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Department of Superintendence

THIRD YEARBOOK

RESEARCH IN CONSTRUCTING THE ELEMENTARY
SCHOOL CURRICULUM

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FOREWORD

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"To bring together the elements for the construction of a suitable curriculum for the boys and girls of American public schools," was the purpose of the Department of Superintendence in its appointment of the Commission on the Curriculum. The 1924 Yearbook of the Department laid the basis for this program through its statement of general educational aims and objectives, through its survey of current curriculum practice, and through its proposed machinery for coöperative effort in curriculum revision in a local community.

When the Commission on the Curriculum met in July, 1924, the question was, What can a national commission do that will be of greatest help to superintendents of schools who are faced with the problem of curriculum revision? The commission decided that the most needed service was the collection and analysis of outstanding research studies in each of the subjects of the elementary curriculum. It was known that many such studies of high value had been made which should be considered in the revision of curricula; but they were, for the most part, inaccessible because of their technical form, or because of their publication in isolated monographs or magazines, or because of their fragmentary distribution. A review of selected scientific studies in one volume, together with an analysis and summary of them in terms easily understandable, was the service for scientific curriculum construction which the Commission on the Curriculum decided to render.

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The work of carrying out the plan was delegated to the Division of Research of the National Education Association. The time allotted was less than six months. The studies to be reviewed were of a technical nature and in fairness to their authors could only be reviewed by specialists thoroughly familiar with each subject. It would have been impossible for any one person to do the work in the limited time. The leadership of the Nation in the curriculum field was sought out. Twelve subcommittees were appointed, one for each elementary school subject. A search for material was made in universities, colleges, and school systems throughout the country. As far as possible all published and unpublished elementary curriculum studies were collected.

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Because of the time limit and the fact that the reports of all subcommittees had to be included in one volume, the studies reviewed are selected and not comprehensive. In some fields much more research has been done than in others. This fact explains why certain subjects are given greater space in the Yearbook. Parts I and II were reduced to a minimum in order to give as much space as possible to the review of research studies.

The Department of Superintendence is most appreciative and deeply indebted for the nation-wide coöperation which it has received. The

Division of Research has bent every effort to make the Yearbook possible. Seventy-five curriculum specialists have given gratis of their time, training, and experience in analyzing the studies collected. Through their unselfish efforts this great piece of coöperative research was made possible. Their most important reward will be in the testing out and application of their findings, to the end that the boys and girls of our public schools may have a curriculum built on scientific principles and American ideals.

CONTENTS

PART ONE—NEED OF REVISION

Chapter	Page
I. A coöperative Plan for the Revision of the American Elementary School Curriculum	9

PART TWO—VARIATIONS IN CURRICULA

II. Possible Variations in Curricula to Meet Community and Individual Needs	17
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PART THREE—CURRICULA PROBLEMS AND THEIR SCIENTIFIC SOLUTION

III. Arithmetic	35
IV. Spelling	110
V. Reading	152
VI. Handwriting	205
VII. The Social Studies	217
VIII. Language and Grammar	278
IX. Elementary Science	297
X. Health and Physical Education	303
XI. Home Economics	320
XII. Industrial Arts	329
XIII. Art Education	337
XIV. Music	354

PART FOUR—ADDENDA

Report of Secretary	367
Members of the Department of Superintendence	372
Index to Authors of Research Studies	422

PART I

A Coöperative Plan for the Revision
of the
American Elementary School Curriculum

PART I.—A COÖPERATIVE PLAN FOR THE REVISION OF THE AMERICAN ELEMENTARY SCHOOL CURRICULUM

CHAPTER I

THE PUBLIC SCHOOL curriculum has a large share in determining the Nation's present and future progress. Through its public schools, America is endeavoring to pass on to its youth all that has been found best in the past: the knowledge, habits, skills, attitudes, and ideals most useful to individual and national life at present; and in addition, it attempts to supply youth with the necessary tools, understanding, foresight, and incentive for the future advancement of its people. Knowledge and skill, disseminated among the masses of the people, according to a leading economist, constitute a nation's greatest wealth. The habits of a people determine the degree of faith that other nations accord it; and the idealism of its citizens is a nation's salvation. Since the public school is designed to disseminate knowledge, develop right habits, and implant proper ideals, it may rightly be termed the life insurance of civilization.

The public school curriculum determines what boys and girls are taught in school. With the exception of the personality of the teacher, no other educational factor equals it in importance. The elementary school curriculum lays the foundation of every child's education; and it constitutes all the school training of about three fifths of America's children.

Why the Elementary School Curriculum Needs Revision

The elementary school curriculum is a more vital factor in the development of national life today than ever before. In pioneer days, ordinary living at home and in the community, directed by insistent family needs, provided a fairly adequate preparation for life. Then the task of the American public school was mainly to supplement the life of the home, church, and community by adding the Three R's. As time went on, the public school was called upon to supply more and more formal education. Many new courses were added to the traditional subjects. Unfortunately, there was often lack of synthesis of the whole, since additions and modifications were made without plan or system; and the result in many instances is "the amorphous product of generations of tinkering." Unless school practice is abreast or ahead of the time, it cannot be a directive power. There has been too much of a tendency for convention and tradition to determine curricula, rather than practical, present-day life demands. An active principle which is now coming to be recognized in the selection of content is that of utility in a broad sense. Will the inclusion of a particular topic or subject increase the effectiveness of the individual? Will it influence life for good? Will it build character? Today we are using a pragmatic philosophy.

Pruning out the dead wood, selecting minimum essentials from total possible content, adding supplementary material—tinkering with the curriculum—will no longer answer the need. A complete revision is demanded by both educators and laymen. Both groups demand a new curriculum, expressive of the changed conditions of modern civilization and reshaped in the light of our better understanding of child life and the learning processes.

The Need for Curriculum Revision—What the Layman Sees

The layman too often views the public school curriculum from these two angles: (1) growing costs, and (2) lack of thoroughness in essentials. The first viewpoint is sane, providing that it is positive and not negative. When larger numbers of children are educated and given the better and richer education which civilization demands, the cost is certain to increase—it cannot be otherwise—and the cost must be met. More careful selection of curriculum materials should be made, but it is doubtful that it will or should result in reduced expenditures.

The second viewpoint from which the layman considers the need for curriculum revision is a supposed lack of thoroughness in essentials. There may be some justification for this attitude. The only reliable evidence, however, such as the Springfield tests and the Boston tests of 1845, has demonstrated that most public schools of today are securing better results in the so-called “fundamentals” with a heterogeneous mass of children than the schools of half a century ago secured with selected groups. The argument for “cutting out fads and frills” is sometimes only a plea for the old-time, traditional school program, which would be an anachronism in present-day life. The American school must expand until it offers whatever is necessary to develop intelligent American citizenship.

The Need for Curriculum Revision—What the Educator Sees

The educator also sees the need of curriculum revision from two angles: (1) the expansion of the field of knowledge, and the need for a discriminating selection of what is best suited to meet present social demands; and (2) provision for character building, including the development of broad interests, liberal views, and the establishment of right social and ethical attitudes. The limited time that the average child spends in school in contrast to the vast amount of knowledge which one might acquire, the complexity of modern life with its varied demands, and the necessity of developing individual talents are conditions which lead educators not only to restudy and analyze the aims and objectives of education, but also to demand a complete revision of the curriculum to express the new conceptions of education. The educator is seeking as the major products of his enterprise strong character and right conduct, built not on precept, but fashioned through years of right thinking during lesson hours and prop-

erly controlled behavior in school activities. Teachers not only want their pupils to meet the standard tests in academic achievement but, what is more important, to meet successfully the tests of life, even to the point of temptation. For this reason, although teachers may rightly expect that character development will be an important by-product of all good instruction, they have definitely in mind the moral qualities which they wish to develop in their pupils, such as: honesty, industry, self-control, courtesy, unselfishness, service, appreciation of beauty, openmindedness, coöperation, responsibility, sympathy, desire for improvement, adaptability, courage, initiative, thoroughness, self-judgment, thrift, faith in mankind, and reverence. Every true teacher hopes to develop these qualities through life situations as they arise.

When the educator fully comprehends that the objectives which the school must serve today are health, training for a vocation, citizenship, worthy home membership, the profitable use of leisure, and ethical character, he keenly feels the need of a thorough revision of the present public school curriculum.

These viewpoints of the layman and the educator relative to the need for curriculum revision can and must be harmonized into a working agreement.

Present Activity in Elementary School Curriculum Revision

The aim of the modern educator includes the aim of the layman, thoroughness in essentials, and goes far beyond it. The teacher strives to have his pupils spell more correctly the words in common use, use the arithmetical processes necessary in modern life with more speed and accuracy, and read more and with greater rapidity and comprehension. In addition, the teacher would have his pupils appreciate the rights of others, and respect the law; in other words, he would have him establish a proper relationship between himself and society.

The public-spirited layman cherishes these same objectives for the public school. He, too, would have the curriculum revised so that the above objectives may be attained. The result is that curriculum revision is in progress in all parts of the country. Several of the national societies and foundations, as well as university and state committees, are engaged in studying the problem of the elementary school curriculum. Among these are the National Society for the Study of Education, the American Association of University Women, The Commonwealth Foundation, The American Association for the Advancement of Science, the California Curriculum Committee, and Teachers College of Columbia University.

Many state, county, and city courses of study have been rebuilt recently, or are in the process of revision. Representative examples of large city school systems where courses of study have been revised recently are: Berkeley, California; Los Angeles, California; Denver, Colorado; Baltimore, Maryland; Detroit, Michigan; Cincinnati, Ohio; and Trenton,

New Jersey. In response to a request for recent elementary courses of study, 200 representative cities, counties, and states replied that they had published courses of study since 1920. This is indicative of the vast amount of activity in curriculum revision in all parts of the country.

Should Curriculum Revision be Done Independently or by Coöperation?

Some of the work in curriculum revision is the result of months of careful study and the pooling of leadership in the field of each subject. In some cities, however, the work has been done hastily and unscientifically; in every city there has been much duplication of effort. When each community attempts to solve all its curriculum problems in isolation, the results are likely to be unsatisfactory and expensive. When scores of cities work independently, there is an unfortunate waste of time and effort in the duplication of bibliographies, in the independent collection of data through repeated questionnaires and other forms of inquiry, and in the formulation of major principles. As a matter of fact, by the process of independent action, only those school systems which can afford to expend thousands of dollars on curriculum revision can make independently a comprehensive and satisfactory study of the problem. Curriculum making is becoming a specialized, technical task, which requires: (1) the study of social needs, including those peculiar to a local community, (2) analyses of the abilities and interests of growing children, (3) experimental study of the learning process, and (4) an understanding of the local school system, the temper and capacity of its teachers and administrators; in other words, what can be expected of them in helping in the development and putting into effect of a new course of study at a given time. One curriculum specialist has wisely said: "To make a radical selection and reorganization of the best in a civilization is not something that can be lightly undertaken or easily accomplished. Conferences and the pronouncements of those in official positions are quite inadequate. Two methods are needed in curriculum making: (1) the subjective method of expert teaching opinion, and (2) the objective method of expert analysis of social and psychological needs." Both processes should work together.

Contribution of Research to Curriculum Revision

During the past ten years, methods of determining what is useful and what is not have been devised in part, and they are still in process of development. Some important results have already been obtained.

Part III, Curricular Problems and Their Scientific Solution, is the work of sixty-nine curriculum specialists and subject specialists. It pools the most important research studies available and presents bibliographies that have already been tested out and found helpful by a number of local communities, and suggests problems which local committees have faced, but which require further research for their solution.

A National Committee Should Present Raw Material Rather Than a National Curriculum for General Acceptance

A strictly uniform American curriculum for the elementary schools is hardly possible, because of the great variations in social, industrial, and economic conditions. Furthermore, it may not be desirable, because of our democratic ideal of recognizing local needs and conditions and of considering individual differences of children. There are three elements in every course of study: (1) the general core that meets nation-wide requirements; (2) the part that has to do with the local community, which may even vary for different communities in the same city; and (3) adjustments for individual children and varying groups of pupils.

In its Second Yearbook, the Department of Superintendence set up the machinery for devising, revising, and supervising a curriculum in an individual city. This machinery was based on the idea of arousing the interest and securing the coöperation of the local staff, and, at the same time, of assembling ideas from the outside. The Commission on the Curriculum has deemed it advisable to apply the same method to the work it has in hand. In Part II of this Yearbook, various ideas as to possible variations in the curriculum to meet community and individual needs are presented; and accompanying each statement, general principles to guide local course of study committees in the adaptation of a curriculum to their particular community and to special groups of pupils are suggested.

A Central Agency Could Render Invaluable Service as a Clearing-house for Curriculum Research

The research studies here reviewed are illustrative of the kind of work which is essential to scientific curriculum revision. More of these are needed. The fact that practice should keep pace with research also calls for the testing of the findings presented in Part III. In many instances research at the present time is ahead of practice.

The Commission on the Curriculum presents this Yearbook as the first comprehensive effort to develop a coöperative plan for curriculum revision. The commission believes that there should be a central agency, continuing from year to year, which would act as a clearing-house for school systems which desire to coöperate in the work of curriculum revision. In other words, provision should be made for the exchanging of bibliographies, for rendering available research studies as soon as they are completed, and for the interchanging of the findings of local communities, as classroom teachers test out certain content and procedures. Just as scientifically trained workers in our laboratories furnish us with the bulk of scientific literature, so in the future more and more of our educational contributions should come from teachers, administrators, and research workers trained scientifically to observe children and analyze the needs of society.

It is the nature of education to be ever progressing. Continuous, constructive, scientific study must be carried on, if the public school curriculum is to keep pace with social demands and to become a contributory element to more intelligent and abundant living.

The Commission on the Curriculum proposes that for the school year 1925-1926 as many school systems, as will, shall agree to coöperate in testing the findings of the research studies reported in this Yearbook, that new studies be undertaken, and that the results be placed at the disposal of the schools of the country through the Department of Superintendence as a central agency.

PART II

Possible Variations in Curricula to Meet Community and Individual Differences

CHAPTER II

PART II. POSSIBLE VARIATIONS IN CURRICULA TO MEET COMMUNITY AND INDIVIDUAL NEEDS¹

MOST of the present elementary school curricula are based upon the theory that the course given in the first six grades covers the so-called tool subjects of learning; that these subjects are fundamental to the education of all children and should consequently be given approximately in the same degree to all normal children; that differences in aptitudes and life plans should be recognized at about the age of twelve; and that elective work should begin in the junior high school and should continue in increasing degree through high school, college, and university.

Although this means that all children, except atypicals, shall take the same subjects during the first six grades of the elementary school, it does not mean that the content of each subject shall be the same for all children, or that the method of approach to a particular subject or topic or the time allotment will be the same. For, notwithstanding in each subject of the elementary school curriculum there is a general core which is universal and belongs to the nation, there is additional material which must be adapted to community and individual needs.

The General Core of the Elementary School Curriculum Belongs to the Nation

For the drill subjects, Part III would seem to indicate that research will have soon determined what the general core of the elementary school curriculum should be—that is, the irreducible minimum for all normal children in various years of work the country over.

Charles M. Reinoehl, in his *Analytic Survey of State Courses of Study for Rural Elementary Schools*,² lists topics which are common to nearly all present state courses of study. In his opinion, these topics, with some modifications, include much information of which every American has need. He shows that there are social and economic problems national in scope. There are problems peculiar to a state, but typical of problems in other

¹ This section is a summary of statements of general principles for the differentiation of curricula obtained for this Yearbook from those who have had practical experience in the adaptation of education to the needs of individual children. Among those consulted were: Velda Bamesberger, director of research, Okmulgee, Okla.; Orville G. Brim, professor of education, Ohio State University; Kenyon L. Butterfield, president, Michigan Agricultural College; M. G. Clark, superintendent of schools, Sioux City, Iowa; H. M. Corning, superintendent of schools, Trinidad, Colo.; Virgil E. Dickson, director of research and guidance, Berkeley and Oakland public schools, Calif.; John M. Foote, rural school supervisor, State Department of Education, Baton Rouge, La.; Armand J. Gerson, associate superintendent of schools, Philadelphia, Pa.; S. Monroe Graves, superintendent of schools, Wellesley, Mass.; W. J. Osburn, director of educational measurements, State Department of Public Instruction, Madison, Wis.; and Carleton W. Washburne, superintendent of schools, Winnetka, Ill.

² Reinoehl, Charles M. *Analytic survey of state courses of study for rural elementary schools*. U. S. Bureau of Education, Bulletin, 1922, No. 42. 116 pp.

states. There are problems truly representative and suggestive in character, which with proper adaptation are fully as valuable as those of wider application. There is also a considerable body of subject-matter requiring drill, of which every normal American child has need. Reinoehl's study is intended to indicate the content of the core of the rural elementary school curriculum. The studies reviewed in Part III are applicable to communities of every sort. However, even if research should determine what the minimum essentials in curricular content should be, every course of study committee is still faced with the problem of additional adaptations for its particular school system.

Two Guiding Principles for Curricular Adaptation

What are the general principles for differentiation which should guide course of study committees? Two guiding principles invariably present themselves.

The first principle has to do with *education's material, the individual child*, for whom educational activities are being planned. The second principle has to do with the *child's environment*. Nature and nurture are important factors to be taken into consideration when planning a curriculum.

Differentiation of Curricula to Fit Individual Needs

The fact that pupils differ in ability to master the work offered in the ordinary curriculum in any subject is well known to any one familiar with the teaching of children. Hence in fairness to the rights of each child, it is not only impractical but impossible to teach all children in the same manner or to give them the same content.

Ability grouping and the curriculum problem—One superintendent who has made a special study of the adaptation of curricula to individual children in his school system states that about six or eight children in every ten can work with satisfactory profit with the same educational projects. Two of every ten children can usually achieve more satisfactory results if given an opportunity with projects more advanced than that of the so-called "average six" of each ten. There are also frequently two of each ten who cannot, or at least do not experience the same or equivalent success as do the others in the group. The proportions may vary, but the differences remain.

Curriculum making, therefore, has specifically to do with the regular grade work of children of average ability. It also has to do with ungraded classes of children who are below the average group of the class in actual results secured as indicated by the grades obtained by each in school. In addition there is the rapid promotion class, or the class capable of a wide scope of comprehensive offerings, but with the possibility of early promotion from grade to grade held in abeyance. In larger communities admin-

istrative action is imperative in dealing with the problem of the physically handicapped, as well as of children with emotional instability. These pupils may rank well in intellectual performance but, because of physical disabilities or emotional instability, they cannot profit from the standard curriculum unless many adjustments are made. Similarly, special courses must be arranged for the predelinquent.

Number of ability groups—The size of the school usually determines the number of ability groups that it is administratively possible to organize. Even when there are as many as five or six ability groups, there will be considerable variation between individual members in any one group. The larger the number of groups, the smaller should be the variation in ability between individual students.

What are the general principles that every course of study committee attempting differentiation of material should recognize? This question is one which deserves further study. In the absence of any better evidence, these principles are tentatively proposed for discussion.

Major principles of curricular differentiation for ability groups:

1. Methods of teaching and standards of attainment differ for groups of different levels of ability, but there are real possibilities for achievement in any class in the public school. If possible, teachers should find at least one socially useful thing at which even the very limited¹ pupil can succeed, train him in this, and let him experience honest success.

2. Minimum essentials must be clearly stated for all, but the fundamentals set forth for the lowest group must be included as a part of the material for the highest groups. It is important in a democracy that certain information shall be the common heritage of all. In so far as they are able to acquire it, all children should have the best of the social heritage of the race.

3. The aims, objectives, and outcomes for all subjects should be definitely set forth for the different ability groups. For the most part, there should be a common background for these aims. The methods and emphasis are necessarily different, as are the immediate objectives and outcomes, but the same ultimate aim of education should guide all teaching. The same philosophy of education is back of whatever differentiation is made.

4. Definite standards of attainment must be indicated for all levels. Much study is needed to determine the amount and quality of work which we rightly can expect from pupils of different levels of ability.

5. The dull pupil should have extensive opportunity for drill. Contrary to general belief, the slow thinker is not necessarily the accurate thinker. Nor does the child who learns slowly necessarily have a more retentive memory than the bright child.

¹ The term "limited" is used to designate those pupils who do not seem to have the ability to do the work of the standard elementary school curriculum.

6. Limited pupils usually differ from superior pupils in their lack of ability to project themselves into new situations. The superior child with his quick imagination and ready powers of generalization does this very easily. On the other hand, the limited pupil usually cannot reason out general principles or methods of attack but has to learn largely by imitation and successive experiences.

To illustrate, according to W. J. Osburn, a dull child who has learned 8 from 13 will probably be confused by the 48 from 53 which occurs in the exercise $534 \div 6$. To a gifted child this presents little difficulty. Dull pupils must have direct teaching on all of the important elements of instruction, whereas gifted pupils will probably master the material after one tenth of it has been taught. There are more than 1200 combinations in arithmetic which everyone must know in order to carry on ordinary computation with integers; yet we know gifted pupils can attain a reasonable mastery of this material by the presentation of 180 combinations; that is, the 45 principal combinations in each of the four processes. This is not true of the limited pupil.

7. The content of the course of study for the slow group should stand the test of practicability. A large majority of slow pupils leave school early, not because of economic necessity, but because the traditional curriculum does not meet their needs and interests. In order to meet their needs, the work must be of such a character that it will be especially applicable to their every-day life needs. Local course of study committees must be guided by what they know almost certainly lies ahead of certain groups of students.

8. The content of the course of study for the gifted group must be enriched, not necessarily by more difficult or more extensive material of the same type, but by a wider and more varied choice. Certain additional material may also be presented, as the beginning of foreign language study, and other work which will provide for initiative, organization, and development of the many-sided interests of the superior child, for which there is little time in the average class.

9. The course of study should make provisions for the rate of progress which may be expected in the various ability groups. The gifted child should probably be allowed to complete the elementary course in six years or less; for in addition to enrichment of courses, there is sometimes advantage in acceleration in the elementary grades when much of the work is in drill subjects. The normal group should finish the six grades of the elementary school in six years; and the under-average should be expected to make normal progress as far as possible, within their own group. In each grade the atypical group should be expected to acquire academic knowledge only in so far as their capacities permit, without excessive expenditure of time.

10. Suggestions as to methods and procedure best adapted to the different levels should be included in the course of study. Critical investiga-

tions should be made of our present methods and their relative effectiveness in reaching pupils of varying ability, social background, and environment.

11. It is generally conceded that the keynote in the education of a child of limited mental ability is the establishment of specific habits.

12. The differentiated subject-matter for different groups should be elastic in content, so that it can be modified to meet individual needs as well as group needs. For example, children from foreign-speaking homes may have the same mental ability as other children in their group, but they have a different social background, which the teacher must consider in her approach to the subject-matter which she wants her pupils to acquire.

Individual Instruction and the Curriculum Problem

The viewpoint is pretty largely accepted that the needs of individual children can be far better met when children are classified on an ability basis determined by such factors as seeming innate mental capacity, teacher's estimate of ability, previous accomplishment, industry, health, and social maturity, than they can in a heterogeneous class. The larger the number of groups, the more nearly homogeneous can each group be made. In every instance, however, there will still be considerable variation between individuals in any one group. Hence, some argue that individual instruction is the only plan whereby the curriculum can really be made to fit all children.

The Winnetka Plan of Meeting Individual Differences

Carleton W. Washburne, superintendent of schools of Winnetka, Illinois, discusses this point as follows:

Children differ as individuals, not as artificially formed groups. The children of high intelligence quotient will usually do better work than children of low intelligence quotient; children who are good in one subject are more likely than not to be good in other subjects; but the exceptions to these rules are numerous in every class or school and the variations within each group of ability are far wider than the variations between the central tendencies of any two ability groups.

Where children are allowed to advance individually at their own natural rates, as in Winnetka, for example, it has been found that twenty-four per cent of the children who are advanced in reading are only average or actually retarded in arithmetic and that sixteen per cent of the children who are advanced in reading are average or retarded in language. The same sort of thing is true of the children who are advanced in arithmetic or in language, although the percentages of the children average or retarded in the other subjects is somewhat lower in these cases.

Similarly, twenty-five per cent of children of high intelligence quotient, 123 to 166, tend to progress in school at an average rate or a little below average, while forty-nine per cent of children of low intelligence quotient, 60 to 100, tend to progress at an average rate or a rate above average.

If children are divided into three ability groups as the result of an intelligence test, the high group containing the quarter with the highest intelligence quotients, the low group containing the quarter with the lowest intelligence quotients, and the middle group containing the half of the children between the two extremes, it is found in Winnetka, Illinois, that the difference in median progress of the three groups amounts to only about two months' work per year; whereas the range from the poorest child to the best in any one of the groups is from eight to ten times as great. The median child of the gifted or high group saves only about a month a year, while the median child of the low groups loses only about two weeks a year. Yet the slowest child in the gifted group loses two weeks a year, while the fastest one gains seven and one half months—that is, does almost two years' work in a year. The range between the slowest and fastest children in the middle group and low group is even greater than that in the gifted group. The slowest child in the low group, for example, does only a little over one third of a grade's work in a year, while the fastest child in the low group does the work of a grade and one half. Consequently, the organization of the curriculum to fit children should be an organization that permits each child to spend the amount of time he needs to master each phase of that curriculum.

If the curriculum is to be fitted to the individual children rather than to ability groups, the following general principles may be laid down:

1. The knowledge and skills which every child must master shall be clearly specified. The knowledge and skills should be those which will be used by every child in his life. They should be determined by scientific investigations of social needs, not by tradition or committee judgment. They will be the common essentials—those facts and skills which are essential to all of us in common.

2. Opportunities for the mastery of these common essentials should be given to every child. This inevitably means differing amounts of time for differing children. But it also means that all the children get the habit of mastery and that all the children master those things which are essential for all.

3. Provision shall be made for the valuable and educative use of the varying amounts of surplus time of the more rapid workers. Too often plus assignments are given to such children in an effort to occupy their time. Such assignments are frequently mere padding. It is not necessary that the time a child saves in one subject should be spent in educational work on that same subject. It is often wiser to allow him to progress as rapidly as his ability will permit until he has a large enough unit of saved time to enable him to undertake some worthwhile project in line with his interests or needs.

Time and Content—Two Factors in Differentiation to Meet Individual Needs

The methods of meeting individual needs in children through more homogeneous grouping and through individual instruction accept as the bases of adjustment the modification of time that children of different ability require to complete the course of study together with modification in content. Many would agree that both the factors of time and content should be modified. Limited pupils, even when given more time, do not always grasp the same subject-matter as do gifted children. In curriculum construction, we are faced with the fact that all individuals cannot ultimately learn the same things.

Differentiation of Curricula to Fit Community Needs

The discussion thus far has dealt with education's material—the individual child. The second general principle of curriculum differentiation has to do with the child's environment. In rural districts the objectives of elementary education are not different from those in the city, but the means of reaching them and materials available differ from those in large centers of population. Some communities are cosmopolitan in their makeup. They contain within their limits all sorts and types of school environments and the superintendent soon finds that a curriculum which would fit one district in his city will not completely fit another district. The ultimate purpose of elementary education is the same everywhere, but the content and method through which it is achieved varies.

Major principles for community curriculum differentiation—1. The materials of instruction must be approached in terms of the child's interests and experience. The experiences may be pre-school or contemporary with his school life. Since the environmental conditions surrounding pupils must be made the basis of approach to larger experiences to be developed through the curriculum, local course of study committees, the elementary school principal, and the individual teacher must be responsible for the approach to subject-matter. This approach will be a means to an end, not an end in itself. To illustrate, agriculture and farm life experience may be used as the starting point of elementary rural education; they need not, and oftentimes should not, be the ultimate goal.

2. Sheer economy in learning requires that the educational resources of local life be used. For example, museums and art galleries are sources of art lessons for the city child. Autumn coloring of woods, sunsets, and mountains may be the rural art teacher's approach. The elementary science teacher in the city could profitably have his pupils study gas meters; rural children would probably find the Babcock milk tester of more direct interest. The important educational resources of the community not presented in the curriculum must be organized for instructional purposes so

as to contribute to the education of the child. Here again local course of study committees, the elementary school principal, and the individual teacher must be responsible for the educational use of materials of a local nature not found in the general curriculum.

3. The details, sequence, and emphasis of subject-matter must frequently vary with community needs. To illustrate, the manual training teacher may discover that pupils in the slum sections of a city will be interested in learning to make household repairs. The child from a wealthy home would probably have no opportunity to use this knowledge if he acquired it. He would be interested, however, in learning to make certain toys which money cannot buy. In the end, both children will have learned the same fundamental principles of manual training and the use of the same tools. The mere going through a process after it has been learned and ceases to have educational value should always be guarded against.

4. The course of study should not be based on traditions of the past or the customs of a community, although both of these should be taken into consideration in order that they may be evaluated. We need constantly to challenge our educational program if this program is to keep abreast of the progress made in social and economic organization.

5. A survey should be made of every community before planning its course of study to determine in so far as possible: (a) Physical boundaries and nature of the community; (b) economic interests and relations of these interests to social and spiritual values; and (c) social assets and liabilities of the community, including such items as communication; transportation, means of play and recreation, intellectual and spiritual leadership.

6. Curricula for both urban and rural communities should be developed with specific reference to the "lacks" or "needs" of urban or rural life in general and to each community in particular.

7. It is of vital importance that the community know, through parent-teachers' associations, school officials, etc., the reasons underlying the organization of the course of study and its relation to the community. Out of a free and frank discussion of this phase of the problem will come the best suggestions as to: (a) The use of a community as source material for the elementary schools; and (b) the ways in which the elementary schools may better serve the community.

The public school must seek constantly to interpret itself to the adult community. Unless it does this, its efforts are bound to be hampered. The adult public, not school officials, is the court of final authority. Hence the public must come into possession of the evidence.

8. Local school systems within states should be given a certain amount of freedom to test new educational theories.

Progress in education, like progress in social and industrial development, comes largely through the ability of individual units to experiment, differentiate, and in various ways modify both the method and the material of their curricula. The contributions of Rochester, Gary, Winnetka, and

countless other schools have come through their opportunity to differentiate more or less established curricula.

9. The outstanding character of a school doing a valuable piece of individual differentiation becomes a challenge first to schools in its immediate neighborhood and finally throughout the county, the state, and the nation. The purpose, living within a community, must find its initiative or motive within itself, not from without. A system superimposed may become an attitude, but never assumes sufficient importance to be character. External conformity may not mean inner acceptance.

The Final Test of Differentiation

To summarize, although there is a general core of subject-matter which should prevail throughout the nation in all courses of study for the first six grades, each local course of study committee and individual teacher must be responsible for the *approach* to the subject-matter, for the *use* and *adaptation* of the materials of the curriculum for community needs, for *organization for instructional purposes of the educational resources of the community* not presented in the curriculum, and for *introducing material* which will meet the needs peculiar to a given community.

When these differentiations are wisely planned and carried out, community interest and appreciation result from the service which the school renders the community. In turn the public gives better support, both financial and moral, to the work of the public school, so that the school is enabled to render still larger service; in other words, the initiative of the individual community is aroused.

To achieve this, we must have in addition to differentiation of curricula to meet the larger community needs, a flexible curriculum in the hands of an administrative and teaching force sensitive to the interests and needs of individual children; for, after all, the problem of differentiation of courses of study is one of constant adaptation of education to the individual.

PART III

Curricular Problems and Their Scientific Solution

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The summer school class at the University of Oregon, conducted by Carleton W. Washburne, helped in collecting and reviewing research studies. Those so assisting were: Florence E. Anderson; Wave Anderson; Edward Anderton; Edna Biles; LaMoine R. Clark; Cora E. Coleman; Lyndsay L. Eastland; Almeda J. Fuller; E. H. Hedrick; Guy L. Lee; C. L. McFaddin; Delphie M. Taylor; J. K. West; L. Lee Williams; and F. C. Wooton.

INTRODUCTION

TRADITION and opinion, unsupported by facts, are no longer sufficient bases for including any subject or topic in the public school curriculum. The material available for instruction is so vast that no one person can hope to master more than a small portion of it. How is selection to be made? The subjects in the elementary school curriculum are those intended for universal study. They must meet the tests of social usefulness and individual development, achievement, and happiness. Some of the research studies reviewed in this section represent attempts scientifically to determine what subject-matter is socially useful in present-day life. Others seek to learn what is of greatest interest to children; for, other things being equal, material should be taught at the moment when the use for it is apparent. Hence, the studies of the interests of children are important to curriculum makers.

It is generally accepted that the traditional curriculum for each subject in the elementary school must be modified to satisfy specific objectives and definite outcomes formulated in the light of present-day standards. The immediate needs of the child, the future demands of his adult life, and his capacity for education are all determining factors.

The drill subjects, where the content is definite, have been dealt with more or less completely. For these subjects the minimum essentials in functional content should be tentatively determined soon by research workers.

In this section of the Yearbook, the outstanding research studies which have been made up to date are reviewed. In some subjects the research work which has been done is fragmentary. This largely explains why certain subjects are treated so much more completely than others, although space allotment in the Yearbook was to some extent a determining factor. It was necessary to limit the number of studies reviewed in those subjects where extensive research has been carried on.

The methods of attack in these research studies represent a conscientious striving for the scientific solution of curricular problems. The technique of the investigations in some instances is crude. In the absence of absolute measurement, consensus of expert opinion as well as of mass opinion, has been resorted to. Even this procedure, however, gives an approximation which is far superior to the personal opinion of a few individuals.

The findings of some investigations are incomplete. They should serve as starting points for further work, not as bases for statements of universality of results. These studies are the first forward steps and may be more useful as pointing the way rather than as presenting conclusive results. Perhaps their greatest service will be to show the vastness of the task of bringing the elementary school curriculum up to date and keeping it there and to emphasize the need for research to blaze the way for practice and to check results actually obtained.

At the beginning of each chapter are listed problems which confront course-of-study committees in outlining that subject. In so far as possible these questions are answered by a review of scientific studies bearing upon them. The number of unanswered questions, however, shows that at the present time the outstanding need in the field of curriculum construction is the making of hundreds of technical studies.

This section of the Yearbook pools most of the important existing curricular studies. Here is made available much material of high value which hitherto has been inaccessible because of its technical form and presentation, or because of its fragmentary distribution. The analyses of the studies which follow should have these four advantages:

- Many mooted curricular questions are answered;
- Material is collected for a later program of evaluation;
- Information is presented that is at least useful in the form of suggestions;
- Connecting links are furnished between principles and practice.

The public school recognizes as its first aim the development of character through fixing right habits of conduct. Such habits are fundamental to moral integrity. Preachments of the moral virtues too often miss their mark. But when a child in real life over a period of years finds himself in a situation in which it is made pleasant to be honest, to cooperate effectively with his neighbors, to reverence things which should be revered, progress has been made toward developing his character.

Research workers and school administrators recognize the importance of character development through the curriculum. Progress in this field has been more rapid during the past year than ever before.

School systems in revising their courses of study are shaping their whole school programs, so that every subject taught and every school activity engaged in make their proper contribution toward the development of character.

The reader will probably note the absence of any report of researches in the important subject of character-building. The members of the Commission recognize the paramount importance of this subject, and they are aware of much of the splendid work that is being done, both directly and indirectly, by both public and private schools toward character-building. In many cities, notably, Buffalo, Philadelphia, Salt Lake City, Los Angeles, and Chicago, there are well organized courses in use. In other cities, a course in character-building comprises a definite element of the course in civics, or citizenship. In practically all schools of the country, principals and teachers are consciously and definitely seeking opportunities for the development of good moral habits through all studies, and especially through organized play, games, athletics, and through all group activities in which pupils participate. Progress in this field has been more conspicuous since the war than at any time in the history of our schools. Unfortunately, we find little that can be classified as scientific research in this field. To quote Professor Edwin D. Starbuck: "There are a good many

studies that try to be scientific in the matter of character education, but they surely have little right to be dignified by the term, research." The Indiana Survey, by Professor Ahearn, is suggestive of what may be, and needs to be, done in this field. Several studies are under way. Professor May, of Teachers College, and Professor Starbuck are just now engaged in making a bibliography of such studies.

The members of the Commission would feel remiss in their duty to the children of our schools, if they did not urge all school officials who are engaged in revising their courses of study to shape their programs so as to make definite provision for character-building.

CHAPTER III

ARITHMETIC

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ARITHMETIC is not an end in itself. It is a tool. To meet the demands of social utility, three phases of arithmetic need attention: (1) The basic experience which is necessary in order to make manipulative work meaningful; (2) the mastery for automatic reproduction of the useful number facts; (3) training in application to life and business situations.

The curriculum demands for the above program are so simple that there is no reason why it should not yield to complete analysis and scientific determination. Much scientific progress has been made. The problems needing solution may be listed with reasonable completeness; on some there are much data.

The following is submitted as a representative statement of the problems on which further scientific evidence is wanted.

Major Curriculum Problems in Arithmetic

1. Specifically, what is the purpose of arithmetic; what is its relation to the major objectives of education?

2. How much emphasis should be placed upon the building up of experience before proceeding with the manipulation of symbols? In other words, this is the problem of building up experience, so that number work shall be meaningful, rich in application, and actually useful instead of being merely formal memory work.

3. When should formal drill work begin and at what rate should it proceed? In this connection, there is needed a set of criteria and a means of checking, so that drill may not proceed on a meaningless basis.

4. Is it possible to replace haphazard drill by a scheme of drill that is completely systematized, all inclusive, with the elements ranked on the basis of difficulty? This complete scheme should lend itself as a means for checking or testing the entire range of the child's ability on fundamental drill needs.

5. What is the proper unit of instruction in arithmetic?

6. What are the procedures or requirements necessary to place arithmetic on a 100 per cent motivated basis? This is a problem of making arithmetic grow out of pupil experience and real life situations that are thoroughly comprehended by the children.

7. What is the best plan for eliminating the traditional and useless in arithmetic by a positive procedure that shall carry conviction to teacher, pupil, and patron?

8. By what plan or procedure may teachers eliminate merely stock examples in so-called reasoning problems, substituting therefore life situations worth while in themselves?

9. What are the reasonable limits of general arithmetic or arithmetic needed by the consumer group; where does vocational arithmetic begin; and what are the specific needs for arithmetic by the various vocational groups?

10. Is it possible to have an elastic set of norms or standards of performance that shall include speed, difficulty, and accuracy, and make proper allowance for individual differences?

11. In usable form, what is the specific psychology involved in learning and remembering in the various phases of arithmetic work—drill, reasoning, and application to life situations?

12. How much of the failure in lower grade arithmetic may be accounted for by low ability in reading, and what adjustments in time schedule are necessary to make sure that reading ability is adequate to carry the necessary work in arithmetic?

13. How replace the formal textbook procedure by the actual figuring used in business? In other words, what is wanted is a method by which the children may learn of the actual figuring used in business and be conscious themselves that they are figuring in practically the same form in which it is being done by adults.

14. How should we profitably use the time usually allotted to arithmetic? Sixteen and two thirds per cent of all school time for arithmetic, as shown by previous studies, is obviously more than is justified. Shall the extra time be used as a vehicle, or excuse, for approach to other aims in education: for example, effective home membership through the study of the budget, the civic-economic aim through a study of the cost of strikes, etc., or shall the time devoted to arithmetic be reduced as made possible and desirable by the greater efficiency of present-day teaching and the broader view of present educational objectives?

The Committee's Plan of Report

The Committee sought to obtain a review of all important studies, published or unpublished, and to organize the findings as answers to definite problems. The references in the Judd-Buswell Commonwealth Fund bibliography on arithmetic were divided among the Committee for review, and the entire country was sectioned for the gathering of unpublished studies. Members of the Committee gave such unlimited time and effort, that finally, the chief handicap of the Committee is lack of space assignment to include its full report.

The report takes up successively the following problems:

- I. When should formal arithmetic begin? (*Stone*).
- II. What are the socially useful processes? (*Woody*).
- III. According to what criteria should drill be organized?, (*Knight*).

- IV. What is the best procedure for building up ability to handle concrete or reasoning problems? (*Clark*).
- V. What has psychology and experimental education to contribute? (*Myers and Osburn*).
- VI. What help from standard tests? (*Wilson*).
- VII. What is the method of curricular determination in arithmetic? (*Wilson*).

For several reasons these problems will not receive a well-balanced treatment. The amount of available data varies, and, due to the manner of apportioning the work, some problems received much more attention than others. The chairman took the liberty of reducing his own work to a mere summary in order to make space for the carefully prepared work of Woody and Knight.

I. When Should Formal Arithmetic Begin?

The term "formal arithmetic," as here defined, means formal drill work and a definite attempt to teach for automatic reproduction the number combinations in the fundamental processes, such as simple fractions. Since the purpose of drill is to fix by repetition something previously comprehended, it is evident that drill should follow, not precede adequate experience and understanding. Moreover, there should be on the part of the child before he begins formal repetition a real feeling of need and clear vision of use and application—in short, there should be complete motivation. The psychology of interest is so well established by scientific evidence that this statement should go unchallenged.

Obviously, there is a tremendous opportunity for individual differences in the date of beginning formal drill. Dr. Washburne at Winnetka, Illinois, and Miss Ringer at Longbranch, Washington, have shown how to adapt a drill technique to differences in interest and capacity. There are a few other considerations involved. The relation of reading is evidently one consideration. The total profit resulting from work in a lower grade is another consideration. Scientific evidence is meager. Three studies which have a bearing follow:

STUDY NO. 1. Taylor, Joseph S. "Omitting arithmetic in the first year," *Educational Administration and Supervision*. February, 1916. pp. 87-93.

This is an experiment conducted in Public School No. 16, the Bronx, New York City during 1913 to 1915. During the first of these two years, half the entering children in the school did no work in arithmetic except counting. The extra time was devoted to reading. At the close of the second year of the experiment, children who had had two years of formal number work and those who had had but one year—the children being otherwise equivalent—were compared by the use of standard tests. A summary of the results follows:

2A Tests	Oral	Written
Classes with arithmetic in first year.....	81.0	72.6
Classes omitting arithmetic in first year.....	87.1	89.4
2B Tests		
Classes with arithmetic in first year.....	87.2	69.5
Classes omitting arithmetic in first year.....	90.7	61.0

From this summary it is evident that the classes which omitted formal number work during the first year of school and gave the extra time to reading were, all told, at an advantage by the close of the second year. The quality and quantity of reading greatly improved, while the number work showed improvement—that is, in the 2A tests the children omitting number work in the first year were superior in both oral and written work, while in the 2B tests they were superior in the oral and inferior in the written. The totals, therefore, appear to favor omitting formal number work from the first year and giving the time to reading. This is the interpretation placed upon the results by Taylor, the author.

STUDY NO. 2. Hackler, John Monroe. *The relation between successful progress in mathematics and the ability to read and understand, and the factors that contribute to success or failure in mathematics.* An unpublished master's thesis in the library of the University of Chicago, Chicago, Ill. September, 1921.

Problem. The main problem, as stated in the title, is to ascertain whether ability in mathematics depends on ability to read, at least to a certain extent. Apparently, comprehension-ability in silent reading is the thing in the author's mind, since silent reading tests were used.

