13
8 7	9 6	20	1	926	48.74	0	494	24.70	0	1,058	52.90	0	411.11	20.56
9 7	10 6	41	0	2,110	51.46	0	1,121	27.34	1	2,382	59.55	1	812.12	20.30
10 7	11 6	33	1	1,700	53.13	0	917	27.79	0	2,104	63.76	0	676.96	20.51
11 7	12 6	35	0	1,930	55.14	0	1,007	28.77	0	2,516	71.89	0	726.98	20.77
12 7	13 6	49	2	2,679	57.00	1	1,419	29.56	0	3,776	77.06	1	1,001.41	20.86
13 7	14 6	32	0	1,908	59.63	0	1,001	31.28	0	2,890	90.31	0	677.46	21.17
14 7	15 6	31	0	1,910	61.61	0	998	32.20	0	3,117	100.55	0	657.76	21.22
15 7	16 6	18	0	1,124	62.44	1	557	32.76	0	1,852	102.89	0	379.61	21.09
16 7	17 6	10	0	625	62.50	0	326	32.60	0	1,165	116.50	0	215.48	21.55
17 7	19 9	9	0	563	62.56	0	299	33.22	0	961	106.78	0	194.24	21.58
		332	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXVII.—*Colored boys with abnormalities.*

SICKLY BOYS.

Limits of different ages.		Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—	To—		No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs. Mos.	*Yrs. Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6 4	7 6	11	0	497	45.18	0	272	24.73	0	506	46.00	0	225.00	20.45
7 7	8 6	14	1	606	46.62	1	335	25.77	0	762	54.43	2	245.75	20.48
8 7	9 6	11	1	471	47.10	1	256	25.60	0	600	54.55	1	209.50	20.95
9 7	10 6	4	0	205	51.25	0	111	27.75	0	254	63.50	0	84.50	21.13
10 7	11 6	7	0	366	52.29	1	168	28.00	0	454	64.86	0	147.50	21.07
11 7	12 6	7	0	380	54.29	0	196	28.00	0	528	75.43	0	142.12	20.30
12 7	13 6	4	0	228	57.00	0	116	29.00	0	324	81.00	0	86.00	21.50
13 7	14 6	7	0	406	58.00	0	205	29.29	0	601	85.86	0	148.25	21.18
14 7	15 6	3	0	178	59.33	0	88	29.33	0	269	89.67	0	63.00	21.00
15 7	18 6	4	0	244	61.00	1	86	28.67	0	399	99.75	0	86.50	21.63
		72	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

BOYS OTHERWISE DEFECTIVE, MENTALLY OR PHYSICALLY.

Yrs. Mos.	*Yrs. Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6 4	7 6	3	0	139	46.33	0	73	24.33	1	105	52.50	0	60.25	20.08
7 7	8 6	3	0	146	48.67	0	79	26.33	0	178	59.33	0	62.95	20.98
8 7	9 6	3	0	144	48.00	0	77	25.67	0	156	52.00	0	65.00	21.67
9 7	10 6	6	1	250	50.00	1	129	25.80	0	394	65.67	1	103.50	20.70
10 7	11 6	4	0	208	52.00	0	114	28.50	0	254	63.50	0	85.75	21.44
11 7	12 6	4	0	209	52.25	0	114	28.50	0	292	73.00	0	82.50	20.63
12 7	13 6	6	1	282	56.40	1	140	28.00	0	470	78.33	0	127.00	21.17
13 7	14 6	4	0	227	56.75	0	118	29.50	1	271	90.33	0	85.37	21.34
14 7	15 6	4	0	238	59.50	0	125	31.25	0	368	92.00	0	85.00	21.25
15 7	18 6	2	0	131	65.50	1	34	34.00	0	247	123.50	0	44.25	22.13
		39	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXVII.—*Colored boys with abnormalities*—Continued.

ALL COLORED BOYS WITH ABNORMALITIES.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	4	7	6	14	0	636	45.43	0	345	24.64	1	611	47.00	0	285.25	20.38
7	7	8	6	17	1	752	47.00	1	414	25.87	0	940	55.29	2	308.70	20.58
8	7	9	6	14	1	615	47.31	1	333	25.61	0	756	54.00	1	274.50	21.12
9	7	10	6	10	1	455	50.56	1	240	26.67	0	648	64.80	1	188.00	20.89
10	7	11	6	11	0	574	52.18	1	282	28.20	0	708	64.36	0	233.25	21.20
11	7	12	6	11	0	589	53.55	0	310	28.18	0	820	74.55	0	224.62	20.42
12	7	13	6	10	1	510	56.67	1	256	28.44	0	794	79.40	0	213.00	21.30
13	7	14	6	11	0	633	57.55	0	323	29.36	1	872	87.20	0	233.62	21.24
14	7	15	6	7	0	416	59.43	0	213	30.43	0	637	91.00	0	148.00	21.14
15	7	18	6	6	0	375	62.50	2	120	30.00	0	646	107.67	0	130.75	21.79
				111	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXVIII.—*Colored girls with abnormalities.*

SICKLY GIRLS.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	16	0	718	44.88	0	379	23.69	1	667	44.47	0	321.75	20.11
6	7	7	6	19	0	886	46.63	1	412	22.89	1	793	44.06	0	383.50	20.18
7	7	8	6	29	0	1,392	48.00	0	718	24.76	0	1,443	49.76	0	591.25	20.39
8	7	9	6	21	0	972	46.29	0	510	24.29	0	1,104	52.57	1	389.50	19.48
9	7	10	6	11	0	549	49.91	0	290	26.36	2	507	56.33	1	207.50	20.75
10	7	11	6	24	0	1,295	53.96	0	668	27.83	0	1,543	64.29	0	486.50	20.27
11	7	12	6	19	2	935	55.00	1	511	28.38	1	1,387	77.06	0	396.25	20.86
12	7	13	6	14	0	799	57.07	0	408	29.14	0	1,183	84.50	3	232.75	21.16
13	7	14	6	9	2	424	60.57	0	275	30.56	0	884	98.22	0	197.50	21.94
14	7	15	6	9	0	532	59.11	0	276	30.67	0	907	100.78	1	171.50	21.44
15	7	16	6	9	0	563	62.56	2	222	31.71	0	949	105.44	0	190.50	21.17
16	7	17	6	5	0	307	61.40	0	161	32.20	0	547	109.40	0	109.75	21.95
18	7	21	6	3	1	115	57.50	0	95	31.67	0	310	103.33	0	66.00	22.00
				188	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

GIRLS OTHERWISE DEFECTIVE, MENTALLY OR PHYSICALLY.

Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	4	0	194	48.50	0	95	23.75	1	142	47.33	0	81.50	20.38
6	7	7	6	10	1	393	43.67	1	215	23.89	2	361	45.13	4	119.25	19.88
7	7	8	6	3	0	150	50.00	0	79	26.33	0	157	52.33	0	63.25	21.08
8	7	9	6	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
9	7	10	6	10	1	460	51.11	0	265	26.50	0	640	64.00	1	190.50	21.17
10	7	11	6	5	0	265	53.00	0	138	27.60	0	355	71.00	0	107.50	21.50
11	7	12	6	9	0	500	55.56	0	260	28.89	1	610	76.25	0	193.25	21.47
12	7	13	6	6	0	286	47.67	0	170	28.33	0	460	76.67	0	125.00	20.83
13	7	14	6	3	0	182	60.67	1	60	30.00	0	277	92.33	0	64.50	21.50
14	7	15	6	8	1	419	59.86	1	215	30.71	0	763	95.38	0	169.62	21.20
15	7	16	6	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
16	7	17	6	4	0	246	61.50	1	93	31.00	0	442	110.50	0	85.25	21.31
18	7	21	6	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	.....
				62	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

TABLE LXXVIII.—*Colored girls with abnormalities*—Continued.

ALL GIRLS WITH ABNORMALITIES.

Limits of different ages.				Total number of pupils.	Height.			Sitting height.			Weight.			Circumference of head.		
From—		To—			No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.	No. omitted.	Total.	Average.
Yrs.	*Mos.*	*Yrs.*	*Mos.*			*Inches.*	*In.*		*Inches.*	*In.*		*Pounds.*	*Lbs.*		*Inches.*	*In.*
6	0	6	6	20	0	912	45.60	0	474	23.70	2	809	44.94	0	403.25	20.16
6	7	7	6	29	1	1,279	45.68	2	627	23.22	3	1,154	44.38	4	502.75	20.11
7	7	8	6	32	0	1,542	48.19	0	797	24.91	0	1,600	50.00	0	654.50	20.45
8	7	9	6	21	0	972	46.29	0	510	24.29	0	1,104	52 57	1	389.50	19.48
9	7	10	6	21	0	1,009	48.05	0	555	26.43	2	1,147	60.37	2	398.00	20.95
10	7	11	6	29	0	1,560	53.79	0	806	27.79	0	1,898	65.45	0	594.00	20.48
11	7	12	6	28	2	1,435	55.19	1	771	28.56	2	1,997	76.81	0	589.50	21.05
12	7	13	1	20	0	1,085	54.25	0	578	28.90	0	1,643	82.15	3	357.75	21.04
13	7	14	6	12	2	606	60.60	1	335	30.45	0	1,161	96.75	0	262.00	21.83
14	7	15	6	17	1	951	59.44	1	491	30.69	0	1,670	98.24	1	341.12	21.32
15	7	16	6	9	0	563	62 56	2	222	31.71	0	949	105.44	0	190.50	21.17
16	7	17	6	9	0	553	61.44	1	254	31.75	0	989	109.89	0	195.00	21.67
18	7	21	6	3	1	115	57.50	0	95	31.67	0	310	103.33	0	66.00	22.00
				250	...	.....	.....	...	.....	.....	...	.....	.....	...	.....	.....

III.—MEASUREMENTS OF SCHOOL CHILDREN IN THE UNITED STATES.

The object of this section is to give brief summaries of anthropometrical and psycho-physical measurements made by different investigators in this country. For a more extended study of the measurements, the reader is referred to the original articles noted in the bibliography.

BOSTON SCHOOL CHILDREN.

The results of Dr. Bowditch's measurements of Boston school children are given below.

Dr. Bowditch finds in general the children of the nonlaboring classes to be larger than the children of the laboring classes (see Tables A and B). This is not only true of children of American parents but also of children of Irish nationality. This is mainly, although not wholly, due to conditions of greater comfort and ease in life.

TABLE A.—*Showing average heights and weights of Boston school boys, irrespective of nationality.*

Occupation of parents.	Age at last birthday.	Number of observations.	Height.		Weight.	
			Inches.	*Centimeters.*	*Pounds.*	*Kilograms.*
Nonlaboring	5	135	41.64	105.8	41.21	18.70
	6	243	44.11	112.1	45.50	20.64
	7	294	46.23	117.5	49.77	22.57
	8	295	48.08	122.2	54.64	24.78
	9	272	50 03	127.1	59.89	27.16
	10	262	52.12	132.5	66.31	30.08
	11	284	53.84	136.8	71.81	32.57
	12	277	55.92	142.1	80.38	36.46
	13	277	58.13	147.7	88.59	40.18
	14	265	60.52	153.8	96.54	43.79
	15	231	62.68	159.3	108.81	49.36
	16	169	65.23	165.8	122.48	55.56
	17	97	66.17	168.1	128.23	58.16
	18	46	66.69	169.4	132.00	59.87
Laboring	5	694	41.57	105.6	41.00	18.60

TABLE A.—*Showing average heights and weights of Boston school boys, etc.*—Continued.

Occupation of parents.	Age at last birthday.	Number of observations.	Height.		Weight.	
			Inches.	*Centimeters.*	*Pounds.*	*Kilograms.*
Laboring	6	1,007	43.74	111.2	45.06	20.44
	7	1,133	45.61	116.0	48.93	22.19
	8	1,161	47.67	121.2	53.67	24.34
	9	1,097	49.73	126.4	59.22	26.86
	10	1,023	51.55	131.0	64.89	29.58
	11	956	53.17	135.1	69.67	31.60
	12	899	54.84	139.4	75.88	34.42
	13	800	56.89	144.5	83.40	37.83
	14	582	59.31	150.7	93.67	42.49
	15	365	61.90	157.3	104.88	47.57
	16	162	64.65	164.3	119.03	53.99
	17	77	65.75	167.1	125.28	56.83
	18	28	66.35	168.6	131.60	59.69

TABLE B.—*Showing average heights and weights of Boston school girls, irrespective of nationality.*

Occupation of parents.	Age at last birthday.	Number of observations.	Height.		Weight.	
			Inches.	*Centimeters.*	*Pounds.*	*Kilograms.*
Nonlaboring	5	120	41.66	105.9	40.55	18.39
	6	172	44.12	112.1	44.14	20.02
	7	247	45.71	116.3	48.02	21.73
	8	297	47.92	121.8	52.79	23.94
	9	224	50.16	127.5	58.78	26.66
	10	232	51.66	131.3	63.76	28.92
	11	210	53.66	136.4	70.49	31.97
	12	237	56.16	142.7	80.18	36.37
	13	191	58.67	149.1	90.68	41.13
	14	226	60.28	153.2	99.40	45.09
	15	168	61.19	155.5	107.70	48.85
	16	147	61.46	156.2	111.22	50.44
	17	98	61.88	157.3	115.15	52.23
	18	77	62.26	158.2	115.83	52.54
Laboring	5	491	41.26	104.8	39.48	17.91
	6	809	43.24	109.9	43.13	19.56
	7	921	45.41	115.4	47.16	21.39
	8	982	47.47	120.6	51.81	23.50
	9	913	49.27	125.2	56.74	25.74
	10	854	51.25	130.3	61.98	28.11
	11	719	53.41	135.7	68.01	30.85
	12	671	55.70	141.5	77.52	35.16
	13	593	58.01	147.4	87.88	31.66
	14	419	59.84	152.1	97.92	44.42
	15	258	61.00	155.0	105.11	47.68
	16	169	61.55	156.3	112.59	51.07
	17	89	61.92	157.4	115.72	52.49
	18	46	61.70	156.8	112.94	51.23

The number of children measured was 24,626, of which 13,722 were boys and 10,904 girls. The following are some of the conclusions of Dr. Bowditch:

1. Maximum yearly growth in height and weight occurs in boys two or three years later than in girls.

2. Large children make their most rapid growth at an earlier age than small ones.

3. In boys at 11 years of age there is remarkably slow growth in height and weight; a similar period but less marked in retarded growth is found in girls at 9 years of age.

4. At about 13 or 14 years, girls are during two years both taller and heavier than boys at the same age; though before and after that period the reverse is the case. The prepubertal period of accelerated growth occurs earlier in girls than boys. This fact may account for the temporary superiority of the girls.

5. Children of American-born parents are taller and heavier than those of other nationalities. The relation of weight to height is as follows: Below 58 inches boys are heavier; above 58 inches girls are heavier. Dr. Bowditch illustrates how healthy growing children, during adolescence, may vary within a range of 4 or 5 per cent on either side of an average. To determine how much wider the variation may be without passing the limits of health would necessitate a very large number of observations.

Milwaukee School Children.

These results were obtained by George W. Peckham. The conclusions from his study are:

I. Rate of growth is such that the boys are taller until the twelfth year and heavier until the thirteenth; between 13 and 15 the girls are both taller and heavier; after 15 the boys excel the girls; girls nearly cease to grow when about 17 years of age.

II. Children of purely American descent are taller than children of foreign-born parents; but children of German parents are heavier; Irish children are taller than the German; greater height is due to stock or race.

III. School children in Milwaukee are taller than those in Boston; boys are heavier also, but girls are slightly lighter; superiority of height may be due to less density of population; the struggle for existence is not so severe; urban disadvantages are fewer in Milwaukee.

IV. The height of American-born men is modified by density of population. Urban life decreases stature from five years of age on.

V. Growth of Germans is much modified by residence in this country through one generation. In intermarriage with Americans, the offspring seem to take the height of taller parent.

VI. The sitting height in girls is less than in boys until the tenth year and then greater till the sixteenth year. From 15 to 18, sitting height in girls increases only 2 inches, but over 4 inches in boys. At 14 the lower extremities of girls almost cease growing, while those of boys increase 4 inches between 14 and 19.

School Children of St. Louis, Mo.

In 1892 Dr. Porter studied the school children of St. Louis, securing results from 33,500 boys and girls, as to weight, height, length and breadth of head, vital capacity of chest, acuteness of vision, and nationality of parents. The larger part of the measurements were made by the teachers. The classification of pupils is irrespective of nationality; the children were weighed in indoor winter clothing; the shoes were taken off when the standing height was measured.

It is the opinion of Dr. Porter that weight may be looked upon as an index to physical development; and that weight also has a very close relation to strength.

The general conclusions from the following table (No. 1) are that there is a physical basis for precocity (brightness) and dullness. Dull children are lighter and precocious children heavier than the average child. Mediocrity of mind is associated with mediocrity of physique.

TABLE No. 1.—*Average weights of St. Louis schoolboys.*

Age at nearest birthday.	Average weights.	Average weights distributed by grades.								
		Kindergarten.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	High school.
6	**43.49**	**43.27**	**44.99**								
	19.75	19.64	20.42								
7	**47.73**	**45.26**	**48.49**	**52.75**							
	21.67	20.79	22.01	23.95							
8	**52.39**	**48.21**	**51.58**	**54.32**	**57.33**						
	23.78	21.89	23.42	24.66	26.02						
9	**57.41**		**55.52**	**57.56**	**59.26**	**61.91**					
	26.06		25.22	26.13	26.90	28.11					
10	**62.38**		**60.36**	**61.10**	**63.57**	**64.33**					
	28.32		27.41	27.74	28.86	29.20					
11	**68.30**		**64.22**	**65.55**	**67.77**	**71.39**	**72.37**	**74.12**			
	31		29.16	29.76	30.77	32.41	32.85	33.65			
12	**73.82**			**70.63**	**71.86**	**74.31**	**75.26**	**77.83**			
	33.51			32.06	32.63	33.73	34.17	35.33			
13	**80.65**			**74**	**77**	**78.83**	**81.94**	**83.69**	**86.83**	**82.26**	
	36.61			33.60	34.96	35.79	37.20	38	39.42	37.33	
14	**89.09**		-		**84.63**	**85.59**	**90.68**	**87.75**	**93.28**	**98.22**	**91.88**
	40.44				38.42	38.86	41.17	39.87	42.35	44.59	41.72
15	**101.80**					**92.52**	**98.71**	**96.38**	**106.16**	**104.72**	**103.27**
	46.22					42	44.81	45.12	48.20	47.54	46.88
16	**113.65**							**116.60**	**102**	**114.57**	**123.77**
	51.60							52.93	46.31	52.01	56.19

In table No. 1, is found the average weights of boys distributed by school grades and the average weights irrespective of grade. Pounds are in heavy-faced type and kilograms in light-faced type. In other tables Dr. Porter shows that his results are supported by means[1] as well as averages.

If weight is to be regarded as a good index of physical development then, a priori, height, chest girth, and other dimensions follow the same law, as Dr. Porter shows in table No. 2, which follows:

TABLE No. 2.—*The mean and the average height, standing, of boys, aged 10.*

School grade.	Mean.	Average.	Number of observations.
	Cm.	*Cm.*	
I	126.50	126.13	109
II	129.39	128.78	440
III	130.29	129.96	436
IV	131.22	131.99	185

TABLE No. 3.—*The mean and the average height, standing, of girls, aged 12.*

School grade.	Mean.	Average.	Number of observations.
	Cm.	*Cm.*	
II	136.06	135.93	73
III	139.04	138.97	217
IV	140.08	139.77	395
V	141.96	140.57	227
VI	141.90	141.80	110

Boys at age 10, and girls at age 12, may be selected, as at these ages the number of observations is large and the pupils are found in several grades. From the table

[1] Porter found the mean weight, for instance, by adding the figures in the column, beginning at the bottom, until the sum could not be increased by the next number without exceeding 50 per cent of the total number in the column.

above it appears that precocious children are taller as well as heavier than dull children.

From the following tables, Nos. 4, 5, and 6, it will be seen that precocious children have larger chests than dull children:

TABLE No. 4.—*Distribution of girls, aged 12.*

School grade.	Number of observations.
I	13
II	68
III	204
IV	381
V	210
VI	111
VII	13
VIII	3

The girth of chest was taken over the shirt in boys, and over the dress in girls, in each case on a level with the nipples.

Grade IV, containing the greatest number of girls, is the mean grade at this age. With it may be compared the mean chest girth of the 285 girls in grades I, II, and III, and the 337 girls in the higher grades V, VI, VII, and VIII. The following results appear:

TABLE No. 5.—*Girth of chest at forced expiration in dull, mediocre, and precocious girls, aged 12.*

School grade.	Mean.	Number of observations.
	Cm.	
I, II, III	66.21	285
IV	66.78	381
V, VI, VII, VIII	67.89	337

TABLE No. 6.—*Girth of chest at forced expiration in boys, aged 10.*

School grade.	Mean.	Average.	Number of observations.
	Cm.	*Cm.*	
I	62.96	62.62	115
II	63.27	63.11	454
III	63.94	63.81	462
IV	64.24	64.32	189

The width of the head or distance from one parietal eminence to the other is also greater in more advanced pupils than in the less advanced:

TABLE No. 7.—*Width of head of girls, aged 12.*

School grade.	Mean.	Average.	Number of observations.
	Mm.	*Mm.*	
II	144.25	143.68	68
III	145.52	144.77	193
IV	145.75	144.94	343
V	146.24	145.50	217
VI	148.08	147.64	89

TABLE No. 8.—*Width of head of boys, aged 10.*

School grade.	Mean.	Average.	Number of observations.
	Mm.	*Mm.*	
I	146.06	145.86	92
II	146.33	146.73	408
III	146.71	146.48	397
IV	147.45	147.21	170

The head measurements were made by the undergraduates of the St. Louis Medical College.

Gratsianoff, of Russia, measured a number of children, showing that the bright pupils were larger than the dull, but the number was too limited. Sack studied some 4,245 boys, measuring 2,600 twice. He confirms the results of Gratsianoff, that the brighter children have a larger chest girth and are taller than the dull. Sack found the rate of growth regular. Dr. Porter arrived at his conclusions independently, without any knowledge of the results of the Russian scientist.

TABLE No. 9.—*Mean of the weights of boys of mean precocity and dullness compared with the mean weight irrespective of school grade.*

Age.	Mean precocity.	Mean dullness.	Mean.	Mean irrespective of school grades.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
7	48.64	46.69	47.66	47.73
8	53.50	51.59	52.54	52.58
9	58.64	56.12	57.38	57.75
10	64.05	60.95	62.50	62.48
11	69.57	66.96	68.26	68.47
12	75.24	72.26	73.75	73.61
13	81.00	77.36	79.18	79.85
14	90.57	85.69	88.13	88.08
15	105.27	94.78	100.02	100.20
16	120.96	105.00	112.98	114.17

TABLE No. 10.—*Mean of the weights of girls of mean precocity and dullness compared with the mean weight irrespective of school grade.*

Age.	Mean precocity.	Mean dullness.	Mean.	Mean irrespective of school grades.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
7	46.96	44.68	45.82	45.84
8	51.20	49.52	50.36	50.35
9	56.25	54.32	55.28	55.17
10	61.34	59.44	60.39	60.46
11	66.73	64.84	65.78	65.64
12	74.59	71.72	73.15	73.23
13	86.43	80.39	83.41	83.73
14	96.61	92.00	94.30	93.94
15	104.54	100.03	102.28	103.20
16	113.31	108.39	110.85	110.06

From the two preceding tables Dr. Porter concludes:

1. That the comparative rate of growth of dull, mediocre, and precocious children of the same sex is the same at all ages from 7 to 16, inclusive.

2. That the acceleration in weight preceding puberty takes place at the same age in dull, mediocre, and precocious children.

3. The point in the period of accelerated development at which girls become heavier than boys is the same in the dull, the mediocre, and the precocious.

These conclusions of Dr. Porter are based upon both means and averages, but how far they are applicable to individuals he does not think can be determined from the per cent data; but notwithstanding this he thinks the results of his research warrant the following practical deduction:

4. *No child whose weight is below the average for its age should be permitted to enter a school grade beyond the average of its age, except after such a physical examination as shall make it probable that the child's strength be equal to the strain.*

THE GROWTH OF FIRSTBORN CHILDREN.

Measurements of children in Toronto were made by Dr. A. F. Chamberlain and in Oakland, Cal., by Prof. Earl Barnes, under the general supervision of Dr. Boas, who finds that firstborn children excel later-born children in stature as well as weight, and that this difference prevails from the sixth year to the fifteenth in boys. The material is not sufficient to show whether the same is true of adult males. The difference is not large, but it occurs with such regularity that there can be no doubt as to its reality. It would seem that the greater vigor of the mother at the time of birth of first child and the more care she can give them than to later-born children is the cause that gives the firstborn the advantage; but it is interesting to know that the relations of size existing at the time of birth are reversed in later life, for the weight and length of new-born infants increases from the firstborn to the later-born children.[1]

Worcester (Mass.) School Children.

GROWTH IN BODY, HEAD, AND FACE.

In 1891 an investigation of growth of the Worcester school children was made by Drs. Boas, West, and Chamberlain, assisted by Drs. Bolton, Reigart, and Professors Lee, Russell, and others.

Table No. 11.

Age.	Average stature.		Average sitting height.		Average length of head.		Average breadth of head.		Average breadth of face.		Cephalic index.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
	Mm.	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*
5	1,097	1,074	603	586	176	174	140	138	114	112	79.56	79.40
6	1,127	1,113	614	615	177	172	142	139	114	114	78.94	79.60
7	1,170	1,175	642	639	179	175	142	140	117	114	79.42	80.02
8	1,223	1,216	666	656	180	174	143	141	116	115	78.71	80.41
9	1,270	1,266	689	678	181	176	144	140	120	117	79.63	79.71
10	1,340	1,328	708	698	182	177	145	142	120	118	80.30	79.46
11	1,388	1,370	722	726	183	180	144	142	121	120	78.80	78.90
12	1,429	1,447	747	757	183	180	145	143	122	122	79.40	79.40
13	1,476	1,479	766	783	184	181	147	145	124	123	79.50	79.60
14	1,543	1,537	799	806	187	183	147	144	126	125	78.60	79.00
15	1,622	1,570	845	832	188	184	148	146	129	126	78.59	78.99
16	1,658	1,584	862	847	191	184	149	144	130	126	77.81	78.48
17	1,685	1,594	885	852	189	185	150	146	131	127	78.34	78.50
18	1,700	1,591	889	851	192	186	151	147	134	129	78.88	79.36
19	1,713	1,593	896	851	192	183	150	145	133	129	78.33	79.68
20	1,739	1,590	898	853	195	182	152	147	136	129	77.88	79.41
21	1,705	1,592	887	853	192	186	153	145	138	129	79.29	78.36

[1] H. Fassbender in Zeitschrift für Geburtshülfe und Gynäkologie; Vol. III, p. 286. Stuttgart, 1878.

TABLE NO. 11—Continued.

Age.	Relative breadth of face to length of head.		Relative breadth of face to breadth of head.		Relative sitting height to stature.		Relative length of head to stature.		Average weight (pounds avoirdupois).	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
5	64.51	64.27	80.95	80.92	55.24	55.27	16.0	16.2	42.63	39.36
6	63.90	64.98	80.97	81.86	55.20	55.66	15.9	15.6	46.04	43.70
7	64.08	65.60	80.82	82.03	54.63	54.63	15.3	14.9	49.37	47.96
8	64.44	65.95	80.91	82.44	54.05	53.94	14.6	14.5	53.64	51.50
9	65.34	66.61	82.10	83.58	53.60	53.50	14.2	13.9	59.81	57.37
10	65.87	66.65	82.71	83.35	53.52	53.37	13.7	13.4	66.51	63.52
11	66.08	67.17	83.67	83.73	52.42	52.93	13.3	13.0	71.00	69.94
12	66.14	68.12	83.60	85.67	52.26	52.42	12.8	12.4	78.75	79.74
13	66.88	67.77	84.30	85.35	51.87	52.53	12.6	12.2	86.13	87.66
14	67.21	68.40	85.56	86.56	51.83	52.70	12.3	11.9	98.18	99.10
15	68.15	68.65	87.21	86.80	51.77	52.98	11.6	11.8	112.21	105.00
16	68.37	68.76	87.29	87.63	51.99	53.30	11.5	11.7	123.56	109.00
17	68.83	68.59	87.94	87.32	52.52	53.52	11.4	11.6	132.91	115.00
18	69.30	69.38	88.38	87.75	52.23	53.60	11.3	11.7	133.17	120.00
19	68.95	70.34	88.28	88.37	52.36	53.71	11.2	11.6	142.62	118.25
20	69.82	69.58	89.61	87.71	51.90	53.73	11.3	11.7	.....	119.75
21	71.96	69.28	90.77	88.64	52.99	53.75	11.3	11.6	.....	118.12

Table No. 11 gives the observations made in the Worcester primary, high, normal, and two private schools. The number of individuals measured was 3,250, the ages ranging from 5 to 21 years. There were different nationalities; about 66 per cent were native American, 20 per cent Irish, 7 per cent English and Scotch, and 6 per cent of various nationalities.

We present in substance the results as given by Dr. West.

LENGTH OF HEAD.

In the measurements of the head the girls were less than the boys in length of head throughout the whole period of growth, and consequently throughout life. The difference in length, however, varies considerably from year to year, being, for example, 3 millimeters at the ages of 11, 12, and 13, and rising as high as 6 millimeters before and 7 millimeters after that age. The annual increase is very irregular, periods of growth sometimes alternating with a cessation of growth.

In girls the greatest length of head is reached at about the beginning of the eighteenth year; in boys the head continues to grow until at least the age of 21. The period of greatest annual variation in increase seems to be before the eleventh or twelfth year in girls, and after this age in boys.

BREADTH OF HEAD.

The breadth of head presents, like the length, periods of alternate growth and cessation of growth. The girls' width of head is less than that of the boys', but the difference is less about the eleventh year; from this age until the fourteenth year the development is parallel; then the difference increases. The age of maximum width in girls is about 17, in boys not until 21.

GROWTH OF FACE OF GIRLS.

There seem to be three distinct periods in the growth of the female face, the first ending about the seventh year and the third beginning about the fifteenth year. There is an abrupt transition from the types of one period to those of the succeeding. There is a sudden shooting up of the widths to almost adult dimensions at about the age of 8 or 9, offset by the equally sudden disappearance of the distinctively childish characteristics at the age of 11. These peculiarities appear also at the ages of 12 and 14, suggesting the very slow growth of some children until the ages of 8 and 14 respectively are reached, and then a very rapid development of each individual

to her proper position in the series. Axel Key found the same to be true as to the total height of Swedish children.

In the second period very many of the forms are already adult. From the fifth to the tenth year, inclusive, the growth is somewhat slow, about 6.5 millimeters in all, but for the next four years, the period of adolescence, the growth is 6.2 millimeters. From the fourteenth year on there is very little advance, the maximum seeming to be reached at about 128 millimeters in the twentieth year. Comparing this growth with that of the male face, it is found that the male face, with perhaps a single exception, is larger for the same period of life and for the same years, growing more rapidly and growing later in life. Taking all the cases after 20, the advance is far beyond the breadth attained at 19, rising to about 138 millimeters. At about 9 years the two types approach very near, and as found in the case of height by Bowditch in Boston and Peckham in Milwaukee, the female face may for a short period become the broader; but, according to Dr. West, further investigation is necessary to determine this point. The present investigation by him was made on 2,500 persons of both sexes.

There are four points to be noted. First, the time of growth in the diameters of the heads and faces of girls is shorter than in the case of boys. Second, up to about the twelfth year these diameters grow more rapidly in girls than boys, while after this age the opposite is the case. Third, by an apparently sudden rise in the annual rate of growth in the girls, their diameters approach much more nearly those of the boys during the eleventh, twelfth, and thirteenth years. Finally, the average annual rate of growth in the diameters of the girls' heads and faces is nearly uniform during the two periods before and after the eleventh to the thirteenth years. In the case of boys it is considerably greater, actually and relatively, after than before. Between the fifth and eighteenth years the length of head of boys increases 16 millimeters; in the same period the breadth of head increases 11 millimeters and the width of face 18.5 millimeters. The corresponding measurements in the case of girls increase 12, 8, and 17 millimeters, respectively, for the same period of time. A comparison of the annual increments of the length of head and of the breadth of head seem almost to suggest an alternation in growth between the two diameters. This is further suggested by the alternate rising and falling of the cephalic index.

THE CEPHALIC INDEX.

Although the cephalic index is quite irregular in its annual stages, yet there is a certain general regularity, showing three periods, to wit, from the fifth to the eleventh, the eleventh to the sixteenth, and the sixteenth year on, in girls; from the fifth to the tenth, the tenth to the thirteenth, and from the thirteenth to the eighteenth in boys. The cephalic index for girls is for the period of growth higher than that of boys, except at about the ages of 9 and 10.

RELATION OF BREADTH OF FACE TO BREADTH AND LENGTH OF HEAD.

The breadth of face grows much more rapidly in proportion to the growth of the head in breadth and length. In proportion to the length of head the width of head and face of girls is generally greater than that of boys.

STATURE.

At 5 years of age the boys are taller than the girls; but the girls appear to equal them at the seventh year, and continue thus up to and including the ninth year, after which the boys rise again above the girls for two years. At about 12 years the girls suddenly become taller than the boys, continuing until the fifteenth year, when the boys finally regain their superiority in stature. After the age of 17 there seems to be very little, if any, increase in the stature of girls, while the boys are still growing vigorously at 18.

WEIGHT.

Weight, stature, and sitting height are somewhat parallel, but with minor differences. In weight, the girls seem to reach their maximum average at 17, the boys continuing to increase in average weight until a much later period in life.

SITTING HEIGHT.

Sitting height is in general parallel to stature in rate of growth. In the eleventh year, nearly a year earlier than in the case of stature, the girls exceed the boys, who do not regain their superiority until the fifteenth year, about half a year later than in the case of stature.

The greater part of the growth in stature, up to the twelfth year in the case of girls and until the fifteenth year in boys, is made in the lower limbs, while after these ages it is made in the trunk. Except for about two years throughout the period from 5 to 18 the limbs grow more rapidly than the trunk in boys, while in the case of girls the period of great comparative growth is divided nearly equally between the extremities and the trunk. Except from about the seventh to the tenth year the trunk is proportionally longer in girls than in boys; after the thirteenth year the difference is much more marked.

As before shown, the diameters of head and face in girls grow more rapidly than in boys up to 12 years; less rapidly after that age.

By comparison it will be seen that in stature and sitting height the annual rate of increase for girls is considerably less after 12 years than before. The boys maintain the same rate throughout. The results show that women reach maturity before men, except as to weight; girls complete their growth by the eighteenth year.

COMPARISON OF LENGTH OF HEAD TO STATURE.

Until the fifteenth year the length of head of girls is less in proportion to their stature than is that of boys to their stature. At 15 the ratio of the boys' length of head to their stature suddenly drops, while that of the girls gradually rises, indicating that in the adult the heads of women are proportionately longer than those of men. This is also true of the width of head and the width of face.

Measurements in the Public Schools of Iowa City and Other Places.

Dr. J. Allen Gilbert, of the University of Iowa, in his researches on school children in Iowa City and other places finds the following results (about 100 of each age were tested):

PAIN THRESHOLD.[1]

The results show a gradual decrease of sensibility to pressure as a rule from 6 to 19, boys being less sensitive than girls throughout. Girls reach nearly the minimum of sensibility at 13. At this age the boys begin to show the most rapid falling off of sensitiveness to pressure, so that up to the age of 14 the difference is nearly the same for both sexes, the average difference being about 4 kilograms, but subsequent to this time the difference increases until 19, when there is a difference of more than a kilogram between the sexes.

Pain tests for boys at 15 reach 820 grams pressure, the lowest mean variation being 330 grams at the age of 16 for girls. Age produces a gradual and for the most part regular decrease in the sensibility, but the mean variations are not so regular, but vary from age to age, there being apparently no law, except that the mean variation is less for girls than for boys, which is to be expected, as the threshold for pain is lower for girls than for boys.

[1] Pain threshold may be defined as the point where pain begins to be felt.

WRIST LIFT.

Increase in strength is very regular and marked throughout the development of the child, but having the same marked dividing point in the rapidity of development at the age of 14 for both sexes, boys beginning their most rapid increase at that point, while girls begin slightly to retard their rate of development. Boys have a greater strength at all ages, but the difference is not so marked till 14, and at age 19 a boy lifts about twice what a girl does. At 6 the difference is only 0.5 kilogram, at 14, 3.5, and at 19, 13 kilograms. The mean variation begins to increase at the same age at which there is a change in rapidity of growth for both sexes. The mean variation is less for girls than for boys, largely because the girls have less strength.

LIFT WITH ARMS.

The results of this test follow about the same law as in the wrist lift.

ESTIMATION OF LENGTH BY ARM MOVEMENT.

Accuracy in judging space by movements of the arm increases with age. There is an underestimation of distance translated from the sense of sight to the muscle sense. Boys are less accurate than girls from age 6 to 10; then the reverse is the case till age 19, boys becoming more accurate than girls. The time element is probably the cause of underestimating distance. The eye makes a rapid sweep in judging of distance, while the arm is gradual in its change of position. The mean variation decreases with age, with no indication of difference between sexes.

ESTIMATION OF LENGTH BY SIGHT.

To find at what age children begin to make accurate estimates of special dimensions was one of the main aims of this test. This ability increases very rapidly from 6 to 11, and more rapidly with boys than with girls. Boys are more accurate than girls, with the exception of the ages 6 and 14. At age 6 the child estimates the line at about one-fifth its real length, making it 10.7 centimeters when it is 50.8 centimeters long. The child does not seem to have a proper conception of the matter until 9 or 10 years of age, girls having accurate judgment about two years later than boys. Up to the age of 15 distance is always judged shorter than it really is; after this age it is estimated longer than it really is, the most accurate age being between 15 and 16. However, the line is judged larger and longer as age advances. The reason for this, perhaps, is that the older the person the more careful he is to divide the space in equal parts with the eye rather than looking at it as a whole; filled space is overestimated. The mean variation decreases for both boys and girls, that of the boys being greater than that of the girls previous to age 9 and less subsequent to that age.

LUNG CAPACITY.

Boys have a larger lung capacity than girls at all ages. The difference is not so large from 6 to 13, but subsequently the difference between the sexes increases very rapidly. At 6 the boys have an advantage of 65.7 cubic centimeters; at 13, 283.6 centimeters, while at 19 the boys exceed the girls by 1,610.5 cubic centimeters. Here, as in the lifting tests, the girls reach their maximum at about 13, while at this age the most rapid growth for boys begins.

WEIGHT.

The weights were taken to an accuracy of two ounces. The general law is shown in all previous measurements of children, viz: Before the age of 11 boys are heavier than girls; from between 11 and 12 to between 13 and 14 the order is reversed and girls are heavier than boys; after this time the order is again reversed and boys are heavier. Girls grow most rapidly from 10 to 15, boys from 12 to 17.

The mean variations are largest in the period of fastest growth, increasing up to puberty and decreasing after that. Previous to age 11 the mean variation is about the same for both sexes. During the period in which girls are heavier than boys the mean variation is larger for the girls, the reverse being the case when the boys become heavier.

HEIGHT.

The same general rule applies to the growth of both sexes as in weight. Boys are taller than girls till between 10 and 11 years; the girls then become taller till about 14, when the boys again lead. Girls advance more slowly after 15 than before that age. The mean variations, in a general way, follow the same law as in weight, increasing till after the period of most rapid growth and then decreasing as rapidly as they increased.

VOLUNTARY MOTOR ABILITY.

The number of taps made in five seconds is given. For the first three years the girls tap faster than the boys, but from then till 19 the boys excel the girls. There is a gradual increase in rapidity of tapping for both sexes from age 6 to 19, showing an increase of about 15 taps in five seconds, the boys of 6 years tapping 22 times, while the boys of 19 tap 36.7 times in five seconds. Mean variations for voluntary motor ability increase greatly just previous to the change of growth for both sexes, reaching the maximum at age 10 for girls and at 13 for boys. Mean variations for fatigue also point to irregularity at this period.

FATIGUE.

Fatigue was expressed in per cent of loss in rapidity of tapping. This was calculated after tapping for forty-five seconds. The per cent of loss in rate of tapping decreases with age, girls not losing as much as boys.

PULSE.

With exception of age 6, the boys' pulse is slower than the girls' until between 10 and 11; faster from then till between 13 and 14, and then slower again from 14 on. There is an increase of pulse during the age of puberty in both sexes, being more marked in boys than girls.

TESTS AS RELATED TO MENTAL ABILITY.

There is in most of the tests very little evidence of any direct relation between mental ability and acuteness in the tests, yet in some there is sufficient relation for special mention. In estimation of length by sight, except at ages 9 and 13, the bright subjects make a more accurate estimate than the dull ones. Between 15 and 16 the dull suddenly change from an underestimation to an overestimation of true length. After age 14 the bright show nearly absolute accuracy, the average and dull ones being most accurate at about 15 years of age.

In graded weight there seems to be no constant relation between physical development and mental ability. From 10 to 14 there is a marked difference, the dull children being much heavier, while at other ages there is no definite indication. In respect to height there is no constant relation with mental ability. The same is true of lung capacity until age 10 to 15, when the duller children have the largest capacity, but after 15 the distinction disappears.

In voluntary motor ability, with the exceptions of ages 10 and 17, the bright children tap faster than the dull ones, the difference being very marked. The bright lose more in their rate of tapping by the fatigue induced.

SENSITIVE TO COLOR DIFFERENCES.

Ability to distinguish different shades of the same color increases with age. As a rule at 7 marked irregularities occur in all the curves which require mental action or discrimination. The average is slightly in favor of the girls. The boys excel the girls at 6, but at 17 the girls take the lead. With the boys 22.3 per cent failed to discriminate at all; in the case of the girls only 18.7 per cent failed, so the final balance is in favor of the girls.

FORCE OF SUGGESTION.

In this experiment large and small blocks were compared, being exactly alike in weight. Owing to this difference in size the child's judgment as to what the blocks would weigh by muscle sense was so influenced by suggestion from the eye as to what their relative weight should be if judged from sight that at 6, for example, they thought there was a difference of 42 grams between them. At 7 they were influenced more by the suggestion of sight than at 6, making a difference of 45 grams between the blocks. The influence of suggestion gradually increased, reaching its maximum at 9, where the average child thought there was a difference of 50 grams, which is almost as much as the weight of the blocks themselves; that is, 55 grams. From 9 to 17 the influence of suggestion gradually decreased, the muscle sense becoming more corrective of the suggestion given by sight. On the whole, variation decreases with advance in age.

REACTION TIME.[1]

The time of simple reaction decreases with age. Boys and girls at 6 when averaged together react in 29.5 hundredths of a second. This decreases to age 12, when the time is 18.7 hundredths of a second. From 12 to 13 no increase is made; from 13 there is a gradual increase until 16, when the reaction time is 15.5 hundredths of a second. Boys are quicker than girls throughout.

As to mental ability, bright children react much more quickly than dull. The average reaction time of all ages for bright children was 20.7 hundredths of a second; for average children 21.03 hundredths, and for dull children 22.4 hundredths of a second.

REACTION TIME WITH DISCRIMINATION AND CHOICE.

The length of time required decreased with advance in age, while ability increased. This is the case with other mental tests.

In girls development between 6 and 7 is for some reason arrested, but boys suffer no retardation. Starting at 53.5 hundredths of a second, they continually increase from 6 till 13. From 13 to 14 they suffer slight loss, after which they gain till 17, losing a little from 15 to 16. At 17 the time required for boys is 30.5 hundredths of second.

From 6 to 7 girls increase the time from 51 to 52.8 hundredths of a second. After 7 they increase in ability very rapidly till 12, where the length of time is 37 hundredths of a second. From 12 to 13 they lose much, requiring at 13 41.5 hundredths of a second, which is no better than they required at 10. After 13 they increase rapidly, with a small loss from 15 to 16, similar to the loss of the boys at that age.

Boys are superior to the girls in this test. The average for all the boys of all ages is 39.8 hundredths of a second, and that of the girls is 41 hundredths of a second.

General comparison of sex shows the boys to be superior.

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[1] Reaction time is the time between the application of a stimulus and the resultant reaction.

GENERAL RELATIONS AND COMPARISONS.

Marked changes in the development of the child are found about the age at which the change of growth occurs; that is, from 12 to 16, the most striking results being at about 14. Many variations are comparatively regular for the two sexes until about the age of 14. The change in variation is largely due to change of growth at this age. Girls complete to a great extent their development a year or two before the time the boys have just begun their most rapid period of growth.

In pain threshold, arm lift, wrist lift, and lung capacity the girls reach their maximum at 14. Comparing these tests with those taken at New Haven, it seems probable that a girl has largely completed her physical development before the age of 14 or 15. Comparing New Haven school children with those in Iowa City, in lung capacity, the Iowa children excel at all ages. In height they are about the same at the age of 6, but at 17 the boys of Iowa are 2.6 centimeters and the girls 2.2 centimeters taller than those of New Haven. In weight, at age 6 New Haven boys and girls are, respectively, 2 and 4.2 pounds heavier than the Iowa children, but at age 17 the Iowa boys and girls are 12.3 and 2.6 pounds heavier. This is probably due to the difference in environment. Boston and Milwaukee school children are still lighter and shorter than either New Haven or Iowa school children.

Comparing weight and height with mental ability the results are negative.

Graded weight, lung capacity, and wrist lift follow approximately the same law.

RESEARCHES ON NEW HAVEN SCHOOL CHILDREN.

Dr. J. A. Gilbert, in his researches on New Haven school children, gives the following results:

MUSCLE SENSE.

By muscle sense is meant sensitiveness to weight. There is a gradual increase in ability to discriminate between weights from the ages 6 to 13. At 6, the worst year for discrimination, the least perceptible difference was 14.8 grams, with 38 per cent of nondiscrimination; at 13 years, only 5.4 grams, with 2 per cent of nondiscrimination. At 6 there is a large difference of 3.8 grams in discriminative ability in favor of boys. At 7 they have the same ability with the girls. From 13 to 17 the boys excel again. In general the superiority of boys increases with age.

The curves for discrimination and mean variation agree in general; thus, when power of discrimination decreases, variation decreases for the corresponding period.

Marked changes in the curve for variation represent changes in growth.

RELATION OF THE DIFFERENT TESTS.

Weight and height conform almost exactly to the same rules. In both very slight differences exist between boys and girls until puberty.

After 12 girls gain very little in lung capacity, while the boys do not begin their real growth till 14. Not only the physical curves, but those representing the mental aspects show that the turning point in life comes later for boys than for girls. The three physical curves correspond generally; variation increases with advance in years; mean variations change with the change of rate in growth. The mean variations in the physical curves for boys and girls are largest during the years from 12 to 15.

The mental curves show an increase in ability with advance in years, with the exception of the test on the force of suggestion.

The curves in voluntary motor ability and fatigue are closely related to those for weight and height.

The effect of puberty is very marked in the muscle sense, but affects least of all the discrimination of color differences.

Tests, where quickness and accuracy of action are involved, are affected in a most marked way by puberty, making it probable that puberty has a greater effect on the

mental than even on the physical nature of man. This effect is much greater on girls than on boys.

In comparing graded reaction with discrimination and choice, it is found that the bright and dull act with the same rapidity between 11 and 12, just before puberty, but after that age the dull are much slower than the bright. By a general comparison it seems that all children are of about equal ability at age 11.

In general, the brighter the child the more accurate his sense of time.

In comparing results with Bowditch, of Boston, and Peckham, of Milwaukee, New Haven children are shown to be the heaviest and the tallest. This may be due to the small proportion of foreigners included in the results, for Bowditch has shown that American-born children are taller and heavier than foreign-born children. There is agreement as to the relation of growth of different ages.

Kansas City, Mo., School Children.

Superintendent J. M. Greenwood, of the Kansas City schools, finds that girls, especially those in the high school, learn more rapidly than boys; they stand usually much higher in their classes. He thinks this is due to the fact that girls cease to grow more rapidly at an earlier age than boys, and their systems have attained, as it were, a higher degree of solidity than the boys of corresponding age.

Table No. 12.

WHITE CHILDREN (1890).

Boys.				Girls.			
Number.	Age.	Average height.	Average weight.	Number.	Age.	Average height.	Average weight.
	Years.	*Inches.*	*Pounds.*		*Years.*	*Inches.*	*Pounds.*
349	10	52	67.5	400	10	51.68	65.92
395	11	53	70.96	411	11	52.7	66.2
408	12	56	78.28	469	12	54.015	80.64
293	13	56.6	87.45	311	13	57.43	91.72
347	14	58.6	93.45	366	14	60.31	100.1
133	15	62.4	111.27	313	15	62.04	109.36
129	16	63.93	119	186	16	62.52	111.16
77	17	64.8	126.6	87	17	62.9	117.11
24	18	66.66	136.83	52	18	63.29	118.92
				24	19	64.2	120.25

COLORED CHILDREN (1890).

28	10	51	72.7	30	10	49.8	74.56
36	11	53.36	78.25	52	11	52.8	79.85
44	12	53.73	83	61	12	54	82.83
51	13	56	89	62	13	56.85	97.145
29	14	58.88	93.55	44	14	58.75	103.83
33	15	61	112.3	46	15	61.54	110.13
9	16	64.44	121.1	32	16	62.8	117
5	17	65	130	12	17	66	128

In the tables above the pupils were measured with shoes off and weighed without their wraps.

The results in Greenwood's table show that at 10 there is a little difference between the height and weight of boys, but between 11 and 12 the girls grow more rapidly than boys, usually till 14 or 15, and then the boys go ahead again.

Greenwood says that from an educational point of view there are periods in a child's life when growth is greatest. At these times the vital functions are the most active in making accumulations for the future wants of the body; at this time the educational stress upon the system should be the least possible. Here, owing to superabundance of inertia, both teacher and parent are most likely to find fault. Excessive study, overstrain, late hours, loss of sleep, may destroy the most vigorous constitutions or sow the seeds of weakness throughout life.

Growth of United States Naval Cadets.

Dr. Beyer, in his study of the growth of United States naval cadets, makes the following observations (see table below):

From the great preponderance of blue eyes and light brown hair in the naval cadets it is safe to consider the great majority of them as belonging to the Teutonic races.

The fact that cadets come from all parts of the United States gives to the measurements a more national character. A large percentage of the measurements were continued from year to year.

An examination of the tables shows:

Weight.—There is an almost steady increase from the fifteenth to the twenty-third year, amounting in all to 37 pounds, the annual increase declining as age advances.

Height.—The greatest increase in height is between 15 and 16 years of age, after which the annual increase rapidly declines, growth being distinctly retarded at about 18; then another marked increase occurs, which closes at 21; a third increase leads to final growth.

Sitting height.—Increase in sitting height comes to a close at 19 years of age.

Circumference of chest.—This becomes highest at 17, which it attains at rapidly advancing rates; after 19 it is steadily advancing, but only by small fractions of an inch.

Lung capacity.—It reaches its maximum at 19 and continues steady or varies only slightly.

Waist.—Here there is a continued increase up to 23, remaining, however, stationary from 19 to 21, and after this it increases most rapidly.

Span of arms.—Its greatest increase is between 15 and 16, then it increases slowly but steadily until the twenty-third year.

Vision.—It is significant that both right and left vision show a positive increase up to the nineteenth and twentieth years. This fact seems important, in apparently demonstrating that the course of study at the Naval School and the strain upon the eyes does not in itself diminish the degree of distance vision in an otherwise normal eye, but that on the contrary it is advantageous in slightly increasing the visual range. Beyer thinks that the slight decrease in distance vision at 23 would indicate that the requirements of those at sea result in undue strain.

Hearing.—This is affected quite perceptibly, but in a contrary direction from sight. There is a gradual but steady decrease for both ears, which the occupation of naval cadets would lead one to expect.

Beyer agrees with Bowditch that the period of accelerated growth is prepubertal in time. Beyer thinks it natural that the fullest maturity should be followed by a period of retarded growth, which is shown in his figures for annual growth.

Tall boys are much more likely to have completed their growth at an earlier age than short boys. Also short boys not only grow more rapidly and more extensively than tall boys, but also continue to grow up to a later age than tall boys, who complete their development in height first.

Height once attained is not so easily lost, but weight and strength are easily lost as well as quickly regained. It would seem also that the ratio between growth in height and chest girth is different for short boys from that for tall boys.

TABLE NO. 13.—*Measurements of United States naval cadets (Beyer), giving averages.*

Age at nearest birthday.	Number of observations.	Weight.		Height. Standing.		Height. Sitting.		Height. Perineal.		Circumference of chest.		Lung capacity.		Waist.	
		Kilos.	*Lbs.*	*Cm.*	*In.*	*Cm.*	*In.*	*Cm.*	*In.*	*Cm.*	*In.*	*Liters*	*Cu.in.*	*Cm.*	*In.*
15	132	48.53	107	162.05	63.8	84.58	33.3	81.28	32	77.47	30.5	2.998	183	63.75	25.09
16	395	53.01	118	167.45	65.93	86.48	34.5	83.82	33.2	80.51	31.67	3.293	201	66.04	26
17	722	56.70	125	170.30	67.05	88.90	35	86.36	34	82.55	32.5	3.555	217	69.59	27.36
18	841	60.55	133.4	170.71	67.29	90.79	35.75	87.36	34.6	85.09	33.46	3.702	226	70.80	27.9
19	750	63.36	139.7	172.46	67.90	91.56	36.50	91.80	35.9	88.90	35	3.932	240	72.61	28.6
20	645	64.05	141.2	174.11	68.55	89.10	35.77	88.90	35	87.12	34.3	3.915	239	72.64	28.62
21	493	63.40	140	174.22	68.6	91.44	36	86.36	34	87.12	34.3	3.948	241	72.89	28.68
22	328	64.09	141.3	173.86	68.45	91.44	36	88.90	35	87.20	34.35	4.030	246	73.15	28.8
23	232	65.31	144	174.29	68.62	91.44	36	88.90	35	88.39	34.8	3.964	242	74.16	29.2

Age at nearest birthday.	Number of observations.	Span of arms.		Vision. Right eye.		Vision. Left eye.		Hearing. Right ear.		Hearing. Left ear.		Squeeze. Right hand.		Squeeze. Left hand.	
		Cm.	*In.*	*Met.*	*Feet.*	*Met.*	*Feet.*	*Met.*	*Feet.*	*Met.*	*Feet.*	*Kilos.*	*Lbs.*	*Kilos.*	*Lbs.*
15	132	162.30	63.9	7.314	24	7.314	24	12.192	40	12.192	40	27.66	61	27.21	60
16	395	170.94	67.33	7.332	24.6	7.559	24.8	11.978	39.3	12.192	40	32.43	71.5	31.75	70
17	722	172.72	68	7.742	25.4	7.620	25	11.887	39	12.009	39.4	35.127	77.47	34.74	76.6
18	841	175.84	69.25	7.711	25.3	7.528	24.7	11.826	38.8	11.978	39.3	36.74	81	36.28	80
19	750	178.05	70.12	7.711	25.3	7.681	25.24	11.887	39	12.039	39.5	38.55	85	37.64	83
20	645	178.05	70.1	7.345	24.1	7.925	26	11.643	38.2	11.826	38.8	39.46	87	38.55	85
21	493	179.83	70.67	7.437	24.38	7.620	25	11.887	39	11.582	38	39.91	88	39.64	87.4
22	328	178.30	70.2	7.498	24.6	7.406	24.34	11.217	36.8	11.338	37.2	39.23	86.5	38.91	85.8
23	232	180.34	71	6.888	22.6	7.010	23	11.427	37.5	11.368	37.3	39.28	86.6	38.42	84.7

MEASUREMENTS OF TRUANTS.

Table No. 14 gives data collected by Kline to ascertain whether the physical condition of truants will account for their truancy. The results from this and other tables show that the mean heights, weights, and girths of chest of the truants are less than those of the public-school boys in every instance except at age 10, when they are equal in weight and height. The public-school boys gained more in height and less in weight than the truants.

TABLE NO. 14.—*Growth of chest and ratio of weight to chest of Worcester public-school boys and truant schoolboys.*

[By L. W. Kline, of Massachusetts.][1]

Boys in public schools.				Boys in truant schools.		
Age.	Number of observations.	Mean girth.	Ratio of weight to girth.	Number of observations.	Mean girth.	Ratio of weight to girth.
		Inches.			*Inches.*	
9	68	23.48	2.65	18	23.28	2.43
10	82	24.30	2.63	23	24.27	2.61
11	109	25.34	2.83	31	24.92	2.73
12	119	26.28	2.36	46	25.80	2 80
13	111	27.28	3.04	49	26.72	3.04
14	81	28.55	3.26	25	27.80	3.21
15	36	29.90	3.51	10	28.84	3.29

[1] Pedagogical Seminary, January, 1898.

TABLE NO. 15.—*Average mean weights and heights (in slippers), rate of increase, etc., of public-school boys of Worcester, Mass., and truant schoolboys of Massachusetts.*

[By L. W. Kline.][1]

Age.	Weights.								Heights.								
	Boys in public schools.				Boys in truant schools.				Boys in public schools.					Boys in truant schools.				
	Number of observations.	Average weight.	Mean weight.	Rate of increase.	Number of observations.	Average weight.	Mean weight.	Rate of increase.	Number of observations.	Average height.	Mean height.	Rate of increase.	Ratio of mean weight to mean height.	Number of observations.	Average height.	Mean height.	Rate of increase.	Ratio of mean weight to mean height.
Years.		*Lbs.*	*Lbs.*			*Lbs.*	*Lbs.*			*In.*	*In.*				*In.*	*In.*		
9	68	62.10	61.43		18	57.73	56.75		68	50.91	50.81		1.20	18	49.42	49.49		1.14
10	82	65.56	63.50	2.07	23	64.75	63.51	6.75	82	52.03	52.25	1.44	1.21	23	51.77	52.25	2.76	1.21
11	109	71.43	72	8.50	35	69.85	68.25	4.70	109	54.20	54.25	2	1.32	35	52.61	53	.75	1.28
12	120	77.27	76	4	50	74.55	72.37	4.12	120	55.79	55.37	1.12	1.37	50	53.99	53.62	.62	1.34
13	112	87.49	83.12	7.12	55	83.30	80.25	7.88	112	57.04	57.25	1.88	1.45	55	55.71	56	2.38	1.44
14	84	93.98	93.25	10.13	26	85.98	89.50	8.25	84	60	59.87	2.62	1.55	26	57.45	58.50	2.50	1.54
15	37	105.24	105	11.75	11	94	95	5.50	37	62.21	62	2.13	1.69	11	57.72	58.50		1.62
Total.	612	.....	.....	.....	218	.....	.....	.....	612	.....	.....	.....	.....	218	.....	.....	.....	.....

[1] The Pedagogical Seminary, January, 1898.

MEASUREMENTS OF PAIN ON CHILDREN IN PUBLIC AND PRIVATE SCHOOLS, ETC.[1]

The following tables (I–VIII) give in grams the average least sensibility to pain (by pressure) on the temples. The measurements were made under the direction of the author.[2]

TABLE I.—*Measurements of all persons (girls and women) of every division, arranged according to ages. Whole number, 899.*

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
10	91	1,926	1,750
11	111	2,129	1,969
12	131	1,854	1,705
13	123	1,877	1,881
14	92	1,878	1,858
15	80	1,926	1,837
16	75	2,102	1,661
17	64	2,119	2,130
18	34	2,154	2,072
19	31	2,610	2,458
20–30	30	1,912	1,743
30–40	18	2,035	2,097
40–50	13	2,179	2,088
50 on	6	2,225	2,141

[1] A paper read by the author before the American Psychological Association, December 30, 1898. See Psych. Rev., March, 1899.

[2] The algometer used is described on page 1155.

TABLE II.—*Girls in private schools.*

[Measured by A. B. Jones and A. E. Palmer.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
10	5	648	604
11	4	725	580
12	3	466	433
13	13	729	713
14	7	801	828
15	20	842	793
16	18	955	1,008
17	14	1,318	1,353
18	9	1,250	1,238
19	3	900	900

TABLE III.—*Girls in public schools of Saginaw, Mich.*

[Measured by A. Carman.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
10	86	2,001	1,817
11	107	2,182	2,021
12	128	1,887	1,807
13	110	2,013	2,019
14	85	1,990	1,944
15	60	2,288	2,185
16	57	2,463	2,394
17	48	2,373	2,382
18	25	2,480	2,374
19	20	2,885	2,632

TABLE IV.—*Boys in public schools of Saginaw, Mich.*

[Measured by A. Carman.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
10	98	2,233	2,102
11	105	2,241	2,314
12	120	2,393	2,363
13	150	2,507	2,444
14	98	2,638	2,529
15	83	2,780	2,621
16	54	2,782	2,682
17	34	2,990	2,959
18	15	3,000	2,807

TABLE V.—*University women.*

[Measured by F. A. Kellor and Emily Dunning.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
17–20	19	2,306	2,201
21–32	14	2,103	1,935
.....	33	2,220	2,088

TABLE VI.—*Washerwomen.*

[Measured by A. O. Moore.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
25–39	8	3,129	3,200
40–55	6	3,000	2,950
.....	14	3,073	3,092

TABLE VII.—*Business women.*

[Measured by A. O. Moore.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
30–40	5	1,260	1,271
45–60	4	1,587	1,450
.....	9	1,405	1,350

TABLE VIII.—*Self-educated women.*

[Measured by A. MacDonald.]

Nearest ages in years.	Number of persons.	Right temple.	Left temple.
21–36	13	1,150	1,119
41–53	11	1,475	1,365
.....	24	1,299	1,233

CONCLUSIONS.

1. In general (Table I), the sensibility to pain decreases as age increases. The left temple is more sensitive than the right. This accords with former experiments (see below), that the left hand is more sensitive to pain than the right hand. There is an increase of obtuseness to pain from ages 10 to 11; then a decrease from 11 to 12; then an increase from 12 to 13. From 13 to 17, while the right temple increases in obtuseness, the left temple increases in acuteness. This is in the post-pubertal period. There is a general variation, which experiments on larger numbers might modify (Table I).

2. Girls in private schools (Table II), who are generally of wealthy parents, are much more sensitive to pain than girls in the public schools (Table III). It would appear that refinements and luxuries tend to increase sensitiveness to pain. The hardihood which the great majority must experience seems advantageous. This also accords with our previous measurements (see below), that the nonlaboring classes are more sensitive to pain than the laboring classes.[1]

3. University women (Table V) are more sensitive than washerwomen (Table VI), but less sensitive than business women (Table VII). There seems to be no necessary relation between intellectual development and pain sensitiveness. Obtuseness to pain seems to be due more to hardihood in early life.

4. Self-educated women (Table VIII), who are not trained in universities, are more sensitive than business women. Giving, then, the divisions in the order of their acuteness to the sense of pain, they would stand as follows: (1) Girls of the wealthy

[1] By "laboring classes" are meant artisans and unskilled laborers. "Nonlaboring classes" refer to professional and mercantile men.

classes; (2) self-educated women; (3) business women; (4) university women; (5) washerwomen. The greater sensitiveness of self-educated women as compared with university women may be due to the overtaxing of the nervous system of the former in their unequal struggle after knowledge.

5. The girls in the public schools (Table III) are more sensitive at all ages than the boys (Table IV). This agrees with the results of our previous measurements, that women are more sensitive to pain than men.

These measurements of least disagreeableness, or of threshold of pain, are approximate measurements of the combination of nerve, feeling, and idea.

Results of Previous Experiments[1] (1,412 Persons).

Women are more sensitive to pain than men.

American professional men are more sensitive to pain than American business men, and also more sensitive than both English and German professional men. The laboring classes are much less sensitive to pain than the nonlaboring classes.

The women of the poorer classes are much less sensitive to pain than those in more comfortable conditions.

Young men of the wealthy classes are much more sensitive to pain than men of the working classes.

Young women of the wealthy classes are much more sensitive to pain than young men of the wealthy classes. As to pain, it is true in general that women are more sensitive than men, but it does not necessarily follow that women can not endure more pain than men.

The left hand is more sensitive to pain than the right hand.

Children in Public Schools of Saginaw, Mich.

Measurements of Pain in Relation to Age, Sex, Order of Birth, and Mental Ability.

These measurements of least sensibility to pain were made on 1,507 public-school children in Saginaw, Mich., by Miss Ada Carman.

The instruments used were the author's temple algometer and Collin's hand dynamometer, described in the section on instruments.

Before the experiments were made the pupils answered the following questions in writing:

Name, age, sex, order of birth; first, second, or later born; color of hair, color of eyes, left-handed, near or far sighted, nationality of father, nationality of mother, occupation of father, occupation of mother, education of father, education of mother.

When a pupil could not answer any question he was helped by his teacher or by the experimenter. At least 25 per cent did not know the color of their hair, and at least 50 per cent did not know the color of their eyes.

Most of the children were of foreign parentage and of the laboring classes, by which is meant artisans and unskilled laborers.

The tables give in grams the average least sensibility to pain by pressure on the temples, and in kilograms the average greatest strength by grasp of hands.

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[1] In previous experiments the author employed Cattell's hand algometer. Psychological Review, March, 1895 and 1896.

TABLE I.—*Boys.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	96	2,253	2,191	16	14
11	104	2,359	2,337	19	15
12	123	2,359	2,337	21	18
13	152	2,447	2,432	22	20
14	101	2,629	2,523	26	23
15	79	2,738	2,656	30	27
16	53	2,824	2,700	35	30
17	33	3,036	3,023	40	35
18	15	3,267	3,077	42	38
Total	756	2,493	2,466	24	21

TABLE II.—*Girls.*

Nearest age, in years.	Number of persons	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	86	1,874	1,827	11	10
11	102	2,107	1,983	13	12
12	132	1,873	1,788	15	14
13	107	2,017	1,997	18	16
14	84	1,955	1,961	20	17
15	82	2,218	2,165	21	18
16	66	2,433	2,283	21	18
17	48	2,360	2,330	23	22
18	25	2,478	2,374	24	22
19	19	2,937	2,705	23	20
Total	751	2,097	2,030	17	16

TABLE III.—*Boys first born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	20	2,180	2,178	15	12
11	40	2,420	2,363	18	16
12	31	2,421	2,390	21	18
13	55	2,537	2,461	22	20
14	25	2,390	2,208	27	23
15	23	2,354	2,189	29	26
16	20	2,845	2,603	38	33
17	8	3,288	3,163	43	37
18	4	3,575	3,275	40	37
Total	226	2,506	2,405	24	21

TABLE IV.—*Girls first born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	29	2,167	2,193	11	10
11	21	2,136	2,133	13	12
12	36	1,956	1,815	15	14
13	29	2,174	2,140	18	16
14	24	1,973	1,985	20	16
15	23	2,203	1,963	22	19
16	24	2,369	2,169	20	17
17	18	2,344	2,386	23	21
18	7	2,236	2,086	20	20
19	4	2,825	3,125	22	19
Total	215	2,163	2,096	17	16

TABLE V.—*Boys second born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	28	2,102	2,069	16	14
11	15	2,520	2,570	18	16
12	28	2,218	2,115	21	19
13	31	2,442	2,490	23	21
14	28	2,702	2,613	25	23
15	15	3,000	2,847	31	27
16	15	2,723	2,708	31	28
17	8	3,050	3,500	38	35
18	4	3,213	3,113	40	33
Total	172	2,519	2,489	24	21

TABLE VI.—*Girls second born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	28	1,746	1,714	11	10
11	35	2,120	1,929	13	11
12	32	1,652	1,633	15	13
13	24	1,948	2,023	17	15
14	18	2,194	2,142	20	17
15	19	2,258	2,289	23	19
16	16	2,572	2,397	20	19
17	9	2,183	2,211	21	22
18	2	3,225	3,150	28	21
19	6	3,100	2,717	21	21
Total	189	2,069	2,008	17	15

TABLE VII.—*Boys later born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	48	2,372	2,302	16	14
11	49	2,260	2,245	18	15
12	64	2,374	2,409	20	17
13	66	2,375	2,381	23	20
14	48	2,711	2,635	26	23
15	41	2,857	2,849	30	25
16	18	2,881	2,803	33	29
17	17	2,912	2,732	39	35
18	7	3,121	2,943	45	42
Total	358	2,527	2,493	24	21

TABLE VIII.—*Girls later born.*

Nearest age, in years.	Number of persons.	Average least sensibility to pain (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
10	29	1,703	1,534	11	11
11	46	2,084	1,957	13	12
12	64	1,938	1,843	15	13
13	54	1,964	1,908	18	16
14	42	1,843	1,869	19	17
15	40	2,208	2,221	20	17
16	26	2,406	2,317	21	19
17	21	2,498	2,333	24	23
18	16	2,491	2,403	25	24
19	9	2,878	2,511	24	21
Total	347	2,080	1,998	18	16

TABLE IX.

	Number of persons.	Average least sensibility (in grams).		Average strength of grasp (in kilograms).	
		Right temple.	Left temple.	Right hand.	Left hand.
Dark boys	356	2,462	2,408	25	22
Light boys	400	2,570	2,518	23	20
Dark girls	402	2,113	1,840	18	16
Light girls	349	2,884	2,022	17	15

TABLE X.

	Average least sensibility (in grams).		Average strength of grasp (in kilograms).	
	Right temple.	Left temple.	Right hand.	Left hand.
Bright	1,737	1,736	16	13
Dull	2,094	1,868	13	12

The following is a summary of the foregoing tables: With both boys and girls sensitiveness to pain decreases as age increases, and the left temple is more sensitive than the right (Tables I and II).

Girls are more sensitive and have less strength at all ages than boys (Tables I and II).

In boys, sensitiveness to pain decreases in order of birth (Tables III–V); with girls the reverse seems to be true (Tables VI–VIII.)

Boys with light hair and eyes are less sensitive and less strong than boys with dark hair and eyes. Girls with light hair and eyes are less sensitive to pain than girls with dark hair and eyes; they are also less strong (Table IX).

Bright boys are more sensitive to pain than dull boys and are stronger (Table X); the same is true as to girls.

IV.—MEASUREMENTS OF SCHOOL CHILDREN OF EUROPE.

The purpose of this part, as of part III, is to give in brief the results of studies upon children in Europe. For more detailed information the reader should consult the original articles.

Human Growth in English Towns.

According to John Yeats Peckham, of England, there were very few more persons in 1851, living in rural districts in the United Kingdom, than there were in 1801. There were on an average in 1851 in city districts 5.2 persons to an acre; in the rural districts, 5.3 acres to a person; in the one, 3,337 persons to the square mile; in the other, 120 only. As the inhabitants of cities become more and more numerous and influential, they must ultimately shape the future of any country. Peckham says that infancy and age, with all their ills, detract, economically speaking, from the effectiveness of life and add to its burdens. Thus, the population was more youthful than it should be by the natural standard. The inference is, therefore, that the youthful element may preponderate whether it be wisely progressive or rashly precipitate. Dr. Lankaster, when investigating in the South Kensington Museum, said that healthy men ought to weigh an additional 5 pounds for every inch in height beyond 61 inches, at which height they ought to weigh 120 pounds less one-seventeenth of that gross weight for clothing.

According to Liharzik growth is regular, and all deviation tends to produce disease, as disease also produces deviation. A large head is frequently accompanied with a contracted chest; here mental action may be slow—probably from deficient supply of purified blood. Boys of small frames often have rather large heads and are deficient in repose of character. City-bred children are usually more vivacious, but have less power of endurance (Liharzik) than children reared in the country.

Examination of Heights, Weights, etc., of Human Beings in the British Empire.

In the report of the anthropometric committee of the British Association for the Advancement of Science in 1880, are given the results of observations in over 50,000 individuals. In Table 1 below is shown how growth degenerates as we go lower in the social scale; there is a difference of 5 inches in average statures between the best and worst nurtured classes in the community.

There is a constant but more or less uneven growth in height, weight, chest girth, and strength of arm, increasing annually up to 16 or 17, and then rapidly diminishing. Between 11 and 14 the rate of growth in height is almost uniform. At 15 it begins to advance more rapidly, at 16 still more, at 17 it falls off by more than one-half, and after this decreases rapidly. The same is true in regard to weight, except that the rate begins a year earlier.

The growth of chest girth is uniform up to 13, when it becomes double and then follows nearly the same course as that of height and weight, except that it continues higher at 17 and 18.

The growth of strength is not so regular. It doubles at 13, making no advance at 14, but making a great advance at 15, continuing longer and diminishing more slowly than height and weight.

Color of Eyes and Hair.

Dr. Beddoe in a limited number of observations (1,027 in all) has found much difference between women of 18 to 23 and women over 25 years of age. In men the greatest change takes place from 20 to 23, while in women it is earlier. Green eyes do not occur with black hair, nor do so-called black eyes with the blackest hair, which often accompanies dark-gray eyes. Dark-blue eyes are rare with reddish hair, but often accompany dark or even black hair. A larger number of observations would probably enable young people to be distinguished from adults through the color of eyes and hair.

From this table (No. 1) of Charles Roberts[1] will be seen the relative statures of boys of the age of 11 to 12 years under different social and physical conditions of life. The zigzag line running through the means shows the degradation of stature as the boys are further and further removed from the most favorable conditions of growth.

Table 1.

Height.	Total number of observations.	Public schools, country.	Middle-class schools.		Elementary schools.				Military asylums.	Industrial schools.
			Upper towns.	Lower towns.	Agricultural laborers, country.	Artisans, towns.	Factories and workshops.			
							Country.	Towns.		
60 inches	6	2	.....	3	.....	1	.....	.....	.....	.....
59 inches	16	2	3	5	2	2	.....	.....	1	.....
58 inches	35	9	9	8	5	0	2	.....	2	.....
57 inches	66	11	17	13	4	4	5	5	7	1
56 inches	118	21	23	27	14	4	10	3	15	.....
55 inches	230	28	35	57	32	15	13	17	33	.....
54 inches	329	33	53	68	47	24	36	20	46	2
53 inches	361	15	55	58	47	26	34	38	84	4
52 inches	441	14	37	61	58	36	52	59	118	6
51 inches	370	6	25	40	36	28	45	57	123	10
50 inches	367	7	23	27	32	17	46	61	143	11
49 inches	252	2	8	20	14	12	31	40	114	11
48 inches	132	.....	3	1	7	4	11	20	76	10
47 inches	102	.....	3	4	5	7	5	13	59	6
46 inches	22	.....	.....	.....	1	1	3	7	7	3
45 inches	12	.....	.....	.....	.....	.....	.....	1	10	1
44 inches	1	.....	.....	.....	.....	.....	.....	.....	0	1
43 inches	1	.....	.....	.....	.....	.....	.....	.....	1	.....
42 inches	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Total	2,862	150	294	392	304	181	293	341	840	66
Average height, inches	52.60	54.98	53.85	53.70	53.01	52.60	52.17	51.56	51.20	50.02
Mean height, inches	52.5	55.0	54.0	53.5	53.0	52.5	52.0	51.5	51.0	50.0

Growth of the Sane and Insane.

Dr. Robert Boyd, of England, from examinations of 2,086 persons in an infirmary and 528 insane, gives among other results the following:

The body and internal organs arrive at their full size between 20 and 30 years of age. In children especially the body is attenuated by disease. The average weight of males is greatest from 70 to 80 years, which may be explained from the fact that many die at earlier periods from consumption.

[1] Manual of Anthropometry, London, 1878, page 32.

The mean weight of the male brain was at all periods above that of the female. Boyd thinks this is the probable cause of the large number of stillborn male infants as compared to females, 51 to 32. The highest average weight of brain in both sexes is from ages 14 to 20 years. The next highest was in the males from 30 to 40, and in the females from 20 to 30 years.

Growth of Boys in Breslau.

Carstädt, of Breslau, gives the results of 4,274 measurements in the following table:

Table 2.

Age.	Number of measurements.	Average height.	Growth in—	
			One-half year.	One year.
		Centimeters.	*Centimeters.*	*Centimeters.*
6 years	68	109.3	.....	.....
6½ years	147	111.8	2.5	.....
7 years	203	113.8	2.0	4.5
7½ years	199	116.8	3.0	.....
8 years	197	118.9	2.1	5.1
8½ years	189	121.6	2.7	.....
9 years	174	123.7	2.1	4.8
9½ years	157	126.0	2.3	.....
10 years	204	128.5	2.5	4.8
10½ years	232	130.8	2.3	.....
11 years	272	133.3	2.5	4.8
11½ years	317	135.6	2.3	.....
12 years	298	138.1	2.5	4.8
12½ years	325	140.4	2.3	.....
13 years	291	143.3	2.9	5.2
13½ years	274	145.8	2.5	.....
14 years	206	149.1	3.3	5.8
14½ years	157	152.3	3.2	.....
15 years	125	156.6	4.3	7.5
15½ years	104	159.9	3.3	6.2
16 years	75	162.8	2.9	.....
16½ years	60	164.5	1.7	.....

In the four years from 8 till 12 the growth is entirely regular, being for each year 4.8 centimeters. The greatest growth is from 14 to 15.

Kotelmann's Investigations in Hamburg.

In an investigation of the 515 students of the Johannaeum, in Hamburg, published in 1878, Kotelmann makes the following statements:

The students in the gymnasium exceed those in the lower schools in weight and height, more because of unfavorable social conditions of the pupils in these schools. The older the boys the more the muscles of the upper extremities grow as compared with those of the lower, which is explained by the fact that, as they are sitting more, the lower extremities are less active. Thus the muscles of the legs are less contractile as years increase, while the opposite is true with the muscles of the arms. With this is connected the further fact that the strength of the arms increases from year to year with the increase of their circumference, while the strength of the leg as compared with that of the arm is less as age increases.

The development of the superficial facia, which increases with weight of body in the older pupils, is not only greater than in the younger pupils, but increases greatly with the growth of the muscles in the older scholars.

The time of puberty is of the greatest importance for the whole development of the body, since not only the height and weight, but also the muscles and strength of the upper and lower extremities, the chest girth and lung capacity, all at this period increase the most. The only exception is the increase of fat, which is some what irregular at different ages.

The lung capacity increases with age faster than the length of body. Following is the table of Kotelmann:

TABLE 3.

Age, in years.	Length of body.	Lung capacity.	Relation of length of body to lung capacity.
	Centimeters.	*Cubic cm.*	
9 years	128.58	1,771.15	1:13.77
10 years	130.75	1,865.45	1:14.26
11 years	135.06	2,021.66	1:14.22
12 years	139.91	2,177.41	1:15.56
13 years	143.09	2,270.28	1:15.86
14 years	148.88	2,496.15	1:16.76
15 years	154.19	2,757.69	1:17.88
16 years	161.65	3,252.97	1:20.12
17 years	166.90	3,553.72	1:21.29
18 years	168.39	3,686.11	1:21.89
19 years	166.86	3,891.25	1:23.32
20 years	167.19	3,926.92	1:23.48

Wintrich also confirms the conclusions from the above table.

But, on the other hand, the weight of body increases with age faster than the lung capacity, as shown in the table which follows:

TABLE 4.

Age, in years.	Weight of body.	Lung capacity.	Relation of weight of body to lung capacity.
	Kilograms.	*Cubic cm.*	
9	25.55	1,771.15	1:69.32
10	26.89	1,865.45	1:69.37
11	29.22	2,021.66	1:69.18
12	32.34	2,177.41	1:67.51
13	34.01	2,270.28	1:66.75
14	38.96	2,496.15	1:64.07
15	43.65	2,757.69	1:63.18
16	49.33	3,252.97	1:65.94
17	54.03	3,553.72	1:65.77
18	57.34	3,686.11	1:64.28
19	58.76	3,891.25	1:66.22
20	60.40	3,926.92	1:65.01

Vierordt has arrived at similar results by combining the figures of Schnepf for lung capacity with those of Quetelet for weight of body.

CHILDREN OF FREIBERG IN SAXONY AND OF THE WHOLE KINGDOM OF SAXONY.

Drs. Geissler and Uhlitzsch, by comparing their measurements of the school children in Freiberg with those of the Kingdom of Saxony, found that the children in Freiberg are smaller. They found also that in the common schools of Freiberg the children had a higher average height than children of the farmers in the surrounding towns.

There were in all 21,173 children—10,343 boys and 10,830 girls—studied, from 6½ to 14½ years of age.

Measurements of School Children in Gohlis-Leipzig, Saxony.

Dr. Paul Hasse in 1889 measured 2,806 school children in Gohlis-Leipzig—1,386 boys and 1,420 girls. The average heights and weights at different ages were as follows:

Table 5.

Age.	Height.		Weight.	
	Boys.	Girls.	Boys.	Girls.
	Cm.	*Cm.*	*Pounds.*	*Pounds.*
6–7 years	110.2	109.3	42.7	40.9
7–8 years	114.4	113.7	45.8	44.7
8–9 years	119.4	117.7	49.3	48.1
9–10 years	123.9	124.0	53.4	52.4
10–11 years	129.1	128.6	57.5	57.0
11–12 years	132.4	133.9	61.9	63.2
12–13 years	138.2	139.5	69.1	70.5
13–14 years	140.7	145.1	71.8	77.2
Over 14 years	146.2	149.1	79.8	86.5

The relation between height and weight should be noted. It is well known that they stand in a constant relation to each other. In comparing these with other measurements, the boys are not so large as those measured by Kotelmann in Hamburg or those measured by Bowditch in Boston. The girls are second only to the Boston girls. The children of Gohlis-Leipzig excel in weight and height those in central Russia measured by Erismann, those in Turin measured by Pagliani, those in Poland measured by Landsberger, in Breslau by Carstädt, and in Freiberg by Geissler and Uhlitzsch.

Comparing the poor with the well-to-do classes, the results show that for boys of the same age the height varies from 0.7 to 4 centimeters in favor of the well-to-do classes; for girls it varies from 1.7 to 4.1 centimeters in favor of the well-to-do. The children of the well-to-do classes excel also in weight for the same age; for boys the excess runs from 0.3 to 4.7 pounds; for girls from 1.6 to 4.6 pounds. In general the difference between the classes is not so great as in other places, as in Freiberg and Turin, except in Boston, where the difference between the classes is less marked.

Hasse also gives data concerning the weak or defective children, who generally can not attend school regularly. Such children are usually abnormally developed or have some chronic ailment. In the primary schools 9 per cent belonged to this class. A striking fact is this, that in many cases these children in certain years were over normal; that is, were taller and heavier than other children. This suggests that there is a certain normal relation between mental and physical development, the finding of which is one of the aims of anthropometry.

Measurements of Children in Lausanne, Switzerland.

In November of each year Dr. Combe measured the children in Lausanne, arranged according to the month in which they were born, giving averages for the month as well as for the year. He found that boys up to 14 and girls up to 11 developed regularly, but from 11 to 14 the girls grew faster. The length of body showed great variations. From the single month's average Combe made the yearly average from 8 to 18. The height of boys corresponding to the years was 117.4, 122.2, 126.9, 131.3, 135.4, 139.8, 144.4, 149, 156, 162, 167; of girls, 116.3, 121.2, 126.1, 131, 136.4, 141.9, 147, 153, 157, 163.

The height of girls up to 11 years is continually less than that of boys; then suddenly it increases and exceeds the boys in the fourteenth year by 1–1.5 centimeters. Then the growth falls back, and that of the boys is greater and continues so.

TALLEST CHILDREN BORN IN SUMMER.

According to Combe (Table No. 6), boys born in the months of September, October, November, December, January, and February are not so tall as those born in the other months. Those born in November are the shortest. Those born in July are the tallest.

TABLE 6.

Age.	Average length of body of boys born in—											
	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
8 years	117.9	118.3	117.6	117.8	116.9	117.3	117.0	118.4	117.3	117.6	116.8	117.0
9 years	122.1	122.6	122.0	123.1	122.0	121.8	121.8	123.6	122.3	122.5	121.3	121.8
10 years	126.3	127.4	126.7	127.6	127.8	126.8	126.6	128.9	126.6	126.9	126.2	126.6
11 years	131.8	131.4	130.7	131.4	131.9	131.6	130.8	133.1	131.4	130.9	130.3	130.8
12 years	135.3	135.5	135.1	135.5	136.4	135.5	134.7	136.9	135.6	135.3	134.9	134.7
13 years	139.5	139.6	139.3	141.3	141.0	139.9	138.6	141.3	140.3	139.4	139.1	138.8
14 years	143.9	144.4	143.9	146.2	145.4	144.6	142.4	146.4	145.3	144.9	143.7	142.2

If we examine the following table (No. 7) of Combe, we will find that girls born in December, January, February, March, April, and May show a less length of body than those born in the other months; those born from June till November are taller. The tallest are born in August.

TABLE 7.

Age.	Average length of body of girls born in—											
	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
8 years	115.8	116.6	116.1	117.7	116.3	117.2	116.6	115.7	116.5	115.7	115.3	116.6
9 years	120.8	121.1	120.9	121.5	121.1	121.7	121.7	120.7	121.3	120.6	121.5	121.2
10 years	125.3	125.7	125.8	126.3	126.0	126.1	126.9	125.6	126.8	124.9	126.5	126.6
11 years	130.2	130.4	130.3	130.5	131.3	130.8	132.6	130.5	132.0	129.4	131.9	131.8
12 years	135.3	134.8	136.1	136.9	136.7	136.2	137.8	135.7	138.1	134.2	137.8	137.0
13 years	140.5	140.6	142.1	142.4	141.8	141.3	142.7	141.9	144.1	140.1	143.6	142.6
14 years	145.3	146.0	147.2	146.8	146.3	145.9	147.8	147.8	149.5	146.0	148.1	148.3

The investigations of Wahl in Denmark and Wretlind in Gotenburg, and especially those of Malling-Hansen in Copenhagen, on the deaf, show that the length of body of boys from March till August increases greatly, but very little from September to February. Malling-Hansen assumes that this is due to the summer vacation; but Combe thinks not, because Wahl has observed the same thing in children under 7 years who had not been at school. Combe thinks it is due to the nature of the child, and is analogous to the influence which the birth-period has upon the length of the body, for in both cases the maximum of body-length is found in the same period, that is from March till August.

But it may be due, as it seems to us, to some extent to economic conditions, for a child born in summer generally has better food and air. As we know, a large number of parents of public-school children are poor; in winter they are forced to economize more on account of expense of heating. They generally live also in small and poorly-ventilated rooms. The influence of such conditions on a very young child would be much more detrimental than when the child is older and better able to resist unfavorable surroundings.

SICKNESS IN SCHOOL.

Combe found sickness in girls existing to some extent to the eleventh year, then it increased faster than in boys up to 15. In the case of girls, sickness depended less on contagious diseases; it was due rather to the want of resistance, etc.

TABLE 8.—*Percentage of sickliness in school children in Copenhagen and Lausanne.*

Age.	Boys.			Girls.		
	Sickly in Copenhagen.	Sickly in Lausanne.	Growth.	Sickly in Copenhagen.	Sickly in Lausanne.	Growth.
	Per cent.	*Per cent.*	*Cm.*	*Per cent.*	*Per cent.*	*Cm.*
6–7 years	48.0	.....	.....	52.0	.....	.....
7–8 years	50.0	.....	.....	50.0	.....	.....
8–9 years	48.0	64	4.8	52.0	88	4.9
9–10 years	46.7	43	4.7	53.0	75	4.9
10–11 years	42.5	42	4.4	57.5	60	4.9
11–12 years	39.6	40	4.1	60.4	66	5.4
12–13 years	39.4	33	4.4	60.6	68	5.5
13–14 years	37.3	29	4.6	62.7	61	5.1
14–15 years	42.9	34	7.0	57.1	39	5.0

From the above table (No. 8) of Combe, it will be noted that the girls attend school at the age when they are most disposed to sickliness, as anemia, headache, etc.; while the boys, if they enter into this dangerous period, have left the primary schools. Combe criticises especially any school plan which does not consider this difference between the sexes as contrary to nature, for it makes at this time the same requirements of boys and girls. The girls demand special care during the age of puberty; their tendency to anemia during this period, according to all rules of hygiene, should be combated every way, at home, in regard to air, light, exercise, and nutrition, and especially in school where sufficient air-space, good ventilation, light, and heating are demanded. Girls at this period should not have much housework to do, for it robs them of necessary exercise in the open air.

SIZE OF BODY AND WEIGHT OF SCHOOL CHILDREN IN SAALFELD, GERMANY.

Emil Schmidt, of Leipzig, in 1892, published observations on 9,506 school children in Saalfeld, 4,699 being boys and 4,807 girls.

Comparing these measurements with those in other countries, Schmidt finds that the children in Saalfeld are not so tall for their ages as Boston school children, who from ages 7 to 10 exceeded by 1.3 to 1.9 centimeters; from ages 11 to 14, by 2.2 to 3.1 centimeters.

Compared with the children of the English working classes, the Saalfeld children excel at age 12, by 2 centimeters; at age 13, by 3.2; at age 14, by 1 centimeter.

Danish boys at all ages are taller by 0.1 to 2.7 centimeters than Saalfeld boys. Swedish children are still taller by 1.8 to 6.7 centimeters.

The Turin boys of the well-to-do classes are larger than the boys of Saalfeld, but those of the lower classes are smaller than the boys of Saalfeld. This would indicate in Turin a wider distinction between the classes. The same general comparisons apply to the girls, with a few exceptions.

The investigations of the children of Saalfeld in general confirm the results of previous investigations. Thus it has been found that boys grow more regularly than girls. In Danish and Swedish schools it was shown that girls react more upon outer influences than boys; also that the total growth of girls during school years is greater than that of boys.

Schmidt shows from the following tables that in the city the average size of body during school years is less and the growth is slower than in the country. There is more elasticity in the conditions of the country, which aids the child in overcoming any injurious effect of confinement in school.

TABLE 9.

	City.	Country.
	Cm.	*Cm.*
Length of body in seventh year	109.0	109.6
Length of body in fourteenth year	140.7	143.4
Length of body in twenty-first year	165.3	166.5
Growth from birth until seventh year	59.0	59.6
Growth from seventh till fourteenth year	31.7	33.8

CHILDREN OF POLAND.

The first part of Table No. 10 below is that of Dr. Landsberger, of Poland. From 1880 to 1886 he measured yearly in May 104 children. He lays stress upon the fact that it was always the same children. Many of the children, however, fell out from year to year, from one cause or another. Yet Landsberger says the numbers were large enough at the outset to give the average value.

The children were separated into two classes, the poor and the well-to-do. He made measurements of the liver by percussion, and found that from 6 to 8 in boys the liver to be on an average 10, 10¼ to 10½ centimeters long in the well-to-do classes; in the children of the poorer classes it was less. The liver is from 8.9 to 9.3 per cent the length of the body. Frerichs[1] has found by measurements on the dead, where the length of body was from 100 to 150 centimeters, the liver was 8.3 centimeters, and in boys from 6 to 15 years 6.7 long. Hensen[2] makes the liver of the new-born infant weigh 4.39 per cent and that of the adult 2.77 per cent of the whole weight of the body.

TABLE 10.

	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	Increase— From 6 to 13 years.	Increase— Per year.
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
Length of body	106.9	112.2	117.3	122.1	125.4	130.0	135.2	139.2	32.3	4.6
Arm reach	106.3	112.5	116.9	122.2	125.0	129.6	135.4	140.5	34.2	4.8
Length of left arm	47.3	49.4	50.2	53.6	54.9	57.0	59.7	62.7	15.4	2.2
Maximum length of head	16.5	16.6	16.7	16.5	17.0	17.1	17.2	17.5	1.0	.....
Maximum width of head	13.7	14.5	14.3	14.5	14.5	14.6	14.6	14.5	0.8	.....
Height of head	20.7	20.8	20.3	21.2	21.0	21.4	21.3	21.7	1.0	.....
Height of face	14.7	14.7	14.9	15.4	15.7	15.6	16.1	16.5	1.8	0.2
Circumference of head	50.9	51.0	51.3	51.7	51.8	51.9	52.3	52.3	1.4	0.2
Circumference of neck	24.9	25.4	26.0	26.3	26.7	27.0	27.9	29.1	4.2	0.6
Circumference of chest	54.8	55.4	58.0	60.2	61.9	63.7	65.0	69.0	14.2	2.0
Length of left arm:										
Quetelet	44.7	47.5	50.2	53.1	55.6	.....	60.5	.....	*a* 15.8	.....
Zeising	50.0	.....	.....	60.4	.....	.....	61.7	.....	*a* 11.7	.....
Height of head:										
Quetelet	19.5	19.8	20.1	20.3	20.5	.....	20.9	.....	.....	.....
Liharzik	*b* 20.4	21.0	21.0	21.4	21.7	.....	22.2	22.6	.....	.....
Circumference of head:										
Quetelet	50.8	51.3	51.9	52.3	52.7	.....	53.5	.....	.....	.....
Circumference of chest:										
Quetelet	54.3	56.4	58.5	60.6	63.0	.....	67.5	.....	.....	.....
Kotelmann	.....	.....	.....	60.7	62.4	63.8	65.8	.....	.....	.....

a From 6 to 12 years. *b* About.

[1] Klinik der Leberkrankheiten, S. 40.

[2] Hermann's Handb. d. Physiologie. Leipzig, 1881, VI, 2.

The difference between the classes is brought out clearly in the following table:

TABLE 11.

Year.	Average height of well-to-do.	Average height of poor classes.
	Centimeters.	*Centimeters.*
1880	108.9	106.1
1881	114.5	111.4
1882	119.6	116.7

Children of the well-to-do classes are stronger and larger when beginning school life, but in spite of their better nourishment do not grow faster than the poorer children. This is not in accord with the conclusion as to Washington school children, but Landsberger measured only 106 children. This points to the great importance of nourishment in the earliest childhood, before school life begins. This will be clear if we examine the following painstaking measurements made by Russow.[1]

TABLE 12.

Year.	Children nursed by mothers.		Children artificially nourished.	
	Weight.	Length.	Weight.	Length.
	Kilograms.	*Centimeters.*	*Kilograms.*	*Centimeters.*
First year	9.9	73	7.4	66
Second year	11.1	83	8.6	75
Third year	12.6	89	10.5	83
Fourth year	14.2	93	12.0	87
Fifth year	15.3	100	13.4	98
Sixth year	17.0	106	15.7	102
Seventh year	18.2	110	15.9	105
Eighth year	20.7	116	18.3	113

From the table below it will be seen that the head in its diameters and circumference grows much more slowly than the body; also that the head seems to be independent of the length of the body in its growth. Thus, let us consider the relation of the length of the head to the length of the body, giving the former in per cent of the latter.

TABLE 13.

	Per cent according to Quetelet.	Per cent according to Liharzik.	Per cent according to Landsberger.
In the new-born child	24.0	24.0	.....
In the second year	21.2	17.2	.....
In the sixth year	17.0	13.0	15.3
In the seventh year	16.2	13.0	14.7
In the eighth year	15.4		14.2
In the ninth year	14.8	12.8	13.5
In the tenth year	14.2	12.5	13.5
In the eleventh year	.....	12.3	13.1
In the twelfth year	13.3	12.1	12.7
In the thirteenth year	.....	11.9	12.5
In the eighteenth year	11.5	11.2	.....
In adults	11.3	12.0	.....

During school age the maximum width of head increases very little or none at all, but the height of face increases faster than all the other head measurements.

Schaaffhausen in Bonn has shown the importance of the relation between height of face and length of body. His table (No. 14), which follows, gives the heights of head and face in per cent of the length of body.

[1] Jahrb. f. Kinderheilk., XVI, 1-2.

These figures (Table No. 14) agree substantially with Quetelet's, showing the strong growth of the face in school days. In consequence of the great growth of the body, the head is relatively slow in its growth.

The children measured by Landsberger are mostly hyper-brachy-cephalic—that is, the width of head is comparatively very great.

The chest girth increases constantly with the length of the body, and is generally half the length of the body.

TABLE 14.

Age.	Height of head.	Height of face.
	Per cent.	*Per cent.*
6 years	19.3	13.7
7 years	18.5	13.1
8 years	17.8	12.7
9 years	17.3	12.6
10 years	16.7	12.5
11 years	16.4	12.0
12 years	15.7	11.9
13 years	15.5	11.8

INFLUENCE OF UNFAVORABLE CONDITIONS ON THE GROWTH OF CHILDREN.

Influence of unfavorable conditions on the life and physical development of youth is shown in the following table of Pagliani:

TABLE 15.

Number of persons.	Age.	Average weight.	Average height.	Average chest girth.	Average lung capacity.	Average muscular force.
	Years.	*Kilograms.*	*Centimeters.*	*Centimeters.*	*Cubic cm.*	*Kilograms.*
9	10	24.51	126.3	61.0	1,660	66.5
34	11	26.18	128.1	61.2	1,700	68.5
45	12	28.38	132.1	62.8	1,860	79.0
41	13	31.75	137.5	65.2	2,045	95.0
28	14	33.06	140.0	66.4	2,100	105.0
23	15	39.36	148.6	69.5	2,445	118.5
15	16	41.47	151.2	70.3	2,485	121.0
9	17	43.20	151.3	71.6	2,660	136.0
6	18	44.55	154.3	72.6	3,115	142.0
4	19	46.65	156.0	74.2	3,125	150.0

These measurements were made on the inmates of an institution in Italy.

In the following table by Weissenberg the number in some of the groups is not large, but the figures show a general regularity.

TABLE 16.

Age.	Length of body.			Weight of body.			Strength of lift.		
	Poor.	Middle classes.	Wealthy	Poor.	Middle classes.	Wealthy	Poor.	Middle classes.	Wealthy
	Cm.	*Cm.*	*Cm.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
10 years	124.2	124.7	125.6	25.95	25.69	25.25	36.2	34.6	32.1
11 years	125.9	128.0	131.5	26.99	27.29	27.28	40.1	40.7	40.1
12 years	130.8	134.5	137.8	29.03	30.75	31.97	49.4	54.2	53.2
13 years	133.3	137.7	140.4	32.23	33.34	34.74	54.5	60.8	60.5

TABLE 16—Continued.

Age.	Length of body.			Weight of body.			Strength of lift.		
	Tailor.	Middle class.	Smith.	Tailor.	Middle class.	Smith.	Middle class.	Tailor.	Smith.
	Cm.	*Cm.*	*Cm.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
13 years	138.4	137.7	138.4	33.52	33.34	33.68	65.4	60.8	67.0
14 years	144.4	144.8	143.8	37.47	37.89	36.59	80.3	80.1	80.3
15 years	147.7	148.2	145.9	40.07	40.98	40.30	81.9	90.6	89.7
16 years	152.5	155.8	149.7	45.52	46.34	40.87	97.1	107.2	111.7
17 years	160.0	160.1	157.4	50.10	51.40	51.40	98.7	119.9	138.0
18 years	159.0	161.1	161.0	50.76	53.98	52.84	120.8	129.6	136.8
19 years	161.0	164.1	165.0	54.24	56.75	61.50	123.0	143.4	175.0
20 years	164.5	164.0	163.3	54.67	56.60	57.10	124.7	149.9	175.2
21-25 years	162.5	164.8	166.5	55.37	58.51	61.69	132.0	143.7	185 5
26-30 years	162.9	165.9	167.8	56.91	61.69	63.86	126.4	142.8	170.6
31-40 years	162.4	164.3	167.2	58.09	60.45	63.91	105.0	133.0	165.0
41-50 years	164.1	164.2	164.8	59.53	62.92	62.40	97.30	124.5	152.5

The poor are less in height and weight than the wealthy classes. There is a striking offset in the difference in trades on the strength of lift; thus the smiths are much stronger than the tailors.

CHEST GIRTH IN RELATION TO LENGTH OF BODY.

As the development of the body may be expressed in its length, so chest girth can be considered as an expression for the width of the body.

TABLE 17.—*Chest girth in relation to length of body.*

Age.	Average circumference of chest.				Yearly increase.			
	Jews (Weissenberg).	Jews (Sack).	Russians (Sack).	Belgians (Quetelet).	Jews (Weissenberg).	Jews (Sack).	Russians (Sack).	Belgians (Quetelet).
	Mm.	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*
5 years	524	.....	.....	522	.....	.....	.....	.....
6 years	560	.....	.....	543	36	.....	.....	21
7 years	575	.....	.....	564	15	.....	.....	21
8 years	600	.....	.....	585	25	.....	.....	21
9 years	618	.....	598	608	18	.....	.....	23
10 years	625	622	624	630	7	.....	26	22
11 years	642	622	636	652	17	0	12	22
12 years	660	628	651	675	18	6	15	23
13 years	679	655	671	697	19	27	20	22
14 years	714	677	697	720	35	22	26	23
15 years	737	734	738	742	23	57	41	22
16 years	766	757	774	767	29	23	36	25
17 years	805	784	803	797	39	27	29	30
18 years	819	797	825	821	14	13	22	24
19 years	837	802	842	845	18	5	17	24
20 years	836	808	846	865	—1	6	4	20
21-25 years	850	.....	.....	882	14	.....	.....	17
26-30 years	880	.....	.....	890	30	.....	.....	8
31-40 years	877	.....	.....	890	—3	.....	.....	0
41-50 years	895	.....	.....	.....	18	.....	.....	.....
51-75 years	888	.....	.....	.....	—7	.....	.....	.....

Comparing the foregoing table (No. 17) of chest girths of different nationalities with those of the heights in Table No. 16, Weissenberg says the growth in height does not go parallel with that of the chest. It seems that during puberty the body grows in length at the cost of the chest development. But this unfavorable condition is compensated for after puberty. Since the chest contains the most important organs to life, and since the body during puberty should have the best of care, conditions that affect unfavorably the relation of length of body and chest girth must be avoided. Weissenberg says that from facts already known school life exercises a bad influence in this respect on the development of the body. According to Sack, good food and pure air play the principal rôle. The chest girth increases in relation to the length

of body up to about the age of 50. The weight also reaches its maximum about this time. It is a general observation (Weissenberg) that very thin people can become very fleshy in old age, and that marriage has a good influence in this relation. The increase in flesh is specially in the trunk, chest, and abdomen, and thus the chest girth increases. There is also the emphysematous enlargement of the lungs, which is almost normal in old age. This also increases the chest girth.

Influence of Age on Growth of Body.

The position of the extremities is parallel to the length of the body and corresponds in growth. The length of the extremities is about one-half the length of the body. Examining the following table (No. 18) of Weissenberg, it will be seen that, like the whole body, the extremities grow rapidly up to the sixteenth year. Then there is a slow growth to the thirtieth year, when the maximum is reached; then follows a slight retrogression. The increase of the leg in length is in general up to the tenth year less than half of the increase of the length of the body; but in the following year the leg grows faster than the half of the increase of the body in length. This continues up to the seventeenth year. Directly before puberty leg and trunk grow about equally. The increased growth of the whole body during puberty is due especially to the increase in length of leg.

In advanced age the leg shortens somewhat in length, due to the flattening of the instep, weakness in the kneejoints, and sinking of the neck in the femur.

The greatest yearly increase in the length of the foot is in the sixth year, which is striking. In old age foot and hand decrease. This, as in the extremities in general, is probably due to arthritic changes in the joints. Thus in the general shrinking of old age all members of the body take part.

Table 18.—*Growth in length of the extremities (Jews and Belgians together).*

Age.	Average length.				Yearly increase.			
	Arm.	Hand.	Leg.	Foot.	Arm.	Hand.	Leg.	Foot.
	Mm.	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*	*Mm.*
5 years	435	116	493	167				
6 years	466	122	530	182	31	6	37	15
7 years	485	126	552	179	19	7	22	— 3
8 years	502	132	568	189	17	5	16	10
9 years	529	136	601	197	27	7	33	8
10 years	544	140	621	202	15	5	20	5
11 years	565	145	659	211	20	6	38	9
12 years	595	150	698	221	30	6	39	10
13 years	608	156	722	227	13	5	24	6
14 years	647	163	765	237	39	6	43	10
15 years	660	168	785	242	13	5	20	5
16 years	691	176	822	253	31	5	37	11
17 years	722	181	849	257	31	4	27	4
18 years	724	182	847	256	2	4	— 2	— 1
19 years	740	186	862	259	16	3	15	3
20 years	738	184	861	258	— 2	1	— 1	— 1
21–25 years	742	185	865	258	4	1	4	0
26–30 years	751	187	869	263	9	1	4	5
31–40 years	744	185	856	257	— 7	0	—13	— 6
41–50 years	750	186	864	257	6		8	0
51–75 years	745	186	859	257	— 5		— 4	0

Periods of Growth.

Comparing the results of Weissenberg and others, there are six periods of growth. The first period extends from birth to the sixth or eighth year, and is throughout one of very rapid growth. At the end of this period the body is more than twice as large as it was at birth. It seems that during the fetal life the impulses received mature a number of years after birth. These impulses are of great intensity, as shown from the facts that the foetus at the end of the foetal life is twenty-five hundred times larger than the ovum out of which it has developed.

The second period extends from 11 to 14 years of age and growth is slow.

The third period is from 16 to 17, presenting a sudden advance in growth, which is in relation with the development of puberty.

The fourth period shows a slow growth, extending up to age 30 for length of body; up to age 50 for chest girth. Here growth in the proper sense has ceased.

The fifth period is one of rest, and in normal conditions is from 30 to 50 years of age, and is one of full symmetrical development.

The sixth and last period is characterized by a decrease in all dimensions of the body.

It must be remembered that these periods do not always fall at the same age.

TABLE 19.—*Growth of women of different nationalities.*

Age.	Average length.				Yearly increase in length.			
	1,029 Jews (Weissenburg).	303 Jewesses (Weissenberg).	Swedish women (Key).	Belgians (Quetelet).	Jews (Weissenburg).	Jewesses (Weissenberg).	Swedish women (Key).	Belgians (Quetelet).
	Cm.	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*	*Cm.*
5 years	101.6	99.7	.....	97.4	.....	.....	.....	.....
6 years	108.6	108.0	.....	103.1	7.0	8.3	.....	5.7
7 years	112.1	113.5	113.0	108.7	3.5	5.5	.....	5.6
8 years	115.6	117.0	116.0	114.2	3.5	3.5	3.0	5.5
9 years	120.2	120.0	123.0	119.6	4.6	3.0	7.0	5.4
10 years	124.7	124.6	127.0	124.9	4.5	4.6	4.0	5.3
11 years	128.0	132.6	132.0	130.1	3.3	8.0	5.0	5.2
12 years	134.5	141.2	137.0	135.2	6.5	8.6	5.0	5.1
13 years	137.7	142.4	143.0	140.0	3.2	1.2	6.0	4.8
14 years	144.8	148.4	148.0	144.6	7.1	6.0	5.0	4.6
15 years	148.2	150.5	153.0	148.8	3.4	2.1	5.0	4.2
16 years	155.8	150.7	157.0	152.1	7.6	.2	4.0	3.3
17 years	160.1	151.6	159.0	154.6	4.3	.9	2.0	2.5
18 years	161.1	154.5	160.0	156.3	1.0	2.9	1.0	1.7
19–20 years	164.0	154.3	160.0	157.4	2.9	—.2	.0	1.1
21–25 years	164.8	154.4	.....	157.8	.8	.1	.....	.4
26–30 years	165.9	154.9	.....	158.0	.11	.5	.....	.2
31–40 years	164.3	153.3	.....	158.0	—.16	—.16	.....	.0

Weissenberg measured 303 girls and women in all, of the age from 5 to 40. The results of these measurements are given in the Table No. 19, above. Woman grows somewhat intensive up to 18; after this, growth is at a minimum. The period of puberty is from 9 to 14 here; the woman is larger than the man from 11 to 15; before this she is a little smaller, but after this time she is much smaller.

Comparing women of other nationalities, the Swedish women are like the Jewish, except that puberty is somewhat later. Key's results agree with those of Weissenberg, while Quetelet finds the women always smaller than the men; but Quetelet used small numbers.

TABLE 20.—*Relation of height to circumference of head and chest girth.*

Number of persons.	Age.	Height.	Weight.	Circumference of head.	Chest girth.
	Years.	*Cm.*	*Pounds.*	*Cm.*	*Cm.*
13	13.39	147.93	76.15	52.84	68.00–72.96
24	14.50	149.21	73.92	53.23	66.52–71.77
20	15.38	163.50	96.20	54.34	73.80–79.20
41	16.43	162.77	100.38	54.34	75.58–81.07
35	17.36	167.93	106.88	54.89	78.57–83.70
26	18.35	171.65	124.46	54.91	80.69–85.98
15	19.40	172.57	122.47	55.48	81.07–86.80
6	20.05	173.97	125.58	56.50	82.66–88.00
342	21.02	168.00	126.12	55.37	86.15–91.45
178	22.22	176.25	146.00	55.91	89.14–94.87

In the table (No. 20) of Franz Daffner[1], it will be seen that the increase of chest girth by inspiration, with the exception of the thirteenth year, averages always a little more than 5 centimeters. The persons measured were 180 cadets from 13 to 20 years of age, and 520 Bavarian soldiers.

Daffner observes that chest girth and circumference of head increase in parallel lines; also with the smallest height falls also the smallest circumference of head, and with the smallest weight the smallest chest girth. It is striking to see that the soldiers from 21 to 22 years of age show an increase over the cadets in all measurements except the head. Daffner says this anomaly is due to the greater mental strain which the cadets undergo, increasing the size of the organ of mind, the brain, and therewith the skull.

Growth of Head, Face, and Nose.

The development of the head of children has been studied but very little. It will be interesting to give some of Weissenberg's measurements of Jewish children. It is to be regretted that the number measured is small, especially of the youngest. The table below, No. 21, is a combination of selected measurements from Weissenberg's tables.

The circumference of head of the new-born child is over 60 per cent of its full length of body when grown. At birth the circumference of head is about three-fourths of the height of the body; when the child is grown it has fallen to only one-third of the height of the body.

As to the shape of the head, it is rounder in childhood, but gradually becomes longer as indicated by the cephalic index. As before indicated,[2] the maximum length grows faster than the maximum width.

Table 21.

	New-born children (3).	5 years old (4).	10 years old (25).	Grown children (100).
	Mm.	*Mm.*	*Mm.*	*Mm.*
Circumference of head	365	504	521	550
Maximum length of head	118	170	175	183
Maximum breadth of head	102	144	147	151
Cephalic index	86.4	84.7	84.0	82.5
Per cent of dolicocephaly	----	----	----	1
Per cent of mesocephaly	----	----	12	18
Per cent of brachycephaly	33	50	48	62
Per cent of hyperbrachycephaly	67	50	32	19
Per cent of ultrabrachycephaly	----	----	8	----
Height of face	60	93	101	119
Bizygomatic diameter	89	113	122	138
Width of nose	19	26	30	34
Height of nose	24	40	47	54
Distance between the eyes	21	27	30	31
Nasal index	79.2	65.0	63.8	63.0
Height of body	520	1,060	1,272	1,651

The height of face (Table 21) during the first five years increases more than the other parts of the head; during the second five years the increase is small, but larger afterwards. The width of face or bizygomatic diameter, though having a smaller increase than the height of face, corresponds to it in its growth. The distance between the eyes increases parallel with the width of head; the increase from birth to adult age is only 10 millimeters; at birth this distance is 68 per cent of its full growth.

The height of nose represents the middle division of the face, which grows the most of all, both in width and height. The nose grows much faster in height than in width; the nasal index decreasing with age.

[1] Arch. f. Anthrop. Bd. XV, S. 121, 1885.

[2] See page 1102.

The face may be divided into three parts (Weissenberg): The upper part, from the vertex to the root of the nose; the second or middle part, from the root of the nose to the base of the nose, and the lower part from the base of the nose to the end of the chin.

In duration and quantity of growth these three divisions of the face increase from above to below. The middle division increases the most, and it is the upper jaw that rules the growth of the whole face.

The relatively small increase of head as compared with body may be due to the fact that from the day of birth the child needs its brain and senses as much as when it is grown.

Blond, Brunette, and Mixed Types of Children in Germany.

Out of 6,758,827 school children in Germany[1] Virchow finds, as shown in Table 22, that more than half of the children belong to the mixed type, but more than two-thirds of the rest belong to the blond type.

Table 22.

Type.	Number of children.	Per cent.
Blonde	2, 149, 027	31. 80
Brunette	949, 822	14. 05
Mixed	3, 659, 978	54. 15
Total	6, 758, 827	100100

Considering the different colors of hair, as shown in Table 23, we see more than two-thirds of the children have blond hair:

Table 23.

Color of hair.	Number of children.	Per cent.
Blond hair	4, 617, 546	68. 02
Brown hair	1, 988, 966	29. 42
Black hair	133, 864	1. 98
Red hair	17, 499	. 25

Color of Eyes, Hair, and Skin of Children in Germany.

White children with blue eyes are the most frequent; they are about one-half as frequent as children with blond hair. Brown eyes constitute the smallest number—not over a fourth of the whole number.

Table 24.

Color of eyes.	Number of children.	Per cent.
Blue eyes	2, 673, 539	39. 55
Brown eyes	1, 839, 214	27. 21
Gray eyes	2, 242, 702	33. 18

As to the color of the skin we find the percentage of white and brown skin as given in Table 25.

[1] Virchow, Arch. f. Anthrop, Bd. XVI, S. 275-475, 1885-86.

TABLE 25.

Color of skin.	Number of children.	Per cent.
White skin	6,184,406	91.50
Brown skin	571,628	8.45

The majority of those with black hair have a brown skin (Table 26).

As we go west and south in Germany the number of blondes lessens. They are the most frequent in the north.

If we take the officials of Germany, who belong to the well-to-do classes, we find the largest number of blondes, being 40 or more per cent, among their children. In the North Friesian Islands the percentage of blondes is 52.81.

Among the children of the Government officials, or the well-to-do classes, less than 10 per cent are brunettes.

In general, there is a relatively greater number of blondes in the country than in the city.

In the mixed type blue eyes are the most influenced.

One-third of all the German school children have gray eyes. Another fact is that blond hair prevails in the mixed combinations, reaching an average of 36.41 per cent.

Those with brown hair, who are not brunettes, are a branch of the brunettes rather than of the blondes. The hair of women seems to turn dark faster than that of men.

TABLE 26.—*Percentages.*

	Blue eyes, blond hair, white skin.	Blue eyes, brown hair, white skin.	Blue eyes, brown hair, brown skin.	Gray eyes, blond hair, white skin.	Gray eyes, brown hair, white skin.	Gray eyes, brown hair, brown skin.	Gray eyes, black hair, brown skin.	Brown eyes, blond hair, white skin.
	1	2	3	4	5	6	7	8
Germany	31.80	6.20	1.41	23.41	7.05	1.91	0.66	13.00
North Friesian Islands	52.81	6.50	.89	23.22	3.33	.59	.13	6.37
Prussia, 4,127,766 persons:								
From 6 to 8 years of age	35.04	5.38	1.00	25.32	5.47	1.28	.37	14.56
Over 8 to 10 years of age	38.33	6.13	1.34	23.79	6.13	1.65	.46	12.49
Over 10 to 12 years of age	34.39	6.48	1.25	24.19	6.73	1.61	.44	11.99
Over 12 to 14 years of age	31.89	5.96	1.00	25.57	7.37	1.44	.37	11.74
To 14 years of age	35.59	6.11	1.27	24.09	6.20	1.58	.45	12.65
Over 14 years of age	26.25	6.32	1.65	24.43	9.63	1.91	.55	10.19

	Brown eyes, brown hair, white skin.	Brown eyes, brown hair, brown skin.	Brown eyes, black hair, brown skin.	Blue eyes, red hair, white skin.	Gray eyes, red hair, white skin.	Brown eyes, red hair, white skin.	Other combinations.	Whole number.
	9	10	11	12	13	14	15	
Germany	9.70	3.14	1.21	0.10	0.07	0.06	0.28	6,758,827
North Friesian Islands	3.29	.93	.55	.46	.09	.....	.84	2,369
Prussia, 4,127,766 persons:								
From 6 to 8 years of age	8.32	2.18	.58	.12	.10	.08	.20	546,949
Over 8 to 10 years of age	8.02	2.47	.73	.11	.08	.06	.21	2,156,025
Over 10 to 12 years of age	8.88	2.59	.84	.13	.11	.07	.30	692,839
Over 12 to 14 years of age	10.42	2.69	.91	.13	.11	.07	.33	190,583
To 14 years of age	8.34	2.45	.75	.12	.09	.07	.24	4,070,923
Over 14 years of age	13.01	3.69	1.73	.08	.09	.09	.98	56,843

From an examination of Table 26 it will be seen that the darkening of the hair is very slight in the pure brown type, and in the mixed form with gray eyes it hardly appears, at least during school days. But darkening of the hair is very frequent in the mixed forms with brown eyes, yet it is twice as frequent in the pure blond type, where it reaches the highest per cent.

Hair of Other Nationalities Compared With Hair of Germans.

In comparing the results of observations of school children of other nations the following table is made from Virchow's data. A striking part is the small number of blondes in Switzerland. This may be due to the fact (Virchow) that the country districts were not so thoroughly studied.

Table 27.

Country.	Number of school children.	Blondes.	Brunettes.	Blond hair.	Brown and black hair.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Germany	6,758,827	31.80	14.05	.....	.....
Belgium	608,698	.....	27.50	.....	.....
Switzerland	495,609	11.10	25.70	.....	.....
Austria	2,304,501	19.79	23.17	44.97	54.84
Total	10,077,635	.....	.....	.....	.....

Long Head and Broad Head.

About all European peoples show two different forms of head, a long and small and a short and broad head. Formerly in Germany the long head prevailed, being called the Germanic type, but in recent times short, broad heads have increased, till now they constitute the largest number.

Relation of Color of Skin, Hair, and Eyes.

The color of the skin, which stands in a certain relation with color of hair and eyes, is an important characteristic for distinguishing races, but in Germany, as in other European countries, there is no uniform relation. Blond and brown people follow one another in most places, and to-day only a few peoples are wholly blond. It seems as if brunettes were increasing daily. According to Virchow, if it could be shown that the long-headed people were blond and light colored, and the short-headed brunette and dark colored, the course of the mixture and the spread of different peoples (also in prehistoric times) would present valuable information.

There is in typical individuals of a race a more or less constant relation between the colors of the skin, hair, and eyes. Frequently all are dark, often they are all light.

Virchow assumes that since there was never a dark race with light hair, although originally blond hair can become in adult age dark, that those persons who between the ages of 6 and 14 have blond hair should be considered as belonging to a blond race. There is no race of which the skin, hair, or iris is wholly without pigment. Albinism is a pathological condition. No definite lines can be drawn dividing blondes from brunettes. Every individual has a tendency to darker shade.

The majority of children are born with blue eyes, but with very many the blue soon changes into a brown. This change begins in the first week in life; after two years the permanent color is in most cases determined.

The change of color in the hair is much slower. The majority of children have blond hair at birth. It becomes dark gradually, sometimes not till after puberty. The same is generally true of the skin, only the darkening process extends further into later life. In white races elderly people always have a more colored skin than young people; the difference is more of quantity than quality.

Since there is a certain parallelism in the color of skin, hair, and eyes, persons with blue eyes, blond hair, and white skin are called "blondes," those with brown eyes, brown hair, and brown skin "brunettes." But there is a large number of combinations of less significance. The white races especially show great individual variability in combinations. In making these divisions individuals are generally taken between the ages of 20 and 25.

The general results of the investigation in the schools of Germany are confirmed by similar studies in Austria, Belgium, and Switzerland. The number of children is so great (over 10,000,000) that these results must be considered as fairly well established.

Measurements of Russian Children.

Table 28.

[Vazhnoff's table giving nutrition of poorer classes.]

Age.	Nutrition.													
	Boys.							Girls.						
	Poor.		Medium.		Good.		Total number.	Poor.		Medium.		Good.		Total number.
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	
1 year	51	25	90	44	64	31	205	20	25	30	37	31	38	81
2 years	38	21	68	37	76	42	182	7	15	19	41	20	44	46
3 years	22	20	43	39	45	41	110	2	10	4	21	13	69	19
4 years	7	13	25	47	21	40	53	1	16	4	68	1	16	6
5 years	2	17	4	36	5	47	11	.....	.....	1	.....	2	.....	3
6 years	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Total	120	21.3	230	40.9	212	37.7	562	30	19	58	37	67	44	155

TABLE 29.

[In Centimeters.]

Age.	Vazhnoff. *a*				Measurements by other Russians.													
	Boys.		Girls.		Boys.		Girls.		Boys.		Boys.		Boys.		Boys.		Boys.	
	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.	Chest girth.	Yearly increase.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
8 years	61.4	.....	58.34	.....	61.67	.....	61	.....	61.13	.....	62.7	.....	.....	.....	58.99	1.72	57.5	1.5
9 years	62.75	1.35	59.77	1.43	62.6	0.9	61	0	62.84	1.69	64.5	1.8	63.52	.....	60.36	1.37	58.5	1.0
10 years	64.27	1.52	61.84	2.07	64.39	1.79	64	3	64.88	2.03	66.5	2.0	63.12	0.6	62.16	1.80	60.9	2.4
11 years	65.5	1.23	61.76	0.08	65.8	1.41	65	2	66.69	1.82	66.5	0.0	63.79	0.67	64.09	1.93	62.2	1.3
12 years	66.62	1.12	.....	.....	67.4	1.6	67	2	68.71	2.02	66.75	0.25	64.69	0.9	65.01	0.92	63.6	1.4

a Vestnik. obsh. hig., sudeb. i prakt. med., St. Petersb., 1897, XXXIII, No. 2, secs. 32-44.

TABLE 30.

[In centimeters.]

Age.	Vazhnoff. *a*		Measurements by other Russians.													
	Average height.	Yearly increase.	Average height.	Yearly increase.	Average height.	Yearly increase.	Average height.	Yearly increase.	Average heigh t.	Yearly increase.	Average height.	Yearly increase.	Average height.	Yearly increase.	Average height.	Yearly increase.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
7 years	.....	.....	114.9	.....	114.4	.....	112.62	.....	113.1	.....	117.8	.....	116	.....	.....	.....
8 years	119.5	.....	120.278	5.3	117.7	3.3	117.81	5.19	116.32	3.22	121.5	3.7	121	5	.....	.....
9 years	123.1	3.6	123.44	3.17	122.0	4.3	121.28	4.72	121.04	4.72	124.7	3.2	124	3	124.48	.....
10 years	127.0	3.9	127.03	3.59	126.7	4.7	126.72	5.47	125.91	4.87	128.4	3.7	129	5	127.75	3.27
11 years	130.6	3.6	130.65	3.62	129.3	2.6	130.85	4.10	129.56	3.65	132.7	4.0	133	4	127.95	0.25
12 years	132.8	2.2	134.4	3.8	135.5	4.2	131.71	2.80	134.05	4.49	137.2	4.5	135	2	130.34	2.42
13 years	136.4	3.6	136.54	2.14	136.6	3.1	136.69	2.98	136.95	2.90	137.8	0.6	138	3	135.72	5.35
14 years	.....	.....	141.00	4.46	.....	.....	.....	.....	143.2	6.25	141.7	3.9	.....	.....	137.75	2.83
Total	562.0	.....	947.00	.....	754.0	.....	542.00	.....	630.00	.....	332.00	.....	622	.....	240.00	.....

a Vestnik, obsh. hig., sudeb. i prakt. med., S t. Petersb., 1897, XXXIII, No. 2, secs. 32-44.

TABLE 31.—*Average height (in inches), in various cities and countries of the world.*

[Tables 31 to 34 inclusive are from Amer. Jour. of Psychol., April, 1898. The columns for Washington (D. C.) school children are added by author.]

Age.	Boston. (Bowditch.) 13,691 boys, 10,904 girls.		St. Louis. (Porter.) 16,295 boys, 18,059 girls; age nearest birthday.		Milwaukee. (G. W. Peckham.) 4,773 boys, 4,891 girls.		Oakland. Number not stated.		Worcester. (West.) 3,250 children.		New Haven. (Gilbert.) About 50 of each sex for each age.		Iowa. (Gilbert.) About 50 of each sex for each age.		Pennsylvania. (Hall.) 2,434 males (nude).		Moscow. (Erisman.) 3,212 boys, 1,495 girls.		Sweden Commission. (Key.) 15,000 boys, 3,000 girls.		Denmark Commission. (Hertel.) 17,134 boys, 11,250 girls.		England. (Roberts.) Over 10,000 males.		Washington, D. C. White children; 7,953 boys, 8,520 girls. *a*		Washington, D. C. Colored children; 2,899 boys, 2,558 girls. *b*	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
4½ years					39.98	39.65																						
5½ years	41.57	41.29			42.28	41.72			43.2	42.3													41.2					
6½ years	43.75	43.35	42.9	42.4	44.08	43.78	44.1	44.4	44.4	43.8	45.0	44.9	45.0	44.6					45.6	44.5	44.1	44.1	43.2		44.5	44.2	44.2	43.8
7½ years	45.74	45.52	44.9	44.5	46.09	45.93	45.0	44.9	46.1	46.3	47.1	46.9	47.8	46.8			44.1	43.9	47.6	45.7	45.3	45.3	45.0		46.0	45.1	46.1	46.6
8½ years	47.76	47.58	46.9	46.6	48.05	47.59	47.6	46.8	48.2	47.9	48.9	48.4	49.6	49.2			46.4	45.8	49.6	48.4	47.2	47.2	47.0		47.8	47.4	47.7	47.9
9½ years	49.69	49.37	49.0	48.7	50.00	49.81	49.3	49.2	50.0	49.8	51.2	50.8	51.3	51.3	51.2		48.3	47.1	51.6	50.0	49.2	49.2	49.2		49.7	49.1	49.3	49.0
10½ years	51.68	51.34	50.7	50.6	51.85	51.89	51.9	51.5	52.8	52.3	53.0	52.8	53.3	53.0	53.9		51.5	49.2	52.4	52.0	51.2	51.2	50.5		51.7	51.2	51.1	50.8
11½ years	53.33	53.42	52.7	52.4	53.76	53.5	53.5	53.9	54.6	53.9	55.9	54.6	55.2	54.5	55.1		53.4	51.1	53.5	53.9	53.1	52.4	51.5		53.2	53.1	52.1	52.9
12½ years	55.1	55.9	54.4	54.8	55.0	56.5	55.1	56.6	56.3	57.0	57.0	57.9	57.1	58.0	56.7		55.2	52.3	55.1	56.3	54.3	54.3	53.0		55.1	55.8	53.9	54.5
13½ years	57.2	58.2	56.3	57.7	57.5	58.7	56.8	60.0	58.1	58.2	58.8	60.4	58.7	59.2	61.0		57.2	54.5	56.7	58.3	56.3	57.5	55.9		56.8	57.9	56.1	57.4
14½ years	59.9	59.9	58.3	59.3	59.9	60.5	59.7	61.2	60.7	60.5	59.3	61.4	61.7	61.7	62.3		59.1	57.4	58.7	60.2	58.7	59.4	57.8		59.1	69.2	58.0	59.6
15½ years	62.3	61.1	61.0	61.0	62.3	61.6	61.8	61.9	63.9	61.8	62.8	62.5	64.7	63.3	65.3		61.6		61.4	61.8	61.4	60.6	60.7		61.8	61.6	60.1	60.1
16½ years	65.0	61.6	63.1	62.0	65.1	62.2	64.5	62.7	65.3	62.4	65.7	62.5	66.7	63.3	66.5		63.5		63.8	62.6	64.6	62.6	62.9		64.3	62.4	63.1	61.5
17½ years	66.2	61.9	65.0	62.7	66.6	62.9	67.1	62.7	66.3	62.8	67.1	63.6	68.2	64.5	67.1		64.6		65.7	63.0	65.7		64.5		66.0	63.0		62.2
18½ years	66.7	61.9		62.8		62.5	67.6	63.2	66.9	62.6			68.6	64.6	67.3				66.9	63.0	66.9		65.5		67.1	63.1		62.3
19½ years				62.4					67.4	62.7			69.0	64.6	67.5				67.3	63.8	66.9		66.0					62.7
20½ years									68.5	62.6					67.6				67.7	63.0			66.3					
21½ years									67.1	62.7					67.7													

a See Tables VII and XXXIV, Part II*e*.

b See Tables LXI and LXV, Part II*e*.

TABLE 32.—*Average height (in inches), in various cities and countries of the world.*

[Amer. Jour. Psychol., April, 1898.]

Age.	England. (Anthrop. Com.) Over 30,000 persons.		Belgium. (Quetelet.) Selected 10 of each age and sex.		Turin. (Pagliani.) 1,048 boys, 968 girls.		Lausanne. (Combe.) 6,662 measurements of 2,000 children.		Freiburg. (Geissler-Uhlitzsche.) 10,343 boys, 10,830 girls.		Gohlis. (Geissler.) 1,386 boys, 1,420 girls.		Breslau. (Carstädt.) 4,274 measurements of 600 boys.		Posen. (Landsberger.) 37 to 104 boys for 7 years.		Hamburg. (Kotelman.) 515 boys.		Radom. (Suligowski.) 1,133 boys.		Saalfeld. (Schmidt.) 4,699 boys, 4,807 girls.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
0 years	.....	.....	19.7	19.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1½ years	.....	.....	27.5	27.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2½ years	.....	.....	31.1	30.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3½ years	36.8	36.2	34.0	33.6	33.9	33.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4½ years	38.5	38.3	36.5	36.0	36.2	36.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5½ years	41.0	40.6	38.9	38.3	38.2	38.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6½ years	44.0	42.9	41.2	40.6	40.7	40.2	.....	.....	42.8	42.5	43.4	43.0	43.0	.....	42.1	.....	.....	.....	.....	.....	43.0	42.7
7½ years	46.0	44.5	43.5	42.8	44.3	43.0	46.2	45.8	44.3	44.1	45.0	44.8	44.8	.....	44.2	.....	.....	.....	.....	.....	45.0	44.9
8½ years	47.1	46.6	45.7	45.0	46.6	45.5	48.2	47.7	46.3	45.9	47.0	46.3	46.8	.....	46.2	.....	.....	.....	.....	.....	47.2	46.6
9½ years	49.7	48.7	48.0	47.1	48.8	47.6	50.0	49 5	48.1	47.8	48.8	48.8	48.7	.....	48.1	.....	50.6	.....	49.6	.....	49.2	48.8
10½ years	51.8	51.1	50.1	49.2	49.8	50.1	51.7	51.6	49.6	49.6	50.8	50.6	50.6	.....	49.4	.....	51.5	.....	51.1	.....	50.5	50.9
11½ years	53.5	53.1	52.2	51.2	50.9	51.7	53.3	53.7	51.4	51.6	52.1	52.7	52.5	.....	51.2	.....	53.2	.....	52.7	.....	52.3	52.6
12½ years	55.0	56.7	54.1	53.2	52.6	53.8	55.0	55.9	53.3	53.3	54.4	54.9	54.4	.....	53.2	.....	55.1	.....	54.1	.....	54.3	54.6
13½ years	56.9	57.8	56.0	55.1	55.0	56.1	56.9	57.9	55.2	55.7	55.4	57.1	56.4	.....	55.1	.....	56.3	.....	56.5	.....	56.0	56.8
14½ years	59.3	59.8	57.8	56.9	57.2	58.9	.....	.....	.....	.....	.....	.....	58.7	.....	.....	.....	58.6	.....	58.7	.....	.....	.....
15½ years	62.2	60.9	59.6	58.6	59.8	60.1	.....	.....	.....	.....	.....	.....	61.7	.....	.....	.....	60.7	.....	61.5	.....	.....	.....
16½ years	64.3	61.7	61.2	59.9	62.2	60.6	.....	.....	.....	.....	.....	.....	64.1	.....	.....	.....	63.7	.....	63.5	.....	.....	.....
17½ years	66.2	62.5	62.8	60.9	63.0	61.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.7	.....	65.2	.....	.....	.....
18½ years	67.0	62.4	64.2	61.5	63.3	61.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66.3	.....	65.5	.....	.....	.....
19½ years	67.3	62.8	65.2	61.8	63.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.7	.....	65.3	.....	.....	.....
20½ years	67.5	63.0	65.7	62.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.8	.....	66.4	.....	.....	.....
21½ years	67.6	63.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.7	.....	.....	.....

TABLE 33.—*Showing the weight (in pounds) at successive ages in different cities and countries.*

[Amer. Jour. Psychol., April, 1898.]

Age.	Boston. (Bowditch.) 13,691 boys, 10,904 girls.		St. Louis. (Porter.) 16,295 boys, 18,059 girls; age nearest birthday.		Milwaukee. (G. W. Peckham.) 4,773 boys, 4,891 girls.		Oakland. Number not stated.		Worcester. (West.) 3,250 children.		New Haven. (Gilbert.) About 50 of each sex for each age.		Iowa. (Gilbert.) About 50 of each sex for each age.		Pennsylvania. (Hall.) 2,434 males (nude).		Sweden Commission. (Key.) 15,000 boys, 3,000 girls.		Denmark Commission. (Hertel.) 17,134 boys, 11,250 girls.		Moscow. (Erismann.) 2,453 boys, 1,495 girls.		Turin. (Pagliani.) 1,048 boys, 968 girls.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
3½ years	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27.3	24.7
4½ years	.....	.....	.....	.....	38.8	36.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29.8	28.9
5½ years	41.1	39.7	.....	.....	41.1	40.0	.....	.....	42.63	39.36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33.5	33.1
6½ years	45.2	43.3	43.7	41.7	44.8	43.1	47.6	45.9	46.04	43.70	46.8	44.3	45.9	41.6	.....	.....	45.2	.....	46.3	44.1	44.1	42.8	36.8	36.2
7½ years	49.1	47.5	47.8	45.9	49.1	47.0	50.2	48.1	49.37	47.96	51.2	50.4	51.4	47.4	.....	.....	50.3	47.6	49.6	47.4	48.5	47.0	42.8	39.0
8½ years	53.9	52.0	52.5	50.5	53.8	50.9	54.2	52.2	53.64	51.50	52.5	53.0	55.0	51.0	.....	.....	57.8	55.1	52.9	51.8	53.1	48.5	45.6	41.9
9½ years	59.2	57.1	57.5	55.3	59.5	56.4	59.6	58.6	59.81	57.37	60.0	58.8	61.6	58.1	58.4	.....	64.6	59.3	57.3	56.2	61.1	56.4	49.4	48.3
10½ years	65.3	62.4	62.4	60.6	65.4	62.4	66.7	63.2	66.51	63.52	68.4	62.7	63.7	62.1	66.1	.....	66.8	64.8	62.8	61.7	67.2	60.4	54.7	54.5
11½ years	70.2	68.8	68.3	66.6	70.9	68.8	72.0	69.7	71.00	69.94	70.8	70.0	72.4	69.2	71.7	.....	71.0	70.3	68.3	67.2	73.4	66.8	58.6	59.3
12½ years	76.9	78.3	73.9	74.3	76.1	77.8	77.9	78.9	78.75	79.74	82.3	84.5	78.2	79.7	80.5	.....	76.1	79.1	73.9	75.0	82.9	80.5	64.6	65.0
13½ years	84.8	88.7	80.7	84.9	84.9	88.0	89.4	90.7	86.13	87.66	88.0	92.0	90.9	94.1	89.7	.....	82.9	87.3	80.5	83.8	91.5	89.3	72.8	76.1
14½ years	94.9	98.4	89.1	93.3	95.8	97.6	97.0	98.2	98.18	99.10	91.7	98.0	102.0	99.9	99.6	.....	93.3	98.8	89.3	92.6	102.7	94.4	80.7	84.9
15½ years	107.1	106.1	101.9	103.0	109.0	105.9	108.1	108.9	112.2	105.0	110.0	104.0	117.0	111.3	108.7	.....	103.2	107.8	102.6	102.6	116.8	99.9	92.2	96.6
16½ years	121.0	112.0	113.8	110.9	122.1	110.6	121.6	109.8	123.6	109.0	127.0	113.0	130.0	111.6	125.7	.....	115.3	113.8	116.8	112.4	126.6	101.0	104.1	100.8
17½ years	127.5	115.5	122.8	116.0	130.4	113.3	131.7	117.7	132.9	115.0	130.0	113.7	140.1	121.0	133.8	.....	127.0	120.4	126.8	.....	132.5	.....	116.2	104.7
18½ years	132.6	115.2	.....	115.5	137.8	112.5	137.7	118.3	133.2	120.0	.....	.....	142.6	125.5	138.7	.....	135.1	124.1	134.5	.....	.....	.....	118.6	107.1
19½ years	.....	.....	.....	115.1	.....	.....	.....	.....	142.6	118.3	.....	.....	145.5	126.4	140.7	.....	139.6	126.6	.....	.....	.....	.....	121.3	.....
20½ years	.....	.....	.....	118.8	.....	.....	.....	.....	.....	119.8	.....	.....	.....	.....	142.6	.....	143.7	127.2	.....	.....	.....	.....	.....	.....
21½ years	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	145.1	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 34.—*Weight (in pounds).*

[The last four columns are added by author.]

Age.	Gohlis. (Geissler.) 1,386 boys, 1,420 girls.		Belgium. (Quetelet.) selected 10 of each age and sex.		England. (Roberts.) over 10,000 males.		England. (Anthrop. Com.). Over 30,000 persons.		Denmark. (Vahl.)		Saalfeld. (Schmidt.) 4,699 boys, 4,807 girls.		Radom. (Suligowski.) 1,133 boys.		Japan. (Miwa.) 1,250 boys, 2,800 girls.		Washington, D. C.			
																	White children; 7,953 boys, 8,520 girls.		Colored children; 2,899 boys, 2,558 girls.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
0 year			6.8	6.6	7.6		7.1	6.9												
1½ years			21.8	19.0																
2½ years			24.3	24.3																
3½ years			27.6	27.3			34.0	31.6		32.3					31.0	29.6				
4½ years			30.9	30.6	41.2		37.3	36.1		35.8					33.0	32.6				
5½ years			35.1	33.7	50.0		40.0	39.2		39.5					36.1	34.3				
6½ years	47.2	45.2	39.2	36.8	54.2		44.4	41.7		41.6	41.9	40.1			37.9	37.0	45.2	43.3	43.4	42.6
7½ years	50.5	49.4	43.4	39.2	56.9		50.0	47.5		48.4	46.7	44.8			41.9	39.4	47.8	45.7	50.1	48.6
8½ years	54.5	54.0	47.6	41.9	59.0		54.9	52.1		53.6	51.1	48.5			44.7	43.2	51.5	49.4	54.0	53.0
9½ years	58.9	57.8	51.8	46.3	62.6		60.4	55.5		59.0	55.8	53.8	55.3		49.3	48.1	56.2	53.7	59.0	56.9
10½ years	63.5	62.8	55.6	50.9	66.3		68.0	62.0		64.9	58.6	58.6	61.8		52.6	52.4	61.5	58.5	65.2	62.9
11½ years	70.5	69.7	59.5	56.2	69.5		72.0	68.1		74.0	65.7	65.0	68.0		57.2	57.6	66.2	64.2	69.4	68.9
12½ years	76.3	77.8	63.9	63.9	73.7		76.7	76.4		80.6	71.0	72.1	73.4		62.1	66.2	72.7	73.2	76.0	77.5
13½ years	79.4	85.1	73.0	71.7	78.3		82.6	87.2		89.8	77.2	80.7	82.1		72.1	73.3	79.4	81.8	83.5	88.4
14½ years			81.8	80.0	84.6		92.0	96.7		101.3	79.8		91.9		83.4	85.6	88.3	93.0	90.9	98.5
15½ years			90.8	88.2	96.8		102.7	105.3		108.6			103.6		99.2	90.9	100.9	100.4	99.4	103.1
16½ years			100.1	95.9	108.7		119.0	113.1		100.9			112.5		100.1	93.3	113.7	105.2	113.4	107.0
17½ years			109.6	103.2	116.4		136.9	115.5					123.4		109.5	99.6	121.2	110.0		113.0
18½ years			118.8	109.8	123.3		137.4	121.1					126.8		108.3	100.8	132.0	111.5		115.0
19½ years			127.0	114.9	128.4		139.6	123.8					127.2		112.1	99.5	132.2			117.7
20½ years			131.2	117.3	130.6		143.3	123.4					130.7		111.9	101.3				
21½ years							145.2	121.8					136.9		112.5					

V.—PSYCHO PHYSICAL AND ANTHROPOMETRICAL INSTRUMENTS OF PRECISION IN THE LABORATORY OF THE BUREAU OF EDUCATION.

INTRODUCTION.

A thorough study of any human being can not be made without instruments of precision. Such an investigation of living man is one of the most recent tendencies of science. It is paradoxical that man is the last object to be thoroughly studied by man. Instruments of precision have been employed more extensively, perhaps, in the study of the abnormal, as illustrated in criminology,[1] but it is time they were used in the investigation of normal man.[2]

An instrumental method of inquiry is a more exact way of ascertaining the effects of mental, moral, and physical forces upon the body, of many of which we are unconscious. The facts thus obtained bear the closest relation to new questions in the development and education of man.

LIMITATION OF THE SENSES.

Science in its efforts to seek the truth has a special difficulty to contend against; it is the defectiveness or limitation of our senses. Instruments of precision are for the purpose of correcting these defects by increasing the scope of the senses, so that, when truth may be found, it may be described more fully and determined more definitely.

In ancient times there were instruments to measure the weight and height, etc., or what is called the static condition. Subsequently dynamic movements, electric currents, variations of temperature, etc., were studied, but our senses were too slow and confused to determine these conditions, so instruments were necessary to measure the very small in time and in motion.

The Graphic Method.

The graphic method was employed to translate those changes of the activity of forces into the language of the changes themselves, which words can not do. Writing consists in signs more or less conventional, but the graphic method is natural; it is a universal language, as expressed in the line or the curve.

Descartes inaugurated the graphic expression of ideas. This method was then soon used to represent diverse variations, as the comparison of economical and social phenomena. Tables were published in England, then in France, showing the curves representing successive variations of population, wealth, agricultural production, etc. Since then this method has been enlarged so as to apply to all sorts of things. It gives clearness and conciseness to its representations.

Instruments of precision through the graphic method furnish a mode of expression and a means of research. Every science accumulates facts and observations and compares them to show the relation of

[1] See "Education and Pathosocial Studies," by author, reprint from Reports of the Commissioner of Education, 1889-90 and 1893-94.

[2] See page 991.

cause and effect. Those comparisons are the more important the larger the number of data, but this often gives rise to extreme complexity. The graphic method can reduce these data to a curve that will give clearness and definiteness to their meaning. Nature's processes are often so complex that it is impossible to give attention to many associated phenomena at a time. Instruments of precision with their tracings can record the different movements.

The intention of this chapter is to give a general idea of the more recent instruments of precision,[1] especially those which apply to the nervous system.

Instruments of Precision.

Perhaps one of the most useful and important instruments of precision is the kymographion, which is a sort of typewriter for the laboratory.

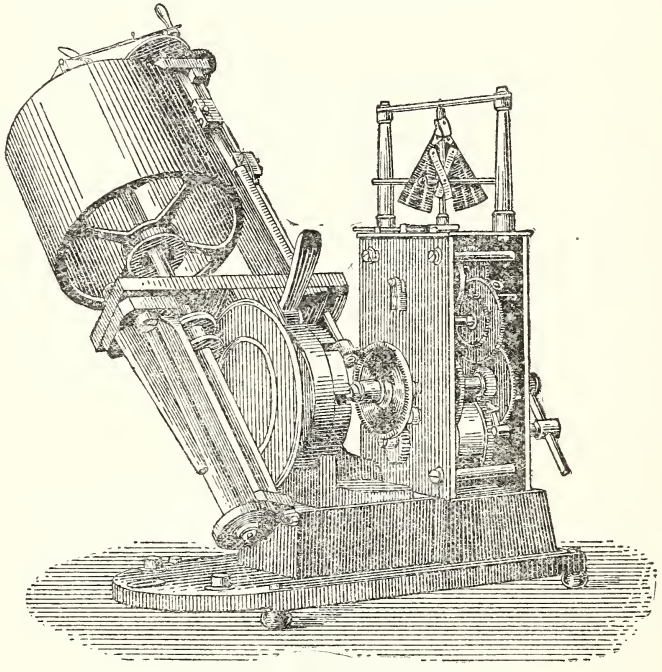


Fig. 1.—Ludwig's kymographion.

The kymographion (fig. 1) is an instrument to furnish uniform motion. It records experiments by movements of a marker or index on smoked paper, which has been wrapped around a revolving cylinder. The kymographion of Ludwig furnishes motion to the cylinder or it may be used as a motor for other light apparatus.

The cylinder is brass and rotates by clockwork. A sheet of glazed paper is wrapped around the cylinder; one end of the paper is gummed and is joined to the other end. The paper is smoked by holding the cylinder over a paraffine lamp, candle, or gas jet. After the tracings are finished the paper is removed from the drum or cylinder and passed through a thin varnish, which when dry makes the tracings permanent. In the most recent form of the instrument, as in the figure, the cylinder can be placed in either a vertical, diagonal, or horizontal position. Any

[1] At the end of this part is a list of instrument makers.

speed between one revolution in five seconds and one in about an hour can be given to the cylinder. The cylinder can be moved along its axis to a distance equal to its length without interrupting its rotation, thus making it possible to record tracings of great length. The adjustments are such that many variations can be given to the speed.

In the use of the kymographion other apparatus is required, such as electrical time-markers (figs. 10 and 11), tuning fork (fig. 6), tambours (figs. 12 and 13), etc. A special leather case was made for the kymographion in the laboratory of the Bureau, so as to make it portable, but one must exercise much care in carrying the instrument. The maker of the kymographion is Petzold,[1] of Leipzig.

THE POLYGRAPH.[2]

The term polygraph is in general a French name for an instrument used for a purpose similar to that of the kymographion or kymograph. The instrument here shown is a portable polygraph of Professor Marey. The cylinder is 180 millimeters

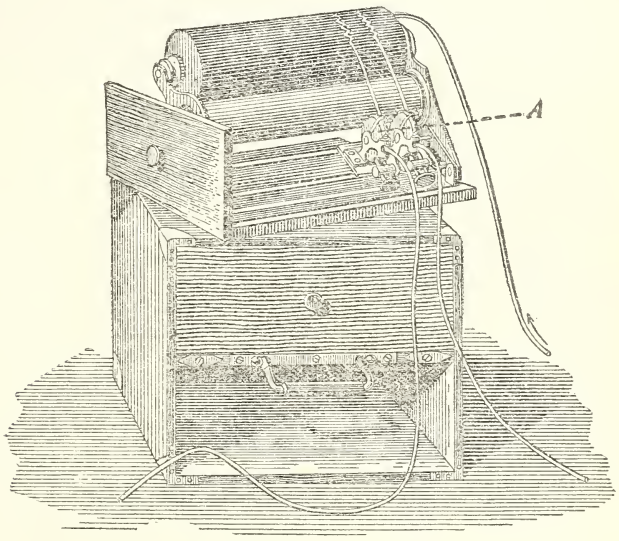


FIG. 2.—The polygraph.

long and 70 millimeters in diameter, and revolves at the rate of 1 centimeter a second. Two tambours, A, are fastened on two rods below, on which they can be moved. Two valves with rubber tubes are fastened to the tambours.[3] There is a place for glazed paper, varnish, etc., in the box. The instrument is easy to carry and convenient for experiments outside of the laboratory.