Method. Tests were given in silent reading and intelligence, and teachers' estimates were obtained in mathematics and other subjects and correlated with each other. The experiment was conducted with 40 students in the preparatory department first-year class in mathematics in the Northeastern State Normal School, Tahlequah, Oklahoma, and with the pupils of Grades III to VIII inclusive, of the Tahlequah city schools. The class in the preparatory department corresponds roughly to a first-year high-school class, but is far more heterogeneous, containing a wide range of ages, and for this reason the correlation studies of this group are supplemented by an individual analysis.

Conclusions and Results. The results of this investigation have not confirmed the original hypothesis to the extent expected. It has failed to show that ability to succeed in mathematics depends to any great extent upon reading ability. Results with the preparatory school class showed correlations of $+.36$ between the Kansas Silent Reading Test and teachers' estimates of ability in first-year mathematics by the "listed pairs" method, and $+.60$ by the Ranks' method. In the city schools positive correlations of from $.22$ to $.70$ were obtained between reading tests and teachers' estimates in arithmetic.

The author states, "Personal investigations and analysis of individual cases lead to the belief that reading ability is a factor in successful work in mathematics."

STUDY NO. 3. *The effect of a year's drive on motivated reading in arithmetic for mixed drill tests.* Unpublished study, University of Iowa, reported by F. B. Knight.

Data: 111 pupils in grades 3, 4, 5, 6, 7, and 8. Public Schools, Radcliff, Iowa.

Tests used: Arithmetic computation phase of Stanford Achievement Test.

Time of testing: First test, September 15, 1923; Second test, May 15, 1924.

Results: I. Whole group of 111 pupils:

A. Beginning status

1. Average actual arithmetic, comprehension age 138.5 months
2. Average theoretical arithmetic, comprehension age 144.6 months
3. Average loss in arithmetic comprehension age due to faulty reading 6.1 months

B. Status after one year of motivated drive on reading

1. Average actual arithmetic comprehension age 165.3 months
2. Average theoretical arithmetic comprehension age 166.0 months
3. Average loss in arithmetic comprehension age due to faulty reading .7 month

C. Gain in arithmetic comprehension age due to improvement in ability to resist influence of isolated drill

5.4 months

II. Group of 67 pupils who made errors due to reading:

A. Average loss in arithmetic comprehension age due to faulty reading. First test

10.0 months

B. Average loss in arithmetic comprehension age due to faulty reading after year's drive

1.0 month

C. Gain in arithmetic comprehension age due to improvement in reading

9.1 months

III. Gains during year in arithmetic comprehension age as result of year's drive on motivated reading of arithmetic:

A. Average gain of 67 faulty readers	29.7 months
B. Average gain of 44 good readers	21.2 months
C. Excess gain in arithmetic comprehension age of faulty readers over good readers	8.5 months

IV. Summaries:

A. Gain in arithmetic comprehension age of faulty readers due to improvement in reading	9.1 months
B. Excess gain in arithmetic comprehension age of faulty readers over good readers	8.5 months

V. Conclusion:

The excess gain made in arithmetic comprehension age made by the original faulty readers over the original good readers was in the main due to their improvement in the specific type of reading needed in offsetting the influence of isolated drill—namely, ability to follow directions calling for several processes in mixed order.

Conclusion. The above studies and data are obviously inconclusive. They do, however, point to the desirability of more careful attention to reading and the entire omission of formal number work from the first grade. These conclusions are supported by much unscientific evidence from various parts of the country, some of which may be briefly recounted.

Professor Stone reports that the demonstration and practice school in the State Normal College of Ypsilanti, Michigan, 1902-1911 began formal number work in the third grade, except counting and simple addition and subtraction, facts that arose in regular school activities. The public schools of that city began number work in the first year. Pupils entering the training school from the city schools in the fourth year showed a little advantage in written work at the beginning of the year, but by the end of the second semester there was no difference between those who had had number work for three and one half years and those who had had number work for only one and one half years.

Dr. H. L. Smith in the Bloomington (Illinois) Survey shows that children who had had no formal number work in grades one and two were not handicapped by the end of the third year in competition with children who had had number work regularly during the first and second year.

II. What are the Socially Useful Processes?

McMurry, as long ago as 1904, with keen insight, called the attention of superintendents to the fact that many processes taught in arithmetic had

little or no social value. His opinion was supported again and again, but then as now mere opinion carried less weight than scientific evidence. Fortunately, a method has been discovered for gathering such scientific data. The actual analysis of usage has become the basis for inclusion of processes found useful, or the exclusion of processes not used.

Mrs. Gallaway's study deals with the needs of freshmen college girls who take a course in clothing. Obviously, with the basic arithmetic taught and with the evident need at hand, college women will master additional arithmetic as needed. The same statement applies to the study of Williams dealing with the mathematics needed in freshman chemistry. If chemistry calls for more arithmetic, then is the time to teach it.

The other studies divide themselves sharply into two classes, according to viewpoint. Adams and Mitchell are dealing chiefly with ability to read numbers and understand them in general and not with manipulative ability; on the other hand, the studies by Charters, Hanus, Wilson, Wise, and Woody deal with manipulative skills demanded of adults. It should be noted that these two viewpoints show radically different results.

For a century or more after the founding of Yale University, it was possible for students to enter without knowing the multiplication table, yet there is little doubt that the general reading ability called for in the Adams study was met. Doubtless also the multiplication table was learned, but the point is that there is no established and verified relationship between the general understanding required for reading ability and the automatic response required for calculating. The findings from these studies point strongly to the following conclusions: (1) That experience must in all cases precede formal work in calculating; (2) that manipulative or calculating skill required is relatively small and not a matter of momentary occurrence to even the busiest of adults; and (3) many processes long retained in the textbooks in arithmetic have practically zero value.

It is safe to say that most superintendents of schools today would agree to the complete elimination of the following processes:

Compound numbers, addition, subtraction, multiplication, division.
Greatest common divisor and least common multiple beyond the power of inspection.
Long confusing problems in common fractions.
Complex and compound fractions.
Reductions of denominate numbers.
Cases two and three in percentage.
Annual interest.
Compound interest, except savings.
Partial payments.
True discount.

Proportion.
Ratio beyond the ability of fractions to satisfy.
Partnership with time.
Longitude and time.
Exchange, domestic and foreign.
Apothecaries' weight.
Troy weight.
Table of folding paper, surveyor's table, table of foreign money.
Much of mensuration—trapezoid, trapezium, polygons, frustrums, spheres.
Cube root.
The metric system.

The curriculum in arithmetic should make no provision for formal drill on the above processes. This does not preclude some "informational" attention to them, or some special attention whenever one of them is involved in a "life situation" studied in detail by the pupils.

A summary by Woody of the scientific evidence follows in order of appearance:

1. *Computational uses of arithmetic*—The findings on the computational uses of arithmetic are so different from those on informational or general reading usage that it seems wise to separate the studies. The computational uses are much simpler, and according to Woody (Study No. 14), they are being further reduced by the uses of commercial calculating machines. By separating the studies into these two divisions they show great consistency as to conclusions.

STUDY NO. 4.* Wilson, Guy M. *Connersville course in mathematics*. 1911; republished by Warwick and York, 1922. Baltimore, Maryland.

Problem. To get the sentiment and goodwill of the business men of Connersville in the construction of the course of study in arithmetic in the public schools of that city.

Method. The following questionnaire was submitted to the business men for consideration:

(1) At present the school time in the grades is divided approximately as follows: Reading, 26 per cent; arithmetic, 16 per cent; language, 12 per cent; history, 11 per cent; geography, 8 per cent; spelling, 7 per cent; music, 6 per cent; drawing, 6 per cent; writing, 4 per cent; physiology, 4 per cent. Does this appeal to you as a proper division of school time in the grades?

(2) Stated differently, English receives 49.2 per cent of the school time in the grades; the three R's receive 65.24 per cent; the fundamentals (the three R's plus geography and history) receive 86.09 per cent; the special subjects (physiology, music, and drawing) 13.91 per cent. Does your experience suggest any change of emphasis?

(3) Following are some topics we, as boys, studied in arithmetic in the grades. Check (✓) the topics for which you have had considerable use during the past six months. Cross (X) the topics for which you have had little or no use during the six months:

Troy weight	Foreign exchange
Longitude and time	Compound proportion
The surveyor's table	True discount
The greatest common divisor	Cases 2 and 3 in percentage
The least common multiple	Compound interest
Complex fractions	Partial payments
Cube root	Partnership
Compound fractions	

* The studies are numbered consecutively throughout the chapter for convenience in reference.

May some of these topics be omitted from our arithmetic work without material loss? Which ones?

(4) Following are some topics we did not study in arithmetic as boys:

Saving and loaning money	Keeping simple accounts
Mortgages	Investing money
Modern banking methods	Bonds as investments
Building and loan associations	

Real estate as investments (cheap rentals, good residence property, business blocks, farm lands as investments)

Marks of a good investment (It is estimated that the get-rich-quick concerns fleece the American people out of \$60,000,000 a year)

Taxes, levies, public expenditures

Profits in different lines of business

Check (✓) any of the above that appeal to you as worthy of a place in present-day arithmetic work.

(5) Connersville is developing important industrial and commercial interests. To what extent should those interests have an influence in shaping a course of study for our schools, especially in arithmetic?

(6) Suggest some feasible plan of bringing the schools into closer relations with the industrial, commercial, and business interests of our community. Give some figures and problems from your own business.

Findings. 1. On questions (1) and (2) few suggestions were made. Of these, most recommended reducing the time given to drawing and increasing the time given to writing and spelling.

2. On question (3) the business men reported which topics had been little used and suggested that they be eliminated from the course of study. There was meager support for cube root, compound proportion, cases in percentage, and the surveyor's table, and the majority favored eliminating these and putting the time on the fundamentals.

3. On question (4) all agreed that every topic should be included in the course of study.

4. On question (5) all agreed that the schools and the course of study should take into consideration the industrial and commercial interests of the community.

5. On question (6) nothing of consequence was submitted.

STUDY NO. 5. Jessup, W. A. and Coffman, L. D. *The supervision of arithmetic*, Chapters I and II. New York, Macmillan, 1916. pp. 1-38.

Problem. To determine the attitude of city and county superintendents toward the elimination of certain questionable subject-matter and the introduction of certain other new subject-matter.

Method. The following letter was sent to all superintendents of schools in cities of 4000 population or over, and to every sixth county superintendent in the United States:

Underscore once the subjects which should receive slight attention; underscore twice the subjects which should be eliminated.

Apothecaries' weight, troy weight, furlong, rod in square measure, drachm, quarter in avoirdupois weight, surveyor's tables, foreign money, folding papers, reduction of more than two steps, long method of finding greatest common divisor, lowest common multiple, true discount, cube root, partnership, compound proportion, compound and complex fractions, cases in percentage, annual interest, longitude and time, unreal fractions, alligation, metric system, progression, and aliquot parts.

Others -----

Underscore subjects which should receive more attention than is usually given:

Addition, subtraction, multiplication, division, fractions, percentage, interest saving and loaning money, banking, borrowing, building and loan associations, investments, stocks and bonds, taxes, levies, public expenditures, insurance as protection and investment, profits in business, and public utilities.

Findings. 1. Replies were received from 52 per cent of the superintendents of the city schools, and from 24 per cent of the superintendents of the county schools.

2. There was a majority of those reporting in favor of increasing the emphasis on the four fundamental operations, and upon phases of arithmetic involving savings and loaning of money, taxation, public expenditures, fractions, insurance, and percentage.

3. Between 10 and 50 per cent of those reporting favored increased emphasis on stocks and bonds, levies, banking, interest, building and loan associations, and profits.

4. Over half of the superintendents reporting favored eliminating: apothecaries' weight, rod in square measure, drachm, quarter in avoirdupois weight, compound proportion, unreal fractions, alligation, and progression.

5. From 8 to 50 per cent of all the replies favored elimination of all other topics included in the second half of the questionnaire.

STUDY NO. 6. Chase, Sara E. "Waste in arithmetic." *Teachers College Record*, Volume 18, No. 4, September, 1917. New York, Bureau of Publications, Teachers College, Columbia University, 1917. pp. 350-371.

Problem. 1. To determine waste through the measurement of the permanent effects resulting from the teaching of mensuration and through ascertaining the extent to which various terms and operations involved in mensuration were used in life outside of school.

2. To determine the waste due to the pupil's unfamiliarity with the language and conditions of given problems.

Part I. Method. **Test I.** Sheets of paper, upon which were drawn a square, a rectangle, a rhomboid, a triangle, and a circle, were given with

a ruler to the following groups of students who were told to determine the exact area of each figure:

- Group I. One hundred and twenty-three pupils in Grades IX to XII.
 Group II. Thirty-eight pupils in Grade IX who had just spent three months in mensuration.
 Group III. Thirty pupils in Grade XI in a technical high school three months after they had completed mensuration in connection with plane geometry.
 Group IV. Fifteen adult students at Teachers College, Columbia University.

Findings.

In Group I

Forty-four per cent could not find any of the areas.

Ninety-three per cent failed on the rhomboid.

Fifty-five per cent failed on the square.

In Group II

Twenty-four per cent could not find any of the areas.

Ninety-three per cent failed on the rhomboid.

Thirty-two per cent failed on the square.

Even in Group IV there was considerable failure.

Test II. As another test, the following lists of areas and volumes (1) area of square, rectangle, triangle, circle, and rhomboid; (2) entire surface of a cube, prism, pyramid, cylinder; (3) volume of a cube, prism, cylinder, were given to the following groups of people: (a) Pupils in school, (b) teachers of drawing, sewing, and manual training, (c) one hundred forty men and women engaged in various occupations. These different groups were asked to cross out all items in the given list which they had not used in their life out of school.

Findings. Seventy-eight per cent of all the pupils crossed off everything. Teachers of manual training said that board measure was needed to compute cost, but no other areas were needed in this work. Teachers of other subjects answered that neither areas nor volumes were needed for their work. Of the workers, 68 per cent of the women and 30 per cent of the men crossed off everything.

TABLE 1.—PERCENTAGE OF MEN AND WOMEN USING DIFFERENT ITEMS IN ARITHMETIC

Area of	Men	Women	Entire surface of	Men	Women	Volume of	Men	Women
Square.....	66%	27	Cube.....	38	8	Cube.....	39	9
Rectangle.....	61	26	Prism.....	20	5	Prism.....	18	8
Triangle.....	42	8	Pyramid.....	9	0	Cylinder.....	36	9
Circle.....	32	12	Cylinder.....	24	5	Square root of number.	41	12
Rhomboid.....	11	3						

Part II. Method. Vocabulary tests, patterned after the Thorndike Vocabulary Tests were made from words in textbooks in arithmetic and given to pupils in appropriate grades.

Findings. Results show a woeful lack of knowledge of the vocabulary used in the written problems of arithmetic. Below is a list of words and the percentage of pupils in each grade failing to use each word in a sentence to illustrate its meaning:

	Percentage of pupils in		
	Grade III	Grade IV	Grade V
The dealer	80	40	24
The grocer	40	20	20
The merchant	90	60	0
The contractor		95	80

Children in the city do not know what is meant by "bin, head of cattle, loading grain, etc." The article makes a plea for the use of concrete situations true to life and within the child's experience.

STUDY NO. 7. Hanus, Paul H., and Gaylord, Harry D. "Courtis arithmetic tests applied to employees in business houses." *Journal of Educational Administration and Supervision*, Volume 3, No. 9, November, 1917. pp. 505-520.

Problem. To find out how the results achieved on the Courtis Research Test, Series B, by 446 employees of one of the largest trust companies and one of the largest department stores in Boston compared with those achieved by the pupils in Grade VIII in the Boston public schools.

Method. The Courtis tests were given to the employees in groups of approximately 35 individuals and the results obtained compared with the achievements in Grade VIII in the Boston public schools.

Findings. 1. In addition, the median number of problems solved by the employees was 22.87 per cent; the median accuracy, 88.6 per cent. By the pupils in Grade VIII, the median number of problems correctly solved was 12.9 per cent; the median accuracy, 77 per cent. Many of the employees finished the test before the end of eight minutes.

2. In subtraction, the median number of exercises solved by the employees was 19.3 per cent with a median accuracy of 85.3 per cent correct; by the pupils in Grade VIII, 12.9 per cent exercises correct with an accuracy of 90 per cent. It is interesting to note that the pupils in Grade VIII were approximately five per cent more accurate than the employees.

3. In multiplication, the median number of exercises solved by the employees was 13.8 per cent with a median accuracy of 64.8 per cent; the median number of exercises correctly solved by the pupils was 11.8 per cent with a median accuracy of 82 per cent. Note that the pupils solved almost as many problems and were much more accurate.

4. In division, the median number of exercises solved by the employees was 11.1 per cent with an accuracy of 84.8 per cent; the median number of exercises by the pupils, 12.2 per cent correct with a median accuracy of 94 per cent. Note that the pupils worked more problems and were more accurate.

5. Analysis of the results showed that the accountants in the department store made much higher scores than the salesgirls, and that bookkeepers in the bank made higher scores than those in the listing department. It is possible that the former groups were more highly selected, but the fact that their speed in addition was much greater in proportion than that in other operations suggests that the greatest efficiency results from greater practice rather than selection of higher initial ability. Relatively greater practice in multiplication and division on the part of the school children of Boston accounts for their higher percentage of accuracy.

STUDY NO. 8. Wilson, G. M. "A survey of the social and business use of arithmetic." A preliminary study. *16th Yearbook, Part I. National Society for the Study of Education*. 1919. Wilson, G. M. "The social and business uses of arithmetic." *Teachers College Contributions*, No. 100. New York, Teachers College, Columbia Univ. pp. 1-62.

Problem. To determine the nature of the arithmetic used by adults in their social and business relations.

Method. Study based upon the analysis of 14,583 problems contributed by 4068 different persons representing 155 different occupations. These problems were collected through the coöperation of superintendents and teachers in the public schools of the east and the middle-west, who asked the children in Grades VI, VII, and VIII to get from their parents, each night for a period of two weeks, a statement of the uses which they had made of arithmetic during the day. The statements of the problems encountered, thus collected, provided the data upon which this study was based. The author contended that the data were extensive and varied enough to be representative of adult social and business life.

Findings. 1. Eighty-five per cent of all problems involved the use of money in either the buying or selling of goods. Labor and wages, interest, rent, and insurance covered two thirds of the problems involving money, but not involving buying or selling. Problems not involving money involved hours of labor, measurement of capacity of bins, cisterns, cribs, tanks, estimates of building materials, etc.

2. Of all the problems involving buying and selling, 45.9 per cent related to food; 17.9 per cent to clothing. For all occupations the ten topics involved the greatest number of times in the different problems were: groceries, dry goods, labor, milk, making change, meat, eggs, clothing, butter, and fuel.

3. Multiplication, addition, subtraction, division, and fractions reported constituted 90.6 per cent of all the problems. Little use was made of pro-

portion, decimals, apothecaries' weight, square root, partial payments, and troy weight. When these topics were involved the problems were too complicated for the elementary grades.

4. In the problems involving addition only two and one half per cent of the problems had more than four places in the largest addend. Almost all of the multiplication problems had either one or two place numbers in the multiplier. In division 39.6 per cent of all the problems had one number in the divisor; 43.4 per cent had two-place numbers in the divisor.

5. The most commonly used fractions had denominators of halves, thirds, fourths, fifths, and eighths.

6. The following processes did not appear in the adult figuring reported: greatest common divisor, least common multiple, long confusing problems in common fractions, complex and compound fractions, reduction in denominate numbers, tables of folding paper, surveyor's measure, foreign money, compound numbers, longitude and time, compound interest, annual interest, exchange, true discount, partnership with time, ratio, mensuration involving trapezoids, trapeziums, polygons, frustrums, spheres, cube roots, or the metric system.

STUDY NO. 9. Mitchell, H. Edwin. "Some social demands on the course of study in arithmetic." *Seventeenth Yearbook of the National Society for the Study of Education, Part I.* Bloomington, Ill., Public School Pub. Co., 1918. pp. 7-17.

Problem. To determine the relative importance of the various content elements of the course of study in arithmetic through ascertaining the frequency of their occurrence and the manner of their use.

Method. Study based upon the arithmetic appearing in a standard cook book, in the payrolls of a number of artificial flower and feather factories, in marked-down sales advertisements, and in a general hardware catalogue.

Findings.

Study I—From the cook book:

- (1) The numbers occurring were very small regardless of whether they were integers or mixed numbers.
- (2) The most commonly occurring fractions had denominators of 2, 3, 4, and 8.

Study II—From the factory payrolls:

- (1) The word "dozen," and fractional parts of twelve were used very much. The commodities were made and sold by the dozen.
- (2) To compute earnings the arithmetical processes involved: addition of all possible fractions with 12 as a dozens; of decimals in terms of dollars and cents; cation by a fractional, integral, or mixed number of denominator to integers and mixed numbers; multipli-addition of United States money.

- (3) The fractions emphasized were twelfths, fourths, thirds, and sixths.

Study III—From marked-down sales advertisements:

- (1) Discount notes with the exception of *halves* and *thirds* were expressed in percentages.
- (2) The most common practices were to use 10 per cent, 20 per cent, 25 per cent, one third, and one half off.

Study IV—From the general hardware catalogue:

- (1) Many articles were sold by the dozen, thus necessitating ability to calculate using fractions and mixed numbers involving 12 as the denominator of the fraction.
- (2) Fractions with denominators of 16, 32, and 64 were used. Many of these fractions were merely descriptive, although the dealer had to read and understand them.
- (3) Quantities tabulated under avoirdupois weight were descriptive of the weights of articles, but addition of weights was necessary in determining freight rates.
- (4) The terms used frequently were: inches, feet, yards, ounces, pounds, dozen, gross, quarts.
- (5) The units often used in selling were: per each article, per dozen, per gross, per hundred, per pound, per foot, per hundred feet, per square foot, per hundred square feet.

STUDY NO. 10. Wise, Carl T. "Survey of arithmetical problems arising in various occupations." *Elementary School Journal*, Vol. 20. October, 1919. pp. 118-136.

Problem. To test over a more varied area, the Wilson Survey method of determining the social needs for the arithmetical processes.

Method. The problems of adults, 7345 in number, were gathered from the States of Texas, Iowa, Illinois, Wisconsin, California, and Missouri. The classification used showed the processes and their difficulty.

Findings. 1. Differences in the classifications of problems from the city and rural districts and also differences in the classifications of problems from different parts of the country were negligible.

2. Eighty-five per cent of all problems classified involved only the four fundamental operations, or combination of fundamental operations.

3. The fractions commonly used were $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, and $\frac{1}{8}$. These constituted 93.9 per cent of all fractions which occurred.

4. Problems involving common weights and measures occurred very frequently.

5. There were very few problems in compound interest, compound proportion, insurance, plastering, painting, masonry, and bank discount.

6. No problems were received involving taxes, investments, stocks and bonds, equation of payments, foreign exchange, apothecaries' weight, alligation, annual interest, compound and complex fractions, folding paper, troy weight, or the metric system.

STUDY NO. 11. Noon, Philo G. "The child's use of numbers." *Journal of Educational Psychology*, Volume 10, November, 1919. pp. 462-467.

Problem. 1. What arithmetical knowledge and power should be acquired by a child at the end of Grade VI.

2. What should be the content of the arithmetic course in Grades IV, V, and VI?

Method. The author went to 12 classes of Grades IV, V, and VI, and two immature classes of Grade VII in a choice residential section of Boston and asked the children to tell what numbers they make use of or notice outside of school. Items reported were accredited to the lowest grade mentioned.

Summary:

A. Games: (1) Calling or reading numbers: (a) Football signals; (b) spots on dice; (c) spots on dominoes; (d) number on sled to indicate size; (2) Counting marbles, children in games, tops, stripes, etc.

B. Going to store: (1) Knowledge of quantity (pound), (2) number of articles, (3) finding cost, and (4) counting change.

C. Other instances of reading numbers: (1) Telephone numbers, (2) automobile numbers, (3) policeman numbers, (4) numbers on fire engine, (5) numbers on police engine, (6) dates on almanac.

D. Other instances of counting: (1) Money belonging to child, (2) postage stamps, (3) steps in dancing, (4) number of Christmas presents.

Conclusion. Reading of numbers and counting include nearly every item recorded above. Below Grade VII there is no felt need for problems in arithmetic. These emphasize mechanical work up to the sixth grade. Then is the time for applied arithmetic. Before Grade VI, emphasize the four processes (addition, subtraction, multiplication, division), common fractions, and decimals.

STUDY NO. 12. Woody, Clifford. "Types of arithmetic needed in certain types of salesmanship." *Elementary School Journal*, Volume 22, No. 7, March, 1922. pp. 505-521.

Problem. The investigation was undertaken to gain a reliable index of arithmetic needed by the clerk in selling goods and by the consuming public in purchasing goods.

Method. The study consists of an analysis of 4661 bills of sale, representing a total value of \$41,560.67 obtained from three large stores in Seattle, a wholesale and retail hardware, a wholesale and retail grocery, and a

large department store. In this study a problem was defined as any situation demanding calculation. Oftentimes one situation demanding more than one set of calculations was listed as more than one problem. As the author collected data, he interviewed managers concerning needs for arithmetic and concerning the arithmetic used.

Findings. 1. Nine hundred forty-five of the 4661 bills of sale required no computation other than in the payment of bills. (This was true with regard to the vast majority of the business conducted in one of the firms, as bills of sale were made only in case the purchases were to be delivered.)

2. There was no use of decimals save in connection with United States money. This was to be expected since calculations involved only buying and selling.

3. Of the problems in addition encountered none had more than five places in any addend, and few had more than six addends. The most common type of problem in addition consisted of adding two three-place numbers.

4. Few problems in subtraction, other than making change, were encountered. In the grocery only one of the 206 bills of sale involved any subtraction, other than making change. When subtraction was involved, usually the problems had but three or four numbers in the minuend.

5. In multiplication, the vast majority of the problems had but two or three-place numbers in the multiplicand and one or two-place numbers in the multiplier.

6. By far, the most common problems in division had two or three-place numbers in either the dividend or the divisor. Division as a process was used less than addition or multiplication.

7. The most commonly used fractions had denominators of 2, 4, 6, and 12, although 3, 5, 9, 10, 16, 24, and 144 were used to some extent. The most common unit of sale determined very largely the fractions used. Dozen or gross were often employed and thus the fractions with denominators of 12 and 144 were used. Such fractions were rarely reduced to lowest terms. There was much multiplication of a two, three or four-place number by a simple fraction, or by a mixed number having one, two, or three places and a fraction. There was little use of addition, subtraction and division of fractions.

8. Denominate numbers were encountered as units of sale, but no reduction into larger or smaller units took place.

9. Discount was widely used, especially in the hardware store. The most common rates of discount were 5, 10, 20, 25, 30, 35, 40, and 50 per cent. Inquiry revealed that discount tables were used and that little calculation was employed.

10. Interviews with the managers of these stores to supplement the analysis of the bills of sale revealed the following significant points: (a) The goods were marked in terms of the decimal system to make calculations easy; (b) Goods were sold by convenient units or groups of units, and were not usually sold by using a simple unit or a multiple of the total cost of a

large amount of goods; (c) Measuring devices, weighing devices, calculating machines, calculating devices, such as discount books, price tables, cash registers, central cashiers, etc., have reduced the amount of arithmetic used by clerks to a minimum. Oftentimes the manipulating of a mechanical device and reading numbers was all the arithmetic needed by the clerks in selling goods. If there was no central cashier, in addition to the ability to read numbers, the clerks had to be able to make change.

11. While the evidence indicated that the clerks under consideration made little use of arithmetic, the author argued that the consuming public needed arithmetic for its own satisfaction in checking the accuracy with which the calculating and measuring devices were manipulated. He argued for much emphasis on mental arithmetic—that is, calculating without pencil or paper, and for much emphasis on quickly estimating or approximating a correct answer to the problem involved.

STUDY NO. 13. Woody, Clifford. *Results obtained from giving the Courtis arithmetic test to members of the Rotary and Kiwanis Clubs.* Unpublished study on file in the office of the Bureau of Educational Reference and Research, University of Michigan.

Problem. To determine the level of efficiency in addition and multiplication existing in highly selected groups of our adult society and to make comparison with the level of efficiency attained by the children in Grade VIII.

Method. The addition and multiplication tests of the Courtis Research Tests in Arithmetic, Series B, were given to 203 adults belonging to Rotary and Kiwanis Clubs in seven different cities of Michigan. The results achieved were compared with the Courtis Standards of Achievement for the children of Grade VIII.

Findings. 1. In general, the members of the Rotary and Kiwanis Clubs attempted more exercises than the children in Grade VIII. The median number of problems attempted by the members of the clubs was 19.5 in addition and 13.7 in multiplication; the general standard of achievement for the children in Grade VIII is 11.6 in addition, and 10.2 in multiplication.

2. There was much variation in the median number of exercises attempted by the various clubs. In addition, the median scores ranged from 13.0 to 24.1 exercises attempted; in multiplication, from 8 to 16.5 exercises attempted.

3. In general, the members of the Rotary and Kiwanis Clubs were more accurate in addition and less accurate in multiplication than the children in Grade VIII as indicated by the Courtis general standards. The median percentage of accuracy for the 203 members in addition was 82 per cent correct; in multiplication, 71 per cent correct. The corresponding figures for the general standards of the Courtis Tests in Grade VIII are 76 and 81 per cent, respectively. The variation of the median percentages of accuracy in

addition among the different clubs was from 71 per cent to 86.5 per cent correct; in multiplication, from 64.6 per cent to 79.6 per cent correct. It is interesting that the median percentage of accuracy in multiplication in each club was less than the general standard for Grade VIII.

4. In general, the median percentage of accuracy in the clubs was higher in addition and lower in multiplication than in Grade VIII.

Note. This study suggests that the level of efficiency existing in these processes is largely conditioned by the social demands made upon the different individuals. Although the different investigations indicate that multiplication as a process is used in business and social life more than addition, it is ventured that the problems in addition in the Courtis Tests approximate the type of problems solved in business and social life more closely than the problems in multiplication do. Furthermore, much practice in addition is gained in exercises in which the predominant process is multiplication. Thus it seems safe to suggest that the club members achieved relatively higher scores in addition than in multiplication because relatively greater practice of the type measured by the test in addition is encountered in the routine of everyday business life.

STUDY NO. 14. Woody, Clifford. *The use of calculating and measuring devices in business and their influence on the use of arithmetic.* Unpublished study made in coöperation with Leander Beach, 1923. On file in the office of the Bureau of Educational Reference and Research, University of Michigan.

Problem. To find out to what extent calculating and measuring devices were used in business houses and to determine something of the nature of arithmetic utilized in carrying on business transactions.

Method. The managers of 40 business houses in Ann Arbor were personally interviewed concerning the use of mechanical devices, short-cut methods, and the nature of arithmetic utilized by salesmen and consumers. This list of business houses included: three banks, five drug stores, six grocery stores, four drygoods stores, three bakeries and restaurants, two hardware stores, two shoe stores, three men's clothing stores, two book stores, one electric shop, one wall-paper and paint store, one jewelry store, one office outfitting store, one five-and-ten cent store, one news company, one tea and coffee house, one meat market, one candy store, and one phonograph store. The same questions were asked each firm in accordance with a specially prepared questionnaire.

Findings. 1. Each of the business houses made much use of mechanical calculating devices. Each firm had at least one cash register, and some had as many as 10. Almost all firms had at least one adding machine, and the banks had from six to eight machines. The banks used bookkeeping machines. Computing scales were used in all grocery stores, all meat markets, all drug stores, and in all candy shops. In one grocery store two cheese cutters were operated on the computing plan.

2. Many tabular devices were utilized in order to reduce the amount of tabulation. The banks used bond and interest tables. The news company used a "price" table to tell the price of the different magazines or combinations of magazines. The drug stores used "percentage solution" tables whereby it was possible to find the different amounts of a chemical to make a solution of a particular strength. The hardware had "screen" tables for finding the areas of screens of different lengths and widths, and discount tables for determining the cost price from the list price in wholesale catalogues. The book stores used a "printer's" table for determining the number of sheets per pound according to the quality. In fact, almost every firm used tabular devices of some kind.

3. Several "short-cut" methods were discovered. In computing interest at six per cent when the interest book is not used, point off two places in the principal and multiply by half the number of months. In figuring the selling price on an article when there is a discount, the method is to subtract the discount from 100, point off two places in the remainder and multiply by the original price. A system of alligations was used by the druggists.

4. The goods were always marked to avoid complicated calculations. Firms are now avoiding marking in fractions and employ the unit of decimal system to a great extent. They also avoid the sliding scales and sell at so much per unit or multiple of this unit, or group of units. An illustration of the unit or group of units plan is: selling six bars of soap for 25 cents but charging 35 cents for eight bars.

5. Many of the managers insisted that neither their employees nor the purchasers did much actual calculation. In certain stores like restaurants, and ice cream stores where articles were sold in combinations the clerks learned the sale price for the combination of articles: for example, they learned the regular price for a sandwich, coffee, and a piece of pie was 45 cents and did not have to add the price of the different items to get the total. The managers estimated that only about 29 per cent of the buyers ever add the cost of different articles purchased to find the total amount purchased, and that only about 66.6 per cent of their customers ever check the change given them.

6. These business men insisted that the school needs to emphasize the four fundamentals. They felt there is great need for "mental" arithmetic. Some emphasized the need for training involving interest, discount, and the metric system. The particular needs emphasized by the business men depended largely on their type of business.

7. The business men agreed that the greatest number of mistakes made in the buyer's calculations involve making change. The buyer does not understand the "make-change" method and gets lost.

8. The outstanding conclusion drawn from this investigation is that little calculation in arithmetic was actually done.

STUDY NO. 15. Charters, W. W. *Department store arithmetic*. Study reported in Charter's *Curriculum Construction*. New York, Macmillan, 1923. pp. 231-236.

Problem. To determine what operations in arithmetic are important for salespeople.

Method. Study consisted of analyzing the arithmetic involved in the use of several thousand sales checks. In addition, multiplication and division 7337 charge checks were examined; in subtraction 4304 cash checks were analyzed. The analyses consisted of detailed accounts of the number of addends, the number of figures in the addends, the number of figures in the minuend when subtraction was involved, the number of times a particular amount of money was offered in payment for a bill of goods, the number of places in the multiplicand and multiplier when multiplication was involved, the number of places in the dividend and divisor when division was involved, the size of the fractions encountered, etc.

Findings. The reader is referred to Charter's book for a detailed summary, but the main points are set forth in the paragraph quoted: "In this one vocation of department-store selling the chances are nine out of ten that no problem in addition will be more complicated than the addition of four-place addends; no subtraction is used in making change, and if it were, only forty-five out of one hundred subtraction facts would be used; the chances are ninety-seven out of one hundred that in multiplication the multiplier will be 12 or less and the multiplicand three places or less; in fractions, only eleven denominators are found, all being under 10 except 10, 12, and 16, and by a simple device of using the thumb decimals disappear."

STUDY NO. 16. Moore, Ernest C. *Minimum course of study*. Chapter I. Arithmetic. pp. 1-41, 1923.

At the beginning of this chapter, three studies for the purpose of ascertaining the minimum essentials of arithmetic were reported.

Study I. Problem. To find out how much arithmetic is used in everyday life.

Method. A questionnaire was sent to men of various vocations asking them certain questions concerning their use of arithmetic. Typical questions follow: Do you personally have occasion to add columns of 2, 3, 4, 5, 6, or more figures in width? Do you personally have occasion to compute simple interest, etc.

Findings. From the 799 replies to the questionnaire, it was evident that the minimum essentials should include: (1) Addition—five addends, five figures in width; (2) multiplication—the multiplicand, five figures in width, the multiplier, four figures in width; (3) division—the dividend, five figures in width, the divisor, four figures in width; (4) fractions—halves, thirds, fourths, fifths, eighths, with tenths; (5) decimals of three places; (6) simple interest; and (7) percentage.

Study II. Problem. To find the amount of arithmetic used in everyday life with regard to subject-matter.

Method. A second questionnaire, listing various topics in arithmetic, such as addition of fractions, subtraction of fractions, simple cash accounts, drawing to scale, etc., was sent to the persons mentioned above with the request that they relate to the children in the home all the uses made of arithmetic each day for ten consecutive days and have the children record such uses by placing an X on the question blank after the enumerated topic.

Findings. On the basis of the 314 replies to this questionnaire, it was concluded that the following should be included in the list of minimum essentials: (1) Simple cash accounts, or family expense accounts; (2) cash, checks, or bills; (3) addition of fractions; (4) multiplication of fractions; (5) subtraction of fractions; (6) banking; and (7) division of fractions.

Study III. Problem. To find out the amount of arithmetic needed by the employees in fifty business firms of Los Angeles.

Method. The following questionnaire was sent to fifty leading business firms in that city: (1) How much arithmetic should young people know when they enter your employment? (2) In what arithmetic work do you find them weak or unsatisfactory? (3) What suggestions do you make that may assist in correcting mistakes? (4) So far as it comes to your attention, what work in arithmetic is being taught that is of little or no value in your business?

Findings. From the 24 replies received, the following answers were obtained: (1) The arithmetic needed on entering the firms should include addition, multiplication, division, decimals, subtraction, percentage, and fractions; (2) The weaknesses manifested were in accuracy (mentioned by 18 of the 24 replying), decimals, addition, multiplication, fractions; (3) The suggestions made for correcting the mistakes were: accuracy, shortcuts, mental arithmetic, and "teach the why"; and (4) In response to what should be eliminated, the replies were: no topics, higher mathematics, algebra, all except the four fundamentals, decimals, interest, and discount.

Although the above questionnaires are suggestive, the nature of some of the answers given suggest that they should not be taken too seriously, for they do not smack of serious thought. It may be noted that Study II, based upon actual usage instead of opinion, shows a much simpler demand. Tabulation of usage is now conceded to be the most effective procedure in checking needs.

STUDY NO. 17. Hansen, Einar A. *The arithmetic of salespersons' tally cards.* 1924. Unpublished study, Department of Education, Univ. of Iowa.

Problem. To determine what additions salespersons use in totaling their daily sales: 1. How many of the cards have but one sale listed; how many two, three, etc.

2. How many sales are totaled in each column of sales on the cards?

3. What is the size of the final sum as measured in terms of the number of digits involved?

4. How many columns of sales are added by the salesperson?

Method. 1324 tally cards, the cards on which sales are entered for purposes of record, from four large downtown stores, a bookstore, a music store, a department store, and one selling athletic goods, besides one fairly large drygoods store on the west side of the city, were used. The frequencies of occurrence of the four characteristics listed above were tabulated. The findings are recorded in tabular and graphic form.

Findings. 1. Twelve per cent of the total number of cards fall in the group having one or two sales. The curve falls rather regularly from this point to two and one per cent toward the latter end, where it rises again to six per cent for those having fifty or more sales.

2. The number of sales totaled in the various columns was determined partially by the type of card used, depending upon whether the fifty possible items were arranged in four, three, or two columns. Thirteen-item columns ranked first with fifteen per cent, 12 and 2—item columns second, with eleven per cent each. The preponderance of 2-item columns was due in part to the number of additions of sub-totals into final totals.

3. The number of digits involved in the final totals ran in the following order: four digits, 73 per cent; three digits, 17 per cent; five digits, 10 per cent. Single entry cards were excluded from this tabulation.

4. The number of columns added varied first, with the type of card used; second, in actual count, the one column leading with 44 per cent; two columns having 27 per cent, three columns 10 per cent, and four columns 9 per cent.

With the exception of the tally cards from the bookstore, the sales considered are the records of cash sales only and therefore do not represent all the sales made by these salespersons for a single day.

2. *General informational or reading uses of arithmetic*—The arithmetic needed by any individual for actual computation is obviously limited, and actual computational practice is being further curtailed by the rapid introduction of calculating machines. But the same limitations do not apply to number concepts in general and the ability to interpret the number concepts met with in general reading. The suggestion naturally follows that in many phases of arithmetic, manipulation should be omitted and the time devoted to informational concepts and the general understanding of business situations. In time, we may have some phases of arithmetic dealt with in an arithmetic reader with little or no figuring required.

STUDY NO. 18. Camerer, Alice. "What should be the minimum information about banking?" *17th Yearbook of the National Society for the Study of Education, Part I.* Bloomington, Ill., Public School Pub. Co., 1919. pp. 18-26.

Problem. To discover what should be taught concerning banking.

Method. An analysis was made of 35 replies to a questionnaire sent to bank employees in the states of Illinois, Indiana, Iowa, Kentucky, Missouri, Nebraska, North Dakota, Oregon, and Texas, relative to the facts in banking that all people in a community should know. A similar analysis was made of the replies sent in by parents of the pupils in the elementary school of the University of Iowa. The instructions were to mark important items "XX", less important items "X", and to cross out those of no importance. The items reported in the replies were arranged according to their importance as determined by the bank employers and comparison made with their importance as determined by the parents. The results are reported under the findings.

Findings. The bank employees determined the following rankings on twenty of the fifty-five items, the most important being placed first:

(1) How to write a check, (2) how and why to fill out a stub, (3) when a check should be cashed, (4) how to stop payment on a check, (5) how to sign your name when indorsing a check, (6) what to do if a check is lost, (7) how to indorse a note, (8) how to write a negotiable note, (9) how to indorse a check in full, (10) how to use a bank book, (11) how to make a deposit slip, (12) how to find interest, (13) importance and purpose of savings banks, (14) importance and purpose of commercial deposit banks, (15) how to use a promissory note, (16) responsibility of maker if note is lost, (17) certified checks, (18) how to open an account, (19) when notes are void, and (20) legal rate of interest.

Parents of the children in the elementary school placed 15 of the 20 items named above in their list of the 20 most important items, although the order selected was not quite the same.

STUDY NO. 19. William, L. W. "The mathematics needed in freshman chemistry." *School Science and Mathematics*, Volume 21, No. 7. October, 1921. (Reported in Charter's *Curriculum Construction*.)

Problem. To determine what mathematics is necessary to carry successfully a course in freshman chemistry in which the textbook was Noyes, *A Textbook in Chemistry*.

Method. Study consisted of analyzing both the expository body and the problems of the text, and recording all words or expressions which were distinctly mathematical or implied mathematics and the nature of the different operations involved. All exercises were worked out by the simplest methods, and both the operations and the quantities were tabulated.

Findings. See the original article or the account in Charter's *Curriculum Construction* for detailed summary. 1. In the body of the text, 124 mathematical concepts were used 1156 times, of which *per cent* and *volume* comprised nearly one half.

2. Seventy-three different denominate numbers were used, the most common of which were: *degree, gross, and liter*.

3. Fifty-five different fractions were used, but the denominators in all but 43 of the fractions were less than 10. Of these 43 denominators, eight denominators were less than 100, but 24 ended in hundreds or thousands.

4. Complicated decimals were very frequent. The one-place, two-place, and three-place were most frequent, but one decimal had eight places. There were usually two integers and one or two places, but at times the decimals were more complicated. Oftentimes decimals were mixed with fractions.

5. Chemical equations occurred very often. There were nine cases of substitution in formulæ and seventy-seven cases of ratio and proportion.

6. The arithmetic at times was complicated. In addition there were problems consisting of adding an integer and three decimals, two integers and three decimals, and three decimals. In subtraction the most difficult problem was taking a six-place decimal from another. In multiplication at times it was necessary to multiply a four-place number by a six-place number. Mixed decimals had to be multiplied together. Complicated decimals at times had to be divided by one another. Thus the arithmetic needed in chemistry was complicated, but the algebra simple.

STUDY NO. 20. Gallaway, Mrs. T. T. *Mathematics needed in a freshman course in clothing*. Unpublished study reported in Charter's *Curriculum Construction*. pp. 241-43, 1923.

Problem. To determine what mathematics is necessary to carry successfully a freshman college course in clothing in which the text used is Baldt's *Clothes for Women*.

Method. Study consisted of analyzing both the expository body and the problem of the text, and recording all words or expressions which were distinctly mathematical or which implied mathematics, and listing the nature of the different operations involved. All of the exercises were worked out by the simplest methods, and both the operations and the quantities were tabulated.

Findings. See the account in Charter's, *Curriculum Construction* for a detailed summary.

1. It is necessary to understand 111 mathematical concepts correctly to read this text intelligently. Of these, 43 were geometrical terms, chiefly included in mensuration. All other terms were arithmetical. Chief among these terms were: line, equal, center, measure, width, length, and point.

2. Denominate numbers such as appear in the ordinary arithmetic occurred and in addition, the two units of measure head and skein. The most common units of measure were: inch, dollar, yard, head, and year.

3. The most common fractions used were: halves, quarters, sixths, eighths, tenths, twelfths, and sixteenths. There were a few cases of decimal fractions.

4. The integers occurring were mostly one-place integers if expressed in words instead of figures. If the integers were expressed in figures, the majority of them had less than four figures and none of them had as many as five figures.

5. Roman numerals were used considerably, although none of them had more than two places.

6. In the chapters on drafting and the use of patterns much use was made of algebraic equations: for example, "A. E. equals one-sixth neck measure plus three-eighths inch." The solution of similar problems involved: (a) Translating the algebraic equation expressed in words into a symbolic numerical equation, (b) multiplying a whole or mixed number by a fraction, (c) subtracting a whole or a mixed number from a whole or mixed number, (d) adding a fraction to a whole or mixed number, (e) finding a fraction of a fraction, (f) reducing a mixed number to an improper fraction, (g) reducing an improper fraction to a whole or mixed number, (h) reducing yards to inches, (i) drawing a line of a given length, (j) reducing inches to yards, (k) division of whole numbers, mixed numbers, or fractions, (l) drawing a line parallel to a given line, (m) drawing a line perpendicular to a given line, (n) drawing a circle or the arc of a circle, having given the center and radius, and (o) reading geometrical figures by means of letters representing points.

STUDY NO. 21. Smith, Nila B. "An investigation of the uses of arithmetic in the out-of-school life of first-grade children." *Elementary School Journal*, Volume 24, No. 8. April, 1924. pp. 621-23.

Problem. To determine the type of arithmetic used by 500 first-grade pupils in the Detroit public schools in their out-of-school life.

Method. The data were obtained by having 100 regular room teachers interview five selected children each morning for 25 consecutive days concerning their out-of-school activities and record facts concerning the arithmetic used in connection with these activities. The interviews during the first week were for the purpose of familiarizing the teachers and pupils with the technique of the investigation and were not in the data under consideration. In the investigation each teacher itemized daily for each pupil the content of the situation in which arithmetic was used, the numbers involved, the operations involved, whether the operation was performed by the child or not, the classification of the activity according to types, and the number of times the particular type of activity was used. Much use was made of code numbers as aids in tabulating the data.

Findings. The results are shown in these two tabular summaries:

TABLE 2.—RELATIVE FREQUENCY WITH WHICH SITUATIONS INVOLVING ARITHMETIC OCCURRED

Activity	Per cent
Transaction in stores.....	30.0
Games involving counting.....	18.0
Reading Roman numerals on clock.....	14.0
Reading Arabic numerals in finding pages in a book.....	13.0
Dividing food with playmates and pets (fractions).....	6.0
Depositing money in and drawing money from toy banks.....	5.0
Playing store.....	3.0
Measuring distance.....	2.2
Using calendars.....	2.0
Running errands.....	1.2
Setting the table.....	1.2
Buying and selling tickets.....	1.1
Acting as newsboy.....	1.0
Measuring in sewing.....	1.0
Counting in rhymes and jingles.....	.5
Reading house numbers.....	.2
Investments (made for them).....	.1
Measuring in manual training.....	.1
Measuring height.....	.1
Measuring objects.....	.1
Reading numbers on book in hall.....	.1
Reading numbers on ticket.....	.1
	100.0

TABLE 3.—RELATIVE FREQUENCY OF ARITHMETICAL OPERATIONS

Process	Per cent
Addition.....	35.0
Counting.....	23.0
Subtraction.....	20.0
Reading Arabic numbers.....	6.0
Measuring.....	5.5
Comparison.....	4.3
Reading Roman numerals.....	3.1
Multiplication.....	2.0
Division.....	1.1
	100.0

STUDY NO. 22. Adams, H. W. *The mathematics encountered in general reading of newspapers and periodicals.* Unpublished Master's thesis. Department of Education, University of Chicago. Reviewed by Franklin K. Bobbitt in *Elementary School Journal*, Volume 25, No. 2, October, 1924. pp. 133-143.

Problem. To discover the mathematics employed in the news, special articles, editorials, advertisements, legal notices, market reports, sporting pages, etc., in one issue, 20 newspapers and magazines, widely read by the general public.

Method. All pages of one issue of the following newspapers and magazines were analyzed: the *Chicago Herald and Examiner*, the *Chicago Evening American*, the *St. Louis Post Dispatch*, the *Springfield, Missouri, Republican*, the *Springfield Leader*, the *Lebanon Rustic*, the *Pathfinder*, the *Furrow*, the *Dearborn Independent*, the *Springfield Laborer*, the *Cosmopolitan*, the *Woman's Home Companion*, the *American Magazine*,

the *Household*, the *Pictorial Review*, the *Woman's World*, the *Literary Digest*, the *Modern Priscilla*, *McCall's*, and the *National Geographic Magazine*.

Findings. 1. Dates were numerous, oftentimes giving the year, the month, the day, the hour, and the minute.

2. There were found 3378 street addresses in all sorts of combinations, e.g., 1918 Broadway, Department 909; and 4711 North Clark Street.

3. A total of 1713 telephone numbers were discovered. They were expressed in a great variety of ways.

4. Numbers varied from such expressions as "50 words" to "255,000,000 packages of breakfast food." In all there were 21,619 such expressions. Most of them had two-place numbers, but many had nine or more places.

5. Roman numerals occurred 148 times. They were used most frequently to designate the volumes of papers or books, chapters of books, or sections of books. Most of the Roman numerals were below a hundred.

6. References to United States money varied from one cent to \$100,000,000,000. However, most of the amounts were less than \$100. Reference to foreign money contained the following terms: German marks, Italian lire, Japanese yen, Indian rupees, English pounds, English three-pence, English guineas, and English half-crown.

7. Only six fractions out of 3000 had a denominator larger than 16. The largest denominator was 10,000,000.

8. Decimals without the use of United States money occurred frequently. The smallest decimal without the use of United States money was .000,012, and the largest one was .97. Most decimals had less than four places.

9. A great variety of percentages were found, e.g., $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{3}{4}$, 3, $33\frac{1}{3}$, $99\frac{44}{100}$, 177, 700, 1,000, and 1,300.

10. Simple ratios were found in a variety of ways, e.g., 30 to 1, 1 in 1,000,000,000, a 5-3-3 ratio, fifty-fifty, etc.

11. Almost every conceivable unit of measure was used. The different units usually found in the following tables of measure were used: dry measure, liquid measure, linear measure, square measure, avoirdupois measure, measure of time, measure for electricity, and various miscellaneous measures as degree, calorie, volt, cord, dozen, teaspoon, tablespoon, etc.

12. Few graphs were used.

13. There were numerous mathematical terms or expressions used as: cedar chest 40 x 18 x 18, 40 per cent surtax, 90 miles-an-hour-gale, a 12 horse-power engine, etc.

14. No arithmetic problems of the textbook type occurred, although mathematical materials were presented so as to enable the reader to solve almost any problem which might occur to him concerning the situation described.

15. There was virtually no reference to algebra, geometry, and trigonometry in the magazines analyzed.

III. According to What Criteria Should Drill be Organized?

The committee has not succeeded in getting a summary of studies bearing upon this point. Kirby, *Practice in the Case of School Children*, Teachers College, Columbia University, 1913, showed the large values resulting from systematic drill.

Thorndike has given data bearing upon the same point. The trend of evidence is that in the intermediate grades, when drill is confined to processes that are useful and well understood, regular time spent upon systematic drill gives returns unequalled by any other type of procedure. The findings are in favor of systematic drill rather than incidental drill.

Another finding, on which the evidence is not so satisfactory as one could wish, is that attempts to do number work in the lowest grades, particularly in grades one and two where the processes are so frequently not comprehended by the children, results in the development of errors which become a strong handicap in later work. This will be noted more fully under Section IV of this report.

The chief contribution under this section is a definite and complete plan worked out by F. B. Knight for organizing the drill work of the fifth and sixth grades. The summary of this report is presented first for the convenience of the reader. Dr. Knight has shown, in a masterful way, and much more thoroughly than present space permits to be shown, the surprising inefficiency and haphazard procedure which exists in drill work; the possibility of formulating drill to meet definite specifications; and the necessity of systematic drill if automatic memory results are to be had and permanently maintained.

Summary of Report on Organization of Drill

Introduction: Two uses of drill: 1. Drill as a teaching instrument; 2. Drill to maintain skills after instruction is passed. The following is a list of processes to be drilled under Use 2, with suggested times at which drill on each process should begin.

DRILL ORGANIZATION FOR MAINTAINING ACQUIRED SKILLS

Specification I. Drill should be on the entire process.

- (a) Various forms or types
- (b) Frequency of each number combination in drill
- (c) Location of number combinations in all positions
- (d) Computation difficulties present
- (e) Illustrations from texts on appearance of unit skills in fraction drills
- (f) Comment on the distribution of practice among the several unit skills involved in the division of fractions
- (g) Drills can be built to specifications

Specification II. Drill should come frequently in small amounts.

- (a) Distribution of time for drill on a single process
- (b) Two opposing theories of time distribution
- (c) The cold storage theory and its weaknesses
- (d) Illustrations from texts on time distribution of drill on division of fractions
- (e) Comments on the illustrations of fraction drill

Specification III. Each drill unit should be a mixed drill

- (a) Isolated and mixed fundamental types of organization
- (b) Illustrations of the isolation theory
- (c) Illustrations of the mixed fundamental theory
- (d) Examples in each process to contain calculated practice
- (e) Advantages of the mixed fundamental type of drill

Specification IV. Drills should have time limits.

- (a) Speed a secondary consideration
- (b) Wrong types of time standards
- (c) Correct use of time standards involves product measures

Specification V. Drills should have accuracy standards.

- (a) The shortcomings of the 100 per cent accuracy standard for a list of examples
- (b) Time and accuracy standards combined
- (c) Three factors of time and accuracy standards
- (d) A definite technique described
- (e) Advantages of the suggested technique
- (f) Use of the progress chart
- (g) Cost of the suggested technique is justified

Specification VI. Examples in a unit of drill should be in the order of difficulty.

- (a) Range of difficulty should be commensurate with range of abilities
- (b) Easy examples should include all processes

Specification VII. Drill units should include verbal problems.

Problem solving should not be isolated.

Specification VIII. Drills should facilitate diagnosis.

- (a) Remedial work should be specific
- (b) Waste of indiscriminate drill
- (c) Suggested standards of technique facilitates remedial work
- (d) Hard aspects as well as total examples should be present in drills
- (e) Teacher's cue for remedial work

Drill in Fifth and Sixth Grades

For the purpose of facilitating discussion, let us assume by agreement that drill or practice has two functions: First, to aid in learning new processes, this use of drill is the *instructional use*; second, to help maintain a skill after the class and the teacher have gone to the trouble of building up a new skill. This second use of drill is *drill for permanency*. The present discussion is concerned with the organization of drill material in the fifth and sixth grades, the purposes of which are to keep permanent the skills that have been built.

Listing the Skills

The list of skills to be kept permanently up to standard as a result of drill is more or less arbitrary. It should be limited to useful processes as developed in Section II above. On this basis, one is justified in listing at least the following skills:

Addition, subtraction, multiplication, and division of whole numbers.

Addition, subtraction, and multiplication of small fractions; occasionally division of simple fractions

Addition, subtraction, multiplication, and division of decimals as required in United States money

Computing simple areas and simple percentage

The time of entrance of these skills into the course of study is conditioned by local requirements and should be largely governed by individual interests and local needs. Since the topic under discussion is drill for the permanence of holding skills, it goes without saying, that if the topics listed above are to be drilled to maintain skill in them at the time listed, they must have been taught previously to those times.

Specifications of Proper Drill Organization

The next pages contain a description of the organization of drill which serves the purpose of maintaining skill in a process after it has been taught and after the instructional aspect of the class work is no longer concerned with that skill but with some new process. Examples are given supporting the specifications for organization of drill which are believed to be superior. Examples of contrasting types of drill organization are on occasion inserted not for purposes of criticism but to make the specifications, present in the report, clear through contrast with opposite types.

Specification I. Drill Should Be On the Entire Process

(a) *Various forms or types*—After instruction on a process is completed, the drill given to it should practice in some calculated fashion all the various types of that process or all that have been taught. Such drill should continue throughout the elementary school. By way of illustrations:

Example A	Example B	Example C
345	768	427640
567	54	392769
879	879	4318
407	807	915043
215	423	_____

All the drill in the addition of whole numbers given after the process of whole numbers has been mastered from the standpoint of instruction should not be like Example A above. There should be some drill upon examples like B and C, since the ability to neglect gaps in the column is an ability that does not come by magic, can just as well be practiced, and is a type which the demands of life often present.

In the present drill services, we note a lack of presenting the pupil with addition examples of irregular outline.

The list of the items which go to make the total process of addition, subtraction, multiplication, or division of whole numbers is a list on which there is as yet no common agreement. Following this paragraph, there are included the two analyses of processes, subtraction of whole numbers and division of fractions. Some such analyses as these should be used to check drill provisions. Drill provisions are weak to the extent that they slight important units of skill. They are also weak to the extent that they pro-

vide unnecessary over-practice or wasteful practice upon units of skill which possess no particular difficulty. Obviously, drill is good to the extent that it provides practice upon each type of the total skill in proportion to the difficulty of each type.

Analysis of Subtraction of Whole Numbers in Terms of Learning Process

		<i>Unit of Skill Number</i>
I.	AS TO FORM OF STATING EXAMPLE:	
A.	Number written with figures	
1.	Indicated subtraction, as $6 - 2 = 4$	1
	Additive subtraction, as $6 - ? = 4$	1a
2.	Column subtraction, as $\begin{array}{r} 6 \\ 2 \\ \hline 4 \end{array}$	2
	$\begin{array}{r} 6 \\ ? \\ \hline 4 \end{array}$	2a
3.	Words used 9 "minus" or "less" or "take from", as 9 minus 4	3
B.	Numbers written with words	
1.	Indicated subtraction, as Four—two	4
2.	Words used, as Four "minus", "less", "take from".	5
C.	Pictures used	
1.	Indicated subtraction, as $\bigcirc \bigcirc \bigcirc - \bigcirc \bigcirc$	6
2.	Words used, as $\bigcirc \bigcirc \bigcirc$ minus $\bigcirc \bigcirc$	7
II.	AS TO PROCEDURE:	
A.	No borrowing or carrying	
1.	One digit, as number—1 digit number. $6 - 4 =$	8
2.	Two digit number—1 digit number	
	When difference is 1 digit, as $\begin{array}{r} 12 \\ -4 \\ \hline \end{array}$	9
	When difference is 2 digits, as $\begin{array}{r} 18 \\ -6 \\ \hline \end{array}$	10
3.	Two digit numbers less two digits, as $\begin{array}{r} 48 \\ -24 \\ \hline \end{array}$	11
4.	When the remainder is zero, as $\begin{array}{r} 6 \quad 16 \\ -6 \quad -6 \\ \hline \end{array}$	12
5.	More than two digit number, as $\begin{array}{r} 483 \\ -121 \\ \hline \end{array}$	13
6.	Zero in subtrahend, as $\begin{array}{r} 463 \\ -102 \\ \hline \end{array}$	14

7. Zero in both subtrahend and minuend, as	$\begin{array}{r} 40 \\ -20 \\ \hline \end{array}$	15
8. Gaps in column, as	$\begin{array}{r} 483 \\ -21 \\ \hline \end{array}$	16
B. Borrowing or carrying:		
1. Two digit number — one digit, as	$\begin{array}{r} 46 \\ -6 \\ \hline \end{array}$	17
2. Two digit number — one digit Zero in minuend, as	$\begin{array}{r} 40 \\ -6 \\ \hline \end{array}$	18
3. More than two digit number		
(a) Borrowing units column, as	$\begin{array}{r} 423 \\ -117 \\ \hline \end{array}$	19
(b) Borrowing other than units column, as	$\begin{array}{r} 463 \\ -178 \\ \hline \end{array}$	20
(c) Borrowing two consecutive columns, as	$\begin{array}{r} 482 \\ -197 \\ \hline \end{array}$	21
(d) Borrowing two not consecutive columns, as	$\begin{array}{r} 4236 \\ -1718 \\ \hline \end{array}$	22
4. Borrowing zero in minuend, as	$\begin{array}{r} 420 \\ -128 \\ \hline \end{array}$	23
5. Borrowing two zeros in minuend, as	$\begin{array}{r} 4200 \\ -1267 \\ \hline \end{array}$	24
6. Borrowing more than 2 zeros, as	$\begin{array}{r} 43000 \\ -12675 \\ \hline \end{array}$	25
7. Borrowing zero in both not final, as	$\begin{array}{r} 4306 \\ -1204 \\ \hline \end{array}$	26
8. Borrowing zero final, as	$\begin{array}{r} 248000 \\ -162000 \\ \hline \end{array}$	27
9. Subtraction unequal number digits, as		
(a) Where zero is subtracted from last left number, as	$\begin{array}{r} 4862 \\ -732 \\ \hline \end{array}$	28

(b) Where zero is not subtracted, as	$\begin{array}{r} 1467 \\ -835 \\ \hline \end{array}$	29
(c) Last left numbers are equal, as	$\begin{array}{r} 635 \\ -604 \\ \hline \end{array}$	30
C. Ability to check		31
D. Ability to copy for work as	$43728 - 39162 =$	
	$\begin{array}{r} 43728 \\ -39162 \\ \hline \end{array}$	32

Analysis of Division of Fractions in Terms of the Learning Process

	<i>Unit of Skill Number</i>
I. AS TO THE FORM OF STATING THE EXAMPLE	
A. Fractions written in figures	
1. Indicated divisions, as $3/8 \div 1/2$	1
2. Words "divided by," as $4/5$ divided by $1/3$	2
3. Complex fractions, as $3/5$	
	$\frac{1}{3}$
	3
4. Division indicated by parentheses, as $1/4) \underline{1/12}$, or $1/2) \underline{4/5}$	4
B. Fractions written with words	
1. Indicated division, as two sevenths $\div$ one sixth	5
2. Words "divided by" used, as one eighth divided by three fifths	6
I. AS TO PROCEDURE	
A. Nature of terms—Expression of all terms as fractions	
1. Unit fraction $\div$ unit fraction, as $1/8 \div 1/9$	7
2. Unit fraction $\div$ other proper fraction, $1/3 \div 2/5$	8
3. Unit fraction $\div$ improper fraction, as $1/9 \div 7/4$	9
4. Unit fraction $\div$ mixed number, as $1/2 \div 2 \frac{3}{5}$	10
5. Unit fraction $\div$ whole number, as $1/4 \div 7$	11
6. Other proper fraction $\div$ unit fraction, as $3/4 \div 1/7$	12
7. Other proper fraction $\div$ other proper fractions, as $3/4 \div 2/7$	13
8. Other proper fraction $\div$ improper fraction, as $3/8 \div 4/3$	14
9. Other proper fraction $\div$ mixed number, as $7/10 \div 1 \frac{2}{3}$	15
10. Other proper fraction $\div$ whole number, as $4/9 \div 8$	16
11. Improper fraction $\div$ unit fraction, as $7/5 \div 1/3$	17
12. Improper fraction $\div$ other proper fraction, as $5/4 \div 7/8$	18
13. Improper fraction $\div$ improper fraction, as $5/2 \div 8/3$	19
14. Improper fraction $\div$ mixed number, as $9/7 \div 1 \frac{1}{5}$	20
15. Improper fraction $\div$ whole number, as $7/5 \div 3$	21
16. Mixed number $\div$ unit fraction, as $1 \frac{5}{6} \div 1/2$	22
17. Mixed number $\div$ other proper fraction, as $3 \frac{8}{9} \div 4/5$	23
18. Mixed number $\div$ improper fraction, as $5 \frac{2}{5} \div 13/4$	24
19. Mixed number $\div$ mixed number, as $4 \frac{2}{9} \div 7 \frac{1}{3}$	25

20. Mixed number $\div$ whole number, as $3\frac{7}{8} \div 5$	26
21. Whole number $\div$ unit fraction, as $8 \div \frac{1}{7}$	27
22. Whole number $\div$ other proper fraction, as $9 \div \frac{3}{5}$	28
23. Whole number $\div$ improper fraction, as $6 \div \frac{7}{3}$	29
24. Whole number $\div$ mixed number, as $4 \div 3\frac{5}{8}$	30
25. Whole number $\div$ larger whole number, as $7 \div 15$	31
B. Change of $\div$ to $\times$	32
C. Inversion of divisor	33
D. Cancellation	
1. No cancellation possible, as $3/5 \times 4/7$	34
2. Single cancellation	
a. One number, a factor of the other, as $3/5 \times 7/9$	35
b. Two numbers with a common factor, as $6/7 \times 5/8$	36
3. Double cancellation	
a. In each case one number a factor of the other, as $3/4 \times 8/9$	37
b. In each case two numbers with a common factor, as $8/9 \times 15/18$	38
4. Rec. One case of each type of cancellation, as $3/10 \div 8/9$	39
5. Reduction cancellation	
a. One number a factor of the other, as $2/8$	40
b. Two numbers with a common factor, as $8/10$	41
6. Incomplete or continued cancellation	
a. One number a factor of the other, $8/9 \div 1\frac{1}{3} \div 1\frac{1}{15}$	42
b. Two numbers with a common factor, $1\frac{37}{40} \div 2\frac{3}{16} \div 1\frac{19}{25}$	43
E. Multiplication	
1. Neither factor unity in numerator or denominator, as $3/8 \times 5/6$	44
2. One factor unity in numerator, as $1/7 \times 5/8$	45
3. One factor unity in denominator, as $3/5 \times 4$	46
4. Both factors unity in numerator, as $1/4 \times 1/6$	47
5. Both factors unity in denominator, as $10 \times 3/5$	48
F. Analysis of quotient	
1. Quotient a whole number	
a. Cancellation complete—irreducible as $7/1$	49
b. Cancellation incomplete—reducible as $15/3$	50
2. Quotient a proper fraction	
a. Cancellation complete—irreducible as $2/3$	51
b. Cancellation incomplete—reducible	
(1) Numerator a factor of denominator, as $3/15$	52
(2) Numerator and denominator having a common factor as $8/10$	53
3. Quotient an improper fraction—reduce to mixed number	
a. Cancellation complete—fraction irreducible, as $13/4$	54
b. Cancellation incomplete—fraction reducible, as $21/6$	55

(b) *Frequency of each number combination in drill*—A consideration of the nature of drill material second only in importance to the calculated appearance of every type of example is the matter of the frequency with which each number combination occurs.

FIG. 1

Subtrahend	-	0	1	2	3	4	5	6	7	8	9	T
	1	261	372	214	136	146	171	80	106	73	71	1258
	2	84	48	311	149	142	91	59	57	50	75	755
	3	63	31	48	189	103	92	69	55	50	54	565
	4	100	50	77	35	205	164	71	67	75	74	713
	5	198	36	57	22	25	136	81	59	50	48	571
	6	83	41	57	40	37	33	192	156	62	55	588
	7	57	32	35	29	36	19	16	80	48	55	327
	8	124	46	80	35	49	48	36	27	152	124	569
	9	91	35	30	28	32	20	26	20	19	133	301
	Total 5617											

This Chart is Based on Data Published in Thorndike's *Psychology of Arithmetic*.

Figure 1.—Distribution of Practice from Text X.

Read as follows: 1 is taken from 0, 261 times; 7 is taken from 5 (15), 19 times; etc.

If an analysis of a year's drill in the addition of whole numbers revealed the fact that the combination $2 + 2$ appeared twice as often as did the combination $9 + 7$, a superintendent would be justified in suspecting that the drill work for that year was incorrectly constructed.

Most review drill work at the present time is constructed more on the "number of examples," or the "number of pages" principle than upon the more useful principle of the number of appearances of each combination.

Figures 1-3 show the frequency with which the several subtraction combinations are practiced in the drill work on the subtraction of whole numbers given in two textbooks, grades three to six. The names of these books are withheld for obvious reasons. It should be noted, however, that one of these texts observes that aspect of Specification 1 which has to do with the distribution of drill upon all the combinations. The other textbook serves as a practical contrast with Specification 1.

A study of Figure 1 will show the reader that while this drill looks satisfactory when hurriedly scanned, it does as a matter of fact fail to meet Specification 1. Those combinations which involve borrowing, or carrying, according to the method of subtraction used, are practiced less frequently than those which involve no borrowing or carrying. Thus, the easier is practiced the more often. The frequency with which combinations occur was evidently not a matter of deliberation. No one would, for instance, really purpose to practice $7-6$, 156 times and $7-5$, 59 times.

It seems fair to say that the theory upon which this drill is built is one that maintains that gross quantity of drill or drill by the square inch of printed page is satisfactory. It is not.

FIG. 2

	-	0	1	2	3	4	5	6	7	8	9	T	
	1	62	40	30	30	30	40	40	40	40	40	39	2
	2	62	62	40	30	30	30	30	40	40	40	40	4
	3	62	62	62	40	30	30	30	40	40	40	43	6
	4	62	62	62	62	40	30	30	40	40	40	45	6
	5	62	62	62	62	62	40	30	30	40	40	49	0
	6	62	62	62	62	62	62	40	40	40	50	54	2
	7	62	62	62	62	62	62	62	40	40	50	56	4
	8	62	62	62	62	62	62	62	65	40	50	58	6
	9	65	65	65	65	65	65	65	65	65	40	6	25
	Total												4495

Figure 2.—Distribution of Practice from Text Y.

Read as follows: 2 is taken from 0 (10), 62 times; 2 is taken from 1 (11), 62 times; etc.

A study of Figure 2 will show that it observes Specification I of this report.

FIG. 3

		Text x	Text y
A	Total	5617	4495
B	Amount Number Borrowing.....	3306	1675
C	B is per cent of A.....	57½%	36½%
D	Amount with Borrowing.....	2391	2820
E	D is per cent of A.....	42½%	63½%

Figure 3.—A Comparison of Figures 1 and 2.

It is noteworthy that while the gross amount of drill in Text X is greater than the gross amount in Text Y, the amount of drill upon the harder aspects of subtraction, in Text X is significantly smaller than in Text Y.

(c) *Location of number combinations in all positions*—To construct drill that will possess a defensible distribution of practice among the various number combinations would be a substantial advance upon much of the drill material of the present time. A further advance is desirable though its attainment involves exceeding care in drill construction. Every num-

ber combination should not only appear with calculated frequency but should appear in examples in various places. This variety of position within the examples will offset any subtle tendency to learn a number of combinations in a lopsided fashion. A few illustrations are pertinent.

In these multiplication examples, note that multiplying by 6 does not always mean *first* multiply by 6.

$$\begin{array}{r} 856 \\ \times 406 \\ \hline \end{array} \quad \begin{array}{r} 856 \\ \times 463 \\ \hline \end{array} \quad \begin{array}{r} 856 \\ \times 643 \\ \hline \end{array}$$

In these addition examples, the carrying of two is not tied to the first carrying to be done.

$$\begin{array}{r} 201 \\ 430 \\ 674 \\ 805 \\ 354 \\ \hline \end{array} \quad \begin{array}{r} 120 \\ 340 \\ 467 \\ 580 \\ 435 \\ \hline \end{array} \quad \begin{array}{r} 102 \\ 304 \\ 746 \\ 508 \\ 453 \\ \hline \end{array}$$

In these subtraction examples, 7 is subtracted from 4, not only when both the 7 and the 4 are seen but also when one of the numbers in the subtraction 7 from 4 is unseen.

$$\begin{array}{r} 564 \\ - 347 \\ \hline \end{array} \quad \begin{array}{r} 552^a \\ - 378 \\ \hline \end{array} \quad \text{or} \quad \begin{array}{r} 542^b \\ - 368 \\ \hline \end{array}$$

Generally, it is unwise in drills involving several processes always to have the addition example come first, then the subtraction examples, and so on. The order in which examples of different processes come, should be mixed as well as the examples. This is to offset any subtle help that the order of drill work might give to the pupil in forming the harmful habit of first adding, then subtracting, etc., in a unit of any kind of arithmetic work. This last consideration assumes that the drills for maintaining skills previously learned contain examples of several processes, a specification defended later in this report.

(d) *Computation difficulties present*—Under Specification 1, we are concerned not only in practicing all the various types of examples of a process that may be expected to appear in real life but in practicing with calculated frequency the specific number combinations which occur in that process; we are also concerned with the calculated frequency of appearance of all the specific difficulties that are contained in that process.

Thus in the addition of whole numbers, it would be possible to practice all the combinations and all forms of examples and still practice the carrying of 1 or nothing practically all the time. This would be patently unfortunate since by the very mechanics of habit-formation, if a pupil carries 1

^a 552 practices 4—7 if the borrowing method is used by the pupil.
— 378

^b 542 practices 4—7 if the additive method is used by the pupil.
— 368

or nothing most of the time he is more liable to carry 1 (what he usually does) when he ought to carry 2, 3, or even 4.

We are of the opinion that many of the irritating errors of pupils are due to the fact that one response has been so favored that it has become a preferred response to a situation that should be attached to several responses instead of to a single one. Thus a pupil using a textbook or a drill service which gives 85 per cent of carrying practice to the carrying of 1 probably aids and abets errors in carrying.

(e) *Illustrations from texts on appearance of unit skills in fraction drills*—Table 4 shows the frequency with which the several types of possibilities in the division of fractions and small mixed numbers are met in five standard textbooks during the sixth-grade drill work on maintaining that skill. The unit skill number at the left of the page refers to similar numbers found in the analysis of the division of fractions given on page 68.

TABLE 4.—THE FREQUENCY OF PRACTICE ON UNIT SKILLS INVOLVED IN THE DIVISION OF FRACTIONS IN FIVE SIXTH-GRADE TEXTBOOKS

Unit of Skill Number	Frequency				
	Text A	Text B	Text C	Text D	Text E*
1	161	112	84	85	84
2	0	0	0	0	4
6	7	0	0	0	0
7	0	0	2	0	0
8	0	0	0	2	2
10	0	0	0	0	0
11	0	0	0	6	4
12	0	0	12	8	6
13	13	38	0	0	18
15	0	0	0	0	11
16	10	0	0	0	4
22	0	0	0	2	1
23	2	18	3	2	7
24	5	0	0	0	0
25	16	8	2	25	14
26	6	23	9	7	4
27	18	0	7	1	3
28	15	10	17	4	5
29	0	1	0	0	1
30	15	10	4	23	4
34	40	76	12	24	35
35	86	1	29	34	30
36	3	3	0	3	5
37	3	21	4	21	9
38	5	0	0	0	1
39	4	0	0	0	6
42	0	0	0	0	1
43	0	0	0	0	0
44	35	90	29	62	64
45	10	17	20	26	30
46	28	4	8	29	30
47	6	4	0	4	12
48	2	6	32	38	10
49	45	50	34	36	13
51	27	24	13	19	35
52	0	6	18	0	1
53	18	2	14	0	1
54	45	33	7	31	37
55	5	1	0	0	1

*Those unit skills which would not ordinarily appear in drill, or which are taboo, or which are common to all examples, are omitted from this frequency table.

(f) *Comments on the distribution of practice among the several unit skills involved in the division of fractions*—1. The texts vary in their utter omission of certain elements of the division of fractions. Of the unit skills listed in Table 4, Text A gives no practice on 12 of the unit skills; Text B on 16; Text C on 18; Text D on 16; and Text E on 5.

It is evident that these texts vary in the amount of faith held in transfer. To leave out 18 of the unit skills involved in the division of fractions assumes a transfer within a function of a type and of an amount that no published experimental data support.

After studying the analysis given above and the omissions in the table, the reader will be hard put to it to justify many of the omissions.

2. These texts vary in their opinion concerning the amounts of drill that each unit skill should have. Some of the unit skills receive much practice in one text and little or none in another text. Thus children studying sixth-grade arithmetic from different texts receive a very different experience in the division of fractions. It would be valuable to know the relationship between the amount of drill in terms of the unit skills involved and the frequency of errors in standard tests.

3. Since the relative difficulty of the several unit skills involved in the division of fractions is unknown and since the amount of transfer among the unit skills is unknown, the writer of drill material is on uncertain ground when he purposely omits or gives but little practice to any of the more common unit skills.

(g) *Drills can be built to specifications*—It is perfectly practical to build drill to specifications. As an illustration of this, the following sample of drill material in the addition of fractions is inserted.

SAMPLE DRILL IN ADDITION OF FRACTIONS	Unit Skills Number
$2/5 + 1/2 = 9/10$	1—6—12—16—19
$1/7$	
$1/11$	
$18/77$	2—6—12—16—19
Add two-thirds plus one-fourth= $11/12$	5—6—12—16—19
$3/10 + 1/2 = 4/5$	1—6—12—15—20
$2/3 + 4/9 = 1 \ 1/9$	1—6—12—15—22
$8/20 + 3/5 = 1$	1—6—12—15—21
$4 + 1/2 + 1/4 = 4 \ 3/4$	1—7—13—15—24
$1/4 + 8 \ 5/6 + 1/3 = 9 \ 5/12$	1—8—13—18—26
Two and three-eighths plus three and two-fifths= $5 \ 31/40$	5—9—12—16—24
One-third + four-fifths + eight-fifteenth= $1 \ 2/3$	4—6—13—15—23
Add $9 \ 7/19$ plus $4 \ 12/19 = 14$	3—9—12—14—27
$3 \ 1/2 + 4 \ 3/10 = 7 \ 4/5$	1—9—12—15—25
$4/9 + 11 \ 5/6 = 12 \ 5/18$	1—9—12—17—26
$3/5 + 12 + 4 \ 1/2 = 17 \ 1/10$	1—11—13—16—26
$7 \ 1/2 + 5 + 4 \ 1/3 = 16 \ 5/6$	1—10—13—16—24
$2/5$	
$1/2$	
$2/4$	
$1 \ 2/5$	2—6—13—18—23

1. It is further entirely practical that committees in charge of the making of curricula and the providing of instruments of instruction analyze and appraise such instruments not only in terms of gross amount but also in terms of the internal organization of the material. In fact, specifications for drill should be written first and the drills subsequently built according to them.

Summary of Specification I

A. At the present time, there is a little carelessness in many drill services relative to the insertion of all types of examples in drill material. There is in many drill services an unfortunate disregard of the proper distribution of practice of every combination used in a process. There is a frequent omission of proper practice on all the difficulties of procedure within a total process.

B. We do not yet know how many times any given number combination should be practiced, nor do we know the relative difficulty of the several combinations. Until we do, it is best to practice all combinations an equal number of times, or if more practice is given to some combinations than to others, we should base this inequality or practice upon some reasonable assumptions rather than have the inequality a matter of chance or luck.

C. In drill construction, scientific specifications should be written first and the drills drawn to meet these specifications. The specifications should be based on an adequate analysis of the process concerned.

Specification II. Drill Should Come Frequently in Small Amounts

(a) *Distribution of time for drill on a single process*—The nature of Specification II can best be described by meeting a concrete situation. Suppose 100 minutes are allotted to drill in the addition of whole numbers in grade six, how can the 100 minutes be best distributed? Consider the possibilities below:

100 minutes all in one drill in September

50 minutes in September and 50 minutes in June

25 minutes in September, 25 minutes in November, 25 minutes in March, 25 minutes in June

10 minutes each month

5 minutes each two weeks

2½ minutes each week.

(b) *Two opposing theories of time distribution*—The extremes of practice relative to the distribution of drill on any process are based on two theories of drill organization which may be called "the cold storage theory" and "the small doses theory." The total amount of drill or the time spent on drill may well be the same in both instances. The question here is not, "How much time shall be spent," but "How shall any given amount of time be distributed through the year?"

(c) *The cold storage theory and its weaknesses*—The present practice of textbook organization, with two notable exceptions, leans to the cold

storage theory. The embarrassment of having to defend the cold storage theory of drill is avoided by occasional footnotes to teachers telling them to practice on a certain drill frequently during the rest of the year. This attempt at avoiding the weaknesses of the cold storage theory of drill organization carries no guarantee of success since the average classroom teacher has many things on her mind, is always pressed for time, and rightly feels that the text should as far as possible arrange material in defensible order rather than ask her to do what the author of the text could do himself.

Another and much more successful escape from the cold storage theory of drill organization is the use of practice material which is quite independent of the text. By the use of these drill services a pupil can practice a skill at frequent intervals. It should be pointed out, however, that the use of many of the drill services will by no means guarantee the maintaining of skills since other imported specifications of good drill are slighted in them.

Space will not be taken here to defend the practice of giving a little drill frequently as opposed to giving large amounts at long intervals. The psychology of forgetting and the futility of practice at any one time in excess of a rather modest optimum are too well known by the readers of this report to need rehearsing here.

(d) *Illustrations from texts on time distribution of drill on division of fractions*—Table 5 shows the degrees of respect paid to the specification of drill organization which has to do with the time distribution of drill.

Five reputable textbooks of sixth-grade arithmetic are used for illustration. The progress of a class through each textbook for the school year was estimated by eight competent and experienced teachers of arithmetic. Each textbook was divided into 36-week sections by each of the eight judges estimating the natural progress of a class through each book separately. The eight judgments for each book were then averaged. This average was used as the 36 weekly divisions of each text. In Table 5 each week represents the amount of work that a class would do if the total book is finished during the year. Since the amount of material in the texts studied varies, classes using one text might have to go faster per hour or spend more hours or omit more material than a similar class using another of the texts. Of course all classes do not go at the same rate and no one class may go at exactly the rate used here. These considerations, however, are vital to the consideration of distributed versus concentrated drill.

(e) *Comments on the illustrations of fraction drill*—1. If the organization of drill in texts A, B, C, and D is correct, then the organization of drill work in text E is wrong, and the reverse. While no important significance should be attached to minor differences in drill organization, it is obvious that the theories underlying the construction of the five texts above are *radically* different. Texts A, B, C, and D practice the theory that large amounts of drill infrequently are an economical method of maintaining a skill. Text E is built on the theory that a little drill weekly is

TABLE 5.—THE TIME DISTRIBUTION OF EXAMPLES IN THE DIVISION OF FRACTIONS DURING A 36-WEEK SCHOOL YEAR FOR 5 SIXTH-GRADES TEXTBOOKS

Week	Number of Examples				
	Text A	Text B	Text C	Text D	Text E*
1	0	0	0	0	1
2	0	0	16	0	2
3	64	6	0	0	3
4	0	38	40	0	1
5	0	31	0	0	3
6	0	0	0	0	3
7	0	0	0	0	3
8	0	0	0	0	4
9	0	0	0	0	3
10	0	0	0	0	2
11	0	0	0	0	3
12	1	0	0	0	5
13	0	0	0	17	1
14	0	0	0	15	3
15	0	0	2	0	5
16	0	0	0	2	1
17	0	0	0	1	3
18	0	0	0	8	3
19	0	0	0	0	2
20	0	0	0	14	2
21	33	0	0	3	4
22	41	0	0	2	1
23	14	0	0	0	2
24	0	0	0	0	3
25	0	0	0	0	2
26	0	0	2	0	3
27	0	0	4	0	2
28	0	0	0	1	1
29	0	0	0	4	3
30	0	0	13	0	3
31	0	0	0	0	2
32	0	36	0	1	4
33	0	0	0	4	3
34	8	0	0	0	1
35	7	0	9	11	2
36	0	1	0	1	1
Total.....	168	112	84	85	88

* Certain examples in the division of fractions included in Text E are omitted from this count because they are incorporated in a series of inventory units which are not paralleled by similar units in the other texts.

an economical method to use in maintaining skills. It is hardly possible that both theories are equally sound.

2. It might be urged that the texts A, B, C, and D assume the use of drill pads. However, although there are available at the present time various drill services for whole numbers, there is no widely used drill service for fractions.

3. There is a difference of opinion as to the amount of drill that is necessary. Text A uses the same theory of infrequency of practice as does text C. Yet text A gives exactly twice as much practice. Here again both texts cannot be right. If 168 examples in the division of fractions is the correct amount of practice for a sixth-grade text, then text A has made

adequate provision but text C fails to give enough practice. However, if about 90 practices during the sixth grade is an adequate provision then text A provides wasteful overpractice while text C provides sufficient drill.

4. The difference in the amount of drill between text A and text E may be explained by the difference in the distribution. It is possible that text E with its distributed practice will give as much or more skill with 88 practices as one will get from 168 concentrated practices of text A.

5. It is also possible that the authors of the texts desire different amounts of skill. If this is so, we have a defense for the varying amounts of practice. The fact is that text E alone gives any *usable* information about standards of attainment in the division of fractions. It is doubtful if the problem of attainment in measurable terms was dealt with seriously by the other texts.

Specification III. A Drill Unit Should Be a Mixed Drill

A further consideration of drill organization has to do with the content of any single drill unit. If we agree to have short drills used frequently for any single process (Specification II); if we agree to have in the examples used for any one process as they run along in sequence, practice all the combinations, appear in various forms, and possess the obvious and hidden difficulties in an orderly fashion, we have yet to agree upon the nature of any single drill unit.

Shall we practice addition of whole numbers today, subtraction of whole numbers tomorrow, multiplication the next day, and so on? Or shall we practice a little of each process so far mastered in each drill unit?

(a) Let us call the theory of having each drill unit possess but one process the *Isolation Theory*, and the theory of having each drill unit contain several or all processes mastered at the time the *Mixed Fundamental Theory*. With these definitions in mind, a proper specification for drill units to maintain skill is the use of the *Mixed Fundamental Theory*.

Below are examples organized according to the two theories.