The cylinder goes by clockwork, which is wound by turning the button at the end. In order to stop the cylinder, one blows into the rubber tube marked with an arrow. To start it again one draws the air out of the tube. To render the cylinder free to revolve, the button to the left is turned to the left. This is necessary to smoke the paper on the cylinder. To connect with the clockwork again the button is turned to the right. The maker is Verdin, of Paris.

The small polygraph (fig. 3.) is a French instrument. The cylinder can be made to revolve, varying at the rate of once in five seconds to once in thirty seconds.

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[1] See list of instrument makers at end of this chapter.

[2] Marey, Circulation du sang, 2e édition, page 342.

[3] See page 1149–1150.

Different speeds can be obtained by changing the position of the wings (a) of the regulator. The one in the laboratory of this bureau has been made portable by having a case made for it. The maker is Verdin, of Paris.

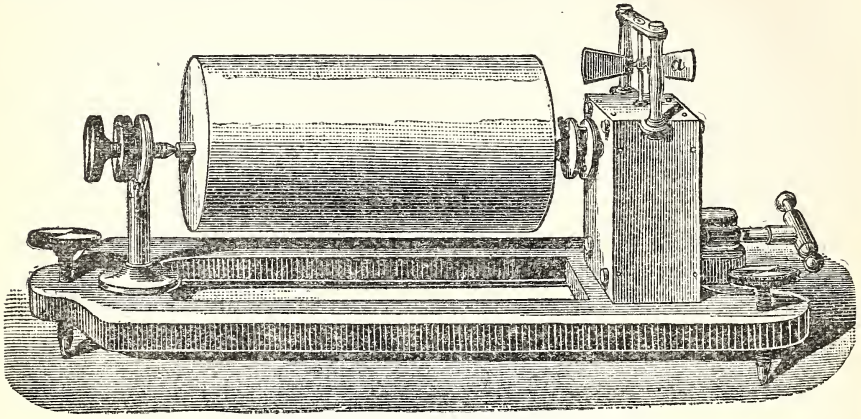


FIG. 3.—Small polygraph.

HIPP-CHRONOSCOPE.

The standard instrument for measuring time relations is the Hipp-Chronoscope (fig. 4). It consists of clockwork moved by a weight. There are two dials, the hands of which can be thrown in and out of gear. Either a glass or a wooden case covers the clockwork. This instrument measures to thousandths of a second. In using this instrument, electric keys, commutators, batteries, testing apparatus, etc., are required. Maker, Krille, Leipzig.

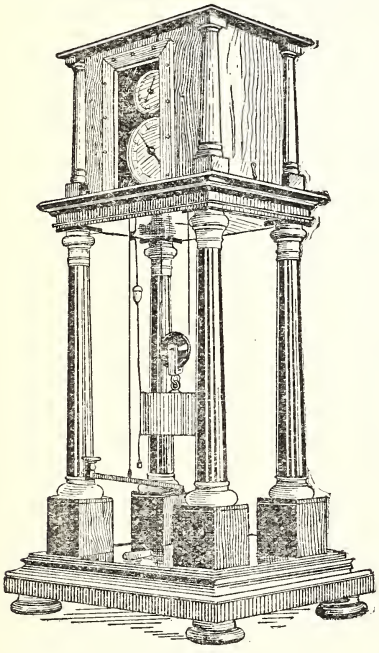


FIG. 4.—Hipp-Chronoscope.

THE VERNIER CHRONOSCOPE.[1]

The essential part of the instrument is the pair of unequal pendulums at the left. The longer of these is of such a length as to make one complete swing (i. e., to traverse its arc and return to the same point) in 0.80 seconds; the shorter makes a complete swing in 0.78 seconds, thus gaining 0.02 seconds at each of its swings, and fixing the unit of measurement of the instrument at one-fiftieth of a second. With these rates, if both pendulums start together, the shorter will gain a whole swing of the longer, and they will be together again after forty of its swings; $0.80 \div 0.02 = 40$. If the shorter starts later than the longer, it will gain, as before, at the rate of one-fiftieth of a second per swing; and in order to know in fiftieths of a second the interval by which it started later, it will only be necessary to count its swings until it catches up; and in general to measure any short interval it will only be necessary to start the longer

[1] Professor Sanford has given a detailed account of his instrument in the American Journal of Psychology, vol. 9, No. 2.

pendulum at the beginning and the shorter at the end, and to count the swings of the shorter up to and including a coincidence. The number counted is the interval expressed in the units of gain—that is, in fiftieths of a second.

The base of the instrument is of cast iron. On one corner of it rises a column $7\frac{1}{2}$ inches high, which, with the little platform supporting the keys, is cast in one piece with the base. From the top of the column an arm extends forward over the base $3\frac{1}{4}$ inches. The pendulums are released from the keys at the right in the cut.

While the instrument is primarily intended for demonstration purposes, yet it can be used for research where a unit of one-fiftieth of a second is sufficiently small.

The instrument can be obtained at Clark University, Worcester, Mass.

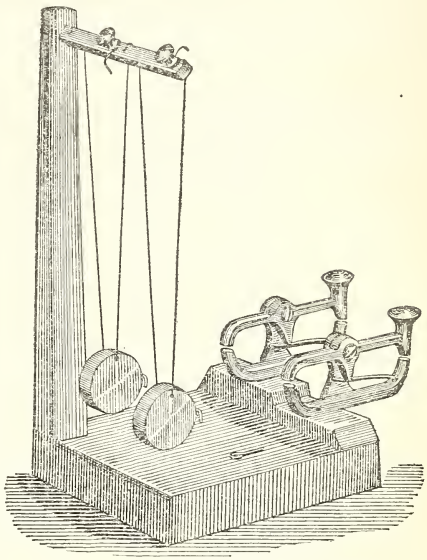


FIG. 5.— Vernier chronoscope. (Sanford.)

TUNING-FORK STAND.

In fig. 6 below is represented a tuning-fork stand for making electrical contact 50, 100, or 200 times per second by means of tuning forks the vibrations of which are electrically maintained. Any of the tuning forks can be fixed in the slot in the heavy cast-iron block. A platinum wire *A* projects vertically downward from the lower prong of the fork, and at each vibration dips into a cup containing mercury and completes an electrical circuit. The current thus formed is taken to a small electro-magnet *B* placed between the prongs of the fork. The ebonite block supporting the electro-magnet and the mercury cup can slide along a rod *C* to suit the lengths of the various forks. The level of the mercury in the cup can be adjusted by a screw plunger. The mercury can be kept clean by passing a continuous stream of water over its surface. The supply of water must be taken to the instrument by india-rubber tubing. The amplitude of the vibration of the fork can be varied by a lateral adjustment of the electro-magnet; a vertical adjustment

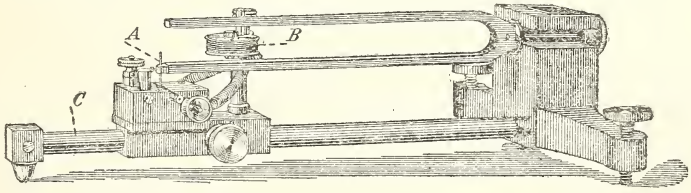


FIG. 6.—Tuning-fork stand.

also allows the electro-magnet to be fixed at an equal distance from each prong of the fork. The feet should stand upon three pieces of india-rubber tubing; when this is done the vibrations transmitted to the table are lessened, and the fork vibrates more readily. Maker: Cambridge Scientific Instrument Company, Cambridge, England.

PENDULUM CHRONOSCOPE.

The pendulum chronoscope, as represented in fig. 7, was designed and constructed by Professor Scripture,[1] of the psycho-physical laboratory of Yale University.

[1] Studies from the Yale psychological laboratory, Vol. III, 1895.

This instrument is designed to meet the following requirements: (1) Accuracy to the thousandth of a second; (2) ease of transportation; (3) readiness of setting up; (4) quickness in reading; (5) availability for many kinds of experiments on time.

The instrument contains a double bob, which is held by a catch at the right-hand side. When this catch is pressed the pendulum starts its swing, soon reaching a light pointer held in position by a delicate spring, which it carries along. At the exact moment the pendulum takes up the pointer it presses a catch which releases the mechanism beneath the base; this mechanism causes a shutter to drop, thus covering an opening in a metal plate at the back of the chronoscope. The person to be experimented upon is seated at the back; a curtain keeps him from seeing anything except the metal plate with the covered opening. He presses a rubber button as soon as he sees the shutter move, and a horizontal bar is released running behind the scale. The pointer swings between this bar and the scale, and is consequently stopped when the bar snaps against the scale. The pointer starts to move as soon as the shutter starts to fall, and consequently any time that elapses thereafter will be indicated by the distance through which the pointer travels before being caught. The connection of the pointer with the pendulum is so delicate that it continues its swing until it is caught on the other side.

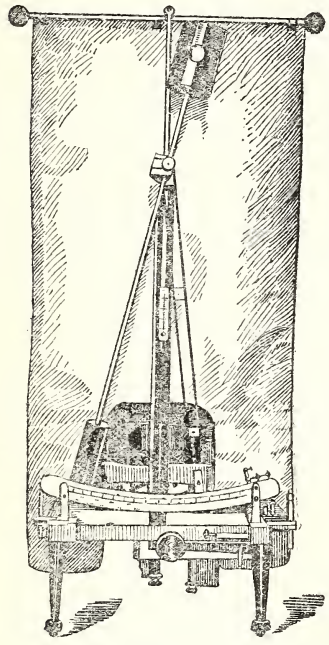


FIG. 7.—Pendulum chronoscope. (Scripture.)

Electrical contacts are arranged so that the units of the scale always indicate the elapsed time between the starting of the shutter and the pressing of the button; that is, all lost time in the action of the mechanism is taken up in the scale, which is marked in hundredths and half-hundredths, which, by the eye, can be easily divided into fifths, thus giving records in thousandths of a second.

For reactions to sound, the shutter is so arranged as to strike with a noise; for reactions to light, colored cards are placed in a holder behind the shutter, or a reflecting surface at this point receives light from the side and sends it through colored glass or gelatin.

The instrument is made at the Yale laboratory, New Haven, Conn.

A LOCATION REACTION APPARATUS.

Professor Fitz, of Harvard University, has designed an instrument for the purpose of testing the power of an individual to quickly and accurately touch an object suddenly disclosed in an unexpected position. The apparatus is so devised as to require the subject to make a movement of the finger from the end of the nose to some portion of the arc of a circle of which he is the center and whose plane is at the level of his elbow. The whole arrangement consists of a location apparatus, error index, pendulum chronoscope, pendulum and index clamp, release, etc.[1]

Three positions, A, B, and C, fig. 8, are selected, so as to give a wide range of movement. The object to be touched is a white spot half an inch in diameter placed at one of the points without the knowledge of the subject. There is a screen in front, which can be arranged to fall so as instantly to disclose the spot. There is a pendulum chronoscope (fig. 9) in connection with this, which measures the interval of time between the falling of the screen and the touching of the white spot. The

[1] For complete description, see Psychological Review, January, 1895.

error of the movement and its direction is determined by the apparatus for that purpose.

The chronoscope (fig. 9) has a balanced pendulum, total length of which is 12 inches, and so weighted that the time of swing is about a second and a half. The pendulum carries a small index that may be clamped instantly in any position on the scale, which is graduated in hundredths of a second by a falling weight. The pendulum is held in preparatory position by means of a hook connected with the

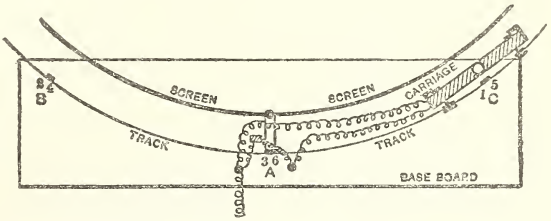


FIG. 8.—Location apparatus. (Fitz.)

armature of an electromagnet. When the screen falls the circuit is broken and the pendulum carrying its index is released. The remaking of the circuit by the touch of the subject's finger releases a clamp and catches the index, so that the time may be read upon the scale. Professor Fitz measured some of the elements making up the differences which exist between individuals in their power to do certain

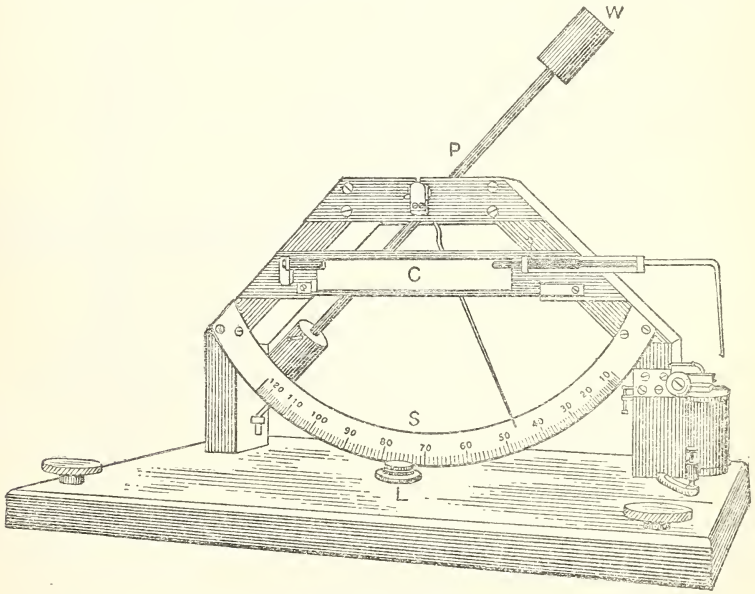


FIG. 9.—Pendulum chronoscope (Fitz.)

things requiring quickness and accuracy. The differences were found to be quite considerable, and there was an apparent lack of coordination between time and error. Those who were quick were not necessarily less accurate than those who were slow. The table which follows gives results suggesting the wide range of individual ability.

TABLE 1.—*Differences in individuals in quickness and accuracy.*

Time in $\frac{1}{100}$ seconds.	Males.			Females.		
	Number of individuals.	Per cent of total.	Average error.	Number of individuals.	Per cent of total.	Average error.
27- 35	11	6.2	11.1	1	1.5	10.0
35- 45	48	22.5	10.05	12	18.0	9.4
45- 55	54	31.0	8.25	18	26.0	7.8
55- 65	29	17.0	9.0	25	35.0	7.2
65- 75	18	11.0	8.2	11	16.0	5.4
75- 85	8	5.0	3.1	4	5.0	4.4
85- 95	4	2.0	4.05	0	.....	.....
95-105	0	0.0	0.0	.....	.....	.....
105-115	1	6.0	7.8	.....	.....	.....

The table contains observations on 173 males and 72 females. The first column gives limits of quickness, the second column number of individuals, etc. Though the time of the women is longer than that of the men, there is a compensatory increase in accuracy. It may be that everyday activity determines for each individual his range of error, and that time is the main element of variation. (Fitz.)

TIME MARKERS.

The form of time markers (fig. 10) below can be used in connection with an electrically maintained tuning fork of slow vibration. A small electro-magnet moves a lever carrying a writing point A, which marks on the surface of the paper of a recording instrument. It may also be connected with a clock, and used to analyze

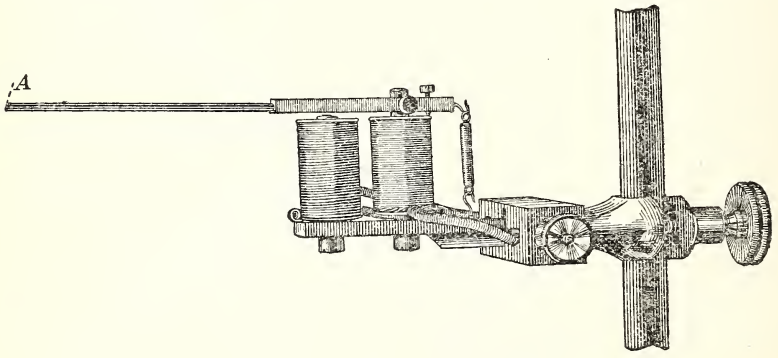


FIG. 10.—Time marker for smoked paper.

any other curve drawn at the same time by another instrument. Another form of the time marker writes with ink on continuous paper. Maker, Cambridge Scientific Instrument Company, England.

The Deprez signal or time marker, represented in fig. 11, has very small electromagnets, and the parts are very light. When connected with a tuning fork interrupting the current 200 or more times a second, it will give a good tracing. Maker, Cambridge Scientific Instrument Company, England.

MAREY'S TAMBOUR.

This is the original pattern of Marey's tambour (fig. 12). The tambour slides up and down a rod R, fastened to a small firm iron stand. An india-rubber membrane, B, is tied over the shallow brass vessel *V*, making an air-tight inclosure. An aluminum plate is fastened to the center of the membrane and is attached to the rod *A*, which writes. This rod can be adjusted in its connection with the brass disk so as to allow

its multiplication to be changed. The fulcrum of this rod or lever can be placed horizontally. The principle of the tambour is to record movements which are transmitted to it by means of a tube filled with air. On the iron tube *D* can be fastened a rubber tube conveying the movements of the air to the tambour. When the pressure of the air increases, the rod or marker *A* rises; when the pressure is less, the rod falls. The increase or decrease of pressure is caused by another instrument with which the experiment is being made. Maker, Cambridge Scientific Instrument Company, England.

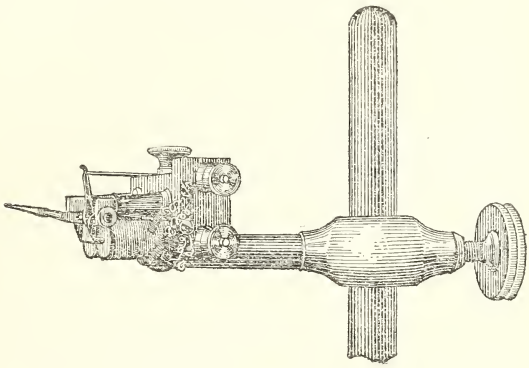


FIG. 11.—Deprez signal.

The figure below (fig. 13) represents Marey's tambour, after the Cambridge pattern. This tambour is made of a thin piece of ebonite. The india-rubber membrane *C* is held between the brass plate *B* and the ebonite *D*. The membrane *C* can be easily replaced by taking off the brass plate *B*, which is screwed on. The rod *E*, which consists of a thin piece of cane, is slipped into a slit in a small block of ebonite *F*, which rests directly on the membrane. A thin piece of brass *H* is put

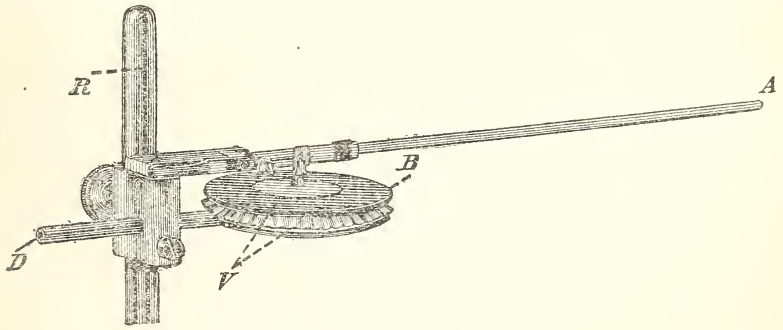


FIG. 12.—Marey's tambour.

into another slit in the ebonite block *F*, and serves as an axis for the rod or marker *E*. *A* is the brass tube on which a rubber tube is drawn conveying the waves of air to the membrane *C*. Maker, Cambridge Scientific Instrument Company, England.

GRAPHIC REGULATOR.

The graphic regulator of Binet & Courtier is designed to eliminate errors from tracings by suppressing oscillations due to the inertia of the marker or pen. In fig. 14 the different parts of the apparatus are represented in their natural size. The maker is Otto Lund, Place de la Sorbonne, Paris.

THE MYOGRAPH.

The myograph is an instrument which shows the differences between muscles in strength, and in the duration and phases of their movements. As the most of life's functions are made known through movements, and as the cause of each movement is generally a muscle, the importance of a knowledge of muscular functions is evident.

The myograph of Marey, in fig. 15, consists of a sort of bracelet made of small strips of wood fastened together by a cord which passes through holes in each end of the strips of wood. On the under surface of this bracelet is a rod with a plate on

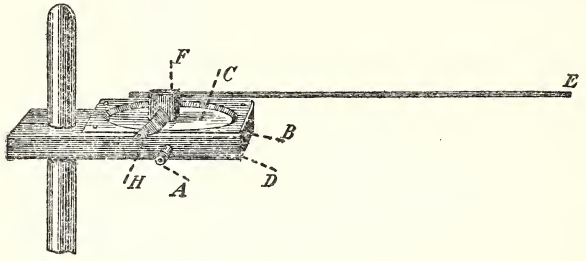


FIG. 13.—Marey's tambour, Cambridge pattern.

the end of it to insert against the muscle. This rod is connected with a brass vessel, A, which has a rubber membrane over it, making it air-tight, and in this way the movements of the muscle are transmitted through the air tube D to a tambour, and thus recorded on a revolving cylinder. The electrical excitation of the muscle comes through the two wires, *b* and *f*. The maker is Verdin, of Paris.

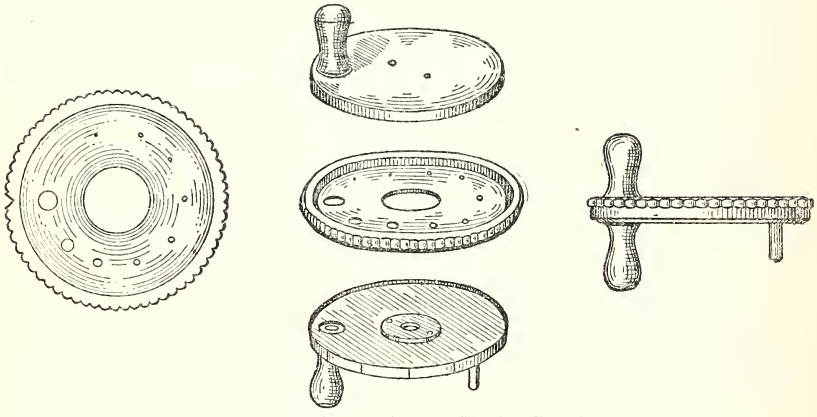


Fig. 14.—Graphic regulator. (Binet & Courtier.)

APPARATUS FOR MUSCULAR SENSE.

The apparatus (fig. 16) for muscular sense is the invention of Professor Münsterberg, of Harvard University. A strong iron rod, C, a little over an inch in diameter, is supported by a heavy iron stand *a* into which the rod C moves up and down, being held at will by the screw *b*. At the end of the rod C is an iron frame which turns upon an axis. This frame has on it two small rails upon which runs lightly a car, *k*, with four small brass wheels. The car is held upon the track at any desired position by a piece of metal, which has upon the end a small wheel running along the under side of a third rail, midway between and a little above the other two rails. An indicator is attached to the car, showing its position upon the scale, which is 900 millimeters long. To the top of the car is attached a short, hollow brass cylinder, *l*, into which the end of the index finger can be inserted and the car

set in motion. The limits to the motion of the car can be fixed by two clamps, m.

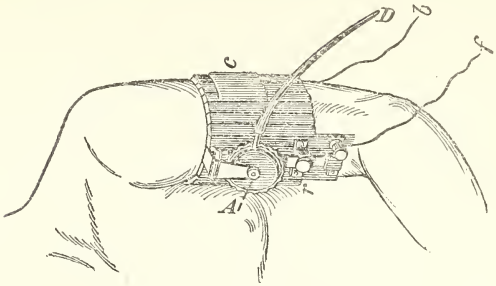


FIG. 15.—Marey's myograph.

and m'. There are two pulleys, n and n', one at each end of the middle track. A string is drawn over these two pulley wheels and is fastened at one end to the little car and at the other end to a scale pan, s, so that the weight of the car can be compensated for or the movement of the car made more difficult or easier. Maker, Elbs, of Freiburg, Germany.

In a series of experiments with this instrument Professor Delabarre, of Brown University, determined, among others, the following points:[1]

1. Those distances are considered equal, the sensible elements of which are considered equal.

2. Therefore everything which unconsciously increases the sensible elements or the strength of the sensations, causes distances to be overestimated, so that a short distance will be felt to be equal to a longer distance.

3. When the person experimented upon is conscious of these causes, which make him overestimate distance, he strives to correct the error. This correction can easily be too great, so that he falls into an opposite error of underestimating the distances on the rails of the instrument.

4. These principles hold for similar movements, whether they occur in succession or at the same time. When they occur in succession another factor must be considered—that is, error in time; for a distance seems longer in memory than when we execute it, providing, of course, any other disturbing factors are eliminated.

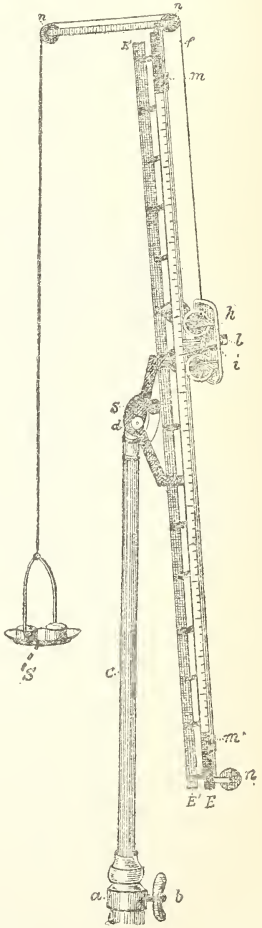


FIG. 16.—Apparatus for muscular sense. (Münsterberg.)

THE PLETHYSMOGRAPH.

This instrument is used to measure the variations in the volume of an organ. One principle upon which this is done is to place the organ in water in an air-tight cylinder and measure the amount of water displaced. Archimedes was the inventor of this method. The apparatus above (fig. 17) is to measure changes in the volume of the hand, a model of François Franck. If to the tube A is fastened a rubber tube, connecting with a tambour, it is evident that when the volume of the hand increases, the surface of the water at B will rise and increase the pressure of the air against the

[1] Delabarre, E. B., Ueber Bewegungsempfindungen, Freiburg, 1891.

membrane of the tambour, making its lever rise, giving an upward curve on a recording instrument. Maker, Verdin, of Paris.

A drawing is given (fig. 18) showing the newest form of Mosso's plethysmograph. This is constructed somewhat on the principle of the instrument (fig. 17) just mentioned.

Mosso's plethysmograph consists of a long glass vessel A. The opening through which the arm is introduced is closed with caoutchouc, and the vessel is filled with water. A complete description of this apparatus would go further than is the purpose of this chapter, which is to give the plan and general idea of the form and application of instruments. But it may be said in regard to the rest of the apparatus employed to convey the results of the variations in the volume of the arm, that it is so adjusted that any increase or decrease in the volume of the arm, and consequently in the pressure of the water, causes the weight H, on which is a marker K, to rise or fall, giving an upward or downward curve on a revolving cylinder.

This instrument has served particularly to determine the amount of blood in the arm. It can be applied to other researches in physiology. By making the glass tube N small, one can see in the tracings of the marker K the pulsations of the heart, the respiratory oscillations, and the undulations of the vessels depending on the vasomotor center.

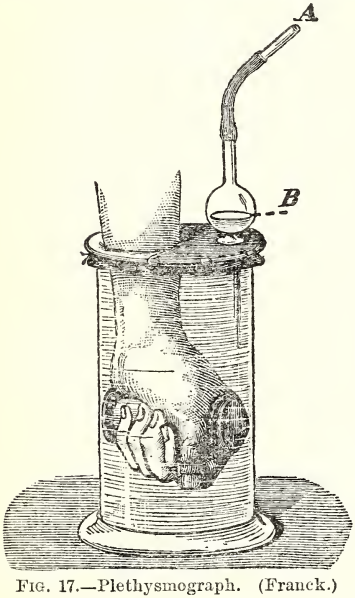


FIG. 17.—Plethysmograph. (Franck.)

In experiments on the action of medicaments in sleep, etc., where it is necessary to measure greater changes of volume in the arm, a larger tube N is used. Maker, Verdin, Paris.

THE PNEUMOGRAPH.

Knowledge as to the movements of the chest in respiration is considered of great importance. The instrument that records these movements is the pneumograph. The one in fig. 19 is after Marey's model. It consists of a flexible brass plate A A, on which are fastened two levers, B and B. The plate A A is placed against the walls of the chest; it is suspended from the neck by cords fastened at D, and it is held against the chest by a cord passing around the body and fastened to both levers B B. A tambour C is so connected with the brass plate A A that any movement of the chest causes the tambour to expand or the reverse, and this movement is carried through the air tube E to a tambour recording upon a cylinder.

Thus, fig. 20 gives a curve of normal respiration, where the rising of the curve traced by a tambour represents inspiration and the falling expiration. Types of respiration may be studied and the effects of disease on movements of the chest shown.

In studying the influence of intellectual and emotional states upon the respiratory movements, the writer, in a series of experiments, found in general that concentration of thought, as in mathematical calculations or in reading, lessens the respiratory movements considerably.

A most recent form of the pneumograph is given in figure 21. It is constructed of aluminum. It is held up partly by a cord around the neck. The instrument consists of a plate A, with two movable basins B B, each covered with a rubber membrane, making the inclosure air-tight. A cord around the body is fastened to a hook in each of the membranes. Two rubber tubes from the membrane join at D, where they can be connected with a tambour, for recording the expansion or contraction of the chest. Maker, Verdin, Paris.

APPRECIATION OF WEIGHT.[1]

The instrument consists of a box containing ten trays which can be easily removed. Each tray contains three weights, identical in size and appearance, but differing in

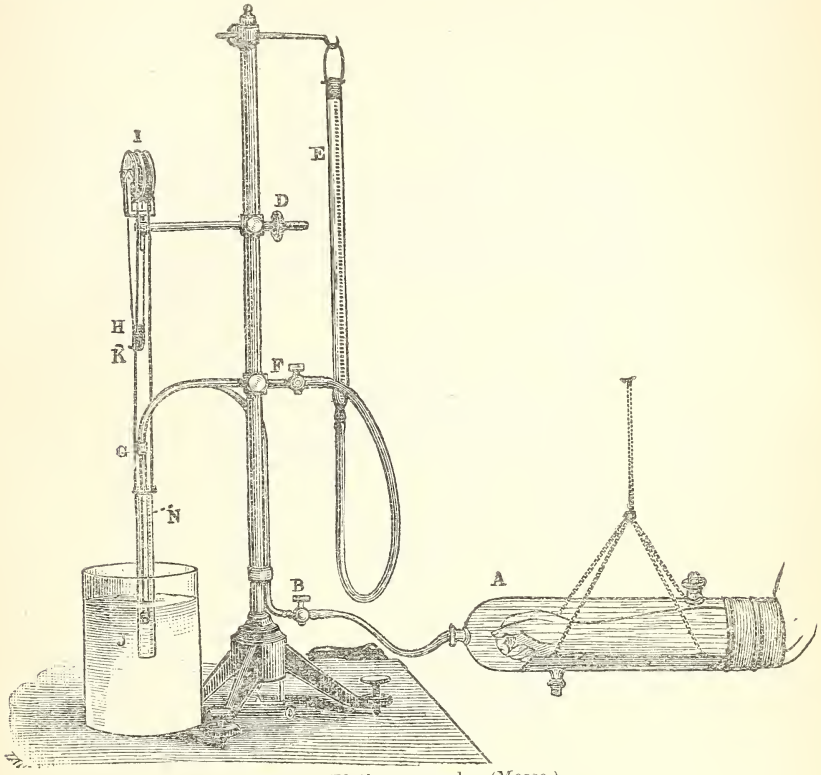


FIG. 18.—Plethysmograph. (Mosso.)

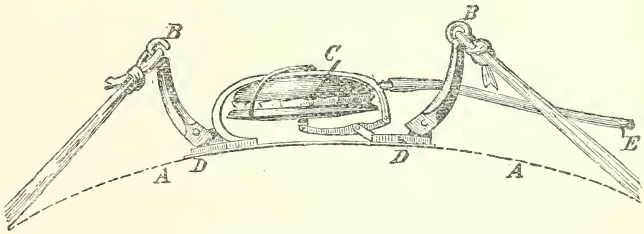


FIG. 19.—Pneumograph. (Marey.)

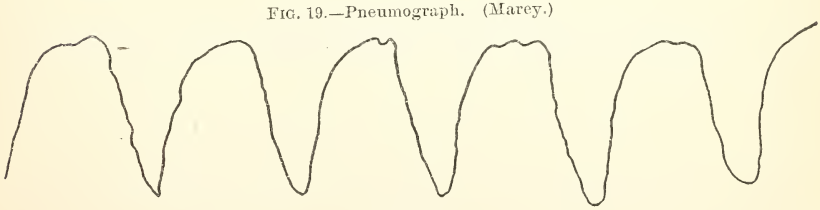


FIG. 20.

[1] See "On apparatus for testing the delicacy of muscular and other senses in different persons," by Francis Galton, F. R. S., Journal of the Anthropological Institute, May, 1883.

weight from each other. The three weights in each tray form a series of gradually increasing weights in geometrical progression and the series in each tray differ in value.

It follows from Weber's law that if a person can just appreciate the differences between two consecutive weights in one tray he can then also just appreciate the

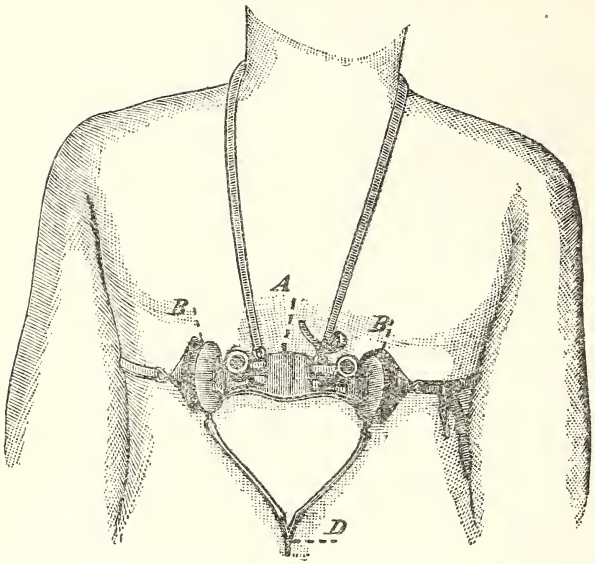


FIG. 21.—Pneumograph. (Verdin.)

difference between the other consecutive pair in that tray. The following are the values of the weights in each tray, where $W=1{,}000$ grains and of $r=1.01$:

Weights contained in tray—

No. 2	Wr^0,	Wr^2,	Wr^4
No. 3	Wr^1,	Wr^7,	Wr^{10}
No. 4	Wr^6,	Wr^{10},	Wr^{14}
No. 5	Wr^4,	Wr^9,	Wr^{14}
No. 6	Wr^0,	Wr^6,	Wr^{12}
No. 7	Wr^0,	Wr^7,	Wr^{14}
No. 8	Wr^2,	Wr^{10},	Wr^{18}
No. 9	Wr^0,	Wr^9,	Wr^{18}
No. 10	Wr^4,	Wr^{14},	Wr^{24}
No. 12	Wr^0,	Wr^{12},	Wr^{24}

Each weight has engraved in an inconspicuous manner the index of the power of r: thus in tray No. 2 the weights have the numbers 0, 2, 4, and in tray No. 3 they have 4, 7, 10. Thus the number of each tray is the difference of the powers of r in two consecutive weights in that tray. Maker, Cambridge Scientific Instrument Company, England.

MEASUREMENT OF PRESSURE—BARÆSTHESIOMETER.

The baræsthesiometer (fig. 22), designed by Professor Eulenburg, of Berlin, is constructed on the principle of a spiral-spring balance. A small knob A is pressed upon the skin gradually. One method is to press until the marker B reaches, say, 50 grams, then the subject closes his eyes and the experimenter gradually increases the pressure. The subject is to indicate as soon as he feels the additional pressure,

thus giving his least sensibility to the increase of pressure. The amount is recorded by the hand B. Maker, Hirschmann, Berlin.

BARO-ELECTRO-ÆSTHESIOMETER.

The baro-electro-æsthesiometer, as its name indicates, measures, the amount of pressure at the time electrical sensilility to tingling or pain is felt.

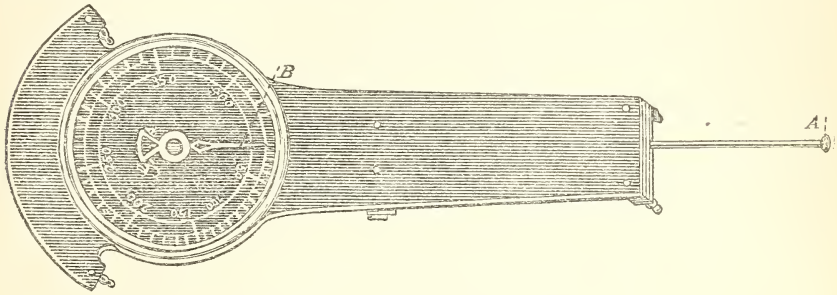


FIG. 22.—Baræsthesiometer. (Eulenburg.)

The instrument (fig. 23) is Eulenburg's baræsthesiometer, with such additions by the author as to make it serve for an electrode. Two round steel knobs can be screwed on to the end of rod A; one is 20 millimeters, the other 35 millimeters in diameter. At B is fastened a short rod, with a hole and screw, by which a wire can be held, which connects with the battery. An indifferent electrode is fastened, say, to the back of the head. We will suppose it is desired to find the strength of cur-

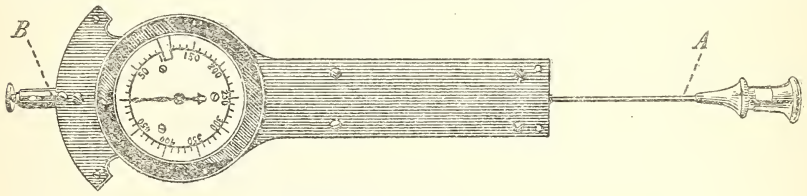


FIG. 23.—*Baro-electro-æsthesiometer.* (Eulenburg and MacDonald.)

rent passing through the cranium and brain. The instrument is pressed against the forehead. The advantage is that the amount of pressure is known and can be kept constant, whereas with the ordinary electrode the amount of pressure is unknown and is liable to vary, so that in comparing two persons the difference in the strength of the current required to make them feel it may be influenced by the amount of pressure, rather than by the real difference in their electrical sensibility.

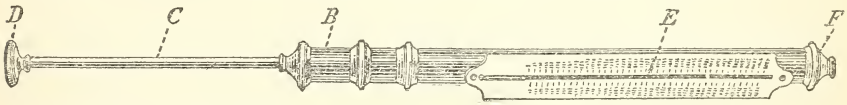


FIG. 24.—Temple algometer. (MacDonald.)

THE MEASUREMENT OF PAIN.

Pain is caused by applying to a sensory nerve a greater stimulation than is normal. The stimulation may be mechanical, electrical, thermal, etc. The measurement of pain can only be approximated, and here there is often difficulty.

The writer has designed a new instrument (fig. 24,) which may be called a temporal or temple algometer.

It measures sensibility to painful or disagreeable impressions caused by pressure, and is generally applied to the temporal muscles. The instrument consists of a brass cylinder B F, with a steel rod C running through one of its ends; this rod is attached to a spring, with a marker E on the scale, measuring pressure from 0 to 4,000 grams.[1] The brass disk D is 15 millimeters in diameter; a piece of flannel is glued to its surface so as to exclude the feeling of the steel when pressed against the skin, thus giving a pure-pressure sensation. The whole instrument is 30 centimeters in length.

In using this algometer it is held in the right hand, as represented in fig. 25, by the experimenter, who stands back of the subject and presses the disk D against the right temporal muscle; then he moves in front of the subject, where he can conveniently press the disk D against the left temporal muscle. As soon as the subject feels the pressure to be the least disagreeable, the amount of pressure is read from the scale A (fig. 24), as indicated by the marker E. The subject sometimes hesitates to say just when the pressure becomes the least disagreeable, but this is part of the experiment. The idea is to approximate as near as possible to the threshold of pain. Maker, Verdin, Paris.

In making experiments upon both sexes the author has found women to be more acute in sensitiveness of disagreeableness or pain from pressure than men.

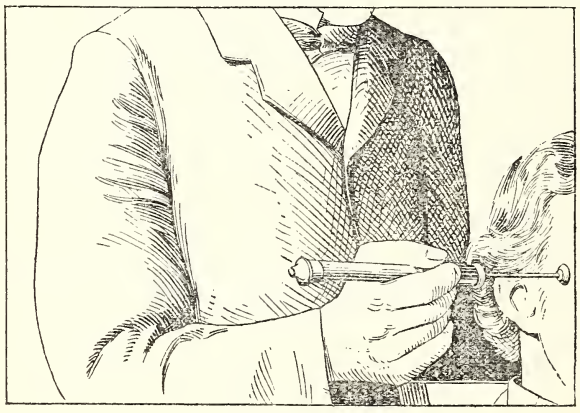


FIG. 25.

In the three following tables (2, 2*a*, 2*b*) are given recent measurements of pain by Misses F. Alice Kellor, Emily Dunning, Alice O. Moore, and Alice E. Palmer. These measurements were made with the author's temple algometer under his direction. Four distinct classes are represented in the tables: University women students, washerwomen, business women, as clerks and stenographers, and young women of the wealthy classes.

The young women of the wealthy classes (Table 2*b*) are, according to the measurements, very much more sensitive to pain than any of the other classes. The university women are more sensitive to pain than the washerwomen (Tables 2, 2*a*). The business women are, however, more sensitive than the university women. As is well known, the majority of university students, both men and women, are not wealthy, but simply in moderate circumstances. It seems that the sociological condition is one of the main factors to affect sensibility to pain.[2]

[1] In experiments upon criminals a pressure of 4,000 grams would in some cases not feel the least disagreeable. A larger form of the instrument is being constructed, so as to measure 8,000 grams pressure.

[2] For further consideration of these measurements see page 1113.

TABLE 2.—*Measurements (in grams) of the least sensibility to pain in university women students, with temple algometer.*

[By F. Aliee Kellor and Emily Dunning, of Cornell University.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left temple.
17 years	1,725	1,925	21 years	1,550	1,350
17 years	1,550	1,150	21 years	2,450	1,550
			21 years	3,225	2,750
Total	3,275	3,075	21 years	1,650	1,450
Average	1,637	1,537	Total	8,875	7,100
			Average	2,218	1,775
19 years	2,000	1,750			
19 years	2,450	1,950	22 years	2,725	2,400
19 years	2,900	2,550	23 years	2,200	2,400
19 years	2,550	2,700	23 years	1,600	1,350
19 years	2,825	3,000			
19 years	3,900	4,000	Total	6,525	6,150
19 years	2,450	2,950	Average	2,175	2,050
19 years	1,450	1,950			
			25 years	2,650	1,925
Total	20,525	20,850			
Average	2,565	2,606	27 years	2,500	2,350
			27 years	1,850	1,600
20 years	2,325	2,125	Total	4,350	3,950
20 years	3,400	2,200	Average	2,175	1,975
20 years	2,800	2,100			
20 years	1,600	1,450	28 years	2,150	2,625
20 years	1,350	1,900	28 years	1,550	2,100
20 years	2,925	1,050	29 years	1,700	1,100
20 years	2,325	2,960	32 years	1,650	2,150
20 years	1,750	2,425			
20 years	1,550	1,750	Total	7,050	7,975
			Average	1,762	1,993
Total	20,025	17,900			
Average	2,225	1,988	Average of all	2,220	2,088

TABLE 2*a*.—*Measurements (in grams) of the least sensibility to pain in washerwomen and business women, with temple algometer.*

[By Alice O. Moore, of the Charity Organization Society, of Buffalo, N. Y.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left. temple.
WASHERWOMEN. *a*			BUSINESS WOMEN (CLERKS, STENOGRAPHERS, ETC.). *b*		
25 years	2,750	2,950			
31 years	4,500	4,500	30 years	1,500	1,000
31 years	3,500	4,000	31 years	1,400	1,300
32 years	2,150	1,900	35 years	1,100	1,150
35 years	4,000	4,000	38 years	1,100	1,450
36 years	2,300	2,050	40 years	1,200	1,450
37 years	2,700	2,800	45 years	1,650	1,350
39 years	3,134	3,400	60 years	1,650	1,600
40 years	3,900	3,750	60 years	1,000	850
41 years	2,900	3,000	60 years	2,050	2,000
42 years	3,450	3,250			
45 years	2,950	2,600	Total	12,650	12,150
49 years	2,250	2,850	Average	1,405	1,350
55 years	2,550	2,250			
			Average of all	2,421	2,410
Total	43,034	43,300			
Average	3,073	3,092			

a Average age, 38 years.

b Average age, 44 years.

TABLE 2b.—*Measurements (in grams) of the least sensibility to pain in young women of the well-to-do classes, with temple algometer.*

[By Alice E. Palmer, teacher of mathematics, Pittsburg, Pa.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left temple.
12.8 years	700	650	16.2 years	1,000	1,100
12.9 years	750	600	16.3 years	1,000	1,000
12.10 years	650	800	16.3 years	900	1,100
12.11 years	800	850	16.3 years	650	700
			16.8 years	950	1,100
Total	2,900	2,900	16.9 years	1,100	950
Average	725	725	16.9 years	900	950
			16.9 years	1,000	1,050
13.2 years	1,150	1,200			
13.4 years	600	600	Total	7,500	7,950
13.6 years	750	750	Average	937	993
Total	2,500	2,550	17.1 years	750	850
Average	833	850	17.1 years	1,750	1,550
			17.2 years	700	650
14 years	1,600	1,550	17.2 years	1,500	2,000
14.4 years	950	950	17.4 years	1,200	1,150
14.6 years	700	700	17.7 years	1,300	1,350
14.7 years	1,000	950	17.9 years	1,700	1,600
			17.9 years	1,050	1,000
Total	4,250	4,150	17.10 years	600	650
Average	1,062	1,037			
			Total	10,550	10,800
15.1 years	950	950	Average	1,172	1,200
15.2 years	600	550			
15.2 years	1,700	1,550	18 years	850	950
15.3 years	700	650	18.2 years	600	600
15.4 years	1,450	1,500	18.4 years	2,000	1,600
15.5 years	950	1,050	18.8 years	1,050	950
15.5 years	750	800			
15.6 years	850	900	Total	4,500	4,100
15.6 years	600	650	Average	1,125	1,025
15.6 years	950	950			
15.7 years	1,350	1,400	19.1 years	800	850
15.9 years	750	850	19.2 years	850	900
15.9 years	600	800			
15.9 years	1,650	1,650	Total	1,650	1,750
			Average	825	875
Total	13,850	14,250			
Average	989	1,017			

ÆSTHESIOMETER.

The æsthesiometer measures the degree of ability to distinguish points on the skin by the sense of touch. This is called the sense of locality, which varies in acuteness according to the mobility of the part.

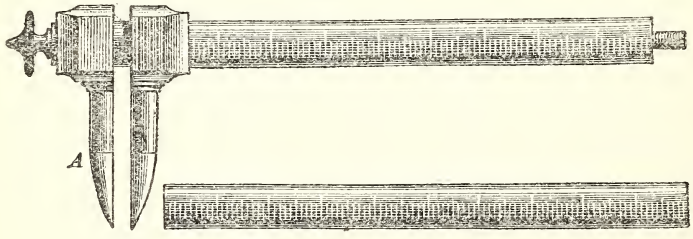


FIG. 26.—Æsthesiometer.

The instrument (fig. 26) consists of a round brass rod on which is a scale. One point A is fastened on the rod, the other point slides on the rod. The subject, with eyes closed, is asked, when the two points are made to gently touch the skin simultaneously, how many points he feels, one or two. When he is in doubt the distance between the two points can be read on the scale. This distance is an approximate measure of his sense of locality on the skin. Maker, Verdin, Paris.

The following table gives the the smallest distance (in millimeters) at which two points can still be distinguished as double by an adult and by a boy 12 years of age:

TABLE 3.

[Physiology, Landois and Sterling, Philadelphia, Pa.]

	Adult.	Boy 12 years old.		Adult.	Boy 12 years old.
Tip of tongue	1.1	1.1	Center of hard palate	13.5	11.3
Third phalanx of finger, volar surface	2–2.3	1.7	Lower third of forearm, volar surface	15.0	.....
Red part of the lips	4.5	3.9	In front of the zygoma	15.8	11.3
Second phalanx of finger, volar surface	4–4.5	3.9	Plantar surface of great toe	15.8	9.0
Third phalanx of finger, dorsal surface	6.8	4.5	Inner surface of the lips	20.3	13.5
Tip of nose	6.8	4.5	Behind the zygoma	22.6	15.8
Head of metacarpal bone, volar surface	5–6.8	4.5	Forehead	22.6	18.0
Dorsum and side of tongue, white of the lips, metacarpal part of the thumb	9.0	6.8	Occiput	27.1	22.6
Third phalanx of great toe, plantar surface	11.3	6.8	Back of the hand	31.6	22.6
Second phalanx of fingers, dorsal surface	11.3	9.0	Under the chin	33.8	22.6
Back	11.3	9.0	Vertex	33.8	22.6
Eyelid	11.3	9.0	Knee	36.1	31.6
			Sacrum, gluteal region	44.6	33.8
			Forearm and leg	45.1	33.8
			Neck	54.1	36.1
			Upper arm, thigh, and center of the back	67.7	31.6–40.6

THERMÆSTHESIOMETER.

The thermæsthesiometer (fig. 27), designed by Professor Eulenburg, of Berlin, measures the least sensibility to heat. It consists of two thermometers fastened

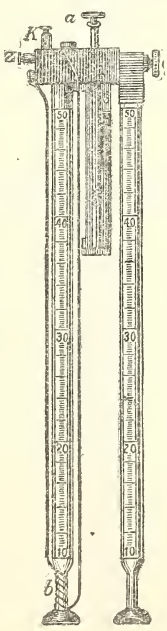


FIG. 27.—Thermæsthesiometer. (Eulenburg.)

together as seen in the figure. There is an electrical arrangement for changing the temperature of one of the thermometers. One thermometer is heated until the

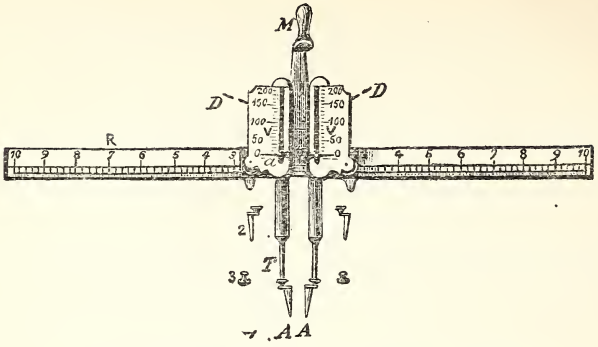


FIG. 28.—Dynamometrical æsthesiometer. (Verdin.)

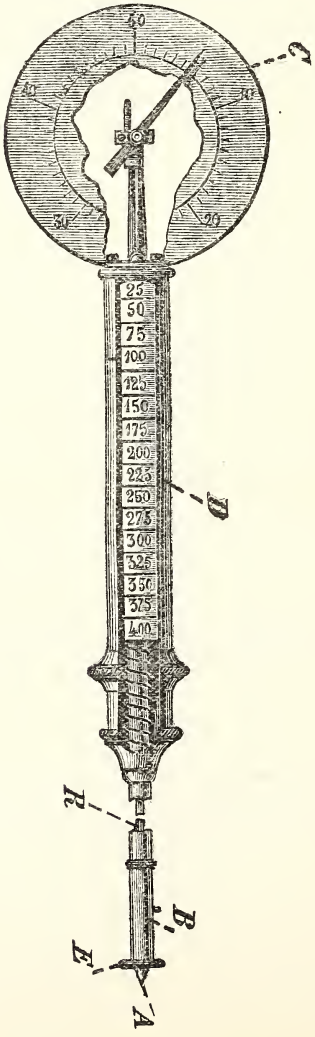


FIG. 29.—Algometer. (Chéron.)

difference from the other is easily perceived; then both are placed upon the skin. The person to be experimented upon is asked to say as soon as the difference between the thermometers becomes imperceptible. The real difference between the thermometers is then read; this is called the least perceptible difference. If for one person this difference is 2° and for another person 3°, then the former is said to be more acute in sensibility to heat by 1°; for small differences are less easily perceived than large differences.

The maker of the form of instrument represented in the figure (27) is Windler, Berlin.

DYNAMOMETRICAL ÆSTHESIOMETER.

In fig. 28, below, is represented a dynamometrical æsthesiometer designed by Charles Verdin. It measures the different degrees of the sensibility to pain by pressure of two points AA, on the skin.

It is composed of a flat steel bar R marked off in centimeters, on the back of which is fastened a handle M. The two scales DD, which measure the amount of pressure of the points AA, are graduated from 0 to 250 grams. They are fastened to the rods with the points at the end and slide along the bar R, so that the points may be at different distances from each other. Maker, Verdin, Paris.

Another algometer (fig. 29) is that of Dr. Chéron. Its purpose is not only to measure how much pressure of the point A on the skin is necessary to produce pain, but also how much the point A penetrates the skin. The amount of pressure is measured on the scale D; the distance the point enters the skin is measured in tenths of millimeters on the circular scale C. A brass tube, B, slides up and down the rod R. This tube is slid down so that its edge, E, is even with the point, A, and is connected by a thin rod, R, with the scale, C, so as to measure the amount of the sinking of the point, A, into the skin as soon as pain is felt. Maker, Verdin, Paris.

HAND ALGOMETER.

The hand algometer in fig. 30 is a design by Professor Cattell, of Columbia University, New York. The body of the instrument is made of gutta-percha. The brass rod A, with a rounded gutta-percha tip at one end, is connected with a spring within the body of the instrument; the scale is in kilograms. The instrument is pressed

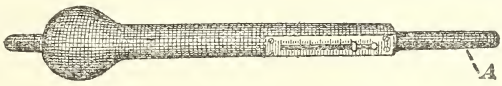


FIG. 30.—Algometer. (Cattell.)

against the palm or other part of the hand, and as soon as the pressure becomes the least painful the amount the pointer indicates on the scale is recorded. Makers, Brown & Getty, Camden, New Jersey. The author has used Cattell's instrument upon 188 persons, testing the palm of both hands for pain, with the results as indicated in Table 4, which follows:

TABLE 4.—*Sensibility to pain by pressure in hands of individuals of different classes, sexes, and nationalities.*[1]

No.	Class.	Total number of persons.	Right hand.			Left hand.		
			Number requiring more pressure in right hand.	Total.	Average.	Number requiring more pressure in left hand.	Total.	Average.
1	2	3	4	5	6	7	8	9
				Kgm.	*Kgm.*			
1	American professional men	20	14	74.50	3.72	5	65.25	3.26
2	American business men	14	6	85.25	6.08	6	87.75	6.05
3	American women, nonlaboring class	27	13	93.25	3.45	6	91.83	3.38
4	English professional men	17	9	88.50	5.20	6	87.25	5.13
5	English women, nonlaboring class	7	4	43.00	6.14	2	44.25	6.32
6	German professional men	6	5	31.25	5.20	1	29.00	4.83
7	Salvation Army members, London	8	6	73.25	9.15	2	51.00	7.62
8	Slum men in Chapel-Rouge, Paris	9	3	122.50	13.61	2	119.50	13.27
9	Boston army of the unemployed	34	16	332.50	9.77	14	333.75	9.81
10	Women in "Maisons de Tolérance," Paris	9	3	82.00	9.00	5	84.25	9.36
11	Epileptic patients, laboring people	3	1	28.00	9.33	1	27.00	9.00
12	Odd ones, men, in Paris	7	4	28.25	4.03	3	26.25	3.75
13	Odd ones, men, in different countries	18	10	96.25	5.34	5	89.50	4.97
14	Men in general	142	76	1,012.75	7.13	49	979.50	6.89
15	Women in general	46	21	230.50	5.01	15	233.08	5.06

Should these results prove to be generally true by experiments on larger numbers of people, the following statements would be probable:

The majority of people are more sensitive to pain in their left hand. (Only exception is No. 10, columns 4 and 7.)

Women are more sensitive to pain than men. (Nos. 14 and 15, columns 6 and 9.) Exceptions are: compare Nos. 4 and 5, columns 6 and 9. It does not necessarily follow that women can not endure more pain than men.

American professional men are more sensitive to pain than American business men (compare Nos. 1 and 2, columns 6 and 9); and also than English or German professional men. (Compare Nos. 1, 4, and 6, columns 6 and 9.)

The laboring classes are much less sensitive to pain than the nonlaboring classes. (Compare Nos. 1, 2, and 9, columns 6 and 9.)

The women of the lower classes are much less sensitive to pain than those of the higher classes. (Compare Nos. 3, 5, and 10, columns 6 and 9.) In general, the more developed the nervous system the more sensitive it is to pain.

Remark: While the thickness of tissue on the hand has some influence, it has by no means so much as one might suppose, a priori; for many with thin hands require much pressure. (Nos. 5 and 10, columns 6 and 9.)

MUSCLE READING.

Some explanation of muscle reading and like phenomena may be suggested by experiments with the digitalgraph[2] (fig. 31) and the automatograph (fig. 32).

Figure 31 represents an instrument for recording the unconscious movements of the finger, designed by Dr. Delabarre, of Brown University. The movements of the finger are communicated by two chords, A and B, to two rods, V and H, on which can be fastened markers to make tracings upon a revolving cylinder. The rods V

[1] Psychological Review, March, 1895.

[2] We have ventured to name this instrument.

and H are held in a state of tension by rubber bands, which react in such a way as to cause every horizontal or vertical movement of the finger to be recorded. Maker, Verdin, Paris.

THE AUTOMATOGRAPH.

The automatograph (fig. 32) below, designed by Professor Jastrow of the University of Wisconsin, is an instrument for the study of involuntary movements. It

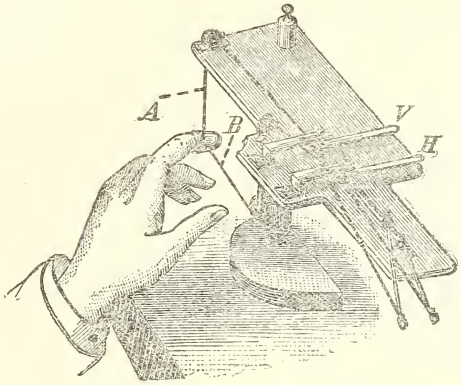


FIG. 31.—Digitalgraph. (Delabarre.)

consists of a wooden frame, B, mounted on three adjustable brass legs, raising it from the table a little, and enabling one to make the plate glass E (15 inches square) exactly level. Three glass balls and polished spheres, three-fourths of an inch in diameter, are placed in triangular form upon the plate glass; a very light crystal plate glass (14 inches square) rests upon these balls. This crystal plate is mounted in a light frame. A piece of paper is placed upon the plate to hide the balls; the ends of the fingers are lightly rested upon this paper. The least movement of the hand

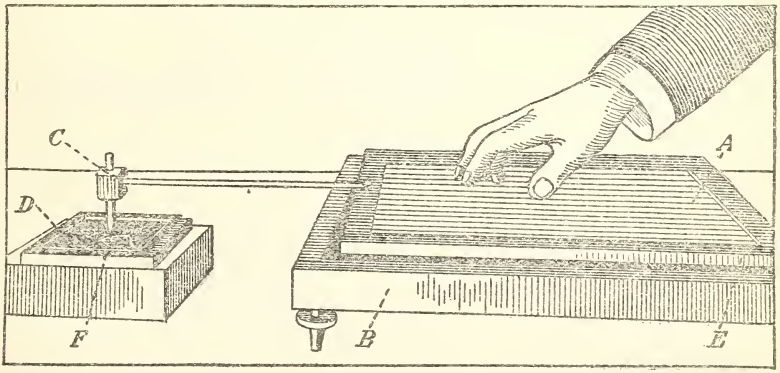


FIG. 32.—Automatograph. (Jastrow.)

slides the upper plate upon the balls. To the light frame of the upper plate A is fastened a small rod 10 inches long, upon the end of which is a cork, C, pierced by a small glass tube. In this tube is a glass rod fitting the tube snugly. The fine point to this rod traces every movement of the hand exactly. A piece of smoked paper, D, is placed over a glass plate to receive the markings of the rod or pointer F. A large screen is used to prevent the subject from seeing the record. The instrument records all movements in the horizontal plane. Jastrow calls it an automatograph, because

it records slight involuntary movements. The results of experiments by Jastrow[1] show that the meaning of the movements recorded depends mostly upon the testimony of the subjects. In general the subject becomes aware his hand has moved, but seldom knows the direction; the movements, though always involuntary, are sometimes unconscious. The subject is often surprised at the result. This and the digitalgraph of Delabarre suggest many subtle ways[2] in which by movement we unwittingly give others an idea of what is going on in our minds. Jastrow intentionally simulated these movements and the result was measurably different from the genuine involuntary movements.

Details as to instrument may be obtained from the inventor.

TREMBLING OF THE TONGUE AND HAND.

In fig. 33 is an instrument designed to measure the trembling of the tongue. It consists of a brass frame B, fastened to the mouth by a braid around the head. The tongue is held against a little disk attached to a tambour C with a brass tube A that can be connected with a recording tambour. The instrument measures rather the control of the will over the movements of the tongue. Maker, Verdin, Paris.

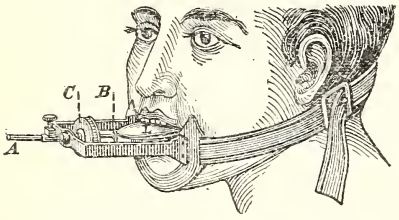


FIG. 33.—Instrument for measuring the trembling of the tongue.

In order to measure the trembling or movement of the hand or arm the instrument in fig. 34 has been devised. It consists of a rubber membrane M, fastened to a small shallow brass basin C, making a tambour. A brass disk D is glued to the membrane M, and on this disk is a brass rod T. Different weights of 5, 10, etc., grams can be screwed upon the rod T. A brass tube passes through the handle, on the end of which can be fastened a rubber tube K, connecting with a recording tambour. Any movement of the hand or arm up and down causes the weight to press upon the membrane M, which sends a wave of air to the recording tambour. Maker, Verdin, Paris.

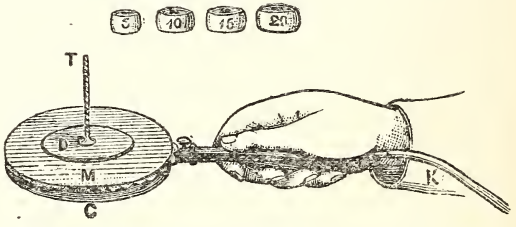


FIG. 34.—Instrument to measure the trembling of the hand and arm.

Figure 35 is a combination of instruments to record the movements of tongue, finger, lips, etc. The apparatus comprises a cylinder E, recording tambour A, connected with another tambour D. A light rod T is connected with this second tambour D. At the end of this rod, at K, is tied a small cord, running on a pulley P, which is fastened to a small brass rod F; this rod slides up and down freely in a brass tube. The purpose of this is to obtain a state of equal tension of the cord for all experiments, by having the cord hold the pulley, the weight of which is constant. As soon as the tension is obtained a button N is pressed and the pulley is held firm, suppressing weight of pulley and cord. Then the trembling of the member is recorded. Maker, Verdin, Paris.

THE PSYCHOGRAPH.

The psychograph is a new apparatus for the study of trembling. The instrument in fig. 36 was designed by Professor Sommer, of Giessen, Germany, and is used for the investigation of the unconscious movements of the hand.

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[1] Amer. Jour. Psychology, Vol. IV, 1892, page 398.

[2] As when a company of people place their hands upon a table, and it moves, although none are conscious of pushing it.

There are two special difficulties in studying the trembling of the hand. One is to analyze the movements and distinguish them—that is, each movement in three directions, horizontal from right to left, and forward and backward, and vertical up and down. It is necessary also to lessen friction as much as possible, for recording the slightest movement of the hand. This latter difficulty is overcome by employing systems of levers, reducing the friction to a minimum. It is necessary to con-

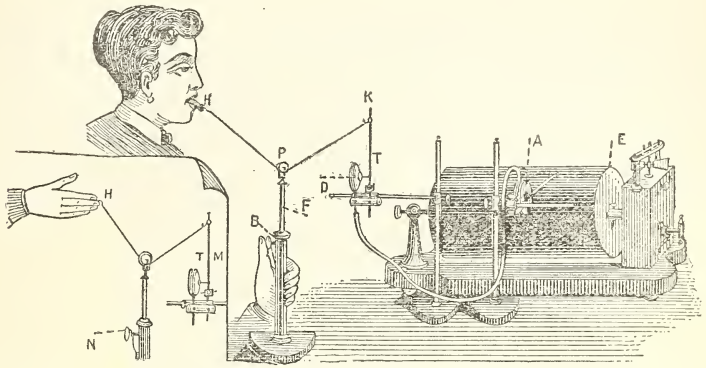


FIG. 35.—Apparatus for measuring the movement of hand, tongue, etc. (Filliatre.)

nect the hand with the different levers corresponding to the three principal directions, and to record separately the movements of each of these levers. To record these movements on the same cylinder, angular levers must be interposed between the rod upon which the finger rests and the marker on the cylinder. The horizontal movement of the hand is transformed into a vertical movement of the

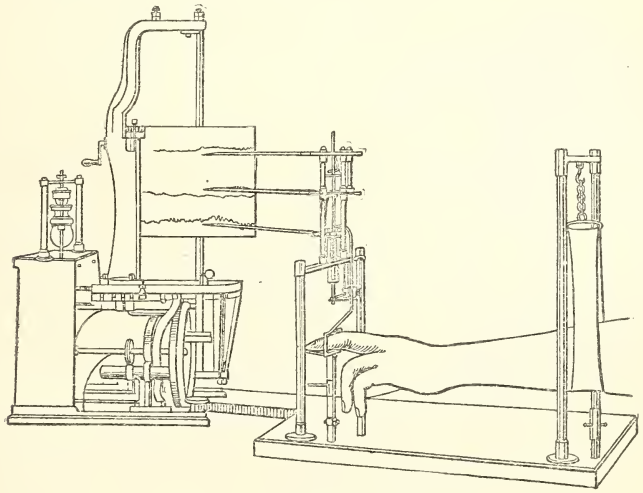


FIG. 36.—Psychograph. (Sommer.)

marker. Sommer considers his instrument useful in the study of nervous functional diseases. The curves in fig. 37, below, show the trembling of the hand of a person with paralysis. The first curve indicates horizontal movements forward and backward; the second lateral horizontal movements. The third curve, hand movements up and down. The trembling is quite different in each of the three directions. Maker is Schmidt, of Giessen, Germany.

Hypnotic Instruments.

Hypnotic instruments are used as aids to the operator in producing hypnotism or suggestions.

The hypnotic ball (fig. 38) has been used at the Hospital Saltpétrière in Paris. It consists of a curved flat piece of metal B, holding a lead wire A, on which is fastened

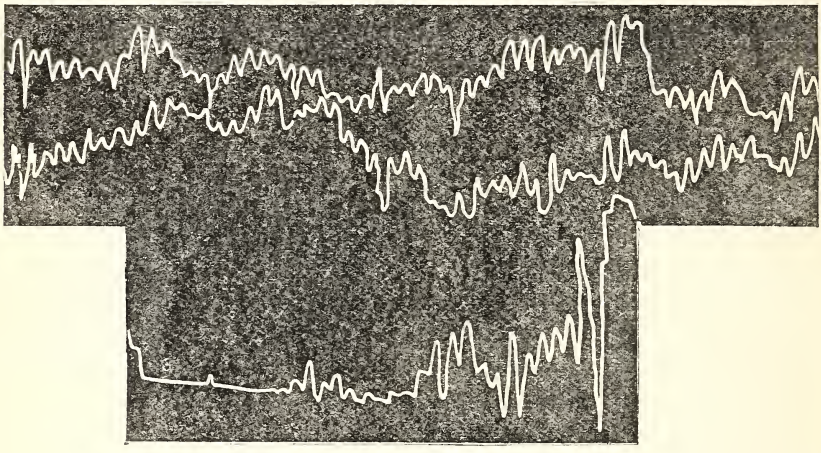


Fig. 37.—Trembling of hand in paralysis.

a nickel ball 15 millimeters in diameter, which can be changed from one position to another by bending the wire. The ball is so placed as to strain the attention; the muscles of the eye are fatigued. After concentrating the eyes upon the ball for awhile the operator can suggest heaviness of eyelids, sleepiness, and the like. There is an imitation of nature here, as when we feel sleepy our eyelids are heavy and we can hardly keep them open. Maker, Verdin, Paris.



Fig. 38.—Hypnotic ball.

Mirror-Hypnotizer.

Fig. 39 represents a mirror-hypnotizer, consisting of two revolving ebony pieces about 8 inches long, 1 inch wide, and a quarter of an inch thick, each piece having seven mirrors. The instrument is run by clockwork. Some subjects are peculiarly susceptible to the dazzling of the revolving mirrors. If several persons are in a room and mirror-hypnotizers are placed one before each person who desires to be hypnotized, some may fall into a hypnotic sleep without the aid of the operator, especially those who have been hypnotized before. Others may be so affected as to be quickly hypnotized by the operator. Maker, Mathieu, Paris.

Suggestion Blocks.

An experiment with the two round blocks (one 9 centimeters in diameter by 3 centimeters thick, the other 3 centimeters in diameter by 3 centimeters thick), fig. 40, below, will serve as an example of what may be called natural suggestion. The blocks each weigh exactly 55 grams. If held, say between the thumb and second finger of both hands at the same time, or of one hand at successive times, the smaller block will feel the heavier. The blocks at their centers are held between the fingers,

so that the special contact of each block with the fingers and thumb is the same. It is perhaps generally true that when objects look alike in every respect, except that

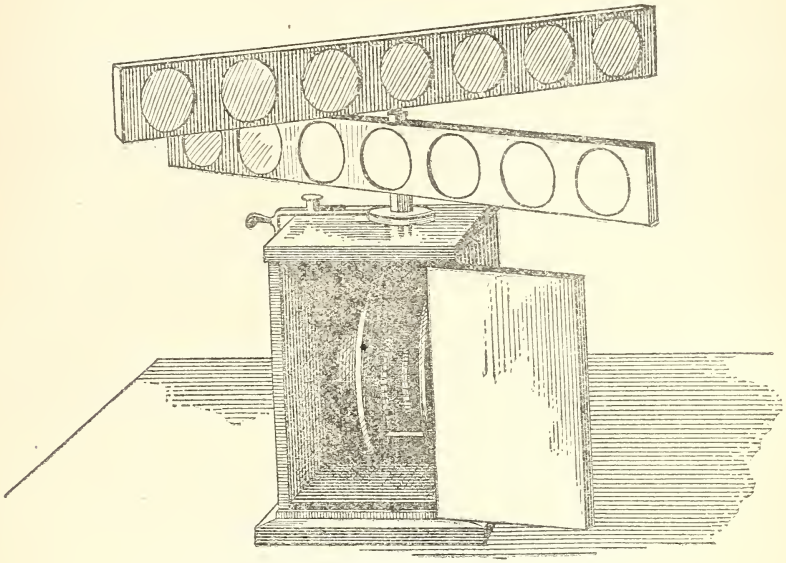


FIG. 39.—Mirror-hypnotizer.

one is larger than the others, we think the largest one to be the heaviest before we lift them. But if upon lifting them the largest one does not feel the heavier, an unconscious counter suggestion seems to make us feel the smallest block heavier; it

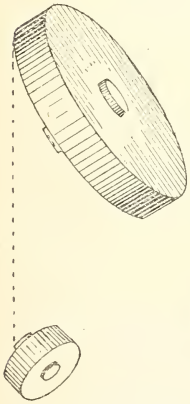


FIG. 40.—Suggestion blocks. (Gilbert.)

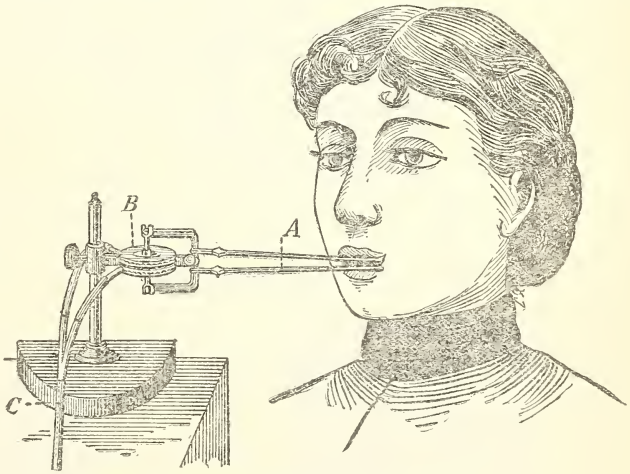


FIG. 41.—Labiograph. (Rousselot.)