(b) *Illustrations of the Isolation Theory.*

A Short Addition Drill for Monday

1.	2.	3.	4.	5.	6.
526	228	4.37	169	437	.06
540	239	.28	598	602	5.01
124	548	.51	798	591	.23
521	139	9.26	529	832	2.96
985	747	—	699	475	5.72
400	529		538	—	—

A Short Subtraction Drill for Tuesday

1.	2.	3.	4.	5.
94327	14409	89176	\$14.70—\$6.30	14332
-65234	- 5642	-24589		-5729

A Short Multiplication Drill for Wednesday

1. 348 x70 —	2. 12.40 x119 —	3. 709 x603 —	4. 214 x5 —	5. 195 x69 —
6. 864 x628 —	7. 214 x5 —	8. 432 x67 —	9. 7528 x269 —	10. 6104 x3724 —

Other processes could be drilled upon in this fashion:

(c) Contrast this use of the *Isolation Theory* with the use of the *Mixed Fundamental Theory*. Note that the examples given above appear in these mixed fundamental drills on page 81.

The examples of the mixed fundamental theory of drill organization here given are used in the first half of the sixth grade. Similar drills used in the last half of the sixth grade would contain examples of processes mastered during the year. Those who organize the drill work upon the mixed fundamental theory should make it a point to insert into each drill unit examples of each new process as soon as it is mastered from the instruction of the year. In this way each process that a pupil has learned is practiced upon at very short intervals.

(d) *Examples of each skill to contain calculated practice*—This same principle of frequent practice upon the process should be extended to the items that constitute the process itself. Thus to have a little addition of whole numbers at frequent intervals is not enough or at least is not the best that we can do by way of drill provision. The addition examples should be so constructed that if the combination $6 + 9$ is practiced 20 times during the year those 20 practices should not be bunched so that the practice will come at any one time. The addition examples should be so built that the $6 + 9$ appears as evenly and widely distributed throughout the year as is reasonably possible.

(e) *Mixed fundamentals type recommended*—At the present time, crucial experimentation is lacking to prove that the mixed fundamental theory of drill is really more effective than the isolation theory. However, there are certain considerations which make it the preferred type of drill until the crucial experimentation is performed. Some of these considerations are:

1. Life does not bring us addition on Monday, subtraction on Tuesday, division on Wednesday, etc. The demands that life puts upon arithmetical skill are to be able to use the several processes separately and to be able to use them together, in any order, and several times during the same work period. It is good psychology to practice a total skill as we shall have to use it. The total hierarchy of arithmetic habits formed by the work of the first six grades will be better organized if we practice at one time the total

hierarchy, not segments of it in isolation one from the other. The Mixed Fundamentals type of drill puts together the things that belong together. The Isolation type of drill keeps apart the things that should not be kept apart.

2. From the observation of pupils at work there is reason to suspect that the monotony of drill work is greatly relieved by a change of process used.

3. Many of the more recent texts in arithmetic are using the Mixed Fundamental type of drill for the maintenance of skills previously learned. There are no administrative exigencies which make the use of the Mixed Fundamentals type of drill impractical.

4. Breakdowns in any one process due to forgetting are more immediately located since the mixed fundamental type of drill organization allows all skills to be passed in review with great frequency.

5. Mixed drills tend to offset the practice of working the wrong process in taking a Standard Test. In analysing errors made on standard tests it is found that many of the errors are not ones of computation at all but persistence of procedure. Thus if the first three examples on a test are addition and the next three subtraction there is a tendency to add instead of subtract in the three subtraction drills in regular class work. If from the start pupils become accustomed to treating examples in drill work as units, not assuming because the first examples are in addition all must be, this type of error will be greatly reduced.

Summary of Specification III. A. For drill to maintain skills the Mixed Fundamental Type of organization is preferable.

B. Care should be taken to insert into the drills examples of a process as soon as it is mastered. No process should ever drop out of the drills after it is inserted, though examples of the easier processes may become increasingly infrequent.

Specification IV. Drills Should Possess Time Limits

(a) *Speed a secondary consideration*—Although the world at large pays no extra bonus for phenomenal speed in mathematical computation except to vaudeville performers, it does penalize excessive slowness. It is not within the province of the elementary school to develop excessive speed, and there need not be major emphasis on speed in elementary school arithmetic. Accuracy is an objective far overshadowing in value ambitions of spectacular speed. It should be borne in mind, however, that accuracy and slowness are not significantly correlated and that a certain measure of speed is not only demanded from the world but is also a measure of attainment in and of itself.

It is not correct to think of drill work for the maintenance of skills as a process to be done accurately in any amount of time. It is work to be done accurately within a reasonable time. Reasonable time is to be defined as that amount of time required by the pupil to complete the work when he is working hard and economically on material that he has been well taught.

DRILL NO. I

1. Subtract:

$$\begin{array}{r} 94327 \\ 65234 \\ \hline \end{array}$$

2.

$$\begin{array}{r} 437 \\ 602 \\ 591 \\ 832 \\ 475 \\ \hline \end{array}$$

3.

$$\frac{1}{5} \times \frac{2}{3} =$$

4.

$$\begin{array}{r} .06 \\ 5.01 \\ .23 \\ 2.96 \\ 5.72 \\ \hline \end{array}$$

5. Multiply:

$$\begin{array}{r} 432 \\ 67 \\ \hline \end{array}$$

6.

$$3\frac{1}{4} \div 2\frac{1}{4} =$$

7.

$$37 \overline{)2405}$$

8.

$$18 \overline{)2004}$$

9.

$$\begin{array}{r} 7528 \\ \times 269 \\ \hline \end{array}$$

10.

$$\begin{array}{r} 6104 \\ \times 3724 \\ \hline \end{array}$$

11.

$$3\frac{1}{4} - 2\frac{3}{8} =$$

12.

$$\frac{3}{18} \text{ of } 5 =$$

13.

$$\begin{array}{r} 4\frac{1}{2} \\ 2\frac{3}{8} \\ 17\frac{5}{8} \\ 9\frac{3}{4} \\ \hline \end{array}$$

14.

$$\frac{3}{4} + \frac{5}{8} =$$

15.

$$82 \overline{)1435}$$

DRILL NO. II

$$\begin{array}{r} 1. \quad 214 \\ \times 5 \\ \hline \end{array}$$

$$2. \quad 12 \overline{)264}$$

$$3. \quad 64 \overline{)768}$$

$$4. \quad \frac{1}{4} - \frac{3}{4} =$$

$$\begin{array}{r} 5. \quad 14409 \\ - 5642 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 89176 \\ - 24589 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 43.70 \\ 2.80 \\ 5.10 \\ 92.60 \\ \hline \end{array}$$

$$8. \quad 74 \overline{)1184}$$

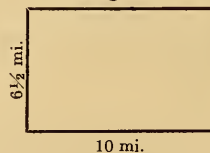
$$9. \quad 2 \times \frac{1}{3} =$$

$$\begin{array}{r} 10. \quad 195 \\ \times 69 \\ \hline \end{array}$$

$$11. \quad \frac{1}{4} \times 3 =$$

$$\begin{array}{r} 12. \quad 169 \\ 598 \\ 798 \\ 529 \\ 699 \\ 538 \\ \hline \end{array}$$

13. Find the area of this figure:



$$\begin{array}{r} 14. \quad 864 \\ \times 628 \\ \hline \end{array}$$

$$15. \quad 2 \div \frac{1}{2} =$$

DRILL NO. III

1.

$$51 \overline{)1122}$$

3.

$$\begin{array}{r} 348 \\ \times 70 \\ \hline \end{array}$$

4.

$$14.70 - 6.30 =$$

5.

$$\begin{array}{r} 14332 \\ - 5729 \\ \hline \end{array}$$

6.

$$\begin{array}{r} 709 \\ \times 603 \\ \hline \end{array}$$

7.

$$\begin{array}{r} 228 \\ 239 \\ 548 \\ 139 \\ 747 \\ 529 \\ \hline \end{array}$$

8.

$$\frac{9}{4} + 3 + \frac{1}{2} =$$

9.

$$\frac{1}{4} \div 3 =$$

172336

12.

$$\frac{1}{3} \div 2 =$$

13

$$\frac{9}{10} + \frac{1}{6} =$$

14.

$$\frac{8}{25} - \frac{1}{16} =$$

This amount of time varies with individual pupils, and a single time standard for all members of a class should be used only where rating devices allow for various amounts of product. To ask all to do the same amount in the same time denies most of the important facts of individual differences and such standards are always of superficial value.

In view of the fact that most competent superintendents accept the specification for drill that is concerned with time standards the question is not, "Shall we use time standards in drill work?" but, "What type of time standards is the effective type?" The latter question will be discussed in this chapter.

(b) *Wrong types of time standards—Type A.* To use any variation of the following type of time standard in drill work is wrong: "See how long it takes you to work the following exercise." We find in current use the above type of time standard in various forms. Your committee wishes to oppose the use of this type for the following reason.

It is fundamentally a matter of curiosity not a matter of educational direction. If a child finds that a certain exercise takes him ten minutes to work that knowledge may or may not be of some interest to him. But the use he is to make of that knowledge is not forthcoming. He is given no information to use in making such judgments as these:

Am I working too slowly?

Am I working too fast?

Am I fast for my grade?

Am I slow for my grade?

The information asked for in the type of time standard above leaves the whole matter of speed of performance dangling in the thin air.

Type B. Another wrong type of time standard is any variation of the following: "Practice upon this exercise until you can do it correctly in ten minutes."

There are several reasons why this type of time standard in any of its many disguises should not be tolerated. Among these reasons are:

1. The time standard given is rarely a properly derived standard. Such a time standard cannot be derived from the demands of the business world and thus be a minimum requirement for the commercial use of skills built in the elementary school, because the speed requirements of business have never been determined except in extremely local situations. Probably there are no speed requirements of business widespread enough to be useful in this connection.

2. The time standard given in this way is seldom properly derived from the performances of pupils in the school. The amount of genuinely standardized drill work is surprisingly limited. Time standards for single drill units have usually been determined from the average performance of a few classes—often from a very restricted area. And, while in all probability there are some time standards in some textbooks that have been actually determined by experimentation, the sampling area used has often

been so restricted that the standard resulting from improper sampling has vitiated the use of these for even computing class averages on a country-wide basis.

3. A single time standard can give a true measure of nothing but class performance and then it is a function of the type of teaching and drill work that the particular classes used. To set up as a generalized time standard in drill, a time limit based on classes which give 25 minutes a day to arithmetic, should be quite useless for classes which give 40 minutes a day to arithmetic. Time standards derived from classes which use an outworn type of drill organization would be too easy for classes which use more effective types of drill organization.

4. The main reason why a single time standard such as any variation of Type B must in necessity be pedagogically wrong is that its use is restricted to the mythical "average" child. Suppose it were known that the average performance of all the fifth grades in the country upon a certain exercise was exactly ten minutes. To use this knowledge by telling fifth grade pupils to practice upon that exercise until they could do it in ten minutes would be a fine example of educational blundering. (And the fact that many drills now use a single time standard does not make it any less of a blunder. Universality of use in a growing science like education is no proof of merit.)

A single time standard is a blunder, for it refuses to use most of the important facts of individual differences. Thus, a properly derived single average time standard is useful to only pupils of average ability. It is positively harmful to superior pupils because it says to them, "Practice upon this exercise until you can do it in the time it takes pupils of less ability to do it. Thus, bind to yourself habits and ideals of work far below your true capacity. Form habits of working at half effort so that when you get out in the world if you are ambitious you will have many habits as the result of your education that you will have to break."

It tells the more limited pupils to do what they cannot do at all or which they can do only by expending an unwise amount of time. To ask a pupil to practice on an exercise until he can do it correctly in ten minutes is mis-education, if the child is significantly below the average in ability. It may be useful in the sense that it tells the slow pupil with cruel bluntness that he is limited. And, such knowledge may be of value. It is vicious in that it presents to the slow pupil situations which are inveterately discouraging thus creating a negative attitude toward school, which hurts in subtle as well as overt ways. It would be as sensible to tell a plump 45 year-old lady to jump 5 feet from a standing position because that was the average distance that all adults can jump, as it is to tell a limited pupil to try to work an exercise in ten minutes because that was the time in which the average pupil could work it.

Type C. Another misuse of the time standard technique is to ask a child to practice upon an exercise until he can do it *rapidly, or as fast as he thinks*

he ought to do it. On a moment's reflection it will be seen that such vague standards as "rapidly" or any variation of undetermined amounts of time are absurd. Yet a large fraction of pupils at the present time are using just such senseless time standards.

In the long run, competent superintendents will not use time standards in any form apart from accuracy standards, also. Since 100 per cent accuracy within a time standard is a procedure that carries with it too many disadvantages to make it practical, this report will delay positive suggestions concerning time standards until the subject of accuracy standards has been discussed.

Summary of Specification IV. Any variations of the following types of Time Standards are either vicious, or futile, or less useful than other types of time standards. They should not be used. Correct methods are given later.

Type A. See how long it takes you to do this exercise.

Type B. Practice upon this exercise until you can do it in ten minutes.

Type C. Practice upon this exercise until you can do it rapidly.

Specification V. Drills Should Use Accuracy Standards

(a) *The wrong way to use the 100 per cent accuracy standard*—It would seem at first glance that the matter of accuracy standards is very simple, because we need just one standard—namely, 100 per cent for all work. However, the matter of accuracy standards is not so simple as this. We can isolate the factors to be considered by a few illustrations:

Suppose we tell a child to practice upon a list of examples until he can do it with 100 per cent accuracy. If this means until you can take the list *as a whole* and work it all through without error, the direction is an unwise one. Not unwise theoretically, but unwise in the practical situation.

Consider the following typical case:

Let the exercise contain 20 examples. The first time the child works the exercise he misses (for illustration) examples 8, 14, and 19. Since he did not get 100 per cent accuracy on the first trial he must repeat the exercise as a whole. This time he misses only example 19. Since he did not get 100 per cent accuracy, he must work the whole exercise again. This time he gets all the examples correct. He would then pass on to the next card if he is using a drill service which gives directions for 100 per cent accuracy before leaving a card or goes on in the text if the drill is in the text.

Such repetition involves doing three times examples which the pupil got correct on the first trial. This approximates a type of wasteful over-practice opposition to which has been much neglected in current thinking about drill organization. It is poor investment of time to practice on what the pupil needs no practice upon. If in order to practice upon examples done incorrectly, a pupil must repeat much work that he already has mastered, we cannot hope for the best interest in drill work for much of it is obviously futile. If we take the time to repeat correct work in order to

wipe out errors in a few examples—that is, do all the work correct at any one time, we expend much time in repeating correct work. This would not be both harmful and silly, but only silly if the pupil was gifted with eternal life for elementary school education. But, with the crowded curriculum of the present time we must save even minutes wherever we can. We waste time when we demand 100 per cent accuracy at any one sitting in drill work through the demand that everything must be done correctly at once.

Further, a more serious charge may be brought against 100 per cent accuracy on a complete unit of work at any one time. While not theoretically necessary, it is often the actual fact that when all the work is repeated the attention of the pupil is centered on getting the whole exercise correct at any one time and the tendency is away from intensive study of particular errors made. Thus, correctness often comes through trial and error, rather than from enlightened study of specific errors made. The whole spirit of 100 per cent accuracy of the whole exercise is to try the whole exercise again tomorrow, and due to scant time it too often means plunging right into the whole exercise, doing over many examples already done correctly *but omitting a study of errors made.*

The correct procedure is not to repeat the whole exercise but correct at once any mistakes made on the first trial and practice correctly at least three times the examples missed. Without emphasis on the correction of errors, as specific errors to be studied by themselves, practice on error rather than practice in correctness is often the fact. One hundred per cent accuracy standards on whole exercises, as actually used in drill work, are not effective.

Such a technique of accuracy standards involves:

1. Much wasteful time over-practice through repetition of correct work.
2. Reduces interest through the futility of doing over what was done correctly.
3. Takes the attention away from an intensive study of specific errors.

(b) *Time and accuracy combined*—Standards should be in terms of ratings made on first trial with generous time allowance. Obviously time standards without accuracy standards are to be looked at with suspicion. Also, accuracy standards with no time standards fail to take care of important aspects of competent work. The following combination of time and accuracy standards is suggested as an adequate technique for the particularizing of specifications of drill organization relative to standards.

(c) *The three factors of combined accuracy and time standards*—*Factor one*—A time limit. This is to be generous. It is to be experimentally determined. It should be such that more than half the class can finish the drill in the time given. No rewards are offered for spectacular speed. No penalties for moderate rates of work. The emphasis is taken from speed and placed on power.

Factor two. A rating in terms of number examples correct in a given amount of time.

Factor three. Emphasis should be on *correction of specific errors*, not on repetition of work correct, as well as wrong.

(d) *A definite technique described*—Consider the possibilities of the following type of standards organized for each unit of drill work.

(Adapted from drill material. Permission granted by the publisher.)

PRACTICE ON THE FUNDAMENTALS

Self-testing Drill No. 12. Number your paper before the signal "Go!" is given. Wherever possible, save copying by placing your paper right below any example. Copy only when necessary.

You will be allowed exactly 20 minutes. Work as fast as you can without making mistakes. Do the examples and problems in order.

Try to beat all your past records. Use your work on the first trial for rating. Rate yourself by the standards below.

There follows a drill unit. In this instance it is built on the Mixed Fundamental Theory, with distributed practice. At the end of the drill come the standards as follows:

Standards.

Number correct	0	1-2	3-4	5-6	7-8	9-10	11	12	13	14	15
Rating -----	0	1	2	3	4	5	6	7	8	9	10

After you have recorded your rating, correct at once any mistake you may have made.

(e) *Advantage of the suggested technique*—The Standards organization above possess these possibilities:

1. Assuming that the rating device uses facts determined by statistically sound experimentation, provision is made for *measuring amount of correct product per time allowance*.

Since ratings from 0 to 10 are given, provision is made for individual differences. Thus, a rating of 6 might be laid down as minimum performance to pass, but good work brings tangible evidence of merit through higher ratings. The rating scheme allows a pupil to know not only *that* he is doing well or poorly, but also to know *how* well or how poorly he is doing.

2. The above device allows ratings on drill units and thus the drill units themselves to be a continuous process throughout the year. While it would be practically impossible to construct tests of identical difficulty for a year's work, yet drill units can be constructed sufficiently equal in difficulty to use a rating device like the one above. By proper treatment of the pupil's performances used in making the standards, a rating of five can mean the same thing throughout the year. Thus, a rating of 5 on drill 2 can mean the same thing as a rating of 5 on Drill 12 or 22 or 32. A pupil can keep a record of his progress on drills in an orderly and a *meaningful* fashion. A rating of 1 or 2 or 4 or 6, etc., can always mean the same thing because

the ratings would not be computed in percentage of work done correctly which would involve a long series of drills of identical difficulty not only for each drill as a whole but for small parts of each drill. The ratings can be computed, as they were in the drills used as illustration, in terms of the number of pupils getting varying numbers of examples correct on each drill. Thus, a rating of 6 might mean the getting correct of 11 examples in Drill 12, but a rating of 6 might mean getting correct only 10 examples on drill 22 if adequate experimentation showed that Drill 22 was slightly harder.

3. By using a device like the one above a pupil works on drill, knowing at the time of effort how well he did in rather exact terms. By keeping his record of his ratings from drill to drill, he can form an honest and statistically correct estimate of his progress through the year. If he gets low ratings at first but improves, his ratings will show him that fact. If he does well at the beginning of the year and begins to loaf, that fact will be revealed by the use of the type of standard organization here suggested.

(f) *The use of the progress chart*—1. By using a progress chart such as is often used a pupil can see for himself what he is doing on drill work as the year goes on. He can, in fact, begin to think in pretty definite terms about his work and thus in some measure at least become responsible for his own progress.

2. The use of such standards is by no means limited to its effect through definiteness upon the interest of the child. Granted that the standards are true ones, they are immediately useful for grading pupils. They also organize the work of the class in such form that the superintendent can at a glance see what any given class is doing, not only in the estimation of a teacher which might be slightly erroneous, not only from his own observation, which might be slightly hurried, not only in terms of standard tests which are given at infrequent intervals but in measurable objective terms from normal class work. Such accurate data admit of a type of supervision that many wish to do but cannot do for want of the essential data.

3. Further, it is to be noted that the type of standards suggested above do not require the repeating of the whole exercise including examples done correctly. On the contrary it places the emphasis on correcting at once the actual mistakes made. This gives an opportunity though by no means guarantees that pupils will be led to the study of specific errors made as opposed to the more or less repeating of whole units of work.

4. By having the ratings made on the first trial, repetition of error is avoided. No practice "in the dark" is called for. The procedure of the standard test technique is approximated.

The above technique, while not perfect, makes greater uses of the strong points in the test and standardization movement, and avoids more of the weak points of improper uses of standards than any other method that has yet come to the writer's notice.

(g) *The cost is justifiable*—There is one weak point in the use of this device. To build correct standards in terms of several ratings instead of a single standard involves a huge expenditure of time and money, provided of course that the standards are properly obtained. In fact, the use of such standards means the taking of carefully constructed standardized tests and using them as drill units. As far as the writer knows, this has been done but once. Dr. G. M. Ruch, of the University of Iowa, has standardized 64 drills for the fifth grade and 60 drills for the sixth grade, using the rating and standards technique herein described.

Summary of Specification V. One hundred per cent accuracy standards as applied to a list of examples are unwise for the following reasons:

- (a) They involve wasteful overpractice on examples done correctly the first time.
- (b) They do not provide careful study of specific errors.
- (c) They reduce interest because of useless repetitions.

Factors of Combined Time and Accuracy Standards

(a) Time limits are to be generous, placing chief emphasis on accuracy rather than on speed alone.

(b) Rating should be in terms of examples done correctly in a given amount of time.

(c) Emphasis should be on correction of specific errors.

Provision should be made for self-testing drills to be given once a week rather than two or three times a year. These should be accompanied by a rating scale and progress chart.

(a) Provision is made for individual differences.

(b) A given rating on one drill can be made approximately of the same value on all drills, and so throughout all the drills for the year, thus giving the pupil a continuous standard to rate himself on.

(c) The pupil is then motivated by awareness of success.

(d) Dependable data are made available for the teacher and supervisor.

Specification VI. Examples in a Drill Should Come in Order of Difficulty

(a) *Range of difficulty commensurate with range of abilities*—Since the typical class harbors pupils of widely varying ability, each drill should provide some work that all, or almost all, pupils can do. It should also provide some work that will tax the ability of even the ablest pupil. By arranging the individual examples in each drill, from easiest to hardest, the slowest pupil is able to get something from each class exercise. It is equally important that the ablest pupils be given more often than they are a little work that is a worthy foe for their steel. Up to the present time, drill work has been designed for the more limited pupils.

(b) *Easy examples should include more than one process*—It is wise in taking care of this specification to make sure that all the easy problems are

not concerned with one process. We should make sure that limited pupils receive practice on their own level in all the processes they have learned up to the time of any particular drill.

Specification VII. Drill Work Should Include Verbal Problems

(a) *Problem solving should not be isolated*—It is unwise to keep apart those things that ought to work together. The ultimate justification for all drill work is the beneficial results it has upon solving problems in contrast to examples, for life is concerned with problems, not mere drill examples. If all drill work is kept persistently apart from practice in problem solving, the pupil does not operate together the skills which ought to operate together.

Crucial experimentation to support this contention is lacking. But in the absence of such experimentation, it is better to practice good instead of poor theory.

The samples of drill organization in Appendix C show verbal problems as organic parts of drill units.

Summary of Specification VII. Verbal problems should be included as organic parts of drill units. Problem solving should not be isolated.

Specification VIII. Drills Should Facilitate the Diagnosis of Specific Error for the Facilitation of Remedial Work

(a) *Remedial work should be specific*—In remedial work, it is almost essential to drill on the specific skills that are weak in contrast to drill on both the strong and weak in an indiscriminate manner.

(b) *The waste of indiscriminate drill*—Indiscriminate drill is indulged in when the directions call for the repetition of all the drill including examples done correctly as well as those done incorrectly. It might be urged by those who show a marked lack of insight into practical school conditions that the redoing of examples that possess no difficulty to a child is not a cause of criticism, because such practice will not do any harm, may do good in general, and the pupil has plenty of time anyway.

All of these defenses are false. The repeating of work done correctly does positive harm, if continued. No self-respecting pupil of even third grade judgment can have much respect or loyalty to a drill service which calls for the same treatment of correct work that it does for incorrect work—namely, to do it over. A negative set toward drill work on the part of many pupils is not a symptom of contrariness. It is a symptom of common sense. It also tends to take the attention away from specific errors which, incidentally, are the only important type of errors pupils make. The argument that there is plenty of time anyway needs no refutation here.

(c) *The suggested standard technique facilitates remedial work*—The drill organization defended in specifications V and VI, which have the ratings made on the first trial, avoids the blunder of repeating work done correctly and tends to center attention on errors made. This organiza-

tion approximates the conditions under which standard tests are given. The child does not keep working on a unit until he can do it all correctly. He makes his rating and then corrects his errors. He can make a better rating on the next drill, more surely by a study of his errors in the time available than he can if he spends a major portion of his time in repeating work already done correctly.

(d) *Hard aspects, as well as complete examples, should be present in drills.* We can, however, provide other measures for remedial work. In drill construction, it is not compelling to have only total processes presented. To the extent that we know the particular hard spots in processes, we can drill on these in isolation. While the carry over to the total process is probably not 100 per cent perfect, it may be sufficient to pay when the time factor is given due weight. Just as we learn bit by bit, so we can drill bit by bit, especially on the hard bits.

(e) *The teacher's cue for remedial work.* If a teacher will notice what types of examples are being missed most frequently, he can make a good guess as to what total process needs special drill the most. If, in addition, the crucial or hard spots on the several processes are inserted in the drills he can locate with useful but not complete exactness whatever part of a total process needs special attention.

The last word in remedial work in arithmetic will, however, not be spoken until a whole series of studies on that complex subject has been made, based upon pupils who have had good drill from the start. This will be a matter of some years.

Comments on remedial work to follow systematic drill work are considerably compressed in this report for two reasons. First, it is not at present known what errors are due to genuine learning difficulty and what errors are due to faulty construction of drill. It is probable that much need for remedial work lies not in giving pupils more drill but in giving them *better drill from the first*. If errors are due to the wrong experiences and lack of experiences in systematic drill, then the main drive upon remedial work should be upon the reconstruction of drill work from the start. There is some ground for the contention that much of the remedial work now needed will no longer be needed when drill work meets more adequately the specifications suggested in this report.

We are not concerned in the science of education with the planning of remedial work for pupils who have not had the correct experience with numbers in their systematic instruction and drill. We are concerned with remedial work for errors which persist after the pupil has had the best type of drill available. What these persistent errors are will not be known until a sufficiently large number of pupils has had several years of drill which meet proper specifications.

The second reason why remedial work is not stressed in this report is that practically all that is now known about remedial work is contained in Dr. Osburn's latest book, *Corrective Arithmetic*. Since most of the readers

of this chapter will no doubt also read Dr. Osburn's book, there is little need for extended treatment of remedial work here.

Summary of Specification VIII. Directions for drills and the organization of standards for drill should direct the attention to specific errors.

Teachers should note which process is being missed most frequently in drill work. Special emphasis should be placed on this process.

Specific work on the crucial parts of a total process should be inserted in units of drills, so that guidance may be given to both teacher and pupils as to what specific weakness may exist.

IV. What is the Best Procedure for Building up Ability to Handle Concrete or Reasoning Problems?

Isolated reasoning problems are not meeting the demands of life as it is. Under life conditions, problems are solved when the individual is keen as to consequences. Any calculating is a small detail in a larger unified process. The condition is being met in the schools by building up pupil experience, by confining number work in the lower grades to actual needs, and by providing artificial life situations for the intermediate and upper grades such as conducting a cafeteria, managing a department store sale, or working out large unit problems in any form. This whole matter of reasoning is connected with the problem of larger units of instruction properly motivated and the building up of pupil experience. There is no doubt that in the past, much time has been spent on meaningless puzzle and academic material. The result has been a minimum amount of understanding and a maximum amount of discouragement for the children.

Following is a brief summary of available studies on reasoning in arithmetic:

STUDY NO. 23. Davies, G. R. "Elements of arithmetical ability." *Journal of Educational Psychology*, Vol. V, 1914. pp. 131-140.

The purpose of this investigation was to determine to what extent computation, reasoning, visualizing, memory span and "mental arithmetic" are related to each other and to what extent each is related to "general efficiency" in arithmetic. Special tests were designed to give measures of computation, reasoning, visualizing, memory span, and mental arithmetic. The term "grades" in arithmetic was used as measures of general efficiency. Data were obtained from two adult classes numbering 29 and 32 persons. By statistical methods (rank order correlations) the following, among lesser important conclusions, were arrived at: There is (1) a close relationship between the skills in the four fundamental operations; (2) a rather close relationship between computation and term grades ($r=0.44 \pm .10$); (3) a very slight relationship between visualization and memory, memory span and "mental" arithmetic, memory span and visualization; (4) a rather high relationship between visualization and term grades, and between visualization and reasoning; (5) a very slight relationship between computation and

reasoning; (6) a close relationship between reasoning and term grades; and (7) a very great variation among the pupils in each ability.

The investigation lacks reliability because of the small number of persons from whom data were obtained. The principal conclusion calls attention to the close connection between reasoning and general efficiency in arithmetic.

STUDY NO. 24. Newcomb, R. S. "Teaching pupils how to solve problems in arithmetic." *Elementary School Journal*, Vol. 23, 1922-23, pp. 183-9.

Mr. R. S. Newcomb, of the East Central State Teachers College, Ada, Oklahoma, compared the effectiveness of the "usual manner" of solving problems with a method that emphasized a "careful, systematic and logical" procedure. He chose four classes of seventh and eighth grade pupils to whom he taught the proposed method. Two other classes were used as the check or control group. The initial and final ability of both groups were measured by the Stone Reasoning Test 2.

In the "careful, systematic and logical" procedure the pupils were instructed to (1) understand each word in the problem, (2) read the problem intelligently, (3) add, subtract, multiply, and divide with speed and accuracy, (4) determine what is given in the problem, (5) determine what is required, (6) select the different processes to be used in the solution and the order in which these processes are to be used, (7) plan the solution wisely and systematically, and (8) check readily.

After "twenty carefully prepared problems of graded difficulty" had been taught to the four classes comprising the experimental group, one each day, Stone Reasoning Test 2 was repeated. The test results showed that the experimental group had made appreciably greater improvement both in accuracy of reasoning and speed in reasoning. The experiment suggests that pupils do profit from instruction in the method or technique of problem solving.

STUDY NO. 25. Banting, G. O. "The elimination of difficulties in reasoning," *Second Yearbook of the Department of Elementary School Principals*. Wash., D. C. Department of Elementary School Principals.

A study of pupils' difficulties in reasoning was made in the Waukesha (Wisconsin) schools by G. O. Banting in 1922. The causes of failure or of inability to reason correctly were found to be lack of general ability in silent reading, lack of familiarity with technical terms in arithmetic, carelessness in reading, lack of the experiences necessary to understand the "setting" of the problem, inadequate skill in computing, lack of knowledge of such essential facts as tables of weights and measures, inability to see the relationships in the problem so as to choose the proper operation, inability to do reflective thinking, and the like. In cooperation with the teachers, Mr. Banting devised corrective or remedial devices for each of these difficulties. For example, in teaching pupils to associate the proper

operation with the context of the problem, easy one step, two step, and three step problems, to which the pupils responded by giving the appropriate operation (or operations) were designed; pupils were practiced in making up problems in which a given operation (or a combination of operations) was used; and lists of miscellaneous problems were analyzed, so as to discover the problems whose solution required a given operation (or a combination of operations). Mr. Banting's study is reprinted in *Educational Bulletin*, Number 5, recently published by the Minneapolis public schools. This bulletin contains excellent suggestions for teaching arithmetic.

STUDY NO. 26. Stevenson, P. R. "Increasing the ability of pupils to solve arithmetic problems." *Education Research Bulletin* (Ohio State University) Vol. III, No. 13.

P. R. Stevenson measured the increase in ability to solve arithmetic problems that followed twelve weeks of remedial instruction in the technique of problem-solving. During the first, second, and third of the twelve weeks the pupils were taught to analyze textbook problems. Many types of problems containing data from actual life situations were solved during the fourth, fifth, and sixth weeks. The problems were collected by the pupils. During the third three-week period the pupils solved problems "without numbers." The last of the three-week periods was devoted to a study of the difficult words that appear in textbook problems. As a result of the twelve weeks' instruction, the increase in power to solve problems, as measured by the Buckingham Scale and the Stevenson Problem Analysis Test, was approximately equal to the gains that pupils normally make during an entire year. Stevenson's data showed that the slower pupils made the greater gains.

STUDY NO. 27. Hunkins, R. V. and Breed, F. S. "The validity of arithmetical reasoning tests." *Elementary School Journal*, Vol. 23, pp. 453-466.

Hunkins and Breed conducted an investigation to determine the relative validity of seven reasoning tests in arithmetic. These tests were given to 127 pupils in the fifth, sixth, seventh, and eighth grades. By statistical methods, a composite score for all of the tests was found for each pupil. The best test was the one whose scores were in closest agreement with the composite scores. The final rating or merit of the tests arranged them in this order: (1) The Stone Reasoning Test, (2) and (3) the arithmetic reasoning sections of the Haggerty Intelligence Examination, and the Otis Group Intelligence Scale, Advanced Examination, (4) the arithmetic reasoning section of its National Intelligence Test, (5) Starch's Arithmetical Scale, Form A, (6) Monroe's Standardized Reasoning Test in Arithmetic, Form 1, and (7) the Buckingham Scale for Problems in Arithmetic, Form 1.

STUDY NO. 28. Stone, John C. *Standardized reasoning tests in arithmetic and how to use them.* Bureau of Publications, Teachers College, Columbia University, New York City.

In his *Standardized Reasoning Tests in Arithmetic and How To Use Them*, Stone indicates that standardized tests are useful in surveys, in supervision, and in teaching. Just as the skilful physician measures, diagnoses, prescribes treatment, and measures again, so will the good teacher measure, diagnose, prescribe remedial treatment, and measure again. Stone suggests the making of diagnostic records, showing the specific difficulties of each pupil. He cautions teachers not to place too much reliance on a single test record of an individual pupil. The descriptions of how certain pupils increased their efficiency in reasoning by being taught to read the problem more carefully, to use less labelling in the written solutions, and the like, indicate the value of tests in improving teaching.

STUDY NO. 29. *A comparison of two methods analyzing problems.* A study soon to be published by The Lincoln School, Columbia University, New York City.

Most textbooks in arithmetic suggest that pupils should analyze problems by thinking: (1) What am I asked to do in this problem? (2) What facts are known? (3) How should these facts be used to solve the problem? Another method, less generally used, calls for the following kind of analysis: In this problem, I am trying to find the profit; the profit depends upon the cost and the selling price; the cost depends upon the number of articles bought and the price paid for each; and the selling price depends upon the number sold and the price of each. These facts are given in the problem; I can easily solve the problem.

John R. Clark and Leona Vincent compared these two methods by having two carefully selected equivalent groups of eighth and ninth-grade pupils solve a list of fifty problems. The group that used the second method of analysis received the highest score both in correctness of reasoning and in correctness of answers. The investigators believe that this method should be studied more fully before its superiority over the traditional method can be claimed with any degree of certainty.

STUDY NO. 30. Myers, G. C. *The tragedy of errors in arithmetic.* Plymouth Press, Chicago.

We have seen that the chief difficulty in problem solving is inability to comprehend the relationships between the quantitative elements in the verbally presented problem. Myers believed that problems presented in the form of vivid, imaginative descriptions are more readily comprehended than similar problems presented in the ordinary brief, terse, conventional bookish style. He designed a test containing six problems, each phrased in two ways. The two presentations of one of the six problems follows:

(C) Bertha's daddy bought her a new string of 100 beads. While she was playing tag, the string broke. Poor Bertha! The beads scattered in every direc-

tion. She caught 48 of them before they fell, but she found only half of the rest. When she put the beads on another string, she had only beads.

(C') A girl caught only 35 of her string of 135 beads when the string broke, and could find only half of the rest, how many beads did she save? The same arithmetical reasoning is involved in the paired forms; there is a slight difference in the computation required to solve them, though Myers evidently assumed that there was no difference.

The twelve problems, arranged in mixed order, were solved by 468 persons. In five of the pairs of problems, the imaginative type proved noticeably easier.

This investigation suggests the desirability of describing problems in language such that pupils will more easily understand their relationships.

Conclusion. These investigations of reasoning in arithmetic appear to justify the following conclusions: 1. There is a closer relationship between reasoning ability and general intelligence than between reasoning ability and skill in computation. Consequently, pupils with low intelligence are very unlikely, even under the best instruction, to succeed well in arithmetical reasoning. Conversely, pupils with high intelligence are able to reason fairly well without any systematic instruction in problem solving. 2. Instruction in the technique of problem solving, accompanied by practice, results in increased power to do arithmetical reasoning. 3. The factors that seem essential to one's success in arithmetical reasoning, in addition to general intelligence, are (a) silent reading ability, (b) familiarity with the vocabulary of arithmetic, (c) the experience necessary to understand the "setting" or context of problems (d) knowledge of certain measures (e) dependable habits of computation (f) ability to associate relationships described in the problem with the proper arithmetical operations, and (g) interest in solving problems. 4. There is some evidence that the graphic method of analyzing problems leads to greater accuracy in reasoning than the verbal or conventional method. 5. Reasoning tests are invaluable working tools for teachers of arithmetic.

No investigations of the relation between the number of "steps" in the problem and its difficulty were found. In general, teachers believe that one step problems should predominate in the second and third grades, reserving two and three "step" reasoning for the later grades. Very likely, the difficulty of a problem, other things being equal, increases with the number of "steps" involved in its solution. Of the 488 problems in a widely used text in arithmetic for grades III and IV, 404 were "one step" problems, and 73 were the "two step" kind.

A fifth conclusion should be added—namely, that the whole question of reasoning and reasoning problems in arithmetic has not been sufficiently investigated.

V. What has Psychology and Experimental Education to Contribute?

In recent years there has been an increased attention to testing by scientific methods the traditional conclusions and practices of arithmetic. Many of

the studies are too small to do more than suggest a method of final study. Others give only tentative conclusions. Eight of the questions studied are partially answered by Studies 31-48.

1. WHAT METHOD OF SUBTRACTION IS MOST EFFECTIVE?

STUDY NO. 31. Ballard, P. B. "Norms of performance in the fundamental processes of arithmetic, with suggestions for their improvement." *Journal of Experimental Pedagogy*. December, 1914, Volume 2, pp. 386-405; March, 1915, Volume 3, pp. 9-20.

The author finds a superiority from a practical point of view of the method of equal addition over the method of decomposition in subtraction. By equal addition the author means increasing the subtrahend in "paying back." By decomposition he means decreasing the minuend in a similar situation. He says, "The main secret of the difference lies in the dispatch with which accounts are settled. One is 'cash payment,' the other 'credit.' And the postponement of the compensating act increases the chances of its fulfillment being forgotten." For example, "in subtracting 37 from 85, after taking 7 from 15 the disturbed relationship of difference between minuend and subtrahend is immediately restored by increasing the 3 tens to 4 tens. In the method of decomposition, however, it is the 8, the second figure dealt with that has to be changed to restore the balance. If the minuend figure is zero, the balancing of account is still longer deferred."

The author says further, "The disadvantage of the decomposition method is not of course limited to pure subtraction sums; it vitiates all exercises into which subtraction enters—long division, for instance—and is, as I have abundantly tested, performed in the schools using this method of subtraction with difficulty and with dubious accuracy—and yet the decomposition method is apparently taught in about two thirds of the London schools.

"The reason for this lies in the fact that the rationale of the decomposition method is more easily understood than that of the equal addition method. The decomposition method is 'more intelligible but its practical efficiency is not encouraging.'"

STUDY NO. 32. Gray, P. L. "Norms of performance in the fundamental processes of arithmetic." *Journal of Experimental Pedagogy*. London, June, 1916. Volume 3, pp. 310-318.

This is a repetition of Ballard's experiment on the same problem. The superiority of the equal additions method of subtraction is confirmed.

STUDY NO. 33. Mead, C. D., and Sears, Isabel. "Additive subtraction and multiplicative division tested." *Journal of Educational Psychology*. May, 1916. Vol. 7, pp. 261-270.

One second-grade class was taught by the additive method of subtraction, another second-grade class was taught by the traditional (decomposition) method. All the children were taught 30 minutes a day for four months.

They found no clear-cut difference. The median of the "take-away" class was 4.5 above that of the additive class.

STUDY NO. 34. McClelland, William W. "An experimental study of the different methods of subtraction." *Journal of Experimental Pedagogy*. London, December, 1918. Vol. 4, pp. 293-299.

The findings favor the method of equal additions.

STUDY NO. 35. Winch, W. H. "Equal additions versus decomposition in teaching subtraction: An experimental research." *Journal of Experimental Pedagogy*. London, June and December, 1920. Vol. 5, pp. 206-220 and pp. 261-270.

These articles describe experiments in teaching each of these methods to equalized groups. Extremely interesting case studies are given. The conclusions are:

1. The method of equal additions in subtraction taught to children late in school life, who have hitherto worked by decomposition, produces on the whole results in a few weeks and superior in the weaker children, to those produced by the method of decomposition.

2. The amount of gain involved does not justify a change of method at this late period of a child's school career.

3. The method of equal additions shows to decided advantage with young children in accuracy and rapidity; and this is true both for superior children, who had already learned something of both methods, and for inferior children, who, prior to the experiment, knew practically nothing of either method.

STUDY NO. 36. Beatty, W. W. "The additive versus the borrowing method of subtraction." *Elementary School Journal*. November, 1920. Vol. 21, pp. 198-220.

Beatty found that in the San Francisco Normal School where the additive method had been taught for a number of years, 43 students had abandoned the additive method and adopted the borrowing method. Of 175 California children, only 52 used the additive method against 123 the borrowing method. The respective rates on the Courtis subtraction test were 8.2 and 9.2 for speed, and 81.7 per cent and 79.3 per cent for accuracy.

STUDY NO. 37. Johnson, T. J. "The merits of different methods of subtraction." *Journal of Educational Research*. November, 1924. Vol. 10, pp. 279-290.

This is a study in subtraction with 277 Chicago Normal School students to whom were dictated the exercises from the Courtis Standard Practice Tests.

After all the students had finished their attention was called to the fourth example which was 137017. Each was asked to analyze the method 70719

used as follows:

Either,

9 from 17 are 8

1 from 10 is 9

etc.

or

9 from 17 are 8

2 from 11 are 9

etc.

or

9 and what are 17

1 and what are 10

etc.

or

9 and what are 17

2 and what are 11

etc.

or any other method used.

Out of the 277 cases, 220 used the first method; 23 used the second method; 8 used the third method; 13 used the fourth method; and 13 used a mixed method. It was found that those using the way first mentioned were slightly slower and less accurate than those using any one of the other three methods. But the difference is too small to be of significance, since there is no way of knowing how the group using the different methods compared in intelligence and general mathematical ability. It may be, for example, that more inferior people use the first method.

2. IN MULTIPLICATION, WHAT SHALL THE CURRICULUM SPECIFY AS TO METHOD?

STUDY NO. 38. Mead, Cyrus D., and Sears, Isabel. "Additive subtraction and multiplicative division tested." *Journal of Educational Psychology*. May, 1916. Vol. 7, pp. 261-270.

Mead and Sears in Study No. 33 on page 96 also gave to a third grade class four months training in the multiplication method of division and to another class training in learning by first mastering the division tables. They found practically no difference between the two methods.

3. WHAT ARE THE PREFERABLE PROCEDURES IN ADDITION?

STUDY NO. 39. Connard, H. F., and Arps, George F. "An experimental study of economical learning." *American Journal of Psychology*. 1916. Vol. 27, pp. 507-529.

By Arps and Connard, on the basis of performance in Courtis tests 64 college students were divided into two equal groups. In adding a column

5
like 7 Group T were

1

6

2

3

instructed to add in the traditional way saying to themselves 3 and 2 are 5 and 6 are 11 and 1 are 12, etc. Group E were to say 5, 11, 12, 19, 24, etc.

This was to be known as the economical way. Each group practiced 8 periods, solving 7 problems in each of the four fundamental operations. After practice the Courtis tests were repeated with gain by T group of 8.5 attempts and minus 2.5 rights; by E group of 34.4 attempts and 30.5 rights.

STUDY NO. 40. Uhl, W. L. "The use of standardized materials in arithmetic for diagnosing pupils' methods of work." *Educational School Journal*. 1917. Vol. 18, pp. 215-218.

Using the Courtis tests, Uhl checked on the variety of ways grade children have in devising new modes of breaking up and recombining numbers into smaller and larger units. He concluded that such ingenuity offered at least 2 serious shortcomings: (1) the danger of increasing errors; and (2) reduction of speed in working.

4. PUPILS' ERRORS, HOW NUMEROUS, THEIR NATURE, THEIR CAUSE, THEIR REMEDIES

Only two of the many studies on errors in arithmetic are briefly summarized here.

STUDY NO. 41. Osburn, W. J. *Diagnostic and remedial treatment of errors in arithmetic reasoning*. State Department of Public Instruction, Madison, Wis. December, 1922.

This study shows that errors may be reduced to a few classes. Four or five different classes of errors are responsible for at least three-fourths of the trouble which children have. The 30,000 errors made by 6,000 children on the Buckingham Problem Test, Form 1, are reduced to six classes as follows: (1) Total failure to comprehend the problem, 30 per cent; (2) procedure partly correct, but one or two essential elements omitted, 20 per cent; (3) ignorance of fundamental quantitative relations, 10 per cent; (4) errors in fundamentals, 20 per cent; (5) miscellaneous errors, 2 per cent; (6) errors whose cause could not be discovered, 18 per cent. "About 60 per cent of the wrong answers are due to failure right in the beginning to understand what is to be done."

STUDY NO. 42. Myers, G. C. "Persistence of errors in arithmetic." *Journal of Educational Research*. June, 1924. pp. 19-28. (Appearing more fully in *The prevention and correction of errors in arithmetic*. Chicago, The Plymouth Press, 1924.

The method was to note the actual response of a child to a number situation and to follow this child on the same detail for a long period of time. Child M. B. of the third grade responded on successive school days to 2 as follows: 7, 7, 6, 6, 7, 6, 6, 6, 6, 6, 6, 7, 7, 6, 7, 6, 6, 6, 6, 6, 7, 6.

4

Successive responses by child F. W. of Grade 2A to 8 and 5 were, 13, 15, 13, 15, 13, 13, 13, 13, 13, 13, 13, 13, 15, 15, 12, 15, 13, 13. To 13-9:

4, 4, 4, 4, 5, 4, 5, 5, 5, 4, 4, 4, 5, 4, 4. This was an average child of his class who gave the foregoing in flash card drill. Following each error he was told the correct answer as "8 and 5 are 13" and was made to repeat it after the teacher in that way immediately.

At the conclusion of extensive researches, Myers concludes:

1. A mistake is immeasurably serious.
2. We are never sure that an error once made will not be made again and in just the same way.
3. A wrong answer in number work is apparently just as definite as a right answer. In terms of habit process there is no difference between a wrong answer and a right one. Errors are not negative entities. They are just as positive as correct responses.

From the foregoing data what we have called drill is obviously a process of fixing errors as well as of fixing facts. True drill can be looked upon only as repetitions of correct bonds.

Other studies dealing with errors in arithmetic are:

Scott, W. "Errors in arithmetic." *Journal of Experimental Pedagogy*. London, December, 1917. Volume 4, pp. 147-150.

Courtis, G. S. *Arithmetic tests and studies in the psychology of arithmetic*. University of Chicago Press, 1917. 127 pp.

Anderson, C. J. "The use of the Woody scales for diagnostic purposes." *Elementary School Journal*. June, 1918. Volume 18, pp. 770-81.

Theisen, W. W., and others. *An educational survey of Janesville, Wisconsin*. State Department of Public Instruction. Madison, Wisconsin. 1918.

Morton, R. L. "An analysis of pupil's errors in fractions." *Journal of Educational Research*. February, 1924. Volume 9, pp. 117-125.

Osburn, W. J. *Corrective arithmetic*. Houghton Mifflin, 1924.

5. IS THERE TRANSFER OF TRAINING?

Is there a transfer of training in the sense that drill upon the useful fractions as shown by the studies of Section II of this chapter, will enable pupils to deal successfully with other fractions when encountered in equally meaningful situations?

Knight's study on this subject is so encouraging that we may limit work to situations that are useful and meaningful for the child at the time he does them.

STUDY NO. 43. Knight, F. B., and Setzafandt, A. O. H. "Transfer within a narrow mental function." *Elementary School Journal*. June, 1924. Vol. 25, Number 10, pp. 780-88.

Problem. To determine the amount of transfer in the narrow mental function of the addition of fractions.

Method. A group of pupils just ready to take up the study of addition of fractions was given tests to make sure that they did not have this ability. Then the group was divided into two groups of equal ability, A and B. Both groups were given the same type of instruction and the

same amount of practice. The practice materials for Group A were so constructed that there were evenly distributed and thorough practices on the following denominators: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 21, 24, 28, 30. In Group B the practice was confined to the denominators: 2, 4, 6, 8, 12, 24. The drill material consisted of ten exercises in addition, two exercises in the reduction of fractions, and one exercise in adding mixed numbers. After the drill period two tests were given both groups, involving denominators practiced by both groups and also denominators practiced upon Group A and not practiced upon by Group B.

Findings. Almost complete transfer resulted. Group B solved almost as many exercises involving the denominators upon which they had not practiced as did Group A. The correlations between the number of exercises attempted and the number of exercises correct showed practically no variation from Group B with limited training to Group A with general training.

Note. The particular bearing of this investigation upon the social use of arithmetic lies in the facts that the fractions in the practice material for Group B are virtually the fractions commonly met in business and social transactions and that this investigation suggests that mastery of the manipulations of these will give the necessary command over the uncommon fractions if encountered.

6. WHAT IS THE RELATIVE IMPORTANCE OF MENTAL FACTORS IN THE LEARNING OF ARITHMETIC?

A study showing the primary importance of interest, attitude, or motive, for successful learning is—

STUDY NO. 44. Huffaker, Carl Leo. *Psychological analysis of learning in arithmetic*. Unpublished Doctor's Thesis, 1923. Library of State University of Iowa, Iowa City, Iowa.

Problem. To isolate, describe, and measure the effect of some of the causes of individual variations in general arithmetical ability and the special abilities of which it is composed: (a) the special ability to solve problems stated in words, and (b) the special ability of computation.

Method. The author had the teacher rate the experimental groups as to attitude, gave them one individual and two group intelligence tests, and then used two achievement tests for testing three kinds of arithmetical ability—namely, general, problem solving, and computation abilities. He then treated them statistically by applying the methods of partial and multiple correlations.

Conclusions reached. The chief conditioning factors in each of the three kinds of arithmetical ability were found to be of the same order of importance—namely, *first, attitude; second, mental age; and third, chronological age.*

The author states that "when case studies were made of all pupils whose accomplishment in arithmetic varied widely from their accomplishment in general educational ability, the outstanding feature of the case studies was the tendency of pupils who scored higher in arithmetic than in other subjects, to score *high in attitude*. The opposite is generally true of the pupils who scored relatively higher in other school subjects than in arithmetic."

7. WHAT IS THE RELATIVE DIFFICULTY, OR THE ORDER OF DIFFICULTY, OF THE PRIMARY NUMBER COMBINATIONS?

From the curriculum standpoint, this is a fundamental question, and it is surprising that it did not become an object of study until recently.

STUDY NO. 45. Holloway, Harry Vance. *An experimental study to determine the relative difficulty of the elementary number combinations in addition and multiplication.* Trenton, N. J., State Gazette Publishing Company, 1915.

Problem. To determine the relative difficulty of the simple combinations in addition and multiplication.

Method. In the first part of the investigation a preliminary test involving the 45 combinations in addition was given to the children in Grade I and in the first half of Grade II, and a test involving the 78 combinations in multiplication was given to the children in the second half of Grade II and in the first half of Grade III to discover the particular combinations to which wrong responses were made. After the test, the 45 combinations were arranged in 9 groups of approximately the same difficulty and similarly the 78 combinations in multiplication, in 16 groups. In the respective classes, instruction and testing on the different groups in turn was begun and continued until class responses of 97 per cent correct on the different groups were obtained. Two weeks after beginning instruction on a new group of combinations, a test involving the combinations of the previous groups was given. Then the original list of combinations was arranged in 3 groups, and those in multiplication in 5 groups, and instruction was continued until the desired 97 per cent correct responses on these groups were obtained. The final tests involving the original combinations were given. In this portion of the investigation, the number of times each individual combination was missed on the various tests given was taken as an indication of its difficulty.

As a second portion of the investigation, to check upon this method of determining difficulty, the author gave written tests involving these same sets of combinations to a large number of pupils in Grade III just before and just after the summer vacation. These results were combined with those previously obtained in giving the final difficulty rating of the combinations.

General conclusions. 1. In the process of learning, each group of combinations, power or method is developed whereby subsequent groups are more easily managed.

2. Girls learn the addition combinations with less difficulty than boys by about 10 per cent and make 10 per cent fewer errors in the process.

3. Girls learn the multiplication combination with about 25 per cent less difficulty than boys, and make about 13 per cent fewer errors in the process of mastery, but boys retain 2.7 per cent better than girls when the whole series of products is considered, excelling especially in the larger ones, while girls excel slightly in retaining the smaller products.

4. In the process of teaching the addition facts, fewer errors appear in the double numbers even when equal opportunity for making errors is provided; the fewest appearing in $5 + 5$, and the greatest in $8 + 8$.

5. In teaching multiplication the fewest errors appear in the 10's and 11's and the next fewest in the doubles after 3×3 .

6. Combinations in the latter part of the series in both addition and multiplication are more readily learned, but they are also more easily forgotten.

7. From the standpoint of skill in manipulation, difficulty in addition increases with the magnitude of the numbers.

8. The groups showing the least skill for their manipulation are the same as those showing the greatest number of errors. This shows close correlation between speed and accuracy; greater speed accompanying greater accuracy.

STUDY NO. 46. Heilman, J. D. and Shultis, Frank W. "A study in addition." *Research Bulletin, Number 1, State Teachers College, Greeley, Colorado.*

Problem. To determine the difficulty order of the combinations in addition.

Method. The study was based upon the length of time taken by 20 pupils in Grades V and VI in responding to the different combinations in addition. The 20 children were chosen from the total number of children in these grades because preliminary tests showed that they manifested sufficient variation in responding to the different combinations to indicate clearly difficulty differences among the combinations. Obviously, either the children who manifested little or no knowledge of the combinations, nor those who knew them so well that their responses to the individual combinations showed no variation could be used. Each of the 20 pupils selected was given an individual examination on 59 combinations in addition. In this examination, the examiner read a combination orally and the child gave the correct response as quickly as possible. The examiner by means of a stop-watch measured the time intervening between the time he ceased reading the combination and the time the child began to give his response. The average time taken by the 20 children to respond to each of the different combinations was taken as an indication of the difficulty. In connection with the individual examination, each child was questioned as to the method employed in arriving at the response given. On the basis of the results

of these examinations a three-minute drill was given throughout the year. At the end of the year these 20 pupils were re-tested in exactly the same manner as at the beginning of the experiment. The second examination gave a check upon the difficulty of the combinations determined by the first examination. Upon the results of these two examinations a table setting forth the difficulty of the different combinations was developed.

Findings. Some of the most important findings of the experiment are as follows:

1. The easiest types of combinations are doubles, such as $2 + 2$; other easy combinations are those having one small number, such as $3 + 1$; combinations with small sums, such as $3 + 2$; combinations with sums one more or one less than twice one of the numbers, such as $4 + 3$; combinations with one number an easy multiple of the other, such as $8 + 4$.

2. Combinations with the small number last are easier than those with the small number first, such as $3 + 1$ and $1 + 3$.

3. The most difficult combination, $7 + 9$, requires a response time more than three times as long as the response time of the easiest, $2 + 2$.

4. Long response times indicate the use of counting or some other indirect method of addition. The child who responds 16 to the situation, $9 + 7$, uses much less time than the child who responds by saying $9 + 5 + 2$ or $9 + 9 - 2$.

5. The data of the experiment furnish the following theoretical table showing the 81 combinations used in all tests, arranged according to difficulty, the easiest first:

2+2	8+8	1+3	4+2	6+3	4+5	8+4	6+7	8+9
1+1	9+9	1+4	5+2	2+8	3+5	3+7	4+9	9+5
3+3	3+1	1+5	6+2	2+7	7+3	3+8	7+5	8+6
5+5	4+1	1+6	2+4	3+6	6+5	4+8	8+5	5+9
4+4	5+1	1+7	2+5	2+9	9+3	7+4	5+7	6+8
6+6	6+1	1+8	7+2	4+3	5+6	3+9	5+8	9+6
7+7	7+1	1+9	8+2	3+4	6+4	4+7	8+7	6+9
1+2	8+1	3+2	2+6	5+4	8+3	7+6	9+8	9+7
2+1	9+1	2+3	9+2	5+3	4+6	9+4	7+8	7+9

STUDY NO. 47. Osburn, W. J. *Corrective arithmetic*. Houghton Mifflin Company, 1924, Boston, Mass.

The appendix lists about 1700 combinations in the four fundamental processes, which the author regards as necessary for tool mastery.

STUDY NO. 48. Clapp, Frank L. *The number combinations, their relative difficulty and the frequency of their appearance in textbooks*. University of Wisconsin, July, 1924. 120p.

Method. 1. About 7000 pupils in four school systems were tested for the automatic mastery of the primary number combinations when presented singly.

2. About 3500 pupils in forty-five different school systems were tested for ability in connection with the number combinations when presented in problems with no time limit.

3. The first two books of two three-book series were analyzed in order to determine the number of times each combination appeared.

Results. 1. Two sets of tables present the combinations in decreasing order of difficulty for each grade. The first is the result of that part of the investigation referred to in "1" above, the second is the result of that referred to under "2."

2. Tables are presented showing the number of times each combination appeared in each of texts while other tables show the combinations arranged in decreasing order of frequency of appearance.

3. Combinations tend to hold the same general position of relative difficulty throughout the grades.

4. The zero combinations afford much greater difficulty when presented singly than when presented in problems.

5. In general, the larger the members of a combination the greater its difficulty although there are many exceptions.

6. Pupils have reduced the combinations almost to an automatic level in addition—then come in order multiplication, subtraction, and division.

7. In actual problems pupils make the smallest percentage of errors on combinations in multiplication—then come in order, subtraction, addition, and division.

8. The coefficients of correlation between the difficulty of combinations when presented singly with a time limit and when presented in problems without a time limit are as follows: Addition $+.544$; Subtraction $+.390$; Multiplication $+.580$; and Division $+.022$.

9. Members of "pairs" of combinations are no more nearly equal in difficulty than are other combinations.

10. There are 100 simple combinations to be taught in addition, in subtraction, and in multiplication, and 90 in division.

11. The number of actual errors in relation to the number of possible errors is greater for certain phases of each of the processes than for the combinations.

12. The total number of basic combinations in each of the two texts that were analyzed was as follows:

	Text A	Text B
Addition	25,490	28,239
Subtraction	14,053	11,889
Multiplication	24,704	29,604
Division	13,146	11,043

13. The correlation between the difficulty of combinations and the frequency of their appearance in the two texts is negative, the coefficients being as follows:

	Text A	Text B
Addition	-.452	-.532
Subtraction	-.329	-.277
Multiplication	-.384	-.465
Division	-.421	-.538

8. WHAT ARE THE FACTS ABOUT INDIVIDUAL DIFFERENCES AND WHAT MAY BE DONE ABOUT THEM?

The entire testing movement in arithmetic has given evidence on the facts of individual differences. It seems unnecessary to review the data. What to do about individual differences is not so clear. But drill and practice plans are being evolved which wisely used can provide for individual differences in maturity in interest and in ability.

VI. What Help from Standard Tests?

Arithmetic deals largely with tool material on a drill basis. Such material lends itself most readily to standardized testing. Standardized tests in arithmetic have met all reasonable expectations, although the emphasis has been gradually shifting from national standards to individual diagnosis and motivated practice drill. The chief help from standard tests is summarized in the following:

A. By emphasizing tool material they have helped in eliminating the traditional and useless.

B. Properly used they have great possibilities in motivating drill either for the class or the individual.

C. They have made possible reasonable norms of performance that are perfectly definite and adapted to different levels of intelligence.

D. They have made evident the facts of individual differences.

E. They have made it safe and easy to release pupils from further drill.

F. They have become the chief aid in the diagnosis of the difficulties of individual pupils.

G. For the above reason, they have helped in directing the teacher's time and effort to actual needs of the class and individuals.

In general, standardized tests make it possible to write drill specifications that are specific and definite; to measure the ability of pupils with accuracy and to diagnose their difficulties in terms of specific responses; and to motivate, on a class or individual basis, the entire procedure of mastering the drill material of arithmetic. The present tendency is towards the inventory-diagnostic tests that shall cover all needed responses and so make possible a complete check on arithmetic skill.

The results for reasoning problems are not so definite or so satisfactory.

VII. What is the Method of Curriculum Determination in Arithmetic?

The exceptional teacher or leader of children can, through the mere force of her charming personality and her resourcefulness, lead children through almost any difficulties. The type of motivation that is based on the personal charm of the teacher, while no doubt desirable and acceptable, is not sufficient. In the long run, the center of interest must be in the child or with the child group rather than in the teacher. The problem is to organize a course of study or plan of work in which the material will be most useful to the child and most appealing to him. There is gradually shaping through the force of previous studies, a tentative curriculum-making procedure for arithmetic.

The following points will be recognized as being drawn directly from this accumulating scientific data and experience.

A. The survey method as explained in the preliminary report of the Arithmetic Committee of the National Education Association (Addresses and Proceedings of the National Education Association, 1924, pp. 324-330) is the first essential in gathering useful material with reference to processes to use and in convincing teacher, pupil, and patron that processes for which the community has no use may be properly omitted from the work in arithmetic. The survey method does carry conviction and even in a small community secures enough data for determining the useful processes.

B. Definite standards of motivation need to be set up in order that teachers may not proceed with meaningless drill or formal textbook work. This means:

1. The basis in actual experience shall be built up before any kind of formal drill work is organized or assigned.

2. The child sees at every step the use and application of the process or material on which he is working.

3. The work at all times is connected with the personal interests of the children. This is so important that a teacher is justified in omitting drill and other formal work while she takes her class to a cafeteria, to a store, to a station, to a bank, etc., in order to build up experience.

4. The teacher should take time, as necessary, to develop a feeling of need for the work being done, and this feeling of need should be kept strong.

5. Pupil behavior patterns should be utilized by the teacher, so that the Arithmetic of the classroom fits into what the child wants to do instead of becoming a formal isolated classroom procedure.

C. The first work in arithmetic is the organization of experience. The possibilities in this line are well illustrated by Miss Larkin, *Number Based on the Child's Experience*, in Kindergarten and First Grade, Vol. 2, pages 12, 72, 109, 151. Miss Larkin made progress with her children in proportion as she kept behind their experience.

D. The next work is a broadening of experience. At this point, definite extension of knowledge begins. The curriculum must provide for new information for the pupils. Starting with present interests, the children must be led out into the larger aspects of business life. This means the organization of life situations, trips, the study of business, the organization of arithmetic work around large community interests, the use of the school bank, the use of advertising from the local papers, in fact it means any procedure by which the children are led into the business situations where arithmetic is used. This becomes the work of the teacher in either making or administering the curriculum.

E. As formerly indicated, drill must keep behind meaning. Drill is important. But drill can be motivated. It can be aided through real games. Where the need is apparent, even devices are acceptable to the children. If the standards of motivation as set forth in "B" above are observed, and, if the drill is confined to really needed and useful processes, there is nothing that pays better than systematic drill. Such systematization of drill must become a regular part of the curriculum in arithmetic. Merely to indicate the teaching of a process should be scored in future course of study as of zero value.

F. In the upper grades, lists of isolated written problems should be replaced by larger life situations involving business and figuring. Life demands thinking in large units rather than the solution of isolated puzzles. For example:

Should I buy a house or rent?
Can I afford to own an automobile?
What is the cost of a child to age six?
What does it cost to clothe a school pupil for a year?
What are the sources of loss in the grocery business?
What are the marks of a good investment?

These are samples of the newer type of reasoning situations to which children should be introduced. A good course of study will suggest many such, and arrange so as to avoid duplication.

G. Needless to say no course of study is satisfactory which does not involve the active participation of the teaching corps, as well as superintendent, supervisors, and the entire community. If the final product is to serve the community it should grow out of the community and its activities, as emphasized in point "A" above. But the teachers must help in order to insure careful grading and proper articulation with the needs of the children.

H. Manifestly, no mere textbook outline deserves the name of curriculum, nor does a mere outline of topics. The modern course of study includes in addition to processes, details as to skills and abilities, standards, provision for individual differences methods, standard forms for the solution of processes, suggestions as to tests and remedial treatment, illustrations of good work, suggestions for local applications, a detail of life situations for use in each grade. Nor should the curriculum fail to make clear to the

teacher that the provisions of the curriculum are merely suggestive; the teacher's independence and initiative should be fully protected.

Comment. The apparent tendency of most of the above studies in arithmetic is in the direction of emphasizing local meanings and requirements as a basis for curriculum material. A careful comparison of the studies, however, shows that local processes in Texas are duplicated in Illinois and Massachusetts, but the concrete applications vary somewhat. There is no evident conflict between local and national needs. The consideration of paramount importance in arithmetic is that of substituting useful and significant subject-matter for the old formal grind on indefinite preparation for something, sometime, somewhere—that is, substituting life experience for verbal memory. In the long run, the best preparation for coöperative living anywhere and everywhere is intelligent participation in the life of one's own community. In the case of arithmetic, we are now reasonably sure that the general need and the local need are so nearly identical, as to give no cause for concern, so long as there is good teaching with the use of meaningful material of present and practical value and of local utility.

CHAPTER IV

SPELLING

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THERE ARE five main groups of problems involved in the improvement of spelling: (1) Making the course of study, (2) Deciding what shall be taught in each grade, (3) Determining the most efficient methods of learning and teaching, (4) Providing a satisfactory plan of measuring results, and (5) Determining what text to select, if any.

Each of these groups of problems contains a number of important sub-problems. For example, in making the course of study one must decide: (a) Whether or not spelling is to be taught incidentally, (b) What words should be taught, (c) How these words should be arranged or grouped, (d) How much time should be given to spelling, (e) What, if anything, should the course of study contain in addition to a word list, and (f) What should be the relation of the course of study in spelling to the spelling which is done in the writing required for other subjects.

The summaries in this chapter are limited to those studies which bear on the selection of the words which are to be included in a course of study in spelling. This restriction was decided upon for three reasons: first, the scientific data which bear on this problem are less well-known and less available than those bearing on the other problems; second, since the space allotted to spelling was limited, it seemed better to give an adequate survey of what has been accomplished in solving this problem rather than to give a less adequate survey of a greater number of problems; and, third, the committee, in the brief time allowed, was not able to complete a sufficiently critical analysis of the studies bearing on the other problems.

In conformity to the procedure in the other chapters in this Yearbook, the various investigations are organized under questions, the earliest investigation being given first and the others following in chronological order. The questions used for group headings for the various investigations are as follows:

- I. What words are most frequently written in life outside the school?
 - a. In writing personal letters
 - b. In writing business letters
 - c. In writing letters and other communications to newspapers and magazines
 - d. In writing minutes, resolutions, and committee reports
 - e. By parents in writing excuses to teachers
 - f. In the letters written by literary men
 - g. In the correspondence of a single individual
 - h. In letters of application and recommendation
- II. What words are most frequently used in the writing done in schools?
 - a. In children's themes
 - b. In taking examinations

III. What is the significance, for purposes of spelling, of the words found in investigations?

- a. Of the vocabulary of reading
- b. Of the vocabulary of speaking
- c. Of the vocabulary of other languages
- d. Of the vocabulary needed in connection with other subjects

For data bearing on other problems in spelling the reader is referred to the digest and bibliography given in Chapter 3 of the 18th Yearbook, Part II, of the National Society for the Study of Education, published by the Public School Publishing Company, Bloomington, Illinois, and to Tidyman, W. F. *The Teaching of Spelling*, World Book Company, Yonkers-on-Hudson, New York, 1919.

I. What Words are Most Frequently Written in Life Outside the School?

Study No. 1. Chancellor, W. E. "Spelling: 1000 words." *The Journal of Education*, Boston: Vol. 71-2. May, 1910.

Purpose. To find the 1000 most important spelling words.

Sources. Lists of words submitted by 500 grammar school pupils, each list containing ten words which the pupil thought most worth knowing.

Letters which the author had received dealing with business, school, political, social, and personal matters.

Number of lists of words submitted by pupils:	500
Number of letters examined:	Not given
Number of running words:	Not given
Frequencies of words chosen for 1000-word list:	Not given

Comment. The making of the 1000-word list was the culmination of a series of studies in spelling made by Dr. Chancellor. For five years he had been studying the spelling situation in American schools. He had read one dictionary fifteen times and examined two others carefully and annotated each for spelling purposes. In this way 400,000 words were considered. In addition to this work, he carefully examined nearly every spelling book then on the American market, looked through courses of study in spelling, and read every available article on that subject in current periodicals. Spelling papers, written by thousands of pupils, were also care-

Special acknowledgment is due to the following persons who kindly assisted the chairman in preparing summaries included in this chapter of the Yearbook.

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fully studied. As a result of this work, he made a list of 20,000 words, which he felt no grammar school graduate should miss. Different forms of root words were included in this list.

Dr. Chancellor next sought the answer to this question, "What is the number of new spelling words that an ordinary pupil can acquire?" Tests containing 100 words of from four to eleven letters each were given to 250 eighth-grade pupils. All the words had been taught in class previously. The average score was 71 per cent. A similar test which had been given five years before to 10,000 pupils showed almost the same results, 72 per cent. Dr. Chancellor concluded, "I don't believe that the average boy or girl can learn over 75 per cent of 4,000 words before grammar school graduation."

The impossibility of teaching 20,000 words to elementary school children brought up the problem of what words were the most useful of all. It was in an attempt to answer this problem that Dr. Chancellor made his 1000-word list.

He asked each of 500 grammar grade children to write out independently a list of ten words that he or she thought most worth knowing. These lists were carefully examined in an effort to obtain some guiding principles in his work.

He next canvassed his own letters—"a score or two daily in number, sometimes a hundred"—in order to find what words were most frequently used. These letters dealt with business, school, political, social, and personal matters.

Dr. Chancellor does not state just what methods were employed in making his 1,000-word list, but apparently no scientific tabulation of words with their frequencies was attempted. He states that he "tried to find what words we all need in common."

His conclusions were, "These are the 1,000 words that the grammar school graduate should be examined and should attain 90 per cent upon. These are not only the words he will use most frequently; but they are also, according to my finding in the fashion indicated in this series of articles, the written words that when needed are most needed, that when needed appear indispensable."

It is probable that in doubting the ability of "the average boy or girl" to "learn over 75 per cent of 4000 words before grammar grade graduation," Chancellor underrated the efficiency of teaching at the time at which his article was written. Certainly we have reliable data to show that, using modern improved methods, it is possible for "the average boy or girl" by the end of the eighth grade to spell more than 4000 words with an accuracy of more than 90 per cent.

STUDY NO. 2. Ayres, L. P. *The spelling vocabularies of personal and business letters.* New York: Russell Sage Foundation, 1913.

Purpose. "To find out whether or not there exists a fairly definite body of words so generally used in ordinary correspondence that they should

form the core or basis of the spelling vocabulary taught in the lower grades of our elementary schools."

Source. Personal and business letters:

Number of running words analyzed: 23,629

Number of different words: 2,001

Comment. In January, 1913, the Division of Education of the Russell Sage Foundation analyzed the vocabularies of 2,000 short business and personal letters. Twelve sources were used as follows:

Letters to a firm doing a mail order business

Letters received by a practicing physician

Letters to the query department of a city newspaper

Letters received by a practicing lawyer

Letters received by school teachers from the parents of pupils

Miscellaneous business letters to a publishing firm

Letters received by the secretaries of the Y. W. C. A.

Letters received by a playground association

Letters received by a philanthropic organization

Personal family letters from a large number of sources

Letters received by a magazine conducting a query department

A small but varied collection of love letters

Only the first word in each line was tabulated, or, according to Dr. Ayres, about one-fifth of the words contained in all the letters. The total number of running words actually tabulated was 23,629. Only 2,001 different words were found, omitting the names of numbers, persons, and places. "The beginning and ending words, such as 'Dear Sir,' 'Yours truly,' etc., were included only in their proper proportions." The number of times various salutations and conclusions were found is given in tabular form.

One eighth of all the words appearing were the three most common words *I*, *the*, and *and*. Nine common words formed one fourth of the aggregate number of words tabulated. Forty-three words with their repetitions contributed one half of the number of words tabulated. Table 6 shows how a small number of words with their repetitions make up a large proportion of the total running words which Dr. Ayres analyzed.

TABLE 6.—NUMBER OF SEPARATE WORDS AND THEIR AGGREGATE NUMBER OF APPEARANCES BY EIGHTHS OF THE DISTRIBUTION AFTER WORDS ARE ARRANGED IN DESCENDING ORDER OF FREQUENCY.

	Number of Separate Words	Total Numbering of Appearances
One-eighth.....	3	2,954
One-fourth.....	9	5,907
Three-eighths.....	21	8,861
One-half.....	43	11,815
Five-eighths.....	99	14,768
Three-fourths.....	226	17,721
Seven-eighths.....	542	20,675
Eight-eighths.....	2,001	23,629

The bulletin contains a list of 532 words which appeared in the investigation with a frequency of six or more. The frequency with which each word was found is given. These words with their repetitions constitute seven-eighths of the 23,629 words tabulated.

Dr. Ayres points out the fact that "no final conclusions can be drawn from this study because it is too limited in scope to warrant them."

The chief importance of this study lies in the fact that it was a pioneer investigation. No other single study has been so influential in creating an interest in research for determining the word list in spelling.

This list of words must not be confused with the 1,000 words given in Ayres' *A Measuring Scale for Ability in Spelling*. The words in this scale are the result of the compilation of the data from a number of investigations including *The Spelling Vocabulary of Personal and Business Letters*. *A Measuring Scale for Ability in Spelling* is summarized elsewhere in this chapter.

STUDY NO. 3. Studley, C. K., and Ware, Allison. *Common essentials in spelling*. Sacramento, Calif. State Printing Office, 1914.

Purpose. To "provide the teacher with suitable subject-matter for a common school course in spelling."

Source. (1) 524 words from Dr. Leonard P. Ayres' Spelling Vocabularies of Personal and Business Letters. (2) The 840 words which occurred more than twice in the study of 91 Friends' Letters by Miss McFadden and Dr. Burk. (3) Words collected and tabulated by the authors from 920 compositions written by city and rural school children from grades three to eight of Chico District, California, aggregating nearly 200,000 running words, were inspected and 3,459 different words or different forms of the same word were found.

Number of running words for the compilation: Not given

Number of words chosen for the spelling list: 3,470

Comment. The authors do not state whether the frequencies of the different words were kept or not. They state that words "not clearly of common written use in life were omitted in the final compilation."

An appendix of 462 additional words to be used as supplementary material has been included in the spelling book.

STUDY NO. 4. Nicholson, Anne, *A speller for the use of the teachers of California*. Sacramento: Calif. State Printing Office, 1914.

This speller contains, in the appendix, the words from four original investigations, a brief description of which follows:

A. Burke, Frederick, *Ninety-one friends' letters*. Source: personal letters; number of running words: 19,288; number of different words: 752. Comment: There is no description of the manner in which this list of words was compiled, but the frequencies are given. The number of different words is small for this number of running words.

B. Members of the Parents' Association. Normal Training School, San Jose, Calif. Source: social letters; number of running words: not given (25 letters);

number of different words: 719. Comment: An alphabetical list of the 719 words is given, but no frequencies are reported for them.

C. California Barrel Company; Source: Business correspondence—100 letters; number of running words: 2412; number of different words: 665. Comment: The frequencies are given for each word.

D. The Emporium, San Francisco, and Hale's Department Store, San Jose, California; Source: 400 business letters; number of running words: 10,834; number of different words: 1576. Comment: the derived forms were scored but not reported separately. Certain inflected and derived forms are grouped in the reported list under the roots upon which they are based. For this reason only 1058 different words are reported. The frequency for each of these 1058 words is given.

STUDY NO. 5. Cook, W. A., and O'Shea, M. V. *The child and his spelling*. Indianapolis. The Bobbs-Merrill Company, 1914.

Source. The personal correspondence of 13 people

Number of running words: approximately 200,000

Number of different words: 5,200

Comment. In Part II of *The Child and His Spelling*, comprising 142 pages, are presented the results of an investigation of the number of words used by a group of adults in their written communications. The present analysis deals only with Part II of *The Child and His Spelling*.

In the study of the spelling vocabulary, the authors decided to tabulate the words used by thirteen adults in their correspondence with one another. Eight of the correspondents were women and five of them were men. Six of them were connected in family relationships. Some of them had practically no education, not having gone beyond the third grade of the elementary school, while others had graduated from college. Five thousand words were chosen from the letters of each six correspondents. Forty thousand words were selected from the letters of each of three correspondents. Six thousand words were written by one correspondent, eight thousand by another, twenty-four thousand by another, and twelve thousand by another. The topics discussed in these letters related to a great variety of interests and activities. The authors claim that practically every matter which would be written upon by the typical adult in communication with his friends was included in the letters of the correspondents who furnished the material for this investigation.

In the construction of the spelling vocabulary, the authors first tabulated separately the vocabulary of each of the thirteen correspondents. This was done for the purpose of determining whether the range in individual cases differed greatly and what words were common to all the vocabularies. It was maintained by the authors that in determining the spelling vocabulary the use of words by all correspondents should be emphasized as against the frequent usage of certain words by a few correspondents. If a given word occurs frequently in the usage of a few correspondents but if it is also common in the usage of all correspondents, it should play a more important rôle in the spelling vocabulary than a word which ap-

pears as frequently in the totals but which is not used by all the correspondents. The authors found that certain words, not many of them, however, were used excessively by one or two correspondents, and this served to give them a prominence in the frequency of totals out of all proportion to their actual importance in a spelling vocabulary.

Four lists of words were finally constructed:

1. List I comprises 186 words used by every one of the thirteen correspondents;
2. List II comprises 577 words which were used by most but not all of the correspondents;
3. List III comprises 2207 words which were used by less than a majority of the correspondents;
4. List IV comprises 2230 words used by only one of the correspondents, and 1804 of these words were used only once in the entire correspondence of all of the thirteen writers. To put it another way, 1804 of the words appearing in List IV were used only once in a total of 200,000 words tabulated.

In presenting these tables the frequency of occurrence of each word is shown; then it is shown whether each word appears in one or more of three spelling textbooks which were studied in the investigation. Further, it is noted after each word appearing in all the lists whether the word occurs in the spelling vocabulary constructed by Ayres and by Chancellor as a consequence of their investigation of the spelling needs of pupils.

Tables were constructed showing:

1. Words which were used by all the women and all the men correspondents;
2. Words which were used by most but not all of the men and women correspondents;
3. Words used principally by women correspondents;
4. Words used principally by men correspondents.

Proper names were tabulated separately.

1. In the total of 200,000 words examined there were 1209 different proper names with a total of 9740 occurrences.
2. In treating the proper names, words that were identical in spelling except for a final *s* were counted as a single word.
3. Nicknames, diminutives, and personal idiosyncracies in spelling names were all reduced to standard forms.
4. Envelope addresses were included in the tabulation.
5. Local publications, organizations, streets, and family names, except those of historical characters or prominent persons, were excluded from the lists.

The authors determined to see to what extent the words which they found occurring most frequently in the material examined were found in three spelling textbooks in general use in the schools. It was found that 65 per cent of the words given in the spelling textbooks did not occur

in the spelling vocabulary based upon the letters written by correspondents. However, 70 per cent of the words appearing in all the spellers appear also in the lists constructed by the authors to constitute a spelling vocabulary: 27 per cent of the words in List I, 33 per cent of those in List II, 28 per cent of those in List III, and 12 per cent of those in List IV are found in the spelling textbooks. No proper name was found in all the textbooks.

This investigation is one of a very few which throw light on the nature and extent of vocabularies of individual letter-writers.

STUDY NO. 6. Ayres, L. P. *A measuring scale for ability in spelling.* New York: The Russell Sage Foundation. 1915.

Purpose. To develop "a scale for measuring attainment in the spelling of common words."

Source. A compilation of the four most extensive studies made up to that time "to identify the words most commonly used in different sorts of English writing."

Number of running words analyzed was approximately: 386,000

Number of words selected: 1,000

Comment. Although this study was prepared for the purpose of making a spelling scale, it is useful for the purposes of this chapter since it contained a compilation of four investigations. The work was begun in 1914 by the Division of Education of the Russell Sage Foundation. The first step was to determine a list of common words. These words were finally chosen by combining the results of four studies.

"The first of these studies was published by the Rev. J. Knowles in London, England, in 1904 in a pamphlet, *The London Point System of Reading for the Blind*. The author says of it, 'Taking passages from the English Bible and from various authors, containing 100,000 words, a list was made of the 353 words which occurred most frequently, and the number of times each occurred was noted.'

"The second of the studies was made by R. C. Eldridge, of Niagara Falls, New York, and the results were published in 1911 in a pamphlet, *Six Thousand Common English Words*. Mr. Eldridge made an analysis of the vocabularies of 250 different articles taken from four issues of four Sunday newspapers published in Buffalo. He found that they contained a vocabulary of 6002 different words, which with their repetitions made an aggregate of 43,989 running words. He reported the number of times that each word appeared.

"The third study was conducted by the present writer in 1913 and the results were published by the Division of Education of the Russell Sage Foundation in a monograph, *The Spelling Vocabularies of Personal and Business Letters*. The study consisted of the tabulation of 23,629 words from 2000 short letters written by 2000 people. The total vocabulary

used was found to consist of 2001 different words and the number of appearances of each was reported.

"The last of these four studies was carried through by W. A. Cook and M. V. O'Shea and the results presented in 1914 in a book, *The Child and His Spelling*, published by the Bobbs-Merrill Company. This study consisted of the tabulation of some 200,000 words taken from the family correspondence of 13 adults. The total vocabulary was found to consist of 5200 different words and the number of times each occurred was reported."

In addition to determining the thousand words which are used in his spelling scale, Dr. Ayres makes the following comments:

1. About nine words recur so frequently that they constitute in the aggregate one fourth of the whole number of words written, while about 50 words constitute with their repetitions one-half of all the words we write. With the exception of *very*, these words are all monosyllables.

2. At first the purpose was to identify the 2000 most commonly used words, but this project was abandoned because it was soon found to be impossible of realization. It is easily possible to identify the 10 commonest words in written English. These are probably *the, and, of, to, I, a, in, that, you, for*. With their repetitions they constitute more than one-fourth of all the words we write. Save for the personal pronouns, they are essential in writing about any subject, whatever its nature, from *Aaron* through *zythum*. It is likewise possible to identify the 50 commonest words, for, like the first 10, they are true construction words and necessary no matter what the nature of the subject under consideration. With progressively decreasing reliability the list may be extended to include the 500 commonest words and possibly the 1000 commonest, but not the 2000 commonest, for long before this point is reached the identity of the frequently used words varies according to the subject under consideration.

It should be pointed out that two of the investigations used in this compilation deal with reading, and two with spelling. Moreover, 200,000 of the 223,629 running words of writing vocabularies are taken from the Cook and O'Shea investigation which is based on the family correspondence of thirteen adults. It is not strange, therefore, that later investigations have shown that only about two thirds of the thousand words of this scale are really among the first thousand most frequently used. On the other hand, about 95 per cent of the words are shown, by more recent investigations, to be used frequently enough to be included in a course of study in spelling.

It is interesting also to note that the available data, aggregating over four and a half million running words, bring changes in Ayres' conclusions as to the 10, 50, 100, and 500 commonest words.

Although this chapter does not deal with spelling scales, it should be pointed out here that this 1000 word scale has been more influential than any other study in stimulating interest in the measurement of spelling.

STUDY NO. 7. Andersen, W. N. *Determination of a spelling vocabulary based upon written correspondence*. Iowa City: Univ. of Iowa Studies in Education, Vol. II, No. 1, 1917.

Purpose. (1) To show comparatively the number of words common to the writing vocabularies of persons in various callings, (2) to show the extent and range of vocabularies used by persons in certain callings, (3) to point out the educational significance of the findings, and (4) incidentally to discover what words are commonly misspelled.

Source. Personal and business letters (3723 in number) written by adults in Iowa, more than 35 different occupations being represented.

Number of running words: 361,184

Number of different words: 9,223

Comment. Seventh, eighth, and ninth-grade pupils in 23 towns and cities in Iowa were asked to collect letters received by their parents and friends.

The preliminary scoring was done by pupils under the supervision of superintendents and teachers after practice had been given to established skill in the use of the method prescribed. The final work was done by the investigator with the aid of four trained adult assistants. The tabulations made by pupils included the following items:

All misspelled words

Number of letters analyzed in making the list

Occupation and sex of person who wrote the letter

Occupation and sex of person who received the letter

Alphabetical arrangement of all words. (Every word of different spelling was counted as a different word, except where the word was pluralized by adding "s" only. Such words were recorded as singular. All proper nouns, except days of the week, names of the months, holidays, and nationalities were excluded.)

Name of pupil, grade, and town.

In the final tabulation no attention was paid to the sex of persons writing or receiving the letters and all occupations were classified under six heads as shown in the table below:

COMPARATIVE VOCABULARY RANGE OF DIFFERENT GROUPS

<i>Calling</i>	<i>Letters</i>	<i>Running Words</i>	<i>Different Words</i>
Professional	824	85,161	5,368
Business	1,202	112,363	4,105
Domestic	700	61,368	3,280
Miscellaneous	688	73,001	5,861
Personal	149	14,778	1,980
Farmers	160	14,513	1,754
Totals	3,723	361,184	9,223

Words used only once (3217 in number) constituted about 9 per cent of the running words and about 35 per cent of the total number of different words. Incidentally, Andersen found 126 words misspelled two or more times, and ten more than ten times each. It is probable, however, that many spelling errors were overlooked by the pupils in their tabula-

tions. There were few words peculiar to any of the callings represented, and these occurred but infrequently. The tabulation by classes shows, however, that a really comprehensive list can be obtained only by a very wide sampling.