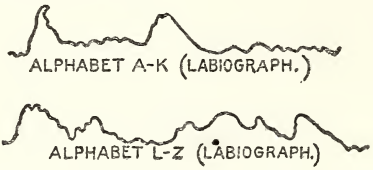
is an illustration of the adage that a pound of lead is heavier than a pound of feathers. As Professor Scripture puts it, it is a "disappointed suggestion of weight." In a series of experiments with different blocks upon New Haven school children, Scripture and Gilbert have shown that suggestibility slowly increases from 6 year to 9 years of age; after 9 years it steadily decreases as the children grow older. The girls were found more susceptible to suggestion than the boys, with the exception of age 9, where both were very susceptible. Dr. Gilbert, of the Yale laboratory, has

designed fourteen apparently solid black round blocks, each 6 centimeters in diameter and 3 centimeters thick, having weights of 15, 20, 25, etc., up to and including 80 grams. Maker, Willyoung & Co., Philadelphia, Pa.

Mechanics of Speech.

Speech involves specially the muscles of the tongue, lips, larynx, soft palate, etc. The labiograph (fig. 41) is an instrument with two brass levers A, grooved so as to fit the lips.

These levers are connected with a tambour B, which in turn is connected with a recording tambour by the rubber tube C. Here is the tracing of the movement of the lips while repeating the alphabet:



The writer made this experiment upon a young man who repeated the alphabet quite fast. It is thought by some that this instrument might aid in reading the lip movements of the deaf. Maker, Verdin, Paris.

The laryngograph (fig. 42) (maker, Verdin, Paris) gives the movements of the larynx in speech. It consists of an ebony frame which fastens around the neck. To this frame is attached a tambour, B, connected with a brass rod, A, the end of

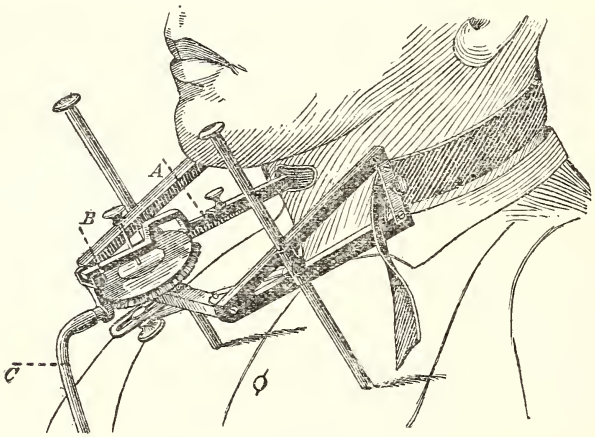
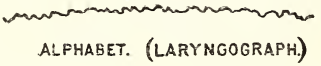


Fig. 42.—Laryngograph.

which consists of a curved nickel plate covered with flannel. This plate rests against the larynx so that its movement up and down is communicated to the tambour B, which is transmitted by the rubber tube C to a recording tambour. Here is a tracing made while repeating the alphabet:



Glosso-dynamometer.

The glosso-dynamometer[1] (fig. 43), as its name indicates, measures the strength of the tongue to resist pressure. It consists of a small brass disk, A, screwed on a steel

[1] Rév. internat. des Sourds-muets, 9e année, février–mars 1894, p. 325.

rod attached to a scale, B. The tongue is stretched out and the subject is asked to resist the pressure of the disk A as much as possible. The scale B indicates the limit of this resistance. Maker, Verdin, Paris.

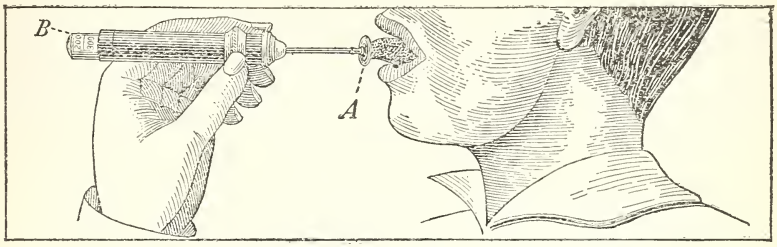


FIG. 43.—Glosso-dynamometer. (Féré.)

PALATOGRAPH.

This palatograph (fig. 44), designed by Dr. Weeks, is to record the movements of the palate in speech. It is composed of the following pieces: A band to fasten around the head, with a rod, H, attached to another rod fixed to the band. At the

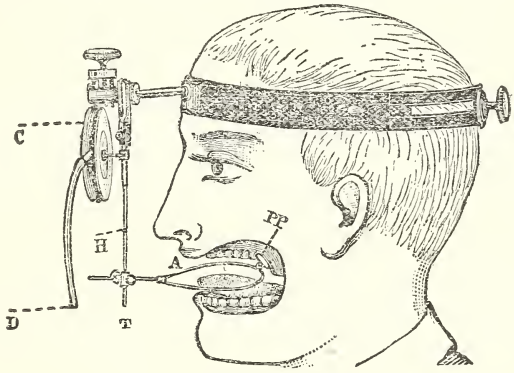


FIG. 44.—Palatograph. (Weeks.)

end of the rod H is fastened a racket-shaped wire, A, with a little round disk, PP, which touches the palate and becomes glued to the palate by a preparation upon the disk. This racket-shaped wire can be kept free from the movements of the mouth and the tongue.

The lever H of the tambour C has near its extremity T a double ring, so that

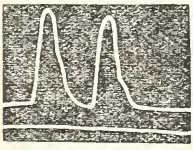


FIG. 45.—No. 1.

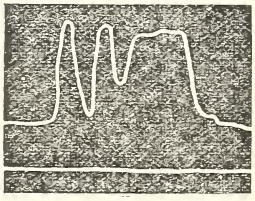


FIG. 45.—No. 2.

the movements of the palate are transferred to the lever or rod H, which in turn communicates them to the tambour to be recorded on a cylinder. Here are two tracings made by Weeks, which read from right to left.

No. 1 represents the movements of the palate, when the French word "fonte" is spoken; the first summit or wave represents the "f," the second summit the "t" in the word "fonte."

No. 2 represents the French word "continuité," where it appears that the nasal syllable "con" requires more movement.

Maker, Verdin, Paris.

THE DYNAMOLABIOMETER.

The instrument represented in fig. 50 was designed by Dr. Féré and Monsieur Boyer, professor at the National School for the Deaf in France. It is used for the

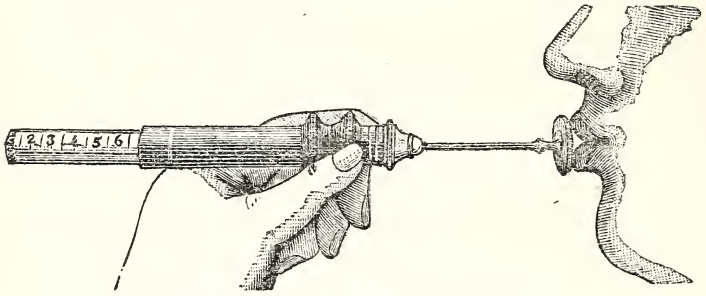


FIG. 50.—Dynamolabiometer. (Féré and Boyer.)

study of the development of the lips of the deaf, and based upon the same principles as that of the sphygmometer in fig. 55, but made somewhat stronger. Total length of instrument is 20 centimeters; diameter of the disk is 40 millimeters; diameter of the body of instrument is 15 millimeters. The maximum amount of pressure is 1,500 grams. The disk is slightly concave on the side that presses the lips. Maker, Verdin, Paris.

THE SPHYGMOGRAPH.

The sphygmograph records the variations of blood-pressure in the arteries. Each time that the heart sends a wave of blood into the arterial system there is produced in each artery a hardening which follows the movement of the wave of blood.

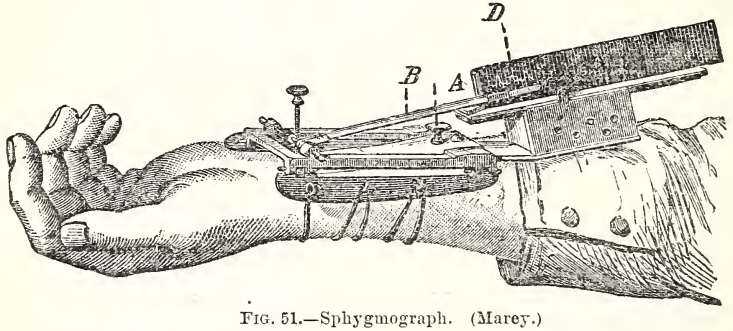
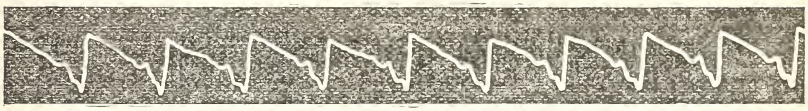


FIG. 51.—Sphygmograph. (Marey.)

There are two kinds of sphygmographs—the direct and those by transmission. Fig. 51 represents a direct sphygmograph of Marey, which is applied to the exterior of an artery and records the wave movement (hardening, or change of pressure). The direct sphygmograph presses upon the artery by means of a spring, the pressure of which is regulated by a screw A. As the blood-wave comes in the artery the walls of the artery rise and fall, transmitting this movement to the sphygmograph, which movement is recorded by the lever B on the smoked paper D. The arterial wall pressed down by the spring rises, as the blood-wave advances, to the normal diameter.

The radial artery is the one upon which the sphygmograph is usually placed. We give tracings of Marey's sphygmograph: Maker, Verdin, Paris.

No. 1.—Normal pulse.



No. 2.—Typhoid fever (period of decline).



No. 4.—Rheumatismal pericarditis with fever.



No. 6.—Pulse of an aged man (extreme rarity of beats).



SPHYGMOGRAPH BY TRANSMISSION.

The sphygmograph by transmission,[1] or indirect sphygmograph (fig. 52), has the advantage of giving the tracings a very good length, so that certain irregularities are recorded that would escape one's notice with the ordinary sphygmograph with its short tracings. If one desires to see the influence of different physiological conditions on the pulse, or to record simultaneously the pulse of several arteries, or the

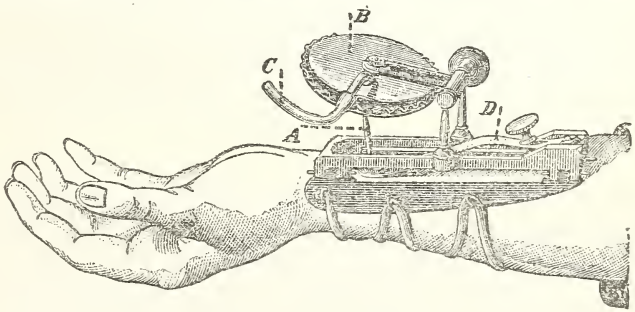


FIG. 52.—Sphygmograph by transmission. (Marey.)

arterial pulse with the pulsation of the heart, the indirect sphygmograph is used. The adjustable steel-rod A rests on the end of the spring D, which is directly over the pulse. The pulse-beat is carried to the tambour B, from which it is carried to some recording tambour, through the rubber tube C. Maker, Verdin, Paris.

[1] Marey. Circulation du sang, 2e édition.

SPHYGMOGRAPH OF PHILADELPHIEN.

The sphygmograph of Monsieur Philadelphien (fig. 53) has the advantage of measuring exactly on the scale 3 the amount of pressure upon the artery in obtaining the tracing. It is known that the tracings change in form and amplitude according to the pressure upon the artery.

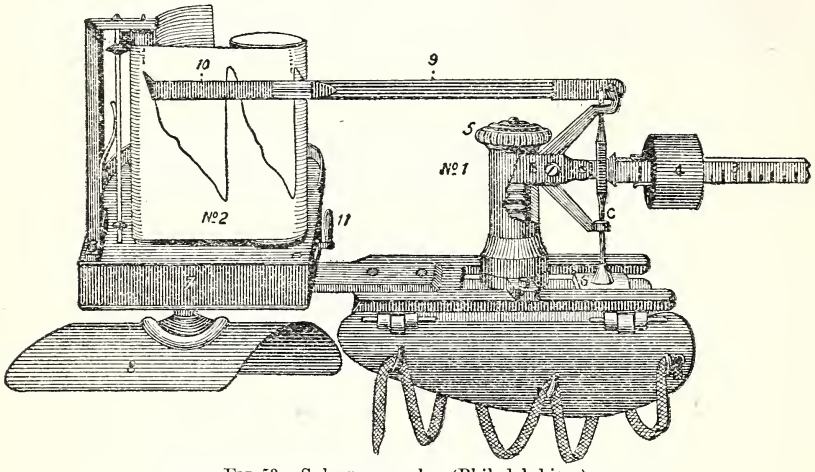
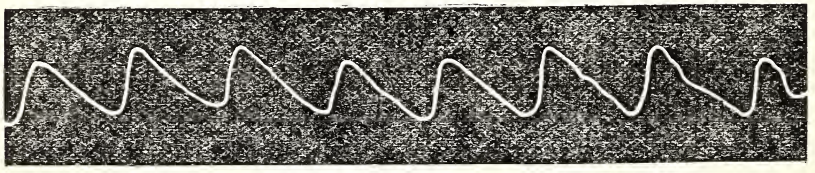


FIG. 53.—Sphygmograph. (Philadelphien.)

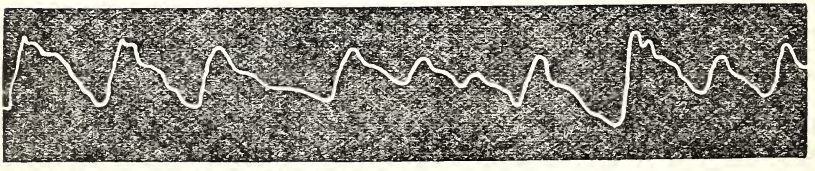
The tracings are made with ink on a band of paper 2, which is a meter long. This instrument permits a number of tracings of variable forms according to the pressure of the ivory plate 6 upon the artery, which is regulated by the weight 4. The screw 5 regulates the plate of ivory 6 in connection with the artery on the marker 10. The handle 11 starts or stops the clockwork 7.

Here are some tracings:

Normal pulse.



Mitral insufficiency.



Maker of instrument: Verdin, Paris.

VON FREY'S SPHYGMOGRAPH.

Von Frey's sphygmograph (fig. 54) has for its purpose to give as true a representation of the arterial pulse as possible and an exact time measurement. It rests upon the steel band A. An ebony oval piece, B, at the end of the steel spring rests upon

the artery, connecting directly with the marker D. Another marker for the time can be fastened to the steel box C, which incases the clockwork, which records fifths of a second. Maker: Petzold, Leipzig.

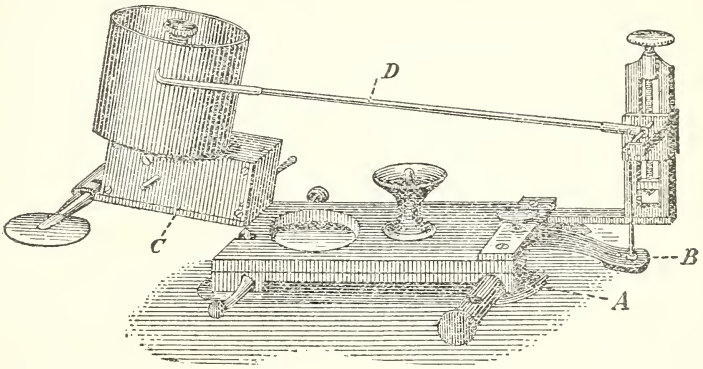


Fig. 54.—Sphygmograph. (Von Frey.)

THE SPHYGMOMETER.

The sphygmometer is employed to measure the amount of pressure necessary to arrest the radial pulse beats.

In Verdin's instrument (fig. 55) the left thumb, B, of the operator rests upon the radial artery of the right hand of the subject. The instrument is held in the right hand of the operator, who presses it upon his thumb nail until no pulse can be felt. Then the amount of pressure is read from the scale S. The instrument consists of

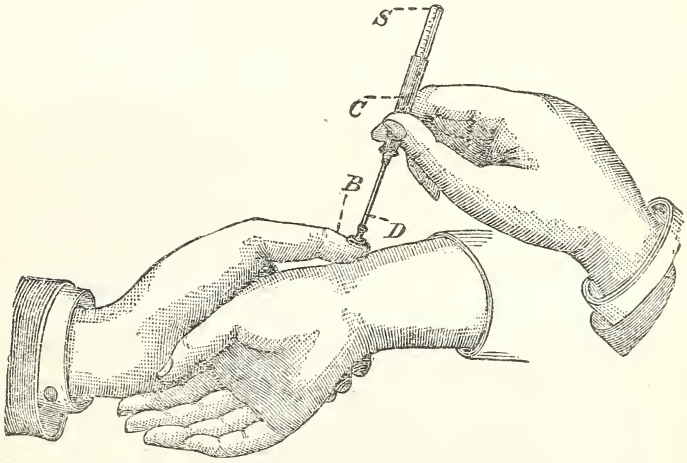


Fig. 55.—Sphygmometer. (Verdin.)

a small cylinder of brass, C, containing a spring acting in connection with the rod D. A brass circular plate three-eighths of an inch in diameter is screwed on to the end of this rod. The instrument is five and a half inches in length.

When the pulse is bounding, or has some intensity, its complete suppression may appear difficult. There are recurrent beats that can give difficulty, but a little practice will overcome these causes of error. Maker and inventor: Verdin, Paris.

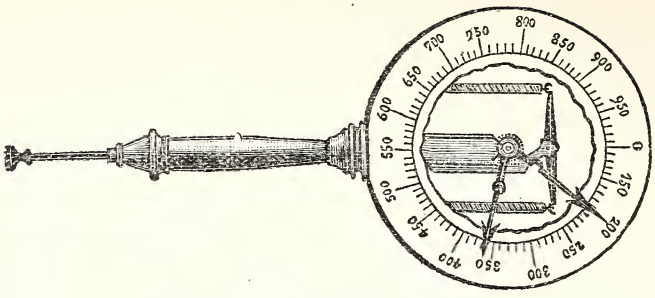


FIG. 56.—Sphygmometer. (Bloch.)

The sphygmometer in fig. 56, designed by Bloch, is modified by Verdin. Two exterior springs are fixed behind the scale; there are two pointers, one pushing the other. The latter remains at highest point of pressure, indicating the amount. This instrument is used for demonstrations at a distance. Maker: Verdin, Paris.

MOSSO'S SPHYGMOMANOMETER.

The sphygmomanometer of Mosso (fig. 57) enables one to record the pulsations of four fingers, which are pushed into rubber tubes E E. The instrument is filled with water, and communicates with the cylinder A, the revolving piston of which regu-

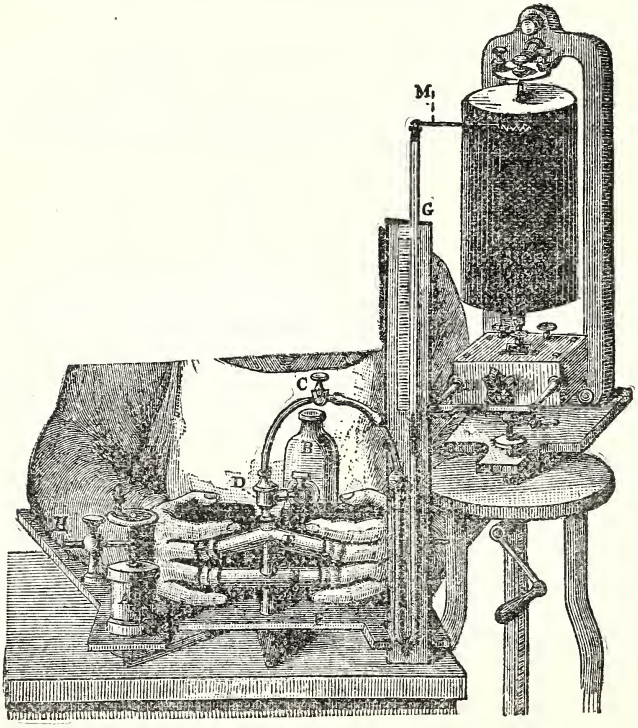


FIG. 57.—Sphygmomanometer. (Mosso.)

lates the pressure of the water. The bottle B receives the water forced out when the fingers are introduced into the tubes E E. A manometer, G, indicates the pressure, and the marker M records the pulse waves on the cylinder.

C is a faucet to let out the air. By means of the manometer G the sphygmograph will record the periodical changes of blood pressure or tension, and their correlation to mental conditions. The instrument can be used instead of the plethysmograph (fig. 18) for research in the circulation of the blood, for the study of the inervations of the blood vessels, of the effects of medicaments on the circulation, and of pathological conditions. Maker: Verdin, Paris.

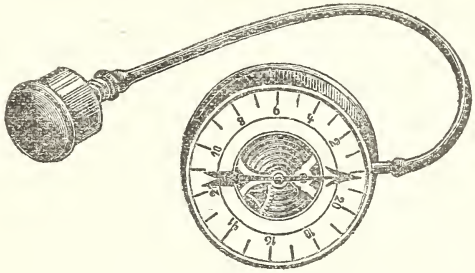


FIG. 58.—Sphygmomanometer. (Basch.)

SPHYGMOMANOMETER.

The sphygmomanometer (fig. 58) measures blood pressure in the arteries. Maker, Windler, Berlin.

ACHROMATOMETER OF BLOCH.

This instrument[2] (fig. 59) is designed to measure the blood pressure in the capillaries. It consists of a rod with spring; at the end of the rod is an iron disk, A.



FIG. 59.—Achromatometer. (Bloch.)

One presses with this disk the part of the body to be explored, as the lobe of the ear, the finger nails, or skin of the hand, etc. The pressure drives the blood from the small vessels, the part pressed by the disk becomes pale, and one reads on the scale the amount of pressure in grams required.

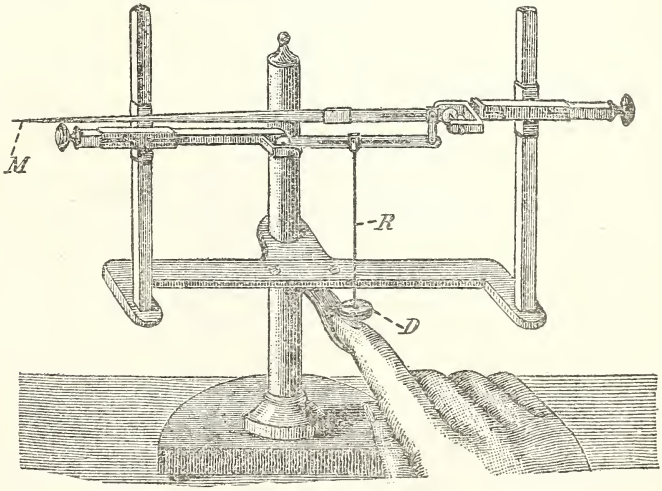


FIG. 60.

Fig. 60 represents an instrument for recording pulsations of the vessels on a circumscribed region of the skin. A disk, D, rests upon the index finger; the disk is

[2] L'Intermédiaire des Biologistes, 5 novembre 1897.

fastened to a small rod, R, communicating with a lever, by means of which the pulsations of the small vessels are recorded by the pointer M. Maker, Verdin, Paris.

Dr. Chéron has prepared the following table, which transforms the results of the sphygmometer into centimeters of mercury.

TABLE 5.

Grams.	Centimeters of mercury.	Grams.	Centimeters of mercury.
100	3	700	15
150	4	*a*750	*a*16
200	5	*a*800	*a*17
250	6	*a*850	*a*18
300	7	900	19
350	8	950	20
400	9	1,000	21
450	10	1,050	22
500	11	1,100	23
550	12	1,150	24
600	13	1,200	25
650	14	1,250	26

a Normal pressure.

THE CARDIOGRAPH.

The heart-beat or cardiac impulse is visible in the fifth left intercostal space, 2 inches below the nipple and 1½ to 1 inch to its sternal side. The cardiograph measures the cardiac impulse. The cardiograph stethoscope (fig. 61), below, consists of a button, B, which by turning increases or decreases the pressure of the knob H, against the walls of the chest. F is a bell-shaped piece of wood forming the stethoscope. D is a ferrule of brass on which is fastened a rubber tube to be introduced into the ear for mono-auricular auscultation. An elastic chord, C E, placed around the body holds the apparatus against the chest. By fastening a rubber tube on A, the heart-beats can be transferred to a recording tambour. Maker, Verdin, Paris.

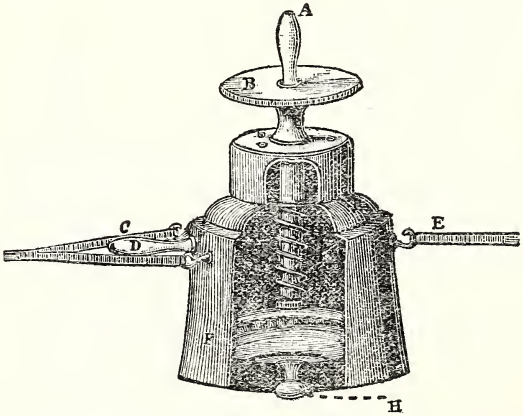


FIG. 61.—Cardiograph stethoscope. (Edgren.)

THE PHONENDOSCOPE.

The phonendoscope (fig. 62) serves to render perceptible all normal or abnormal sounds in the human body. The instrument below in the figure gives more intensity to the sounds than the ordinary stethoscope. It renders perceptible—

1. The sounds of respiration, circulation, and of the digestive organs.
2. The sounds of the muscles, articulations, and bones.

3. The sounds of the capillary circulation (dermatophony).

4. The sounds produced by morbid states and those determining the size, position, or change of position of organs.

5. The sounds of the eye and ear.

6. The sounds of the uterine murmur and fœtal sounds.

The phonendoscope is composed of two ebony disks, one, L, fastened directly to the body of the instrument, the other, G, above, by means of rings. The body of the instrument B is made of copper (nickel-plated). The lower disk serves for auscultation; the upper disk G is thicker; at its center there is an ebony plate C, into which screws the rod A. This disk, by means of the rod A, is used for percussion. The lower disk L of the phonendoscope has two orifices to receive the auricular tubes, on the ends of which are ebony olive-form rings for the ears.

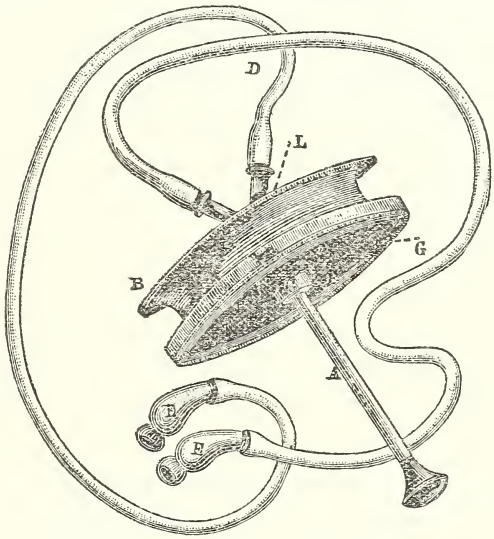


FIG. 62.—Phonendoscope. (Bazzi and Bianchi.)

There is a box for this apparatus; in the box is a compartment for two rods with knobs, one of ordinary length say 55 millimeters, the other 80 millimeters; also two pencils, one blue, the other red. Maker, Verdin, Paris.

THE ERGOGRAPH.

The ergograph (fig. 63) is an apparatus to measure the results of fatigue. The record is made by the marker A, which is attached to a little car B, which slides forward and backward on two parallel horizontal steel rods C. A string is fastened by a leather loop to the finger pulling the car B in one direction, and a weight W, which is attached to a cord fastened to the car, pulls it in the opposite direction. When the finger is bent, the car B is drawn toward the hand; and when the muscles of the finger relax, the weight causes the finger and the car to return to their original position. The marker A records the movements of the car upon a cylinder. The arm and hand are held firm by a special rest, as indicated in the drawing.

Lombard, in a number of experiments with the ergograph upon himself, found that if he voluntarily contracted a muscle frequently and each time raised a weight with his utmost force, the muscle weakened and after a time scarcely stirred the weight. But if now he continued to make this effort, regardless of the results, with all the power of his will, sooner or later the strength of the muscle began to return and to move the weight almost as much as before. Then the strength would gradually

cease for a second time; thus an almost complete loss of power to voluntarily contract the muscles, alternated with periods of nearly complete recovery of the strength. This phenomenon, according to Lombard, was due to the results of fatigue, caused probably by changes in the central nervous system. The writer has made some experiments with the ergograph, and his results are similar to those of Lombard.

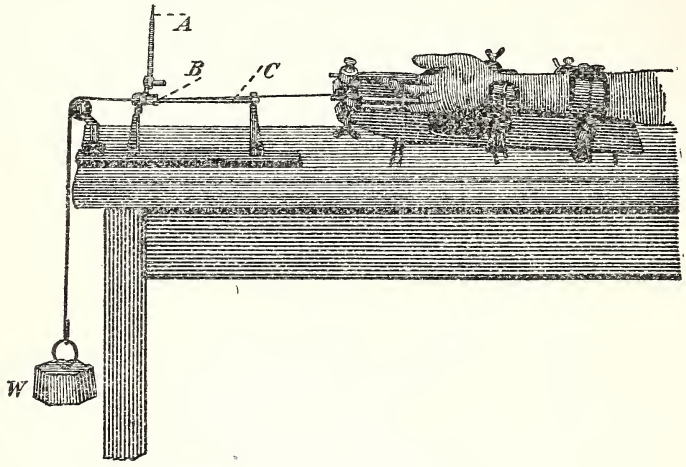


FIG. 63.—The ergograph. (Mosso.)

There are a number of phenomena in which fatigue causes a periodicity depending upon the central nervous system. This is probable in the "second wind" of the athlete. The intensity of after-images is due to periodic variation. Maker, Verdin, Paris.

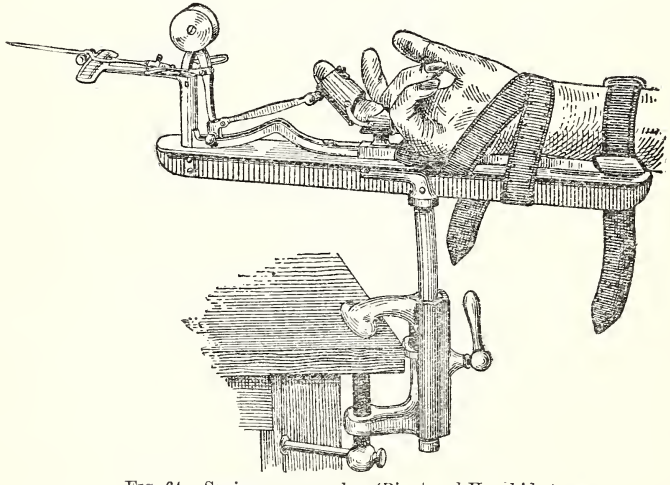


FIG. 64.—Spring ergograph. (Binet and Vaschide.)

SPRING ERGOGRAPH.

Professor Cattell has designed a new ergograph in which a spring dynamometer is substituted for the weight used by Mosso. It is claimed that this has many advantages over the lifted weight used by Mosso. Questions of the relation of muscular to mental fatigue are not only of theoretic interest, but have practical value in schools.

Binet and Vaschide have also made an ergograph[1] (fig. 64), which is a modification of Mosso's ergograph. It consists in the substitution of a spring, as illustrated in the figure, for the weight and in using the middle finger for the experiment.

The lever permits one to increase or decrease at will the course of the finger in order to accomplish a certain work, while the force of resistance remains the same. It is possible to modify one single factor in work and the space gone over, and so to study points in the physiology of movement.

THE KINESIMETER.

The kinesimeter is an instrument to measure the sense of movement upon the skin. The apparatus in fig. 65 was designed by Professors Scripture (Yale University) and Titchener (Cornell University).[2]

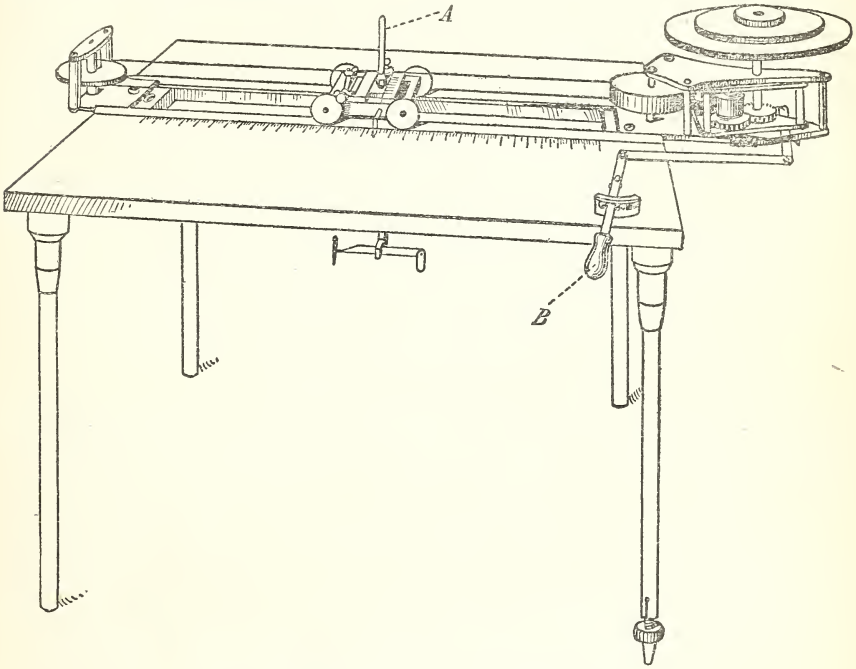


FIG. 65.—Kinesimeter. (Scripture and Titchener.)

The table is of brass casting, the top of which is perfectly smooth. One of the legs has an adjusting screw. The car A is made of brass, nickel-plated; it runs on four wheels, turned on a perfectly true arbor. The bearings are bushings of hardened tool-steel; the holes are ground and lapped, so as to give trueness in running. The wheels are easily taken off their bearings. The horizontal slide of the car, which holds the vertical rod, is easily adjusted. The vertical rod may carry rubber stimulus-point, tube, or whatever is preferred, and is held in position by a brass nut. The rotating power comprises three gears and three friction-rolls. The movement of the car is regulated by a lever. The pressure of the driving-rolls against the principal roll is maintained by two springs, and is adjusted by two nuts on end of a bar connected with the lever. An endless cord propels the car. The instrument is made at the Yale Laboratory, New Haven, Conn.

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[1] L. Intermédiaire des Biologistes, 5 May, 1898.

[2] American Journal of Psychology, Vol. VI, 1895, page 425.

TOUCH-WEIGHTS.

Touch-weights for finding the threshold of contact with the skin (fig. 66) consist of little disks 3 millimeters in diameter suspended from a fine cocoon-fiber fastened to a wood handle. The handles are stuck into holes in a round block, A, fastened to a pillar and frame. We take out the lightest disk B and let it touch the skin while the subject's eyes are closed; if nothing is felt, the next heavier disk is used, and so on until the least pressure of the disk is felt. The disks weigh from

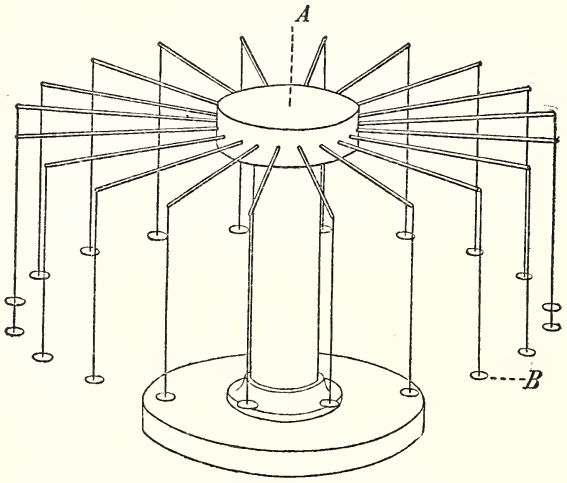


FIG. 66.—Touch-weights. (Scripture.)

1 to 20 milligrams. Scripture finds the threshold of sensation for the sense of pressure in an average person to be 2 milligrams on the forehead, temple, and back of forearm; 5 milligrams for nose and chin, and 15 milligrams on inner surface of fingers. Maker: Willyoung, Philadelphia, Pa.

HAIR-ESTHESIOMETER.

In order to produce very slight pressure upon the skin, Professor Von Frey, of Leipzig, has employed hairs of different size and thickness. The hair-esthesiometer (fig. 67) enables one to produce various degrees of pressure with the same hair. The hair

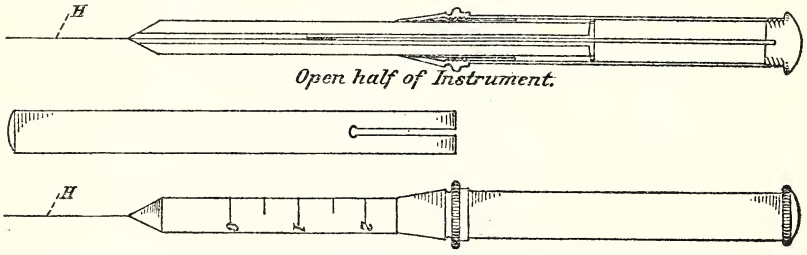


FIG. 67.—Hair-esthesiometer. (Von Frey.)

H is in a capillary tube, and a longer or shorter portion of the hair can be made to come out of the tube; a graduated scale shows the distance or the length the hair projects from the tube. The less the distance the hair projects the greater the pressure exercised by the hair. The hair is pressed vertically against the skin until it bends.[1] The maker of the instrument is Zimmerman, of Leipzig.

[1] Details of the instrument are given by Von Frey in Abhandlungen d. math. physch. Classe d. Königl. Sächs Gesellschf d. Wiss., 1866.

THE GALVANOMETER.

The galvanometer measures the strength of an electric current. The instrument (fig. 68) is used for medico-electrical purposes. It is also employed in scientific investigations, and is then so constructed that the strength of the most delicate current can be measured.

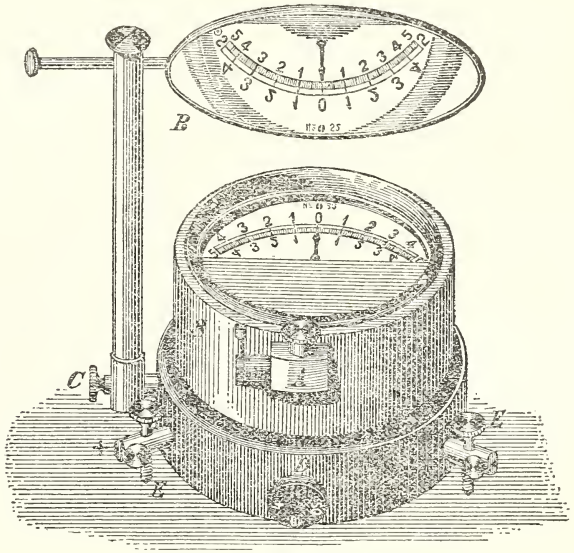


FIG. 68.—A periodic horizontal galvanometer. (Hirschmann.)

The instrument is represented one-third its real size. This is a direct-reading instrument, it being possible to measure a current to one one-hundredth of a milliampère. In order to have a vertical reading, a mirror, B, is used. The lever S arrests the needle, which is brought to the zero point of the scale. The wires for conducting the current are fastened in the clamps E E. Maker: Hirschmann, Berlin.

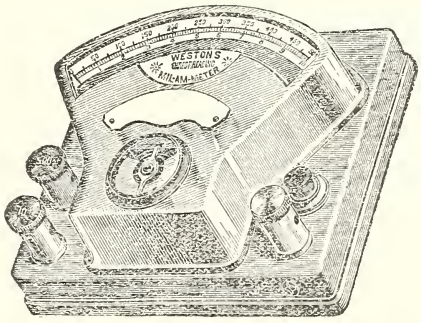


FIG. 69.—Weston's standard direct-reading mil-am-meter.

Fig. 69 represents a convenient form of instrument for measuring delicate currents. It has a scale of double values with ratio of 50. Each division on upper scale values is 5 milliampères; each division on the lower scale values is one-tenth milliampère, readable to one one-hundredth. A change from one scale to the other is made by changing the connection on the left of the instrument from one binding post to the other. Maker: Weston Electric Instrument Company, Newark, N. J.

THE FARADIMETER.

The two instruments just mentioned measure the galvanic or direct current only. The instrument below (fig. 70) is a faradimeter and measures the faradic or indirect current. This form of the instrument is transportable. The case which covers it is 12 centimeters wide, 20 centimeters long, and 29 centimeters high. When in use it is laid on the table, as shown in the drawing. The induction apparatus P S is placed at such a distance that the galvanometer G is not influenced by it. The

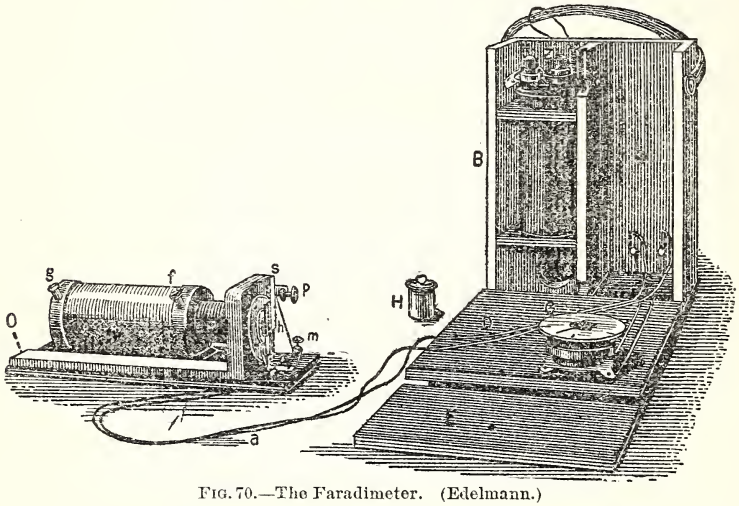


FIG. 70.—The Faradimeter. (Edelmann.)

induction coil P S, by means of wires a, is connected with the battery A for the primary current. The faradimeter is gauged only for a certain intensity of the primary current (O. 4 A) so that the galvanometer G is to measure the strength of this current. The intensity desired is obtained by first placing the galvanometer at zero and then sinking the zinc rod Z into the element A until the needle of the galvanometer reaches the desired intensity on its scale, while the interrupting spring S is pressed tightly against the contact screw p with the finger.

The battery A is filled with a solution of crystallized chromic acid, which consists of water up to about 3 centimeters from the top of A and of a half glassful (H) of

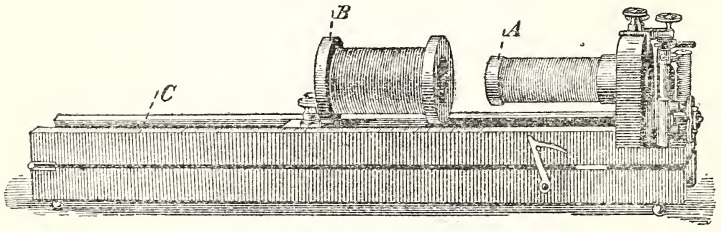


FIG. 71.—Induction coil. (Du Bois-Reymond.)

the acid. When the battery is not in use the zinc rod Z is taken out, washed, and placed in a case at the side of the battery. The chromic acid solution can be left in the battery so long as it furnishes the desired strength of current. When the interrupting spring plays and the primary current is at its normal strength (which from time to time should be tested by pressing the spring against the contact screw p) the secondary induced or indirect current is developed, so that the maximum of any single opening of the induction stroke has the value indicated by the induction coil S by means of the pointer on the scale O. Maker, Edelmann, of Munich.

INDUCTION COIL.

In fig. 71 is represented Du Bois-Reymond's pattern of an induction coil. The primary coil A is fixed at the end of a wooden base board and consists of a coil of thick copper wire wound around a bundle of soft iron wires. The secondary coil B is wound around a wooden reel and slides in a groove in the base-board and can pass over the primary coil, its position being read from a scale, C, in millimeters fixed to the base. The secondary coil consists of about 7,000 convolutions of fine wire. The base is made long with a hinge in the middle, but is represented folded back in the engraving, which makes it more portable. The hammer for giving a series of induced currents is arranged so it can break the current absolutely in the primary coil or can shorten its circuit. Maker, Cambridge Scientific Company, Cambridge, England.

THE RHEOCORD.

The rheocord is an instrument for measuring the resistance or for varying the strength of an electric current, in proportion to the greater or less length of it

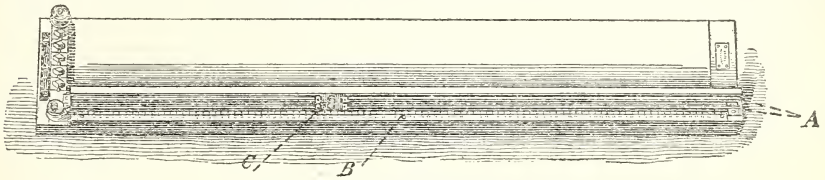


FIG. 72.—Du Bois-Reymond's rheocord.

inserted into the circuit. Du Bois-Reymond's pattern (fig. 72) consists of two platinum wires stretched by the side of a scale B 1 meter long attached to a board. The wires are electrically connected by an ebonite trough, C, containing mercury, which slides along the wires; its position can be read on the scale. The terminals are connected to one end of each of the platinum wires by means of brass plates.

In one of these plates there are five pegs, which can be removed like those of a resistance-box, and various resistances thrown into the circuit; thus when the peg opposite No. 3 is removed, a resistance equal to three times the resistance obtained by sliding the trough to the far end of the scale is thrown into the circuit. In this way the resistance of the rheocord can be gradually increased from zero to a resistance

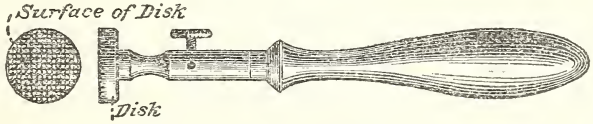


FIG. 73.—Erb's electrode.

equal to 42 meters of the platinum wire. Maker, Cambridge Scientific Instrument Company, Cambridge, England.

THE ELECTRODE.

In investigation with the Faradic or induced current, one of the standard electrodes employed is that of Professor Erb, of Heidelberg.

This electrode (fig. 73) consists of a bundle of more than 400 fine metallic wires,[1] which are inclosed in a hard rubber tube about 2 centimeters in diameter. By means of these 400 fine wires a uniform action upon the numerous nerve ends is obtained, and sources of error from sweat canals and hair follicles are avoided. When the first electrical sensation is felt, after the electrode is placed on the skin, the point on the scale is noted where the marker of the induction coil has reached; the coil is moved on still further until the first feeling of pain occurs, and the point

[1] The maker of this electrode is Hirschmann, of Berlin.

on the scale is noted as being the measure of pain through the Faradic current. In this way Professor Erb has obtained the following table giving average figures for healthy men, and a basis for comparison in pathological conditions:

TABLE 6.—*Electrical sensibility.*

Place of applying electrode.	First sensation with an induction coil at a distance on the scale from—	Feeling of pain with induction coil at a distance on the scale from—	Deflections of the needle with 8 cells and 150 resistance.
Cheeks	200–220	120	26°
Neck	180–200	120	22°
Upper arm	200	120	21°
Forearm	190	115	18°
Palm of hand	175	110	15°
Finger ends	125	90	2°
Abdomen	190	120	20°
Leg	170	110	19°
Upper part of foot	175	110	10°
Sole of foot	110	80	5°

DYNAMOMETER.

The dynamometer (fig. 74) is to measure the strength of grasp. The instrument is squeezed in the hand while the arm is held out horizontally from the side of the

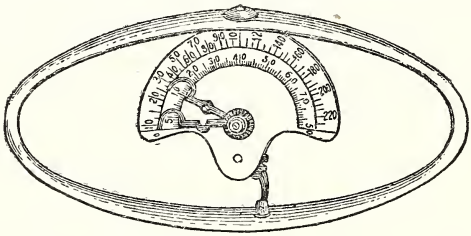


Fig. 74.—Dynamometer. (Collin.)

body. The amount of pressure is read from the scale as indicated by the pointer. Maker, Collin, Paris.

DYNAMOGRAPH.

The instrument in the hand (fig. 75) is a dynamograph. It is used in the laboratory of Salpétrière, at Paris, to record the different impressions which certain hys-

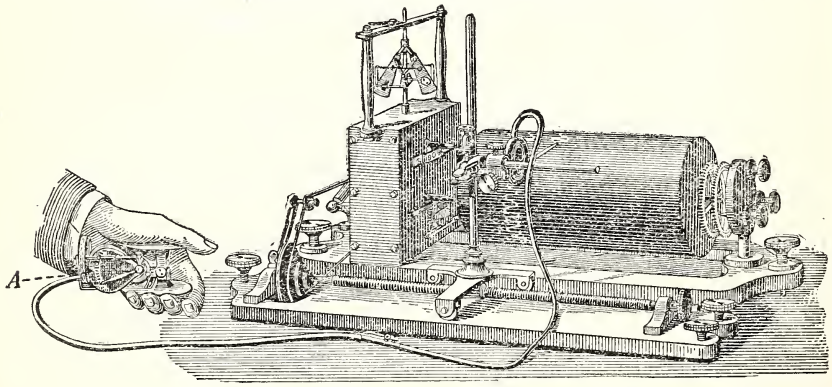


FIG. 75.—Dynamograph. (Duchêne.)

terical subjects experience at the view of a ray of light. It is in reality a dynamometer of Duchêne's, with a tambour, A, attached to it, so that the results may be recorded

on a cylinder, as indicated in the cut. The dynamograph is used also to show the effects of sound and color upon strength of grasp. In sound the pitch has effect

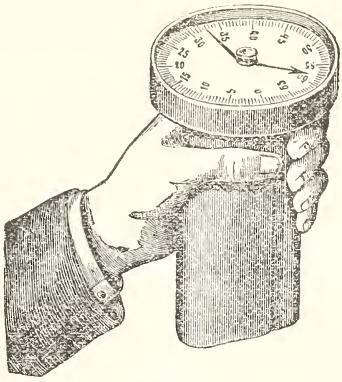


FIG. 76.—Dynamometer. (Ulmann.)

upon the greatest strength of grasp. Smell and taste have their effects upon the strength. Maker, Verdin, Paris.

In fig. 76 is a form of dynamometer that avoids the unpleasant cutting feeling caused by the handles of the ordinary dynamometer. Maker, Windler, Berlin.

DYNAMOMETER OF CHÉRON AND VERDIN.

One of the inconveniences of the ordinary dynamometers is the pain experienced when one tests his strength of grasp five or six times in succession, for the edges of

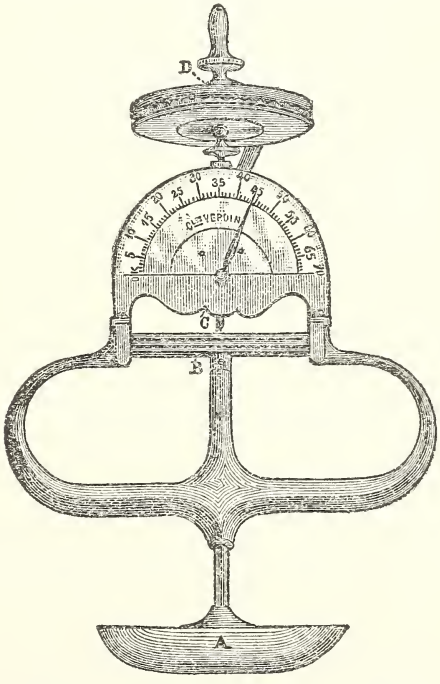


FIG. 77.—Dynamometer of Chéron and Verdin.

the handle produce a cutting sensation, thus rendering the experiments of much less value for comparison.

The dynamometer of Chéron and Verdin (see fig. 77) has been designed to eliminate the inconvenience above mentioned. The fingers are placed upon a handle rounded upon all sides; the palm of the hand rests upon a round oval plate A, serving as a handle, which is fastened to a piston and spring connected by a cogwheel and bar C, with the pointer upon the dial. This dynamometer can be changed to a dynamograph, as indicated in the figure, by the addition of a tambour D. The maker is Verdin, of Paris.

SCRIPTURE'S DYNAMOMETER.

Dr. Scripture, of Yale University, has invented a new "dynamometer and the scale of effort." The thumb and index finger are pressed on small knobs borne by two

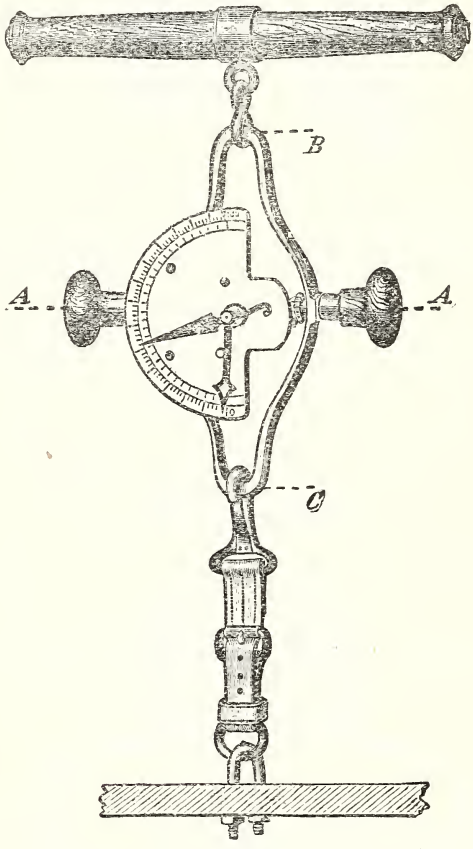


FIG. 78.—Back, chest, and leg dynamometer. (Pfarre.)

steel rods; the amount of movement is small, while the scale can be made very accurate. To transform the psychophysical measurements into purely psychological ones, Scripture proposes to have the subject give his own scales of pressure in the relations of 1, 2, 3, 4, etc., and to reduce all readings to the scale.

CHEST AND BACK DYNAMOMETER.

The dynamometer (fig. 78) may be used to measure the strength of arms and strength of lift. If the handle is unfastened at B and the hook at C from the instrument proper, and with the instrument thus disconnected the two handles A A are pressed against by the hands, the strength of arms and chest can be measured.

With one's elbows extended at the sides until the forearms are on the same horizontal plane, and holding the dynamometer so that the dial will face forward and the indicator point upward, one takes a full breath and pushes hard against the handles A A, allowing the back of the instrument to press on the chest. In measuring the strength of lift the instrument can be attached to the floor, as represented in fig. 78, or to a board, specially designed, on which the subject stands when lifting, thus making the apparatus easily portable. The strength of lift can be taken both with and without bending the knees. In the former instance one stands on the foot rest, with head and body erect and chest thrown forward, bends the knees, sinking down until the handle grasped rests against the thighs, then takes a full breath, lifts hard, principally with the legs, using the hands to hold the handle in place.

In the second instance one does not bend the knees. The handle is grasped with both hands, the body being inclined forward at an angle of 60 degrees, a full breath is taken, and a hard lift is given, mostly with the back. Makers, Tiemann & Co., New York.

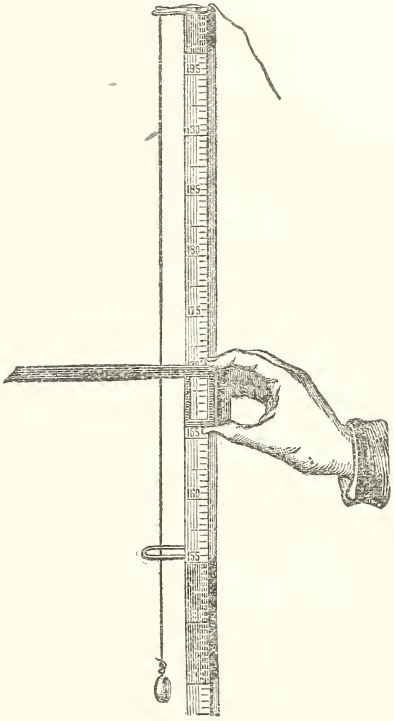


FIG. 79.—Anthropometer. (Topinard.)

THE ANTHROPOMETER.

The anthropometer (fig. 79) is for measuring the height and sitting height. It is divided into four pieces that screw one to the other, so that it can be taken apart and made conveniently portable. Maker, Collin, Paris.

CEPHALOMETRIC SQUARE.

The cephalometric square (fig. 80) is used to make detailed measurements of the projections of the face. Instead of measuring from the ground surface on which the person stands, as in finding the height, the measurement is taken with a square B (fig. 80), on one arm of which is a scale in millimeters. The other arm of the

square is held over the vertex as horizontal as possible with the left hand, while with the right hand a three-cornered piece of wood is run up and down the scale, measuring the distance of the projections of the face from the horizontal plane of the vertex. This distance might be measured from the ground, but there is more liability to error, owing to the tense or loose position of the body in standing. Maker, Collin, Paris.

CALIPERS.

The calipers in fig. 81 are used to measure the head, especially its length and width. The instrument represented consists of a scale A, in millimeters, fastened to one arm B, and sliding through the other arm. Maker, Collin, Paris.

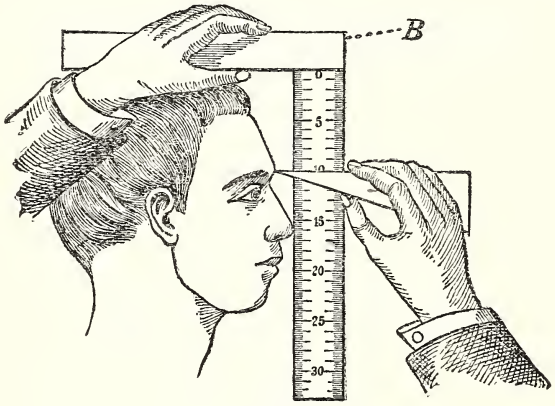


FIG. 80.—Cephalometric square.

The calipers (called "glissière anthropometrique") in fig. 82 are divided into two parts. There are two steel rods, one of which slides on the scale. This instrument

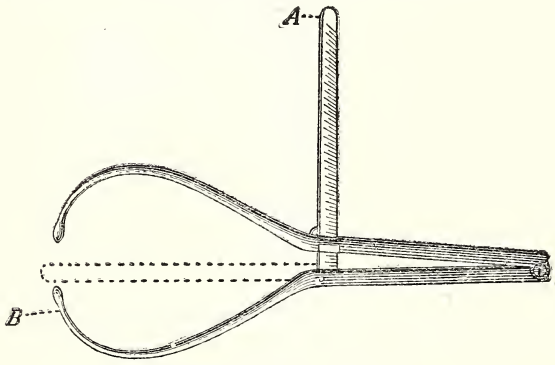


FIG. 81.—Calipers. (Broca.)

is used for direct measurements, as well as for measuring the projections or larger members of the body, such as leg, arm, shoulder, etc. Maker, Collin, Paris.

In fig. 83 are represented small sliding calipers made of steel. They measure very exactly distances between projections of the body and head. Maker, Collin, Paris.

THE GONIOMETER.

The goniometer[1] is an instrument for measuring angles, as of the face or cranium. The one in fig. 84 is the design of Topinard. Broca has also designed a similar

[1] Bull. Soc. d'Anthropologie, 2 sér., tome ix.

goniometer and also a goniometer for the ear; also a profile-klinometer.[1] Maker, Collin, Paris.

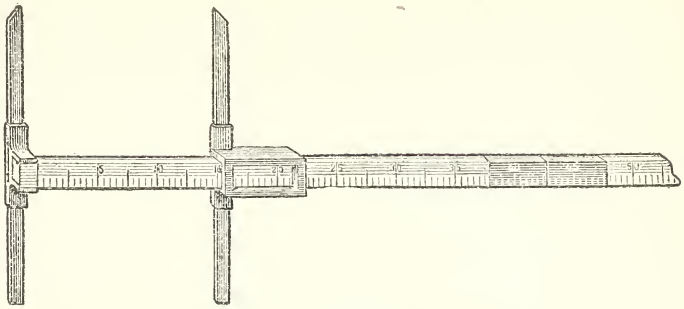


FIG. 82.—Calipers. (Topinard.)[2]

HEIGHT OF VAULT OR PALATE.

In 4,614 measurements Talbot finds the average height of the palate to be 0.58 of

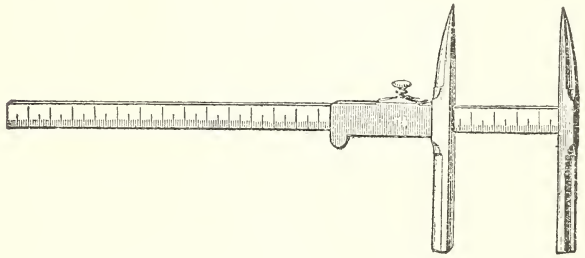


FIG. 83.—Sliding calipers. (Topinard.)

an inch. Fig. 85 illustrates his instrument. The measurement is made from the alveolar border, between the second bicuspid and the first permanent molar, to the

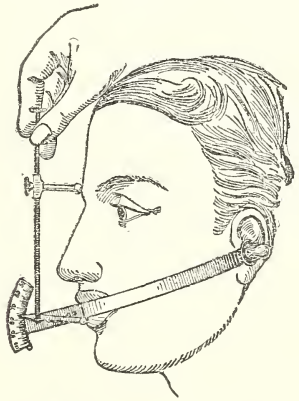


FIG. 84.—Goniometer. (Topinard.)

height of the arch. The cut (fig. 85) shows the position of the instrument when the measurement is made:

[1] Schmidt, Emile. Anthropologische Methoden, Leipzig, 1888.
[2] Revue d'Anthrop. 1885, 3 sér. tome viii, page 407.

By turning the steel rod at its end, F, the scale, H (in millimeters), is moved up until it touches the palate, when its height can be read on the scale. The high palate is often found among feeble-minded children.

This instrument is specially made under the direction of the inventor, E. S. Talbot, M. D., D. D. S., Chicago, Ill.

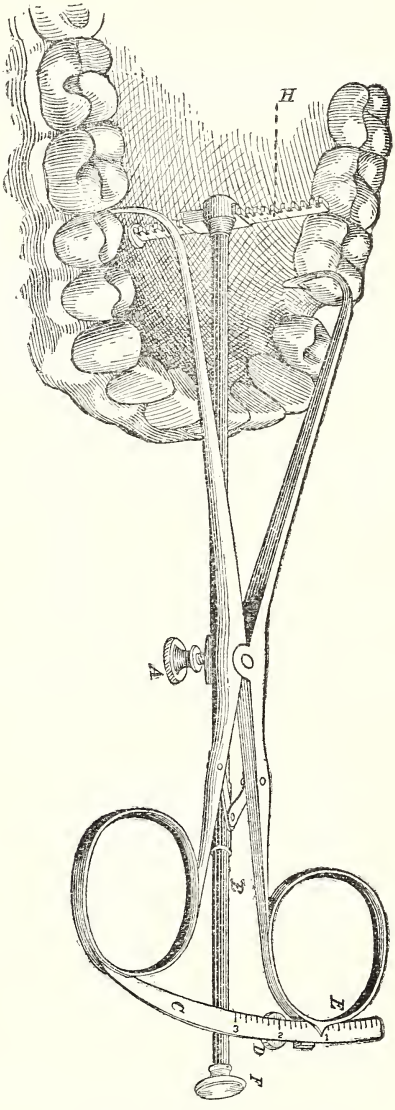


FIG. 85.—Palatometer. (Talbot.)

CASE OF ANTHROPOLOGICAL INSTRUMENTS FOR TRAVELERS, ARRANGED BY TOPINARD.

1. Sliding callipers (fig. 83).
2. Anthropometer (fig. 79).
3. Two special steel squares, used with anthropometer.

4. Cephalometric square (fig. 80) string with plumb.
5. Small wood square.
6. Small steel sliding callipers.
7. Callipers.
8. Tape measure.
9. Pencil with two colors.
10. Dynamometer for strength of hands (fig. 74).
11. Box for carrying instruments.

Maker of case and instruments is Collin, of Paris.

Instruments Used in the Bertillon System of Identification.

The Bertillon system[1] of measurements is primarily for practical purposes—that is, for the identification of criminals, but some of the measurements are also of scientific value.

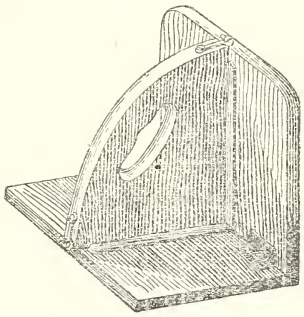


Fig. 86.—Portable square.

Fig. 86 represents a portable square with double projection, and is used in measuring the height and sitting height or trunk, as represented in fig. 87 by B, B. A rule half a meter long, for measuring the sitting height is designated by A. C is a stool used in measuring the trunk. D is a rule for measuring the height.

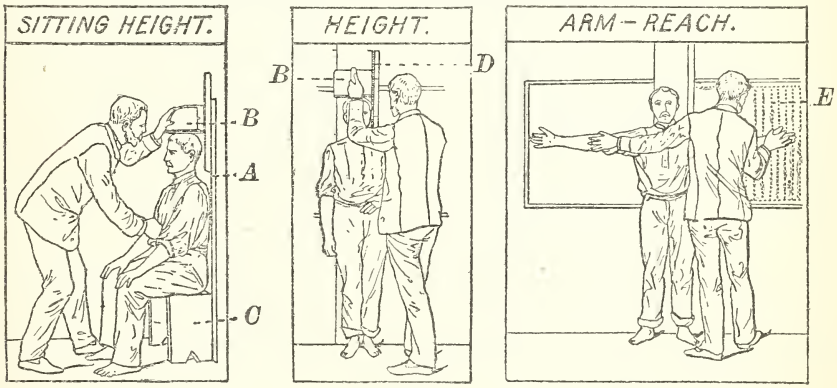


Fig. 87.

In taking the height, the subject should have his back against the wall, his heels together, touching the wall, the knees stiff, the body erect.

In finding the arm reach, the subject has his back to the wall, and extends his

[1] For a detailed account of this system, see The Bertillon System of Identification, published in Chicago, 1896; also Chapter xxviii in Report of Commissioner of Education for 1895–96.

arms horizontally until the tip of his middle finger touches the projection. E represents graduations on paper or oilcloth.

We do not regard this measurement as of great value, because it depends too much upon the will power of the subject to stretch or not to stretch his arms, and therefore may be quite inaccurate. Manouvrier, of the School of Anthropology, of Paris, considers this measurement of very little value.

These calipers are heavier and the ends are more blunt than is the case with calipers in general. They are used for measuring the length and width of head, as

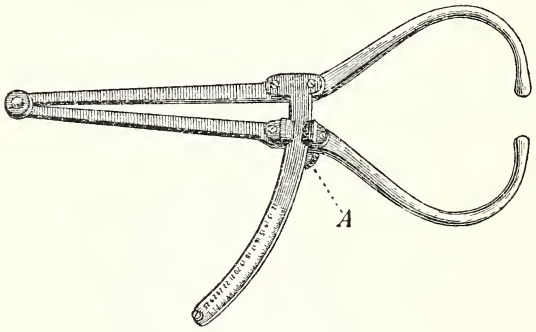


FIG. 88.—Calipers.

represented in fig. 89. The left end of the calipers (fig. 89) is held at the root of the nose; the one measuring watches the scale while he brings the right point of the calipers over the back and middle of the head, thus finding the maximum length of head. The operator removes the calipers from the head of the subject, and by means of a thumbscrew, A (fig. 88), fixes the calipers at the length measured on the scale; then he replaces the calipers upon the head, and tests the accuracy of his measurement by the friction of the right end of the calipers against the back of the head.

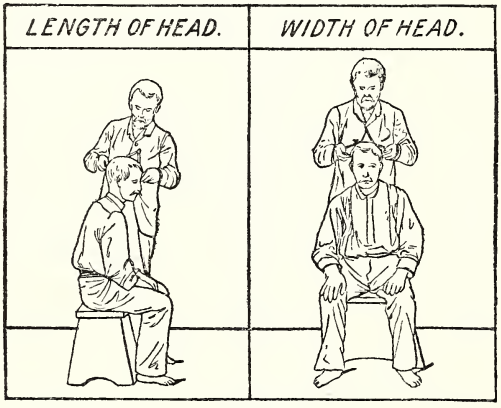


FIG. 89.

The width of the head is measured and verified in a similar way to that of the length. In these measurements a mistake of a millimeter is allowed. In scientific measurements only a half millimeter is allowed.

In measuring the distance between the zygomatic arches (bizygomatic diameter) the same calipers are employed and a similar method as in finding the length and width of head.

In fig. 90 is represented a small caliper rule for measuring the length of the ear. The flat and stationary end A of the instrument is placed so as to just touch the

superior border of the ear, and is held still by pressing the left thumb on the end of the stem, resting the other fingers upon the top of the head. The stem of the calipers is held parallel with the axis of the ear, the movable branch is pushed up till it just

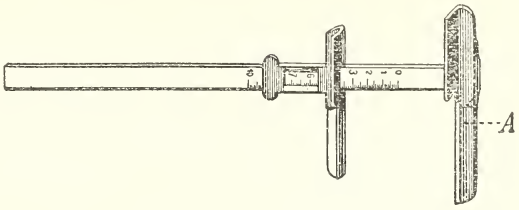


FIG. 90.—Small caliper rule.

touches the inferior extremity of the lobe, when the figure indicated upon the scale is read. Care should be taken that the pavilion of the ear is not depressed by either branch of the calipers.

The large caliper rule (fig. 91) is used in measuring the foot, middle and little fingers and the forearm.

For measuring the foot (fig. 91) the operator, with his subject in the position represented in fig. 92*a*, presses the fixed end of the caliper against the back of the

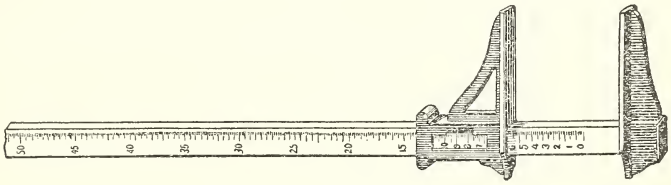


FIG. 91.—Large caliper rule.

heel, then he pushes down the movable end of the caliper until it touches the great toe, reading the distance indicated on the scale.

In measuring the middle finger (fig. 92*b*) the operator places it on the back of the rule, turning the finger to be measured into a position at right angles to the back of the hand.

To measure the forearm (fig. 92*c*) the shoulder of the subject should form an acute angle with it.

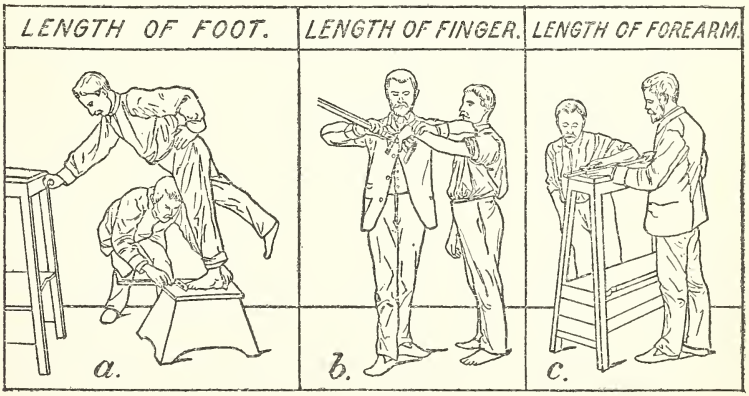


FIG. 92.

It is a common saying that two carpenters never measure a plank exactly the same. If one individual were measured seven times, there would probably be seven signalments, differing by very small quantities. These differences can be ignored

until they reach a certain point, after which they destroy the value of the measurement. The following table gives the limits of necessary approximation according to Bertillon:

TABLE 7.[1]

[In millimeters.]

	Approximation theoretically requisite (in + or in —).	Discrepancy beyond which grave error begins.	Mistakes of serious character beyond which nonidentity can be declared.
Height	7	15	30
Arm reach	10	20	40
Trunk	7	15	30
Length of head	0.5	1	2
Width of head	0.5	1	2
Length of right ear	1	2	4
Width of right ear	1.5	3	6
Length of left foot	1.5	3	6
Length of left middle finger	0.5	1	2
Length of left little finger	0.75	2	3
Length of left forearm	1.5	3	6

[1] The Bertillon system of identification, p. 24.

PORTABLE CASE CONTAINING INSTRUMENTS FOR BERTILLON'S SYSTEM OF IDENTIFICATION.

1. Two-meter measure (in three sections).
2. One-meter rule.
3. One-half meter rule
4. Double decimeter.
5. Calipers for the head (fig. 88).
6. Sliding calipers for the ear (fig. 90).
7. Sliding calipers for the elbow (fig. 92 c).
8. Directing rod for the ear.
9. Scissors to cut finger nails.
10. Instrument to verify calipers.
11. Roller, tablet, and ink to take finger prints.
12. Signaletic instructions by A. Bertillon, 2 volumes.
13. Box to carry the instruments.

Maker of instruments, Collin, Paris.

EQUIPMENT OF A PSYCHOPHYSICAL LABORATORY.

The growth of psychophysical laboratories has been very great within recent times, especially in our own country. Many questions arise as to the equipment of such laboratories. It is not intended here to enter into details as to the formation of a laboratory, but merely to give a general idea as to its scope. The instruments already described will aid some in this direction, although, as before mentioned, they were selected with regard to recent phases in the experimental study of human beings. A careful consideration of laboratory equipment, description, and use of instruments, etc., will be found in Sanford's work entitled A Course in Experimental Psychology, in an article by E. B. Titchener in Mind, series No. 27, July, 1898; in Scripture's book on Thinking, Feeling, and Doing; in Marey's works, entitled as follows: La Méthode Graphique, La Physiologie Experimentale, La Circulation du Sang, and in Physiologische Graphik, by Langendorf.