From a total of approximately 361,184 running words, a list of 3087 was made by selecting only those which occurred in three or more of the six groups and which also had a frequency of five or more. The frequency of occurrence and spread of distribution are given for each word. This list has been based upon a reasonably good sampling of letters from all classes of people in all parts of one state. The method of securing such a sampling is the most important contribution made by the investigation. It is peculiarly valuable since no selective factor operates to eliminate any group of letter writers. The plan by which pupils did the preliminary scoring seems to have been economical and quite satisfactory when checked later by trained adults. The group divisions did not, as Andersen himself notes, yield results that led to adequate or profitable comparisons.

STUDY NO. 8. Pryor, H. C. "A suggested minimal spelling list," *Sixteenth Yearbook*, p. 73. National Society for the Study of Education, Bloomington, Ill.: Public School Pub. Co., 1917.

Purpose. To determine "more definitely what, and how many words should be included in a minimal spelling list."

Source. A study and compilation were made of the following spelling tests and word lists:

1. *Concrete investigation of the material of English spelling and the child's own spelling book.* Franklin W. Jones.
2. *Common essentials in spelling.* C. K. Studley and Allison Ware.
3. *The need of intensive work in spelling* (unpublished). Algar Woolfolk.
4. A list of words compiled from children's compositions by Homer J. Smith, published in *The child and his spelling*, by Cook and O'Shea.
5. *List of spelling words.* Prepared by the teachers and supervisors of the public schools of Johnstown, Pa.
6. "Spelling in the Boston public schools." *McCray's Magazine*, March, 1915.
7. *Measuring scale for ability in spelling.* Leonard P. Ayres.
8. *Champion spelling book.* Warren E. Hicks.
9. *One thousand words.* W. E. Chancellor.
10. *The child and his spelling*, a list chosen from personal correspondence. W. A. Cook and M. V. O'Shea.
11. *Six thousand common English words.* R. C. Eldridge.

Only eleven lists are given, but by implication Dr. Ayres' list of 542 commonest words in his study of *The spelling vocabularies of personal and business letters* is counted separately from his *Measuring scale for ability in spelling*.

Number of running words: The author gives no estimate.

Number of words checked: The author states that "altogether about 30,000 words were checked," which apparently means 30,000 different words.

Number of words chosen: 1478.

Comment. "After the lists had been selected, each one was numbered and all the words were checked off in a dictionary. The figure 'one' was placed before every word in the dictionary which occurred in the Eldridge list. 'Two' was placed before each word that was found in the Jones list. The other ten lists were checked against the dictionary in the same fashion. Altogether, about 30,000 words were checked. By far the greater number occurred in only one list, a somewhat smaller number in two lists, and so on down to 121 that were common to 10 lists, 54 common to 11 lists, and only 9—namely, *again, any, believe, look, many, money, remember, there,* and *through* that were found in all of the lists.

"It was arbitrarily decided to include in the final list all words which occurred in at least six of the twelve lists examined; there were 1309 such words. To this number were added 169 words from the Ayres scale which were not among these 1309 words, making a total of 1478 words."

The words were arranged by grades by the following method: Eight different graded lists were examined—namely, the California and Johnstown spellers, Hick's *Champion spelling book*, the Boston, New Orleans, Richmond, Smith, and Woolfolk lists. "Each word in the entire list was assigned to the grade agreed upon by the majority of authors investigated, although in some cases the placing appeared to be pedagogically unsound. Some words, about whose location there was an exact division of opinion, were placed in the lowest grade mentioned. The distribution was as follows:

Grade	II	343	words
Grade	III	408	"
Grade	IV	216	"
Grade	V	187	"
Grade	VI	157	"
Grade	VII	131	"
Grade	VIII	38	"

Professor Pryor's evaluation of the graded list is: "Obviously, many of the words, such as *am*, are not properly placed and therefore the list is not the *best* for school purposes."

The technic of the investigation is marred by including the Eldridge list, which is not a writing vocabulary, and the list from the Champion Speller, which is very poor in its vocabulary.¹ However, since no word was taken unless it occurred in at least six investigations, the results are not much affected by these defects in procedure. Indeed, except for grading, this list was probably one of the best in print at the time of its publication.

STUDY NO. 9. Houser, J. D. "An investigation of the writing vocabularies of representatives of an economic class." *Elementary School Journal*, Volume 17, 1916-1917, pp. 708-718.

¹ Woody, Clifford. "Application of scientific method in evaluating subject matter of spellers." *Journal of Educational Research*, Vol. I, pp. 118-128.

Purpose. To discover the vocabulary used in letters written by farmers about farming.

Source. 750 letters written by farmers to the Agricultural Department of the University of California.

Number of running words: approximately 65,500

Number of different words: 1,869

Comment. It should be pointed out that this investigation was limited to one vocation, since it includes only letters written by farmers to professors of agriculture about farm problems.

816 of the 1869 words were used but once. A list of all words found five or more times is given. Words found in this list, but not in the Ayres list, are printed in italics. The investigator correctly points out the fact that this does not necessarily mean these words are peculiar to farmers' letters since they might easily occur outside of the words in the Ayres list.

STUDY NO. 10. Clarke, W. F. "Writing vocabularies." *Elementary School Journal*, Vol. XXI, pp. 349-51. January, 1921.

Purpose. To find out whether or not the spelling vocabularies based on recent investigations and proposed for use in the public schools, actually contain the words pupils in the public schools will need in later life.

Source. 2000 letters written to the editor taken from the columns of a large Chicago daily paper.

Number of running words: 28,292

Number of different words: 3,360

Comment. Mr. Clarke says that in the Ayres 1000-word list there are 117 common words such as *five, rain, hat, top, dress*, etc., which should have occurred in the Chicago list at least three times, and many of them oftener, but which did not occur even once. 237 very common and non-technical words such as *add, hay, idle, pint, farmer*, etc. which occurred four or more times in the Chicago list are not in the Ayres list. 108 common words such as *worse, owner, loyal, rich*, etc. which occurred four or more times in the Chicago list were not in the lists in the speller.

He believes that these facts cast doubt upon the reliability of two assumptions:

1. That, because a word occurs twelve times in a few lists of 100,000 running words each, it may be expected to recur similarly in any other list compiled in the same manner.

2. That a list of words occurring twelve or more times in a few lists of 100,000 running words will contain all the words apt to occur in other lists of this kind.

The author's conclusion is that present lists of words proposed for spelling vocabularies are inadequate for the needs of the average person. This inadequacy is due, the writer believes, to an insufficient regard for important geographical and social factors. "Numerous other like studies should be made covering the writing vocabulary of many more people in

widely scattered and representative localities and of diverse but representative social groups."

The author's emphasis upon the need for more extensive and more representative word counts is well-founded. It is interesting to note that more extensive counts of letters written to newspapers and magazines indicate that the vocabulary of such letters differs somewhat from that of personal or business letters.

STUDY NO. 11. Horn, Ernest. "The spelling vocabularies of bankers' letters." *English Journal*, Vol. XII, No. 6, June, 1923.

Purpose. To answer two questions: "First, is there a need for a special spelling list for those who write letters about banking; second, do the correspondence needs of bankers vary according to locality?"

Source. Bank letters

Number of letters scored: 1,125

Number of running words: 67,581

Number of different words: 2,623

Comment. Letters—in number 1125—written by bankers to the National City Bank, New York City, about banking, were tabulated. These letters were chosen by a sampling of the correspondence of fifteen states grouped so as to represent various sections of the country. The distribution of the letters is shown in Table 7:

TABLE 7.—DISTRIBUTION OF THE CORRESPONDENCE OF FIFTEEN STATES

Sections	Number of Letters	Running Words	Different Words
Western.....	50	2,689	509
Pacific.....	200	8,462	975
Central.....	125	9,298	1,200
North Central.....	125	14,520	1,306
Southern.....	50	2,475	485
South Central.....	200	8,238	954
Eastern.....	50	2,571	572
New York.....	300	16,758	1,432
Iowa (scored separately in addition to 125 letters scored in North Central).....	25	2,570	553
Total.....	1,125	67,581	2,623

With the exception of the pronoun *I* and the article *a* all words occurring in these letters were tabulated. All derived forms were scored separately.

The 2,623 words found in this analysis were compared with the vocabulary of general correspondence. The vocabulary of each section was also compared with that of other sections. The investigator's conclusions are:

"Summarizing, this study does not show that the words used in bankers' correspondence apply at all exclusively to the banking business, and yet the list is in a certain sense a vocational list. The highly inflected character of the words does indicate that those who are to dictate or to type letters in

banking should have more than an average education. Those who are to dictate should be able to express themselves courteously and with great precision, and those who are to take dictation should be trained accordingly. A training which will meet the needs in one section of the country will also meet the needs in other sections."

STUDY NO. 12. Crowder, Cora. *A study of the spelling vocabulary of representative businesses of Saint Paul and Minneapolis*, Master's Thesis, University of Minnesota, 1924.

Purpose. To determine (a) what words are most commonly used by writers of business letters, (b) what is the relationship of such words to those needed in writing personal letters.

Source. 2258 letters from nine types of business

Number of running words analyzed: Approximately 200,000

Number of different words: 5,088

Comment. This investigation was carried on over a period of two years from 1922 to 1924. The separate sources of the words are as follows:

Manufacturing and printing of advertising specialties

Mail order business

Life insurance

Fur manufacturing

Wholesale dealers in drugs and druggists' supplies

Wholesale grocers

Boot and shoe manufacturers

Wholesale dry goods

Manufacturing men's furnishings

With the exceptions noted below, all words in the body of every letter were arranged alphabetically with the total number of times that each word occurred in the whole investigation as well as the number of times in each business. As to duplicate letters, only one copy was tabulated, since it represented only one dictation. Words of the same spelling but different meanings were listed as one word. Plurals in *s* were counted as different words, as were all derived forms.

The exceptions to the above procedure were the omission of (a) geographical names when used as such, (b) all names of persons and firms, (c) salutations and complimentary closes, (d) all words of two letters (e) *its*, *ours*, *may*, *been* and *bad*, (f) the sixty commonest words after Horn.¹ This study contains an alphabetical list of the words found arranged in table form to show (a) the scale location according to Ayres, (b) words not found in Webster's New International Dictionary, 1923, (c) the frequency of each word in each type of correspondence, and (d) the total frequency of each word in the study.

¹ Ernest Horn, University of Iowa, 1921. *A compilation of the commonest words from twelve investigations of spelling vocabularies.* (Unpublished.)

Subsidiary questions discussed in this study are as follows: (a) What evidence is there of a distinctive vocabulary for each type of business? (b) How much of specialization is observable? (c) To what extent does technical terminology color business vocabulary? (d) Is there a divergence between the vocabulary of commercial correspondence and a composite reading vocabulary?

From comparisons between this and other studies the following conclusions are presented: "The vocabulary as found in the investigations of business correspondence is of a decidedly general character. It is comparatively simple as to spelling difficulty. There is little evidence of distinctive vocabularies for each type of business. A comprehensive, composite word list based upon actual tabulations of correspondence is the logical source from which to draw the subject-matter for teaching the spelling of business correspondence.

"Matters of style, recurrent phrases, the relative frequency of certain words characteristically stamp any one sort of correspondence without materially altering the basic word list. One would not confuse the sources of farmers' letters and bankers' letters in spite of the fact that there are relatively few words appearing in the one sort which do not appear in the other.

"The 'generalness' of the vocabulary may be accounted for in four ways. In the first place, the greater the number of sources we study, the more of overlapping there appears between different lists. Words which appear to be vocational or technical in one list appear in another list with a somewhat figurative meaning or in an original and unspecialized usage. . . .

"In the third place, the choice of words is conditioned by the most important of limiting factors, *the man who reads them*. By and large, he is not a technician. Hence the correspondent writes to him on the plane of his interest and in the general vocabulary of the laity.

"The fourth influence toward a general as opposed to a technical style of correspondence is the prevalence of ordering by catalog number instead of by name and description of the article.

"As to the amount of specialization and technical terminology, we are forced to conclude that there is relatively little. The various investigations show a small amount. There are few words in any one line of business which show a technical character when the list is compared with a composite list of the several lines investigated."

From the statistical treatment given the data, it is concluded that a composite spelling vocabulary of high reliability for the needs of business correspondence can be compiled from the correspondence of various business enterprises.

Table 8, showing the divergence between a composite reading vocabulary and that of commercial correspondence, is here given. "1a" indicates the first 500 words in order of frequency; "1b" indicates the second 500 words; "2a" indicates the first half of the second thousand words, etc.

The Thorndike list is a composite of the 10,000 words which occur most frequently in a total of 4,565,000 words about one ninth of which are derived from general correspondence and the rest from reading.

While the tendency of these first five hundred words of the present study to appear early in both lists is very marked, it is far more consistent in the correspondence or Horn list.¹ There is an evident divergence between the vocabularies of commercial correspondence and general reading. However, many of the 104 words not found in the Thorndike list are

TABLE 8.—FIRST 500 WORDS OF THE PRESENT STUDY COMPARED FOR FREQUENCY LOCATION WITH HORN¹ AND THORNDIKE²

	Horn	Thorndike
1a.....	260	177
1b.....	104	74
2a.....	53	46
2b.....	31	16
3a.....	12	20
3b.....	9	17
4a.....	3	4
4b.....	3	6
5a.....	5	10
5b.....	2	8
6.....	10	18
0.....	8	104
Total.....	500	500

¹ Horn, Ernest. University of Iowa, 1923. A compilation of the commonest words from twelve investigations of spelling vocabularies. (Unpublished.)

² Thorndike, E. L. The teachers word book. New York: Columbia University, 1921.

probably accounted for by the fact that certain derived forms are not reported separately in that list. The closeness of agreement between the two correspondence lists is an argument for the reliability of a basic spelling vocabulary for correspondence that is derived from a sufficient sampling of sources.

STUDY NO. 13. Warning, Winifred C. *An investigation of the word usage of adults in written correspondence.* This vocabulary was collected in 1913-1917 and has not yet been published.

Purpose. To secure data on adult spelling needs.

Source. Written correspondence of adults, containing, letters from 9 different sources:

1. Letters received by a university housing bureau, library, dean's office, and business office, 200 in number, yielding 16,337 running words.
2. Letters received by a large dry goods firm, including mail orders and general correspondence, 500 in number, yielding 32,375 running words.
3. Letters received by a real estate firm, 300 in number, yielding 21,067 running words.
4. Letters received by a business college, 100 in number, yielding 8386 running words.
5. Letters received by a newspaper office, 100 in number, yielding 8467 running words.

6. Letters received by a seed store, 100 in number, yielding 7316 running words.
7. Letters from the general correspondence of a prominent educator, 300 in number, yielding 27,852 running words.
8. Form letters, 200 in number, yielding 33,945 running words.
9. Personal letters, 550 in number, yielding 153,642 running words.

Total number of letters	2,350
Total number of running words	309,387
Total number of different words on a dictionary basis	6,682
Total number of different words	10,107

Numbers and the names of persons were omitted from the tabulations.

The entire study is the work of one person. Comparisons with the results of other similar investigations are now being made, report of which will appear at a later date.

From the nature and extent of this investigation it seems likely to be an important addition to similar data secured by other investigators.

STUDY NO. 14. Curtis, Ethel. *A study of the correspondence of a single individual over a period of eight years.* (As yet unpublished.)

Purpose. As indicated in the title.

Number of running words: 230,000

Number of different words: 6,512 (exclusive of proper nouns)

Comment. This study was undertaken in order to discover the extent of the vocabulary of a single individual. The letters were taken from the files of a superintendent of schools in a small city. Although letters aggregating over 200,000 running words were analyzed, there was no indication that the limits of this individual's vocabulary had been reached.

STUDY NO. 15. Horn, Ernest. "10,000 Words Most Commonly Used in Writing." *State University of Iowa Studies in Education* (in preparation).

Purpose. To determine the words most often needed in the writing done in life outside the school by compiling together all existing data concerning adult writing needs.

Sources. 1. The following investigations by the author:

- a. Vocabulary of Business Letters
- b. The Vocabulary of Letters Written by Literary Men
- c. The Vocabulary of Correspondence of a Personal Nature
- d. The Vocabulary of Letters of Application and Recommendation
- e. The Vocabulary of Material Contributed by Laymen to Newspapers and Magazines
- f. The Vocabulary of Minutes, Sets of Resolutions, and Reports of Committees
- g. The Vocabulary of Excuses Written by Parents to Teachers
- n. A Compilation of certain investigations made previous to 1922, including the investigations (summarized elsewhere in this chapter) by Andersen, Ayres, Cook and O'Shea, and Burke. In addition it includes an unpublished study, by the author, of 100,000 running words of highly personal correspondence.

2. Curtis, Ethel. "A study of the correspondence of a single individual over a period of eight years."

Number of running words: approximately 5,180,000

Number of different words: approximately 38,000

Comment. This compilation was made by combining the alphabetical lists of words resulting from each of the investigations given above. When the total frequency of each word had been determined the words were arranged in order of frequency and the 10,000 most important words selected. The measures of importance were frequency and distribution of occurrence in these nine lists.

All of the investigations used in compiling these 10,000 words were financed wholly or in part by a grant from the Commonwealth Fund, with the exception of that by Clark, that by Houser, those in the California Speller, and those in 1 h. At the time this grant was made, 1922, a total of approximately 800,000 running words of adult correspondence had been analyzed by various investigators. By that time, it was clearly established that the following words would, in a more extensive count, fall within the first 100 words most frequently used. These words were not counted in the investigations made under the grant from the Commonwealth Fund.

<i>Pronouns</i>	<i>Auxiliary Verbs</i>	<i>Prepositions</i>	<i>Miscellaneous</i>	
that	could	about	come	some
their	been	after	good	there
them	have	before	here	thing
these	must	from	just	time
they	shall	over	know	very
this	should	under	letter	well
what	were	until	much	when
which	will	with		
your	would			
yours				

In addition, words of less than four letters were omitted, since such words have little or no spelling difficulty, and also proper names of people, places, months, and days. By these omissions, it was possible to score a much wider and more extensive sampling of adult writing needs than would have been possible had all words been scored.

The total of the frequencies of all words thus omitted, excepting proper names, was found in the 800,000 running words which had already been recorded. This total made up somewhat more than 60 per cent of the 800,000 running words. The assumption was made that words thus omitted would, if they had been scored, make up approximately the same percentage of the running words in the other investigations. An estimate of the total number of running words was made by calling the number of running words actually tabulated 40 per cent of the total number of running words examined. It will be seen that the total number of words

in the material examined is somewhat more than two and one half times the number of running words actually recorded.

Because the number of running words is an estimate, all figures are given in round numbers, but the exact frequencies upon which estimates are based will be printed in the study. The number of different words is also given in round numbers. A description of the various investigations included in this compilation follows, with the exception of two which are summarized earlier in this chapter.

1. Investigations by the author:

a. "Vocabulary of Business Letters."

Purpose. (1) To discover the words most commonly needed in business correspondence; (2) to discover to what degree specialized business words exist; (3) to compare the vocabulary of business correspondence with that of general correspondence.

Source. The letters from 26 different types of business.

Number of running words: approximately 1,650,000

Number of different words: 15,200

Comment. In analyzing this vocabulary, the coöperation of Rotary Clubs in different sections of the United States was sought. In addition, a large amount of correspondence was secured by a personal canvass of business firms in Minneapolis and St. Paul by Miss Cora Crowder. Miss Crowder's own independent investigation of business vocabularies is included, as is the author's "Vocabulary of Banker's Letters," the list from the California Barrel Company, the list from the Emporium and Hale's Department Store, and Houser, "Writing Vocabularies of Representatives of an Economic Class."

At the outset the intention was to sample an amount of correspondence equal to the relative importance of the business. However, it was found impossible to secure adequate amounts of correspondence from certain types of business. The investigator, therefore, had to be satisfied with the analysis of such letters as could be procured from these 26 different groups. It should be kept in mind that this does not mean there were only 26 different firms which contributed correspondence. Under publishing firms, for example, are included letters from 16 different firms.

The number of different kinds of business and the large number of running words counted are sufficient to indicate the words which have widespread usage in various types of business correspondence. The counts for most of the 26 types, however, are not sufficient to afford a satisfactory basis for making special vocational lists.

b. "The Vocabulary of Letters Written by Literary Men."

Purpose. To discover in what ways, if any, such vocabulary differs from that found in the letters analyzed in other investigations.

Source. An extensive sampling of the letters of eight well-known American writers and eight well-known English writers. In addition, all of the letters given in E. V. Lucas' *The Gentlest Art* were analyzed.

Number of running words: approximately 690,000

Number of different words: approximately 23,600

Comment. The letters of the following American and English writers were analyzed:

<i>American</i>	<i>English</i>
Abraham Lincoln	Lord Chesterfield
John Hay	Percy Bysshe Shelley
Franklin Lane	Lord Byron
Walter H. Page	Charles Lamb
Theodore Roosevelt	Horace Walpole
James Russell Lowell	Robert Browning
Phillips Brooks	Elizabeth Browning
William Dean Howells	Robert Louis Stevenson

The Gentlest Art is a compilation of letters of well-known writers.

Although the only use made of this list so far is to compile it with the other correspondence investigations reviewed in this chapter, the data from the list will be used to help answer two questions: (1) In what ways does the vocabulary of literary men differ from that found in ordinary correspondence? (2) Are there discoverable differences between the vocabulary of English and American writers? It will also be used for the purpose of comparing the vocabulary of past periods with that of the present.

The number of different words in this vocabulary is larger, for the amount of material analyzed, than in any other type which was scored. In fact, more different words were found in the correspondence of literary men than were found in any other type of correspondence in spite of the fact that only 690,000 running words were analyzed. This may be explained in part by the fact that these letters were written over a larger geographical area as well as over a longer period of time. On the other hand, an examination of the detailed list shows clearly that literary men use the language with great freedom. It is particularly interesting to note the commonness with which contractions, slang, and colloquial words appear in these letters.

c. "The Vocabulary of Correspondence of a Personal Nature"

Purpose. First, to secure additional data regarding the vocabulary of personal letters; second, to determine whether the vocabulary used in letters varies according to the locality in which the letter is written.

Source. Letters written to college students by friends and relatives in each of the following geographical divisions and in the states indicated under each division.

Pacific: Washington, Oregon, California.

Western: Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico.

South Atlantic: Georgia, Florida, North Carolina, South Carolina, Virginia, West Virginia, Maryland, Delaware, District of Columbia.

New England: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island.

Middle Atlantic: New York, New Jersey, Pennsylvania.

South Central: Alabama, Kentucky, Tennessee, Mississippi, Arkansas, Oklahoma, Louisiana, Texas.

North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota.

Number of running words: approximately 1,402,000

Number of different words: approximately 19,200

Comment. The investigator desired to obtain the vocabulary of highly personal letters from each section of the United States. Requests were therefore sent to professors of education and psychology in universities and colleges in all parts of the country asking that they request students in their classes to make alphabetical lists of the words in the letters they had received from friends and relatives. The instructors were asked to explain that all types of personal letters were desired—love letters, letters from parents or other members of the family, and letters from friends. Since the student did not contribute the letters in their original form, but only an alphabetical list of words, he could be sure no confidence would be betrayed. In this fashion it was possible to get the vocabulary of letters of a highly personal nature when the letters themselves would not have been available to the investigator.

Each student in handing in his alphabetical list of words reported (a) his name and address, (b) types of letters he had scored, (c) states from which the letters were written, (d) approximate number of running words in the letters.

The vocabulary secured by this method represented every type of personal letter from love letters of engaged people to the ordinary news letter from home. It is possible that since writers of these letters were friends or relatives of college students, the vocabulary secured is, on the average, that of people of a somewhat higher level of education than that secured by Andersen. On the other hand, it seems likely from the constitution of student bodies in the various universities and colleges that letter writers from every educational level are represented.

It is probable that words pertaining to education and college life appear somewhat more frequently in this investigation than would be the case had the letters not been written to college students. A consideration of the probable subject-matter of such correspondence, as well as a detailed examination of the word list, shows this to be true. Examples of such words are *fraternity*, *dormitory*, *examination*. On the other hand, an examination of the relationship existing between the writers and recipients

of the letters makes it seem likely that almost every type of human relationship was touched upon in these letters.

d. "Letters of Application and Recommendation"

Purpose. To find the words used most frequently by students and teachers in applying for positions, and by those who write recommendations for such students and teachers.

Source. The letters of application and recommendation on file in one normal school.

Number of running words: approximately 154,000

Number of different words: approximately 5,100

Comment. The amount of material analyzed is probably sufficient to indicate the words most frequently used in letters of this type of application and recommendation. One cannot, of course, generalize from this study as to the vocabulary of letters of application and recommendation in other professions or in business. Many words, such as *recommendation*, would be found in other types of letters of application. The misspelling of a word in a letter of application is so heavily penalized that similar studies need to be made for other types of professions and business.

e. "The Vocabulary of Material Contributed by Laymen to Newspapers and Magazines"

Purpose. To discover in what ways the vocabulary of such contribution differs from that of other correspondence.

Source. Letters written to the *Atlantic Monthly*, to the *Chicago Tribune*, to the *Chicago Daily News*, and to the *Chicago Evening Post*. In addition, the vocabulary of Clark's investigation was included.

Number of running words: 86,000

Number of different words: 13,300

Comment. These contributions to periodicals and newspapers were analyzed in the belief that those who make such contributions have more than average education. The vocabulary thus obtained, like that secured from the letters of literary men, gives some indication of the range and quality of the vocabulary of people of somewhat superior writing ability.

f. "The Vocabulary of Minutes, Resolutions, and Committee Reports"

Purpose. To discover the words most frequently used in minutes, resolutions, and committee reports.

Source. The minutes, resolutions and committee reports of learned, professional, and philanthropic associations and societies in the United States. Minutes of various types of women's clubs. Minutes of a list of other organizations.

Number of running words: 124,000

Number of different words: 5,700

Comment. This investigation was undertaken after a canvass of a large number of adults indicated that the writing of minutes, resolutions, and committee reports was practically universal, even though somewhat infrequent, among individuals who have completed a high-school education. Many of the words most commonly used in minutes are very difficult to spell. An examination of actual sets of minutes shows that misspellings are not infrequent.

In obtaining data for this investigation, use was made of the minutes of a large number of organizations which were found in printed form. Among these are the following:

American Association for the Advancement of Science.
Associated Advertising Clubs of the World.
Association of American Universities.
National Municipal League.
Daughters of the American Revolution.
National Education Association.
Ancient and Accepted Scottish Rite of Freemasonry.

In addition, a request was sent out to individuals in various communities in the state asking that they secure samples of minutes from local organizations. Returns to this request included two types of minutes: first, those from various types of women's clubs; and second, those from various other types of associations, such as commercial clubs, boards of education, lodges, athletic associations, and declamatory associations.

From the amount of material analyzed and from an examination of the detailed word list, it seems probable that the important words peculiar to the writing of minutes, sets of resolutions, and committee reports are included in this list.

g. "The Vocabulary of Excuses Written by Parents to Teachers"

Purpose. To discover the nature and extent of this vocabulary.

Source. Excuses written by parents to teachers in schools located in Ohio, Iowa, Minnesota, and Pennsylvania

Number of running words: 30,000
Number of different words: 900

Comment. Writing excuses to teachers constitutes a common need for all parents. While the amount of material scored is small, it must be kept in mind that excuses are short. Except for the vocabulary needs arising in special circumstances, it seems probable that this investigation discloses most of the words frequently needed in writing excuses.

The outstanding impressions given by these excuses are: that they are poorly written, that they seldom show a desire on the part of the parent to coöperate wholeheartedly with the teacher, and that they are full of errors in spelling and in other phases of composition. Certainly no type of mate-

rial which the writer has studied, including children's themes, is so poorly written and so full of errors.

h. "A Compilation of Certain Investigations of Correspondence Made Previous to 1922"

Purpose. To combine together, for purposes of comparison, certain investigations of correspondence made previous to 1922

Source.

Burke's study.

Andersen's list.

Cook and O'Shea list.

Ayres' list.

Horn's study of 100,000 running words of highly personal correspondence.

Number of running words: 678,000 (not including proper names from the Cook & O'Shea list or words found but not reported by Ayres, Andersen, and Burke).

Number of different words: 6,900

Comment. This compilation was used as a measure of the reliability of other lists. It will be noticed that the total number of running words does not equal the number of running words given in the summaries of these various investigations. This is because very low frequency words were not reported in some of these investigations. The number of running words represents the actual addition of the frequencies taken from these various lists. The number of different words is based on words actually reported in these investigations and is therefore much less than the number actually found.

General Evaluation of the "10,000 Words Most Frequently Used in Writing"

A few words pertaining to school matters are undoubtedly overweighted in this summary because of the large number of letters written to students. Words frequently used in business but less frequently used in other types of writing are also given a more important place in the list than would be justified by the number of times a word is used in such writings as is done by the ordinary individual in life outside the school. The overweighting of such business words is justified because of the fact that spelling errors are more serious in a business letter than in personal letters. It must be kept in mind that in determining these 10,000 words account was taken not only of the total number of times a word was used but also of the number of different types of writing in which it was found. It seems likely that the high frequency words in this list are, for all practical purposes, those which should be included in a course of study in spelling.

II. What words are most frequently used in writing done in school?

STUDY NO. 16. Jones, F. W. *Concrete investigation of the material of English spelling.* Vermillion, Univ. of South Dakota, 1915.

Purpose. "To determine what words, grade for grade, children use in their own free written speech, and what words, therefore, they need to know how to spell."

Source. 75,000 children's themes

Number of running words analyzed: 15,000,000

Number of different words: 4,532

Comment. The material used in this investigation consists of the approximate writing vocabularies of 1050 grade students, grades two to eight inclusive, in four States: Illinois, Maryland, Iowa, and South Dakota. Teachers were asked to have students write themes, under regular school conditions, and on any topics of interest to the students. Specific directions were given to the teachers. The theme writing was begun in the third month of the school year and continued until the vocabularies were apparently completed. This apparent exhaustion of the child's vocabulary was reached by most of the students at the end of the fortieth theme. The titles of the themes were then varied so as to reach into new fields of experience and stimulate the children to use new words. When a given student failed to use any new words for eight themes, Jones concluded that that student's word-well was dry. The total number of themes examined per student ranged from 56 to 105.

The 4532 words reported as found are printed, without frequencies, in grade lists. A count was also made of the frequency with which each word was misspelled. The 100 words having the highest number of misspellings are printed under the title "100 Spelling Demons."

Later investigations have not confirmed Jones' results, but his study has had an important influence in stimulating an interest in the study of children's themes. The number of words is astonishingly small, considering the total number of running words reported to have been analyzed. More recent investigations have shown clearly that with an adequately stimulating list of theme topics one would secure far more than 4532 words in 15,000,000 running words written in grades two to eight.

STUDY NO. 17. Bauer, Nicholas. *The New Orleans public school spelling list.* New Orleans: F. F. Hansell & Bros., 1916.

Purpose. To prepare a list of words to be used as spelling material in the grades by determining the writing vocabularies of pupils.

Source. 18,000 children's themes

Number of running words analyzed: 2,500,000

Number of different forms of words: approximately 19,000

Comment. The pupils of the New Orleans public schools were required to write on one or more of ninety assigned topics related to child life and activities. The words used by the children of the different grades were arranged alphabetically by the teachers and the frequency of occurrence and of misspelling recorded. The final compilation was made by Superintendent Bauer.

3037 words having a frequency of forty or more each were assigned to grades as follows:

Grade	II	385
"	III	467
"	IV	476
"	V	543
"	VI	566
"	VII	600
"	VIII	Review of the 3037 words.

"In making the assignment of words to the grades, the 385 words which had been used the greatest number of times in the third grade were listed as words to be studied by the second-grade pupils. The same method of procedure was followed for the other grades except in the sixth and seventh grades where the remaining 1166 words were apportioned to the two grades."

A comparison of the words secured in this investigation was made with those given in the study by Cook and O'Shea. It was found that with a very few exceptions all the words given in the first and second lists in Cook and O'Shea were also found among the words frequently used by these children.

Although Superintendent Bauer makes no pretense of having exhausted the vocabularies of the children of New Orleans, the number of different words found in analyzing two-and-a-half million running words is more than four times as large as that reported by Jones from his analysis of 15,000,000 running words. The larger number reported by Bauer agrees much more closely with what we now know about the extent of children's vocabularies.

STUDY NO. 18. Barthelmess, Harriet M. "The teaching of spelling." *Annual Report of School Committee*. School Document No. 19. Boston: Boston Printing Department, 1916.

Purpose. "To find out what common words the pupils needed most in their written work (as shown by the actual words they use in their original composition work) and which of these words they were misspelling most often."

Source. Lists of words which children most frequently misspell in their written work, prepared by representative teachers from 70 elementary school districts of Boston.

Number of words recorded by teachers:	15,223
Number of different words recorded by teachers:	5,231
Number of words selected for minimum list:	840
Number of words selected for supplementary list:	2,542

Comment. These words recorded by the teachers were compiled by the Department of Educational Investigation and Measurement into minimum and supplementary lists of words on the basis of the frequency with which the individual words occurred in the lists of the several teachers.

"In May, 1915, tests were given in order to determine the degree of difficulty of each word as shown by the ability of a thousand pupils to spell it. In most cases each pupil was asked to spell words from the minimum list of his own grade."

"The words in the minimum lists were re-listed according to the per cent of accuracy established for each word in its assigned grade."

Additional words were added to the minimum lists. Two factors governed the selection of these additional words "(1) They are words that appear a sufficient number of times in the teachers' lists to suggest their need by the pupils; (2) they appear in the Ayres List, which indicates that they are among the 1000 most common words."

"The supplementary lists were revised to include words from the best-known scientific spelling lists that were not already included somewhere in the Boston lists."

STUDY NO. 19. Kansas City, Missouri, Public Schools. *Preliminary report of the committee on spelling.* Research Bulletin 2. Kansas City, Mo.: Board of Educ., 1916.

Purpose. To make a minimum word list based on words most frequently missed in children's compositions.

Source. 49,797 compositions written in 55 schools in Kansas City. In addition, opinions of first-grade teachers on 327 different words.

Number of running words:	Not given.
Total number of different words misspelled:	4448

Comment. This study is based on the analysis of lists of misspelled words sent in by 683 teachers in 55 schools. The misspellings were those discovered in 49,797 compositions written by 16,591 pupils. Only one misspelling of a word was counted for a given pupil. 4448 were missed. 1926 words were missed by three or more pupils. These 1926 words are given in the form of a table in which is shown for each grade the number of pupils who missed the word.

While the total number of running words is not given, it is probable that about five million running words were examined. This estimate is made on the basis of 100 words to a composition. As can be readily seen, the work of recording errors only is small as compared with that of recording all words. The time saved in recording nothing but errors

was enormous. Since the prevention and correction of spelling errors is the purpose of the investigation, the recording of errors seems sufficient.

In having the compositions written, an effort was made to find as wide a range of topics as possible. However, from the nature of the topics suggested to the teachers as samples of theme subjects upon which pupils should write, one gets the impression that the subjects were somewhat limited in type.

The weakness in the investigation is the lack of a well-planned list of theme topics which could be expected to sample adequately the written vocabularies of the children in the various grades. However, this investigation must be counted among the most important of all those which have dealt with children's themes. With an adequate list of theme subjects and approximately the same technique, the same type of investigation could profitably be carried out in a number of public school systems.

STUDY NO. 20. Tidyman, W. F. *Survey of the writing vocabularies of public school children in Connecticut.* Teachers' Leaflet No. 15, November, 1921. 18 pp.

Purpose. To supplement previous investigations in three particulars: "(1) to determine the second and third thousand words commonly used by children in their spontaneous compositions, (2) to determine the grades in which all common words are used, and (3) to develop an accurate and expeditious method of examining words in large numbers."

Source. Compositions written by school children in grades three to nine inclusive.

Number of running words analyzed: 538,500

Number of different words: 3,850 occurring two or more times in one section of the investigation, omitting short words and 102 common words.

Comment. During the school year of 1917-1918 the author analyzed 5000 compositions chosen at random from 150,000 written in 27 schools by children in grades 3-9. The general plan of the procedure was to correct the compositions for spelling; to cut the compositions up so that one line only appeared on a slip of paper; to throw out words of assuredly common use; and to sort the remainder into alphabetical and sub-alphabetical lists until words of the same kind fell into the same pile; finally, to count and record the number of times each word was used. The cutting and sorting was made possible by having the compositions "written upon uniformly ruled paper, usually five-eighths inch ruling, on one side of a sheet only. A special effort was made to have children write on the line and to space words well."

Some of the words were not counted. Since "the purpose of the investigation was to determine the frequencies of rarer words, the words of assuredly common use were omitted." Words of one or two letters and

a few special words were omitted in all the grades. In addition, "words of three letters were omitted in grades four and above, and all words of four letters were omitted in grades seven and above." The names of persons and places were not counted.

There is no doubt that the author saved a great deal of time by eliminating short words and very common words, even though some of his 102 common words lie far beyond the first 100 words of greatest frequency. Dr. Ayres in reporting his investigation of the spelling vocabulary of personal and business letters pointed out that 99 words with their repetitions made up five eighths of all the running words. The extensive data now available indicate that the 100 commonest words with their repetitions make up nearly 59 per cent of all the words which one writes. It is easy to see that the omission of these common words and all short words saves a large amount of time in the final sorting and recording. The bulletin gives what the author considers to be the first, second, and third thousand words. These words are also arranged in grade lists.

In order to select the first 1000 words, the author took the 1254 words reported in four or more of the following investigations: "those of Chancellor, Smith, Cook and O'Shea, Jones, Studley and Ware, and Ayres—and selected from these the 1000 words that were found to be used most frequently in the present investigation. The second and third thousand words were then determined. As a rule, words that occurred at least 15 times were placed in the second thousand, and words that occurred between 5 and 14 times were placed in the third thousand."

"In arranging grade lists a word was placed in the grade in which it first occurred. The words are distributed among the grades as follows:

Grade	III	1,103
Grade	IV	726
Grade	V	578
Grade	VI	293
Grade	VII	169
Grade	VIII	113
Grade	IX	22"

It should be pointed out that, when one considers the wide range of ability in a given grade, "first occurrence" in a grade is a doubtful method of grading.

This investigation adds to our knowledge of the vocabulary of children's themes in which the theme topics are not planned or controlled. The author's method of cutting and sorting words is a contribution. The author's statement is: "It is not an exaggeration to say that, following this method, one can handle words in thousands while by the old checking method he handled them by hundreds. In 48 hours the author, working alone, sorted and counted 48,000 words, including the eliminations noted above." While a comparison with time costs of other methods of recording does not show that the advantages of cutting and sorting are as great as are here indicated, there is no doubt that the elimination of short words and

common words brings a substantial saving. If the cutting and sorting method is to be used, the lines on the paper must be far apart and the words well-spaced. The method has not proved practicable in tabulating the vocabularies of letters.

STUDY NO. 21. McKee, Grace M. "Children's themes as a source of spelling vocabulary." *The Elementary School Journal*. Nov., 1924, Chicago: The Univ. of Chicago. For a more detailed discussion see: McKee, Grace M. *Children's themes as a source of spelling vocabulary*, Master's thesis, University of Iowa, July, 1924.

Purpose. "First, to determine how adequately certain previous theme investigations have really discovered the vocabulary which children use in writing compositions and, second, to determine whether or not the words reported by previous investigations and the words found in this investigation are included in such standard lists as the Horn Composite List and the Thorndike Word List."

Source. 180 themes of sixth-grade pupils in 5 Iowa cities and 2 Illinois cities.

Number of running words: 18,958

Number of different words: 2,329

Comment. In order to provide a more adequate vocabulary stimulation, Mrs. McKee sought to formulate theme subjects which would bear on a great variety of experiences with which sixth-grade children should be familiar. As a guide in formulating the theme subjects, she used as a starting point Bobbitt's classification of the values of life. She then constructed and assigned 387 theme subjects grouped under the following main headings:

- 30 topics on communication.
- 28 topics on health.
- 21 topics on unspecialized practical labors.
- 8 topics on religion.
- 16 topics on citizenship.
- 20 topics on social contacts and relationships.
- 16 topics on general mental efficiency.
- 41 topics on leisure activities.

180 themes were written by sixth-grade pupils upon subjects selected from this list. Every word in the themes was tabulated, each word form being scored separately. Although but 18,958 running words were scored, 2,329 different words were found.

In order to compare her findings with those reported in other investigations of children's themes, Mrs. McKee made a compilation of the vocabularies reported by Jones, Smith, Bauer, and Brown. These investigations are described elsewhere in this chapter. She found that there was a great lack of agreement among these various lists as to what words children use

in writing themes. She found but 1475 words which were common to four of the five lists.

The list of 2329 words was then compared with the word lists in each of these investigations with the following results:

- 893 of these words were not found in the Jones list.
- 1,623 of these words were not found in the Smith list.
- 1,154 of these words were not found in the Bauer list.
- 1,174 of these words were not found in the Brown list.
- 1,099 of these words were not found in the Tidyman list.
- 587 of these words were not found in any one of the five lists.

These data seem to indicate clearly that no previous investigation has used a list of topics which was at all adequate to discover what words a child can use in a theme. This defect probably accounts for the lack of agreement among the lists, as well as for the relatively small vocabulary found in each in proportion to the number of words analyzed.

The 1475 words common to four of the five previous theme investigations were then compared with the Horn investigation of adult writing needs and with the Thorndike investigation of the vocabulary of reading. Mrs. McKee draws two conclusions from these comparisons: first, that very few of the words in children's themes were not found in investigations of adult writing or reading needs; and second, that the vocabulary of theme investigations falls so far short of adult requirements as to constitute inadequate preparation for adult needs.

The comparison of Mrs. McKee's list with that of Thorndike and that of Horn shows that 368 of the 2329 words in Mrs. McKee's original investigation are not in the Horn list and that 758 of these words are not in the Thorndike list. The conclusions to be drawn from these figures are: first, when the vocabulary of children is stimulated by an adequate list of theme topics, the vocabulary of the themes secured more nearly resembles that of adult writing than it does that of adult reading or that secured by any of the previous investigations of children's themes; second, if children write upon a wide list of topics dealing with every phase of their experience, the vocabulary secured will certainly be very much greater than that obtained in any previous investigation of children's themes.

STUDY NO. 22. Capps, A. G. "Curriculum content of a high school spelling course." *Journal of Educational Research* 2: 626-655, October, 1920.

Purpose. To discover the words misspelled in the course of the school year by high school pupils in a school of 120 pupils in a town of 1000 inhabitants in northern Missouri.

Source. All the written work of pupils including note-books.