For anthropological instruments, etc., consult Anthropologische Methoden, by Schmidt; L'Homme dans la Nature, by Topinard; Grundzüge einer Systematischen Kraniometrie, by Török, and the Bertillon System of Identification.

LITERATURE ON PSYCHOLOGICAL LABORATORIES.[1]

J. M. Baldwin. "The psychological laboratory in the University of Toronto." Science, O. S., vol. 19, 1892, p. 143.
M. Baudouin. "La phychologie expérimentale en Amérique. Le laboratoire et les cours de Clark University à Worcester." Archives de neurologie, vol. 28, No. 89. "Les laboratoires et les cours à Yale, Harvard, Cornell, Pennsylvania," . . . etc. Ibid., vol. 28, No. 93.
W. Bechterew. "Le laboratoire psychophysique de l'université impériale de Kazan." Cong. de Zool. de 1892, vol. 3.
E. Bérillon. "Notice sur l'institut psychophysiologique de Paris." Paris, 1897.
M. W. Calkins. "Experimental Psychology at Wellesley College." Am. J. of Psych., vol. 5, p. 260.
E. Casslant. "Le laboratoire de physiologie des sensations de la Sorbonne." Paris, 1897.
E. B. Delabarre. "Les laboratoires de psychologie en Amérique." L'annee psychologique, vol. 1, p. 209.
T. Flournoy. "Notice sur le laboratoire de psychologie de l'université de Genève." Geneva, 1896.
V. Henri. "Les laboratoires de la psychologie expérimentale en Allemagne." Rev. Phil., vol. 36, Dec., 1893.
J. Jastrow. "The section of psychology." World's Columbian Exposition Official Catalogue. Pt. 12, p. 50.
W. O. Krohn. "Facilities in experimental pyschology in the colleges of the United States." Report of the Commissioner of Education for 1890–91, vol. 2, p. 1139. "Experimental psychology at the various German universities." Am. J. of Psych., vol. 4, p. 585. "The laboratory of the Psychological Institute at the University of Göttingen." Ibid., vol. 5, p. 282.
"Psychological laboratory of Harvard University." Cambridge, Mass., 1893.
E. C. Sanford. "Some practical suggestions on the equipment of a psychological laboratory." Am. J. of Psych., vol. 5, p. 429.
G. M. Stratton. "The new psychological laboratory at Leipzig." Science, N. S., vol. 4, 1896, p. 867.
H. de Varigny. "Le laboratoire de Madison, Wis." Rev. Scient., 1891, p. 624.

For the convenience of those who may desire to know names of instruments for fitting out a psychophysical laboratory, we quote below a catalogue of instruments at the psychological laboratory at Harvard University, prepared by Professor Münsterberg, director of the laboratory.

A laboratory may be used in three general ways—(*a*) for simple demonstration in lecture courses, (*b*) for courses of practical work for beginners, and (*c*) for extensive research work.

CATALOGUE OF THE INSTRUMENTS AND APPARATUS CONTAINED IN THE PSYCHOLOGICAL LABORATORY OF HARVARD UNIVERSITY.

I. OBJECTS FOR ANATOMICAL AND PHYSIOLOGICAL DEMONSTRATIONS OF THE PHYSICAL BASIS OF MENTAL LIFE.

A. BRAIN.

a. HUMAN BRAIN.

1. Large wire model, showing the fibers and the cerebral masses. After Aeby, by Buechi, Bern.
2. Large elastic model, showing the course of the nerve-fibers throughout the encephalic mass. After Luys, by Auzoux, Paris.
3. Natural sized elastic model, showing the nerve-fibers on one hemisphere, and the cerebral ganglion masses on the other. After Luys, by Auzoux, Paris.
4. Natural sized elastic model. By Bock-Steger, Leipzig.
5. Large model, showing the convolutions. By Talrich, Paris.
6. Large model, showing horizontal section. By Talrich, Paris.
7. Large model, seen from below. By Talrich, Paris.
8. Large model of corpus callosum, seen from below. By Talrich, Paris.
9. Large model, showing median section. By Talrich, Paris.
10. Large elastic model of cerebellum and spinal cord. By Auzoux, Paris.

[1] See article in Mind, July, 1893, by Prof. E. B. Titchener, of Cornell University.

11. Vertical section of head. By Bock-Steger, Leipzig.
12. Model of the head of adult male, brain exposed on the side. By Casciani, Dublin.
13. Model of the head of middle-aged female, brain exposed on the side. By Casciani, Dublin.
14. Model of the head of an aged man, brain exposed on the side. By Casciani, Dublin.
15. Model of the head of elderly female, insane, brain exposed on the side. By Casciani, Dublin.
16. Set of fourteen wax models, showing the development of the fetal brain. After Ecker, by Ziegler, Freiburg.
17. Model of the head of a seven months' fetus, brain exposed on the side. By Casciani, Dublin.
18. Model of the head of a child six months old, brain exposed on the side. By Casciani, Dublin.
19. Model of the head of a girl, brain exposed on the side. By Casciani, Dublin.
20. Collection of human brains in alcohol.
21. Collection of charts, showing sections of the brain, and forty-eight stereoscopic views of the central nervous system. After Debierre and Doumer, by Alcan, Paris.

b. Vertebrate Brains.

22. Set of eight wax models showing the phylogenic development of the brain. After Wiedersheim, by Ziegler, Freiburg.
23. Model of the head of chimpanzee, brain exposed on the side. By Casciani, Dublin.
24. Model of the head of orang-outang, brain exposed on the side. By Casciani, Dublin.
25. Collection of sheep brains in alcohol.
26. Collection of charts showing development of brain, from gymnotus to mammal.

B. SENSE ORGANS AND NERVES.

a. Anatomical Demonstration.

27. Half skull, with the seven first cerebral nerves in wax. By Tramond, Paris.
28. Large elastic model of eye, divided by a vertical section. By Auzoux, Paris.
29. Large elastic model of eye, showing muscles, nerves, vessels, etc. By Auzoux, Paris.
30. Elastic model of human eye. By Bock-Steger, Leipzig.
31. Small model of entire eye. By Browning, London.
32. Set of 9 wax models of the eye, showing the embryological development of the vertebrate eye. After Manz, by Ziegler, Freiburg.
33. Standard eyes for anthropological comparison. After Galton, by Cambridge Scientific Instrument Company.
34. Large elastic model of the ear, showing the internal, middle, and external ear. By Auzoux, Paris.
35. Large elastic model of the ear, showing especially the internal ear. By Brendel, Berlin.
36. Large collection of histological preparations for microscopical study of brain, sense organs, and muscles. By Bourgogne, Paris; Queen, Philadelphia; Kloenne & Müller, Berlin, etc.
37. Collection of charts and large photographs in frame, showing anatomy of nerves and sense organs.

b. Physiological Demonstration.

38. Artificial eye, consisting of glass water tank, lenses, etc. After Kuehne, by Jung, Heidelberg.
39. Thread model, representing rays of light, and demonstrating effects of astigmatism. After Knapp, by Meyrowitz, New York.
40. Phakoscope, for demonstrating accommodation of lens. After Helmholtz, by Sittel, Heidelberg.
41. Ophthalmotrope, demonstrating movements of the eye, and action of the different muscles which produce them. After Ruete, by Kohl, Chemnitz.
42. Model showing mechanism of the drum and bones of the ear. After Helmholtz, by Jung, Heidelberg.

N. B.—Compare Groups IV. A. B. Microscope, instruments of dissection, etc.

II. APPARATUS FOR STUDYING THE SENSATIONS.

A. HEARING.

43. The harmonical, furnishing 24 overtones of C (66) and the first 16 of C_1 (132). After Ellis, by Moore, London.
44. One large tuning fork, giving from 32 to 48 vibrations. By Koenig, Paris.
45. Set of 12 tuning forks, with resonance boxes, Ut_2, Ut_3, Mi_3, Sol_3, La_3, Ut_4, Mi_4, Sol_4, seventh harmonic of Ut_2, Ut_5, Re_5, Mi_5. By Koenig, Paris.
46. One extra Ut_4 tuning fork and one Ut_4 + four vibrations, with resonance boxes. By Koenig, Paris.
47. Five tuning forks, with resonators, tuned to the characteristic notes of the vowels. After Helmholtz, by Koenig, Paris.
48. Bow for vibrating tuning forks. By Queen, Philadelphia.
49. Series of 10 resonators. After Helmholtz, by Koenig, Paris.
50. Series of 22 steel cylinders, giving notes from Ut_7 to Ut_{10} by stroke of steel hammer. By Koenig, Paris.
51. Apparatus for testing the appreciation of difference in musical pitch. After Galton, by Cambridge Scientific Instrument Company.
52. Large bellows, with regulator and wind chest for 12 pipes. By Koenig, Paris.
53. Nine open wooden pipes, from Ut_2 to Ut_3, to be used with the organ bellows. The Ut_2 duplicated. By Koenig, Paris.
54. Eight stopped pipes, giving the scale from Ut_3 to Ut_4. By Koenig, Paris.
55. Apparatus for studying the nonmusical intervals of sounds between 128 and 256 vibrations (Tonmesser). By Appunn, Hanau.
56. Apparatus for studying the nonmusical intervals of sounds between 256 and 512 vibrations. By Appunn, Hanau.
57. Revolving mirror, manometric capsule, etc., for analyzing manometric flames. By Koenig, Paris.
58. Whistle for determining highest limit of sound. After Galton, by Koenig, Paris.
59. Differential sonometer, with weights. After Marloye, by Koenig, Paris.
60. Toothed wheel. After Savart, by Queen, Philadelphia.
61. Siren and toothed wheels, giving the same notes, with centrifugal machine. By Kohl, Chemnitz.
62. Eight electric bells of various pitches, from 6 to 16 cm. in diameter. By Brock, Cambridge.
63. Two electric bells, single stroke. By Brock, Cambridge.
64. Snappers for giving different qualities of short noises, three telephones, pistols, etc.
65. Large electric phonometer, producing noises of various intensities. After Münsterberg, by Elbs, Freiburg.
66. Small phonometer. Made in the laboratory.
67. Two large boxes for tuning forks impervious to sound, with ear appliances, etc. After Gilman, made in Cambridge.

N. B.—Compare groups—
I. B. Models of ear, etc.
III. A. Registering tuning forks, etc.
III. B. Instruments for localization of sound. Time sense.

B. SIGHT.

68. Large color mixer, with horizontal rotating disks, connected with foot machine. Six dozen colored-paper disks. After Hering, by Rothe, Prag.
69. Apparatus for color sense of the eccentric parts of retina, to be attached to Hering's foot machine. After Hering, by Rothe, Prag.
70. Color mixer, adjustable under rotation. After Pillsbury, by Bradley, Springfield.
71. Large color mixer for four disks, two upon each spindle. After Wundt, by Krille, Leipzig.
72. Set of color disks, 60 cm. in diameter. By Krille, Leipzig.
73. Color mixer. After Galton, by Cambridge Scientific Instrument Company.
74. Two color wheels, with disks. By Milton Bradley Company, Springfield.
75. Newton's disk, 80 cm. in diameter. By Queen, Philadelphia.
76. Apparatus for mixing colors by mirrors and colored glasses. After Hering, by Rothe, Prag.
77. Apparatus for mixing colors by the combination of colored gelatin papers. After Münsterberg, by Elbs, Freiburg.
78. Three boxes for mixing colors by reflection. Made in the laboratory.

79. Simultaneous contrast apparatus, with two prisms for binocular or monocular investigation. After Hering, by Rothe, Prag.
80. Simultaneous contrast apparatus, with colored glasses. After Hering, by Rothe, Prag.
81. Instrument for the recombination of parts of the solar spectrum. By Kohl, Chemnitz.
82. Instruments for successive contrast, irradiation, etc. By Kohl, Chemnitz.
83. Apparatus for color after-images. After Hering, by Rothe, Prag.
84. Chromatoskiameter. After Holmgren, by Rose, Upsala.
85. Apparatus for diagnosing color-blindness. After Hering, by Rothe, Prag.
86. Apparatus for appreciation of color. After Galton, by Cambridge Scientific Instrument Company.
87. Apparatus for testing simulated blindness. After Snellen, by Meyrowitz, New York.
88. Nachet's adjustable trial frame. By Meyrowitz, New York.
89. Two perimeters. After Landholt and Priestly Smith, by Meyrowitz, New York.
90. Two hundred and fifty perimeter charts. By Meyrowitz, New York.
91. Apparatus for testing keenness of eyesight. After Galton, by Cambridge Scientific Instrument Company.
92. Spectroscope. After Vogel, by Schmidt and Haensch, Berlin.
93. Large glass prism, 15 by 10 cm. By Queen, Philadelphia.
94. Two smaller mounted prisms. By Duboscq, Paris.
95. Set of spectacles, with concave, convex, cylindrical, prismatic, and colored glasses. By Miller, Boston.
96. Excelsior lantern. By Queen, Philadelphia.
97. Magic lantern. Stereopticon screens. By Elbs, Freiburg.
98. Gorhams's kaleidoscope top. By Griffin, London.
99. Micrometric shutter for studying minute fields of color. After Münsterberg, by Elbs, Freiburg.
100. Magnifying mirror. By Lloyd, Boston.
101. Set of Geissler tubes.
102. Thirty plates colored glass. By Redding, Baird & Co., Boston.
103. Prismatic spectrum charts in frame. By Prang, Boston.

N. B.—Compare groups—
I. B. Models of eye, etc.
III. A. Apparatus for optical reaction time.
III. B. Apparatus for study of visual space perception, etc.
III. C. Apparatus for study of optical recognition, discrimination, æsthetics.
IV. A. Heliostat, photometer, microscopes, etc., colored papers, etc.

C. DERMAL AND MUSCULAR SENSATIONS.

104. Kinesimeter. After Hall, by Pfeifer, Baltimore.
105. Tube for hot and cold spots.
106. Six æsthesiometric compasses.
107. Set of 200 arrangements for studying number and extension of skin sensations. After Nichols; made in the laboratory.
108. Instrument for studying the fusion of touch sensations. After Krohn; made in Cambridge.
109. Apparatus for testing appreciation of weight. After Galton, by Cambridge Scientific Instrument Company.
110. Dynamometer for showing strength of hands. By Verdin, Paris.
111. Salter's dynamometer for showing strength of hands. By Cambridge Scientific Instrument Company.
112. Salter's dynamometer for showing strength of arms. By Cambridge Scientific Instrument Company.

N. B.—Compare groups—
III. A. Instrument for touch reaction, etc.
III. B. Apparatus for tactual space, movement presentations, etc.
III. C. Ergograph, etc.
IV. Thermometers, atomizer, electric apparatus, etc.

III. APPARATUS FOR STUDYING THE HIGHER PSYCHICAL PROCESSES.

A. TIME MEASUREMENT OF MENTAL ACTS.

113. Kymograph. After Ludwig, by Cambridge Scientific Instrument Company.
114. Revolving drum. By Verdin, Paris.
115. Two electric signals, one with tuning-fork attachment. After Deprez, by Verdin, Paris.
116. Two tambours for giving signals upon revolving drum. After Marey, by Verdin, Paris.

117. Two connected tambours. After Marey, by Verdin, Paris.
118. Large demonstration drums, etc. Made in Cambridge.
119. Electrical tuning fork of 100 vibrations. By Koenig, Paris.
120. Electrical tuning fork of 50 vibrations. By Verdin, Paris.
121. Electrical tuning fork of 10 vibrations. By Verdin, Paris.
122. Registering tuning fork of 50 vibrations to be set in motion by a Bunsen aspirator. After Ewald, by Maier, Strasburg.
123. Four simple writing tuning forks. By Kohl, Chemnitz.
124. Metronome, with electrical connection. After Kronecker, by Verdin, Paris.
125. Hipp's chronoscope, measuring one-thousandth part of a second. By Peyer, Favarger & Co., Neufchatel.
126. Control hammer for Hipp's chronoscope. After Wundt, by Krille, Leipzig.
127. Pendulum instrument for giving rhythmical electric contacts and short optical impressions, and for controlling the chronoscope. After Münsterberg, by Elbs, Freiburg.
128. Chronoscope measuring the hundredth part of a second, by registering the vibrations of a tuning fork. After Ewald, by Maier, Strassburg.
129. Clock measuring the hundredth part of a second, with spring and mechanical starter. After Münsterberg, by Elbs, Freiburg.
130. Stop watch giving only fifths of a second. By Kohl, Chemnitz.
131. Reaction time pendulum. After Galton, by Cambridge Scientific Instrument Company.
132. Machine for measuring reaction time by a falling rod. After Galton, by Cambridge Scientific Instrument Company.
133. Reaction-time instrument with vibrating arm and smoked slide. After Exner, by Heinitz, Wien.
134. Large demonstration-chronoscope. After Wundt, by Krille, Leipzig.
135. Flash-light instrument, with electric contact. After Bowditch, by Marie, Boston.
136. Drop window, for the sudden exposure of colors, numbers, etc. By Elbs, Freiburg.
137. Touch-reaction instrument, with 20 different stimuli. By Elbs, Freiburg.
138. Two telegraph keys, with sounder.
139. Five simple telegraph keys.
140. Electric key. After Ewald, by Maier, Strassburg.
141. Electric key. After Dubois-Reymond, by Cambridge Scientific Instrument Company.
142. Electric key, combined with writing signal. Made in the laboratory.
143. Reaction-key with 50 buttons. After Münsterberg, by Elbs, Freiburg.
144. Chain-reaction instrument for 10 persons, each instrument provided with 5 electric keys and 5 frames. After Münsterberg, by Elbs, Freiburg.
145. Set of 600 disks for the chain-reaction instrument. By Cooperative Association, Cambridge, Mass.

N. B.—Compare groups—
II. A, B, C. Instruments for optical, acoustical, tactual stimulation.
IV. B. Electric apparatus, especially elements, rheochord, commutator, etc

B. PERCEPTION, SPACE, TIME.

146. Instrument for investigating the power of the eye to compare lengths (Augenmassapparat). After Münsterberg, by Elbs, Freiburg.
147. Instrument for the optical reproduction of given lengths. After Münsterberg, by Elbs, Freiburg.
148. Instrument for estimating the divisions of a line. After Galton, by Cambridge Scientific Instrument Company.
149. Instrument for estimating angular divisions. After Galton, by Cambridge Scientific Instrument Company.
150. Wheatstone's stereoscope, with slides. By Queen, Philadelphia.
151. Five hand stereoscopes. By Lloyd, Boston.
152. Stereoscopic pictures. After Kroll, by Voss, Hamburg; and other sets.
153. Twenty tin tubes, and pasteboard tubes for stereoscopic purposes.
154. Pseudoscope. After Ewald, by Maier, Strassburg.
155. Pseudoscope. By Elliott, London.
156. Two human concave masks, illustrating optical illusions.
157. Apparatus for showing appreciation of distance by convergence. Made in the laboratory.
158. Haploscope. Made in the laboratory.
159. Set of charts, with optical illusions.
160. Zoötrope.

161. Stroboscopic rotating disk, with Geissler's tube. After Poggendorff, by Kohl, Chemnitz.
162. Artificial waterfall. After Bowditch; made in the laboratory.
163. Two large instruments for studying the muscle sensations, tactual space, and the presentations of movement. After Münsterberg, by Elbs, Freiburg.
164. Apparatus for studying the perception of the position of the body. After Aubert; made in Cambridge.
165. Apparatus for studying the localization of simultaneous equal or unequal sounds. After Münsterberg, by Elbs, Freiburg.
166. Apparatus with electric contacts for studying the time sense. After Schumann, by Diederichs, Goettingen.
167. Sound hammer for experiments on time sense. By Krille, Leipzig.
168. Metronome, with bell.
169. Set of 24 instruments for studying space sense in coordinated movements of both arms. After Bowditch, by Marie, Boston.
170. Set of balls of the same weight, but of different sizes. By Marie, Boston.

N. B.—Compare groups—
II. A, B, C. Instruments for optical, acoustical, tactual impressions, micrometric shutter, etc.
III. A. Kymograph.

C. ASSOCIATION, ATTENTION, DISCRIMINATION, MEMORY, FEELINGS, EMOTIONS, WILL, ETC.

171. Material for studies in association (400 photographs, picture books, large printed numbers, letters, words, etc.).
172. Eight sets of arrangements for studies in memory. Made in the laboratory.
173. Instrument for studies in association and memory. After Münsterberg, by Elbs, Freiburg.
174. Instrument for studying the complication of perceptions. After Wundt, by Krille, Leipzig.
175. Instrument for the study of the attention, two simultaneous impressions being given to disparate senses. After A. H. Pierce; made in the laboratory.
176. Instantaneous shutter for association experiments. By Elbs, Freiburg.
177. Rotary chair for the study of dizziness, etc. After Münsterberg, by Elbs, Freiburg.
178. Small instrument for studying the movements during the emotions. By Elbs, Freiburg.
179. Large instrument for the study of æsthetic forms and proportions. After Münsterberg and Witmer, by Elbs, Freiburg.
180. Six sets of arrangements for the study of æsthetic combinations of color. Made in the Laboratory.
181. Cercle chromatique de Charles Henry.
182. Ergograph. After Mosso, by Corino, Torino.
183. Ponograph. After Mosso, by Verdin, Paris.
184. Myograph. After Marey, by Verdin, Paris.
185. Sphygmograph. After Marey, by Verdin, Paris.
186. Instrument for registering the pulse of the two carotids at once. After Marey, by Verdin, Paris.
187. Pneumograph. After Marey, by Verdin, Paris.
188. Instrument for studying the time relations of voluntary movements. After Loeb; made in the laboratory.
189. Apparatus for studying unconscious movements.
190. Hypnoscope. After Luys.

N. B.—In this group especially, everything depends upon unlimited combinations of almost all the instruments of the laboratory.

IV. TECHNICAL OUTFIT.

A. OPTICAL AND MEASURING INSTRUMENTS.

191. Two heliostats. By Kohl, Chemnitz.
192. Photometer. After Bunsen and Toepler, by Kohl, Chemnitz.
193. Microscope, with adjustment by graduated micrometer screw, Abbé condenser, iris diaphragm, cylinder diaphragms, double nose piece, objectives, 2, 4, 7, 9, eyepieces, i, iii, iv. By Leitz, Weimar.
194. Microscope. By Hart & Praz, Paris.
195. Small microscope. By Queen, Philadelphia.

196. Photographic camera. By Lerchours, Paris.
197. Large and small reading glasses.
198. Cardboard and gelatin paper of various colors, 200 sheets of colored paper, colored crayons, etc. By Milton Bradley Co., Springfield; Prang, Boston, etc.
199. Large and small finely graded thermometers; six ordinary thermometers.
200. Three aërometers, measuring tubes for liquids, pipettes, etc.
201. Mathematical drawing instruments, protractors, etc.
202. Apothecary scale, with weights. By Whitall & Tatum, Boston.
203. Balance scale, spring letter balance, etc. By Fairbanks, St. Johnsbury.
204. Two sets of brass weights. By Kohl, Chemnitz.
205. Instrument for showing the variations of error from the average. After Bowditch, by Marie, Boston.

N. B.—Compare groups—
II. B. Spectroscope, magic lanterns, etc.
III. A. Chronoscopes, registering tuning forks, etc.

B. ELECTRIC APPARATUS.

206. Eighteen Leclanche cells (Gonda).
207. Three Grenet cells.
208. Sixteen Bunsen cells.
209. Six Grove cells.
210. Large induction coil for producing sparks. By Kohl, Chemnitz.
211. Induction coil. After Dubois-Reymond, by Krüger, Berlin.
212. Electro-magnetic machine. By Smith, New York.
213. Small induction coil, with handles. By Elbs, Freiburg.
214. Large electro-magnet. Made in the laboratory.
215. Rheochords. By Elbs, Freiburg; by Krille, Leipzig, etc.
216. Galvanometer, with mirror, etc. After Nobili, by Kohl, Chemnitz.
217. Compass galvanometer.
218. Commutator for four currents. By Marie, Boston.
219. Two rocking mercury commutators. By Cambridge Scientific Instrument Company.
220. Large set of electrodes, electrical connections, and wires (copper, platina, brass, and iron; coarse and flexible; insulated, etc.).

N. B.—Compare groups—
III. A. Electric chronoscopes, keys, tuning forks, reactors, etc.
IV. C. Mercury, acids, etc.

C. SURGICAL, MECHANICAL, CHEMICAL OUTFIT.

221. Surgical outfit (4 pairs scissors, 17 forceps, 17 scalpels, 15 probes, 6 silver probes, set of saws, scissor pliers, hammers, and chisels for dissecting, set of syringes, camel's-hair brushes, etc.).
222. Glass dissecting slabs.
223. Pigeon holder. After Ewald, by Maier, Strassburg.
224. Arrangement for smoking kymograph papers, and fixing the curves in the shellac bath. Made in the laboratory.
225. Carpenter's bench, with full set of carpenter's tools (vice, scroll saw, etc.).
226. Large grindstone.
227. Collection of metal stands and rods, etc.
228. Holder for prisms. By Kohl, Chemnitz.
229. Universal holder. By Cambridge Scientific Instrument Company.
230. Glass apparatus (tubes, rods, jars, funnels, etc.).
231. Rubber tubes (from 2 to 25 mm. in diameter), rubber bands, rubber atomizers, etc.
232. Porcelain jars, basins, etc.
233. Brass and copper sheets, nails, screws, hooks, pins, corks, straw, wadding, boards, boxes, cloth, linen, etc.
234. Chemical apparatus and reagents.
235. Jar of mercury.
236. Blast lamp and bellows for glass blowing.
237. Bunsen burner.
238. Set of soldering tools.
239. Water motor.
240. Edison mimeograph, copying machine.

MAKERS OF PSYCHO-PHYSICAL AND ANTHROPOLOGICAL INSTRUMENTS.

Anton, Appunn. Hanau, a. M., Germany, 12 Nürnbergerstrasse. Acoustic instruments.
Auzoux. Paris, 2 Rue Antoine-Dubois. Anatomical models (after Luys).
Boekelman, W. A. Utrecht. Kymographion.
Bradley, Milton, Company. Springfield, Mass. Colored paper, etc.
Brendle, R. Berlin, W., 56 Ansbacherstrasse. Anatomical models.
Bristol's Manufacturing Company. Waterbury, Conn. Recording pressure gauge.
Brown and Getty. Point and Erie streets, Camden, N. J. Psychological instruments.
Browning, John. London, W. C., 63 Strand. Optical instruments.
Brunner. Paris, 59 Rue de Vaugirard. Optical instruments.
Buechi, F. Berne, Switzerland, 34 Spitalgasse. Anatomical models.
Cambridge Scientific Instrument Company. Cambridge, England, St. Tibb's Row. Optical acoustics, kymographs, anthropometric apparatus (after Galton).
Carliczek, Ottomar. Chicago, Ill. Electro-medical instruments and their management.
Casciani, L., & Son. Dublin, 32 Wellington Quay. Anatomical models (after Cunningham., etc.).
Central Electric Company. Chicago, Ill. Electrical supplies.
Chicago Laboratory Supply and Scale Co., 39 West Randolph street, Chicago, Ill.
Chloride of Silver Dry Cell Battery Company. Baltimore, Md.
Alvan S. Clark's Sons. Cambridge, Mass., 186 Brookline street. Lenses.
Clay & Torbensen. Camden, N. J., 117 Front street. Instruments of precision.
Collin. Paris, 6 Rue de l'École de Médecine. Surgical outfits and anthropological instruments.
Corino, Luigo. Torino, Italy, 18 Via Po. Instruments of precision (after Mosso).
Dennison. Boston, 18 Franklin street. Letters, numbers, etc.
Deyrolle, Émile. Paris, 46 Rue du Bac. Anatomical models.
Diederichs, C. Goettingen, Germany. Psychological instruments (after Schumann).
Doerffel, P. Berlin, 46 Unter den Linden. Optical instruments.
Dubosco, Theod. et Albert. Paris, 11 Rue des Fossées Saint Jacques. Optical and acoustic instruments.
Ducretet, E. & Lejeune L. Paris, France. Electrical instruments of measurement.
Edelmann, M. Th. München. Physical and physiological instruments.
Elbs, Hermann. Freiburg, Germany, 17 Friedrichstrasse. Psychological instruments (after Münsterberg).
Elliott Bros. London, 449 Strand. Electrical instruments.
Elmer G. Willyoung & Co. Betz Building, Philadelphia, Pa. Psychological apparatus.
Friez, J. P. Baltimore, Md. Meteorological instruments.
Gaiffe, et Cie. Paris, France. Electrical appliances.
Galvano-Faradic Manufacturing Company. New York. Electrical apparatus.
Gerhardt, C. Bonn, Germany, 90 Bornheimerstrasse. Chemical and physical apparatus.
Greeley, E. S., & Co. New York. Electrical supplies and apparatus.
Green, Henry J. Brooklyn, N. Y. Meteorological and scientific instruments.
Groves, W. London, W. C., 89 Bolsover street, Portland place. Electrical apparatus.
Grunow, W., jr. New York, 204 East Forty-third street. Scientific instruments.
Harvey & Peak. London, W. C., 56 Charing Cross road. Optical instruments, etc.
Himmler, O. Berlin, S., 9 Brandenburgstrasse. Optical instruments.
Hirschmann, W. A. Berlin, S., 54 Kommandantenstrasse. Electrical and medical instruments.

Hugershoff, Franz. Leipzig, Turnerstrasse. Physical and chemical apparatus.
Jung, R. Heidelberg, Germany. Physiological instruments (after Helmholtz, Kuehne, Foerster, etc.).
Jung, R. Heidelberg, Germany. Scientific instruments.
Kagenaar, D. B. Utrecht, Holland. Optical and physiological instruments (after Donders, Snellen, Engelmann).
Koenig, Rud. Paris, 27 Quai d'Anjou. Acoustic instruments (after Helmholtz, etc.).
Kohl, Max. Chemnitz i. S., Germany. Physical apparatus.
Krille, Carl. Leipzig, 8 Schulstrasse. Psychological instruments (after Wundt).
Leiter, Josef. Vienna, Austria. Electro-therapeutical and surgical instruments.
Lindenlaub, H. R. Schmiedefeld in Thüringen, Germany. Glass instruments, thermometers, etc.
Luhme, J. F. & Co. (Rohrbeck). Berlin, N. W., 24 Karlstrasse. Glass instruments.
Lund, Otto. 6 Place de la Sorbonne, Paris.
MacAllister, T. H. New York, 49 Nassau street. Optical instruments.
Majer, F. Strassburg, Germany, 10 Kraemergasse. Physiological instruments (after Ewald).
Mariand, L. Paris, France. Surgical, physiological, etc., instruments.
Mathieu, L. Paris, 113 Boulevard St. Germain. Surgical outfit, vivisection, physiological instruments.
Mayfield, J. T. London, E. C., 41 Queen Victoria street. Electrical apparatus.
McIntosh Battery and Optical Company. Chicago, Ill.
Metropolitan Electric Company. Chicago, Ill.
Meyer, J. F. Zuerich, Switzerland. Physiological instruments.
Meyrowitz Bros. New York, 295 Fourth avenue. Optical instruments.
Moore & Moore. London, E. C., 105 Bishopsgate street. Organs, etc.
Muencke, Rob. Berlin, N. W., 58 Luisenstrasse. Physical and chemical apparatus.
Nalder Bros. & Co. London, England. Electrical testing, mathematical, and optical instruments.
Narragansett Machine Company. Providence, R. I. Scientific and gymnastic apparatus.
Patrick, Carter. Philadelphia, Pa., 125 South Second street. Electrical apparatus.
Petzold, Wilh. Leipzig, 13 Bayrischestrasse. Physiological instruments (after von Kries).
Peyer, Favarger & Co. (successor to Hipp). Neufchatel, Switzerland. Chronoscopes, etc.
Pfeifer, Adam. Baltimore, Johns Hopkins University. Psychological instruments (after G. Stanley Hall).
Prang Educational Company. Boston, 7 Park street. Colored paper.
Queen, James W., & Co. Philadelphia, Pa., 1010 Chestnut street. Optical and acoustic instruments, anatomical models, etc.
Reiniger, Gerbert & Schall. Erlangen, Bayern, Germany, 3 Schlossplatz. Electrical apparatus.
Richard Kny & Co. New York, 17 Park Place. Anatomical models, imported.
Rose, J. L. Upsala. Physiological instruments (after Holmgren).
Rothe, Rud. Wenzelsbad, Austria. Kymographs and optical instruments (after Hering).
Runne, Fr. Basel, Switzerland, 41 Steinenthorstrasse. Chronometers.
Schmidt, Franz, & Haensch. Berlin, S., 4 Stallschreiberstrasse. Optical instruments.
Schmidt. Giessen, Germany.
Siemens & Halske Electric Company. Chicago, Ill. Electrical apparatus.
Stöhrer & Sohn. Leipzig, Germany. Electrical apparatus.
Swinburne & Co. Teddington, England. Electrical apparatus.
Talrich, Jules. Paris, 97 Boulevard St. Germain. Anatomical models.

Tiemann & Co., George. 107 Park Row, New York. Anthropometric instruments.
Vasseur, Tramond. Maison Paris, 9 Rue de l'École de Médecine. Anatomical models.
Verdin, Charles. Paris, 7 Rue Linné. Physiological instruments (after Marey, etc.).
Waite & Bartlett Manufacturing Company. New York. Electro-medical instruments.
Warkentin, G., and Weber, R. Mathematical instruments.
Weisker, Rud. Leipzig. Anatomical models (after Leuckart, His, etc.).
Weston Electrical Instrument Company. Newark, N. J.
Whitall, Tatum & Co. Philadelphia, Pa., 410 Race street. Glassware.
White. Glasgow, 78 Union street. Electrical apparatus.
Windler, H. 3 Dorotheen street, Berlin. Physiological and surgical instruments.
Zeiss. Jena, Germany. Microscopes.
Zentmayer, Jos. Philadelphia, Pa., 209 South Eleventh street. Optical instruments.
Zeigler, Adolph. Freiburg i. B., Germany, Hermannstrasse. Anatomical models (after Ecker, Wiedersheim, Manz).
Zimmermann, L. Heidelberg, Hauptstrasse. Optical and electrical instruments (after Helmholtz, etc.).

CHAPTER XXII.

EDUCATION IN THE ARGENTINE REPUBLIC, URUGUAY, AND BRAZIL.

By F. F. Hilder.

ARGENTINE REPUBLIC.

Among the nations of South America the Argentine Republic is second in size only to Brazil, having an area of 1,118,000 square miles, extending from Brazil on the north to Tierra del Fuego at the southern extremity of the continent. Excepting the northern and Andean provinces, which are mountainous, it is almost an unbroken plain stretching from the foot of the Andes to the Atlantic coast.

It is rather sparsely populated, having only between 4,000,000 and 5,000,000 inhabitants; but its unbounded advantages for agriculture and cattle raising and its great variety of climate offer advantages that must result in the growth, in the near future, of a populous and powerful nation.

It was in 1516 that Juan Diaz de Solis, the Spanish navigator, discovered the Rio de la Plata, and in 1535 an attempt was made to found a colony where the city of Buenos Ayres now stands, but it was soon destroyed by the warlike natives, and it was not until 1580 that the colony was successfully established. In 1661, the amount of territory that had been subjugated was so large that a captain-general was appointed by the King of Spain to govern it, and in 1773 the colonies were raised to the dignity of a vice-royalty.

The colonial policy of Spain, however, produced the same results as in other of her dominions, and after the colonies had fought successfully against the English, who were at war with Spain in 1806 to 1808, they conceived the idea of expelling the Spaniards, as they had the English, and in 1810 the cry of independence was raised, inaugurating a war which terminated in the final overthrow of Spanish rule.

From 1825 to 1828 the new Republic had to maintain itself against Brazil in a war declared by that country for the possession of Uruguay, which ended in both the contending countries guaranteeing its independence. From that time until 1868 the country was disturbed by civil and foreign wars, although the people were learning the art of self-government, and in 1860 the present constitution, modeled upon that of the United States, had been promulgated and the new order of affairs definitely entered upon.

Don Domingo Faustino Sarmiento, who was elected president of the Republic in 1868, while representing his Government as minister at Washington, was a great admirer of the United States, and to him the Argentine Republic is indebted for the introduction of a system of elementary education similar to that in operation here. Throughout his term of office he gave special attention to the foundation of institutions of learning and to the education of the people.

In 1884 a law was passed making education free and obligatory for all children, both male and female, between the ages of 6 and 14 years, and creating a national board of education. By the same law the promotion of education was provided for by the appropriation of funds from the public revenues for its sustenance.

From year to year since the first establishment of the public-school system there has been constant improvement, but it can be affirmed that in the year 1895 a new era commenced for primary education. In that year a commission was appointed by the board of education to consider a programme of studies which had been prepared by a convention of principals and teachers of the public schools. The commission commenced its work in October, 1895, and did not finish it until December, 1896. It started, as stated in the report of proceedings, by defining the position of the school as strictly secular as established by law, avoiding the dangerous extremes of theologic idealism and materialistic positivism, and terminated its laborious sessions by the formulation of a plan of studies as nearly perfect as has perhaps been produced in any country, or, in the words of the report, "A plan which recognizes no other end in instruction but the education of the human being in all that may be necessary and indispensable for personal felicity in the three conditions, as an individual, a citizen, and a member of the great human family."

In the year 1897 the total amount appropriated for all grades of education by the national treasury and by the various States was as follows:

The nation	$11,553,510	Santa Fe	838,000
Buenos Ayres	3,712,329	Salta	197,580
Cordoba	399,600	San Juan	221,356
Corrientes	319,110	San Luis	139,560
Catamarca	176,806	Santiago	177,860
Entre Rios	510,880	Tucuman	438,020
Jujuy	79,820		
Mendoza	491,598	Total	19,411,363
La Rioja	155,340		

But from this total of $19,411,363 must be deducted the sum of $1,760,000, which is included in the $11,553,510 appropriated by the nation, as that amount constitutes a grant to the States in aid of education and forms part of the sums devoted by them to that purpose. This leaves the actual amount devoted to the cause of puplic instruction in the Republic $17,551,363, which is equal to 6.28 per cent of the whole revenue of the country.

Of the sum appropriated by the nation the sum of $5,519,938 was devoted to higher, secondary, and normal education and special institutions in the following proportion:

University of Buenos Ayres	$859,740
University of Cordoba	329,880
Secondary and normal instruction	3,870,854
School of mines	60,000
School of commerce	188,832
Industrial department, school of commerce	25,000
School of commerce at Rosario	43,344
Institute for deaf mutes	114,964
School of pilots	27,324
Total	5,519,938

There are three different grades of public schools: Schools for young children, elementary, and graduated schools, on a plan similar to that adopted in Massachusetts.

The public school statistics in January, 1897, were as follows:

Public schools, 2,838; in the capital, 211. Normal schools, 37; in the capital, 3. Private schools, 1,111; in the capital, 249. Total, 3,986; in the capital, 463.

Number of pupils under instruction in the public schools, 272,073; in the capital, 49,696. In normal schools with primary schools attached, 11,494; in the capital, 1,161. In private schools, 82,274; in the capital, 28,383. Total, 365,841; in the capital, 79,240.

Number of teachers employed in the public schools, 7,006; in the capital, 1,447; in the normal schools, 424; in the capital, 43; in the private schools, 2,865; in the capital, 1,007. Total, 10,295; in the capital, 2,497.

Of the 7,006 teachers employed in the public schools 2,014 are men and 4,992 women. In the public and normal schools the scholars are represented by 152,297 boys and 131,270 girls.

In the private schools 1,206 of the teachers are male and 1,659 females, and of scholars 44,192 are boys and 38,082 girls.

The course of studies in the public schools includes: Reading, Spanish language, arithmetic, history, geography, moral and civic instruction, natural sciences, drawing, writing, geometry, music, French, manual training, and hygiene.

The kindergarten system has been introduced as an annex to primary schools for children from 3 to 6 years of age, as a three years' introductory course to public school education. The sessions occupy from two and a half to three hours each day, but no single exercise is permitted to last more than thirty minutes so that the children may not be unduly fatigued. The kindergarten exercises are continued in the junior grades in the primary schools, and are gradually merged into the manual training work as the pupils grow older.

Normal Schools.

The normal schools for training teachers are divided into three classes: (1) those for males only; (2) those for females only; (3) mixed schools for both sexes.

In these schools, at the date of the latest statistics, 2,136 students were pursuing their professional studies.

To afford the normal students the necessary opportunities for practice primary schools are attached to each normal school, in which they are required to teach in all the grades, commencing in the first year with the youngest children and gradually ascending to the highest grade, in order to obtain a practical knowledge of the duties of their profession.

A normal school has also been founded for the purpose of training female kindergarten teachers, in which the course of study extends over two years. An applicant for entry must be not less than 18 years of age, and possess a teacher's diploma from a normal school. A primary school for practice is also annexed to this establishment.

A superior normal school has also been founded for the purpose of training professors for teaching in the normal and secondary schools.

Commercial School for Women.

A commercial school for women was founded in the city of Buenos Ayres in July, 1897. The sessions are held in the evening in one of the normal school buildings. Applicants for admission must not be less than 12 years of age, must possess general ideas of arithmetic, the national language (reading and writing), or have progressed as far as the fourth grade in the public schools.

The term of study is for two years, and includes the national language, arithmetic, bookkeeping, commercial correspondence, and typewriting. On the termination of the course a certificate of competency is given, signed by the director of the school and indorsed by the minister of public instruction.

There is also operated in conjunction with this school a free class in telegraphy, to enter which it is only necessary for the applicant to be able to read and write correctly.

Although the school has been so recently established, in less than a year it has received 80 pupils and has also a large number of applications for admission.

National School of Commerce at Rosario.

Rosario, situated on the river Paraná, 186 miles above Buenos Ayres, ranks in commercial importance as the second city in the Republic, being the center of the greater part of the trade of the provinces lying between the Paraná and the Andes, and also the terminus of the great railroad system which has been constructed toward the north and west.

The rapidly increasing importance of this city induced the Government to establish there a National School of Commerce, which has proved a great boon to the community and is highly appreciated and successful.

An applicant for admission must present a certificate of having passed the fourth grade in the public schools or pass an examination equivalent to the studies therein.

Originally the course of studies commenced with a preparatory class, but experience proved that the prescribed studies in that class were too difficult for the scholars at entrance, and a lower preparatory class was added by decree in September, 1896. The commercial course, after leaving the preparatory classes, is completed in two years.

The plan of studies is as follows:

Lower preparatory class: Arithmetic, Spanish, Argentine geography, French, penmanship.

Preparatory class: Spanish, arithmetic, national geography, French, English, drawing, penmanship.

COMMERCIAL COURSE.

First year.—Spanish, mental arithmetic, national history, national geography, French, English, drawing, penmanship, typewriting.

Second year.—Spanish, bookkeeping, general history, general geography, natural sciences, French, English, penmanship.

Students who graduate receive certificates signed by the director of the school and indorsed by the minister of public instruction.

National School of Commerce, Buenos Ayres.

The term of study in this institution is three years. The course is as follows:

	Hours per week.
First year:	
Arithmetic	5
Bookkeeping	3
Physical geography	3
Spanish and correspondence	4
English language	4
French language	4
Writing	3
Office practice	4
Total	30
Second year:	
Bookkeeping and office practice	6
Algebra	3
Spanish and commercial correspondence	3

Second year—Continued.	Hours per week.
French	3
English	3
Commercial geography	3
Ideas of industrial chemistry and study of raw materials	4
Stenography	2
Writing	3
Total	30
Third year:	
Bookkeeping and office practice	6
Mercantile technology	3
Ideas of commercial law	2
Ideas of political economy and civic instruction	2
Fiscal legislation and custom-house procedure	3
Spanish and correspondence	3
English	3
French	3
Stenography	2
Visits to industrial and commercial establishments	3
Total	30

On the conclusion of the three years' course the minister of public instruction issues diplomas of proficiency in commercial science to those who pass a successful examination in all the studies comprised in the course prescribed.

The director of the school is authorized to admit pupils to a partial course and to give certificates of proficiency in such subjects as they may have followed successfully.

In February, 1897, an industrial department was annexed to this school for the purpose of giving a technical education to youths who wished to adopt an industrial career.

The instruction in this department is both theoretical and practical. The plan of study is as follows:

First year:	Hours per week.
National language	3
Universal geography	2
Natural history and hygiene	2
English or French	2
Bookkeeping	2
Arithmetic and algebra	4
Plane geometry	3
Mechanical drawing	6
Work in the shops	12
Total	36
Second year:	
National language	2
Industrial geometry	2
Bookkeeping	2
Algebra and ideas of trigonometry	3
Geometry	3
Elements of physics and chemistry	3
English or French	3

Second year—Continued.	Hours per week.
Industrial drawings	6
Work in the shops	12
Total	36
Third year:	
Industrial economy and civic instruction	2
Applied physics	4
Industrial chemistry	3
Drawing	6
Work in the shops	12
Industrial technology and manipulation of dairy products, wine making, alimentary pastes, preserves, and starch	9
Total	36
Fourth year:	
Industrial drawing	6
Applied physics	3
Industrial chemistry	3
Visits to industrial establishments	3
Work in the shops	9
Technology and manipulation of distilling, oil, beer, flour milling, sugar making, tanning, weaving, tobacco manufacturing	12
Total	36

To be admitted to this school the applicant must be not less than 14 years of age, must have good health and conduct, proved by satisfactory certificates, and must pass a satisfactory examination in reading, writing, grammar, arithmetic, history, and geography.

To those who finish the four years' course satisfactorily, the minister of education will grant diplomas of competency and qualification as managers of workshops, industrial overseers, etc., according to the merits of the students.

There are also established scholarships valued at $30 each per month, which are distributed by the minister of education among the most distinguished pupils.

School of Pilots.

The School of Pilots has for its object the training of young men for the position of officers of the national mercantile marine.

The conditions for entry are as follows:

1. The applicant must be a citizen of the Republic, native or naturalized.
2. He must be not less than 18 years of age nor more than 25.
3. He must present a medical certificate of his fitness for the service.
4. He must be able to read and write correctly.
5. Must pass a successful examination in the following branches: Fundamental rules of arithmetic, general ideas of geography, and the national language.

He must also present to the director of the school his application for admission, accompanied by (1) certificate of baptism, (2) naturalization papers, (3) consent of father or tutor if he is a minor.

The term of study in the school is three years. The course commences March 1 and closes November 15.

The plan of studies is as follows:

First year.—Elementary mathematics, arithmetic, algebra and geometry, rigging, and the national language.

Second year.—Navigation by dead reckoning, rigging, natural geography and history, English, plane and spherical trigonometry.

Third year.—Navigation by astronomy, meteorology, rigging and working ship, universal geography, and English.

On the termination of the annual examinations the pupils make a practice voyage and, if possible, by consent of the minister of marine, make two round trips to the Straits of Magellan, or if that be not possible, the director of the school obtains permission from the minister for them to make a voyage on the national practice vessel. The director, subdirector, or one of the professors accompanies the pupils on the voyage and uses every opportunity of instructing the pupils. On the termination of the voyage the director makes a report to the minister of the time employed in the various exercises and names pupils who are worthy of promotion.

The pupils of the second year must always keep the dead reckoning of the ship, and those of the third year take astronomical observations to determine the vessel's position. Both the second and third year pupils must take meteorological observations and learn while on board the principles of meteorology and the use of the signals of the international code.

Although this school was founded only in 1895, it has made satisfactory progress and has already matriculated fifty pupils, of whom the first class will graduate before the close of the present year, 1898.

National School of Mines.

The National School of Mines, which is located at San Juan, is an important institution. It was completely reorganized and its course of studies enlarged and improved in April, 1897, elevating it to a higher standard and largely increasing its reputation and usefulness, with the result of a considerable increase in the number of students.

For admission as a pupil the applicant must present a certificate of having passed a satisfactory examination in the complete course of studies in a national college, unless he asks for admission to the course for assayers only, in which case he can be admitted on presentation of a certificate of having passed satisfactorily the fourth-year studies of a national college, or if he can pass a matriculation examination in the elements of mathematics, geography, history, and the national language.

There are three courses of study, that for the degree of mining assayer being completed in three years, land surveyor in three years, and mining engineer four years; but the diploma of mining engineer authorizes the holder to exercise also the functions of surveyor and assayer.

The plan of studies is as follows:

FOR ASSAYER.

First year.—Algebra, geometry, physics, chemistry, linear and free-hand drawing.

Second year.—Mineralogy, theoretical and practical; analytic chemistry, qualitative and quantitative; laboratory work.

Third year.—Geology; paleontology, theoretical and practical; assaying, laboratory work.

FOR SURVEYOR.

First year.—Algebra; geometry and trigonometry, rectilinear and spherical; physics, chemistry, linear and free-hand drawing.

Second year.—Higher algebra; geometry, analytic, projective, and descriptive; mineralogy, construction of roads, water-color drawing of plans.

Third year.—Infinitesimal calculus, topography, land surveying, geology, topographic drawing, legal surveying.

FOR MINING ENGINEER.

First year.—Algebra; geometry and trigonometry, plane and spherical; physics, chemistry, linear and free-hand drawing.

Second year.—Higher algebra; analytic, projective, and descriptive geometry; mineralogy, theoretic and practical; analytic chemistry, qualitative and quantitative; water-color drawing of plans, laboratory work.

Third year.—Infinitesimal calculus, theoretical mechanics, topography, land surveying; geology and paleontology, theoretical and practical; assaying, topographical drawing, laboratory work, statics, and resistance of materials.

Fourth year.—Constructions relating to the development of mines, roads, and railroads, applied mechanics and electrical appliances, metallurgy, mining development, mensuration, legislation, graphic and laboratory work.

Excursions are made by the students for the purpose of giving them practical lessons in geology, surveying, topography, and the mensuration of mines. Visits are also made by them to mines, metallurgic works, public works, manufactories and industrial establishments, for observation and instruction.

Agricultural Schools.

There is an important agricultural school at San Juan and several others in various parts of the Republic. A school of viticulture was also established in the Province of Mendoza in August, 1897, with a two years' term of study. It has already 41 pupils, and promises to be a permanent success.

Military Academy.

A law passed by the national congress in October, 1869, authorized the establishment of a military school. This was carried into effect in June, 1870, by the establishment of the school and the appointment of Col. Don Juan F. Czetz as director.

A committee composed of four persons was appointed to act with the director to frame the regulations for the school. They promptly completed their work, and although some few changes have from time to time been made, the academy is still conducted substantially on the basis then established.

In the admission of pupils the preference is given to the sons of soldiers who have been killed in the service of the Republic and to orphans of employees of the Government in general.

Applicants for admission must be not less than 12, nor more than 14 years of age, and must be able to read and write and have a knowledge of elementary arithmetic.

The course of study is completed in five years and is as follows:

First year.—Catechism, Spanish grammar, geography, arithmetic, algebra, French, Argentine history, penmanship, linear and topographic drawing, infantry drill and tactics, riding, gymnastics, swimming, and fencing.

Second year.—Catechism, theory of war, infantry tactics, cavalry exercises, fencing, and sword exercise.

Third year.—Christian doctrine, analytic geometry, trigonometry, chemistry, physics, telegraphy, perspective drawing, cavalry tactics, artillery drill, rifle practice, fortification, land surveying, general history.

Fourth year.—Morality, fortification, coast defense, science of projectiles, principles of military strategy, making plans and maps, artillery target practice, military accounts, English.

Fifth year.—Fortification, bridge building; combined tactics of infantry, cavalry, and artillery; application of tactics to a brigade of 4,000 men; frontier defense, skirmishing, pyrotechnics; historical description of modern wars.

At the age of 17 years, or on completion of the five-year course by those who are more than 12 years of age on entry, the six most distinguished pupils are given commissions as second lieutenants in the branch of the service they may have selected, with the obligation of serving at least four years; the other graduates receive commissions as ensigns, with the same obligation of service.

Gold and silver medals are presented annually to the most distinguished graduates.

There also exists an academy for military engineers from which are graduated all the officers who compose the corps of military engineers. There is also a naval academy from which all officers of the Argentine navy are graduated.

National Library for Teachers.

This library for the use of teachers is located in a large hall in the lower floor of the municipal building of the city of Buenos Ayres. It contains a specially selected collection of books on educational and scientific subjects and of general literature; it combines the features of a reading room and circulating library. In the year 1897 814 persons availed themselves of the privilege of taking books for home use. Within the past two years it has been greatly improved, and many new books have been placed on the shelves, correspondingly extending its usefulness.

Educational Museum.

Annexed to the teachers' library is a museum devoted to objects connected with education. The collection is divided into the following sections: (1) School furniture; (2) typical objects designed for educational uses; (3) plastic models; (4) copperplates, photographs, and woodcuts; (5) maps; (6) drawings; (7) work of teachers; (8) work of scholars of the various grades of the public schools.

Educational Review.

A review, with the title "El Monitor de la Educación Comun" (The Monitor of Public Education), is published by the National Council of Education. It was established in 1881, and is distributed free to teachers of all grades who meet at the teachers' conventions and other employees connected with public instruction, to all the public offices and the educational authorities in the provinces. It also exchanges with all similar publications issued in the principal States and countries. It is a most useful medium for disseminating information on educational subjects and recording all new facts and theories relating to public instruction.

The office of the review is in the same building with the Teachers' Library and Educational Museum, to both of which it forms a most useful adjunct.

Educational Medical Corps.

An admirable medical service is connected with the public schools and is now very efficient, having been thoroughly reorganized in the year 1896. It is composed of competent medical men who exercise most careful supervision over the health of the pupils in the schools and the sanitary arrangements of the school buildings.

Every school is regularly inspected, the sewerage, closets, ventilation, and water supply examined. The scholars are vaccinated, and if absent from sickness are visited at their homes and every precaution is exercised to prevent the introduction of contagious diseases into the schools.

National Colleges.

The national colleges of the Republic fill the same place in the plan of secondary education as the high schools of the United States, except that the term of study is longer, a six-year course being required for graduation and qualification to enter one of the national universities.

The plan of studies is as follows:

First year.—Mental arithmetic, Spanish (dictation and composition), history of America, especially of the viceroyalty of Rio de la Plata, as far as 1810, Argentine geography, French (first part), manual training.

Second year.—Algebra, Spanish (dictation and composition), Argentine history from 1810 to 1870, geography of the Argentine Republic and America, French (second part), English (first part), general history (Oriental and Greek), manual training.

Third year.—Plane and solid geometry, Spanish (dictation and composition), geography of Asia, Africa, and Oceania, French (third part), general history (Rome and Media), English (second part), manual training.

Fourth year.—General history (modern and contemporary, to 1870), physics, chemistry, natural history (zoology and botany), philosophy, English (third part), civic instruction, geography of Europe, military instruction.

In order to enter on the fifth-year course the student must have obtained a proper classification in the examinations of the first four years. Those who have not gained the necessary number of marks in these examinations must pass a general examination on the studies of the whole four-years' course.

The studies of the fifth and sixth year courses for students in the cities of Buenos Ayres and Cordoba are divided into three sections, according to the future career elected to be followed.

FIRST SECTION.

Fifth year.—Latin, American history (especially Argentine), physics, literature, philosophy, military instruction.

Sixth year.—Latin, history of civilization, literature, philosophy, military instruction.

SECOND SECTION.

Fifth year.—Hygiene, inorganic chemistry, physics, natural history, philosophy, military instruction.

Sixth year.—Hygiene, organic chemistry, physics, natural history, literature, military instruction.

THIRD SECTION.

Fifth year.—Complementary algebra, geometry and trigonometry, chemistry, physics, natural history, drawing, military instruction.

Sixth year.—Physics, chemistry, natural history, cosmography and topography, drawing, military instruction.

In the provinces of Buenos Ayres, Entre Rios, Corrientes, and San Luis, the fifth and sixth year courses are as follows:

Fifth year.—Cattle raising, agricultural education, military instruction.

Sixth year.—Second course in the same studies.

In the provinces of San Juan, Mendoza, Rioja, and Catamarca:

Fifth year.—Mineral assaying, viticulture, and military instruction.

Sixth year.—A second course of the same studies.

In the provinces of Tucuman, Santiago, Salta, and Jujuy:

Fifth year.—Agricultural education, sugar industry, and military instruction.

Sixth year.—A second course of the same studies.

In the province of Santa Fe:

Fifth year.—Commercial instruction, agricultural education, and military instruction.

Sixth year.—A second course of the same studies.

By this system the secondary education in the provinces is varied during the last two years of the term to suit the local requirements.

Higher Education.

There are two universities in the Republic—one located in Buenos Ayres and the other in the city of Cordoba—both with faculties of law, medicine, and engineering.

The requisite for entrance into these institutions is the presentation of a certificate of having passed a successful examination at the termination of a six years' course in one of the national colleges. To graduate from the universities another course of six years is necessary.

University of Buenos Ayres.

The Spanish conquests in America were made with the idea of establishing in the new territory two principles—religion and absolute monarchy. These leading ideas governed all their proceedings, not only in the viceroyalty of the Rio de la Plata, but in all their dominions in the new world, where educational systems were established with infinite precaution to maintain these ideas unalterable, and this fact determined their character.

With the exception of such elementary education as was afforded in the convents the Jesuits furnished all the educational facilities in Buenos Ayres until their expulsion in 1767. When that event occurred all the property of the Jesuits which had been confiscated was devoted to the establishment of secondary and higher education and benevolent institutions.

In 1771 a project was formed for the foundation of a royal college, but it was not until 1778 that the plan was perfected and the royal approval obtained, and the institution was not officially installed until 1773, under the name of the College of San Carlos, in honor of King Charles III. It was placed under the complete control and direction of the clergy, and the instruction was confined to grammar, rhetoric, philosophy, theology, and the doctrines and discipline of the church, but the greatest prominence was given to the theological studies while the philosophical branch received little attention.

This college reached its highest degree of prosperity in 1803, from which time it gradually declined and lost its prestige until 1818, when it passed out of existence. It had sustained a precarious vitality during the years of the revolution and it died with the extinguishment of the power which had created it.

In June, 1818, a new institution was founded with the title of "El Colegio de la Union del Sud" (The College of the Southern Union). With the opening of this college a new era in education commenced and a much more comprehensive plan of studies was adopted. Philosophy was again given a prominent place, and the study of living languages—English, French, and Italian—was introduced. In 1820 the theological professorships were abolished and in place of them those of international law and history were substituted.

In 1821 measures were perfected for the incorporation of a university to combine the faculties of the College of the Southern Union, the Medical Institute, and the Academy of Jurisprudence, to which was added a department of religious instruction at the expense of the ecclesiastical authorities, and on the 12th of August in that year the University of Buenos Ayres was duly inaugurated, with all the rights and privileges of a national institution. The courses of study were in six departments: (1) Primary department of letters, (2) department of preparatory studies, (3) exact sciences, (4) medicine, (5) law, (6) theology. The latter department was, however, not immediately established, and it was not until 1825 that the professors were appointed for theological and allied studies.

For some years thereafter the progress of the university was very slow; the country was passing through a period of political and social disorganization consequent upon the revolution which accomplished its freedom; afterwards, during

the unsettled condition attending the organization of the Government, with its violent emotions and internal strife, the institution sunk lower and lower until it became little more than a name.

A reorganization was effected in 1833, but for some years afterwards the financial condition of the Government was such that even with the best intentions it was not able to provide the necessary funds for the support of the university.

In 1836 six Jesuits arrived in Buenos Ayres and again assumed charge of the classes, thus preventing the total extinction of higher education.

In 1852, with the fall of the dictatorship which for years had tyrannized over it, the nation entered upon a new career of progress, and the university was one of the first institutions to feel the influence of the reaction. The various courses of study were reestablished under secular professors and many improvements gradually introduced.

The foundation of the national colleges for secondary education rendered the preparatory classes of the university in great measure unnecessary, and in 1868 a decree was published by which the university agreed to accept as valid in its classes and school of medicine the diplomas issued by the colleges, and to admit the holders without other requisites to the higher courses.

The new constitution adopted by the Republic in 1873 contained a clause abolishing fees from students and making all education absolutely free, and in 1874 a decree was issued defining the application of the new constitutional law to the university and arranging the faculties under five titles: (1) Humanities and philosophy, (2) medicine, (3) law and social science, (4) mathematics, (5) physical sciences.

From that time to the present day the university has been kept constantly in touch with the progress of the age, and it now aims to equal in every respect any similar institution in the Western Hemisphere, covering every branch of higher and professional education. Its diplomas, issued to the students who pass successfully the examinations on the termination of the six years' course, are certificates which its alumni may feel proud to possess.

University of Cordoba.

With the exception of colleges in the City of Mexico and Lima, the University of Cordoba is the most ancient establishment for higher education in Spanish America. It was founded by the Jesuits in 1614 as the Colegio Máximo or chief college of the district. In 1622 it was elevated to the rank of a university, and in 1623 it conferred the first degrees, which were those of bachelor of arts. Although the foundation had thus been laid, the institution suffered for some years for lack of thorough and systematic organization, and it was not until 1664 that a constitution was conferred upon it which served for its government for a century and a half, with such slight modifications only as were from time to time suggested by experience. The institution was above all theological, but its studies were divided into two faculties, arts and theology. The first included logic, physics, and Aristotelean metaphysics. To graduate in this branch required a three years' term; in the theological section the term was four years. The degrees conferred were bachelor, licentiate, and master of arts, and bachelor, licentiate and doctor of theology.

In 1714 a new constitution was adopted, introducing many improvements in the studies and regulations for the management of the institution, and reducing the large salaries that had been paid to the rector and professors.

In 1767, in consequence of the decree by which the Jesuits were expelled from all the dominions of Spain, the university had a narrow escape from extinction, as powerful efforts were made to transfer it to Buenos Ayres. It was ultimately allowed to remain at Cordoba, but was placed under the control of the governor of

Buenos Ayres and afterwards of the viceroy of the province, while its management was confided to the order of Franciscans until the year 1800, when they were removed by royal decree and the secular clergy placed in charge. In 1808 the complete secularization was effected under the title of the Royal University of San Carlos and funds were appropriated for its support, a new constitution was framed, and an extended and improved plan of studies was inaugurated.

Political disturbances and the extinction of Spanish sovereignty, however, led to a diminution of revenue and embarrassment to the institution, and in the early days of the Republic it passed through many vicissitudes, but in 1854 it was created a national university.

In 1878 a commission was appointed to reorganize the constitution and plan of studies, which presented its report in 1879, with the result that the university was placed thoroughly in touch with modern progress and fully equipped for teaching law, social and physical sciences, engineering, medicine, literature, and philosophy, rendering it equal to any similar institution in South America. It has an excellent library, fully equipped for all the needs of the students, and its patio or inner court has been converted into a small botanical garden, combining ornament and instruction.

The course required for graduation extends over six years, the same as in the University of Buenos Ayres, and both demand, before granting degrees, that students must pass a final general examination in all subjects comprised in their course of studies and also present essays on subjects relating to the profession they have adopted.

There are no private institutions which confer degrees for the practice of the professions, and every graduate of a foreign college who is desirous of practicing in the Argentine Republic must pass a successful examination before the authorities of one of the national universities in order to obtain a diploma authorizing him to practice his profession.

Literary and Scientific Societies.

There are many literary and scientific associations in the Republic, among the most prominent of which is the Argentine Scientific Society. This association was founded in 1872 and now has 551 members. Its objects are:

First. To promote the study of the sciences in general, with their applications to the arts, to industries, and to the necessities of social life.

Second. To study publications, discoveries, and scientific inventions and improvements, especially those which may have a practical application in the Argentine Republic.

Third. To examine and study by all means in its power the materials of construction and projected works of public interest or which may be shortly projected; also their cost and the systems employed in their execution.

It is in a very prosperous condition and has a library of 6,000 volumes.

The most prominent literary society is the Ateneo Nacional, which includes in its membership many of the most prominent authors and literary men of the Republic.

Another association which deserves special mention is the Argentine Geographical Institute, the aim of which is to encourage exploration and the diffusion of geographical knowledge.

The Argentine Industrial Society, the Argentine Rural Society, the Medical Society, the Lawyers' Society, the Engineers' Society, the Naval Center, and the Military Center are all leading associations, which are active in their respective spheres. All of them publish monthly reviews, in which appear valuable articles written by experts on the subjects treated.

The Museo de la Plata, the national museum at Buenos Ayres, is an admirable institution, which, under the management of its able director, Señor F. P. Moreno, is doing admirable work; it has become known to the scientific world by the review in which its proceedings are published, and which is a valuable addition to scientific literature.

Journalism, which is in these days such a prominent feature of literary activity and such a valuable adjunct to popular education, is in a flourishing condition in the Argentine Republic, where it enjoys perfect liberty and is constantly increasing in influence and improving in quality. In 1881 only 165 newspapers and periodicals were published in the entire country, but in 1896 the number had increased to 610, of which 279 were published in the capital city, 327 in the provinces, and 4 in the national territories. The best newspapers correspond in size to the leading daily papers of the United States. They have a complete telegraphic service and publish every day dispatches giving the important news from all parts of the world.

URUGUAY.

The Republic of Uruguay, or to give it the official title, "La Republica Oriental del Uruguay" (the Eastern Republic of the Uruguay), is the smallest of the independent nations of South America, its area being a little less than 73,000 square miles, with a population, as estimated in January, 1897, of only 818,843, of which a large proportion is concentrated in the department in which Montevideo, the capital, is situated, officially stated as 261,182, or 393.34 per square kilometer, thus leaving a large part of the territory very sparsely inhabited, the least populous department having only 1.30 per square kilometer.

Although the Spaniards, under Juan Diaz de Solis, landed on its shores as early as 1515 and formally took possession of the country in the name of the King of Spain, the indomitable courage of the natives prevented any extensive colonization, and it was not until 1624 that the first of the present centers of population was founded. For many years the jurisdiction was disputed between Spain and Portugal and was fiercely contested, but finally the Spanish power prevailed, and Montevideo was founded in 1726 by a few families from Buenos Ayres.

In 1806 and 1807 the people successfully repelled several combined military and naval attacks by English forces. Emboldened by this trial of strength, they, in 1810, determined to free themselves, and commenced the struggle which ended in the extinction of Spanish rule not only in their territory but in the whole of the South American continent.

After expelling the Spaniards the Uruguayans had again to struggle against the Portuguese, and when Brazil became independent, the Emperor, Dom Pedro, claimed Uruguay as a province of that Empire. It was also claimed by the Argentine Government. After a long and desolating struggle a convention was concluded by the mediation of England, both Brazil and the Argentine Republic renounced their claims, and in 1828 the Eastern Republic of the Uruguay was created.

The struggle against foreign invaders was followed by a period of internal turmoil and bloodshed, caused by the strife of ambitious civil and military chieftains, and it was not until 1875 that a permanent peace was secured, since which time, with some short interruptions, the country has enjoyed repose, political acrimony has largely decreased, and the Republic has entered upon an era of progress—political, economic, and social.

The energetic and indomitable spirit of the people, which successfully achieved their liberty and right of self-government, now that it is directed in the paths of progress, is accomplishing magnificent results, and in no direction is this more

evident than in the advanced educational system which has been evolved, giving promise of stability to the Republic by the increasing intelligence of its citizens and the rapid development of a country so favored by nature in climate, soil, and geographical location.

A thorough system of primary education has been established, and attendance at the schools is made by law compulsory on all children between the ages of 6 and 14 years.

According to the latest statistics there are 533 public primary schools, with an attendance of 51,312 pupils, consisting of 27,558 boys and 23,754 girls, giving an average of 96 pupils to each school. There are employed in these schools 1,041 teachers, of whom 257 are males and 784 females, an average of 1.95 teachers to each school and 49 scholars to each teacher. There are also 379 private schools, with 22,689 pupils, consisting of 11,585 boys and 11,104 girls, and 949 teachers, of whom 344 are males and 605 females, making a total in the public and private schools of 74,001 children receiving instruction.

Including both public and private schools there is 1 school to every 897 inhabitants, 1 teacher to every 411 inhabitants, and about 1 scholar to every 11 of the population, and an average of 81 pupils to each school—37 pupils to each teacher, and 2.18 teachers to each school. There are also in Montevideo 1 normal school for males and 1 for females, and 1 kindergarten.

As the seat of government and metropolis of the Republic, Montevideo is naturally the location of the leading higher educational, scientific, and art institutions of the country. Most prominent among which is the

University of the Republic.

The University of Uruguay is an excellent institution, thoroughly equipped for higher education in law, medicine, and physical science. It has a faculty of 87 professors, of whom 65 are natives and 22 foreigners. They are distributed as follows: In the department of law and social science, 16; medicine and allied branches, 25; mathematics and allied branches, 23, and for preparatory studies, 23. The number of students matriculated in the year 1896 was 587.

The courses of study are as follows:

Preparatory studies for degree of bachelor of science and letters: Latin, two years; French, two years; geography, cosmography, mathematics, two years; physics, two years; chemistry, two years; natural history, two years; universal history, two years; literature, two years; English, two years; philosophy, two years; South American and national history, two years; Spanish grammar, gymnastic exercises.

Preparatory studies for entering the faculty of mathematics: English, two years; French, two years; drawing, two years; mathematics, three years; revision of and higher mathematics, one year; geography, one year; cosmography, physics, two years; natural history, two years; chemistry, Spanish grammar, gymnastic exercises.

Preparatory studies for entering the faculty of pharmacy: French, two years; Latin, two years; geography, cosmography, mathematics, three years; physics, two years; natural history, two years; chemistry, two years; Spanish grammar, gymnastic exercises.

In the faculty of law and social science, for graduation as barrister: Roman law, civil law, constitutional law, penal law, international law, commercial law, political economy, judicial, civil, and commercial procedures, forensic practice, administrative law, legal medicine. Term, four years.

For graduation as notary public: Civil law, commercial law, judicial procedure, private and international law. Term, four years.

For graduation as bookkeeper: A two-years' course in practical bookkeeping.

For graduation as doctor of medicine: Medical physics, medical chemistry,

anatomy, dissection, medical natural history, biological chemistry, general pathology, physiology, pathologic anatomy, medical pathology, surgical pathology, therapeutics, obstetrics, legal medicine and hygiene, operations, clinics in medicine, surgery, obstetrics, gynecology and diseases of children, hygiene. Term, three years.

For graduation as pharmacist: Medical and pharmaceutical physics, medical and pharmaceutical chemistry, medical natural history, chemical and dispensing pharmacy, toxicology, biologic chemistry, chemical analysis, laboratory practice, practical pharmacy. Term, four years.

For graduation as dentist: Pathology of the mouth and teeth, dental therapeutics, practice in dissection, odontological practice, dental system, and anatomy of the mouth and pharynx. Term, two years.

For graduation as midwife: Tocologic anatomy and physiology, assistance in parturition, clinics of parturition, practical obstetrics. Term, two years.

For graduation as engineer of bridges and roads: Study and drawing of the orders of architecture, higher algebra and spherical trigonometry, analytic geometry, industrial physics, ornamental and watercolor drawing, descriptive geometry, topography and topographic drawing, differential and integral calculus, materials of construction, building, architecture, architectural drawing, mechanics, strength of materials, hydraulics, roads, railroads, bridges, plans, political economy and legislation on public works, practice of topography, statistics. Term, two years.

For graduation as land surveyor: Descriptive geometry, analytic geometry, spherical trigonometry and higher algebra, topography, topographical drawing, works on taxation of land, ideas on location of roads, land surveying, legal and for taxation, practice of topography. Term, two years.

For graduation as superintendent of works: Descriptive geometry, building materials, legal architecture, architectural drawing, building, building laws, plans. Term, two years.

For graduation as architect: Legal architecture, higher algebra and spherical trigonometry, descriptive and analytic geometry, history of architecture, hygiene of architecture, industrial physics, ornamental and watercolor drawing, study and drawing of the orders of architecture, architectural plans, topographical drawing, topography, differential and integral calculus, building materials, composition of ornament. Term, two years.

The library of the university contains the latest publications relating to the various courses of study, which are divided into the following sections:

	Volumes.
Faculty of law and social science	4,560
Faculty of medicine	2,374
Faculty of mathematics	2,108
Faculty of preparatory studies	4,203
Rector's library	390
Total	13,635

Military Academy.

The Military Academy was established on August 25, 1885, under the auspices of the government of Captain-General Don Máximo Santos; it is situated on Agraciada street, in the place called Arroyo Seco, in the suburbs of the city of Montevideo. The buildings occupied are extensive; there is a parade ground 80 meters in length by 50 meters wide; also near the academy a tract of land containing four to five hectares, which is used for a camp of instruction. A fine, new edifice is intended to be erected for the use of the academy, for which plans have been drawn.

The conditions required for entry as a pupil are as follows: He must be a native of the Republic, unless exemption is made in his favor by the Government, and not

less than 15 nor more than 20 years of age. He must undergo an examination by the medical officer of the college to prove his physical fitness for a military career, and must pass a successful examination in the studies prescribed for matriculation. He must present a certificate of good conduct, signed by three persons of known respectablity, which must be satisfactory to the commandant.

The applicant for entrance must address to the commandant of the academy an application in his own handwriting, signed by himself and his parent or tutor.

The entrance examination comprises the following studies: Arithmetic, Spanish grammar, general geography, ideas upon physical sciences, and national history.

The courses of study are as follows:

First year.—Common to all pupils: Elementary algebra, geometry, universal history and grammatical composition on historic subjects, French, statutes, linear drawing, fencing and gymnastics, riding and knowledge of horses, theoretical and practical military instruction, national and American geography.

Second year.—Common to all pupils: Geometry and plane trignometry, physics, chemistry, universal history and composition on historic subjects, French, statutes, ornamental drawing, theoretical and practical military instruction, riding and knowledge of horses, fencing and gymnastics.

Third year.—Common to all pupils: Cosmography and physical geography, descriptive geometry, physics, chemistry, national and American history and grammatical composition on historic subjects, French, water-color drawing, ideas of philosophy, theoretical and practical military instruction, riding and knowledge of horses, fencing and gymnastics.

Fourth year.—Common to all pupils: Military penal law, international law, military transactions and constitution of the Republic, military telegraphy, topography, small arms and course of shooting, field fortification, military art, military hygiene, topographic drawing, theoretical and practical military instruction, riding and knowledge of horses, fencing and gymnastics.

Fifth year.—Infantry: Field fortification, art of war, topography, topographical drawing, theoretical and practical military instruction for infantry, fencing and gymnastics.

Fifth year.—Cavalry: Field fortification, art of war, topography, topographical drawing, theoretical and practical military instruction for cavalry, riding and amplification of knowledge of horses, fencing and gymnastics.

Fifth year.—Artillery and engineers: Chemistry of explosives, field fortifications, stereotomy, topography, art of war, advanced algebra and spherical trigonometry, analytic geometry, mechanical drawing, theoretical and practical military instruction for artillery, riding, fencing and gymnastics.

Sixth year.—For artillery: Infinitesimal calculus, mechanics, permanent fortification, course of artillery practice, professional drawing, theoretical and practical military instruction, riding, fencing and gymnastics.

Seventh year.—For artillery: Mechanics, applied sciences, course of artillery practice, theoretical and practical military instruction for artillery, drawing, riding, fencing and gymnastics, permanent fortifications.

Sixth year.—For engineers: Infinitesimal calculus, mechanics, permanent fortifications, astronomy, construction and architecture, theoretical and practical military instruction for infantry, drawing, riding, fencing and gymastics.

Seventh year.—For engineers: Special duties of corps of engineers, mechanics, permanent fortifications, applied sciences, land surveying, construction and architecture, drawing, theoretical and practical military instruction for infantry, riding, fencing and gymnastics.

The graduates of infantry and cavalry are transferred to the army at the end of the fifth year with the rank of ensign and sublieutenant; those of the artillery and engineers with the rank of second lieutenant at the termination of the seventh year.

The examinations take place in the last week of December. When these are finished the pupils of the second and third year are sent to the different army corps for one month to put in practice their technical knowledge. The pupils of the other grades receive a holiday until March 3, when the studies are resumed.

The academy possesses a good library, containing about 936 distinct works for scientific reference, many of which represent the latest perfections and progressive victories of modern industries. It has also laboratories well supplied with modern apparatus for the study of physics, meteorology, photography, chemistry, topography, and natural history.

In the year 1896 41 pupils were receiving instruction.

The School of Arts and Trades.

This important establishment is under the charge of the national commission of charity and public beneficence. It occupies an immense building, erected especially for its use, which was opened in April, 1890. The faculty consists of 20 masters and teachers of arts and trades, 3 teachers of primary instruction, and 7 teachers for special classes. There are also 37 assistants and employees of various grades.

Pupils are admitted at from 13 to 15 years of age. The method of teaching arts and trades is theoretical, practical, and inductive, and in primary instruction the system followed is the programme of the public schools of the second grade from the first to the sixth class.

The following are the arts and trades taught in the institution:

Printing, lithography and phototyping, bookbinding, arithmetic, tailoring, shoemaking, carpentry, cabinetmaking, mechanics, blacksmithing, turning, hotpressing, woodcarving, modeling in plaster and clay, silversmithing, coining, musical-instrument making, painting, and watchmaking.

There are also special classes for telegraphing, linear and architectural drawing, also ornamental and figure drawing, instrumental music, sol-fa and theory of music.

In the year 1896 198 pupils were receiving instruction in the various branches.

There is also in Montevideo a religious seminary with 28 teachers and 50 pupils.

Public Library.

The public library of Montevideo contains 27,731 books and 2,782 pamphlets. It is open to the public on every working day in the year. During the year 1896 4,358 readers availed themselves of the privilege, to whom 8,863 volumes were issued.

National Museum.

The National Museum has sections devoted to archæology, zoology, botany, mineralogy, paleontology, numismatics, etc., and contains an interesting collection of relics of the aboriginal races of the country.

Scientific, artistic, and literary societies and clubs are numerous. Among the most prominent are the Uruguay Atheneum, the Catholic Atheneum, the Society of Arts and Sciences, the Musical Association, and the Lycée.

Many of the larger towns throughout the Republic have public libraries and reading rooms.

One of the most useful adjuncts to the educational system of the Republic is the

Pedagogical Museum and Library of Montevideo.

The Pedagogical Museum and Library was founded in 1889, in virtue of the decree of January 5, 1889, by its present honorary director, Don Alberto Gomez Ruano, and is under the direct control of the minister of fomento.[1]

[1] The cabinet minister who has charge of public works, education, immigration, and all internal improvements.

This most useful institution is a true pedagogical laboratory, and serves most completely the following purposes:

1. To exhibit specimens of school furniture and educational material, both native and foreign, for the benefit of the educational authorities, the professors, and the manufacturers of this class of objects.

2. To display educational material to every person who wishes to study it, especially to teachers who visit the establishment accompanied by their respective pupils; for this purpose there is provided a hall for reading and work.

3. To hold periodical conferences, essentially experimental, for the purpose of making known new methods of education, to popularize pedagogical theories which may indicate a progress in school work, and to present new specimens of educational material uniting the required didactic and hygienic conditions to improve on those in use. In general terms, the Pedagogical Museum and Library of Montevideo omits no effort and loses no opportunity to contribute by all means within its power to the improvement of the primary school.

4. To give information to all who inquire respecting the price and conditions of sale of material displayed by manufacturers, authors, editors, and booksellers who have donated their articles to the institution; for which purpose the givers should send with the articles the necessary particulars for the information of those interested.

5. To hold meetings and temporary expositions at which teachers, authors, and editors of didactic books and methods of teaching can assemble with their works; also physicians and hygienists, engineers, architects, and constructors of models and plans of school edifices, and industrial inventors of apparatus, collections, and models of furniture and movables for schools.

6. To hold meetings and temporary expositions at which the schools of the country may assemble with their work on subjects determined beforehand by the director of the museum; the best exhibits, according to the decision of a jury designated for the purpose, to be rewarded by a diploma in the name of the respective school and preserved for exhibition in the museum.

7. To deliver the material of its duplicate collections to the Government of the Republic whenever it may be invited to take part in expositions, native or foreign, and the minister or the director-general of public instruction may believe that the cooperation of the museum may be opportune, and to take charge of the cataloguing and installation and to arrange the general plan of the section containing the exhibit.

8. To place at the disposal of every person who may ask for it any book in the library for use in the reading room of the establishment during the regular hours. The works in the section for circulation are the only ones which the teachers and the scholars of the normal and public schools are allowed to take to their homes, by giving a special guaranty for the return of the books without damage other than ordinary wear and for their use with the care befitting useful objects.

9. To publish trimonthly a review entitled Annals of the Pedagogical Museum of Montevideo, with illustrations appropriate to the subjects of which it treats, which shall include conferences and lectures given in the building of the institution; biographies, productions, and autographs of educationists and persons who have contributed to the progress of education; models, plans, and views of school edifices; monographs respecting school furniture and material; bibliographies of pedagogical and didactic works, etc.

10. To contribute actively to the improvement of the school, from a hygienic point of view, demonstrating by means of models constructed in the workshop of the museum types of school seats and desks, lighting and ventilation of the class rooms, the superficies and cubic space of the same with regard to the maximum of scholars which they can reasonably accommodate, arrangement of the general plan of the school, and other questions of not less importance for the health of

teachers and scholars, as well as those which refer to the window shades, slates, paper, books, ink, maps, wall charts, etc.

With respect to the masses of the people who do not occupy themselves especially with educational matters, the pedagogical museum will contribute to popularize among all social classes the importance of popular education, demonstrating in objective shape the extent of the studies and work carried on in Uruguay and abroad by the scholastic authorities, guardians of instruction, specialists, and teachers.

In all that appertains to its own progress the pedagogical museum will lose no opportunity to enter into correspondence with institutions of similar character, with foreign scholastic authorities, with the most renowned pedagogists, with manufacturing specialists of scholastic articles, and with educational periodicals, either directly by letter or by means of its corresponding members, who in the discharge of their functions shall endeavor to inform the director of everything relating to primary and special education that may transpire in the country where they reside, sending to him works relating to materials, descriptions, monographs, reports, memorials, etc. The works remitted which contain any novelty of interest shall be read in the public conference hall and inserted in Los Anales.

For authors, editors, and manufacturers of school furniture and educational material in general the pedagogical museum is a permanent exposition in which is exhibited to the public gratuitously every object sent, accompanied by the corresponding catalogue label, on which is displayed the name and address of the person or commercial firm sending it.

The edifice of the Pedagogic Museum and Library is situated in the Plaza Libertad, one of the most central sites in the city of Montevideo. It forms a part of one of the largest public buildings and has large halls and ample galleries for the exhibition and preservation of the various articles. In the same building have been installed the offices of the national weather service.

The staff of the pedagogical museum comprises the director, chief clerk, one assistant, an official in charge of the workshops, and a porter.

It is open from 11 a. m. to 4.30 p. m. on every working day.

BRAZIL.

Brazil, officially known as "the Republic of the United States of Brazil," is the largest country of South America and occupies about two-fifths of the continent. It is divided into 20 States and a federal district, which was formerly known as the municipal district of Rio de Janeiro, the capital.

The boundaries of the Republic, particularly on the northwestern frontier, are somewhat uncertain, but the area, according to the last official figures, is given as 3,209,878 square miles, or nearly as large as the United States, including Alaska. The vast extent of its territory is well indicated by the fact that one of the States, Amazonas, has three times the area of France. It is situated in both the torrid and temperate zones, with large plateaus rising to a considerable elevation above the sea level, extensive districts of which are covered with dense forests, some but little explored and in the far interior never trodden by white men. Its great system of rivers, fed by innumerable streams, its wonderful wealth and variety of vegetable and mineral products, and its marvelous fertility and variety of climate indicate unmistakably the grand future which lies before this great country.

Its population is estimated at a little more than 14,000,000, of whom about one-fifth are of negro blood, and about 250,000 of German origin. There are also colonies of Italians and other Europeans, but the bulk of the population is Portuguese, and theirs is the language of the country.

It was in the year 1500 that the first Portuguese vessel cast its anchor in Brazilian waters and Pedro Alvarez Cabral took possession of the land in the name of the

King of Portugal, but it was not till 1531 that the first serious effort was made by the Portuguese to colonize the country. The French, Spaniards, and Dutch made many efforts during the following two centuries to obtain a foothold, but were never permanently successful, and it remained a dependency of the Crown of Portugal.

In 1807 King John of Portugal fled before the advancing armies of Napoleon and took refuge in Brazil with his family and court and remained there until 1821, when he was recalled to Portugal, leaving behind him his eldest son, Dom Pedro, as regent; but in 1822 the independence of the country was proclaimed, with Dom Pedro as constitutional emperor, who in 1831 abdicated in favor of his son, Pedro, then in the sixth year of his age. His majority was declared in 1840 and he commenced his reign, which continued until 1889, when he was deposed and the present Republic established.

Brazil was the last slaveholding country in America, and it was not until 1871 that a gradual-emancipation law was passed. The final extinction of slavery was due to an irresistible popular movement; probably 200,000 slaves were freed by private means, and two States, then called provinces, Maranhão and Ceará, emancipated their slaves before the abolishment of slavery was declared, on May 13, 1888, by an almost unanimous vote of Parliament, and the nation made a grand forward movement in the cause of humanity and liberty.

Brazil has been fortunate in escaping in great measure from the desolating internal strife and periodical revolutions so frequent in some other South and Central American countries during the periods intervening between their casting off European domination and the establishment of firm independent governments. This immunity it owes in great measure to the wise and patriotic rule of the late Emperor, whose reign, particularly during its later years, was one of peaceful progress and development and growth of liberal opinions and republican ideas, paving the way for the bloodless revolution which effected the extinction of monarchy on the continents of America.

During the colonial period of three centuries Brazil made little progress in literature or education and had little intercourse with the outside world except through Portugal. There were few schools except the Jesuit colleges and hardly any libraries or books. Wealthy young men went to Portugal to study law, medicine, and divinity, but the masses of the people had few facilities for acquiring knowledge.

The sojourn of the Portuguese court at Rio de Janeiro, 1807–1821, was marked by some increase of literary activity, and when the King returned to Portugal in the latter year he left a priceless legacy to the country—his historical library, which became the nucleus of the great public library at Rio de Janeiro.

The proclamation of independence in 1822 brought with it an awakening of aspirations for an enlarged intellectual life. Previous to that time elementary education had been largely controlled by the Jesuits and the clergy. By a decree issued in October, 1823, any citizen was authorized to establish a primary school without obtaining special license or authority, and soon after the Lancasterian system was introduced. In 1827 a law was passed authorizing the establishment of public primary schools in all the cities, towns, and most populous places in the country. The conditions, however, were such that little real progress was made in educational matters until 1854, when a thorough reorganization of the school system was effected. From that time under the Empire good progress was made in the promotion of education, literature, and science, and the good work has been continued even more vigorously by the Republic.

By the provisions of the constitution Congress is given authority to promote in the country the development of literature, arts, and sciences, and the sole power to create institutions of higher instruction and secondary or high school education throughout the Republic and primary schools in the federal district.

The constitution also provides that the instruction given in public institutions shall be secular, and that all laws not declaredly revoked shall remain in force. Among these laws is one which provides that primary instruction shall be gratuitous and at the charge of the various States and municipalities.

In some of the States primary education is compulsory, and in even the most distant from the capital and the least populous it has had a fair start, and will advance as means of communication with older centers of civilization are increased. It is true that Brazil possesses in her marvelous system of rivers great means of developing her natural resources and carrying into a vast extent of territory the civilizing influences of education and enlightenment; but much depends also upon the extension of railroad construction as a factor in the solution of the problem of civilizing and educating the large numbers of barbarous and semibarbarous people in the vast solitudes of its most distant regions.

Brazil has also to solve another problem, similar to that by which we have been confronted in the United States—that of educating and preparing for intelligent citizenship a large negro population only recently redeemed from slavery.

The educational condition of Brazil varies between two extremes, from the highest intellectual culture in the great cities to the lowest conditions of illiteracy and savagery in the remote districts of the Republic. While there exists a great mass of illiterate people, those who are educated are good exponents of its benefits. In the higher schools and institutions much attention is given to instruction in modern languages, and it is rare to meet with an educated Brazilian who does not speak French and has not at least a fair knowledge of English.

Every effort is being made by the Government to encourage the education of the masses of the people, and while many of the schools in the rural districts, far from the larger towns, are below the standard of those in the capital and other cities, the curriculum in use in the primary schools of the federal district presents a fair idea of the excellent standard established.

The primary schools are divided into first and second grade schools. To the first grade pupils are admitted from 7 to 13 years of age, and to the second grade from 13 to 15 years of age for male children. There are also separate schools for girls, who are admitted to the first grade at the age of 8 years.

The course of study in the first grade consists of reading, writing, Portuguese language; counting and calculating; arithmetic as far as the rule of three; the metric system as an introduction to the study of geometry, elements of geography and history, especially of Brazil; introductory lessons in physical science and natural history; moral and civic instruction; drawing; elements of music; gymnastics and military exercises; manual training for boys, and needlework for girls; practical ideas on surveying. This plan of education is divided into three courses: Elementary, for scholars from 7 to 9 years of age; intermediate, for those from 9 to 10; and higher, for those from 10 to 13.

In the second-grade schools the plan is similarly divided into three courses. It embraces penmanship; Portuguese; elements of French; higher arithmetic; elementary algebra; geometry and trigonometry; geography and history, particularly of Brazil; elements of physical sciences and natural history as applied to industries, agriculture, and hygiene; ideas of national law and political economy; drawing, ornamental, mechanical, and topographical; music; gymnastics and military exercises; manual training for boys, and needlework for girls. A diploma from the primary schools forms a certificate for entry into the secondary or normal schools.

The latest statistics obtainable give the number of public primary schools in the Republic as 7,017 and the number of pupils receiving instruction as about 300,000. There are also several hundred private schools. These statistics are not, however, very reliable, as public education in Brazil is largely under the control of the States, and there is no central bureau which collects and records educational

statistics. Statistics collected from the various States, and published in 1895, are as follows:

Amazonas: Population, 250,000. Public schools—male, 57; female, 37; mixed, 12; total, 108. Secondary education, 1 (the Lyceo). This State has also the Institute Amazonas, an orphan asylum and school, a public library, and a botanical museum.

Pará: Population, 700,000. Public schools—male, 349; female, 180; mixed, 54; total, 583; also, a normal college and a manual training school.

Maranhão: Population, 480,000. Public schools—male, 108; female, 59; total, 167. A lyceum for secondary education, a school for trades, and manual training.

Piauhy: Population, 300,000. Has 59 public schools, a normal school, and a public library.

Ceará: Population, 800,000. Public schools—male, 130; female, 90; mixed, 46; total, 266. A lyceum for secondary education, a normal school with a primary school attached for practice. There are also a theological seminary and several religious and private colleges and schools, a military school, and a public library.

Rio Grande do Norte: Population, 300,000. Has 135 public schools, a normal school, an institute for secondary education, and 14 private schools.

Parahiba: Population, 380,000. Has 83 public schools, a lyceum for secondary education, and various educational institutions assisted by the State, and several private schools.

Pernambuco: Population, 1,000,000. Has 495 public schools, a college of law, a college of arts, an institute for secondary education, a normal school, also 6 primary schools in the arsenals and barracks, a public library with 19,000 volumes and an archælogic and geographic institute.

Alagoas: Population, 500,000. Public schools—male, 69; female, 64; mixed, 24; total, 157. A lyceum for secondary education, with 4 professors of languages and 5 of sciences; a normal school founded in 1864, 7 private colleges, school of arts and trades.

Sergipe: Population, 180,000. Public schools—male, 54; female, 56; mixed, 70; total, 180. An institute for secondary education, a normal school, 7 private colleges, and 30 mixed private schools.

Bahia: Population, 1,500,000. Has 642 public schools; a lyceum for secondary education; a college of medicine; a free law school; school of arts and trades, with day and night schools; an academy of fine arts; 2 seminaries, 1 of sciences and 1 preparatory; several normal schools, and many private colleges; a public library in the capital, with 20,000 volumes, and many others in the State; an institute of history and geography, and an agricultural college.

Espirito Santo: Population, 90,000. Has 90 public schools, an institute for secondary education, and a college.

Rio de Janeiro: Population, 1,053,817. Has 627 public schools, a lyceum at Santos for secondary education, a normal school, and many private colleges.

Federal district: Population, 900,000. Has medical college, polytechnic school, military and naval schools, superior college of war, 2 colleges of law for higher education, 2 national institutions for secondary education, military preparatory school, normal school, and many private colleges, school of arts and trades, national institute of music, national school of fine arts, institute Benjamin Constant for higher education, national museum, historical institute, and several libraries.

São Paulo: Population, 2,000,000. Has 749 public schools, faculty of law, medicine and polytechnic school for higher education, many colleges for secondary education, a normal school, school of trades and mechanics, and a theological seminary and several religious schools.

Paraná: Population, 200,000. Public schools—male, 69; female, 39; mixed, 59; total, 167. Fifty-eight assisted private schools, 4 municipal schools, and 20 private schools, an institution for secondary education, a normal school, and a school of arts and trades.

Santa Catharina: Population, 260,622. Has 142 public schools, atheneum for secondary education, normal school, school of arts and trades, and a public library with 3,000 volumes.

Rio Grande do Sul: Population, 1,200,000. Has 450 public schools, a normal school, a night school under State direction, school of arts and trades, and a military school.

Minas Geraes: Population, 3,500,000. Has 1,890 public schools, a superior college of law, school of pharmacy, several institutes for secondary education, school of mines, 8 normal schools, school of arts and trades, and many private colleges and schools: also religious schools.

Goyaz: Population, 170,000. Has 85 public schools, an institute for secondary education, a normal school, and a theological seminary.

Matto Grosso: Population, 70,000. Has 42 public schools, a lyceum for secondary education, and a theological seminary.

Secondary Education.

Secondary education is organized on an excellent basis: the two establishments in the capital are each called Gymnasio Nacional, and are the outcome of the old Pedro II College.

The course of study extends over seven years and is as follows:

First year.—Arithmetic, Portuguese, French, English, or German, geography, drawing, music, and gymnastics.

Second year.—Arithmetic, Portuguese, French, English, or German, geography, drawing, music, gymnastics, and Latin.

Third year.—Arithmetic, algebra, Portuguese, French, English, or German, geography, drawing, music, Latin, gymnastics.

Fourth year.—Arithmetic, algebra, geometry and trigonometry, Portuguese, French, English, or German, geography, zoology and botany, universal history, drawing, music, Latin, gymnastics.

Fifth year.—Arithmetic, algebra, geometry and trigonometry, calculus and descriptive geometry, physics and chemistry, zoology and botany, Portuguese, French, English, or German, geography, universal history, drawing, Latin, Greek, music, gymnastics.

Sixth year.—Arithmetic, algebra, geometry and trigonometry, calculus and descriptive geometry, mechanics, astronomy, physics, chemistry, mineralogy, geology and meteorology, biology, Portuguese, French, English, or German, universal history, history of Brazil, geography, drawing, Latin, Greek, music, gymnastics.

Seventh year.—Arithmetic, algebra, geometry and trigonometry, calculus and descriptive geometry, mechanics, astronomy, physics, chemistry, mineralogy, geology and meteorology, biology, French, English, or German, Latin, Greek, geography, universal history, history of Brazil, general and national history of literature, history of philosophy, drawing, music, gymnastics.

A candidate for admission must not be less than 11 years of age or more than 14, and must present a certificate of age, also of vaccination, and that he is not suffering from any infectious or contagious disease. He must present a certificate of good conduct from the director of the school in which he received his primary education and of successful examination in the studies of the first-grade schools, or pass an examination in the branches included in that grade.

Higher Education.

The national establishments for higher or university education are the two law schools, one at São Paulo and the other at Pernambuco; two schools of medicine and pharmacy, one at Rio de Janeiro and the other at Bahia; the polytechnic school at Rio de Janeiro, and the school of mines at Ouro Prieto, in the State of Minas Gerae.

LAW SCHOOLS.

In the law schools the course of study covers five years. They have each 19 professors and 8 assistant professors.

The plan of studies in both schools is as follows:

First year.—Philosophy of law, Roman law, public and constitutional law.

Second year.—Civil law, criminal law, international law and diplomacy, political economy.

Third year.—Civil law, criminal law (especially military law and penitentiary regulations), financial science and national exchequer, commercial law.

Fourth year.—Civil law, commercial law (especially maritime law, bankruptcy, and judicial liquidation), theory of civil, commercial, and criminal procedure, medical jurisprudence.

Fifth year.—Forensic practice, science of administration and administrative law, history of law and especially of national law, legislation on private laws.

On the termination of the course students may receive the degree of bachelor of laws, which entitles them to practice law and opens to them a career in the public service.

MEDICAL SCHOOLS.

The two schools of medicine were established soon after the declaration of independence by Brazil. Since that time numerous reforms and improvements have been made in them in order to keep pace with the great increase of knowledge in medicine and its allied sciences, with the result that these two schools are now institutions of which any nation might be proud. The school at Rio de Janeiro has the additional advantage of connection with the magnificent hospital of the Misericordia with its 1,200 beds, which affords to the students unsurpassed advantages for observation of every form and phase of human disease and for clinical study and practice.

Both schools are organized on precisely the same basis. There are in each 29 chairs for the various courses, which are divided among the following branches: Medical physics; inorganic and medical chemistry; organic, biologic, analytic, and toxicologic chemistry; botany and medical zoology; materia medica, pharmacy and therapeutics; descriptive and medico-surgical anatomy; histology; physiology; anatomical and pathological physiology; general, medical, and surgical pathology; obstetrics; surgical operations; medical jurisprudence; hygiene, medical and surgical clinics; clinic of obstetrics and gynecology; medical and surgical clinics for children; ophthalmic clinic; clinic of skin and syphilitic diseases; clinic of mental and nervous disorders.

Sixteen laboratories and a large dissecting room are provided with the most complete and modern apparatus for practical experiment in the various branches of science. At the conclusion of the different courses of study diplomas are granted as doctor of medicine, pharmacist, obstetrician, or dentist.

The Polytechnic School.

The Polytechnic School has a general course, which all students must attend, and five special courses; students who pursue these and pass successful examinations may receive a degree of bachelor in physical or mathematical science, or certificates as civil, mining, industrial, mechanical, or agricultural engineer.

The general course is as follows:

First year.—Analytic geometry, differential and integral calculus, experimental physics, meteorology, geometrical drawing, water-color drawing.

Second year.—Calculus, mechanics, topography, land laws and colonization regulations, general chemistry, inorganic chemistry, chemical analysis, topographic drawing.

Third year.—Spherical trigonometry, theoretical and practical astronomy, mechanics applied to machinery, applied dynamics, mineralogy and geology, lectures on drawing geodetic and mechanical charts.

COURSE OF CIVIL ENGINEERING.

First year.—Study of building materials, technology and resistance of materials, stability of buildings, statics, hydraulics, water supply, fords, agricultural hydraulics, applied descriptive geometry, lectures on water supply and irrigation.

Second year.—Railroads and highways, bridges and viaducts, internal navigation, seaports, light-houses, political economy and finance, lectures on causeways, bridges, and hydraulic construction.

Third year.—Architecture, hygiene of buildings, sanitation of cities, machinery (with study of motors and industrial mechanics), constitutional law, administrative law and statistics applicable to engineering, lectures on architecture.

COURSE OF MINING ENGINEERING.

First year.—Same as first-year course of civil engineering.

Second year.—Development of mines, analytic chemistry, political economy and finance, lectures on geology and exploration of mines.

Third year.—General and special metallurgy, machinery (with study of motors and industrial mechanics), constitutional law, administrative law and statistics applicable to engineering, lectures on furnaces and metallurgic appliances.

COURSE OF INDUSTRIAL ENGINEERING.

First year.—Study of building materials, technology and resistance of materials, stability of buildings, statics, hydraulics, water supply, fords, agricultural hydraulics, organic chemistry, lectures on water supply and irrigation.

Second year.—Industrial physics, analytic chemistry, political economy and finance, lectures on industrial drawing.

Third year.—Industrial chemistry, machinery (with study of motors and industrial mechanics), constitutional law, administrative law and statistics applicable to engineering, lectures on plans for motors and operative machinery.

COURSE OF AGRICULTURAL ENGINEERING.

First year.—Same as first-year course of industrial engineering.

Second year.—Botany, zoology, political economy and finance, lectures on organic drawing.

Third year.—Agriculture, zootechnics, veterinary surgery, chemical analysis, constitutional law, administrative law and statistics applicable to engineering, lectures on agricultural machines and rural buildings.

School of Mines.

The School of Mines is located in the State of Minas Geraes and educates engineers for mining and metallurgical works and the various branches of civil engineering. The plan of education is divided into two courses, a fundamental course and a special course. The studies are arranged as follows:

FUNDAMENTAL COURSE.

First year.—Arithmetic, algebra, geometry, theory of derivatives; trigonometry, plane and spherical; physics, gravity, hydrostatics, heat and acoustics, chemistry, ideas of topography, botany, general and topographic drawing.

Second year.—Theory of equations, infinitesimal analysis, analytic geometry, mechanics, topography, physics, optics, electricity, magnetism and meteorology,

chemistry of metals, zoology, practical experiments in physics, chemistry, botany, zoology, and topography.

Third year.—Mechanics, elements of astronomy and geodesy, descriptive geometry, organic chemistry, systematic zoology and botany, practical work in chemistry, astronomy, geodesy, and topography, botanical and zoological excursions.

SPECIAL COURSE.

First year.—Mineralogy, physics and industrial chemistry, mining engineering and metallurgy (first part), stereotomy and woodworking, hydraulics and thermodynamics, machinery, practical work in mineralogy, mineralogical excursions, visits to manufactories and mines, designing and drawing machinery.

Second year.—Geology, mining engineering and metallurgy (second part), resistance of materials and stability of buildings, study of materials and methods of building, construction of machinery, study of railroads and highways, subterranean topography and practical work in same, practical work in geology and metallurgy, geological excursions, visits to mines and workshops, designing machinery.

Third year.—Geology, bridges and viaducts, hydraulic engineering, interior navigation, seaports, and agricultural hydraulics, land and mining laws, political economy, administrative law and statistics, architecture, practical work in geology and geological excursions, architectural designing, plans for mining engineering, railroads, bridges, viaducts, and architecture, visits to mines, smelting works, railroads, bridges and viaducts, and hydraulic works.

For admission to the fundamental course the candidate must pass an examination in French, Portuguese, English or German, history, geography, cosmography, history of Brazil, elementary mathematics, geometrical drawing, ideas of physics, chemistry, and natural history.

For admission the candidate must present a certificate of efficiency in the studies of the fundamental course of this school or of similar studies in the polytechnic, military, or naval schools, or of foreign schools whose grade is similar.

From the most distinguished graduates in the special course the Government is empowered to send one or two, at the cost of the nation, to perfect their studies in the United States or Europe.

Military and Naval Schools.

Military and naval schools comprise a military preparatory school, secondary military and naval schools, and military and naval colleges for higher education. There are also schools for artillery and torpedo practice, school of marksmanship, etc.

National Academy of Fine Arts.

The Academy of Fine Arts is devoted to instruction in painting, sculpture, architecture, and engraving. The courses are divided into a general course and the special courses of painting, sculpture, architecture, and engraving.

The general course extends over three years, as follows:

First year.—Natural history, mythology, linear drawing, elementary studies in figure drawing.

Second year.—Physics and chemistry applicable to the arts, descriptive geometry, archæology and ethnology, figure drawing.

Third year.—History of art, perspective and shading, elements of decorative architecture and elementary ornamental drawing, figure drawing.

THE SPECIAL COURSE OF PAINTING.

First year.—Artistic anatomy and physiology, drawing from living model.

Second year.—Painting.

THE SPECIAL COURSE OF SCULPTURE.

First year.—Artistic anatomy and physiology, drawing from the living model, ornamental sculpture.

Second year.—Sculpture of statuary.

THE COURSE OF ARCHITECTURE.

First year.—Estimates and mechanics, building materials and their strength, technology, ideas of topography, topographical plans and drawing.

Second year.—Architecture, history of architecture and special legislation, theoretical and practical stereotomy, architectural drawing, plans and designs.

THE COURSE OF ENGRAVING.

First year.—Artistic anatomy and physiology, drawing from the living model, ornamental sculpture.

Second year.—Engraving medals and on precious stones.

It has a gallery of sculpture and an art library containing 2,323 volumes. The staff of the academy comprises a director, a secretary, and a librarian, 18 professors, and 8 assistants. It had, in 1896, 98 pupils, of whom 20 were females.

National Institute of Music.

The Brazilians are a music-loving people, and the national institute is a worthy representation of their taste for the art. Its organization is intended to give a sound and complete musical education in all its branches.

The courses of instruction are divided as follows:

ELEMENTARY COURSE.

This is divided into two sections: (1) Course of elementary theory, including rudiments of musical theory, exercises in sol-fa, writing music, and dictation of easy rhymes; (2) course of individual solfeggio.

VOCAL COURSE.

This is divided into two sections: (1) Preparatory course of choral singing, extending over two years; (2) course of solo singing, extending over three years.

INSTRUMENTAL COURSE.

Extends over three years and is subdivided into sections for the following instruments: Piano, organ, harp, violin, violoncello, contrabass, flute, oboe, clarinet, bassoon, horn, trumpet, and trombone.

PREPARATORY AND COMPLEMENTARY COURSE OF COMPOSITION.

Is divided into three courses: (1) One year—harmony and accompaniments; (2) two years—counterpoint and fugue; (3) one year—composition.

LITERARY COURSE.

One year—including general history of music in all places and all ages; acoustics and esthetics of music.

COMBINED COURSE.

Includes higher education in choral singing and course for orchestral instrumentation, course of chamber music for string and wind instruments and piano, course of chamber music for string instruments.

Regular courses of concerts are given by the professors and pupils, to which the public is admitted by payment of a small fee.

The faculty consists of a director and a staff of professors whose number is regulated by the number of pupils and the requirements of the classes.

The National Museum.

This is an excellent institution, which is divided into four sections, viz: (1) Zoology, comparative anatomy, and embryology; (2) botany; (3) mineralogy, geology, and paleontology; (4) anthropology, ethnology, and archæology.

It has a good library and two laboratories for experimental purposes and preparation of specimens. Students approved by the faculty are admitted to the laboratories, lectures, and collecting excursions. A review is published by the scientific staff of the museum with the title of "Archivos do Musêo Nacional," which contains the results of their researches and experiments, and articles of great scientific value.

The National Library.

The National Library is an admirably arranged institution containing an immense collection, which is divided into three sections: (1) Books and maps; (2) manuscripts; (3) prints and coins. It is open to the public from 10 a. m. until 9 p. m. on every day in the year except Sundays and national holidays and the periods between the 1st and 15th of January and the 15th and 31st of December.

There is also in Rio de Janeiro a school for the education of the blind and another for deaf-mutes.

The astronomical observatory of Rio publishes its annals in Portuguese and French, giving results of its observations.

The Pedagogium.

The pedagogium is an institution which forms a central power for promoting public instruction. It was created primarily to carry out the reforms in education initiated by Benjamin Constant. It publishes a magazine entitled Revista Pedagogica, and other works relating to educational matters. It holds evening sessions for disseminating information respecting agricultural science, pedagogy, natural history, and moral and civic education. It holds conventions of literary men and well-known professors and annual pedagogical expositions. It is located in the building of the Academia Braziliera du Letras, recently founded for the purpose of cultivating the national language and literature.

CHAPTER XXIII.

DENTAL EDUCATION IN THE UNITED STATES.

EXHIBIT A.—*Containing a statement of the views of professional authorities in the United States regarding the separation of the branch of dentistry from general medicine.*

It appears from the records that in the United States the branch of minor surgery known as dentistry received great attention quite as early as in Europe, if not earlier, and quickly became a specialty. Instruction in dentistry in Germany was given by the primitive process of apprenticeship, in a preceptor's office, and not until 1884–85 in a university, while in America as early as in 1840 a school of dentistry was established in the city of Baltimore under the name of the Baltimore College of Dental Surgery. In 1845 another school was founded in Cincinnati under the name of the Ohio College of Dental Surgery. In 1868 still another was established as a dental department of Harvard University, and in 1874 still another as the dental college of the University of Michigan. By October 20, 1884, when the study of dentistry was first introduced as a subordinate department of medicine of the University of Berlin, there were in the United States at least twelve reputable colleges of dentistry, having courses of two or three years, that of Berlin University having two years.

It follows from the above statements that dentistry in the United States has been developed and specialized until colleges of dentistry occupy a position peculiarly their own.

It should be noted that the degree in dental science is not a commission to practice medicine. The course of every dental college in good standing emphasizes anatomy, physiology, toxicology, and materia medica and therapeutics, but it is punishable by fine or imprisonment for a dentist as such to practice the profession of a physician. In the specialization of dentistry in the United States the practitioner is considered not as a physician or surgeon, but as a specialist in the preservation and restoration of teeth, in which he is much more than a physician, which he is by education only so far as to know the conditions where a physician should be consulted. It is to be added that the laws of the several States in many instances confine the dental operations of a physician and surgeon to pulling teeth.

The legal direction and control given to this specialization in dentistry is brought out by the laws of New York and Pennsylvania which follow.

In 1895 the legislature of the State of New York passed a law under which the board of dental examiners, in connection with the regents of the University of the State of New York, shall not examine any candidate in order to ascertain his fitness for a license to practice dentistry unless said candidate has graduated with a dental degree from a registered dental school, or who, if a graduate from a registered medical school with the degree of doctor of medicine, has pursued thereafter a course of special study in dentistry for at least one year in a registered dental school, or holds a diploma or license conferring full right to practice

dentistry in some foreign country, which license has been granted by some registered authority.

It may be added that in June, 1897, the regents of the University of the State of New York adopted the following regulations:

No degree in dentistry shall be conferred in this State until the candidate has satisfactorily completed a course of not less than three years in an institution registered by the regents of the University as maintaining proper dental standards, nor before the candidate has filed with the institution conferring it the certificate of the regents that three years before the date of the degree he has either been graduated from a registered college or satisfactorily completed a full course in a registered academy or high school, or has a preliminary education considered and accepted by the regents as fully equivalent, or has passed regents' examinations representing, for degrees conferred in 1898, one year of academic work; for degrees conferred in 1899, two years of academic work, and for degrees conferred in 1900 a full high-school course.[1]

In Pennsylvania the law of 1876 authorized physicians and surgeons to practice dentistry, but the law of 1893 requires every one who desires to be licensed to practice dentistry to be a graduate of a reputable institution having a three-years' course and recognized by the board of dental examiners. Physicians and surgeons, however, may extract teeth without being liable under the law to fine or imprisonment.

Two degrees are given—one, doctor of dental medicine, the other of dental surgery. In 1840 the first college of dentistry in existence adopted for its seal a circle bearing the inscription "Academia chirurgical dentium" and a motto "Artis scientia lumen" above a lamp supported on books. The college therefore had the name of the Baltimore College of Dental Surgery, and its degree was and is now doctor of dental surgery. With two exceptions, according to the information now before this office, this degree is given by all the dental colleges of the United States, of which there are at least 46. The degree of doctor of dental medicine, which foreshadowed the demand that dentistry be regarded as a specialty of medicine under the name of oral medicine or surgery, was inaugurated by Harvard University when establishing the "Faculty of dental medicine" in 1867.

The control of the curriculum of the several colleges of dentistry is more centralized than that of any other class of schools in the United States, taking the country as one whole. The bodies exercising this control are three: First, the National Association of Dental Examiners—that is, an association of the official boards in the several States who pass upon the qualifications of applicants for license to practice dentistry—for members of the dental fraternity will not submit to an examination by physicians who are not themselves trained specialists in dentistry; second, the National Association of Dental Faculties, and, third, the association of practitioners called the National Dental Association. If the Association of Dental Faculties have not recognized or will not recognize a college of dentistry, the Association of Dental Examiners will not give respect to its diploma. All these associations have the common object to perfect the science of dentistry, while in the case of the Association of Dental Faculties the object is specifically to protect the value of the dental diplomas of the several schools in the United States, and, in the case of the Association of Dental Examiners, to protect the public. The three associations are now acting in concert. They have caused schools of dentistry having a two-years' course to add one year more to that course, and the proposition has already been made that on and after the session of 1899-1900 the regular session of colleges belonging to the Association of Dental Faculties shall be extended to four years. Schools that do not comply with the rules formulated by these associations are declared to be "not in good standing."

The National Association of Dental Examiners at its meeting July, 1897, passed the following resolutions: "Each dental college in order to be placed on the list of recognized colleges must have a teaching faculty composed of at least six indi-

[1] Regents' Bulletin, No. 38, June, 1897, p. 451.

viduals, and said faculty must teach the following branches: Operative dentistry, dental pathology, dental prosthetics, and oral surgery. Also the six branches: Anatomy, physiology, general pathology (fundamentals), materia medica and therapeutics, and general surgery. Their students must also be taught the subjects of chemistry and bacteriology in laboratories adapted to the purpose and under suitable instructors. Each college must possess in addition suitable lecture rooms, a well-appointed dental infirmary, and a general prosthetic laboratory, and must also furnish in this way systematic instruction to its students. It is inadvisable for a member of an examining board to be connected with a dental college in any capacity whatever."

The Association of Dental Faculties appointed (August, 1897) a committee to confer with a committee of the Association of Dental Examiners, so that a new code of rules might be prepared which would be advantageous to both associations and aid their mutual desire to advance the standard of dental colleges and dental practice. The list of colleges recognized by the Association of Dental Examiners is given on a succeeding page.

EXHIBIT B.—*Admission requirements of dental schools in the United States demanded by the National Association of Dental Faculties, 1899.*

To get a clear idea of the admission requirements of dental schools in the United States we should first consider the minimum standard established by the American schools practically as a whole, and secondly, we should take up the requirements of a few of the schools which have adopted the highest standards. Between these extremes lie the intermediate standards. All of the dental schools in the United States, except three or four, are members of the National Association of Dental Faculties.

CODE OF RULES REGULATING THE ADMISSION OF STUDENTS.

[In effect for session of 1899-1900.]

PRELIMINARY EXAMINATION.

1. The following preliminary examination shall be required of students seeking admission to colleges of this association:

(*a*) The minimum preliminary educational requirement of colleges of this association shall be a certificate of entrance into the second year of a high school or its equivalent.

(*b*) Nothing in this rule shall be construed to interfere with colleges of this association that are able to maintain a higher standard of preliminary education.

LIMITING THE TIME FOR THE RECEPTION OF STUDENTS.

2. No member of this association shall give credit for a full course to students admitted later than ten days after the opening day of the session, as published in the announcement.

3. In case one is prevented by sickness, properly certified to by a reputable practicing physician, from complying with the foregoing rule, the time of admission shall not be later than twenty days from the opening day.

4. In cases where a regularly matriculated student, on account of illness, financial conditions, or other sufficient cause, abandons his studies for a time, he may reenter his college at the same or a subsequent session, or where, under similar circumstances, he may desire to enter another college, then, with the consent of both deans, he may be transferred; but in neither case shall he receive credit for a full year unless he has attended not less than 75 per cent of a six-months' course of lectures.

ADMISSION TO ADVANCED GRADES ON CERTIFICATES.

5. The colleges of this association may receive into the advanced grades of juniors and seniors only such students as hold certificates of having passed examinations in the studies of the freshman or junior grades, respectively. All students who

have successfully passed their examinations for advanced standing shall have their certificates given or mailed to them within *thirty days* after such examinations shall have been completed. Such certificates to be pledges to any college of the association to whom the holder may apply that the requisite number of terms have been spent in the institutions by which the certificates were issued. * * *

6. This certificate shall, by correspondence, be verified by the dean of the college by which it was issued. Without such certificate no student shall be received by any college of this association for admission to the advanced grade except on such conditions as would have been imposed in the original school, and these to be ascertained by conference with the school whence he came.

STANDING OF STUDENTS HOLDING CERTIFICATES FROM DENTAL COLLEGES IN FOREIGN COUNTRIES.

7. In cases of persons holding certificates from colleges of dentistry in foreign countries, they shall be required to furnish properly attested evidence of study, attendance upon lectures, examinations passed satisfactorily, etc., the same as required of students coming from our own institutions.

ADMISSION OF GRADUATES OF MEDICINE.

8. A diploma from a reputable medical college may entitle the holder to enter the second or junior grade in colleges of this association, and he may be excused from attendance upon the lectures and examinations upon general anatomy, chemistry, physiology, materia medica, and therapeutics.

ADMISSION OF UNDERGRADUATES OF MEDICINE.

9. Undergraduates of reputable medical colleges who have regularly completed one full scholastic year, having attended at least 75 per cent of a five-months' term and passed a satisfactory examination in the studies of the freshman year, may be admitted to the junior grade in colleges of this association, subject to other rules governing admission to that grade.

ADMISSION OF GRADUATES OF PHARMACY AND VETERINARY MEDICINE.

10. The colleges of this association may matriculate as juniors graduates of registered schools of pharmacy and veterinary medicine, subject to the examination requirements of each school of the association.

ATTENDANCE, EXAMINATIONS.

11. Attendance upon three full courses of not less than seven months, or upon four terms of six months each, in separate academic years, shall be required before examination for graduation. The year shall be understood to commence August 1 and end the following July 31.

12. The examinations conducted by the colleges of this association shall be in the English language only. * * *

Membership of the National Association of Dental Faculties, January, 1899.

State.	City.	Name.
Alabama	Birmingham	Birmingham Dental College.
California	San Francisco	University of California, Dental Department.
Do	do	Dental Department, College of Physicians and Surgeons.
Colorado	Denver	University of Denver, Dental Department.
Do	do	Colorado College of Dental Surgery.
District of Columbia.	Washington	Columbian University, Dental Department.
Do	do	Howard University, Dental Department.
Do	do	National University, Dental Department.
Georgia	Atlanta	Atlanta Dental College.
Do	do	Southern Medical College, Dental Department.
Illinois	Chicago	Chicago College of Dental Surgery.
Do	do	Northwestern University, Dental School.
Indiana	Indianapolis	Indiana Dental College.
Iowa	Iowa City	State University of Iowa, Dental Department.
Kentucky	Louisville	Louisville College of Dentistry.
Maryland	Baltimore	Baltimore College of Dental Surgery.
Do	do	Baltimore Medical College, Dental Department.
Do	do	University of Maryland, Dental Department.

Membership of the National Association of Dental Faculties, etc.—Continued.

State.	City.	Name.
Massachusetts	Boston	Boston Dental College.
Do	do	Harvard University, Dental Department.
Michigan	Ann Arbor	University of Michigan, Dental Department.
Do	Detroit	Detroit College of Medicine, Dental Department.
Minnesota	Minneapolis	University of Minnesota, College of Dentistry.
Missouri	Kansas City	Kansas City Dental College.
Do	do	Western Dental College.
Do	St. Louis	Marion-Sims College of Medicine, Dental Department.
Do	do	Missouri Dental College.
Nebraska	Omaha	University of Omaha, Dental Department.
New York	Buffalo	University of Buffalo, Dental Department.
Do	New York	New York College of Dentistry.
Do	do	New York Dental School.
Ohio	Cincinnati	Cincinnati College of Dental Surgery.
Do	do	Ohio College of Dental Surgery.
Do	Cleveland	Western Reserve University, Dental Department.
Do	Columbus	Ohio Medical University, Dental Department.
Pennsylvania	Philadelphia	Pennsylvania College of Dental Surgery.
Do	do	Philadelphia Dental College.
Do	do	University of Pennsylvania, Dental Department
Do	Pittsburg	Pittsburg Dental College, Department Western University of Pennsylvania.
Tennessee	Knoxville	Tennessee Medical College, Dental Department.
Do	Nashville	Central Tennessee College, School of Dentistry.
Do	do	University of Tennessee, Dental Department.
Do	do	Vanderbilt University, Dental Department.
Virginia	Richmond	University College of Medicine, Dental Department.
Washington	Tacoma	Tacoma College of Dental Surgery.
Wisconsin	Milwaukee	Milwaukee Medical College, Dental Department.
Canada	Toronto	Royal College of Dental Surgeons of Ontario.

Total, 47. Taken from Proceedings of the National Association of Dental Faculties, 1898, page 4.

EXHIBIT C.—*I. The course of the dental school of Harvard University, 1868; requirements for admission, 1897–98; requirements for a degree, 1898.—II. Requirements for admission and graduation, University of Pennsylvania, 1898.—III. Course of dentistry in University of Michigan, 1875–76; requirements for admission and schedule of studies, 1897–98.—IV. Requirements for admission, schedule of studies, and requirements for graduation, Vanderbilt University, 1897–98.*

I. HARVARD UNIVERSITY.

THE COURSE OF THE DENTAL SCHOOL OF HARVARD UNIVERSITY, 1868.

Anatomy and physiology: The lectures on these branches are largely illustrated by the anatomical preparations and models of the Warren Museum, and by an extensive series of colored diagrams and drawings. The anatomy and physiology of all the organs especially involved in dentistry will be made the objects of particular attention. In addition, instruction is given upon the use of the microscope as applied to the branches taught. A very ample collection of microscopic preparations is employed in illustrating this department of study.

Practical anatomy: Anatomical material is abundantly furnished at moderate cost. The dissecting room is supplied with brilliant gas reflectors and abundant water fixtures, and is furnished with the anatomical plates of Bourgery, and with excellent diagrams of the nervous system, etc. The demonstrator will be present daily, and will superintend the dissecting.

Surgery: The surgical lectures are illustrated by colored drawings and by recent and morbid specimens. The most recent implements are exhibited and the use explained. Operations upon the dead body in the lecture room form part of the illustrations of these lectures.

Clinical surgery is taught at the Massachusetts General Hospital and at the city hospital. Students have ample opportunity to become familiar with fractures and minor surgery.

Chemistry: Special attention is given to the bearings of chemistry upon physiology and pathology, and to the physical and chemical properties of the metals and their alloys.

Operative dentistry: Instruction is both didactic and practical. The development of the teeth, treatment of irregularities, origin of decay, etc., are taught with the view of making the student practically acquainted with the modern improvements in dental science.

Dental pathology and therapeutics: The professor will teach the application of the general principles of medicine to the specialty of dentistry and the medicines used in dentistry, etc.

Mechanical dentistry: The principles governing the manufacture of artificial teeth, etc.

REQUIREMENTS FOR ADMISSION TO HARVARD DENTAL SCHOOL.

[From catalogue of 1897-98.]

All candidates for admission, except those who have passed an examination for admission to Harvard College or any reputable college of letters or the Lawrence Scientific School, must present a degree in letters, science, or medicine from a recognized college or scientific school, or pass an examination in the following subjects:

1. *English.*—Every candidate will be required to write, legibly and correctly, an English composition of not less than 200 words, and also to write English prose from dictation.

2. *Physics.*—A competent knowledge of physics, such as may be obtained from Gage's Elements of Physics, or any other high-school physics.

3. *Latin or French.*—The translation at sight of simple Latin or French prose.

4. *An elective subject.*—Each candidate for admission must also pass an examination in one of the following subjects: German, the elements of algebra or plane geometry, botany, or chemistry.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class, but before taking the degree, examinations in all the studies must have been satisfactorily passed.

Graduates of recognized dental schools will be admitted without examination to the courses in operative and mechanical dentistry, but attendance on such courses does not entitle a student to examination for the degree nor to a certificate of attendance.

The examinations for admission are conducted in writing. In judging the work of the candidate the spelling, grammar, and construction are considered.

DEGREE OF DOCTOR OF DENTAL MEDICINE, 1898.

The degree of doctor of dental medicine (dentariæ medicinæ doctor) may be conferred upon any candidate of adult age and of good moral character who has passed all the required examinations and convinced the professors and instructors in operative and mechanical dentistry of his ability to meet satisfactorily the requirements of his art. He must also give evidence of having studied medicine or dentistry in some recognized school three full years, the last continuous year of which must have been spent at this school.

He must also deposit with the dean, to be placed in the museum of the school, a specimen of mechanical dentistry, or of practical or pathological anatomy, which he has prepared during the course under the eye of the instructor.

II. University of Pennsylvania, Dental Department.

ADMISSION REQUIREMENTS.

The high standard which the University of Pennsylvania has always maintained in the college and medical departments is well known. In order that the entrance requirements shall be in harmony with those of the other departments, the university will hereafter require the following preliminary education in the dental department: For the session of 1898-99, a certificate of high-school entrance; for the session of 1899-1900, a certificate of two years of high-school attendance; for the session of 1900-1901, a diploma of an approved high school having a three years' course, or a certificate showing three years' attendance at a high school having a four years' course, or certificates from other schools showing equivalent education. In lieu of such diplomas or certificates the candidate will be required to pass a matriculate examination, which shall be the equivalent of that necessary to obtain the certificate above mentioned. It is thought that the adoption of this course will

have a check on the large number of students now in this department. Yet the faculty trusts that the public will appreciate the higher excellence of graduates from this school.[1]

REQUIREMENTS FOR GRADUATION.

At the close of the third year a student who has passed all examinations satisfactorily receives the degree of doctor of dental surgery (D. D. S.) on the following conditions:

I. He must be of age (21 years) and of good moral character.

II. He must have passed a satisfactory examination in all branches of curriculum; must have studied the practical instruction in all departments; his last course of instruction must have been at this university.

III. He must have dissected at least two parts; must have performed thoroughly and satisfactorily all the usual dental operations; must have undertaken at least one artificial case and brought it completed, with the patient, to the professor of mechanical dentistry; must have prepared a specimen case to be deposited in the university collection.

The course requires attendance three years, about nine months each year. Students of the first-year class are required to attend instruction in the following branches and to pass examinations at close of the term: (1) Chemistry; (2) dental materia medica; (3) elementary anatomy, including osteology and histology; (4) physiology, excepting the muscular and nervous systems; (5) histology; (6) osteology; (7) elementary, operative, and mechanical technics; (8) attend lectures on mechanical dentistry.

Second year.—(1) Students of the second-year class attend lectures on anatomy and physiology, operative and mechanical dentistry, and add thereto dental pathology and therapeutics, and clinical dentistry; (2) they pursue operative and mechanical work; (3) final examinations of the second year are upon anatomy, physiology, and progress in operative and mechanical dentistry.

Third year.—(1) Continue the practical work in the operative and mechanical dentistry, and the lectures on these subjects, together with dental pathology and therapeutics, and clinical dentistry. (2) At the close of the term students must pass examinations in these branches.

III. University of Michigan.

COURSE IN THE COLLEGE OF DENTISTRY, 1875-76.

At the session of the legislature of Michigan in 1875, in compliance with a request from the dental association and many citizens of the State, an appropriation was made for the establishment of a dental college in connection with the department of medicine and surgery of the University of Michigan. The course consisted of chemistry, materia medica and therapeutics, anatomy, physiology, and clinics. Or more particularly: First year—anatomy with dissection, physiology, elementary chemistry, materia medica, and mechanical dentistry; second year—pathology, therapeutics, general and special surgery, organic and analytic chemistry, and operative dentistry. A graduate of the medical college might enter the second-year class of the college of dentistry and if found qualified might graduate after one year had been devoted exclusively to the study of dentistry. The requirements for the degree were the same as those of the Harvard University Dental College.

REQUIREMENTS FOR ADMISSION, 1897-98.

Candidates for admission must be at least 18 years of age and of good moral character.

Matriculates in the other scientific departments of the university, and graduates of recognized colleges, academies, or high schools, are admitted without further examination on presentation of proper diploma or certificate. Commercial and English diplomas will only be credited so far as they include the studies of the entrance examination, viz, English, history, mathematics, physics, Latin, botany, zoology, physical geography, and physiology.

The course of study covers three years, and each session extends from October 1 to June 15.

[1] New York Medical Journal, April 23, 1898, p. 578.

SCHEDULE OF STUDIES.

First year.—Osteology and anatomy, chemistry, prosthetic dentistry, dental laboratory work, histology.

Second year.—Anatomy, physiology, bacteriology, prosthetic dentistry, operative principles and materials, regulating and porcelain technique, dissection, qualitative chemistry.

Third year.—Dental surgery and pathology, oral surgery, dental medicine, orthodontia and oral deformities, prosthetic clinic, operative dentistry, operative clinic. Satisfactory examination must be passed in each study.

Candidates for the degree of doctor of dental surgery must be 21 years of age, of good moral character, and must have made satisfactory attainments in all the branches of the course of study. They must present for inspection practical operations performed in the college.

IV. VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

Application for admission must conform to the regulations of the National Association of Dental Faculties. Before admission to the junior class, students will be examined as to their primary education. Satisfactory evidence of having received a collegiate degree or of having graduated at a recognized college or high school, or a teacher's certificate of proficiency, will exempt the candidate from the preliminary examination.

The course of instruction covers three years, with attendance six months in each year.

First year.—Clinical dentistry, histology, chemistry, dental anatomy, prosthetic dentistry, anatomy and physiology, materia medica, therapeutics and hygiene, prosthetic and operative technics. Students are also required to attend the infirmary and laboratory clinics.

Second year.—Clinical, operative, and prosthetic dentistry, metallurgy, anatomy and physiology, practical anatomy, materia medica, therapeutics and hygiene, pathology and oral surgery, laboratory instruction in prosthetic dentistry, operative clinic and clinical practice, crown and bridge work. Students also attend the infirmary and laboratory clinics.

Third year.—Clinical, operative, and prosthetic dentistry, dental medicine, pathology and oral surgery, metallurgy, dental jurisprudence, pathological and bacteriological laboratory, operative clinic, practice in prosthetic dentistry, and crown and bridge work.

REQUIREMENTS FOR GRADUATION.

Twenty-one years of age; good moral character; attendance upon three courses of lectures, laboratory and infirmary instruction; satisfactory examinations in each year's course of study. Student must present to the professor of operative dentistry some patient upon whom he has performed the usual dental operations. He must deposit a specimen of his mechanical work and submit at least one practical case.

EXHIBIT D.

SYNOPSIS OF STATE LAWS GOVERNING THE PRACTICE OF DENTISTRY.[1]

There is given first a statement in a few words of what is necessary in order to secure a license to practice dentistry in each of the several States; that is, whether a license is granted after examination only, or upon presentation of a diploma from a dental school recognized by the State board of dental examiners, or upon

[1] Special acknowledgment is made of information received from Polk's Dental Register.

presentation of a diploma from any chartered dental school. Several States require both the presentation of a diploma from a dental school recognized as reputable by the State board of dental examiners, and the passing of an examination before the State board. In such cases this fact is stated. Afterwards a fuller statement of the laws of the different States is given. As changes are frequently being made in the laws governing the practice of dentistry in the various States, the tendency being to demand higher professional attainments, it would be well for young men desiring to know the law of any particular State with a view to locating for the practice of dentistry to make inquiry of the board of examiners of such State.

Alabama	An examination before the State board of dental examiners is required.
Arizona	A diploma of a reputable dental school or an examination after two years' practice of dentistry.
Arkansas	Diploma of a dental school. The State board determines as to the validity of the diploma.
California	Examination or diploma of a reputable dental college.
Colorado	Examination after receiving a diploma from a reputable dental school.
Connecticut	Examination after receiving a diploma from a reputable dental school or after three years' study or practice of dentistry.
Delaware	Examination or diploma from an approved dental college.
District of Columbia	Examination or diploma of a dental college requiring three years' attendance.
Florida	(See the synopsis on another page.)
Georgia	Examination after receiving a diploma of a dental school recognized by the board, or after being licensed upon examination by another State board.
Idaho	Dental law passed in February, 1899. No information yet as to the requirements.
Illinois	Examination or diploma of reputable dental college.
Indiana	Do.
Iowa	Do.
Kansas	Do.
Kentucky	Examination or dental diploma.
Louisiana	Examination or diploma of a recognized dental college.
Maine	Examination.
Maryland	Examination after graduating in dentistry, or on diploma without examination, in discretion of board.
Massachusetts	Examination.
Michigan	Examination or diploma of dental school under certain conditions.
Minnesota	Examination after obtaining diploma of a recognized dental school.
Mississippi	Examination.
Missouri	Diploma of reputable dental college, or examination after having studied dentistry three years, or after having obtained a license from a dental board in another State.
Montana	Diploma of dental school recognized by the State dental board, or examination after three years' study of dentistry.
Nebraska	Examination or diploma of reputable dental college.
Nevada	Examination or diploma of college recognized by the board as satisfactory.
New Hampshire	Examination.
New Jersey	Examination after obtaining a diploma from a dental school recognized as reputable by the board of dental examiners, etc. (see synopsis of law on another page).
New Mexico	Examination or diploma of recognized dental school.
New York	Examination after obtaining a diploma from a recognized dental school, etc.; a certificate may also be granted without an examination, under certain conditions, to anyone who has practiced dentistry for five years under the laws of another State or country.
North Carolina	Examination.
North Dakota	Examination or diploma of recognized dental school.
Ohio	Do.
Oklahoma	Do.
Oregon	Do.
Pennsylvania	Examination after receiving a diploma from a dental school recognized by the board.
Rhode Island	Examination.
South Carolina	Do.
South Dakota	Diploma of a recognized dental school or examination.
Tennessee	Do.
Texas	Do.
Utah	Do.
Vermont	Examination.
Virginia	Do.
Washington	Examination; but no one is admitted to examination unless a graduate of a dental college recognized by the board or having practiced dentistry ten years.
West Virginia	Examination.
Wisconsin	Examination or diploma of reputable dental college.
Wyoming	Diploma of a recognized dental school.

Alabama.—There is a board of dental examiners consisting of 5 members, each serving five years.

Licenses are granted after examination (fee $5). Licenses to be presented for record to the judge of the county probate court; fee $1.

Penalty for practicing without a license, a fine of $50 to $300.

Law as amended February 28, 1887.

Board of examiners: George Eubank, Birmingham; C. P. Robinson, Mobile; J. A. Hall, T. P. Whitby, R. B. Chapman.

Alaska.—There is no law governing the practice of dentistry in Alaska.

Arizona.—There is a board of registration in dentistry consisting of 5 members, each to serve three years.

A certificate is granted to anyone holding a diploma of a reputable dental college (fee $5); also to anyone passing a successful examination (examination fee $25, not returnable). No one is eligible for examination unless he has had two years' actual practice or has received a diploma from some reputable dental college. The certificate is to be registered with the county recorder (fee $2).

Penalty for violation of law, a fine of $100 to $200 or imprisonment six months, or both fine and imprisonment.

Act approved April 3, 1893, and amended in 1895.

Board of examiners: R. E. Holbrook, Phœnix; William Lentz, Phœnix; L. C. Gonzales, George Holmes.

Arkansas.—Board of dental examiners of 5 members, each to serve four years.

The board decides upon the validity of diplomas presented and issues certificates thereon. Fee for each certificate, $5.

Penalty for violation of law, fine of not less than $10 nor more than $100.

Act approved April 4, 1887.

Board of examiners: W. H. Marshall, Little Rock; W. H. Buckley, Little Rock; H. C. Howard, L. K. Land, J. S. Stilwell.

California.—There is a board of examiners of 7 members, each of whom serves four years.

Certificates are granted after examination or on diploma of a reputable dental college when the board is satisfied as to the character of the institution. "The said board of examiners shall charge each person applying to or appearing before them for examination for a certificate of qualification a fee of $10, which fee shall be in no case returned." Certificates must be registered with the county clerk (fee $1), or they will be forfeited and not regranted except on payment to the board of $25.

Penalty for violation of law, fine of $50 to $200 or imprisonment six months; one-half of the fine to go to the common-school fund of the county, the other half to the person whose information leads to the prosecution and conviction of the offender.

Act approved March 12, 1885, and amended in 1893.

Officers of board of examiners: F. W. Bliss, Santa Cruz, president; W. A. Moore, Benicia, secretary.

Colorado.—There is a State board of dental examiners of 5 members, who serve two years.

Licenses are granted after examination only (fee $10, not returnable in case of failure to pass the examination), and no one is eligible to examination unless holding "a diploma of graduation of some reputable dental college, dental school, or university dental department duly authenticated by the laws of this State or some other of the United States."

Penalty for violation of any of the provisions of this act, fine of not less than $100 nor more than $300.

Act of 1897.

Officers of board of examiners: J. N. Chipley, Pueblo, president; F. F. Graves, 334 Cooper Building, Denver, secretary.

Connecticut.—Dental commissioners, 5 members, each to serve two years.

Every applicant for a license shall comply with the following requirements: (1) He shall have received a diploma or other sufficient certificate of honorable graduation from some reputable dental college or medical college having a department in dentistry, and duly recognized by the laws of the State wherein the same is situated; or he shall have spent as a pupil or assistant at least three years under the instruction and direction of some reputable dentist; or he shall have had at least three years' continuous practice as a dentist. (2) He shall be examined by the commissioners as to his professional knowledge and skill. A fee of $25 shall be paid at the time of application for a license, but if it is not granted $20 shall be returned.

Penalty for violation of law, fine of $20 to $50.

License may be revoked "for good and legal cause," or if holder "is unfit or incompetent."

Passed May 25, 1893.

Officers of dental commissioners: C. P. Graham, Middletown, president; George L. Parnele, Hartford, recorder.

Delaware.—Board of examiners, 5 members, each to serve four years.

"SEC. 1. That it shall be unlawful for any person who is not, at the time of the passage of this act, a recognized practitioner of dentistry in this State, and so recognized by the profession, to practice dentistry, unless he or she shall have obtained a certificate, as hereinafter provided, or shall hold a diploma from a reputable dental college, and so recognized by the board herein created.

"SEC. 5. *Be it enacted*, That any and all persons who shall desire to commence such practice, after the passage of this act, shall appear before said board, at any of its regular meetings, and be examined with reference to their knowledge and skill in dental surgery, and if the examination of any such person or persons shall prove satisfactory to said board, the board of examiners shall issue to such persons as they shall find to possess the requisite qualifications a certificate to that effect, in accordance with the provisions of this act, upon the payment of one dollar for such certificate; all certificates issued by said board shall be signed by its officers, and such certificates and diplomas, granted as aforesaid, shall be prima facie evidence of the right of the holder to practice dentistry in the State of Delaware."

Penalty for violation of law, fine $50 to $300, or imprisonment not more than 6 months.

Passed March 31, 1885.

Thomas H. Gilpin, Middletown, secretary of board of examiners.

District of Columbia.—There is a board of dental examiners of 5 members, each to serve five years.

All graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certification fee ($1), without examination as to their qualifications. All others must pass a satisfactory examination in theory and practice of dentistry (fee $10, and 50 cents for certificate).

Penalty, fine $50 to $200, and in default of payment of such fine imprisonment not less than thirty nor more than ninety days. The board may charge fees not exceeding $1 for each certificate and $10 for each examination.

Certificates shall be presented to the health officer for registration.

Acts approved June 6, 1892, and May 4, 1896.

Officers of board of examiners: Garnett L. Hills, Washington, president; Charles W. Appler, secretary.

Florida.—Board of examiners, 5 members, to serve two years.

The board "grants certificates to all applicants who have obtained a diploma from a reputable dental college and who pass a satisfactory examination." Fee $10.

Penalty for violation of law, fine of $25 to $500.

Acts approved June 7, 1887, and May 25, 1891.

Officers of board: J. N. Jones, Jacksonville, president; R. A. Shine, Tallahassee, secretary. December 15, 1897.

Georgia.—Board of examiners consists of 5 members, who serve five years each.

Licenses are granted to all applicants who undergo a satisfactory examination (fee $10, not returnable on failure to pass the examination).

No one shall be eligible for examination unless a graduate of a dental school whose term and curriculum are equal to those of a majority of schools of dentistry in the United States or unless having been licensed after examination by some other State board.

For violation of law anyone shall be punished as prescribed in section 1039 of volume 3 of the code of 1895.

All licensed dentists must register in the office of the clerk of the superior court of the county (fee 50 cents).

Act approved December 15, 1897.

For various offenses, mentioned in section 7 of the law, licenses may be revoked.

Officers of board: John H. Coyle, Thomasville, chairman; D. D. Atkinson, Atlanta, secretary.

Idaho.—Dental law passed in February, 1899, to establish a board of examiners. No information yet as to the other requirements.

Illinois.—Board of examiners of 5 members, each to serve five years.

"It shall be unlawful for any person, who is not at the time of the passage of this act engaged in the practice of dentistry in this State, to commence such practice unless such person shall have received a diploma from the faculty of some

reputable dental college, duly authorized by the law of this State, or by the laws of some foreign country, in which college or colleges there was, at the time of the issue of such diploma, annually delivered a full course of lectures and instructions in dental surgery: *Provided*, That any person removing into this State who shall have been, for a period of ten years prior to such removal, a practicing dentist: *And provided also*, That any person holding the diploma of doctor of medicine from any reputable medical college, shall be entitled to practice dentistry in this State upon obtaining a license for that purpose as hereinafter provided."

Anyone passing a satisfactory examination (fee $2) before the board of examiners shall receive a license to practice dentistry, but the board shall issue licenses to graduates of reputable dental colleges without examination upon payment of a fee of $1.

Each license must be registered with the county clerk (fee 25 cents), or it will be forfeited and not granted again except on payment to the board of $25.

Penalty for practicing without a license, fine of from $25 to $50.

Act approved May 30, 1881.

Officers of board of examiners: W. C. Jocelyn, Cairo, president; J. H. Smyer, 70 State street, Chicago, secretary.

Indiana.—Board of examiners of 5 members, to serve two years.

Board issues certificates to graduates of reputable dental colleges on payment of fee of $1. Also issues certificates to all who pass a satisfactory examination in anatomy, physiology, pathology, therapeutics, chemistry, and the theory and practice of surgical and mechanical dentistry (fee $5). Certificates to be recorded in the office of the county recorder (fee 25 cents).

Penalty, fine of $20 to $100.

Sections 1163-1174, 1889.

Officers of board of examiners: R. T. Oliver, Indianapolis, president; M. A. Mason, Fort Wayne, secretary.

Iowa.—Board of examiners of 5 members, each to serve five years.

A license shall be granted to any regular graduate of a reputable dental college (fee $2), or to anyone passing a successful examination (fee $10). Each practicing dentist shall annually obtain a renewal of his certificate by the board of examiners (fee $1) on or before May 15, or be liable to a fine of $10 for each calendar month he is delinquent. Licenses must be registered in the office of the clerk of the district court of the county (fee 25 cents).

Penalty for violation of law, fine not exceeding $200, or imprisonment not more than forty days.

Act of 1897.

Board of examiners: J. T. Abbott, Manchester, president; G. W. Miller, Des Moines; F. P. Webber, E. L. Brooks, J. S. Kulp.

Kansas.—There is a board of examiners of 4 members, each to serve four years.

It issues certificate to any person holding a diploma of a reputable dental college "duly authorized by the laws of this State or some other of the United States, or by the laws of some foreign government, and in which college, school, or university department there was, at the time of the issuance of such diploma, annually delivered a full course of lectures and instruction in dentistry and dental surgery" (fee $10), and also to such persons as pass satisfactory examinations (fee $20).

Penalty, fine of $10 to $100.

Acts approved February 25, 1885, and March 9, 1891.

Officers of board of examiners: T. I. Hatfield, Marysville, president; A. M. Callaham, Topeka, secretary.

Kentucky.—The board of examiners consists of 5 members and continues in office the length of time provided by the by-laws of the Kentucky State Dental Association, by whom the board is elected.

The board issues certificates to such persons as hold "a diploma from the faculty of a dental college, duly authorized by the laws of this State or some other of the United States, or a foreign country, or a certificate of qualification issued by the Kentucky State Dental Association;" also to such persons as undergo a satisfactory examination. The fee for each certificate issued shall not exceed $5. Certificates must be registered in the office of the county clerk (fee 50 cents).

Penalty, fine of $50 to $200.

Act approved May 1, 1893.

Officers of board: C. G. Edwards, Louisville, president; J. H. Baldwin, Louisville, secretary.

Louisiana.—Board of examining dentists, 5 members, to serve two years.

"It shall be unlawful for any person to practice dentistry in the State of Louisiana, unless said person has graduated and received a diploma from a recog-

nized faculty of a dental college chartered under the authority of some one of the United States, or shall have obtained a certificate from a board of examining dentists duly authorized by this act to issue such certificates, and all such certificates must be registered with the board of health." The board is authorized to grant certificates to all applicants who undergo satisfactory examinations. No fee to be charged.

"All dentists practicing in the State of Louisiana shall register their names and addresses with the State board of health from a certificate from the State board of dental examiners or with the clerk of the district court for the parish in which he resides." (Registration fee $1.) A list of all registered dentists is published once each year.

Penalty, fine of $50 to $300, or imprisonment not less than thirty days nor more than three months, or both fine and imprisonment.

Acts approved March 10, 1880, and June 26, 1894.

Officers of board of examiners: A. G. Friedrichs, president; C. V. Vignes, New Orleans, secretary.

Maine.—Board of examiners of 5 members, to serve three years each.

Board issues certificates after examination in anatomy, physiology, pathology, therapeutics, chemistry, and the theory and practice of dentistry, upon payment of an examination fee of $20, not returnable. The secretary of the board shall keep a register showing the name, residence, and place of business of every person authorized under this act to practice dentistry, and shall certify a copy of the same to the secretary of state.

Penalty, fine of $25 to $100.

Act approved March 4, 1891.

Board of examiners: Edward J. Roberts, Augusta, president; L. S. Chilcott, Bangor; F. O. Sawyer, E. C. Bryant, D. W. Fellows.

Maryland.—Board of examiners, 6 members, to serve six years each.

Board issues certificate to anyone 21 years of age who is a graduate of a dental school in the United States and who has passed a satisfactory examination, or a certificate may be issued without examination, in the discretion of the board, to anyone who holds a diploma in dental surgery. "A fee of $10 shall be paid to the secretary of the board by any applicant for examination and registration."

Penalty, fine of $50 to $300, or imprisonment not more than six months in the county jail.

Approved April 4, 1896.

Officers of board: E. P. Keech, 525 North Charles street, Baltimore, president; J. G. Heuisler, 521 North Charles street, Baltimore, secretary.

Massachusetts.—Board of registration in dentistry, 5 members, each to serve three years.

Board issues a certificate after examination. Fee for examination and license, $20.

Penalty, fine of $50 to $100, or imprisonment three months in the county jail.

Act approved April 1, 1887, and March, 1897.

Board of registration: John F. Dowsley, Boston; George E. Mitchell, Haverhill; Thomas J. Barrett, Dwight M. Clapp, George A. Maxfield.

Michigan.—Board of examiners, 3 members, each to serve three years.