Number of words analyzed:	956,730
Number of errors:	3,388
Number of different words misspelled:	1,925

Comment. Twenty-eight different words were misspelled 10 or more times, totaling 553 misspellings, or 16 per cent of the errors made. Sixty-two different words were misspelled five to nine times, totaling 400 misspellings. Forty-four different words were misspelled four times, totaling 176 errors. And ninety-nine were misspelled three times, totaling 297 errors. Sixty-two of the words misspelled are in the Ayres' Thousand Commonest Words.

It should be kept in mind that the vocabulary, and therefore the spelling errors, found in the written work of high school students is determined by the nature of the topics written upon. Many of the words reported in this investigation are technical words used in connection with high school subjects and are not found among words frequently used in life outside the school.

STUDY NO. 23. Lester, John A. "A study of high school spelling material." *Journal of Educational Psychology*, 13: 65-74, February, 1922; 152-159, March, 1922.

Purpose. To find those words actually misspelled by secondary school seniors from public high schools and preparatory schools.

Source. The written work of 2414 candidates for the College Board Entrance Examination in English for the seven years, 1913-1919.

Number of running words analyzed: 1,378,000 (approximately)

Comment. The total number of misspellings found was 14,002. The total number of misspelled words was 2620. Ten words were misspelled 917 times and contributed 6.05 per cent of the misspellings. Fifty words were misspelled 2688 times and contributed 19.2 per cent of the misspellings. One hundred words were misspelled 4259 times and contributed 30.4 per cent of the misspellings.

Table 9 gives the full statement of these facts:

**TABLE 9.—MISSPELLED WORDS TAKEN FROM WRITTEN WORK
OF 2414 CANDIDATES FOR THE COLLEGE BOARD ENTRANCE
EXAMINATION IN ENGLISH**

Number of Words	Times Misspelled	Per Cent of Misspelling Contributed
10	917	6.05
50	2,688	19.2
100	4,259	30.4
200	6,161	44.0
250	6,801	48.6
300	7,376	52.6
400	8,275	59.1
500	9,016	64.4
600	9,622	68.7
700	10,122	72.3
775	10,497	75.0
1,000	11,367	81.0
2,000	13,400	95.7
2,620	14,002	100.0

The fifty words most frequently misspelled are given in the order of the frequency of their misspelling, together with the most frequent ways of misspelling them. The first ten were *too*, *its*, *believe*, *together*, *their*, *principal*, *committee*, *therefore*, *separate*, and *pleasant*. These ten words contributed 6.05 per cent of the errors. In another source¹ the 775 words which contributed 75 per cent of the errors are given in the order of the frequency of their misspelling. Thirty-one per cent of these words are in the Ayres list of the one thousand commonest English words.

This study is important because it was among the first studies to find the words actually misspelled by secondary school pupils. It must be pointed out that the written work from which the words were selected was highly specialized and included little opportunity for the use of colloquial language. Then, too, the group that takes the College Entrance Board Examinations is highly selected. What effect these two factors had on the words misspelled is problematical.

STUDY NO. 24. Cesander, P. K. *A basic high school spelling list.* Master's thesis in preparation, State University of Iowa. (Mr. Cesander is superintendent of schools, Rushford, Minn.)

Purpose. To find the words actually misspelled by high school pupils of all grades in written examinations prescribed by the state.

Source. The examination papers in all high school subjects for the four grades, written on questions prepared by a state examining board. Papers from a very large per cent of the high schools of one state will be analyzed.

This list, when completed, will give those words which representative high school pupils of the Middle West misspell in such examinations as are now required.

Up to date, the following papers have been analyzed with the results shown in Table 10.

TABLE 10.—WORDS MISPELLED BY HIGH SCHOOL PUPILS OF THE MIDDLE WEST

Subject	Number of Papers	Number of Running Words	Number of Misspelled Words	Number of Misspellings
General History I.....	163	150,000	320	725
General History II.....	187	224,438	350	510
English I.....	475	205,119	244	502
English II.....	377	196,419	350	470
General Science.....	203	109,830	320	500

¹ Lester, John A. A spelling review, 1920, Pottstown, Pa. John A. Lester, Hill School, Publisher.

III. What is the significance for purposes of spelling of the words found in:

a. Investigations of the vocabulary of reading.

STUDY NO. 25. Thorndike, E. L. *The teachers' word book*. New York, Teachers College, Columbia Univ., New York City.

This investigation is not reviewed in detail here, since such a summary belongs more properly to the section on reading.

This investigation deals with the vocabulary of reading rather than with that of spelling. To quote Professor Thorndike: "It should be noted further that this is *not* a spelling list. If it is used as an aid in the construction of spelling lists, the derived forms in *s, ies, ly, er, r, est, st, s, ed, d, ing*, and *n* should be inserted. They may offer notable difficulty in spelling even when easily read and understood by derivation."

And yet the nature of the English language is such that this list affords valuable additional data upon the words commonly needed in writing. While it is questionable to include in a spelling list a word which occurs in the Thorndike list but not in the important investigations of writing vocabularies, there is no doubt that a word found not only in spelling but also in reading takes on additional importance. This investigation not only contributes the most important collection of data concerning the vocabulary of reading, but also furnishes exceedingly valuable data for purposes of measuring the overlap between the vocabulary of reading and the vocabulary of spelling.

STUDY NO. 26. Dewey, Godfrey. *Relativ frequency of English speech sounds*. Cambridge: Harvard Univ. Press, 1923.

Purpose. "The object of this study was to determin the relativ frequency of occurrence, in good English, as written and spoken today, of the various simple sounds and commoner sound combinations—sillables and words—of the English language."

Source. Approximately 10 per cent of personal and business correspondence and 90 per cent of widely varied types of reading matter.

Number of running words: 106,404

Number of different words: 10,161

Comment. Although this investigation deals chiefly with the vocabulary of reading, the author's interest in phonetic spelling leads him to make some interesting comparisons between his own results and those of investigations of writing vocabularies. The book is intended as a contribution to phonetics.

The following investigations of the vocabulary of school readers are of service in determining in the primary grades the relationship of the vocabulary of spelling and the vocabulary of reading. These investigations are

merely listed here since they are reviewed in this Yearbook in the chapter on reading.

Packer, J. L., "The vocabularies of ten first readers." *The 20th Yearbook*, Part II, Chap. IX. Bloomington, Ill.: Public School Pub. Co., 1921.

Housh, E. T., "Analysis of the vocabularies of ten second year readers." *The 17th Yearbook*, Chap. IV, Bloomington, Ill.: Public School Pub. Co., 1918.

Miller, N. S., "A critical analysis of vocabulary of ten third readers." Master's Thesis, Univ. of Iowa.

Kircher, H. W., "Analysis of the vocabularies of 37 primers and first readers." *The 24th Yearbook*, Part I, Chap. VII. Bloomington, Ill.: Public School Pub. Co., 1925.

b. Investigations of the vocabulary of speaking.

STUDY NO. 27. Horn, Ernest. "The vocabulary of children up to and including first grade." *The 24th Yearbook* of the National Society for the Study of Education, Part I, Chap. VII. Bloomington, Ill.: Public School Pub. Co.

Purpose. To discover the nature and extent of the spoken vocabulary of young children.

Source. 1. An investigation by the author of the vocabularies of individual children varying in age from one to six years.

2. Horn, Madeline. *The Vocabulary of Kindergarten Children.*

3. Packer, P. C. *The Spoken Vocabulary of First Grade Children.*

Number of running words: Approximately 200,000 of children of kindergarten age; approximately 70,000 of children in the first grade; number of running words was not reported by those who contributed the vocabularies of individual children.

Number of different words: Approximately 5000.

Comment. Many of the 5000 different words which were reported occurred but once or twice. In order to secure a more limited list, all words were taken which occurred in three investigations with a frequency of 15 or more, or in two of the investigations with a total frequency of 25 or more. This limited list of words is printed without frequencies. This list contains the words which children understand and use most freely up to and including the age of six. It is therefore useful in helping the curriculum maker to determine what words should be included in the primary grades. It is also interesting to compare the number of different words found in the spoken vocabulary of children of not more than six years with that reported in the investigations of children's themes.

STUDY NO. 28. Graham, L. J. *The vocabulary of the geography recitation.* Master's thesis, Univ. of Iowa, 1923.

Purpose. 1. What are the words used by children in classroom recitations in geography?

2. In what way does this vocabulary differ from grade to grade?

3. How does this vocabulary differ from that of the reading vocabulary reported by Thorndike and from that of adult writing compiled by Horn?

Source. Stenographic reports of geography lessons. Samplings in long-hand of pupil recitations in geography.

Number of running words: 106,071

Number of different words: 5,519

Comment. 783 of the 5519 words found in this investigation are geographical names; 3050 are not found in the Thorndike list, 2565 are not found in a compilation of 800,000 running words of adult correspondence. This compilation included the following investigations described elsewhere in this report:

1. Cook and O'Shea.
2. Andersen.
3. Ayres.
4. Houser.
5. Studies reported in the California Speller.
6. Clark.
7. Horn, Bankers' letters.
8. Horn, 100,000 running words of personal correspondence.

Mr. Graham concludes that it is probable that at least half of the words "which a child uses in his oral recitations in geography are words which he will not use in his writing or find in his general reading." He adds, however, that a much larger sampling will have to be made before such conclusion could be finally accepted.

STUDY NO. 29. Phares, Mary L. *A study of the classroom spoken vocabulary of seventh and eighth grade pupils: Its possible bearing upon the problems of spelling.* Master's thesis, State Univ. of Iowa, 1923.

Purpose. As stated in the title.

Source. Stenographic reports of recitations. Longhand samplings from pupil recitations in these grades.

Number of running words: 141,957

Number of different words: 7,506

Comment. There are three significant contributions in this thesis. First, it shows the extensive vocabulary requirements put upon children in these grades; second, it shows the amount of overlap between this vocabulary and that needed in writing letters; third, it adds to the knowledge of the spoken vocabulary requirements in recitations in each of the prominent subjects taught in the seventh and eighth grades.

Miss Phares reports that 53 per cent of the words found in her investigation occur also in a compilation of 800,000 running words of corre-

spondence. 51 per cent of the words found in her investigation occur also in the Thorndike list.

c. Investigations of the vocabulary of other languages.

STUDY NO. 30. Kaeding, F. W. *Häufigkeitswörterbuch der deutschen Sprache*. Steglitz bei Berlin: Selbstverlag des Herausgebers, 1898, pp. 671.

Purpose. To secure adequate data on the frequency of words, syllables, sound combinations, and letters in the German language for a critical examination and revision of German systems of shorthand.

Source. A wide sampling was taken from literature in the following fields:

	Number of Words.	Number of Syllables.
1. Legal	400,000	810,442
2. Theological	400,000	670,856
3. Medical	100,000	189,832
4. Commercial	300,000	597,786
5. Historical	500,000	894,890
6. Classical	2,000,000	3,329,087
7. Letters:		
a. Commercial	100,000	191,282
b. Military	200,000	375,468
c. Private	700,000	1,182,981
8. Political	900,000	1,745,875
9. Discoveries	400,000	777,047
10. General Military	600,000	1,147,974
11. Miscellaneous	4,306,235	8,086,480

Number of running words: 10,910,777

Number of syllables: 20,000,000

Number of different words: 258,173 (of which 49.14 per cent occur but once.)

Number of letters: 60,558,018

Comment. This monumental work was begun in 1891 after the director had presented to associations of stenographic systems the need for frequency investigations of words, syllables, sounds, sound combinations, and letters if systems of shorthand are to rest on a scientific basis. The necessity for a word count on an extensive scale appeared when comparisons were made of the frequencies of even commonly occurring words with varying material. For example, in forty-five sets of 100,000 words each the range of frequencies for *zu* was from 974 in one list to 1959 in another; for *es* 278 to 1254; and for *er* 198 to 1400. Previously published word or syllable counts, based on considerably less than 100,000 syllables were therefore entirely inadequate.

The research was planned to the last detail. Each word to be counted was written on a card by the participants and the cards sorted into classes according to the number of syllables and according to the type of mate-

rial on which the count was based. 665 individuals coöperated in this preliminary work. Each set contributed was checked at least once, and in difficult sections of the work, twice. 167 coöperators then assisted in grouping all the original material into unit sets of 100,000 words for each sort of literature. Within each set the material was distributed also according to the number of syllables. Table 11 sets forth the summary of words and syllables without the distribution according to type of material.

TABLE 11.—SUMMARY OF WORDS EXAMINED IN THE GERMAN LANGUAGE

Number of Syllables Per Word	Words	Percentage	Syllables
1 Syllable.....	5,426,326	49.76	5,426,326
2 Syllables.....	3,156,448	28.94	6,312,896
3 Syllables.....	1,410,494	12.93	4,231,482
4 Syllables.....	646,971	5.93	2,587,884
5 Syllables.....	187,738	1.72	938,690
6 Syllables.....	54,436	.50	326,616
7 Syllables.....	16,993		118,951
8 Syllables.....	5,038		40,304
9 Syllables.....	1,225	.22	11,025
10 Syllables.....	461		4,610
11 Syllables.....	59		649
12 Syllables.....	35		420
13 Syllables.....	8		104
14 Syllables.....	2		28
5 Syllables.....	1		15
Total.....	10,906,235		20,000,000

The average number of syllables per word ranged from 2.02 for legal and juristic literature to 1.79 for historical material. The general average for all material is 1.83 syllables per word.

The next step was the alphabetical arrangement of all the individual words, the card for each word giving the total frequency in the 10,910,777 words, the frequency per 100,000 words with each type of material, and the frequency with the individual sets of material.

The next step was the analysis of the frequencies of each word in derivatives and compounds as prefixes, roots, and suffixes. For example, the frequency of *Schloss* when appearing alone was counted and also in compounds such as *Luftschloss*, *Kastenschloss*, *Königsschloss*, etc., or of *her* alone and in compounds such as *bisherige*, *woher*, *daher*, *beiher*, etc. The prefixes were written on blue cards, the suffixes on red cards, and root words on white cards and counted, being classified also as to the number of syllables in each.

Finally there was made a count of the letters and the frequency of various combinations which are matters of special interest in the construction of stenographic systems.

The publication of the enormous mass of material accumulated was of course out of the question. The book gives in detail alphabetically and in order of frequency the words, roots, prefixes, and suffixes that occurred 5000 times or more, with an indication of the number of times each was cap-

italized and in small letters. Three words, *die*, *der*, and *und*, constitute 9.47 per cent of all words. The 15 commonest words take up 25.22 per cent of written language, while 66 words make up 50.06 per cent, or half, of running discourse. The 320 words which occur 5000 times or more make up 72.25 per cent of the word frequencies.

Then appears an alphabetical list of the 79,716 words which occur four times or more. The facts presented can be illustrated by an example. *Leben* appears in the list as *leben* (50) 158/483, which means that it occurred 483 times, 158 times as a simple word and capitalized 50 times, while 325 times it appeared in compounds or derivatives.

The root syllables which appeared 5000 times and more are listed alphabetically and in order of frequency with figures for the frequency among the 258,173 words and the average frequency per 100,000 words. There are 401 such forms. There are also listed alphabetically all the root syllables which occurred eight times or more.

Then are listed the prefixes with all their combinations and a separate frequency list of separable and inseparable prefixes. Similarly are listed the simple and compound suffixes which occur 1000 times or more and a list of all suffixes, final and auxiliary syllables.

Part III of this stupendous work is a letter count of the 60,558,018 letters for the 20,000,000 syllables counted. The frequencies of all letter combinations are tabulated and classified as to appearance in prefixes, roots, and suffixes; complete tabulations are also given of all the vowel and consonant sounds and all sound combinations.

The extraordinary detail of the investigation is indicated finally by the tabulation of the frequencies of different forms of punctuation in 9,580,000 running words.

The director met with indifference and open antagonism in his heroic undertaking. Financial support was inadequate and very difficult to secure. Only a portion of the tabulations could be published. All the original cards and tables are deposited in the Royal Library of Berlin for the use of other investigators.

This study is of great value in determining the fundamental ideas for which a vocabulary is needed in any western civilized country. It has valuable uses also in determining the validity of word counts in other languages. For example, in the compilation of adult writing needs by Horn, the commonest noun was *time* and the fourth commonest noun was *order*. It was felt that possibly *order* was overweighted because of its use in business letters. However, reference to the most frequent words in the Kaeding list showed *Zeit* as the commonest noun and *Ordnung* as the second commonest noun.

STUDY NO. 31. Henmon, V. A. C. *A French word book*, based on a count of 400,000 running words. Madison, Wis. Bulletin of the Bureau of Educ. Research, Univ. of Wisconsin Study No. 2, 1924. (In press.)

Purpose. To determine the 1000 commonest words in French discourse.

Source. Wide sampling as indicated below.

Number of running words: 400,000

Number of different words: 9,187 (reduced to dictionary basis)

Comment. This study was undertaken in connection with an investigation for the American Classical League inquiry on the relation of the study of Latin to progress in learning French. The question naturally arose as to the vocabulary in Latin that would be most useful in preparation for the later study of French. Inquiry abroad revealed no word frequency investigations in French. The sources used were as follows:

Texts edited for use in schools and colleges.....	80,000 words
Philosophical prose	20,000
Magazine articles	50,000
Newspaper articles	30,000
Modern French writers (de Maupassant, Daudet, de la Brète, etc.)	140,000
Poetry	15,000
Political and military articles and essays.....	25,000
Letters and Telegrams	15,000
Popular fiction	25,000
	400,000

The tabulation in the published material gives a list of 3500 words which occur five times or more, arranged alphabetically and in order of frequency. French vocabulary scales similar to Thorndike word scales in English graduated on a basis of the frequency of occurrence found have been prepared for publication.

In addition to the purposes for which this study was made, it constitutes a valuable addition to our knowledge of the fundamental vocabulary needs in any western civilization. A comparison between this vocabulary and that most frequently needed in reading and writing English shows a large overlapping. Where differences occur they indicate in an interesting way that where the customs of one country differ from another, a parallel difference will be found in the vocabularies of the two countries.

d. Investigations of the vocabulary needed in connection with other school subjects.

STUDY NO. 32. Byrne, Mary B. C. and Yocum, A. D. *An investigation into the word contribution of every subject required or suggested by the New York City curriculum for the first three years in school.* (Unpublished.)

Purpose. As indicated in the title.

Source. Subject-matter of the course of study for three grades.

Number of running words: Not reported.

Number of different words: Not reported.

Comment. This investigation has been carried on over a period of seven years. It has consisted in the analysis and recording of the "vocabulary contribution of each subject and activity, regardless of whether the source was game, poem, song, story, dance, hygiene, number, dramatization, drawing, construction, sewing, trip lesson, nature, lantern-slide lesson, phonograph lesson, picture study, or what not. Every possible vocabulary source has been combed with care to discover the specific word contribution of each subject, and the total vocabulary contribution of all subjects."

After this vocabulary was determined, further study was made for the purpose of determining the relative worth of each word and also the relative ease or difficulty with which each word is acquired.

While the reviewer has not seen the detail of the investigation, it seems likely to afford data of value for deciding which words among those of known utility in writing may be most advantageously taught in the first three years of school.

STUDY NO. 33. Pressey, Luella C. "The determination of the technical vocabulary of school subjects." *School and Society*, Vol. 20, July 19, 1924.

See also, Pressey, Luella C. "The technical vocabulary of school subjects." Bloomington, Ill., Public School Pub. Co., 1924.

While this investigation is primarily a contribution to reading vocabularies, it will doubtless prove of use to those who wish to include subject lists in spelling courses of study. If pupils are to be required to learn to spell the principal words used in each of the prominent school subjects, this investigation should prove helpful by showing the most important technical words in each subject.

CHAPTER V

READING

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MORE THAN five hundred investigations of reading have been reported during the last thirty years. A recent summary of these studies shows that a large proportion of them contribute to a better understanding of the problems of reading instruction and are, therefore, of value in efforts to reorganize courses of study and to improve classroom teaching.

When the preparation of this section was undertaken it became apparent at once that it would be impossible to summarize in detail in the space assigned to the Sub-Committee on Reading even a small percentage of the studies which are of value in constructing courses of study in reading. The plan was adopted, therefore, of summarizing briefly the results of a large number of investigations that relate directly or indirectly to twelve specific problems that arise in organizing courses of study in reading. A list of these problems follows together with the names of the committee members who prepared the various sections of this chapter.

- I. Aims of reading instruction. (*William S. Gray.*)
- II. Fundamental habits in oral and silent reading. (*William S. Gray.*)
- III. Growth periods or rates of progress in important phases of reading. (*W. W. Theisen.*)
- IV. Children's interests in reading. (*Frances Jenkins.*)
- V. Results of investigations of reading materials. (*W. L. Uhl.*)
- VI. Scientific studies in the field of literature. (*S. A. Leonard.*)
- VII. Studies of reading vocabularies. (*H. A. Greene.*)
- VIII. The evaluation of teaching techniques. (*Laura Zirbes.*)
- IX. The place of phonetics in teaching reading. (*Frances Jenkins.*)
- X. Provision for individual differences. (*W. W. Theisen.*)
- XI. Diagnosis and remedial work. (*Laura Zirbes.*)
- XII. Time allotment. (*F. W. Ballou and Elizabeth Hummer.*)

The organization of the report in terms of problems has necessarily resulted in reference to certain studies in several different sections. This could not be avoided inasmuch as many studies contribute valuable information concerning several problems.

Many other problems relating to curriculum issues would have been discussed and the results of a larger number of investigations summarized in the discussion of each topic, if space had permitted.

I. Aims of Reading Instruction

Current statements of aims differ widely—While it is true that the aims of reading have been discussed widely during recent years, only a

limited number of scientific studies have been published. The four investigations to which reference is made here reflect widely different views.

Aims as reported by elementary-school teachers—In 1917, Gray¹ tabulated the "most desirable results or outcomes of the teaching of reading in the elementary school" as reported by 715 teachers of a large city. The various aims and the percentage of teachers mentioning each follow:

	Per cent
Appreciation of good literature.....	68
Ability to comprehend.....	64
To secure information.....	40
Improvement in oral-reading ability.....	38
Enlargement of vocabulary.....	24
Mastery of the mechanics of reading.....	15
Training for leisure.....	15
Improvement in oral and written English.....	14
Improvement in study habits.....	10
Development of general mental qualities.....	7
Ability to reproduce and utilize materials read.....	6
Moral training.....	6
Use of books.....	1

Although these aims include some of the uses of reading in school and modern life their major emphasis is upon the traditional values attached to reading.

Aims given in state courses of study for rural schools—Reinoehl² made a detailed analysis of the aims of reading as given in 44 state courses of study most of which were issued since 1914. Since less than half of these courses have since been revised, the aims discussed represent to a large extent current objectives of reading in rural schools. The aims which appeared most frequently follow:

Intelligent interpretation of the printed page with reasonable accuracy and rapidity.

Ability to read (for others) in pleasing, natural, forceful expressive ways.

Appreciation of and love for good literature.

Clean, healthy, profitable, enjoyable employment.

Creation of a compelling desire to read the best well.

Develop the power to picture vividly.

For ethical culture and moral development.

Develop the power of discriminative reading.

It is apparent that these aims give most emphasis to intelligent interpretation, expressive oral reading, the appreciation of good literature, and the development of permanent interests in reading.

¹ Gray, William S. "Reading in the elementary schools of Indianapolis." *Elementary School Journal* XIX (January, 1919), 336-53.

² Reinoehl, Charles M. Analytical survey of state courses of study for rural elementary schools, pp. 65-6. *Bureau of Education Bulletin*, 1922. No. 42.

A survey of English objectives—The most extensive study of reading aims thus far completed was made by Pendleton¹ who consulted seven sources of information in a painstaking study of English objectives. These sources were statements of 272 teachers of English, statements of 100 educators, the articles, editorials, and notes pertaining to English published in eleven important periodicals during the years 1915-20, 67 standard general volumes on education, 118 standard volumes about English and the teaching of English, 49 state or municipal courses of study or teachers' manuals in English, and 62 current textbooks on various phases and levels of English. After the aims had been determined they were ranked in the order of importance by eighty teachers of English. Six of the objectives which were considered most important follow:

The habit of reading for enjoyment literature of the better sort.

A taste for reading books (not merely magazines) of an excellent sort.

An attitude of alert interest in the world and all things in it and a desire to increase one's knowledge.

A perennial never-failing interest in people; the habit of studying them sympathetically.

The ability to refrain from marking or marring in any way a borrowed book.

The complete list of objectives include 409 which relate more or less directly to reading. It is evident from the examples given that the objectives which were considered most important reflect largely the special reading interests of teachers of literature.

Limitations of the reading aims presented—The studies of aims to which reference has been made have serious limitations. They indicate primarily what teachers of reading and literature have emphasized in the past and what has appeared most frequently in courses of study. They summarize current practices rather than seek to determine the most valuable uses of reading in school and in modern social life or the changes which should be made in the aim and content of reading instruction. They are, therefore, of limited value in any effort to reorganize courses of study or to improve and refine the technique of teaching.

Uses of reading in social life—In a series of investigations including conferences with more than 900 adults, Gray,² Parsons,³ and others found "that intelligent reading is a most significant means of familiarizing adults with current events, with significant social issues, with community and national problems and with American institutions, ideals, and aspirations." It was also found to be an indispensable means of attaining vocational

¹ Pendleton, S. C. An inquiry into the current specific objectives in English in the public elementary school and high school, Chap. IV. Doctor's dissertation, The Univ. of Chicago, 1921.

² Gray, William S. "The importance of intelligent silent reading." *Elementary School Journal*, XXIV (January, 1924), pp. 348-52.

³ Parsons, R. B. *A study of adult reading*, pp. 96-97. Master's Thesis, The University of Chicago, 1923.

efficiency, of extending experience, of securing a broad outlook on life, and of securing pleasure and profit during leisure hours. The investigations showed that practically all of the reading of adults is done silently. "Fewer than 5 per cent reported oral reading on other than very infrequent occasions." Nevertheless, several important purposes or occasions of oral reading were mentioned. The three reported most frequently were to inform or entertain others in private or public, to increase one's understanding and appreciation of materials read, and to entertain and interest children in reading.

Uses of reading in school—Gray made a study of the uses of reading in preparing assignments in 250 fourth, fifth, and sixth grade classrooms¹ of Rochester and Buffalo and in 250 high school classes² in the central west. These studies showed that reading is used for a wide variety of specific purposes such as finding the author's aim, selecting the main point and supporting details, finding answers to questions, following directions, and securing information to aid in the solution of a problem. The studies showed also that the uses of reading vary in different subjects. Judd and Buswell³ found that changes in the purposes of reading are accompanied by corresponding changes in the habits employed. It follows that specific training should be given in each important use of reading and that effective habits of reading and study should be taught in each content subject as well as during the literature period.

Conclusions—The studies to which reference has been made suggest the following tentative conclusions: (a) That the traditional aims of reading fail to give sufficient emphasis to modern reading needs; (b) that one of the primary purposes of reading is to extend the experiences of the reader, stimulate his thinking powers, and enable him to interpret life more intelligently and accurately; (c) that instruction in reading should develop strong motives for and permanent interests in reading that direct and inspire the present and future life of the reader; (d) that reading should cultivate the attitudes, habits, and skills that are essential in desirable reading activities. These include habits of intelligent interpretation, the fundamental habits of fluent, accurate oral reading and speed of silent reading, effective habits of interpretative oral reading, and skill in the use of books and sources of information.

II. Fundamental Habits in Oral and Silent Reading

The fact has been emphasized that a program of instruction should provide for the development of all essential habits involved in intelligent interpretation, effective oral reading and speed of silent reading. Scientific

¹ Unpublished.

² Gray, William S. "The relation between study and reading," pp. 580-6. *National Education Association: Addresses and Proceedings*, LVII, 1919.

³ Judd, Charles H., and Buswell, Guy T. "Silent reading: a study of its types." Chap. III. *Supplementary Educational Monographs*, No. 23, 1922.

studies have distinguished five such habits for both oral and silent reading—namely, accurate recognition, span of recognition, rate of recognition, the rhythmical progress of perceptions along the lines, and the accurate return sweep of the eyes from the end of one line to the beginning of the next. It is the purpose of this section to consider the nature of these habits and conditions that affect their development.

Accuracy and independence in recognition—The fact is generally recognized that the good reader recognizes words independently and accurately. Although the pronunciation of words need not be recognized in all silent reading activities a reader should be able to recognize them if occasion demands. Inaccuracies of recognition in oral reading result in errors. Several tabular studies¹ of such errors have been made which reveal interesting information concerning their variety and frequency. The most important types reported are non-recognitions, total mispronunciations, partial mispronunciations, omissions, insertions, repetitions, and substitutions.

The causes of errors or failure² in recognition have been classified into ten groups as follows: defective vision; immature language habits; self-consciousness and timidity; lack of interest; limited reading experience; carelessness and lack of feeling of responsibility; failure to direct attention to content; inability to analyze words; a narrow span of recognition; and irregular eye-movements.

The studies to which reference has been made reveal additional facts which should be considered in organizing a program of reading instruction:

Progress in accuracy of recognition varies with the difficulty of the material read, with the kind of instruction given, and with the conditions that prevail in different schools and school systems.

Progress in the elimination of errors in simple passages may take place relatively early in the grades.

Schools which eliminate simple errors early make most rapid progress in developing accuracy and independence in dealing with more difficult words.

Schools that develop accuracy and independence early are free to devote a relatively larger proportion of time to more valuable reading activities later in the grades.

¹ McGrath, Jane. *An experimental study in first grade reading*. Master's Thesis, The Univ. of Chicago, 1918. Gray, C. T. "Types of reading ability as exhibited through tests and laboratory experiments." *Supplementary Educational Monographs*. Vol. I, No. 5, 1917. Chap. II. Anderson, C. J., and Merton, Elda. "Remedial work in reading." *Elementary School Journal*. XX (May-June, 1920), pp. 685-701; 772-91. McLeod, L. S. "The influence of increasing difficulty of reading material upon rate, errors, and comprehension in oral reading." *Elementary School Journal*, XVIII (March, 1918). pp. 523-32. Gray, William S. "Reading in the elementary schools of Indianapolis." *Elementary School Journal*, XIX (February, 1919). pp. 419-44.

² Gray, William S. Remedial cases in reading, their diagnosis and treatment. *Supplementary Educational Monographs*, No. 22, 1922, pp. 128-9. Charles H. Judd. Reading: its nature and development. *Supplementary Educational Monographs*. Vol. II, No. 4, 1918, p. 60.

As the difficulty of the material increases for a given class the character of the errors changes and their number increases. Furthermore, as pupils advance through the grades new types of difficulties are encountered. It follows that the teachers of each grade are confronted with the problem of teaching pupils to recognize words accurately and independently. Courses of study should provide systematic instruction throughout the grades in accuracy and independence of recognition based upon the dominant types of errors made in each grade.

Various methods have been found valuable in overcoming difficulties in word recognition. The following were used by Gray¹ and others in a number of remedial cases: directing attention to the content; drill on words similar in form until they are recognized as sight words or because of their similar elements; drill on phonetic elements, practice in word building, and training in the phonetic analysis of short words; and training in the analysis of polysyllabic words by recognizing familiar parts, dividing words into syllables, and studying prefixes and suffixes. A summary of the evidence with regard to the place of phonetics in a program of instruction will be discussed in a later section.

Span of recognition—The amount recognized at each fixation of the eye is "a very strong factor in determining speed efficiency in both silent and oral reading."² The size of the unit recognized in reading has been measured in terms of the number of fixations of the eyes per line. The results secured by Schmidt in a laboratory experiment appear in Table 12. The entries show that there are wide individual variations and that the amount

TABLE 12. RANGE IN AVERAGE NUMBER OF WORDS RECOGNIZED PER FIXATION

Type of Reading	Adults	High School Students	Elementary Pupils
Oral.....	1.52 to .87	1.39 to .98	1.62 to .86
Silent.....	2.15 to .93	2.04 to 1.04	2.44 to 1.04

Arranged from Schmidt's data, p. 56.

recognized per fixation is greater in silent than in oral reading. The greater speed of silent reading is due largely to this difference in span of recognition.

The entries in Table 12 suggest that there is little growth in span of recognition. This impression is due to the fact that most of the increase comes very early in the grades as shown in an investigation by Buswell³.

¹ Gray, William S. Remedial cases in reading, their diagnosis and treatment. *Supplementary Educational Monographs*. No. 22, 1922. pp. 101-7. Anderson, C. J., and Merton, Elda. "Remedial work in reading." *Elementary School Journal*. XX (May-June, 1920). pp. 685-701; 772-91.

² Schmidt, W. A. An experimental study in the psychology of reading. *Supplementary Educational Monographs*. Vol. I, No. 2, 1917, p. 57.

³ Buswell, Guy T. Fundamental reading habits: a study of their development. *Supplementary Educational Monographs*. No. 21, 1922, Chap. II.

Table 13 includes the average number of fixations per line for both oral and silent reading. The entries in this table show clearly "that the chief

TABLE 13. AVERAGE NUMBER OF FIXATIONS PER LINE IN SILENT AND ORAL READING

Type of Reading	School Grades											
	IB	IA	II	III	IV	V	VI	VII	Fresh.	Soph.	Jr.	Sr. Col.
Silent.	18.6	15.5	10.7	8.9	7.3	6.9	7.3	6.8	7.2	5.8	5.5	6.4 59
Oral.	16.0	14.5	12.0	10.4	10.3	8.7	8.9	8.7	9.1	8.3	8.0	9.3 84

Arranged from Buswell's data, pp. 26 and 37.

development in span of recognition comes early in the school course."

Evidence concerning the effect of training on the span of recognition has been secured by Gray and by O'Brien. Gray¹ gave short exposure exercises and practice in rapid reading to two sixth-grade pupils, one a slow reader and the other a rapid reader. The records of their eye-movements before and after the practice period show that training may increase the size of the unit recognized. O'Brien² obtained similar evidence from five pupils representing the fourth, fifth, and seventh grades who had received training to increase the speed of silent reading and to decrease vocalization. The records showed a "noticeable reduction in the number of fixation pauses" in all the grades represented.

The findings which have been reported show that the first four grades represent the period of most rapid increase in span of recognition and that provision should be made in these grades for appropriate training. The fact should be recognized, however, that practice may prove effective later in the grades in case it is needed.

Rate of recognition.—A good reader not only recognizes large units at each fixation but he also recognizes units rapidly. Schmidt³ found that the average duration of reading pauses varied from 214 to 470 thousandths of a second in silent reading and from 230 to 520 thousandths of a second in oral reading. It is evident from these data that some readers recognize given units much more rapidly than other readers. They also show that recognition is more rapid in silent than in oral reading.

Growth in rate of recognition occurs most rapidly in the primary grades. Buswell's⁴ studies show that it "is one element of reading which can be brought to the level of maturity very early in the school period." His data indicate that a rate of recognition "of from 5 to 6 twenty-fifths of a second satisfies the demands of maturity in reading."

¹ Gray, C. T. Types of reading ability as exhibited through tests and laboratory experiments. *Supplementary Educational Monographs*. Vol. I, No. 5, Chap. V.

² O'Brien, J. A. *Silent reading*, Chap. X. Macmillan Company, New York, 1921.

³ Schmidt, W. A. An experimental study in the psychology of reading. *Supplementary Educational Monographs*. Vol. 1, No. 2, 1917, p. 118.

⁴ Buswell, Guy T. Fundamental reading habits; a study of their development. *Supplementary Educational Monographs*. No. 21, June, 1922, Chap. II.

Little specific evidence has been obtained concerning the effect of training on rate of recognition. The studies of O'Brien¹ and Gray² did not reveal improvement. Their subjects were in the fourth grade or above and the training provided was not given specifically to increase rate of recognition. It remains, therefore, to determine the types of training that are most effective in increasing the rate of recognition and the grades in which results can be secured most economically and effectively. In the meantime, teachers should continue to make use in the primary grades of methods that experience has taught are valuable, such as providing simple selections that are highly charged with interest, developing strong motives for reading, encouraging much independent reading of simple exercises, and providing frequent quick perception exercises.

Rhythmical progress of perceptions—Huey³ early observed that "readers showed a strong rhythmic tendency. Each would fall into a reading pace that seemed most natural to him, and would read page after page in almost exactly the same time." Later experiments of Dearborn, Schmidt, Gray, Buswell, and Judd confirm Huey's observations.

Irregularity in the progress of perceptions has been measured in terms of the number of regressive movements per line. In an analysis of the causes of regressive movements, Buswell⁴ discovered four types produced by as many different causes. They are (a) irregularities at the beginning of lines due to inaccurate return sweeps, (b) irregularities on the part of mature readers who overreach their maximum span of recognition, (c) lack of word knowledge, and (d) "periods of confusion." Judd and Buswell⁵ discovered the following additional causes: increase in difficulty of material read, changing from more familiar to less familiar content, and changing the purpose of reading, for example, from rapid reading to study.

Few efforts have been made to promote the rhythmical progress of perceptions or to eliminate regressive movements through specific training exercises, excepting in remedial cases.⁶ The latter type of studies shows that

¹ O'Brien, J. A. *Silent reading*. Chap. X. New York: Macmillan Company, 1921.

² Gray, C. T. Types of reading ability as exhibited through tests and laboratory experiments. *Supplementary Educational Monographs*. Vol. I, No. 5, Chap. V.

³ Huey, E. B. *The psychology and pedagogy of reading*, p. 175. New York: Macmillan Company, 1912.

⁴ Buswell, Guy T. Fundamental reading habits: a study of their development. *Supplementary Educational Monographs*. No. 21, 1922. pp. 34-36.

⁵ Judd, Charles H. and Buswell, Guy T. Silent reading: a study of its types: *Supplementary Educational Monographs*. No. 23, 1922. Chap. II and III.

⁶ Gray, William S. "The diagnostic study of an individual case in reading." *Elementary School Journal*, XXI (April, 1921), pp. 577-594.

Gray, C. T. Types of reading ability as exhibited through tests and laboratory experiments. *Supplementary Educational Monographs*, Vol. I, No. 5, 1917, p. 153.

O'Brien, J. A. *Silent reading*, p. 266. New York: Macmillan Company, 1921.

training which increases the span of recognition and speed of reading also improves the regularity of eye-movements. Other studies show indirectly that training which increases accuracy and fluency in oral reading and speed in interpreting what is read are equally beneficial.

Accurate return sweeps—Practically all eye-movement studies reveal the fact that the good reader moves his eyes quickly from the end of one line to the beginning of the next. The error of the poor reader is to make the first fixation on a line too far to the right. The child gains his first idea of the return sweep as the teacher writes sentences on the board for him to read or as she points to the lines on a chart. Most pupils form right habits without additional help. It is only in remedial cases that special help is necessary. In one such case,¹ the lines were typewritten about an inch apart. The subject was instructed to move his eyes quickly from the end of one line to the beginning of the next without stopping to look at words on the second line. Ten five-minute practice periods proved very effective as shown by his subsequent reading record.

Conclusion—The studies to which reference has been made emphasize the importance of the fundamental habits in oral and silent reading. Definite provision should be made throughout the grades for systematic training in habits of accuracy and independence of word recognition. Specific provision should be made in the primary grades for the development of span of recognition and rate of recognition and for remedial training later in the grades, if needed in individual cases. Regular progress of perceptions along the lines and accuracy of return sweeps are promoted by the teacher in early reading activities. Little specific training is required later excepting in remedial cases. Important as these habits of recognition are, they should never be emphasized at the sacrifice of intelligent interpretation. They are a means to an end and not the primary goal of reading instruction.

III. Growth Periods or Rates of Progress in Important Phases of Reading

Studies of progress in reading have revealed a number of interesting facts for the practical school man. In general these studies bring out the fact that progress in reading is much slower than need be. Experimental studies have usually shown that it is possible to bring about a decided improvement in reading in a relatively short time if one will but apply the proper remedies. Whether such rates of improvement could be made to continue over a long period or whether improvement under experimental conditions is large because appropriate methods have been tried on many children whose reading was at a low level is impossible to say definitely.

¹Gray, William S. "The diagnostic study of an individual case in reading." *Elementary School Journal*. XXI (April, 1921). p. 587.

Improvement in rate of reading—The average rate of silent reading for children trained under ordinary conditions when material of the usual type is used to test them, as shown by the averages of figures collected by several investigators, is approximately as follows:

TABLE 14. RATES OF SILENT READING

Grades	II	III	IV	V	VI	VII	VIII
Average from several investigations ¹	84	124	166	196	220	242	256
O'Brien—After practice	..	...	236	278	293	322	393
O'Brien—Suggested Norm	..	...	236	266	296	326	356

¹ Figures for grades II and III represent averages of data secured by Courtis, Gray, and Starch and reported in the Gary Survey. Figures for the remaining grades represent averages of six investigations cited by O'Brien: *Silent reading*, p. 203.

Some of the earlier investigations indicated that the largest gains in rate are made below the fourth grade and that there is little gain beyond the fifth grade, a matter which has been attributed by some to the change in character of the reading demands made upon the child at about that time.¹ O'Brien's more recent and extensive experiment shows that marked growth in rate of silent reading may continue in all elementary grades under proper training (See Table 14). He conducted an experiment with approximately 1200 children. The experimental group was given daily training in rapid silent reading followed by reproduction of what was read during the regular reading period for 39 school days. The control group carried on the regular work in reading. At the end it was found that the group which received the training in speed increased 56 per cent in rate as compared with 25 per cent for the control pupils and made a marked gain in comprehension as well. O'Brien concluded that present average rates in reading in grades III to VIII are needlessly slow and inefficient and that they can be improved by systematic training without any impairment of comprehension, if special stress is placed upon that point.² Gates in the period from November to May produced an improvement in rate of silent reading in grades III to VIII averaging above 2.7 years by using a variety of devices for encouraging rate and comprehension.

Improvement in comprehension—There is evidence to show that the rate of progress in comprehension through the grades under ordinary conditions is much lower than necessary. The various reports of individual case studies show that for many children at least progress in reading under usual teaching conditions is far from ideal. With few exceptions in these individual

¹ Judd, Charles H. *Reading: its nature and development. Supplementary Educational Monographs*. Vol. II, No. 4, 1918.

² O'Brien, J. A. *Silent reading*. The Macmillan Co. 1921.

case studies an improvement of from one to several years' progress in a few months' time resulted from proper diagnosis and appropriate training.¹

In some instances, both comprehension and rate have been more than doubled. The studies of Uhl and Reichert indicate that comprehension scores may be materially increased in short periods of from two to six weeks' training. Uhl secured marked improvement in comprehension with daily drill periods of fifteen minutes for pupils who showed marked defects. The group of pupils in each grade who were drilled individually gained, in all but a few instances, more than double that of the groups who were not drilled.² Reichert by six weeks of carefully supervised instruction in one class secured a gain in comprehension double that made in two control classes. In the supervised class a diagnostic study of individual needs was made and pupils were grouped and given the sort of training which the diagnosis showed they needed.³ The improvement obtained by Gates in grades III to VIII from November to May amounted to one and one-half years as measured by the Thorndike-McCall test. On the basis of intelligence quotients the expected improvement would have been but 1.17 years.⁴ Theisen's study indicates that when pupils are sectioned on the basis of ability the brighter classes make progress far in excess of normal expectancy.⁵ In Hawley's study in which pupils of the fifth and sixth grades were given twenty weeks' training for the sole purpose of improving quality, there was an actual increase of 43 per cent in the second test over the first. Although no attention was directed toward the improvement of oral reading, the children actually improved in that phase of reading five times as much as they normally would in the same period of time. Even though some slight allowance must be

¹ Anderson, C. J., and Merton, Elda. "Remedial work in reading," *Elementary School Journal*, Vol. XX (May and June, 1920, and January, 1921), pp. 685-701, 772-91, 336-48.