"It shall hereafter be unlawful for any person to practice dentistry in this State unless such person has received a diploma from the faculty of a reputable dental college, duly incorporated under the laws of this or some other State of the United States, with a course of instruction and practice fully equal or equivalent to that of the college of dental surgery of the University of Michigan, or a certificate of qualification from the board of examiners provided for by this act." Board grants certificates after satisfactory examination; fee $10. Fee for registration on diploma, $3.

Penalty, fine $25 to $100, or imprisonment not exceeding ninety days, or both fine and imprisonment.

Law as amended in 1891.

Board of examiners: H. K. Lathrop, Detroit; M. B. Dennis, Port Huron; F. O. Gilbert, Bay City.

Minnesota.—Board of examiners, 5 members, each to serve three years.

Board grants certificates of license after satisfactory examination (examination fee $10), but no one is eligible for examination unless he shall have received a diploma from some dental college in good standing, as determined by the board. Certificates must be recorded in the office of the clerk of the district court of the county; fee for recording, 50 cents. Every registered dentist must pay an annual license fee of $1.

Penalty for violation of law, fine of $20 to $100, or imprisonment not less than one month nor more than three months in the county jail, or both fine and imprisonment.

Act approved April 24, 1889.

Officers of board of examiners: L. C. Davenport, Moorhead, president; A. D. Douglass, Minneapolis, secretary.

Mississippi.—Board of dental examiners, 5 members, whose term of office expires with that of the governor appointing them.

Board grants license after satisfactory examination (examination fee $10). Each person receiving a license must record it in the office of the clerk of the circuit court of the county.

Chapter 32 of the Laws of Mississippi, 1892.

Officers of board of examiners: George B. Clement, Macon, president; L. G. Nisbet, Aberdeen, secretary.

Missouri.—State board of dental examiners, 5 members, each to serve five years.

Certificates are granted to graduates of reputable dental colleges which require not less than three years of six months each (fee $2), or on examination to anyone having studied dentistry in this State for three years or who has a license from a dental board of another State; examination fee $10. Certificates to be recorded in office of the county clerk (fee 50 cents), or they will be forfeited and not granted again except on payment of $25.

"All licensed dentists shall, on or before the 30th day of November of each year, forward to said board his signature and address, together with a fee of one dollar."

Penalty for practicing without a certificate, fine of $50 to $200, or imprisonment twenty to sixty days, or both fine and imprisonment.

Law of 1897.

Officers of board of examiners: W. M. Bartlett, St. Louis, president; S. C. A. Rubey, Clinton, secretary.

Montana.—Board of dental examiners, 5 members, each to serve five years.

Board grants certificate to anyone who has received a diploma from a reputable dental college approved by the board (fee $10, not returnable), or to anyone passing a satisfactory examination who has practiced dentistry three years or who has been a bona fide student of dentistry for three years under a licensed dentist; examination fee $15, not returnable. Certificates must be filed with the clerk of the county (regular fee charged). Every registered dentist shall annually (by May 1) pay the board a fee of $1, or his certificate may be revoked.

Penalty, fine $50 to $200, or imprisonment one to three months, or both fine and imprisonment.

Act approved March 12, 1895.

Officers of board: W. H. Hall, Butte, secretary; H. J. Wirth, Helena.

Nebraska.—The State board of health appoints 3 secretaries, each to serve three years, to assist the State board of health.

The State board of health grants certificate to anyone passing a satisfactory examination (fee $10) before the secretaries, and also to anyone holding a diploma from a reputable dental college (fee $2). A reputable dental college is defined as follows: "A dental college or university requiring a preliminary examination for admission to its course of study and which requires as requisite for the granting of a dental degree attendance on at least three courses of lectures of six months each, no two of said courses to be held within one year, and having a full faculty of professors in all different branches of dental education." * * * Certificates must be filed with the county clerk (fee same as for recording deeds).

Penalty, fine of $25 to $50 and costs, or be committed until the fine is paid.

Act of 1895 regulating the practice of dentistry and repealing the act approved March 23, 1887.

Board of dental secretaries: W. C. McHenry, Nelson, president; O. F. Lamberton, Lincoln, secretary; H. C. Miller, Grand Island, treasurer.

Nevada.—Board of examiners, 5 members, serving four years each.

Certificate granted on examination or on diploma of recognized college (fee in either case $10, not returnable). Certificates to be recorded in the office of the county clerk, fee 25 cents.

Penalty, fine of $50 to $200, or imprisonment six months.

Law of March 16, 1895.

Officers of board, W. H. Cavell, Carson City, president; D. W. Rulison, Reno, secretary.

New Hampshire.—Board of registration in dentistry, 3 members, each to serve three years.

Board grants certificate after examination. Fee for certificate, $5.

Penalty for practicing without a certificate, fine of $50 to $100.

Approved April 7, 1891.

Board of registration: E. B. Cushing, Laconia, president; W. R. Blackstone, secretary; George A. Bowers, Nashua.

New Jersey.—State board of registration and examination in dentistry, consisting of 5 members, each to serve five years.

A license to practice dentistry is granted after an examination by the board, but "no person shall be examined by the said board unless he be 21 years of age, of good moral character, and have received a preliminary education equal to that furnished by the common schools of this State and be graduated in course with a dental degree from a dental school, college, or department of a university recognized by said board, or shall present the written recommendation of at least five licensed dentists of this State of five years' standing, certifying that he is qualified for such examination, or shall hold a diploma or license conferring full right to practice dentistry in some foreign country and granted by some authority recognized by the board" (examination fee $25, not returnable in case of failure to pass the examination successfully). "The board may also, without the examination hereinabove provided for, issue its license to any applicant therefor who shall furnish proof satisfactory to it that he has been duly licensed after examination to practice dentistry in any State after full compliance with the requirement of its dental laws, and has been lawfully and reputably engaged in said practice for five years next preceding his application: *Provided, however*, That his professional education shall not be less than that required in this State" (fee for such license $50). Licenses may be revoked upon conviction "of felony or misdemeanor."

Any "company" or "association" engaged in the practice of dentistry "shall cause to be displayed and kept in a conspicuous place at the entrance to its place of business the name of each and every person employed by such company or association in the practice of dentistry."

"There shall be an annual registration of every person, persons, company, or association practicing dentistry within the State, together with an annual registration of each and every assistant in the employ of every such person, persons, company, or association," and anyone engaged in the practice of dentistry failing to give the board the information requested as to name, residence, etc., shall be liable to a fine of $10 and costs, and anyone making a false statement shall be liable to a fine of $50 and costs.

Any person, company, or association practicing or holding himself or itself out to the public as practicing dentistry, not being legally licensed to practice, "shall be guilty of a misdemeanor and punishable upon conviction of a first offense by a fine of not less than $50, and upon conviction of a subsequent offense by a fine of not less than $100, or by imprisonment of not less than two months, or by both fine and imprisonment."

"Any person, company, or association shall be guilty of a misdemeanor, and upon every conviction thereof shall be punished with a fine of not less than $500, or by imprisonment for not less than six months, or by both fine and imprisonment, who

"(1) Shall sell or barter, or offer to sell or barter, any diploma or document conferring or purporting to confer any dental degree, or any certificate or transcript made or purporting to be made pursuant to the laws regulating the license and registration of dentists; or

"(2) Shall purchase or procure by barter any such diploma, certificate, or transcript with intent that the same shall be used as evidence of the holder's qualification to practice dentistry, or in fraud of the laws regulating such practice; or

"(3) Shall, with fraudulent intent, alter in a material regard any such diploma, certificate, or transcript; or

"(4) Shall use or attempt to use any such diploma, certificate, or transcript which has been purchased, fraudulently issued, counterfeited, or materially altered, either as a license or color of license to practice dentistry, or in order to procure registration as a dentist; or

"(5) Shall practice dentistry under a false or assumed name; or

"(6) Not being now duly licensed and registered as a dentist, shall assume the degree of 'doctor of dental surgery' or 'doctor of dental medicine,' or shall append the letters 'D. D. S.,' or 'D. M. D.,' to his or her name, not having had duly conferred upon him or her by diploma from some college or school legally empowered to confer the same the right to assume said titles, or shall assume any title or append any letters to his or her name with the intent to represent falsely that he has received a dental degree or license; or

"(7) Any person who, in any affidavit or examination required of an applicant for examination, license, or registration under the laws regulating the practice of dentistry, shall make willfully a false statement in a material regard, shall be guilty of a high misdemeanor punishable upon conviction thereof by a fine not

exceeding $500 or by imprisonment at hard labor not exceeding five years, or both, at the discretion of the court.

"In addition to all of the fines, forfeitures, and penalties hereinabove provided for, it shall be lawful for the said board to institute civil proceedings in any court of competent jurisdiction against any person, company, or association for the violation of any of the provisions of this act; such proceeding shall be brought in an action of debt, and upon conviction thereunder the person, company, or association so convicted shall be liable to a fine, which shall be the same amount fixed in the section of this act for violation of which the suit shall have been brought."

Act approved March 17, 1898.

Officers of board of registration and examination: George E. Adams, South Orange, president; G. Carleton Brown, Elizabeth, secretary.

New Mexico.—Board of dental examiners, 5 members, to serve four years.

Certificate is issued to anyone passing a satisfactory examination (fee $25) or to anyone presenting a diploma from a college recognized as reputable by the National Association of Dental Examiners and paying the sum of $5. Certificate may be revoked for immoral or unprofessional conduct.

Penalty: Fine of $20 to $100, or imprisonment not less than one nor more than three months, or both fine and imprisonment.

Act of February 23, 1893.

Officers of board of examiners: F. E. Olney, East Las Vegas, president; D. W. Manley, Santa Fe, secretary.

New York.—The regents of the University of the State of New York grant licenses to those who pass the examination of the State board of dental examiners. The latter is composed of 8 members, who serve four years.

"But no person shall be examined by said board unless he be at least 21 years old, of good moral character, and shall receive a certificate from said regents that he has satisfied them by examination or otherwise that prior to commencing his professional studies he had a preliminary education equivalent to that required of students entering the dental colleges of this State, which, after January 1, 1897, shall not be less than a full high-school course, and either has been graduated in course, with a dental degree from a registered dental school, or else, having been graduated in course from a registered medical school with the degree of doctor of medicine, has pursued thereafter a course of special study of dentistry for at least one year in a registered dental school, or holds a diploma or license conferring full right to practice dentistry in some foreign country and granted by some registered authority." The fee for examination shall not be over $25.

"Upon the recommendation of the board, the regents may also, without the examination hereinbefore provided for, issue their license to any applicant therefor who shall furnish proof satisfactory to them that he has been duly licensed to practice dentistry in any State or country after full compliance with the requirements of its dental laws, and has been thereafter lawfully and reputably engaged in such practice for five years next preceding his application, or who holds a license to practice dentistry in any other of the United States granted by a State board of dental examiners indorsed by the Dental Society of the State of New York: *Provided*, That in either case his preliminary and professional education shall have been not less than that required in this State. The regents may also license any applicant on the certificate of the board that after due investigation or examination it finds his education and professional attainments and experience of not less than five years in actual practice to be altogether fully equal to the requirements for license in this State.

"Every practitioner of dentistry must display, in a conspicuous place upon the house or in the office wherein he practices, his full name. If there are more chairs, than one in any office or dental parlor, the name of the practitioner using each chair must be displayed on or by said chair in plain sight of the patient. Any person who shall practice dentistry without displaying his name as herein prescribed, and any proprietor, owner, or manager of a dental office, establishment, or parlor who shall fail so to display or cause to be displayed the name of each person practicing dentistry in such office shall be fined $50 for the first offense, and for each subsequent offense not less than $100, or imprisoned not less than sixty days, or both fined and imprisoned."

Licenses must be recorded in the office of the county clerk; fee $1. A license may be revoked for unprofessional or immoral conduct, or for gross ignorance or inefficiency in his profession, and a license shall be canceled if the holder is convicted of a felony.

Penalty: Fine for first offense not less than $50, and upon conviction of a subsequent offense not less than $100, or imprisonment not less than two months, or both fine and imprisonment.

Act passed April 7, 1868, and amendments approved by the governor May 12, 1895, and April 20, 1898.

Board of examiners: F. French, Rochester, secretary; A. M. Wright, Troy; William Carr, William Jarvie, W. H. Colgrove, S. B. Palmer, A. M. Holmes, H. J. Burkhart.

North Carolina.—There is a board of dental examiners of 6 members, each to serve three years.

Certificates are granted on examination.

Each certificate must be registered in the office of the clerk of the superior court of the county (fee 50 cents) or certificate shall be forfeited, and shall not be renewed except on payment of $25 to the board of examiners. The board may charge each person applying for a certificate $10, which shall in no case be returned.

"Any person who shall knowingly and falsely claim or pretend to have or hold a certificate of proficiency granted by said board of examiners shall be guilty of a misdemeanor, and upon conviction shall be fined not more than $50 nor less than $25 for each offense."

Penalty for practicing without a license, fine of $25.

Laws of 1879, 1887, 1889, and 1891.

Board of dental examiners: V. E. Turner, Raleigh, chairman; R. H. Jones, Winston, secretary; J. E. Matthews, Wilmington; T. M. Hunter, Fayetteville; C. A. Bland, Charlotte; S. P. Hilliard, Rocky Mount.

North Dakota.—State board of dental examiners, 5 members, to serve for five years.

Board issues a license upon examination (examination fee $10, not returnable, and the further sum of $5 if a license is granted) or upon a diploma from a reputable dental college (fee for certificate $5).

Each person licensed by the board to practice dentistry shall procure from the secretary of the board, on or before July 1 annually, a certificate of registration, upon payment of a fee not exceeding $2, and shall display it in his place of business. A certificate may be revoked for violation of the dental law.

No one shall be eligible for examination unless he has practiced dentistry for at least three years immediately preceding such examination, or has studied dentistry under the supervision of a regularly practicing dentist for such period.

Penalty: Fine not exceeding $300, or imprisonment not over sixty days, or both fine and imprisonment.

Act took effect January 1, 1896.

Officers of board: R. B. Foster, Grand Forks, president; H. L. Starling, Fargo, secretary.

Ohio.—There is a State board of dental examiners, of 5 members, who serve three years.

Certificates are granted on diplomas of reputable dental colleges of the United States or any foreign country (fee $2), or on examination (fee $10, not returnable if candidate fails to pass the examination). The certificate of registration must be displayed in a conspicuous place in the dental office.

Penalty for violation of law, fine of not less than $25 nor more than $100, or imprisonment not less than ten days nor more than one month, or both fine and imprisonment.

By amendment of 1894, "Colleges of dentistry shall be regarded as reputable which are under State control or are organized, controlled, and governed by a board of trustees as provided by law for governing colleges of medicine, which possess buildings, by lease or otherwise, and equipments valued at not less than $5,000, which have a graded course of not less than three years, the time of instruction in each year being not less than six months, and which have a curriculum which includes anatomy, physiology, histology, pathology, chemistry, microscopy, materia medica, metallurgy, operative, mechanical, and surgical dentistry."

Act of April 8, 1892, and amendment of May 21, 1894.

Officers of board: J. Warren Jackson, Jackson, president; F. H. Lyder, Akron, secretary.

Oklahoma.—Board of dental examiners, 5 members (term of office not stated in the law of 1890).

A certificate is granted to anyone holding a diploma from a recognized college of dentistry (fee $10), or to anyone passing a satisfactory examination (fee $10).

Penalty for practicing without a license, fine of from $25 to $200, or imprisonment not more than six months, or both fine and imprisonment.

Act took effect December 25, 1890.

Officers of board: J. O. Waddell, Kingfisher, president; E. E. Kirkpatrick, Oklahoma City, secretary.

Oregon.—Board of examiners, 4 members, each to serve four years.

Certificate granted to anyone passing a successful examination (examination fee $25, and $1 for certificate), or to anyone holding a diploma from a reputable dental college "duly authenticated by the laws of this State, or some other of the United States, or by the laws of some foreign government," and in which college there was, at the time of issuance of such diploma, annually delivered a full course of lectures and instruction in dentistry (fee $5, and $1 for certificate). Certificates to be registered with county clerk (fee $1), or they will be held suspended and not restored except on payment of $25.

Penalty, fine of $50 to $200, or imprisonment six months. The prosecuting attorneys of the district shall prosecute all offenders.

Act of February 23, 1887.

Officers of board: J. R. Cardwell, Portland, president; E. G. Clark, Portland, secretary.

Pennsylvania.—There is a dental council consisting of 3 members, and a State board of dental examiners of 6 members who serve three years each.

A certificate is granted on examination to anyone 21 years of age, of good moral character and competent common-school education, who has received a dental diploma from a reputable institution recognized by the board and requiring attendance for three years of six months each, or who has received a diploma or license conferring full right to practice dentistry in some foreign country (examination fee $15). A certificate may also be granted without examination (fee $10) to anyone having been examined and licensed by an examining board of another State requiring as high a standard. Each person receiving a certificate must register in the office of the prothonotary (fee $1).

Penalty for practicing without a certificate, fine of $50 to $200.

Act approved July 9, 1897.

Officers of board of dental examiners: Henry Gerhart, Lewisburg, president; J. C. Green, Westchester, secretary.

Rhode Island.—Board of registration in dentistry, 5 members, each to serve three years.

A certificate is issued to anyone passing a successful examination in dentistry. There is charged a fee of $2 for each certificate issued, and a fee of $10 in addition for an examination, the examination fee not being returnable. A certificate may be revoked under certain conditions.

Penalty, fine of $50 to $100.

Act passed June 1, 1888, and amended in 1897.

Officers of board of registration: R. L. Davis, Woonsocket, president; D. F. Keefe, Providence, secretary.

South Carolina.—Board of dental examiners, 5 members, each to serve five years.

License is granted to anyone undergoing a satisfactory examination (fee $15).

Penalty, fine of $50 to $300.

Act approved February 23, 1875, and amended in 1887 and in 1899.

Officers of board: G. F. S. Wright, Georgetown, president; J. R. Thompson, Newberry, secretary.

South Dakota.—Board of examiners, 5 members, each to serve five years.

A certificate is granted to anyone passing a successful examination; also to anyone holding a diploma from a reputable dental college when satisfied with the character of such institution.

"The board of examiners may charge each person applying to or appearing before them for examination for a certificate of qualification a fee of $10, which fee shall in no case be returned."

Certificate to be registered with the register of deeds; fee 25 cents.

Penalty, fine of $50 to $100, or imprisonment six months.

Act approved March 10, 1885, and reenacted by the legislature of South Dakota.

Officers of board of dental examiners: L. F. Straight, Desmet, president; G. W. Collins, Vermilion, secretary.

Tennessee.—Board of examiners, 6 members, each to serve three years.

Certificate issued to anyone passing a satisfactory examination; also to anyone holding a diploma from a reputable dental school duly authorized by this State or some other of the United States, and in which there was at the time of the issuance of the diploma a full course of lectures and instruction delivered. Fee for each certificate issued, $5.

Penalty, fine of $25 to $300.

Act of March 23, 1891.

Officers of board of examiners: J. L. Mewborn, Memphis, president; F. A. Shotwell, Rogersville, secretary.

Texas.—Board of examiners, 6 members, appointed by the governor to serve for the term of two years each.

A certificate is granted to anyone having received a diploma from a reputable dental college, or to anyone passing a satisfactory examination. For each certificate issued a fee of $10 shall be charged. Certificates must be recorded in the office of the county clerk; fee 50 cents.

Penalty for practicing without a certificate, fine of $25 to $300.

Acts of March, 1889, and August, 1897.

Officers of board of examiners: George S. Staples, Sherman, president; C. C. Weaver, Itaska, secretary.

Utah.—Board of examiners, 5 members, to serve four years each.

Certificate granted to anyone passing a successful examination; also to anyone holding a diploma from a reputable dental college recognized by the National Association of Dental Examiners. A fee of $5 shall be charged each applicant for a certificate, whether on examination or on diploma, which fee shall in no case be returned. Certificates to be recorded in the office of the county clerk, or they will be forfeited and not granted again except on payment to the board of $25.

"Any person who shall violate any of the provisions of this act, or who shall knowingly and falsely claim to have or hold a certificate of registration of the board of dental examiners, or who shall falsely and with intent to deceive the public claim and pretend to be a graduate of any incorporated, reputable dental college, or who shall have registered under one name and practiced dentistry under another name with intent to deceive the public, shall be guilty of a misdemeanor."

Acts of March 8, 1894, and 1898.

Officers of board of examiners: William H. Butcher, Salt Lake City, president; George E. Ellerbeck, Salt Lake City, secretary.

Vermont.—Board of dental examiners, 5 members, to serve two years.

A license to practice dentistry is granted on passing a satisfactory examination (fee $10). Each license to be recorded in the office of the secretary of state (fee 25 cents), or license shall be forfeited, and shall not be granted again except upon payment of $10 to the board of examiners.

Penalty, fine of $25 to $100.

Acts approved November 29, 1882, November 11, 1896, and November, 1898.

Officers of board of examiners: S. D. Hodge, Burlington, president; George F. Cheeney, St. Johnsbury, secretary.

Virginia.—Board of examiners, 6 members, each to serve three years.

Section 1767 says it shall be unlawful for anyone to practice dentistry unless he shall have complied with the provisions of section 1769, that is, have passed an examination before the State board of examiners (fee $10). Certificates must be recorded in the office of the county clerk; fee 50 cents.

Penalty, fine of $50 to $200.

Acts of 1885–86, page 235; Code of 1887, page 459; acts of 1889–90, page 24; acts of 1893–94, page 593; act of Feb. 23, 1893.

Officers of board: J. V. Haller, Wytheville, president; H. W. Campbell, Suffolk, secretary.

Washington.—Board of dental examiners, 5 members, each to serve two years.

Certificate granted on examination (examination fee $25, not returnable), but no one is eligible for examination unless he be of good moral character, hold a diploma from a reputable dental college as determined by the board, or have been engaged in the practice of dentistry for ten years. Certificates must be filed in the office of the auditor of the county; fee $1.

Penalty, fine of $50 to $200, or imprisonment not exceeding six months.

"It shall be the duty of the prosecuting attorney for each county to attend to the prosecution of all complaints under this act."

Act approved March 8, 1893.

Officers of board of examiners: C. A. Holmes, Seattle, president; W. E. Burkhart, Tacoma, secretary.

West Virginia.—There is a board of examiners of 5 members, each serving four years.

Certificates are granted only after examination (fee $10).

Penalty: Anyone practicing dentistry without a license shall be fined not less than $50 nor more than $200, or confined in county jail not less than one nor more than three months, or both fined and imprisoned.

Act passed February 20, 1897.

Officers of board of dental examiners: Charles H. Bartlett, Parkersburg, president; J. R. Strathers, Sistersville, secretary.

Wisconsin.—Board of examiners, 5 members, each to serve five years.
Certificate granted on examination (examination fee $10), or to any graduate of a reputable, legally incorporated dental college which requires attendance on two full courses of five months each (fee $1). Certificates to be registered annually with the board of examiners (fee $1).
Penalty, fine of $10 to $100.
Act of April 5, 1887.
Officers of board of dental examiners: R. G. Richter, Milwaukee, president; W. H. Carson, Milwaukee, secretary.

Wyoming.—It is unlawful for anyone to practice dentistry unless he has received a diploma from a reputable dental school, duly incorporated under the laws of some one of the United States or of some foreign government and which is recognized as reputable by the National Association of Dental Examiners. A copy of the diploma must be filed with the county clerk.
Penalty, fine of $50 to $200, or imprisonment sixty days, or both fine and imprisonment.
Act approved February 18, 1893.

Hawaii.—Board of examiners, 3 members, serving three years.
Certificate granted on examination or on approved diploma.
Act of December 19, 1892.

CHAPTER XXIV.

EDUCATIONAL DIRECTORY.[1]

I.—Chief State School Officers.

Name.	Address.	Official designation.
J. W. Abercrombie	Montgomery, Ala	State superintendent of education.
Sheldon Jackson	Sitka, Alaska	General agent of education.
R. L. Long	Phœnix, Ariz	Superintendent of public instruction.
J. J. Doyne	Little Rock, Ark	State superintendent of public instruction.
T. J. Kirk	Sacramento, Cal	Do.
Miss Grace E. Patton	Denver, Colo	Do.
C. D. Hine	New Britain, Conn	Secretary of State board of education.
	Dover, Del	Do.
W. B. Powell	Washington, D. C	Superintendent of District schools.
W. N. Sheats	Tallahassee, Fla	State superintendent of public instruction.
Gustavus R. Glenn	Atlanta, Ga	State school commissioner.
Miss Permeal French	Boise, Idaho	State superintendent of public instruction.
Alfred Bayliss	Springfield, Ill	Do.
D. M. Geeting	Indianapolis, Ind	Do.
R. C. Barrett	Des Moines, Iowa	Do.
William Stryker	Topeka, Kans	Do.
W. J. Davidson	Frankfort, Ky	Do.
J. V. Calhoun	Baton Rouge, La	State superintendent of education.
W. W. Stetson	Augusta, Me	State superintendent of public schools.
E. B. Prettyman	Baltimore, Md	Secretary of State board of education.
Frank A. Hill	Boston, Mass	Do.
Jason E. Hammond	Lansing, Mich	State superintendent of public instruction.
J. H. Lewis	St. Paul, Minn	Do.
Henry L. Whitfield	Jackson, Miss	State superintendent of education.
W. T. Carrington	Jefferson City, Mo	State superintendent of public schools.
E. A. Carleton	Helena, Mont	State superintendent of public instruction.
W. R. Jackson	Lincoln, Nebr	Do.
Orvis Ring	Carson, Nev	Do.
Channing Folsom	Concord, N. H	Do.
Chas. J. Baxter	Trenton, N. J	Do.
M. C. de Baca	Santa Fe, N. Mex	Superintendent of public instruction.
Charles R. Skinner	Albany, N. Y	State superintendent of public instruction.
C. H. Mebane	Raleigh, N. C	Do.
J. G. Halland	Bismarck, N. Dak	Do.
Lewis D. Bonebrake	Columbus, Ohio	State commissioner of common schools.
S. N. Hopkins	Guthrie, Okla	Superintendent of public instruction.
J. H. Ackerman	Salem, Oreg	State superintendent of public instruction.
Nathan C. Schaeffer	Harrisburg, Pa	Do.
Thomas B. Stockwell	Providence, R. I	Commissioner of public schools.
John J. McMahan	Columbia, S. C	State superintendent of education.
E. E. Collins	Pierre, S. Dak	State superintendent of public instruction
Price Thomas	Nashville, Tenn	Do.
J. S. Kendall	Austin, Tex	Do.
John R. Park	Salt Lake City, Utah	Do.
Mason S. Stone	Montpelier, Vt	State superintendent of education.
	Richmond, Va	State superintendent of public instruction.
Frank J. Browne	Olympia, Wash	Do.
J. R. Trotter	Charleston, W. Va	State superintendent of free schools.
L. D. Harvey	Madison, Wis	State superintendent of public schools.
Thomas T. Tynan	Cheyenne, Wyo	State superintendent of public instruction.

[1] Corrected to March, 1899, in so far as changes have been reported to the Bureau.

II.—List of City Superintendents.

ALABAMA.

Anniston, H. C. Gunnels.
Bessemer, G. M. Lovejoy.
Birmingham, J. H. Phillips.
Eufaula, H. M. Weedon.
Florence, H. C. Gilbert.
Huntsville, S. J. Mayhew.
Mobile, John D. Yerby.
Montgomery, Charles L. Floyd.
New Decatur, James C. Smith.
Opelika, T. C. Pinckard.
Selma, R. E. Hardaway.
Tuscaloosa, James H. Foster.

ARIZONA.

Tucson, Samuel P. McCrea.

ARKANSAS.

Fort Smith, J. L. Holloway.
Helena, W. W. Rivers.
Hot Springs, George B. Cook.
Little Rock, J. R. Rightsell.
Pine Bluff, J. H. Hinemon.

CALIFORNIA.

Alameda, D. J. Sullivan.
Berkeley, Franklin E. Perham.
Eureka, P. M. Condit.
Fresno, Morris Elmer Dailey.
Los Angeles, J. A. Foshay.
Napa City, J. L. Shearer.[1]
Oakland, John W. McClymonds.
Pasadena, James D. Graham.[2]
Pomona, Frank H. Hyatt.
Riverside, Eugenie Fuller.[3]
Sacramento, O. W. Erlewine.
San Bernardino, T. H. Kirk.[2]
San Diego, F. P. Davidson.
San Francisco, Reginald H. Webster.
San Jose, Frank P. Russell.
Santa Ana, Lyman Gregory.
Santa Barbara, C. Y. Roop.
Santa Cruz, D. C. Clark.
Santa Rosa, Minnie Coulter.
Stockton, James A. Barr.
Vallejo, Charles A. Fulton.

COLORADO.

Aspen, F. J. Brownscombe.
Colorado Springs, John Dietrich.
Cripple Creek, Ezra W. Palmer.
Denver: District No. 1, Aaron Gove.
District No. 2, L. C. Greenlee.
District No. 7, W. J. Wise.
Denver: District No. 17, J. H. Van Sickle.
Leadville, Edward C. Elliott.
Pueblo: District No. 1, James S. McClung.
District No. 20, John F. Keating.
Trinidad, Eugene C. Stevens.

CONNECTICUT.

Ansonia, Wm. Alexander Smith.
Branford, Henry C. Moore.[4]
Bridgeport, Charles W. Deane.
Bristol, C. L. Wooding.
Danbury, A. C. Hubbard.[5]
Derby, J. W. Peck.
East Hartford, Joseph O. Goodwin,[5] George A. Bowman.[6]
Enfield, Samuel A. Booth.[7]
Greenwich, Newton B. Hobart.[4]
Hartford, Herbert S. Bullard.
Manchester: Town schools, Herbert O. Bowers.
Ninth district (south), F. A. Verplanck; Thomas Sims.[5]
Meriden, A. B. Mather.
Middletown, Walter B. Ferguson.
Milford, H. I. Matnewson.[2]
Naugatuck, J. H. Carfrey.
New Britain, Giles A. Stuart.
New Haven, Calvin N. Kendall.
New London, Charles B. Jennings.
New Milford, Charles H. Soule.
Norwalk, Charles Olmstead.[5]
Norwich, Nathan L. Bishop.[8]
Rockville, I. M. Agard.
Stamford, Everett C. Willard.
Torrington, Edwin H. Forbes.
Wallingford (Central district), Daniel R. Knight.
Waterbury, B. W. Tinker.
West Haven, ——— ———.
Westport, L. T. Day.[5]
Willimantic, George E. Hinman.[9]
Winsted, C. A. Bristol.[5]

DELAWARE.

Newcastle, George W. Andrew.
Wilmington, David W. Harlan.

DISTRICT OF COLUMBIA.

Washington, William B. Powell.[10]
Washington, G. F. T. Cook.[11]

FLORIDA.

Jacksonville, Joel D. Mead.[12]
Key West, C. F. Kemp.[12]
Pensacola, N. B. Cook.[12]
St. Augustine, E. H. Reynolds.[12]
Tampa, L. W. Buchholz.[12]

[1] Principal grammar school.
[2] Supervising principal.
[3] Principal of the high school.
[4] Principal.
[5] Secretary board of school visitors.
[6] Acting visitor.
[7] Chairman school committee.
[8] Superintendent central district.
[9] Secretary of school committee.
[10] Superintendent of public schools.
[11] Superintendent of colored schools.
[12] County superintendent.

II.—List of City Superintendents—Continued.

GEORGIA.

Albany, L. E. Welch.[1]
Americus, J. E. Mathis.
Athens, G. G. Bond.
Atlanta, W. F. Slaton.
Augusta, Lawton B. Evans.
Brunswick, G. J. Orr, jr.
Columbus, Carlton B. Gibson.
Griffin, J. Henry Walker.
Macon, D. Q. Abbott.
Rome, James C. Harris.
Savannah, Otis Ashmore.
Thomasville, K. T. Maclean.[1]

ILLINOIS.

Alton, Robert A. Haight.
Aurora: District No. 5 (east side), C. M. Bardwell.
District No. 4 (west side), A. V. Greenman.
Austin, Newell D. Gilbert.
Beardstown, S. Sterrett Beggs.
Belleville, H. D. Updike.
Belvidere, Arthur J. Snyder.
Bloomington, Edwin M. Van Petten.
Braidwood: North side, John P. Keevers.
South side, C. H. Root.
Cairo, Taylor C. Clendenen.
Canton, Charles S. Aldrich.
Centralia, Irwin F. Mather.
Champaign, Joseph Carter.
Charleston, W. T. Gooden.
Chicago, E. Benjamin Andrews.
Danville, J. E. Bryan.
Decatur, Enoch A. Gastman.
Dixon: Charles W. Groves.
North side, H. V. Baldwin.
Duquoin, David B. Rawlins.
East St. Louis: District No. 1, John Richeson.
District No. 2, range 10, T. J. McDonough.[2]
District No. 2, range 9, I. Harry Todd.[2]
Edwardsville, J. M. Parkinson.
Elgin, M. A. Whitney.
Evanston: District No. 1, Homer H. Kingsley.
District No. 3, North Evanston, ——.
District No. 2, South Evanston, Fred. W. Nichols.
Freeport, R. S. Page.
Galena, James W. Cupples.
Galesburg, William L. Steele.
Jacksonville, J. W. Henninger.
Joliet, Mrs. Kate A. Henderson.
Kankakee, F. N. Tracy.
Kewanee, A. C. Butler.
La Salle, L. A. Thomas.
Lincoln, ——.
Litchfield, J. E. Wooters.
Macomb, R. C. Rennick.
Mattoon, Benjamin F. Armitage.
Metropolis City, O. J. Page.
Moline, W. J. Cox.
Monmouth, James C. Burns.
Morris, P. K. Cross.
Oak Park, William H. Hatch.
Ottawa, Samuel H. Heidler.
Pana, William Miner.
Paris, J. D. Shoop.
Pekin, J. A. Hornberger.
Peoria, Newton Charles Dougherty.
Peru, W. W. Wirt.
Quincy, A. A. Seehorn.
Rock Island, R. G. Young.
Rockford, P. R. Walker.
Springfield, J. H. Collins.
Spring Valley, R. V. De Graff.
Sterling: District No. 1, W. T. Tuttle.
District No. 3, H. L. Chaplin.
District No. 8, S. B. Hursh.
Streator, W. F. Rocheleau.
Urbana, J. W. Hays.
Waukegan, Frank H. Hall.

INDIANA.

Anderson, John W. Carr.
Aurora, J. R. Houston.
Bloomington, W. H. Fertich.
Bluffton, Ellis D. Walker.
Brazil, John C. Gregg.
Columbus, John A. Carnagey.
Connersville, W. F. L. Sanders.
Crawfordsville, G. F. Kenaston.
Elkhart, D. W. Thomas.
Evansville, William A. Hester.
Fort Wayne, Justin N. Study.
Frankfort, Benjamin F. Moore.
Goshen, William H. Sims.
Greencastle, H. G. Woody.
Hammond, W. C. Belman.
Huntington, Robert I. Hamilton.
Indianapolis, David K. Goss.
Jeffersonville, Dorman S. Kelly.
Kokomo, ——.
Lafayette, Edward Ayres.
Laporte, John A. Wood.
Lawrenceburg, T. H. Meek.
Lebanon, James R. Hart.
Logansport, Albert H. Douglass.
Madison, C. M. McDaniels.
Marion, Welford D. Weaver.
Michigan City, Edward Boyle.
Mount Vernon, Edwin S. Monroe.
Muncie, W. R. Snyder.
New Albany, W. H. Hershman.
Peru, A. E. Malsbary.
Portland, Isaac E. Neff.
Richmond, Thomas A. Mott.
Seymour, H. C. Montgomery.
Shelbyville, James H. Tomlin.
South Bend, Calvin Moon.
Terre Haute, Wm. H. Wiley.
Valparaiso, Charles Henderson Wood.
Vincennes, Albert E. Humke.
Wabash, M. W. Harrison.
Warsaw, James Hamilton Henry.
Washington, Wm. F. Axtell.

IOWA.

Atlantic, William Wilcox.
Boone, Geo. I. Miller.
Burlington, Chas. Eldred Shelton.
Cedar Rapids, J. T. Merrill.
Centerville, F. E. King.
Clinton, O. P. Bostwick.
Council Bluffs, Herbert B. Hayden.
Creston, O. E. French.
Davenport, J. B. Young.
Des Moines, East side, Amos Hiatt.
North side, F. A. Lacey.
West side, Frank B. Cooper.
Dubuque, F. T. Oldt.
Fort Dodge, F. C. Wildes.
Fort Madison, C. W. Cruikshank.
Iowa City, S. K. Stevenson.
Keokuk, O. W. Meyer.
Le Mars, E. N. Coleman.
Lyons, O. H. Brainerd.
Marshalltown, F. E. Willard.
Mason City, A. R. Sale.
Mount Pleasant, John F. Riggs.
Muscatine, F. M. Witter.
Oskaloosa, Orion C. Scott.
Ottumwa, A. W. Stuart.
Sioux City, H. E. Kratz.
Waterloo, East side, F. J. Sessions.
West side, S. H. Sheakley.

[1] County superintendent.

[2] Principal.

II.—List of City Superintendents—Continued.

KANSAS.

Argentine, A. P. Warrington.
Arkansas City, W. M. Fisher.
Atchison, J. H. Glotfelter.
Emporia, L. A. Lowther.
Fort Scott, David M. Bowen.
Hutchinson, George W. Winans.
Junction City, George W. Kendrick.
Kansas City, Larkin L. L. Hanks.
Lawrence, Frank P. Smith.
Leavenworth, Miss Mamie E. Dolphin.
Newton, J. W. Cooper.
Ottawa, Walter H. Olin.
Parsons, S. D. Frazier.
Pittsburg, R. S. Russ.
Salina, A. Ludlum.
Topeka, William M. Davidson.
Wellington, H. F. M. Bear.
Wichita, Frank R. Dyer.
Winfield, J. W. Spindler.

KENTUCKY.

Ashland, John G. Crabbe.
Bowling Green, Edward Taylor.
Covington, John Morris.
Dayton, F. S. Alley.
Frankfort, McHenry Rhoads.
Henderson, Edward S. Clark.
Hopkinsville, Livingstone McCartney.
Lexington, William Rogers Clay.
Louisville, E. H. Mark.
Maysville, ——.
Newport, John Burke.
Owensboro, James McGinniss.
Paducah, George O. McBroom.
Paris, E. W. Weaver.
Richmond, J. D. Clark.
Winchester, R. M. Shiff.

LOUISIANA.

Baton Rouge, R. C. Gordon.
New Orleans, Warren Easton.
Shreveport, Jas. A. Thigpen.

MAINE.

Auburn, A. P. Wagg.
Augusta, Caroline S. Fogg.
Albion Hale Brainard.[1]
J. M. Wyman.[2]
S. I. Graves.[3]
Weston Lewis.[4]
Bangor, Miss Mary S. Snow.
Bath, William H. Winslow.
Belfast, Francis S. Brick.
Biddeford, Royal E. Gould.
Brewer, Mrs. Mertie M. Curtis.
Brunswick, Franklin C. Robinson.
Calais, Stephen E. Webber.
Eastport, T. E. St. John.
Ellsworth, Ernest L. Moore.
Fort Fairfield, C. H. Stevens.
Gardiner, Elliot B. Barber.
Houlton, Harry L. Putnam.
Lewiston, I. C. Phillips.
Old Town, Byron Porter.
Portland, Orlando M. Lord.
Rockland, Frank H. Hill.
Saco, John S. Locke.
Sanford, W. B. Shumway.
Waterville, E. F. Hitchings.

MARYLAND.

Annapolis, John G. Bannon.[5]
Baltimore, Henry A. Wise.
Cambridge, Josiah L. Kerr.[5]
Cumberland, H. G. Weimer.[5]
Frederick, Ephraim L. Boblitz.[5]
Hagerstown, George C. Pearson.[5]

MASSACHUSETTS.

Abington, W. H. Sanderson.
Adams, J. C. Gray.
Amesbury, E. O. Perkins.[6]
Amherst, ——.
Andover, George Ellsworth Johnson.
Arlington, Georgiana M. Peatfield.[6]
Athol, W. Scott Ward.
Attleboro, J. O. Tiffany.
Barnstable, F. W. Kingman.
Belmont, George P. Armstrong.
Beverly, Adelbert Leon Safford.
Blackstone, Josiah B. Davis.
Boston, Edwin P. Seaver.
Braintree, Irving W. Horne.
Bridgewater, W. H. Sanderson.
Brockton, B. B. Russell.
Brookline, Samuel T. Dutton.
Cambridge, Francis Cogswell.
Canton, James S. Perkins.
Chelsea, Walter H. Small.
Chicopee, Clarence A. Brodeur.
Clinton, Charles L. Hunt.
Concord, William L. Eaton.
Danvers, A. P. Learoyd.[6]
Dedham, Roderick Whittlesey Hine.
Easthampton, W. D. Miller.
Easton, Edward Bartlett Maglathlin.
Everett, Randall J. Condon.
Fall River, William C. Bates.
Fitchburg, Joseph G. Edgerly.
Framingham, Samuel F. Blodgett.
Franklin, Ernest D. Daniels.
Gardner, Louis P. Nash.
Gloucester, Freeman Putney.
Grafton, Stanley H. Holmes.
Granby, Edward H. McLachlin.
Greenfield, D. P. Dame.
Haverhill, Roscoe D. McKeen.
Hingham, Elmer L. Curtiss.
Holyoke, P. W. Search.
Hopkinton, Alvan R. Lewis.
Hyde Park, William G. Colesworthy.[6]
Lawrence, John E. Burke.
Lowell, Arthur K. Whitcomb.
Lynn, Orsamus B. Bruce.
Malden, George E. Gay.
Manchester, George P. Armstrong.
Marblehead, John B. Gifford.
Marlboro, J. Asbury Pitman.
Medford, Charles H. Morss.
Melrose, Fred H. Nickerson.
Merrimac, F. E. Pease.[7]
Methuen, A. Everett White.
Middleboro, Asher J. Jacoby.
Milford, Charles W. Haley.
Millbury, C. S. Lyman.
Milton, M. W. Richardson.
Natick, Frank Edson Parlin.
New Bedford, William E. Hatch.
Newburyport, William P. Lunt.

[1] Principal Cony High School.
[2] Superintendent of suburban schools.
[3] Superintendent village district.
[4] Principal Williams district.
[5] County school examiner.
[6] Secretary of the school committee.
[7] Chairman school committee.

II.—List of City Superintendents—Continued.

MASSACHUSETTS—Continued.

Newton, George I. Aldrich.
North Adams, Isaac Freeman Hall
Northampton, J. H. Carfrey.
North Attleboro, James W. Brehant.
Northbridge, S. A. Melcher.
Orange, Miss Lizzie A. Mason.
Palmer, A. C. Thompson.
Peabody, John B. Gifford.
Pittsfield, Eugene Bouten.
Plymouth, Francis J. Heavens.
Provincetown, Clarence W. Fearing.
Quincy, Herbert Warren Lull.
Reading, Charles E. Hussey.
Revere, Frank J. Peasiee.
Rockport, Mary L. Lincoln.
Salem, John W. Perkins.
Saugus, Charles E. Stevens.
Somerville, Gordon A. Southworth.
Southbridge, John T. Clarke.
South Hadley, Edward H. McLachlin.
Spencer, Wyman C. Fickett.
Springfield, Thomas M. Balliet.
Stoneham, Charles E. Stevens.
Taunton, C. F. Boyden.
Upton, Stanley H. Holmes.
Wakefield, Charles E. Hussey.
Waltham, William D. Parkinson.
Ware, Samuel W. Hallett.
Warren, Albert Robinson.
Watertown, M. A. Stone.
Webster, A. H. Morse.
Wellesley, Marshall Livingston Perrin.
Westboro, H. C. Waldron.
Westfield, George H. Danforth.
West Springfield, Ulysses G. Wheeler.
Weymouth, I. M. Norcross.
Winchendon, David B. Locke.
Woburn, Thomas Emerson.
Worcester, Clarence F. Carroll.

MICHIGAN.

Adrian, A. E. Curtis.
Albion, W. J. McKone.
Alpena, George A. Hunt.
Ann Arbor, H. M. Slauson.
Au Sable, C. M. Jansky.
Battle Creek, William G. Coburn.
Bay City, John A. Stewart.
Benton Harbor, Eugene A. Wilson.
Big Rapids, James R. Miller.
Cadillac, James Hamilton Kaye.
Charlotte, M. R. Parmelee.
Cheboygan, William C. Thompson.
Coldwater, Egbert L. Briggs.
Detroit, Wales C. Martindale.
Escanaba, George P. Fleisher.
Flint, ——.
Grand Haven, John A. Crawford.
Grand Rapids, F. R. Hathaway.
Hillsdale, W. L. Shuart.
Holland, C. M. McLean.
Ionia, C. L. Bemis.
Iron Mountain, L. E. Amidon.
Ironwood, L. L. Wright.
Ishpeming, Richard Hardy.
Jackson: District No. 1, L. S. Norton.
District No. 17, Martin L. Palmer.
Kalamazoo, O. E. Latham.
Lansing, S. B. Laird.
Ludington, H. T. Blodgett.
Manistee, F. Martin Townsend.
Marquette, Anna M. Chandler.
Menominee, O. I. Woodley.
Monroe, J. F. Rieman.
Mount Clemens, S. C. Price.
Muskegon, David Mackenzie.
Negaunee, F. D. Davis.
Niles, J. D. Schiller.
Owosso, E. T. Austin.
Pontiac, Hugh Brown.
Port Huron, James H. Beazell.
Saginaw: East Side, A. S. Whitney.
West Side, Edwin C. Thompson.
St. Joseph, George W. Loomis.
Sault Ste. Marie, E. E. Ferguson.
Traverse City, Charles T. Grawn.
West Bay City, N. A. Richard.
Wyandotte, A. W. Dasef.
Ypsilanti, Austin George.

MINNESOTA.

Anoka, John L. Torrens.
Austin, W. F. F. Selleck.
Brainerd, Miles H. Carleton.
Duluth, Robert E. Denfeld.
Faribault, George A. Franklin.
Fergus Falls, C. A. Ballard.
Mankato, George F. Kenaston.
Minneapolis, Charles M. Jordan.
New Ulm, E. T. Critchett.
Owatonna, Lyman H. Ford.
Red Wing, F. V. Hubbard.
Rochester, F. D. Budlong.
St. Cloud, S. S. Parr.
St. Paul, A. J. Smith.
St. Peter, Edgar George.
Stillwater, Frank A. Weld.
Winona, J. A. Tormey.

MISSISSIPPI.

Columbus, J. M. Barrow.
Greenville, E. E. Bass.
Jackson, J. C. Hardy.
Meridian, J. C. Fant.
Natchez, J. W. Henderson.[1]
Vicksburg, Charles Pendleton Kemper.

MISSOURI.

Bonneterre, J. H. Malugen.
Boonville, D. T. Gentry.
Brookfield, L. A. Wirick.
Cape Girardeau, E. E. McCullough.[2]
Carrollton, L. W. Rader.
Carthage, W. J. Stevens.
Chillicothe, Oliver Stigall.
Clinton, Charles B. Reynolds.
Columbia, R. H. Emberson.
Desoto, Charles M. Gill.
Fulton, J. C. Humphreys.
Hannibal, R. B. D. Simonson.
Independence, S. M. Barrett.
Jefferson City, W. W. Walters.
Joplin, Joseph D. Elliff.
Kansas City, James M. Greenwood.
Kirksville, C. S. Brother.
Lexington, H. D. Demand.
Louisiana, A. W. Riggs.
Marshall, T. E. Spencer.
Maryville, Benjamin F. Duncan.
Mexico, D. A. McMillan.
Moberly, J. A. Whiteford.
Nevada, A. W. Duff.
Richhill, John P. Thurman.
St. Charles, George W. Jones.
St. Joseph, Edward B. Neely.
St. Louis, F. Louis Soldan.
Sedalia, George V. Buchanan.
Springfield, Jonathan Fairbanks.
Trenton, H. E. Du Bois.
Warrensburg, L. W. Martin.
Webb City, A. G. Young.

[1] County superintendent.

[2] Principal.

II.—List of City Superintendents—Continued.

MONTANA.

Butte, J. P. Hendricks.
Great Falls, E. O. Marsh.
Helena, James E. Klock.

NEBRASKA.

Beatrice, Ossian H. Brainerd.
Fremont, Daniel Miller.
Grand Island, Robert J. Barr.
Hastings, Edwin N. Brown.
Kearney, Jesse T. Morey.
Lincoln, J. F. Saylor.
Nebraska City, Allen C. Fling.
Omaha, Carroll G. Pearse.
Plattsmouth, John G. McHugh.
South Omaha, A. A. Munro.

NEVADA.

Virginia City, George N. Noel.

NEW HAMPSHIRE.

Concord (Union district), Louis J. Rundlett.
Dover, Channing Folsom.
Exeter, John A. Brown.[1]
Keene (Union district), Thaddeus Wm. Harris.
Laconia, J. H. Blaisdell.
Manchester, William E. Buck.
Nashua, James H. Fassett.
Portsmouth, James C. Simpson.
Rochester, William N. Cragin.

NEW JERSEY.

Atlantic City, W. M. Pollard.
Bayonne, Charles M. Davis.
Bordentown, William Macfarland.[2]
Bridgeton, John S. Turner.
Burlington, Wilbur Watts.[3]
Camden, Martin V. Bergen.
Elizabeth, William J. Shearer.
Gloucester, John C. Stinson.
Hackensack, John Terhune.[4]
Harrison, E. A. Murphy.
Hoboken, A. J. Demarest.
Jersey City, Henry Snyder.
Lambertville, Lambert H. Sergeant.
Long Branch, Christopher Gregory.
Millville, A. Duncan Yocum.
Morristown, W. L. R. Haven.
Newark, Charles B. Gilbert.
New Brunswick, George G. Ryan.
Orange, ——.
Passaic, F. E. Spaulding.
Paterson, Addison B. Poland.
Perth Amboy, S. E. Shull.
Phillipsburg, H. Budd Howell.
Plainfield, Henry M. Maxson.
Rahway, W. O. Robinson.
Redbank, S. V. Arrowsmith.
Salem, Morris H. Stratton.
South Amboy, R. M. Fitch.[2]
Trenton: Leslie C. Pierson.
B. C. Gregory.[2]
Town of Union,[5] Otto Ortel.[2]
Vineland, J. J. Unger.
Woodbury, Theodore J. Green.[2]

NEW MEXICO.

Albuquerque, J. T. Perigo.
Santa Fe, ——.

NEW YORK.

Albany, Charles W. Cole.
Albion, Mrs. Ida P. Greene.
Amsterdam, Charles S. Davis.
Auburn, Benjamin B. Snow.
Batavia, John Kennedy.
Binghamton, Rufus H. Halsey.
Buffalo, Henry P. Emerson.
Canandaigua, J. Carlton Norris.
Catskill, T. A. Caswell.
Cohoes, George E. Dixon.
Corning, Leigh R. Hunt.
Cortland, Ferdinand E. Smith.
Dansville, W. G. Carmer.[3]
Dunkirk, John W. Babcock.
Elmira, Elias J. Beardsley.
Fishkill on the Hudson, Lewis N. Crane.[2]
Fulton, B. G. Clapp.
Geneva, William H. Truesdale.
Glens Falls, Sherman Williams.
Gloversville, James A. Estee.
Green Island, James Heatly.
Haverstraw, L. O. Markham.
Hempstead, Ezra Fred Knapp.
Hoosic Falls, H. H. Snell.
Hornellsville, William R. Prentice.
Hudson, F. J. Sagendorph.
Ilion, Judson I. Wood.
Ithaca, H. W. Foster.
Jamestown, Rovillus R. Rogers.
Johnstown, William S. Snyder.
Kingston: District No. 5, "Kingston school district," Charles M. Ryon.
Kingston: District No. 1, P. H. Cullen.[6]
District No. 2, William E. Bunten.[6]
District No. 3, Henry Powers.[6]
District No. 4, William A. McConnell.[6]
Lansingburg, George F. Sawyer.
Little Falls, H. E. Reed.
Lockport, Emmet Belknap.
Lyons, W. H. Kinney.
Malone, Sarah L. Perry.
Matteawan, Gurdon R. Miller.[3]
Medina, T. H. Armstrong.
Middletown, James F. Tuthill.
Mount Vernon, Charles E. Nichols.
Newark, C. A. Hamilton.[3]
Newburgh, R. V. K. Montfort.
New Rochelle, Isaac E. Young.
New York: William H. Maxwell, city superintendent.
Boroughs of Manhattan and the Bronx, John Jasper.[7]
Borough of Brooklyn, Edward G. Ward.[8]
Borough of Queens, Edward L. Stevens.[9]
Borough of Richmond, Hubbard R. Yetman.[10]
Niagara Falls, Nathaniel L. Benham.
North Tonawanda, Clinton S. Marsh.
Norwich, S. J. Gibson.
Nyack, Ira H. Lawton.

[1] Clerk school board.
[2] Supervising principal.
[3] Principal.
[4] County superintendent.
[5] Post-office, Weekawken.
[6] Principal; post-office, Rondout.
[7] Post-office, New York City.
[8] Post-office, Brooklyn, N. Y.
[9] Post-office, Flushing, N. Y.
[10] Post-office, Stapleton, N. Y.

II.—List of City Superintendents—Continued.

NEW YORK—Continued.

Ogdensburg, Barney Whitney.
Olean, Fox Holden.
Oneida: District No. 25, Frank W. Jennings.
District No. 26, H. H. Douglas.
Oneonta, William C. Franklin.
Oswego, George E. Bullis.
Owego, Edwin P. Recordon.
Peekskill: Drumhill district (No. 7), John Millar.[1]
Oakside district (No. 8), A. D. Dunbar.[1]
Penn Yan, George Howard Hoxie.
Plattsburg, James G. Riggs.
Port Chester, E. G. Lautman.
Port Jervis, John M. Dolph.
Poughkeepsie, Edwin S. Harris.
Rensselaer, R. W. Wickham.
Rochester, Milton Noyes.
Rome, Harrison T. Morrow.
Saratoga Springs, Thomas R. Kneil.
Saugerties, Fred N. Moulton.
Schenectady, Samuel B. Howe.
Seneca Falls, Charles T. Andrews.
Sing Sing, J. Irving Gorton.
Syracuse, A. B. Blodgett.
Tonawanda, F. J. Diamond.
Troy, John H. Willets.
Utica, George Griffith.
Waterford, Alexander Falconer.
Waterloo, Thomas C. Wilber.[1]
Watertown, William G. Williams.
Watervliet, J. Edman Massee.
Waverly, H. J. Walter.
Whitehall, Wilber W. Howe.
Whiteplains, S. R. Shear.
Yonkers, Charles E. Gorton.

NORTH CAROLINA.

Asheville, J. D. Eggleston, jr.
Charlotte, Alexander Graham.
Concord, C. S. Coler.
Durham, W. W. Flowers.
Fayetteville, B. C. McIver.
Goldsboro, J. I. Foust.
Henderson, A. M. Matics.[2]
Newbern, John S. Long.
Raleigh, Logan D. Howell.
Reidsville, Edwin S. Sheppe.
Salisbury, R. G. Kizer.
Washington, Harry Howell.
Wilmington, M. C. S. Noble.
Winston, John J. Blair.

NORTH DAKOTA.

Fargo, Darius Steward.
Grand Forks, J. Nelson Kelley.

OHIO.

Akron, R. S. Thomas.
Alliance, John E. Morris.
Ashland, W. S. Robinson.
Ashtabula, J. S. Lowe.
Avondale, I. R. Henderson.
Bellaire, J. R. Anderson.
Bellefontaine, Henry Whitworth.
Brooklyn, Charles M. Knight.
Bucyrus, J. J. Bliss.
Cambridge, C. L. Cronebaugh.
Canton, ——.
Chillicothe, N. H. Chaney.
Cincinnati, William H. Morgan.
Circleville, M. H. Lewis.
Cleveland, Lewis H. Jones.
Columbus, J. A. Shawan.
Coshocton, John F. Fenton.
Dayton, W. N. Hailmann.
Defiance, James J. Burns.
Delaware, Horace A. Stokes.
Delphos, E. W. Hastings.
East Liverpool, R. E. Rayman.
Elyria, Henry M. Parker.
Findlay, J. W. Zellar.
Fostoria, J. S. Young.
Fremont, W. W. Ross.
Galion, I. C. Guinther.
Gallipolis, R. B. Ewing.
Greenville, C. L. Brumbaugh.
Hamilton, S. L. Rose.
Hillsboro, H. C. Minnich.
Ironton, S. P. Humphrey.
Jackson, J. E. Kinnison.
Kent, A. B. Stutzman.
Kenton, E. P. Dean.
Lancaster, Elijah Burgess.
Lima, Charles C. Miller.
Lorain, F. D. Ward.
Mansfield, Edmund D. Lyon.
Marietta, W. W. Boyd.
Marion, Arthur Powell.
Martins Ferry, W. H. Stewart.
Massillon, Edmund A. Jones.
Middletown, J. W. MacKinnon.
Mount Vernon, John K. Baxter.
Nelsonville, Fletcher S. Coultrap.
New Philadelphia, G. C. Maurer.
Newark, J. C. Hartzler.
Niles, Frank J. Roller.
Norwalk, A. D. Beechy.
Oberlin, George W. Waite.
Painesville, W. W. Boyd.
Piqua, C. W. Bennett.
Pomeroy, T. C. Flanegin.
Portsmouth, Thomas Vickers.
Salem, W. P. Burris.
Sandusky, ——.
Sidney, E. S. Cox.
Springfield, Carey Boggess.
Steubenville, Henry Ney Mertz.
Tiffin, J. H. Snyder.
Toledo, W. W. Chalmers.
Troy, Charles L. Van Cleve.
Uhrichsville, R. B. Smith.
Urbana, William McK. Vance.
Vanwert, J. P. Sharkey.
Wapakoneta, C. W. Williamson.
Warren, C. E. Carey.
Washington C. H., N. H. Chaney.
Wellston, Ezekiel Wallace Patterson.
Wellsville, James L. MacDonald.
Wooster, Charles Haupert.
Xenia, Edwin B. Cox.
Youngstown, F. Treudley.
Zanesville, W. D. Lash.

OKLAHOMA.

Oklahoma, B. F. Nihart.

OREGON.

Astoria, R. N. Wright.
Portland, Frank Rigler.
Salem, George A. Peebles.

[1] Principal.
[2] Supervisor.

II.—List of City Superintendents—Continued.

PENNSYLVANIA.

Allegheny, John Morrow.
Allentown, Francis D. Raub.
Altoona, D. S. Keith.
Archbald, W. A. Kelly.
Ashland, William C. Estler.
Beaverfalls, Charles J. Boak.
Bellefonte, David O. Etters.
Bethlehem, George W. Twitmyer.
Bloomsburg, L. Parvin Sterner.[1]
Braddock, John S. Keefer.
Bradford, E. E. Miller.
Bristol, Louise D. Baggs.
Butler, John A. Gibson.
Carbondale, John J. Forbes.
Carlisle, Samuel B. Shearer.
Chambersburg, Samuel Gelwix.
Chester, Charles F. Foster.
Columbia, Daniel Fleisher.
Connellsville, J. P. Wiley.[2]
Conshohocken, J. Horace Landis.
Corry, A. D. Colegrove.
Danville, James C. Houser
Dubois, W. L. Greene.
Dunmore, E. D. Bovard.
Easton, William W. Cottingham,
South Side, A. J. La Barre.
Erie, H. C. Missimer.
Etna, J. Q. A. Irvine.[2]
Franklin, N. P. Kinsley.
Greensburg, A. M. Wyant.
Greenville, T. S. Lowden.
Hanover, A. J. Harbaugh.
Harrisburg, Lemuel C. Foose.
Hazleton, David A. Harman.
Homestead, John C. Kendall.
Huntingdon, Kimber Cleaver.
Johnstown, E. E. Bach.
Lancaster, R. K. Buehrle.
Lansford, I. K. Witmer.
Lebanon, Cyrus Boger.
Lockhaven, John A. Robb.
McKeesport, H. F. Brooks.
Mahanoy City, William N. Ehrhart.
Mauchchunk, James J. Bevan.
Meadville, Henry V. Hotchkiss.
Middletown, H. H. Weber.
Milton, Lewis A. Beardsley.
Minersville, H. H. Spayd.[2]
Monongahela City, E. W. Dalbey.[2]
Mount Carmel, Samuel Halsey Dean.
Nanticoke, John William Griffith.
New Brighton, Joseph Burdette Richey.
Newcastle, J. W. Canon.
Norristown, Joseph K. Gotwals.
Oil City, C. A. Babcock.
Olyphant, M. W. Cumming.
Philadelphia, Edward Brooks.
Phœnixville, Harry F. Leister.
Pittsburg, George J. Luckey.
Pittston, Robert Shiel.[1]
Plymouth, Frank E. Fickinger.
Pottstown, William W. Rupert.
Pottsville, B. F. Patterson.
Reading, Ebenezer Mackey.
Renovo, James W. Elliott.
St. Clair, Thomas G. Jones.
Scranton, George Howell.
Shamokin, William F. Harpel.
Sharon, J. A. McLaughry.
Sharpsburg, E. B. McRoberts.
Shenandoah, J. W. Cooper.
South Bethlehem, Owen R. Wilt.
Steelton, L. E. McGinnis.
Sunbury, C. D. Oberdorf.
Tamaqua, Robert F. Ditchburn.
Tarentum, S. M. Williamson.
Titusville, Henry Pease.
Towanda, F. W. Robbins.[1]
Tyrone, C. E. Kauffman.
Uniontown, Lee Smith.
Warren, W. L. MacGowan.
Washington, A. A. Hays.[1]
Waynesboro, R. T. Adams.[1]
Westchester, Addison L. Jones.
Wilkesbarre, James M. Coughlin.
Wilkinsburg, E. J. Shives.
Williamsport, Charles Lose.
York, Atreus Wanner.

RHODE ISLAND.

Bristol, John P. Reynolds.
Burrillville, Allen P. Keith.
Central Falls, Frank O. Draper.
Cranston, Valentine Almy.
Cumberland, Clarence H. Dempsey.[3]
East Providence, William W. Ellis.
Johnston, Miss Sarah Dyer Barnes.[4]
Newport, Benjamin Baker.
Pawtucket, Gilman C. Fisher.
Providence, Horace S. Tarbell.
Westerly, C. H. Babcock.
Woonsocket, Frank E. McFee.

SOUTH CAROLINA.

Charleston, Henry P. Archer.
Columbia, E. S. Dreher.
Greenville, E. L. Hughes.
Spartanburg, Frank Evans.
Sumter, S. H. Edmunds.

SOUTH DAKOTA.

Sioux Falls, Frank C. McClelland.
Yankton, Edmund J. Vert.

TENNESSEE.

Chattanooga, A. T. Barrett.
Clarksville, J. W. Graham.
Columbia, W. E. Bostick[2] and J. H. Kelly.[2]
Jackson, Thomas H. Paine.
Johnson City, S. C. Brown.
Knoxville, J. H. McCallie.
Memphis, George W. Gordon.
Nashville, H. C. Weber.

TEXAS.

Austin, T. G. Harris.
Brenham, Edward W. Tarrant.
Brownsville, J. F. Cummings.
Corpus Christi, Charles W. Crossley.
Corsicana, H. S. Melear.
Dallas, J. L. Long.
Denison, William Gay.
El Paso, G. P. Putnam.
Fort Worth, M. G. Bates.
Gainesville, E. F. Comegys.
Galveston, John W. Hopkins.
Greenville, C. P. Hudson.
Houston, W. H. Kimbrough.
Laredo, C. C. Pierce.
Marshall, W. H. Attlebery.
Palestine, P. V. Pennybacker.
Paris, J. G. Wooten.
San Antonio, William Schoch.
Sherman, P. W. Horn.
Temple, J. E. Blair.
Tyler, W. T. Potter.
Waco, Charles T. Alexander.

[1] Supervising principal.
[2] Principal.
[3] Post-office, Valley Falls.
[4] Post-office, Olneyville.

II.—List of City Superintendents—Continued.

UTAH.

Logan, Jennie Hubbard Loyd.
Ogden, William Allison.
Provo, William S. Rawlings.
Salt Lake City, J. F. Millspaugh.

VERMONT.

Barre, O. D. Mathewson.
Brattleboro, M. Belle Smith.
Burlington, Henry O. Wheeler.
Montpelier, J. H. Lucia.
Rutland, Willard A. Frasier.
St. Albans, Francis A. Bagnall.
St. Johnsbury, Herbert J. Jones.

VIRGINIA.

Alexandria, Kosciusko Kemper.
Charlottesville, F. A. Massie.
Danville, Abner Anderson.
Fredericksburg, Benjamin P. Willis.
Lynchburg, E. C. Glass.
Manchester, A. H. Fitzgerald.[1]
Newport News, Thomas Temple Powell.
Norfolk, Richard A. Dobie.
Petersburg, D. M. Brown.
Portsmouth, John C. Ashton.
Richmond, William F. Fox.
Roanoke, Bushrod Rust.
Staunton, John H. Bader.
Winchester, Maurice M. Lynch.

WASHINGTON.

Fairhaven, W. J. Hughes.
New Whatcom, E. E. White.
Olympia, F. B. Hawes.
Port Townsend, J. M. Hitt.
Seattle, Frank J. Barnard.
Spokane, D. Bemiss.
Tacoma, R. S. Bingham.
Walla Walla, R. C. Kerr.

WEST VIRGINIA.

Charlestown, Wright Denny and L. L. Page.
Huntington, Wellington D. Sterling.
Martinsburg, C. H. Cole.
Parkersburg, U. S. Fleming.
Wheeling, W. H. Anderson.

WISCONSIN.

Antigo, C. O. Marsh.
Appleton, Carrie E. Morgan.
Ashland, Bennett B. Jackson.
Baraboo, J. E. NeCollins.
Beaverdam, C. W. Voorus.
Beloit, Franklin E. Converse.
Berlin, N. M. Dodson.
Chippewa Falls, Robert L. Barton.
Depere: East side, Andrew C. Mailer.
West Side, J. D. Conley.
Eau Claire, Otis C. Gross.
Fond du Lac, L. A. Williams.
Greenbay, F. G. Kraege.
West side, A. W. Burton.
Janesville, D. D. Mayne.
Kaukauna, E. A. Baker.
Kenosha, Gerald R. McDowell.
La Crosse, John P. Bird.
Madison, R. B. Dudgeon.
Manitowoc, Edwin R. Smith.[2]
Marinette, John T. Edwards.
Menasha, John Rosch.
Menominee, Judson E. Hoyt.
Merrill, W. L. Morrison.
Milwaukee, H. O. R. Siefert.
Monroe, Alvin F. Rote.
Neenah, E. A. Williams.
Oconto, R. P. Smith.
Oshkosh, Buel T. Davis.
Portage, A. C. Kellogg.
Racine, J. B. Estabrook.
Sheboygan, George Heller.
Stevens Point, Henry A. Simonds.
Superior, William H. Elson.
Watertown, Charles F. Viebahn.
Waukesha, H. L. Terry.[1]
Wausau, Karl Mathie.
Whitewater, A. A. Upham.
Wonewoc, W. F. Freeman.

WYOMING.

Cheyenne, James O. Churchill.
Laramie, Frank W. Lee.

[1] Principal.
[2] County superintendent.

III.—College Presidents.

I.—*Colleges for males and coeducational colleges of liberal arts.*

Name of president.	University or college.	Address.
E. L. Blalock, A. M	Blount College	Blountsville, Ala.
Frank M. Roof, A. M	Howard College	East Lake, Ala.
	Southern University	Greensboro, Ala.
Geo. R. McNeill, Ph. D	Lafayette College	Lafayette, Ala.
Henry J. Willingham, A. B	Lineville College	Lineville, Ala.
Benedict Menges, O. S. B	St. Bernard College	St. Bernard, Ala.
C. S. Dinkins	Alabama Baptist Colored University	Selma, Ala.
Michael Moynihan, S. J	Spring Hill College	Spring Hill, Ala.
James K. Powers, LL. D	University of Alabama	University, Ala.
M. M. Parker, A. M	University of Arizona	Tucson, Ariz.
Cadesman Pope	Arkadelphia Methodist College	Arkadelphia, Ark.
John W. Conger, A. M	Ouachita Baptist College	Do.
Eugene R. Long, Ph. D	Arkansas College	Batesville, Ark.
James A. Laughlin	Arkansas Cumberland College	Clarksville, Ark.
A. C. Millar, A. M	Hendrix College	Conway, Ark.
J. L. Buchanan, LL. D	Arkansas Industrial University	Fayetteville, Ark.
James M. Cox, A. M., B. D	Philander Smith College	Little Rock, Ark.
M. Shelby Kennard, A. M	Mountain Home Baptist College	Mountain Home, Ark.
	University of California	Berkeley, Cal.
Franklin L. Ferguson, B. D	Pomona College	Claremont, Cal.
Eli McClish, D. D	University of the Pacific	College Park, Cal.
Guy W. Wadsworth, A. B	Occidental College	Los Angeles, Cal.
J. A. Linn, C. M	St. Vincent's College	Do.
T. G. Brownson, B. D	California College	Oakland, Cal.
Brother Bettelin	St. Mary's College	Do.
Walter A. Edwards, A. M	Throop Polytechnic Institute	Pasadena, Cal.
John P. Frieden, S. J	St. Ignatius College	San Francisco, Cal.
Joseph Riordan, S. J	Santa Clara College	Santa Clara, Cal.
J. S. Austin, A. M	Pacific Methodist College	Santa Rosa, Cal.
D. S. Jordan, Ph. D., LL. D	Leland Stanford Junior University	Stanford University, Cal.
Geo. W. White, A. M	University of Southern California	University, Cal.
James H. Baker, LL. D	University of Colorado	Boulder, Colo.
Wm. F. Slocum, jr., LL. D	Colorado College	Colorado Springs, Colo.
John B. Guida, S. J	College of the Sacred Heart	Denver, Colo.
Wm. F. McDowell, Ph. D., S. T. D	University of Denver	University Park, Colo.
Geo. W. Smith, D. D., LL. D	Trinity College	Hartford, Conn.
B. P. Raymond, D. D., LL. D	Wesleyan University	Middletown, Conn.
	Yale University	New Haven, Conn.
W. C. Jason, A. M	State College for Colored Students	Dover, Del.
Geo. A. Harter, Ph. D	Delaware College	Newark, Del.
Thomas J. Conaty, D. D	Catholic University of America	Washington, D. C.
B. L. Whitman, D. D	Columbian University	Do.
E. M. Gallaudet, Ph. D., LL. D	Gallaudet College	Do.
John D. Whitney, S. J	Georgetown University	Do.
John F. Galligan, S. J	Gonzaga College	Do.
J. E. Rankin, D. D., LL. D	Howard University	Do.
John F. Forbes, Ph. D	John B. Stetson University	Deland, Fla.
W. F. Yocum, D. D	Florida Agricultural College	Lake City, Fla.
T. G. Lang, A. B	Florida Conference College	Leesburg, Fla.
Charles H. More, Ph. D	St. Leo Military College	St. Leo, Fla.
A. A. Murphree, A. B	Seminary West of the Suwanee River	Tallahassee, Fla.
Geo. M. Ward, A. M., B. D	Rollins College	Winter Park, Fla.
Wm. E. Boggs, D. D., LL. D	University of Georgia	Athens, Ga.
George Sale, A. M	Atlanta Baptist College	Atlanta, Ga.
Horace Bumstead, D. D	Atlanta University	Do.
James M. Henderson, A. M	Morris Brown College	Do.
Vachel D. Whatley, A. B	Bowdon College	Bowdon, Ga.
Joseph S. Stewart	North Georgia Agricultural College	Dahlonega, Ga.
P. D. Pollock, LL. D	Mercer University	Macon, Ga.
C. E. Dowman, D. D	Emory College	Oxford, Ga.
Charles M. Melden, Ph. D	Clark University	South Atlanta, Ga.
Thomas C. Hoyl, A. B	Nannie Lou Warthen College	Wrightsville, Ga.
W. F. Robison	Young Harris College	Young Harris, Ga.
Joseph P. Blanton	University of Idaho	Moscow, Idaho.
J. G. Evans, D. D., LL. D	Hedding College	Abingdon, Ill.
E. M. Smith, D. D	Illinois Wesleyan University	Bloomington, Ill.
M. J. Marsile, C. S. V	St. Viateur's College	Bourbonnais, Ill.
W. H. Bradley, A. M., chairman	Blackburn University	Carlinville, Ill.
J. M. Ruthrauff, D. D	Carthage College	Carthage, Ill.
Andrew S. Draper, LL. D	University of Illinois	Champaign, Ill.
	St. Ignatius College	Chicago, Ill.
Wm. R. Harper, Ph. D., D. D	University of Chicago	Do.
W. E. Lugenbeel	Austin College	Effingham, Ill.
Daniel Irion	Evangelical Proseminary	Elmhurst, Ill.
J. H. Hardin, LL. D	Eureka College	Eureka, Ill.
Henry W. Rogers, LL. D	Northwestern University	Evanston, Ill.
J. A. Leavitt, D. D	Ewing College	Ewing, Ill.
J. E. Bittinger, A. M	Northern Illinois College	Fulton, Ill.
J. H. Finley, Ph. D	Knox College	Galesburg, Ill.
Charles E. Nash, D. D	Lombard University	Do.

III.—College Presidents—Continued.

I.—*Colleges for males and coeducational colleges of liberal arts*—Continued.

Name of president.	University or college.	Address.
J. C. McClure, A. M	Greer College	Hoopeston, Ill.
John E. Bradley, Ph. D	Illinois College	Jacksonville, Ill.
James G. K. McClure, D. D	Lake Forest University	Lake Forest, Ill.
M. H. Chamberlin, A.M., LL.D	McKendree College	Lebanon, Ill.
A. E. Turner, A. M	Lincoln University	Lincoln, Ill.
Samuel R. Lyons, D. D	Monmouth College	Monmouth, Ill.
H. J. Kiekhoefer, A. M	Northwestern College	Naperville, Ill.
Louis Haas, O. S. B	St. Bede College	Peru, Ill.
A. M. Danely, A. M	Chaddock College	Quincy, Ill.
Nicholas Leonard, O. S. F	St. Francis Solanus College	Do.
Olof Olsson, D. D., Ph. D	Augustana College	Rock Island, Ill.
Hugoline Storff, O. S. F	St. Joseph's Diocesan College	Teutopolis, Ill.
Austen K. de Blois, Ph. D	Shurtleff College	Upper Alton, Ill.
Wm. S. Reese, Ph. M	Westfield College	Westfield, Ill.
Chas. A. Blanchard, D. D	Wheaton College	Wheaton, Ill.
J. H. Scott	Indian University	Bacone, Ind. T.
W. O. Caldwell	Henry Kendall College	Muscogee, Ind. T.
Joseph Swain, LL. D	Indiana University	Bloomington, Ind.
Geo. S. Burroughs, Ph. D	Wabash College	Crawfordsville, Ind.
Jos. Schmidt	Concordia College	Fort Wayne, Ind.
William T. Stott, D. D	Franklin College	Franklin, Ind.
H. A. Gobin, D. D	De Pauw University	Greencastle, Ind.
D. W. Fisher, D. D., LL. D	Hanover College	Hanover, Ind.
Scot Butler, A. M	Butler College	Irvington, Ind.
L. J. Aldrich, D. D	Union Christian College	Merom, Ind.
C. W. Lewis, M. S	Moores Hill College	Moores Hill, Ind.
Andrew Morrissey, C. S. C	University of Notre Dame	Notre Dame, Ind.
Joseph J. Mills, LL. D	Earlham College	Richmond, Ind.
	Ridgeville College	Ridgeville, Ind.
A. Schmitt, O. S. B	St. Meinrad College	St. Meinrad, Ind.
T. C. Reade, D. D	Taylor University	Upland, Ind.
S. B. McCormick, D. D	Coe College	Cedar Rapids, Iowa.
J. Frederick Hirsch, A. M	Charles City College	Charles City, Iowa.
F. Richter	Wartburg College	Clinton, Iowa.
J. C. Calhoun, A. M	Amity College	College Springs, Iowa.
Laur. Larsen	Luther College	Decorah, Iowa.
H. L. Stetson, D. D	Des Moines College	Des Moines, Iowa.
Wm. B. Craig, D. D	Drake University	Do.
D. E. Jenkins, A. M	Parsons College	Fairfield, Iowa.
John W. Bissell, D. D	Upper Iowa University	Fayette, Iowa.
George A. Gates, D. D	Iowa College	Grinnell, Iowa.
Andrew G. Wilson, A. M	Lenox College	Hopkinton, Iowa.
Joseph B. Harris	Simpson College	Indianola, Iowa.
	State University of Iowa	Iowa City, Iowa.
E. S. Havighorst, A. M., S. T. B	German College	Mount Pleasant, Iowa.
C. L. Stafford, D. D	Iowa Wesleyan University	Do.
Wm. F. King, LL. D	Cornell College	Mount Vernon, Iowa.
A. Rosenberger, A. B., LL. B	Penn College	Oskaloosa, Iowa.
Arthur B. Chaffee, D. D	Central University of Iowa	Pella, Iowa.
W. S. Lewis, D. D	University of the Northwest	Sioux City, Iowa.
Harvey Hostetler, A. B	Buena Vista College	Storm Lake, Iowa.
R. C. Hughes, A. M	Tabor College	Tabor, Iowa.
L. Bookwalter, D. D	Western College	Toledo, Iowa.
Jacob A. Clutz, D. D	Midland College	Atchison, Kans.
Innocent Wolf, O. S. B., D. D	St. Benedict's College	Do.
L. H. Murlin, A. B., S. T. B	Baker University	Baldwin, Kans.
E. H. Vaughan, Ph. D	Soule College	Dodge City, Kans.
J. C. Miller, D. D	College of Emporia	Emporia, Kans.
Roy V. Magers, A. M	Highland University	Highland, Kans.
E. N. Johnson, A. M., C. E	Campbell University	Holton, Kans.
D. S. Stephens, D. D	Kansas City University	Kansas City, Kans.
F. H. Snow, Ph. D., LL. D	University of Kansas	Lawrence, Kans.
C. M. Brooke, A. M	Lane University	Lecompton, Kans.
C. A. Swensson, A. M	Bethany College	Lindsborg, Kans.
J. D. S. Riggs, Ph. D	Ottawa University	Ottawa, Kans.
James McCabe, S. J	St. Mary's College	St. Marys, Kans.
George J. Hagerty, A. M	Kansas Wesleyan University	Salina, Kans.
F. M. Spencer, D. D	Cooper Memorial College	Sterling, Kans.
Geo. M. Herrick, A. M	Washburn College	Topeka, Kans.
N. J. Morrison, D. D., LL. D	Fairmount College	Wichita, Kans.
A. W. Meyer	St. John's Lutheran College	Winfield, Kans.
Chester A. Place, A. M	Southwest Kansas College	Do.
James P. Faulkner, A. M	Union College	Barbourville, Ky.
Wm. G. Frost, Ph. D	Berea College	Berea, Ky.
Wm. A. Obenchain, A. M	Ogden College	Bowling Green, Ky.
Wm. C. Roberts, D. D., LL. D	Centre College	Danville, Ky.
A. C. Davidson, D. D	Georgetown College	Georgetown, Ky.
H. J. Greenwell, A. M	Liberty College	Glasgow, Ky.
S. S. Woolwine	South Kentucky College	Hopkinsville, Ky.
Reuben L. Cave, A. M	Kentucky University	Lexington, Ky.

III.—College Presidents—Continued.

I.—*Colleges for males and coeducational colleges of liberal arts*—Continued.

Name of president.	University or college.	Address.
James K. Patterson, Ph. D	State College of Kentucky	Lexington, Ky.
L. H. Blanton, D. D	Central University	Richmond, Ky.
E. S. Alderman, D. D	Bethel College	Russellville, Ky.
D. Fennessy	St. Mary's College	St. Marys, Ky.
E. H. Pearce, D. D	Kentucky Wesleyan College	Winchester, Ky.
Thos. D. Boyd, A. M	Louisiana State University	Baton Rouge, La.
M. Thouvenin, S. M	Jefferson College	Convent, La.
I. W. Cooper, D. D	Centenary College of Louisiana	Jackson, La.
C. W. Tomkies	Keatchie College	Keatchie, La.
Henry C. Semple, S. J	College of the Immaculate Conception	New Orleans, La.
E. C. Mitchell, D. D	Leland University	Do.
L. G. Adkinson, D. D	New Orleans University	Do.
Oscar Atwood, A. M	Straight University	Do.
Wm. P. Johnston, LL. D	Tulane University	Do.
William De Witt Hyde, D. D	Bowdoin College	Brunswick, Me.
George C. Chase, D. D., LL. D	Bates College	Lewiston, Me.
A. W. Harris, Ph. D., Sc. D	University of Maine	Orono, Me.
Nathaniel Butler, D. D	Colby University	Waterville, Me.
Thomas Fell, Ph. D., LL. D	St. John's College	Annapolis, Md.
D. C. Gilman, LL. D	Johns Hopkins University	Baltimore, Md.
John A. Morgan, S. J	Loyola College	Do.
Francis J. Wagner, D. D	Morgan College	Do.
Charles W. Reid, Ph. D	Washington College	Chestertown, Md.
R. W. Silvester	Maryland Agricultural College	College Park, Md.
Brother Abraham	Rock Hill College	Ellicott City, Md.
C. B. Schrantz, S. S	St. Charles College	Do.
Wm. L. O'Hara	Mount St. Mary's College	Mount St. Marys, Md.
William H. Purnell, LL. D	New Windsor College	New Windsor, Md.
Thomas H. Lewis, D. D	Western Maryland College	Westminster, Md.
	Amherst College	Amherst, Mass.
Timothy Brosnahan, S. J	Boston College	Boston, Mass.
William F. Warren, LL. D	Boston University	Do.
Charles W. Eliot, LL. D	Harvard University	Cambridge, Mass.
Samuel H. Lee	French American College	Springfield, Mass.
Elmer H. Capen, D. D	Tufts College	Tufts College, Mass.
F. Carter, Ph. D., LL. D	Williams College	Williamstown, Mass.
G. Stanley Hall, Ph. D., LL. D	Clark University	Worcester, Mass.
John F. Lehy, S. J	College of the Holy Cross	Do.
Denison C. Thomas, Ph. D	Adrian College	Adrian, Mich.
John P. Ashley, Ph. D	Albion College	Albion, Mich.
August F. Bruske, D. D	Alma College	Alma, Mich.
James B. Angell, LL. D	University of Michigan	Ann Arbor, Mich.
E. A. Sutherland	Battle Creek College	Battlecreek, Mich.
Geo. A. Catton, acting	Benzonia College	Benzonia, Mich.
James D. Foley, S. J	Detroit College	Detroit, Mich.
George F. Mosher, LL. D	Hillsdale College	Hillsdale, Mich.
Gerrit J. Kollen, A. M	Hope College	Holland, Mich.
A. G. Slocum, LL. D	Kalamazoo College	Kalamazoo, Mich.
W. G. Sperry, D. D	Olivet College	Olivet, Mich.
Peter Engel, O. S. B., Ph. D	St. John's University	Collegeville, Minn.
George H. Bridgman, D. D	Hamline University	Hamline, Minn.
Georg Sverdrup	Augsburg Seminary	Minneapolis, Minn.
Cyrus Northrop, LL. D	University of Minnesota	Do.
James W. Strong, D. D	Carleton College	Northfield, Minn.
Thorbjörn N. Mohn	St. Olaf College	Do.
James Wallace, Ph. D	Macalester College	St. Paul, Minn.
Matthias Wahlstrom, A. M	Gustavus Adolphus College	St. Peter, Minn.
R. M. Lawrence, A. M	Parker College	Winnebago City, Minn.
J. W. Provine, Ph. D	Mississippi College	Clinton, Miss.
Wm. W. Foster, jr., D. D	Rust University	Holly Springs, Miss.
W. B. Murrah, D. D	Millsaps College	Jackson, Miss.
Robert B. Fulton, A. M	University of Mississippi	University, Miss.
Zuinglius Moore, A. B	Central Christian College	Albany, Mo.
W. H. Pritchett, A. M	Northwest Missouri College	Do.
James Rice, A. M	Southwest Baptist College	Bolivar, Mo.
R. E. Downing, B. Sur	Pike College	Bowling Green, Mo.
B. W. Baker, Ph. D	Missouri Wesleyan College	Cameron, Mo.
Clinton Lockhart, Ph. D	Christian University	Canton, Mo.
E. M. Hopkins, C. M	St. Vincent College	Cape Girardeau, Mo
Richard H. Jesse, LL. D	University of the State of Missouri	Columbia, Mo.
Geo. W. Mitchell	Grand River Christian Union College	Edinburg, Mo.
E. B. Craighead, A. M	Central College	Fayette, Mo.
John J. Rice, LL. D., acting	Westminster College	Fulton, Mo.
Chas. C. Hemenway, Ph. D	Pritchett College	Glasgow, Mo.
Jere T. Muir, LL. D	LaGrange College	Lagrange, Mo.
J. P. Greene, D. D., LL. D	William Jewell College	Liberty, Mo.
Wm. H. Black, D. D	Missouri Valley College	Marshall, Mo.
Joseph J. Pritchett	Morrisville College	Morrisville, Mo.
J. C. Shelton, A. M	Scarritt Collegiate Institute	Neosho, Mo.
L. M. McAfee, A. M	Park College	Parkville, Mo.
C. L. Wolcott	St. Charles College	St. Charles, Mo.
Brother Paulian, F. S. C	College of the Christian Brothers	St. Louis, Mo.

III.—College Presidents—Continued.

I.—*Colleges for males and coeducational colleges of liberal arts*—Continued.

Name of president.	University or college.	Address.
James F. X. Hoeffer, S. J	St. Louis University	St. Louis, Mo.
Winfield S. Chaplin, LL. D	Washington University	Do.
Homer T. Fuller, Ph. D	Drury College	Springfield, Mo.
J. A. Thompson, A. M	Tarkio College	Tarkio, Mo.
C. J. Kephart, D. D	Avalon College	Trenton, Mo.
Geo. B. Addicks, A. M	Central Wesleyan College	Warrenton, Mo.
A. B. Martin, A. M	College of Montana	Deerlodge, Mont.
J. C. Templeton, B. S	Montana Wesleyan University	Helena, Mont.
Oscar J. Craig, Ph. D	University of Montana	Missoula, Mont.
David R. Kerr, Ph. D., D. D	University of Omaha	Bellevue, Nebr.
W. P. Aylsworth, A. M	Cotner University	Bethany, Nebr.
N. W. Kauble	Union College	College View, Nebr.
David B. Perry, A. M	Doane College	Crete, Nebr.
C. W. Hemry, A. M	Fairfield College	Fairfield, Nebr.
Geo. Sutherland, D. D	Grand Island College	Grand Island, Nebr.
S. G. Pattison, A. M	Hastings College	Hastings, Nebr.
Geo. E. MacLean, LL. D	University of Nebraska	Lincoln, Nebr.
Oscar F. Davis	Gates College	Neligh, Nebr.
John Pahls, S. J	Creighton University	Omaha, Nebr.
D. W. C. Huntington, D. D	Nebraska Wesleyan University	University Place, Nebr.
Wm. E. Schell, A. M	York College	York, Nebr.
Joseph E. Stubbs, D. D	State University of Nevada	Reno, Nev.
W. J. Tucker, D. D., LL. D	Dartmouth College	Hanover, N. H.
Florian Widman, O. S. B	St. Anselm's College	Manchester, N. H.
George Bien, O. S. B	St. Benedict's College	Newark, N. J.
Austin Scott, Ph. D., LL. D	Rutgers College	New Brunswick, N. J.
F. L. Patton, D. D., LL. D	Princeton University	Princeton, N. J.
	Seton Hall College	South Orange, N. J.
B. C. Davis, A. M	Alfred University	Alfred, N. Y.
Joseph F. Butler, O. S. F	St. Bonaventure's College	Allegany, N. Y.
George B. Hopson, D. D., acting	St. Stephen's College	Annandale, N. Y.
C. H. Levermore, Ph. D	Adelphi College	Brooklyn, N. Y.
D. H. Cochran, Ph. D., LL. D	Polytechnic Institute of Brooklyn	Do.
Brother Jerome, O. S. F	St. Francis College	Do.
James J. Sullivan, C. M	St. John's College	Do.
John B. Theis, S. J	Canisius College	Buffalo, N. Y.
John C. Lee, Ph. D., D. D	St. Lawrence University	Canton, N. Y.
M. Woolsey Stryker, D. D	Hamilton College	Clinton, N. Y.
Robert E. Jones, A. B	Hobart College	Geneva, N. Y.
George E. Merrill, D. D	Colgate University	Hamilton, N. Y.
J. G. Schurman, Sc. D., LL. D	Cornell University	Ithaca, N. Y.
Thomas E. Murphy, S. J	College of St. Francis Xavier	New York, N. Y.
Alexander S. Webb, LL. D	College of the City of New York	Do.
Seth Low, LL. D	Columbia University	Do.
Brother Justin, A. M	Manhattan College	Do.
T. J. Campbell, S. J	St. John's College	Do.
H. M. MacCracken, D. D., LL. D	New York University	Do.
P. S. MacHale, C. M	Niagara University	Niagara University, N. Y.
S. A. Lattimore, Ph. D., LL. D	University of Rochester	Rochester, N. Y.
A. V. V. Raymond, D. D	Union College	Schenectady, N. Y.
James R. Day, D. D	Syracuse University	Syracuse, N. Y.
Leo Haid, D. D., O. S. B	St. Mary's College	Belmont, N. C.
E. A. Alderman, D. C. L	University of North Carolina	Chapel Hill, N. C.
D. J. Sanders, D. D	Biddle University	Charlotte, N. C.
J. B. Shearer, D. D., LL. D	Davidson College	Davidson, N. C.
John C. Kilgo, D. D	Trinity College	Durham, N. C.
W. W. Staley, D. D	Elon College	Elon College, N. C.
L. Lyndon Hobbs, A. M	Guilford College	Guilford College, N. C
Robert A. Yoder, A. M	Lenoir College	Hickory, N. C.
M. G. G. Scherer, A. M	North Carolina College	Mount Pleasant, N. C.
J. C. Clapp, D. D	Catawba College	Newton, N. C.
Chas. F. Meserve, A. M	Shaw University	Raleigh, N. C.
W. E. Abernethy	Rutherford College	Rutherford College, N. C.
William H. Goler, D. D	Livingstone College	Salisbury, N. C.
C. E. Taylor, D. D., Litt. B	Wake Forest College	Wake Forest, N. C.
George F. Kirby	Weaverville College	Weaverville, N. C.
Henry C. Simmons, A. M	Fargo College	Fargo, N. Dak.
W. Merrifield, A. M	University of North Dakota	University, N. Dak.
M. V. B. Knox, D. D	Red River Valley University	Wahpeton, N. Dak.
Ira A. Priest, A. M	Buchtel College	Akron, Ohio.
Albert B. Riker, D. D	Mount Union College	Alliance, Ohio.
Isaac Crook, D. D	Ohio University	Athens, Ohio.
Millard F. Warner, A. M	Baldwin University	Berea, Ohio.
C. Riemenschneider, Ph. D	German Wallace College	Do.
David McKinney, D. D	Cedarville College	Cedarville, Ohio.
Joseph M. Scherer, C. S. C	St. Joseph's College	Cincinnati, Ohio.
Michael J. O'Connor, S. J	St. Xavier College	Do.
Edward W. Hyde, C. E., dean	University of Cincinnati	Do.
H. J. Ruetenik, D. D	Calvin College	Cleveland, Ohio.
Godfrey J. Schulte, S. J	St. Ignatius College	Do.
Chas. F. Thwing, D. D	Western Reserve University	Do.
F. W. Stellhorn, D. D	Capital University	Columbus, Ohio.

III.—College Presidents—Continued.

I.—*Colleges for males and coeducational colleges of liberal arts*—Continued.

Name of president.	University or college.	Address.
James H. Canfield, LL. D	Ohio State University	Columbus, Ohio.
John R. H. Latchaw, D. D	Defiance College	Defiance, Ohio.
James W. Bashford, Ph. D	Ohio Wesleyan University	Delaware, Ohio.
C. Manchester, A. M	Findlay College	Findlay, Ohio.
Wm. F. Peirce, L. H. D	Kenyon College	Gambier, Ohio.
D. B. Purinton, LL. D	Denison University	Granville, Ohio.
Ely V. Zollars, LL. D	Hiram College	Hiram, Ohio.
S. P. Long, A. M	Lima College	Lima, Ohio.
J. H. Chamberlin, Litt. D., dean	Marietta College	Marietta, Ohio.
W. A. Williams, D. D	Franklin College	New Athens, Ohio.
Jesse Johnson, A. M	Muskingum College	New Concord, Ohio.
John H. Barrows, D. D	Oberlin College	Oberlin, Ohio.
Wm. O. Thompson, D. D	Miami University	Oxford, Ohio.
Geo. W. MacMillan, Ph. D., D. D.	Richmond College	Richmond, Ohio.
John M. Davis, Ph. D	Rio Grande College	Rio Grande Ohio.
W. G. Compher, Ph. D	Scio College	Scio, Ohio.
Samuel A. Ort, D. D	Wittenberg College	Springfield, Ohio.
John A. Peters, D. D	Heidelberg University	Tiffin, Ohio.
Thomas J. Sanders, Ph. D	Otterbein University	Westerville, Ohio.
S. T. Mitchell, LL. D	Wilberforce University	Wilberforce, Ohio.
James B. Unthank, M. S	Wilmington College	Wilmington, Ohio.
S. F. Scovel, D. D	University of Wooster	Wooster, Ohio.
Daniel A. Long, D. D., LL. D	Antioch College	Yellow Springs, Ohio.
D. R. Boyd, A. M	University of Oklahoma	Norman, Okla.
Chas. H. Chapman, Ph. D	University of Oregon	Eugene, Oreg.
Thomas McClelland, D. D	Pacific University	Forest Grove, Oreg.
C. C. Poling, Ph. B	Lafayette Seminary	Lafayette, Oreg.
H. L. Boardman, A. M	McMinnville College	McMinnville, Oreg.
Thomas Newlin, A. M	Pacific College	Newberg, Oreg.
J. M. C. Miller, M. S	Philomath College	Philomath, Oreg.
Willis C. Hawley, A. M	Willamette University	Salem, Oreg.
Thomas Van Scoy, D. D	Portland University	University Park, Oreg.
W. J. Holland, Ph. D., D. D	Western University of Pennsylvania	Allegheny, Pa.
Theodore L. Seip, D. D	Muhlenberg College	Allentown, Pa.
H. U. Roop, Ph. D	Lebanon Valley College	Annville, Pa.
Leander Schnerr, O. S. B	St. Vincent College	Beatty, Pa.
W. P. Johnston, A. M	Geneva College	Beaver Falls, Pa.
Aug. Schultz, D. D	Moravian College	Bethlehem, Pa.
George E. Reed, D. D., LL. D	Dickinson College	Carlisle, Pa.
C. E. Hyatt, C. E	Pennsylvania Military College	Chester, Pa.
Henry T. Spangler, D. D	Ursinus College	Collegeville, Pa.
E. D. Warfield, LL. D	Lafayette College	Easton, Pa.
H. W. McKnight, D. D., LL. D	Pennsylvania College	Gettysburg, Pa.
Theo. B. Roth, D. D	Thiel College	Greenville, Pa.
Isaac C. Ketler, Ph. D	Grove City College	Grove City, Pa.
Isaac Sharpless, Sc. D., LL. D	Haverford College	Haverford, Pa.
John S. Stahr, Ph. D., D. D	Franklin and Marshall College	Lancaster, Pa.
John H. Harris, Ph. D	Bucknell University	Lewisburg, Pa.
Isaac N. Rendall, D. D	Lincoln University	Lincoln University, Pa.
Wm. H. Crawford, D. D	Allegheny College	Meadville, Pa.
Aaron E. Gobble, A. M	Central Pennsylvania College	New Berlin, Pa.
R. G. Ferguson, D. D	Westminster College	New Wilmington, Pa.
R. E. Thompson, D. D	Central High School	Philadelphia, Pa.
Brother Isidore	La Salle College	Do.
Charles C. Harrison, LL. D	University of Pennsylvania	Do.
Edwin L. York, Ph. D	Duquesne College	Pittsburg, Pa.
John T. Murphy, C. S. Sp	Holy Ghost College	Do.
Thomas M. Drown, M. D	Lehigh University	South Bethlehem, Pa.
G. W. Atherton, LL. D	Pennsylvania State College	State College, Pa.
W. W. Birdsall, B. S.	Swarthmore College	Swarthmore, Pa.
Laurence A. Delurey, O. S. A	Villanova College	Villanova, Pa.
G. E. Brenneman, A. B	Volant College	Volant, Pa.
James D. Moffat, D. D	Washington and Jefferson College	Washington, Pa.
B. F. Clarke, Sc. D., acting	Brown University	Providence, R. I.
Harrison Randolph, A. M	College of Charleston	Charleston, S. C.
A. E. Spencer, A. M	Presbyterian College of South Carolina.	Clinton, S. C.
Wm. D. Chappelle, D. D	Allen University	Columbia, S. C.
F. C. Woodward, Litt. D	South Carolina College	Do.
W. M. Grier, D. D., LL. D	Erskine College	Due West, S. C.
A. P. Montague, Ph. D	Furman University	Greenville, S. C.
Geo. B. Cromer, A. M	Newberry College	Newberry, S. C.
L. M. Dunton, D. D	Claflin University	Orangeburg, S. C.
James H. Carlisle, LL. D	Wofford College	Spartanburg, S. C.
Elmer E. Lymer, D. D	Black Hills College	Hot Springs, S. Dak.
C. H. French, A. M	Huron College	Huron, S. Dak.
W. I. Graham, A. M	Dakota University	Mitchell, S. Dak.
I. P. Patch	Redfield College	Redfield, S. Dak.
James E. Todd, A. M., acting	University of South Dakota	Vermilion, S. Dak.
H. K. Warren, A. M	Yankton College	Yankton, S. Dak.

III.—College Presidents—Continued.

I.—*Colleges for males and coeducational colleges of liberal arts*—Continued.

Name of president.	University or college.	Address.
J. Albert Wallace, D. D	King College	Bristol, Tenn.
John H. Race, A. M	U. S. Grant University	Chattanooga, Tenn.
George Summey, D. D	Southwestern Presbyterian University.	Clarksville, Tenn.
J. F. Spence, S. T. D., LL. D	American Temperance University	Harriman, Tenn.
S. G. Gilbreath	Hiwassee College	Hiwassee College, Tenn.
G. M. Savage, LL. D	Southwestern Baptist University	Jackson, Tenn.
J. S. McCulloch, D. D	Knoxville College	Knoxville, Tenn.
Chas. W. Dabney, Ph. D., LL. D	University of Tennessee	Do.
N. Green, LL. D	Cumberland University	Lebanon, Tenn.
J. L. Dickens, Ph. D., LL. D	Bethel College	McKenzie, Tenn.
S. W. Boardman, LL. D	Maryville College	Maryville, Tenn.
Brother Maurelian	Christian Brothers' College	Memphis, Tenn.
J. Hopwood, A. M	Milligan College	Milligan, Tenn.
J. T. Henderson, A. M	Carson and Newman College	Mossy Creek, Tenn.
J. Braden, D. D	Central Tennessee College	Nashville, Tenn.
E. M. Cravath, D. D	Fisk University	Do.
Owen James, D. D	Roger Williams University	Do.
Wm. H. Payne, LL. D	University of Nashville	Do.
James H. Kirkland, Ph. D	Vanderbilt University	Do.
B. Lawton Wiggins, A. M	University of the South	Sewanee, Tenn.
W. N. Billingsley, A. M	Burritt College	Spencer, Tenn.
J. L. Bachman, A. M	Sweetwater College	Sweetwater, Tenn.
Jere Moore, D. D	Greeneville and Tusculum College	Tusculum, Tenn.
James T. Cooter, A. M	Washington College	Washington College, Tenn.
P. P. Klein, C. S. C	St. Edward's College	Austin, Tex.
Geo. T. Winston, LL. D	University of Texas	Do.
J. H. Grove, A. M	Howard Payne College	Brownwood, Tex.
T. H. Bridges	Henry College	Campbell, Tex.
Oscar L. Fisher, D. D	Fort Worth University	Fort Worth, Tex.
W. F. Lloyd	Polytechnic College	Do.
J. B. Quinlan, S. J	St. Mary's University	Galveston, Tex.
John R. Allen, D. D	Southwestern University	Georgetown, Tex.
S. J. Anderson, D. D	Burleson College	Greenville, Tex.
M. W. Dogan, A. M	Wiley University	Marshall, Tex.
John Wolf	St. Louis College	San Antonio, Tex.
Thornton R. Sampson	Austin College	Sherman, Tex.
L. A. Johnson, Ph. D	Trinity University	Tehuacana, Tex.
Addison Clark, LL. D	Add Ran Christian University	Waco, Tex.
J. C. Lattimore, M. S	Baylor University	Do.
I. M. Burgan, D. D	Paul Quinn College	Do.
Wm. J. Kerr	Brigham Young College	Logan, Utah.
Joseph T. Kingsbury, Ph. D	University of Utah	Salt Lake City, Utah.
Matthew H. Buckham, D. D	University of Vermont	Burlington, Vt.
Ezra Brainerd, LL. D	Middlebury College	Middlebury, Vt.
Allan D. Brown, D. D	Norwich University	Northfield, Vt.
Wm. W. Smith, LL. D	Randolph-Macon College	Ashland, Va.
W. B. Yount	Bridgewater College	Bridgewater, Va.
P. B. Barringer, M. D	University of Virginia	Charlottesville, Va.
R. G. Waterhouse, D. D	Emory and Henry College	Emory, Va.
F. P. Ramsay, A. M	Fredericksburg College	Fredericksburg, Va.
Richard McIlwaine, D. D	Hampden-Sidney College	Hampden-Sidney, Va.
William L. Wilson, LL. D	Washington and Lee University	Lexington, Va.
F. W. Boatwright, LL. D	Richmond College	Richmond, Va.
Julius D. Dreher, Ph. D	Roanoke College	Salem, Va.
L. G. Tyler, LL. D	College of William and Mary	Williamsburg, Va.
A. C. Jones	Vashon College	Burton, Wash.
F. N. English, A. M	Colfax College	Colfax, Wash.
E. J. Hibbard	Walla Walla College	College Place, Wash.
Frank P. Graves, Ph. D	University of Washington	Seattle, Wash.
James Rebmann, S. J	Gonzaga College	Spokane, Wash.
Calvin W. Stewart, D. D	Whitworth College	Sumner, Wash.
C. R. Thoburn	Puget Sound University	Tacoma, Wash.
Brother Zenonian	St. James College	Vancouver, Wash.
S. B. L. Penrose	Whitman College	Walla Walla, Wash.
Tepheniah Meek, D. D	Barboarsville College	Barboursville, W. Va.
C. A. Young, Ph. D	Bethany College	Bethany, W. Va.
Jerome H. Raymond, Ph. D	West Virginia University	Morgantown, W. Va.
Samuel Plantz, Ph. D., D. D	Lawrence University	Appleton, Wis.
E. D. Eaton, D. D., LL. D	Beloit College	Beloit, Wis.
H. A. Muehlmeier, D. D	Mission House	Franklin, Wis.
George J. Jones, Ph. D., LL. D	Gale College	Galesville, Wis.
Chas. K. Adams, LL. D	University of Wisconsin	Madison, Wis.
Wm. C. Whitford, D. D	Milton College	Milton, Wis.
M. J. F. Albrecht	Concordia College	Milwaukee, Wis.
Leopold Bushart, S. J	Marquette College	Do.
Rufus C. Flagg, D. D	Ripon College	Ripon, Wis.
A. F. Erust	Northwestern University	Watertown, Wis.
Elmer E. Smiley, A. B	University of Wyoming	Laramie, Wyo.

III.—College Presidents—Continued.

II.—*Colleges for women.*

Name of president.	University or college.	Address.
H. W. Browder, A. M	Athens Female College	Athens, Ala.
A. B. Ellis	Bailey Springs University	Bailey Springs, Ala.
J. B. Cumming	East Lake Athenæum	Eastlake, Ala.
	Union Female College	Eufaula, Ala.
Robert G Patrick, D. D	Judson Female Institute	Marion, Ala.
Jas. D. Wade, A. M	Marion Female Seminary	Do.
	Isbell College	Talladega, Ala.
E. H. Murfee	Central Female College	Tuscaloosa, Ala.
W. F. Melton, Ph. D	Tuscaloosa Female College	Do.
John Massey, LL. D	Alabama Conference Female College	Tuskegee, Ala.
J. G. Lile	Central Baptist College	Conway, Ark.
Mrs. C. T. Mills	Mills College	Mills College, Cal.
Sister Mary Bernardine	College of Notre Dame	San Jose, Cal.
Mrs. M. A. Lipscomb	Lucy Cobb Institute	Athens, Ga.
Chas. C. Cox, A. M	Southern Female College	College Park, Ga.
Homer Bush, A. M	Andrew Female College	Cuthbert, Ga.
Miss Mabel Head	Dalton Female College	Dalton, Ga.
M. H. Lane	Monroe Female College	Forsyth, Ga.
A. W. Van Hoose	Georgia Female Seminary	Gainesville, Ga.
Rufus W. Smith, A. M	Lagrange Female College	Lagrange, Ga.
G. A. Nunnally	Southern Female College	Do.
J. W. Roberts, D. D	Wesleyan Female College	Macon, Ga.
T. J. Simmons	Shorter College	Rome, Ga.
John E. Baker	Young Female College	Thomasville, Ga.
Joseph R. Harker, Ph. D	Illinois Female College	Jacksonville, Ill.
E. F. Bullard, A. M	Jacksonville Female Academy	Do.
C. W. Leffingwell, D. D	St. Mary's School	Knoxville, Ill.
Phebe T. Sutliff, A. M	Rockford College	Rockford, Ill.
M. H. Reaser	College for Young Ladies	Oswego, Kans.
F. R. Millspaugh, D. D	College of the Sisters of Bethany	Topeka, Kans.
Benj. F. Cabell	Potter College	Bowling Green, Ky.
J. C. Ely, D. D	Caldwell College	Danville, Ky.
Edmund Harrison, A. M	Bethel Female College	Hopkinsville, Ky.
B. C. Hagerman, A. M	Hamilton Female College	Lexington, Ky.
H. B. McClellan, A. M	Sayre Female Institute	Do.
C. C. Fisher, A. M	Millersburg Female College	Millersburg, Ky.
Mrs. B. W. Vineyard	Jessamine Female Institute	Nicholasville, Ky.
A. C. Goodwin, Ph. D	Owensboro Female College	Owensboro, Ky.
G. B. Perry, A. M	Villa Ridge College	Pewee Valley, Ky.
A. G. Murphey	Logan Female College	Russellville, Ky.
William Shelton	Stanford Female College	Stanford, Ky.
George J. Ramsey, A. M	Silliman Female Institute	Clinton, La.
T. S. Sligh, A. M	Mansfield Female College	Mansfield, La.
S. A. Myers	Minden Female College	Minden, La.
H. S. Whitman, A. M	Westbrook Seminary	Deering, Me.
A. F. Chase, Ph. D	Maine Wesleyan Seminary and Female College.	Kents Hill, Me.
John F. Goucher, D. D	Woman's College of Baltimore	Baltimore, Md.
J. H. Apple, A. M	Woman's College	Frederick, Md.
C. L. Keedy, A. M., M. D	Kee Mar College	Hagerstown, Md.
J. H. Turner, A. M	Maryland College for Young Ladies	Lutherville, Md.
C. C. Bragdon, A. M	Lasell Seminary for Young Women	Auburndale, Mass.
Miss Agnes Irwin, dean	Radcliffe College	Cambridge, Mass.
L. Clark Seelye, D. D	Smith College	Northampton, Mass.
Mrs. E. S. Mead, A. M	Mount Holyoke College	South Hadley, Mass.
Miss Caroline Hazard	Wellesley College	Wellesley, Mass.
Ella Young	Albert Lea College	Albert Lea, Minn.
B. G. Lowrey, A. M	Blue Mountain Female College	Blue Mountain, Miss.
John W. Chambers, A. M	Whitworth Female College	Brookhaven, Miss.
George Wharton	Hillman College	Clinton, Miss.
A. A. Kincannon	Industrial Institute and College	Columbus, Miss.
L. T. Fitzhugh	Belhaven College for Young Ladies	Jackson, Miss.
C. H. Otken, LL. D	McComb Female Institute	McComb, Miss.
J. W. Beeson, A. M	East Mississippi Female College	Meridian, Miss.
L. M. Stone, D. D	Stone College for Young Ladies	Do.
A. S. Maddox	Union Female College	Oxford, Miss.
S. Decatur Lucas	Chickasaw Female College	Pontotoc, Miss.
Mrs. M. H. Meek	Port Gibson Female College	Port Gibson, Miss.
Mrs. Eva B. Wilkinson	Hamilton College	Water Valley, Miss.
Mrs. W. T. Moore	Christian Female College	Columbia, Mo.
S. F. Taylor, D. D	Stephens Female College	Do.
Hiram D. Groves	Howard Payne College	Fayette, Mo.
T. P. Walton	Synodical Female College	Fulton, Mo.
George F. Ayres	Presbyterian College	Independence, Mo.
B. T. Blewett, LL. D	St. Louis Seminary	Jennings, Mo.
James A. Beauchamp	Baptist Female College	Lexington, Mo.
Z. M. Williams, A. M	Central Female College	Do.
C. M. Williams	Liberty College for Young Ladies	Liberty, Mo.
J. W. Million, A. M	Hardin College	Mexico, Mo.
Mrs. V. A. C. Stockard	Cottey College	Nevada, Mo.
M. H. Ream	Lindenwood Female College	St. Charles, Mo.
J. W. Blaisdell, D. D	Bordentown Female College	Bordentown, N. J.

III.—College Presidents—Continued.

II.—*Colleges for women*—Continued.

Name of president.	University or college.	Address.
William E. Waters, Ph. D	Wells College	Aurora, N. Y.
Truman J. Backus, LL. D	Packer Collegiate Institute	Brooklyn, N. Y.
A. C. McKenzie, D. D	Elmira College	Elmira, N. Y.
Emily James Smith, dean	Barnard College	New York, N. Y.
James M. Taylor, D. D	Vassar College	Poughkeepsie, N. Y.
Archibald A. Jones	Asheville Female College	Asheville, N. C.
C. B. King, A. M	Elizabeth College	Charlotte, N. C.
S. A. Wolff, A. M	Gaston College	Dallas, N. C.
Dred Peacock, A. M	Greensboro Female College	Greensboro, N. C.
S. P. Hatton, A. M	Claremont Female College	Hickory, N. C.
M. S. Davis, A. M	Louisburg Female College	Louisburg, N. C.
W. O. Petty	Chowan Baptist Female Institute	Murfreesboro, N. C.
F. P. Hobgood	Oxford Female Seminary	Oxford, N. C.
John H. Clewell	Salem Female Academy	Salem, N. C.
G. K. Bartholomew, A. M., Ph. D.	Bartholomew English and Classical School.	Cincinnati, Ohio.
L. D. Potter, D. D	Glendale Female College	Glendale, Ohio.
R. N. Ringland	Granville Female College	Granville, Ohio.
Faye Walker, D. D	Oxford College	Oxford, Ohio.
Leila S. McKee, Ph D	Western College	Do.
Miss Mary Evans	Lake Erie Seminary	Painesville, Ohio.
J. W. Knappenberger, A. M	Allentown College for Women	Allentown, Pa.
J. Max Hark, D. D	Moravian Seminary for Young Ladies	Bethlehem, Pa.
M. Carey Thomas, Ph. D	Bryn Mawr College	Bryn Mawr, Pa.
Samuel A. Martin, D. D	Wilson College	Chambersburg, Pa.
C. L. Moench	Linden Hall Seminary	Lititz, Pa.
E. E. Campbell, A. M	Irving Female College	Mechanicsburg, Pa.
Frances E. Bennett	Ogontz School	Ogontz School, Pa.
R. Jennie DeVere	Pennsylvania College for Women	Pittsburg, Pa.
J. A. Rice, D. D	Columbia Female College	Columbia, S. C.
Robert P. Pell, A. B	Presbyterian College for Women	Do.
C. E. Todd	Due West Female College	Due West, S. C.
Jno. R. Mack, A. M	Cooper-Limestone Institute	Gaffney, S. C.
A. S. Townes	Greenville College for Women	Greenville, S. C.
M. M. Riley	Greenville Female College	Do.
B. F. Wilson	Converse College	Spartanburg, S. C.
B. G. Clifford	Clifford Seminary	Union, S. C.
S. Lander, A. M	Williamston Female College	Williamston, S. C.
S. N. Barker	Sullins College	Bristol, Tenn.
C. A. Folk, A. B	Brownsville Female College	Brownsville, Tenn.
T. W. Crowder	Wesleyan Female College	Do.
Robert D. Smith, A. M	Columbia Athenæum	Columbia, Tenn.
T. E. Allen	Tennessee Female College	Franklin, Tenn.
A. C. Bigger	Howard Female College	Gallatin, Tenn.
A. B. Jones, D. D., LL. D	Memphis Conference Female Institute	Jackson, Tenn.
Miss V. O. Wardlaw, A. M	Soule Female College	Murfreesboro, Tenn.
Geo. W. F. Price, D. D	Nashville College for Young Ladies	Nashville, Tenn.
J. D. Blanton	Ward Seminary	Do.
	Martin Female College	Pulaski, Tenn.
Wm. M. Graybill, A. M	Synodical Female College	Rogersville, Tenn.
Charles Carlton	Carlton College	Bonham, Tex.
W. A. Wilson, A. M	Baylor Female College	Belton, Tex.
L. F. Smith	Chappell Hill Female College	Chappell Hill, Tex.
W. M. Dyer	Martha Washington College	Abingdon, Va.
Kate M. Hunt	Stonewall Jackson Institute	Do.
William H. Tharp, A. M	Southwest Virginia Institute	Bristol, Va.
L. H. Shuck, D. D	Albemarle Female Institute	Charlottesville, Va.
C. F. James, D. D	Roanoke Female College	Danville, Va.
Chas. L. Cocke	Hollins Institute	Hollins, Va.
W. W. Smith, LL. D	Randolph-Macon Woman's College	Lynchburg, Va.
J. J. Scherer, A. M	Marion Female College	Marion, Va.
George F. Winston	Norfolk College for Young Ladies	Norfolk, Va.
Arthur K. Davis, A. M	Southern Female College	Petersburg, Va.
James Nelson, D. D	Woman's College	Richmond, Va.
Mrs. J. E. B. Stuart	Virginia Female Institute	Staunton, Va.
A. M. Smith	Episcopal Female Institute	Winchester, Va.
John P. Hyde, D. D., LL. D	Valley Female College	Do.
Mrs. H. L. Field	Parkersburg Seminary	Parkersburg, W. Va.
Ellen C. Sabin, A. M	Milwaukee-Downer College	Milwaukee, Wis.

III.—*Schools of technology.*

Wm. Le Roy Broun, LL. D	Alabama Agricultural and Mechanical College.	Auburn, Ala.
Alston Ellis, LL. D	Colorado Agricultural College	Fort Collins, Colo.
Regis Chauvenet, A. M., B. S	State School of Mines	Golden, Colo.
George W. Flint	Storrs Agricultural College	Storrs, Conn.
Lyman Hall	State School of Technology	Atlanta, Ga.
F. W. Gunsaulus, D. D	Armour Institute	Chicago, Ill.

III.—College Presidents—Continued.

III.—*Schools of technology*—Continued.

Name of president.	University or college.	Address.
J. H. Smart, LL. D	Purdue University	Lafayette, Ind.
Carl L. Mees, Ph. D	Rose Polytechnic Institute	Terre Haute, Ind.
W. M. Beardshear, LL. D	Iowa Agricultural College	Ames, Iowa.
Thomas E. Will, A. M	Kansas Agricultural College	Manhattan, Kans.
F. V. McNair, U. S. N	United States Naval Academy	Annapolis, Md.
H. H. Goodell, LL. D	Massachusetts Agricultural College	Amherst, Mass.
J. M. Crafts, B. S	Massachusetts Institute of Technology	Boston, Mass.
T. C. Mendenhall, LL. D	Worcester Polytechnic Institute	Worcester, Mass.
J. L. Snyder, Ph. D	Michigan Agricultural College	Agricultural College, Mich.
M. E. Wadsworth, Ph. D	Michigan College of Mines	Houghton, Mich.
S. D. Lee, LL. D	Mississippi Agricultural and Mechanical College.	Agricultural College, Miss.
E. H. Triplett	Alcorn Agricultural and Mechanical College.	Westside, Miss.
James Reid. A. B	Montana College of Agriculture and Mechanic Arts.	Bozeman, Mont
C. S. Murkland, Ph. D	New Hampshire College of Agriculture and Mechanic Arts.	Durham, N. H.
Henry Morton, Ph. D	Stevens Institute of Technology	Hoboken, N. J.
C. A. Colton, E. M	Newark Technical School	Newark, N. J.
C. T. Jordan, A. M	New Mexico College of Agriculture and Mechanic Arts.	Mesilla Park, N. Mex.
Fayette A. Jones, C. E., M. E	New Mexico School of Mines	Socorro, N. Mex.
Barton Cruikshank, M. E	Clarkson School of Technology	Potsdam, N. Y.
John H. Peck, LL. D	Rensselaer Polytechnic Institute	Troy, N. Y.
A. L. Mills, U. S. A	United States Military Academy	West Point, N. Y.
James B. Dudley	Agricultural and Mechanical College for the Colored Race.	Greensboro, N. C.
A. Q. Holladay	North Carolina College of Agriculture and Mechanic Arts.	Raleigh, N. C.
J. H. Worst	North Dakota Agricultural College	Agricultural College, N. Dak.
Cady Staly, LL. D	Case School of Applied Science	Cleveland, Ohio.
Geo. E. Morrow, A. M	Oklahoma Agricultural and Mechanical College.	Stillwater, Okla.
Thomas M. Gatch, Ph. D	Oregon Agricultural College	Corvallis, Oreg.
John H. Washburn, Ph. D	Rhode Island College of Agriculture and Mechanic Arts.	Kingston, R. I.
Asbury Coward, LL. D	South Carolina Military Academy	Charleston, S. C.
Henry S. Hartzog, B. S	Clemson Agricultural College	Clemson College, S. C.
John W. Heston, Ph. D., LL. D	South Dakota Agricultural College	Brookings, S. Dak.
V. T. McGillycuddy	State School of Mines	Rapid City, S. Dak.
L. L. Foster	Agricultural and Mechanical College of Texas.	College Station, Tex.
Joseph M. Tanner	Agricultural College of Utah	Logan, Utah.
J. M. McBryde, LL. D	Virginia Agricultural and Mechanical College.	Blacksburg, Va.
Scott Shipp, LL. D	Virginia Military Institute	Lexington, Va.
E. A. Bryan, A. M	Washington Agricultural College and School of Science.	Pullman, Wash.

IV.—Principals of Normal Schools.

Public normal schools.

Location.	Name of institution.	Principal.
ALABAMA.		
Florence	State Normal College	Marshall C. Wilson.
Jacksonville	do	Jacob Forney.
Livingston	Alabama Normal College for Girls	Miss Julia S. Tutwiler.
Montgomery	Montgomery Normal School	
Normal	State Colored Normal and Industrial School.	W. H. Councill.
Troy	State Normal College	Edwin R. Eldridge.
ARIZONA.		
Tempe	Territorial Normal School of Arizona	James McNaughton.
ARKANSAS.		
Paris	Paris Academy	G. S. Minmier.
Pine Bluff	Branch Normal College	J. C. Corbin.

IV.—Principals of Normal Schools—Continued.

Public normal schools—Continued.

Location.	Name of institution.	Principal.
CALIFORNIA.		
Chico	California State Normal School	Carlton M. Ritter.
Los Angeles	State Normal School	Edward T. Pierce.
San Francisco	San Francisco Normal School	Laura T. Fowler.
San Jose	State Normal School	A. H. Randall.
COLORADO.		
Greeley	Colorado State Normal School	Z. X. Snyder.
CONNECTICUT.		
Bridgeport	Bridgeport Training School	Miss Emma G. Olmstead.
New Britain	Normal Training School	Marcus White.
New Haven	State Normal Training School	Arthur B. Morrill.
Willimantic	do	George P. Phenix.
DISTRICT OF COLUMBIA.		
Washington	Washington Normal School	Mrs. Idaliah G. Meyers.
Do	Washington Normal School, seventh and eighth divisions.	Lucy E. Moten.
DELAWARE.		
Wilmington	Wollaston School	Clara Mendenhall.
FLORIDA.		
De Funiak Springs	Florida State Normal School	C. L. Hayes.
Tallahassee	Florida State Normal and Industrial College.	T. De S. Tucker.
GEORGIA.		
Athens	State Normal School	S. D. Bradwell.
Milledgeville	Georgia Normal and Industrial College.	J. Harris Chappell.
IDAHO.		
Albion	Albion State Normal School	J. C. Black.
Lewiston	Lewiston State Normal School	Geo. E. Knepper.
ILLINOIS.		
Carbondale	Southern Illinois State Normal University.	D. B. Parkinson.
Chicago, Station O	Chicago Normal School	Francis W. Parker.
Normal	Illinois State Normal University	John W. Cook.
INDIANA.		
Indianapolis	Indianapolis Normal School	M. E. Nicholson.
Lexington	Lexington High School	W. N. Parks.
Terre Haute	Indiana State Normal School	William W. Parsons.
IOWA.		
Boonesboro	Boone County Normal Institute	B. P. Holst.
Cedarfalls	Iowa State Normal School	Homer H. Seerley.
Dexter	Dexter Normal School	A. G. Smith.
Rockwell City	Calhoun County Normal School	P. C. Holdoegeland G. B. Rigg.
Woodbine	Woodbine Normal School	M. A. Reed.
KANSAS.		
Emporia	State Normal School	A. R. Taylor.
KENTUCKY.		
Frankfort	State Normal School for Colored Persons.	John H. Jackson.
Hazard	Hazard Normal School	Bailey P. Wootton.
Louisville	Louisville Normal School	W. J. McConathy.
Temple Hill	Temple Hill Normal College	J. W. Davis.
Upton	Uptonville Institute	J. L. Pilkenton.
LOUISIANA.		
Natchitoches	Louisiana State Normal School	B. C. Caldwell.
New Orleans	New Orleans Normal School	Miss Marion Brown.

IV.—Principals of Normal Schools—Continued.

Public normal schools—Continued.

Location.	Name of institution.	Principal.
MAINE.		
Castine	Eastern State Normal School	Albert F. Richardson.
Farmington	Farmington State Normal School	George C. Purington.
Fort Kent	Madawaska Training School	Mary P. Nowland.
Gorham	State Normal School	W. J. Corthell.
MARYLAND.		
Baltimore	Maryland State Normal School	E. B. Prettyman.
Do	Baltimore Normal School for Education of Colored Teachers.	George Harrison.
MASSACHUSETTS.		
Boston	Boston Normal School	Larkin Dunton.
Do	Massachusetts Normal Art School	George H. Bartlett.
Bridgewater	State Normal School	Albert G. Boyden.
Cambridge	Cambridge Training School for Teachers.	Herbert H. Bates.
Fitchburg	State Normal School	John G. Thompson.
Framingham	do	Ellen Hyde.
Lowell	Training School for Teachers	Gertrude Edmund.
Salem	do	W. P. Beckwith.
Westfield	do	Charles S. Chapin.
Worcester	do	E. Harlow Russell.
MICHIGAN.		
Detroit	Detroit Normal Training School	Harriet M. Scott.
Mount Pleasant	Michigan Central Normal School	Charles McKenney.
Ypsilanti	Michigan State Normal School	Richard G. Boone.
MINNESOTA.		
Mankato	State Normal School	Edward Searing.
Moorhead	do	L. C. Lord.
St. Cloud	do	George R. Kleeberger.
St. Paul	Teachers' Training School	Miss B. M. Phelan.
Winona	State Normal School	Irwin Shepard.
MISSISSIPPI.		
Abbeville	Abbeville Normal School	M. E. Avitt.
Ackerman	Central Mississispi Normal Institute	J. A. Hudson.
Holly Springs	Holly Springs Normal Institute	W. A. Anderson.
Do	Mississippi State Normal School	E. D. Miller.
Paris	Paris Normal Institute	T. M. Anderson.
Sherman	Mississippi Normal Institute	D. H. Davis.
Troy	Mississippi Normal High School	R. L. Croswait.
MISSOURI.		
Cape Girardeau	State Normal School	John S. McGhee.
Gainesville	Gainesville Normal School	W. S. Platt.
Kirksville	State Normal School (first district)	W. D. Dobson.
St. Louis	Normal and High School	William J. S. Bryan.
Warrensburg	State Normal School (second district)	George L. Osborne.
MONTANA.		
Dillon	Montana Normal School	D. E. Sanders.
NEBRASKA.		
Peru	Nebraska State Normal Training School.	J. A. Beattie.
NEW HAMPSHIRE.		
Plymouth	State Normal School	A. H. Campbell.
NEW JERSEY.		
Newark	Newark Normal and Training School	Joseph Clark.
Paterson	Paterson Normal Training School	Wm. J. Slattery.
Trenton	New Jersey State Normal and Model Schools.	James M. Green.
NEW MEXICO.		
Silver City	Normal School of New Mexico	C. M. Light.
NEW YORK.		
Albany	New York State Normal College	Wm. J. Milne.
Brockport	State Normal and Training School	Chas. D. McLean.
Brooklyn	Training School for Teachers	John Gallagher.

IV.—Principals of Normal Schools—Continued.

Public normal schools—Continued.

Location.	Name of institution.	Principal.
NEW YORK—continued.		
Buffalo	Buffalo Normal School	James M. Cassety.
Cortland	State Normal and Training School	Francis J. Cheney.
Fredonia	do	F. B. Palmer.
Geneseo	Geneseo State Normal School	John M. Milne.
New Paltz	State Normal School	Frank S. Capen.
New York	Normal College of the City of New York.	Thomas Hunter.
Oneonta	State Normal School	James M. Milne.
Oswego	Oswego State Normal and Training School.	Isaac B. Poucher.
Plattsburg	State Normal School	Edward N. Jones.
Potsdam	State Normal and Training School	Thomas B. Stowell.
Syracuse	Syracuse High School, Normal Department.	Wm. K. Wickes.
NORTH CAROLINA.		
Elizabeth City	State Colored Normal School	P. W. Moore.
Fayetteville	do	E. E. Smith.
Franklinton	Albion Academy and State Normal School.	Rev. J. A. Savage.
Goldsboro	State Normal School	P. W. Russel.
Greensboro	State Normal and Industrial School	Charles D. McIver.
Plymouth	Plymouth State Normal School	John W. McDonald.
Salisbury	State Normal School	J. O. Crosby.
NORTH DAKOTA.		
Mayville	State Normal School	J. T. Perigo.
Valley City	do	George A. McFarland.
OHIO.		
Cincinnati	Cincinnati Normal School	Mrs. Carrie N. Lathrop.
Cleveland	Cleveland Normal and Training School.	Miss L. W. Hughes.
Columbus	Columbus Normal School	Margaret W. Sutherland
Dayton	Dayton Normal School	Grace A. Greene.
Geneva	Geneva Normal School	J. P. Treat.
Wadsworth	Wadsworth Normal School	Frank A. Day.
OKLAHOMA.		
Edmond	Territorial Normal School of Oklahoma.	Edmund H. Murdaugh.
OREGON.		
Drain	Oregon State Normal School	Louis Barzee.
Monmouth	State Normal School	P. L. Campbell.
Weston	do	M. G. Royal.
PENNSYLVANIA.		
Bloomsburg	State Normal School and Literary Institute.	Judson P. Welsh.
California	Southwestern State Normal School	Theo. B. Noss.
Clarion	Clarion State Normal School	A. J. Davis.
East Stroudsburg	East Stroudsburg State Normal School.	George P. Bible.
Edinboro	State Normal School	J. R. Flickinger.
Indiana	Indiana Normal School of Pennsylvania.	D. J. Waller, jr.
Kutztown	Keystone State Normal School	Rev. George B. Haneher.
Lockhaven	Central State Normal School	James Eldon.
Mansfield	Mansfield State Normal School	S. H. Albro.
Millersville	First Pennsylvania State Normal School.	E. Oram Lyte.
Philadelphia	Philadelphia Normal School for Girls.	George Howard Cliff.
Pittsburg	Pittsburg High School, Normal Department.	C. P. Wood.
Shippensburg	Cumberland Valley State Normal School.	G. M. D. Eckels.
Slippery Rock	Slippery Rock State Normal School	Albert E. Maltby.
West Chester	State Normal School	George M. Philips.
RHODE ISLAND.		
Providence	Rhode Island State Normal School	William Ed. Wilson.
SOUTH CAROLINA.		
Rockhill	Winthrop Normal College	D. B. Johnson.

IV.—Principals of Normal Schools—Continued.

Public normal schools—Continued.

Location.	Name of institution.	Principal.
SOUTH DAKOTA.		
Madison	State Normal School	W. H. H. Beadle.
Spearfish	do	F. L. Cook.
TENNESSEE.		
Nashville	Peabody Normal College	N. H. Payne.
TEXAS.		
Detroit	Detroit Normal School	W. A. Dean.
Huntsville	Sam Houston Normal Institute	H. C. Pritchett.
Timpson	Timpson High School	J. B. Ramsey.
UTAH.		
Cedar City	Southern branch of the State Normal School.	Milton Bennion.
Salt Lake City	Utah State Normal School	Wm. M. Stewart.
VERMONT.		
Castleton	State Normal School	Abel E. Leavenworth.
Johnson	do	W. E. Ranger.
Randolph Center	do	Edward Conant.
VIRGINIA.		
Farmville	State Female Normal School	Robert Frazer.
Hampton	Hampton Normal and Agricultural Institute.	H. B. Frissell.
Rye Cove	Washington Institute	R. E. Wolfe.
Petersburg	Virginia Normal and Collegiate Institute.	J. H. Johnston.
WASHINGTON.		
Cheney	State Normal School	W. B. Turner.
Ellensburg	do	P. A. Getz.
WEST VIRGINIA.		
Athens	Concord State Normal School	George M. Ford.
Fairmont	Fairmont State Normal School	J. Walter Barnes.
Farm	West Virginia Colored Institute	John H. Hill.
Glenville	Glenville State Normal School	W. J. Halden.
Huntington	Marshall College	L. J. Crosby.
Shepherdstown	Shepherd College, State Normal School.	A. C. Kimler.
West Liberty	West Liberty State Normal School	J. N. Deahl.
WISCONSIN.		
Milwaukee	State Normal School	L. D. Harvey.
Oshkosh	do	George S. Albee.
Platteville	do	D. McGregor.
River Falls	River Falls State Normal School	W. D. Parker.
Stephens Point	State Normal School	Theron B. Pray.
West Superior	Superior State Normal School	J. C. McNeill.
Whitewater	State Normal School	Albert Salisbury.

Private normal schools.

ALABAMA.		
Huntsville	Central Alabama Academy	A. W. McKinney.
Scottsboro	Scottsboro College and Normal School.	Dr. J. W. Shoemaker.
Selma	Burrell Academy	A. T. Burnell.
Tuskegee	Tuskegee Normal and Industrial Institute.	B. T. Washington.
ARKANSAS.		
Arkadelphia	Shorter University	S. H. Jackson.
Belleville	Belleville Normal College	D. F. Montgomery.
Clarksville	Arkansas Cumberland College	J. A. Laughlin.
Little Rock	Arkansas Baptist College	J. A. Booker.
Pea Ridge	Pea Ridge Normal College	S. C. Parish.
Southland	Southland College and Normal Institute.	Edgar Ballard.
Sulphur Rock	Sulphur Rock College	J. W. Decker.
Wilmar	Drew Normal Institute	J. L. Spence.

IV.—Principals of Normal Schools—Continued.

Private normal schools—Continued.

Location.	Name of institution.	Principal.
CALIFORNIA.		
Martinez	Novitiate of the Brothers of the Christian School.	Brother Theodorus.
Oakland	Gilson's Normal and Special Training School.	J. C. Gilson.
San Francisco	California Kindergarten Training School.	Miss Kate F. Banning.
COLORADO.		
Denver	Denver Normal and Preparatory School.	Fred. Dick.
DELAWARE.		
Newark	Academy of Newark	J. D. Jaquette.
DISTRICT OF COLUMBIA.		
Washington	Kindergarten Normal Training School.	Mrs. Louise Pollock.
Do	Woman's League Kindergarten Training School.	Mrs. Anna E. Murray.
FLORIDA.		
Jasper	Jasper Normal Institute	Wm. A. Cate.
Liveoak	Florida Institute	Rev. Geo. P. McKinney.
Orange Park	Orange Park Normal and Manual Training School.	Ernest R. Latham.
Whitesprings	Florida Normal College	Thomas B. Kirk.
GEORGIA.		
Atlanta	Spelman Seminary	Miss Harriet E. Giles.
Demorest	Demorest Normal School	J. S. Jennings.
Greensboro	Thomas Stocks Institute	N. H. Ballard.
Macon	Ballard Normal School	George C. Burrage.
Monroe	Johnston Institute	John Gibson.
Savannah	Beach Institute	Julia B. Ford.
Thomasville	Allen Normal and Industrial School	Amelia Merriam.
Trenton	Trenton Normal College	George P. Welch.
ILLINOIS.		
Addison	German Evangelical Lutheran Teachers' Seminary.	E. A. W. Krauss.
Bushnell	Western Normal College	W. M. Evans.
Dixon	Northern Illinois Normal School	J. B. Dille.
Do	Steinmann Institute	Charles A. Steinmann.
Galesburg	Galesburg Kindergarten Normal School.	M. Evelyn Strong.
Macomb	Western Illinois Normal School and Business Institute.	I. F. Meyer.
Mount Morris	Mount Morris College	J. G. Royer.
Onarga	Grand Prairie Seminary	S. Van Pelt.
Oregon	Wells School for Teachers	E. L. Wells.
Rushville	Rushville Normal and Business College.	Maxwell Kennedy.
INDIANA		
Anderson	Anderson Normal University	William W. Croan.
Angola	Tri-State Normal School	L. M. Sniff.
Borden	Borden Institute	H. A. Buerk.
Corydon	Ohio Valley Normal School	E. S. Hallett.
Covington	Indiana Normal College	Olive E. Coffeen.
Danville	Central Normal College and Commercial Institute.	J. A. Joseph.
Fairmount	Fairmount Academy and Normal School.	Elwood O. Ellis.
Indianapolis	Indiana Kindergarten and Primary Normal Training School.	Eliza A. Blaker.
Marion	Marion Normal College	C. W. Boucher.
Mitchell	Southern Indiana Normal College	D. B. Gilbert.
Portland	Portland Normal, Music, and Law School.	L. M. Holmes.
Valparaiso	Northern Indiana Normal School	H. B. Brown.
IOWA.		
Afton	Afton Normal and Business College	Albert G. Owen.
Algona	Northern Iowa Normal and Commercial School.	A. J. Lilly.
Bloomfield	Southern Iowa Normal, Scientific, and Business Institute.	A. A. Williams.
Carroll	Carroll Normal and Business College	A. E. Whitten.

IV.—Principals of Normal Schools—Continued.

Private normal schools—Continued.

Location.	Name of institution.	Principal.
IOWA—continued.		
Decorah	Valder Normal School	C. H. Valder.
Denison	Denison Normal School	W. C. Van Ness.
Des Moines	Highland Park Normal College	C. C. Rearick.
Glidden	National Normal School and Business College.	E. L. Essley.
Humboldt	Humboldt College	J. P. Peterson.
Kossuth	Kossuth Academy	Rev. J. McGaughey.
Lemars	Lemars Normal College	R. E. Hatton.
Mount Pleasant	Howe's Academy and Teachers' Training School.	S. C. Howe.
Newton	Newton Normal College	G. W. Wormley.
Nora Springs	Nora Springs Seminary	H. A. Dwelle.
Ottumwa	Ottumwa Normal School	Martha A. Peck.
Perry	Perry Normal School	Will M. Tarr.
Shenandoah	Western Normal College, Shenandoah Commercial Institute and Musical Conservatory.	J. M. Hussey.
Spirit Lake	Spirit Lake Normal and Business Institute.	H. Welty.
Vinton	Tilford Academy	T. F. Tobin.
Waukon	Waukon Business College and Normal School.	L. Eells.
KANSAS.		
Conway Springs	Normal and Business College	S. D. Crane.
Fort Scott	Kansas Normal College	D. E. Sanders.
Great Bend	Central Normal College	E. B. Smith.
Marysville	Modern Normal College	J. G. Ellenbecker.
McPherson	McPherson College, Normal Dept	C. E. Arnold.
Salina	Salina Normal University	Charles Swisher.
Winfield	Soutwest Kansas College, Normal Department.	Chester A. Place.
KENTUCKY.		
Blaine	Blaine Normal School	G. Milton Elam.
Bowling Green	Bowling Green Business College and Southern Normal School.	H. H. and T. C. Cherry.
Bremen	Bremen College	P. G. Shaver.
Corinth	Northern Kentucky Normal School	Marion Pfanstiel.
Fulton	Fulton Normal and Business College	A. M. Kirkland.
Hardinsburg	Breckinridge Normal School	J. H. B. Logan.
Irvine	Irvine Training School	J. E. Wright.
Jackson	Jackson Collegiate Institute	E. P. Mickle.
Lexington	Chandler Normal School	Fannie J. Webster.
Madisonville	Western Kentucky Normal School	H. Evelyn Brooks.
Morehead	Morehead Normal School	W. J. Henry.
Waddy	Central Normal School and Business College.	J. B. Secrest.
LOUISIANA.		
Baldwin	Gilbert Academy and Industrial Institute.	A. E. P. Albert.
MAINE.		
Hampden	Hampden Academy	George C. Webber.
Lee	Lee Normal Academy	James D. Murphy.
Springfield	Springfield Normal School	Ernest H. Pratt.
MARYLAND.		
Ammendale	Ammendale Normal Institute	Brother Christian.
Buckeystown	Buckeystown Normal Training School.	F. R. Neighbours.
Rising Sun	Friends' Normal Institute	Thomas D. Bowers.
MASSACHUSETTS.		
Waltham	Notre Dame Training School	Sister Georgiana.
Worcester	Kindergarten Normal Class	Anna C. Rust.
MICHIGAN.		
Fenton	Fenton Normal School and Commercial College.	W. A. Stevenson.
Owosso	Oakside School	Mrs. Josephine M. Gould.
Petoskey	Graves Normal Academy	M. O. Graves.
MINNESOTA.		
Madison	Normal School of the United Norwegian Lutheran Church.	O. Lokensgard.
New Ulm	Dr. Martin Luther College	John Schalier.

IV.—Principals of Normal Schools—Continued.

Private normal schools—Continued.

Location.	Name of institution.	Principal.
MISSISSIPPI.		
Buena Vista	Buena Vista Normal and Business College.	L. L. Bowman.
Houston	Mississippi Normal School	H. B. Abernethy.
Iuka	Iuka Normal College	H. A. Dean.
Lake Como	Lake Como Normal School	Homer M. Knowles.
Louisville	Louisville Normal School	J. T. McIntosh.
Meridian	Meridian Academy	J. L. Wilson.
Plattsburg	Winston Normal School	J. A. Hall.
Poplar Springs	Poplar Springs Normal College	John D. Mitchell.
Tougaloo	Normal Department Tougaloo University.	Frank G. Woodworth.
Tula	Tula Normal Institute and Business College.	C. C. Hughes.
Yale	Oakland Normal Institute	G. A. & J. T. Holleys.
Walnutgrove	Mississippi Central Normal School	Jno. R. Tally.
MISSOURI.		
Chillicothe	Chillicothe Normal, Business, and Shorthand College.	Allen Moore.
Clarksburg	Hooper Institute	W. C. Lebring.
College Mound	McGee College	E. E. Taylor.
Eldorado Springs	Eldorado Normal and Business College.	W. H. Miller.
Licking	Licking College	Gilbert Lay.
Pleasant Hope	Pleasant Hope Normal Academy	J. F. Martin.
Stanberry	Stanberry Normal School	John E. Fesler.
Thornfield	Thornfield Normal Institute	J. E. Smith.
Weaubleau	Weaubleau Christian College	J. Whitaker.
NEBRASKA.		
Fremont	Fremont Normal School	W. H. Clemmons.
Normal	Lincoln Normal University	James E. Harris.
Santee Agency	Santee Normal Training School	Alfred L. Riggs.
Stromsburg	Bryant Normal University	J. J. Bryant.
Wayne	Nebraska Normal College	J. M. Pile.
NEW YORK.		
Buffalo	School of Pedagogy, University of Buffalo.	Frank M. McMurry.
New York	Teachers' College	Seth Low.
NORTH CAROLINA.		
Asheville	Normal and Collegiate Institute	Rev. Thos. Lawrence.
Beaufort	Washburn Seminary	F. S. Hitchcock.
Concord	Scotia Seminary	D. J. Satterfield.
Kings Mountain	Lincoln Academy	Lilian S. Cathcart.
Lumberton	Whitin Normal School	D. P. Allen.
Poes	Buies Creek Academy	Rev. J. A. Campbell.
Raleigh	St. Augustine's School	Rev. A. B. Hunter.
Traphill	Fairview College	Edwin J. Johnson.
Wilmington	Gregory Normal Institute	Geo. A. Woodard.
Winston	Waters Normal Institute	C. S. Brown.
NORTH DAKOTA.		
Grand Forks	Northwestern Normal College	Arthur Le Dorsey.
OHIO.		
Ada	Ohio Normal University	H. S. Lehr.
Augusta	Augusta Normal School	A. M. Fishel
Canfield	Northeastern Ohio Normal College	John A. Cummins.
Dayton	St. Mary's Academy	F. Spencer.
Defiance	Defiance College	John R. H. Latchaw.
Ewington	Ewington Academy	F. F. Vale.
Fayette	Fayette Normal University	J. E. Dodds.
Fostoria	Fostoria Normal and Academy	R. L. De Rau.
Lebanon	National Normal University	Alfred Holbrook.
Middlepoint	Western Ohio Normal School	T. A. Davies.
New Philadelphia	John P. Kuhn's Normal School	John P. Kuhn.
Piketon	Southern Ohio School of Pedagogy	Levi B. Moore.
Portsmouth	The Normal University	G. W. Moothart.
Woodville	Teachers' Seminary	Theo. Mees.
PENNSYLVANIA.		
Ebensburg	Ebensburg Normal Institute	H. T. Jones.
Huntingdon	Juniata College	M. G. Brumbaugh.
Muncy	Lycoming County Normal School	Call P. Bastian.

IV.—Principals of Normal Schools—Continued.

Private normal schools—Continued.

Location.	Name of institution.	Principal.
PENNSYLVANIA—continued.		
Philadelphia	Institute for Colored Youth	Mrs. Fannie J. Coppin.
Decoraburg	Curry College	Z. G. Call.
Unison sburg	Clarion Collegiate Institute	W. L. Smith.
[illegible]sburg	Waynesburg College	Rev. A. B. Miller.
Glid[illegible]n		
SOUTH CAROLINA.		
Aiken	Schofield Normal and Industrial School.	Martha Schofield.
Charleston	Avery Normal Institute	Morrison A. Holmes.
Do	Wallingford Academy	Rev. David Brown.
Chester	Brainerd Institute	J. S. Marquis.
Frogmore	Penn Normal and Industrial School	Miss Ellen Murray.
Greenwood	Brewer Normal School	Rev. J. M. Robinson.
SOUTH DAKOTA.		
Sioux Falls	Lutheran Normal School	Rev. A. Mikkelsen.
TENNESSEE.		
Anderson	Big Valley Academy	O. H. Lipps.
Birchwood	Rutherford Graded School	R. T. Rutherford.
Bloomingdale	Kingsley Seminary	Joseph H. Ketron.
Chattanooga	Chattanooga Normal University	H. M. Evans.
Dickson	Dickson Normal School	Wade & Loggins.
Edgewood	Edgewood Normal School	Hunt & Smith.
Fountain City	Holbrook Normal College	Jas. C. Blasingame.
Greenbrier	Central Tennessee Normal and Commercial School.	N. J. Pritchard.
Hornbeck	West Tennessee Normal College	W. L. Willingham.
Huntingdon	Southern Normal University	J. A. Baber.
Jonesboro	Warner Institute	Anna R. Miner.
McLemoresville	McLemoresville Collegiate University.	Lewis S. Mitchell.
Maryville	Freedman's Normal Institute	L. H. Garner.
Memphis	Le Moyne Normal Institute	A. J. Steele.
Morristown	Morristown Normal Academy	Judson S. Hill.
Orlinda	Orlinda Normal College	Wm. McNeeley.
Sparta	Dibrell Normal Institute	W. T. Garrett.
TEXAS.		
Brenham	Blinn Memorial College	C. Urbantke.
Castroville	Divine Providence Academy	Mother M. Florence.
Commerce	East Texas Normal College	W. L. Mayo.
Crockett	Mary Allen Seminary	Rev. John B. Smith.
Cumby	Independent Normal College, I. O. O. F.	R. L. Taylor.
Hearne	Hearne Academy, Normal, and Industrial School.	John F. Anderson.
Omen	Summer Hill Select School	A. W. Orr.
Sunset	Sunset Institute	Mrs. C. F. Caylor.
Whitesboro	Whitesboro Normal College	C. L. & N. Adair.
UTAH.		
Provo City	Brigham Young Academy	Benj. Cluff.
Salt Lake City	Latter-Day Saints College	Willard Done.
VIRGINIA.		
Hillsville	Fairview Normal School	J. W. Surratt.
Lawrenceville	St. Paul Normal and Industrial School.	Rev. James S. Russell.
Norfolk	Norfolk Mission College	W. M. Kiraham
Reliance	Shenandoah Normal College	J. S. Gruver.
Richmond	Hartshorn Memorial College	Lyman B. Tefft.
Rocky Mount	Piedmont Normal College	J. P. Matthews.
Scottsburg	Scottsburg Normal College	S. H. Thompson.
Stuart	Stuart Normal College	I. A. Briggs.
Willis	The Mountain Normal School	J. H. Rutrough.
WEST VIRGINIA.		
Fayetteville	Fayetteville Academy	H. C. Robertson.
Harpers Ferry	Storer College	Ernest Earle Osgood.
Summersville	Summersville Normal School	W. G. Brown.
WISCONSIN.		
Milwaukee	National German-American Teachers' Seminary.	Emil Dapprich.
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