Gray, William S. Remedial cases in reading: their diagnosis and treatment. *Supplementary Educational Monographs*. Department of Education, The Univ. of Chicago. No. 22, 1922.

Gray, William S. "Individual difficulties in silent reading in the fourth, fifth, and sixth grades," *The Twentieth Yearbook of The National Society for the Study of Education*, Part II, pp. 39-53.

Geiger, Ruth. "A study in reading diagnosis," *Journal of Educational Research*, VIII (November, 1923), pp. 285-300.

Leland, Bernice. "Herbert: a study of difficulty in spelling and reading," *Journal of Educational Research*, VIII (June, 1923), pp. 49-58.

² Uhl, W. L. "The use of results of reading tests as bases for planning remedial work," *Elementary School Journal*, XVII (December, 1916), pp. 266-75.

³ Theisen, W. W. "Factors affecting results in primary reading," *The Twentieth Yearbook of the National Society for the Study of Education*, Part II, pp. 1-24 (relevant sections).

⁴ Gates, Arthur I. *The psychology of reading and spelling*. Teachers College, Columbia Univ., Contributions to Education, No. 129, 1922.

⁵ Theisen, W. W. "Does intelligence tell in first-grade reading?" *Elementary School Journal*, XXII (March, 1922), pp. 530-34.

made for familiarity with the tests in both silent and oral reading the progress made was considerably more than would normally be expected in the course of an entire year.¹

Improvement in oral and silent reading processes—Buswell's investigations show that there is a rapid increase in eye span, in rate of recognition of words, and in the regular progress of perception along the lines in the first four grades in both silent and oral reading. Thereafter progress continues less rapidly, a fact which he attributed largely to changes in the character of the materials read after the fourth grade. His records reveal a high correlation between progress in these elements of reading and in word recognition. "As the reader develops in span of recognition, rate of recognition and regularity of procedure along the printed lines, he also becomes more mature in the elements which are measured by the oral test, such as repetitions, omissions, substitutions, insertions, and mispronunciations."²

Some of the analytical studies of children's reading give rise to pertinent questions concerning the relative emphasis to be placed upon oral and silent reading. One contention is that when the child's reading has developed to a point where the rate of silent reading begins to exceed the rate of articulation the major emphasis in reading should be changed. In the first three grades, the rate of articulation appears to be greater than the rate of recognition. Under ordinary conditions, however, the rate of recognizing words increases rapidly and surpasses the rate of articulation by the time the fourth grade is reached. There is no evidence to show that the rate of recognition would not surpass the rate of articulation even earlier were children given suitable training in silent reading in the first few years of school. Owing to the fact that the rate of oral reading cannot exceed the rate of articulation and that articulation increases relatively little from grade to grade, the rate of oral reading increases much less rapidly than the rate of silent reading and lags far behind it by the time the upper grades are reached.³ The "stumbling" of fourth grade pupils who were good oral readers in the lower grades is attributed to the fact that the rate of recognition far exceeds the rate of articulation. Professor Judd maintains that such facts as these are

¹ Hawley, W. E. "The effect of clear objectives on the teaching of reading," *Journal of Educational Research*, III (April, 1921), pp. 254-260.

² Buswell, Guy Thomas. *Fundamental reading habits: a study of their development. Supplementary Educational Monographs*, Department of Education, Univ. of Chicago. No. 21, 1922.

³ Curtis, S. A. *The Gary public schools—measurement of classroom products*. Ch. VII. General Education Bulletin, 1919.

Gray, William S. *Studies of elementary school reading through standardized tests. Supplementary Educational Monographs*. Department of Education, The University of Chicago, Vol. I, No. 1, 1917.

Judd, Charles H. *Reading: its nature and development. Supplementary Educational Monographs*. Department of Education, The University of Chicago, Vol. 2, No. 4, 1918.

evidence of the need of placing the major emphasis upon silent reading from the fourth grade on.¹ Subsequent studies may show that it should receive major emphasis even below the fourth grade.

Hindrances to progress—The hindrances to progress are legion. It is impossible to tell even approximately how much each is responsible for unsatisfactory progress. Among some of the more evident causes of unsatisfactory progress are the following: (1) Lack of definite goals of attainment. The teacher who understands exactly what is expected of her pupils and when to expect it will probably achieve her objectives much more quickly than the one who does not. (2) Low intelligence. The Cleveland study showed that the median achievement of 17 first-grade classes in the slowest group at the end of the year as measured by the Haggerty Tests was from three fourths to one year lower than that of the median of the 16 classes in the brightest group. The best class in the slow group, however, exceeded by far the poorest class in the bright group, showing that lower intelligence does not always mean slower progress in reading.² (3) The use of material that is too difficult, lacking in variety, or insufficient in quantity. (4) Mass treatment and failure to provide for individual differences in ability. (5) Undue emphasis upon oral reading. Oral reading as usually practiced is exceedingly wasteful. If a pupil is one of twenty, he waits for his one opportunity in twenty to read. The teacher commonly insists that he follow closely the one who is reading, thus denying him an opportunity to use or employ his time to better advantage. This insistence that the pupil follow the reader, Judd maintains, "tends to keep all children down in their silent reading to the rate set by the oral reading emphasized in the schools."³ (6) Vocalization or lip reading. The effect of vocalization is to retard the development of speed.³ Absence of vocalization is a characteristic of the mature reader.¹ (7) Lack of early training or lack of development in some essential element of reading ability. Children may be retarded in their reading development because of something neglected in their previous training as, for example, phonics or practice in phrasing.⁴ (8) Fixed attitudes or habits of reading. A child who looks upon reading as a matter of pronouncing words is likely to experience difficulty in getting meaning. The more a pupil's habits become fixed the more difficult it is to secure improvement.¹

¹ Judd, Charles H. Reading: its nature and development. *Supplementary Educational Monographs*. Dept. of Educ., Univ. of Chicago, Vol. 2, No. 4, 1918.

² Theisen, W. W. "Does intelligence tell in first-grade reading?" *Elementary School Journal*, XXII (March, 1922), 530-34.

³ Theisen, W. W. "Factors affecting results in primary reading," *The Twentieth Yearbook of the National Society for the Study of Education, Part II*, pages 1-24. (relevant sections).

⁴ Gray, William S. "The diagnostic study of an individual case in reading." *Elementary School Journal*, Vol. XXI (April, 1921), pp. 577-594.

(9) Failure to change to other methods when those in use are no longer appropriate. Methods suitable with young children are frequently inappropriate with older children. (10) Lack of interest and mental stimulation. Children whose interests are not aroused or who are allowed to dawdle along at a slower pace than they are capable of going are not likely to make rapid progress.¹ (11) Home language and standards. (12) Untrained teachers and absence of proper supervision. Relatively few teachers have had modern training in the teaching of reading. Without a well-trained supervisor to guide them the teaching falls far short of its possibilities. (13) Physiological handicaps of hearing and eyesight.

Aids to progress—An understanding of the causes of slow progress frequently suggests the remedy. Most of the causes listed in the paragraph above are fairly easy to remedy if teachers and school officials will but direct their attention to them. Among the steps to be taken are: (1) A careful analysis of objectives and the setting-up of standards of attainment; (2) improvement in the choice of reading materials; (3) adequate provision for individual differences; (4) more emphasis upon silent reading; (5) removal of special difficulties; (6) development of appropriate reading attitudes; (7) choice of methods suitable to the age and development of the child; (8) greater attention to interest and mental effort; (9) training of teachers in modern methods of teaching reading and improved supervision, and (10) treatment of physical defects.

IV. Children's Interests in Reading

Definite progress has been made in discovering the reading materials which make the strongest appeal to children, the factors in these materials which appeal to children's interests, and the types of material which should be avoided if the time devoted to reading is to be spent to best advantage. Most of the investigations concerning these matters are referred to in more or less detail in other sections of the report of the Sub-committee on Reading. It is proposed at this point to describe briefly the methods employed in the study of children's interests in reading and to direct attention to certain general conclusions which these studies justify.

One of the distinguishing characteristics of the more recent studies² is the fact that the preferences or judgments of children received careful

¹ Brown, H. A. "Formulation of method in reading," *Journal of Educational Research*, II (June, 1920). 436-451.

Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918), 505-22.

² Dunn, Fannie W. *Interest factors in primary reading material*. Teachers College, Columbia Univ., Contributions to Education, No. 113, 1921, p. 70.

Jordan, Arthur M. *Children's interests in reading*. Teachers College, Columbia Univ. Contributions to Education, No. 107, 1921, p. 143.

Uhl, Willis L. *Scientific determination of the content of the elementary school course in reading*. Univ. of Wisconsin Studies in the Social Sciences and History, No. 4, 1921, p. 144.

consideration. In the case of younger children this information was obtained by having them express choices between pairs of selections read to them. Older pupils wrote answers to carefully prepared questionnaires and took comprehension tests. Both their school and home reading was checked in this way. Careful observations were also made of children's library choices and reports were obtained from publishers showing sales of children's books. Great care was taken to obtain spontaneous responses of children's preferences rather than answers which they thought would please the teachers. The judgments and experiences of teachers with reading materials were checked and rechecked by questionnaires, making available facts which should have wide influence upon the selection and gradation of reading materials.

Among the factors appealing most strongly to young children¹ are *surprise* and *plot*. In addition, boys are attracted by *animalness* and girls by *childness* and *familiar experience*. Older pupils² are intelligently responsive to *interesting action*, *characters*, and *problems* which challenge their thinking. Sex differences appear between the ages of ten and thirteen, boys being most interested in stories of *heroism* and *adventure*, and girls in *home* and *school* situations, especially those portraying *kindness*. However, *adventure* and *humor*, *kindness*, *faithfulness*, and *loyalty* always make strong appeals to older pupils.

The factors³ most to be avoided are *over-maturity*, *too great difficulty*, and *hard symbolism*. There is no question but that certain selections have long been imposed on children before they were prepared for them. Many of the difficulties of teachers have arisen because they have been expected to teach materials of too great difficulty to their pupils. Recent investigations point the way to wise elimination of certain selections which have become traditional.

An appeal for a greater variety of interesting factual material for pupils of all grades grows out of the discovery³ of the varied interests of children and of the poverty of well-written material suited to those interests. At the same time children's dislike of selections "written down" for them is evident. Questions arise also concerning the need for a common core of literary material which all elementary pupils shall read and concerning the need for standards by which literary materials may be evaluated and selections appropriate for use in the various grades chosen.

¹ Dunn, Fannie W. *Interest factors in primary reading material*. Teachers College, Columbia Univ., Contributions to Education, No. 113, 1921, p. 70.

² Jordan, Arthur M. *Children's interests in reading*. Teachers College, Columbia Univ., Contributions to Education, No. 107, 1921, p. 143.

³ Uhl, Willis L. *Scientific determination of the content of the elementary school course in reading*. Univ. of Wisconsin Studies in the Social Sciences and History, No. 4, 1921, p. 144.

V. Results of Investigations of Reading Materials

The results of investigations of reading materials can be discussed in terms of five problems—namely, types of content in readers, the duplication of reading material, the effect of increasing difficulty in speed and quality of reading, the importance of growth stages, and types of desirable reading materials.

Types of content in readers. Vinal¹ examined "thirty-three of the best and most used first readers" and reported upon them in 1918. His purpose was to find out how much factual scientific material these books contained. He found that "over 50 per cent of the stories in these readers are about animals. Only 33 per cent of these animal stories are true to nature. The other 66 per cent are either fables or personifications where animals act and talk as human beings. For every five animal stories, there is one plant story and one geography story, such as: The wind, the rain, or the Eskimo. . . . The cat is written about more than any other animal. Out of thirty-eight cat stories fourteen are of the fairy type, fourteen are about cats who talk as human beings, and ten are true to cats and their doings." Most of the stories of cats which are true are of the following style: "See mamma. See kitty. Mamma, see kitty." Vinal summarized his results by saying that first-grade readers should contain more selections which portray the everyday activities of animals or facts about nature.

Starch² conducted an investigation to determine, first, to what extent current textbooks in reading agree or differ as to the nature of the material and as to specific selections included; and second, to what extent there are changes in the nature of the material from grade to grade. With these aims in view he analyzed the contents of ten textbooks in each elementary school grade and classified them under sixteen different headings. Eighty-three books from twenty-three different sets or series were included in the study. The analysis revealed wide differences in types of content for lower-grade and upper-grade books. For example, the three leading types in the first-grade books studied are "animals," "boys and girls," and "folklore." These constitute 61 per cent of the content of first-grade books, while they constitute only 3.7 per cent of the eighth-grade books. On the other hand, "classics," "history and patriotism," "biography," and "poetry" constitute 81.7 per cent of the content of the eighth-grade books, but only 16.7 per cent of the first-grade books. He found also that with the exception of "classics" and "history and patriotism" one or more fourth-grade books omitted each of the sixteen classes of content. The amount of overlapping common to three or more of the ten sixth readers examined is very small.

¹ Vinal, William G. "First-grade readers." *Nature-Study Review*, XIV, (December, 1918), 371-379.

² Starch, Daniel. "The contents of readers," *Twentieth Yearbook of the National Society for the Study of Education*, Part II, pp. 145-151. 1921.

One poem, *Horatius at the Bridge*, was, however, found in six of the ten readers. Two selections, *The Chambered Nautilus* and *The Daffodils*, were found in four readers, five in three readers, and eighteen in two readers.

Herriott¹ attempted to ascertain the extent of the shift of emphasis in readers for Grades VII to VIII from social science content to purely literary content. To do this he analyzed the seventh- and eighth-grade books of five series of readers which are now in use. He found that, with the exception of one series, every seventh reader contains more social science content than does its corresponding eighth reader. There is a corresponding increase in pure literature in all except one of the eighth readers. This change in emphasis indicates a tendency in the eighth grade toward the traditional work of high school.

Duplication of reading material—Stone² analyzed the contents of fifteen second-grade readers to discover the amount of duplication of subject-matter. The books selected represent method and content readers, extreme and conservative, real and unreal. Their dates of publication varied from 1906 to 1916. Although he found little exact duplication save in poetry, he did find that stories were virtually duplicated in many books. The range in amount of duplication was from 0 to 41 selections. In terms of pages, the amount of duplication varied from 0 to 121. A total of seventy-seven selections were duplicated in the fifteen readers.

The duplication of a few second-reader selections in books for other grades was investigated. It was found that one selection, *The Ugly Duckling*, appeared in three of fifteen third-grade books. Where duplication existed within a grade, there was evidence of agreement as to grading, but the duplication of selections in books for use in different grades indicated failure to grade carefully. In a later paragraph of this section of the chapter, namely, the importance of growth stages, the duplication of content is further discussed.

Effect of decreasing difficulty. McLeod³ set for himself the task of ascertaining the effect of increasing difficulty of reading material upon rate, types of errors made, and the degree of comprehension. He tested approximately 30 pupils of each grade from the first to the eighth by having them read Gray's *Standardized Reading Paragraphs* according to directions. As a test of comprehension, five questions were asked following the reading of each paragraph. These questions were given a score value

¹ Herriott, M. E. "The content of seventh- and eighth-grade readers." *English Journal*, XII (April, 1923.) 234-240.

² Stone, R. E. "Duplication of reading materials in fifteen second-grade readers." *Elementary School Journal*, XX (May, 1920), 702-710. Much of the same data is also reported by Clifford Woody in the *Journal of Educational Research*, II, 1920, 465-474.

³ McLeod, L. S. "The influence of increasing difficulty of reading material upon rate, errors, and comprehension in oral reading." *The Elementary School Journal*, XVIII (March, 1918), 523-532.

of 20 each and grades 5, 10, 15, or 20 according to the degree of correctness.

He found that the rate increases rapidly in Grades I and II and then more slowly until Grade VI. Plateaus in the curve of progress occur from Grades III to V and from Grades VI to VIII. In Grades I and II the rate of reading is slow, but from Grade III upward the rate of recognition is in advance of the rate of vocalization for paragraphs 1 to 4. This is explained by the fact that in Grades I and II, the child is learning to associate printed symbols with words already spoken. When Grade III is reached, the reading vocabulary probably overtakes the spoken vocabulary. At this stage the learning of new words in difficult passages retards the rate of oral reading.

The types of errors recorded in McLeod's article are mispronunciations, omissions, substitutions, insertions, and repetitions. Of these, mispronunciations were the most common in every grade save the second. Gross mispronunciations were particularly prominent in the reading of difficult passages. Of the substitutions, it was found that the percentage with "no meaning" increased with the difficulty of the passages: "As the reading becomes more difficult, the thought is lost in the maze of difficult words, and substitutions are very largely on the basis of similarity in appearance in some respect, rather than on the basis of thought-suggestion."

Comprehension was impeded by the new words met in the more difficult paragraphs. The results indicate that pupils acquire ability to pronounce words more rapidly than ability to derive their meanings. The test records show that the child's meaning vocabulary was frequently exhausted by the time the more difficult paragraphs of the test were reached although the pupil's mastery of the mechanics of reading enables him to continue to pronounce the words.

The importance of growth stages—Uhl¹ attempted to derive standards for grading selections. The following outline shows the procedure used in obtaining the reactions of teachers and pupils to reading matter:

Reactions from teachers: Analytical questions on the content of basal readers; Classified lists of titles of selections sent to teachers for their comments.

Reactions from pupils: Representative selections presented directly to pupils who read them silently and reported in writing whether they liked or disliked each selection and why; Pupils' comprehension of the selections measured by questions on the selections.

¹Uhl, Willis L. *Scientific determination of the content of the elementary school course in reading*. Univ. of Wisconsin, 1921. Chapter VIII, "The Relation of Reading Selections to the Standards of Grading in Various Schools," pp. 102-107, and Chapter IX, "The Placement of Reading Selections," pp. 108-146. Also reported by the same author in *The Materials of Reading*, Silver, Burdett and Company, 1924. Chapter IV, "The Grading of Content for Reading," pp. 47-74. The plan for this investigation is given in detail in W. W. Charter's *Curriculum Construction*, pp. 316-324. Macmillan Company, 1922.

Judgments concerning the value of several thousand reading selections were obtained from over 3000 selected teachers of Grades I to VIII inclusive. As a check upon teachers' judgments, tests based on certain standard selections were given to 529 pupils of Grades III to VIII. Measures were obtained of the pupils' interest in and comprehension of each selection.

An analysis of the responses of teachers shows that scores of selections are duplicated in the courses of study of different grades just as the statistical studies already reviewed lead one to expect. These responses show also that the success of a selection often depends upon the grade in which it is read. For example, *The Pied Piper of Hamelin*, in various versions was reported for Grades II to VII inclusive, in different cities, while other selections, *The Ugly Duckling* and *The Village Blacksmith*, recur in different books until pupils are alleged to tire of them. Responses to questionnaires show that children thus re-read certain selections instead of extending their acquaintance with other selections or books.

Three significant types of misplacement of selections were discovered. These types are exemplified by selections which gain in favor from grade to grade, selections which decline in favor from grade to grade, and selections which are unpopular in any grade because of their difficulty. Over difficult selections were reported more frequently than those of both the other types combined. Selections representing each type, together with the percentages of gain or loss in favor from grade to grade, are cataloged in the reports of this investigation. For example, the percentage of teachers approving *Christmas at the Gratchits'* increases from 73 in Grade IV to 98 in Grade VIII, and the percentage of pupils approving increases from 81 in Grade IV to 90 in Grade VIII.

Only a very few times were given selections found to be successful in only one grade. In other words, if a selection is highly desirable for any given grade, it is likely to be a favorite in at least one additional grade. The placement of a selection in a single grade often depends, therefore, upon some consideration other than its difficulty, such as the academic standards of a given school, the social value of the selection, or its relation to other school work.

Significant positive correlations were found between pupils' interests in and comprehension of selections. Certain selections were, however, readily comprehended, although specific undesirable qualities prevented their being entirely successful in any grade. Conversely, a few selections which contained superior interest qualities were favored by pupils whose comprehension scores for them were low.

Teachers' and pupils' judgments also show significant positive correlations, although teachers generally rate selections slightly higher than pupils do. In view of the increase in pupil interest after a single class discussion, the higher rating by teachers seems to be justified. When the comprehension scores of different schools were compared, a variability of two or

more grades was found for different selections—for example, in answering questions based on *Paul Revere's Ride*, fifth-grade pupils of one school excelled seventh-grade pupils of another school.

Analyses of the comments of teachers and pupils of different grades show that pupils have varying reasons for interest in selections. Such qualities as personification of animals and repetition add to the interest of primary pupils, while pupils in the later grades seem to have increasing amounts of interest in character analysis and other problematic situations. Several qualities, however, such as dramatic action, adventure, and pleasing characters are apparently keys to interest in any grade. How much of the emphasis upon certain qualities is due to the particular subject-matter in the selections cannot be determined from the data obtained.

Uhl's investigation, so far as it deals with grading, can be summarized as follows. Present-day practice varies widely in the placement of many selections. The success of reading materials depends to a great extent upon the grade in which each selection is read. A moderate amount of flexibility in the placement of selections is desirable on account of varying academic standards in different schools and because of the fact that many superior selections are successful in more than one grade. Choice of content should be made with reference to the interests of pupils, many of which appear to be fairly constant throughout the elementary grades.

Desirable qualities of reading material—Jordan¹ employed the questionnaire and library methods to discover children's interests in reading. By the questionnaire method, he obtained first, second, and third choices of 3598 pupils of Grades VI to XII as to books and magazines. The books named by the children "were classified into adult fiction, juvenile fiction, adventure, biography, history, poetry, science, travel, information, humor, miscellaneous." The magazines named were classified as "adult fiction, juvenile fiction, adventure, nature, pictures, woman's art, science, current events, humor, miscellaneous."

It was found that books and magazines of adventure ranked highest according to boys' choices, and that fiction ranked highest according to girls' choices. Favorites with boys were *The Call of the Wild*, *Treasure Island*, and *Boy Scout Series*; with girls the favorites were *Little Women*, *Pollyanna*, and *The Girl of the Limberlost*. The results indicated also that the interest in fiction of both boys and girls increases rapidly from the age of nine to the age of eighteen. The report of this study contains lists of books and magazines classified according to type and the relative frequency of each book and magazine.

Jordan's library investigation was made in eight libraries. Books and book lists were examined to find out the extent of their circulation. Later, he made over eight hundred observations to determine the approximate age

¹ Jordan, A. M. *Children's interests in reading*. Teachers College, Columbia Univ., Contributions to Education, No. 107, 1921. This monograph contains a digest of earlier investigations of children's interests in reading.

of children who read different books and to discover differences between the interests of boys and girls. He found great dissimilarity of interest between the sexes. The major interests of boys from ten to thirteen years appeared to be in books about war and scouting, school and sports, Boy Scouts, and strenuous adventure. The most popular authors for these four types of fiction were Altsheler, Barbour, Burton, and Clements, respectively. The interests of girls were chiefly concerned with fiction which portrays home life and school life, fairy stories, stories with historical background, and love stories. The most popular writers of these works of fiction are: *home and school*, Alcott, Wiggin, Sidney, and Richards; *fairy tales*, Dodgson; *love stories*, Woolsey. An analysis of the books read indicated that boys were most interested in books which appeal "to the instinct of mastery, fighting, love of sensory life for its own sake, original attention and approval and scornful behavior." In the same way it appeared that girls were most interested in books which appeal "to the following instincts: maternal, kindness, attention to others, response to approval and scornful behavior, and to a less degree than in the case of boys, to rivalry."

Miss Dunn's¹ investigation was conducted to find out "what are the elements in primary reading material that are of interest to children in the first three grades of the elementary school." She began her investigation by analyzing reading selections to discover the various appeals that the existing materials make to readers. She then chose thirty-one representative selections from primary readers so that the following "elemental qualities" were included: child characters; adult characters; boy, the central figure; girl, the central figure; realistic, historical, and geographical material; fairy stories, myths, folk stories, fables, and fanciful themes.

The thirty-one samples were arranged in pairs in such order that certain qualities of likeness and difference existed between each pair of specimens. The samples were then read in pairs to pupils who were requested to indicate on "vote slips" their choices for each pair.

After subjecting her data to statistical treatment, Miss Dunn concluded that characteristic appeals are "*surprise and plot* for both sexes, *animalness* for boys, and *childness, familiar experience*, and to a lesser extent *repetition* and *conversation* for girls." Miss Dunn concluded that instead of a child's having a limited range of interests, his "tastes appear rather catholic. Give him a few important elemental qualities which may enter into fact or fiction, into prose or verse, into real or fanciful situations, and he is attracted and pleased."

¹ Dunn, Fannie W. *Interest factors in primary reading material*. Teachers College, Columbia Univ., Contributions to Education, No. 113, 1921. A more extended résumé of Miss Dunn's monograph is included in *The Materials of Reading*, by W. L. Uhl, p. 99-103.

In pursuing the investigation of reading material referred to in an earlier section of this report, Uhl¹ canvassed teachers and pupils to discover interests in and the effectiveness of reading selections. The information thus obtained was classified and studied with a view to deriving standards for eliminating undesirable selections and detecting superior selections.

Teachers' responses indicated that aside from incorrect grading of content, the most important undesirable characteristics of reading selections are *abstractness, lack of action, unreality, too great length, gloominess, monotony, and poor literary style*. Teachers rated as "superior" selections which contain combinations of qualities as follows: selections which portray *dramatic action, adventure, heroism, interesting non-dramatic action, humor, fairy or supernatural activities, interesting characters, home life, child life, interesting problems, kindness, faithfulness, animal play*, or other activities, *personifications, and interesting repetition*. Their judgments indicated that selections have too often been included in readers for their alleged didactic qualities rather than for the qualities just mentioned, and that, as a result, many inferior or over-difficult selections have been published. The reports of this investigation contain lists of inferior and superior selections and analyses of selections showing the reasons for the failure or success of certain selections.

In addition to obtaining judgments about standard selections, Uhl collected data from teachers and pupils as to the effectiveness of certain informational selections contained in the Community Life Leaflets.² These selections were found to be distinctly superior for use in grades VII and VIII. This investigation emphasizes the importance of consulting children in the selection and organization of courses in reading and literature. This view is supported by the judgments of three thousand teachers whose conviction about the matter was expressed in no uncertain terms.

In 1919 Gray and Bobbitt³ made a survey of reading in Indianapolis. After the methods and materials had been examined and tabulated, desirable standards of practice were set up, and the content of the course of study in reading was judged by these standards.

Four stages in the acquisition of reading ability were described by Gray: "the initial period in attaching meanings to printed words (first grade); the development of the fundamental habits and associations involved in

¹ This investigation is also reported upon in *The Materials of reading*, by W. L. Uhl, p. 103-148 and in his monograph entitled *Scientific determination of the content of the elementary school course in reading*.

² *Community Leaflet*, No. 18, March 1, 1918. U. S. Bureau of Education, Washington, D. C.

³ Gray, William S. "Reading in the Elementary Schools of Indianapolis," Chapters III and IV. *The Elementary School Journal*, XIX, March and April, 1919, 506-531 and 608-627.

Bobbitt, Franklin. "Reading in the Elementary Schools of Indianapolis," Chapters V and VI. *The Elementary School Journal*, XIX, May and June, 1919. 665-688 and 741-761.

fluent oral reading (second and third grades); the broadening of experience through extensive silent reading (fourth, fifth, and sixth grades); the independent application of reading ability to all phases of school work (seventh and eighth grades.)”

The fact was emphasized that the content for each stage of development must harmonize with its aim. During the initial period, therefore, the content should be interesting and valuable to children and readily associated with vivid personal experiences. In Grades II and III the content must grip the attention and be simple enough to encourage rapid reading and to secure accuracy. In Grades IV, V, and VI “an abundance of interesting reading material is necessary both for the wide extension of reading experience and for the development of ability to attach meanings to words. . . .” In addition to this easy, extensive reading, Gray advocated the use of material for training in deliberate reading such as is required in problem-solving.

From this point, Bobbitt continues to the “most pressing current question,” which he states as follows: “What is the purpose of the reading experience of intermediate and grammar grades after the simple mechanics of reading has been mastered?” The answer to this question shows the point of view of the entire discussion: “The purpose is to widen the vision and to extend the experience of the pupils beyond the confines of their narrow immediate environment.”

The types of experience to be gained by reading are next analyzed. These types include geographical, historical, civic, scientific, imaginative, and such human experiences as are portrayed in general literature. For example, “the geographical readings should be such as to permit our children imaginatively to travel through the various cities and countries and regions of the earth. . . . Reading of this character should aim, not at information, but at experience. . . . The getting of information is a portion of the total experience.” Such reading is advocated especially in general literature. The bearing of this type of treatment “on school procedure is easily evident. It demands a wide extension of supplementary and library reading opportunities. It demands much reading; it demands easy reading; it calls for interesting reading; it makes necessary a type of technique of education quite different from the relatively ineffective fact-learning type.”

Following these analyses is a list of the books used for required and supplementary reading in Indianapolis. Having given a statement of what the schools should teach and a list of the books in use, the report continues with an analysis of these books in the light of the aims of the school. The analysis was made with reference to each of the types of content already mentioned.

Of the concluding recommendations of the survey report, the following deal with the content of reading.

That the content of the reading be chosen so as to give the pupils width of vision over, and depth of insight into, all important fields of human affairs.

That the reading experience be adapted to the degree of maturity and previous experience of the pupils

That those responsible for the reading content be fully conscious of the purposes to be served.

That reading materials should be so graded . . . that the gradient is imperceptible.

That there be an *abundance* of reading experience covering in *balanced* way all important fields of human experience.

That the quantity of reading material available be much greater than can be covered by any single pupil, *however* capable, in order to provide for all desirable types of tastes, desires, and appetites.

Summary—Investigations have shown that while no single branch of content has a monopoly upon the interests of children, certain types have maintained a monopoly of space in readers. Statistical investigations show that there is such close agreement upon many favorite selections that certain textbooks contain little or no material which is not duplicated in certain other books. These studies show also that many of these duplications are in books intended for different grades.

Experimental studies show that children have pronounced likes and dislikes for certain reading selections and that the proper placement of selections would greatly reduce dislikes. The information obtained from both teachers and pupils show the need for some degree of flexibility in grading; also that error is more likely to occur as a result of making the course in reading too difficult than of making it too easy. A sufficient array of teachers' and pupils' judgments exists to make possible the correct placement of standard selections.

All investigations here reported support the conclusion that effective training in reading cannot be given when the content is over-difficult. The reasons which support this conclusion are that over-difficult content does not grip the reader's attention, that such content retards the progress by limiting the amount which can be read, and that it forces the child to focus his attention upon the mechanics of reading to the detriment of comprehension. Likewise, investigations indicate that the interests of children can be utilized to distinct advantage in both teaching and learning. These investigations show clearly that while children often desert the realm of fine literature for that which provides merely crude passing pleasure, they can be interested also in worth-while literary selections, if they are properly placed as to difficulty.

Analytical investigations have defined the needs of different periods of development and have shown the need for a miscellany of content to meet these needs. The content should be simple, highly charged with interest, and provided in abundance. It should also serve as a valuable substitute for real experience.

VI. Scientific Studies in the Field of Literature

Children's interests in literature and the grading of reading selections—The first study of scientific validity to which reference will be made is

that of Jordan's.¹ He not only used the questionnaire method more guardedly than the previous investigators whom he reports in his first chapter, but he also made the following useful study of children's reading in public libraries. He assigned points to books according to the number of times they were drawn out, rebound, and waited for in line, and according to the amount of grime on the catalog cards recording them. It is interesting to note that the four most popular authors on the boys' book list totaled considerably more than twice as many points as the first four books on the girls' list. This was not because girls read less. Apparently, in spite of the usual separate analysis of qualities enjoyed, the girls read books on boys' lists a good share of the time. Jordan has derived a useful list of the most popular writers at the time of his study and supplemented it with tables of correlation and with an analysis of the psychological factors which probably account for interest in chosen books.

Two unpublished studies made under Dr. Horn's direction at the University of Iowa and summarized by the authors in the *Elementary English Review* have prepared the way for a scientific determination of the common essentials of a literature course. Mackintosh² first selected from good anthologies one hundred poems for the fifth grade and arranged them in ten groups with like characteristics. These were typed in uniform fashion and read aloud. Each child ranked each poem of the ten from one ("the best poem I ever heard") to six ("the worst I ever heard"); each pupil also selected five that he liked best, and if he were willing to do so, marked those he would not recommend to another fifth grader. Reasons were also given and used in deriving final summaries of criteria for children's choices.

As a further experiment, fifty poems selected as best were tried in several fifth grades totaling 144 pupils without explaining why they were given, and ranks, per cent values, and P. E. values determined. The list derived is significant because it includes excellent new poems not commonly taught so far; it also omits many poems which have been conventionally accepted. It is valid, of course, only for the titles on the original list of 100 verses. The summary of reasons reenforces the view that children like humor, adventure and excitement, dialect, rhythm and rhyme, and understandable experience.

Garnett's³ study of children's choices in prose followed the same general procedure. The stories, like the poems, were read aloud to fourth-grade children, and 24 of the original list of 80 tried in six fourth-grade classes in Minneapolis including 103 boys and 144 girls. By "a somewhat elaborate system of ranking and voting" these stories were grouped in

¹ Jordan, A. M. *Children's interests in reading*, Teachers College, Columbia Univ., Contributions to Education, No. 107.

² Mackintosh, Helen K. "A study of children's choices in poetry." *The Elementary English Review*, I (May, 1924), 85-89.

³ Garnett, Wilma Leslie. "A study of children's choices in prose." *The Elementary English Review*, I, June, 1924, pp. 133-137.

"preferred," a "second preferred," and a "least liked" list. The summary of reasons stresses children's dislike of unworthy traits of character, of stories which they term "silly," and of those they have heard too often. Five of the ten stories on the girls' preferred list are also on the boys'. As far as the selections included are concerned the results of this study are very suggestive. It makes use of a method other than empiricism and adult opinion in reaching conclusions concerning children's likes and dislikes in reading.

Cavins' study,¹ also unpublished, is reviewed briefly by Dr. Lyman in a recent article.² His investigation deals with a problem which has not been sufficiently stressed in previous investigations, namely the comprehension of selections. This was tested by asking pupils to copy the lines which expressed the author's purpose or main idea or central thought. Cavins believes that "unless 60 per cent of a grade can unaided discover this core of meaning and 40 per cent answer easy questions satisfactorily, the poem is more suitable for a higher grade." This surely is a sufficiently conservative position; yet the study demonstrated that "general practice places poems from one to three grades too low in the curriculum." Such studies as this make possible more intelligent practice in the assignment of literary selections, particularly poems, to the various school grades.

The effects of teaching literature upon the commonly accepted objectives of the subject—Hosic's doctoral study³ relates to the effect of the teaching of literature in the grades by conventional methods upon the purposes usually accepted for this subject. Hosic examined four sets of reading books for grades four to six to discover the helps to study which they contain. "The emphasis was found to fall upon questions pertaining to the language used or the facts presented rather than upon conduct, technique, or expressional activities." In contrast to this, "imaginative realization of the piece as a whole as a means to enjoyment and the enrichment of experience was found to be central" among authorities as to the nature and purpose of literature. To weight these differing emphases Hosic tested the teaching of "four poems in two pairs of sixth-grade classes so as to alternate the methods used. For example, Holmes' *Chambered Nautilus* was taught by means of an informal suggestive presentation of the whole to Class A and by means of detailed questions to Class B. Then Blake's *Tiger* was presented by means of detailed questions to Class A and as a whole to Class B. Browning's *How They Brought the Good News* and Reed's *Sheridan's Ride* followed in the same way. Classes X and Y were handled similarly," but with poems and methods reversed. In a preliminary test,

¹ Cavins, L. V. *Grading poems for schools use*. An unpublished doctor's thesis, Department of Education, University of Chicago, 1924.

² Lyman, Rollo L. "What poetry shall we teach in the grades?" *The Elementary English Review*, Vol. 1 (June, 1924), pp. 145-54.

³ Hosic, James F. *Empirical studies in school reading*, Teachers College, Columbia Univ., Contributions to Education, No. 114, 1921.

classes which merely read over or listened to the poems were found to prefer *The Tiger* and *Sheridan's Ride* in a proportion of four to one. Nevertheless, after both methods of teaching described above had been used, each class when tested as to its preferences was found to choose *whichever poem had been taught to it as a whole*. Thus when studied at too great length favorite poems ranked below the less favored ones which were more skillfully and reasonably presented. Care was taken to find out that the poems which were not taught at full length were understood in their essential meaning.

Hosic concludes: "There is apparently a disparity between the aims and methods of literature teaching *per se* and the aims and methods of classroom teachers and of editors of textbooks. The latter emphasize the linguistic element and familiarity with details of fact. . . . Method in teaching literature is a powerful factor, and may practically determine the attitude of a large majority of a class toward a literary selection. Probably the methods now used both by teachers and editors are largely unfitted to attain the objects set up by critical and educational authorities for the study of literature in school."

Measure of appreciation of poetry—The first successful attempt to devise a scientific measure of literary appreciation was that of Abbott and Trabue.¹ The experiment consisted of taking verses of acknowledged and recognizable poetic merit and making three spoiled versions of each: one in which the emotional tone was violated by more or less obvious insincerity and exaggeration; one in which the imaginative quality was reduced to the prosaic; and one in which the rhythm was rendered either awkward or less fine than in the original. The four versions of each stanza were put on a single page and the reader required to mark one best and one worst. There were in each of the two tests thirteen such groups. Conclusions were all drawn from the choices of best versions.

As the median judgments did not vary much from a chance distribution in grades V to VIII inclusive and in many cases were negative, the scale is of no value as a measuring device below the high school. In fact, the median judgments are not preponderantly in favor of the best versions until the fourth year of high school and the correlation of the two tests X and Y is only .44 for that grade. It is only as we come to the group of graduate students who are majoring in English and teachers of English that we get as high a median as 9.5 from the thirteen specimens and a correlation of .723 between the two tests. However, a distinct gain in appreciation is possible if the tests are taken and then discussed with high school children and with teachers of literature for that matter although this of course destroys their validity as a measuring device.

Detailed analyses of the versions preferred in certain school years and of the apparent conclusions following upon these facts are significant and

¹ Abbott, Allan, and Trabue, M. R. "A measure of ability to judge poetry." *Teachers College Record*, Columbia Univ., XXII (March, 1921), pp. 101-126.

are interestingly discussed by the authors. It is noted that disturbance of the rhythm is felt earliest; that the prosaic versions drop out of favor after the third year of high school or first year of college in the majority of pupils, but that the sentimentalized or emotionally false versions are preferred in nearly half of the poems well into the high school period, and in two instances by all save the graduate students. There seems to be clear evidence that sentimentalism, if not positively promoted, is by no means rooted out by the procedures in school courses in literature. The authors are led to question whether there is in schools a tendency to inculcate a liking for absurdly false sentiment.

VII. Reading Vocabularies

This section describes the purpose of representative studies of reading vocabularies, outlines the methods employed in making each investigation, and presents the most important results. On account of the limitations of space, it has been impossible to include reference to all vocabulary studies or to present in detail the conclusions of the investigations to which reference is made.

Study of the Vocabularies of Beginning Books in Twelve Reading Methods¹

Purpose. The purpose of this investigation was to determine the vocabularies of the beginning books of twelve different sets of readers, each series representing a more or less distinct method of reading.

Methods. 1. Each word was listed and its frequency determined for each book. Where the letter "s" was used as a suffix, the word was counted with the root word. When other suffixes were added to the root, the words were listed separately. "It's" was not included with "its" but was listed separately. Words connected with a hyphen were counted as two different words.

2. A study was also made of the number of words common to any two books, to determine the extent to which the vocabularies were similar.

Results. 1. A total of 1636 different words was found in the twelve beginning books. The number of words introduced in a single book ranges from 157 to 630.

2. Four of the books have 70 per cent or more of the total number of words occurring less than 10 times; four others from 60 to 69 per cent; three from 50 to 59 per cent; and but one less than 50 per cent.

3. Of 1636 different words found in all of the methods, 783 are found in only one book. Only 38 words are common to all twelve books.

4. A large number of words appear only once in each book.

¹ Selke, Erich, and Selka, G. A. "Study of the vocabularies of beginning books in twelve reading methods." *Elementary School Journal*, Vol. XXII, June, 1922, 745.

5. The overlapping of vocabulary content of each book is shown definitely in Table 15.

TABLE 15.—NUMBER AND FREQUENCY OF DIFFERENT WORDS INTRODUCED IN EACH OF TWELVE BEGINNING READERS

Method	Number of words	1	2 to 5	6 to 9	10 to 19	20 plus
I. Rational Method Ward.....	546	183	161	43	53	106
II. Progressive Road	579	140	204	71	78	86
III. Beacon	630	164	252	76	60	78
IV. Riverside	396	30	155	70	71	70
V. Gordon	383	79	123	62	75	44
VI. Merrill	427	37	122	99	96	83
VII. Aldine	157	10	18	16	28	85
VIII. Edson—Laing	427	65	138	80	81	63
IX. Lippincott	377	82	67	68	78	82
X. Reading—Literature	209	6	53	47	45	58
XI. Natural	436	49	154	69	80	84
XII. Winston	308	53	111	53	51	40

The Vocabularies of Ten First Readers¹

Purpose. The purpose of this study was to determine the vocabularies of ten first readers in common use in American elementary schools.

Method. The words of the readers were counted page by page and the frequency of each word listed.

Results. The report of the study does not indicate the exact number of running words tabulated but an estimate shows it to be around 92,000. A total of 3541 words was found, only 96 of which appear in all ten first readers, and only 69 in nine of the ten readers. Two thousand forty-eight appear four times or less.

The results are summarized in Tables 17 and 18. The first is a frequency table showing the exact number of words appearing with specified frequency.

TABLE 16.—PERCENTAGE OF TOTAL NUMBER OF DIFFERENT WORDS IN TWELVE BEGINNING READERS COMMON TO ANY TWO OF THESE BOOKS

Method.....	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
I.	..	22	23	21	22	22	15	20	23	16	20	20
II.	..	..	35	27	33	34	18	35	36	22	33	34
III.	..	..	..	30	22	32	17	32	33	17	32	27
IV.	..	..	..	..	31	34	21	28	30	17	29	28
V.	..	..	..	..	..	36	24	34	46	27	34	32
VI.	..	..	..	..	..	..	22	35	35	23	34	35
VII.	..	..	..	..	..	..	..	20	23	23	21	19
VIII.	..	..	..	..	..	..	..	..	33	25	30	39
IX.	..	..	..	..	..	..	..	..	..	24	39	31
X.	..	..	..	..	..	..	..	..	..	..	21	36
XI.	..	..	..	..	..	..	..	..	..	..	..	30
XII.	..	..	..	..	..	..	..	..	..	..	..	..

¹Packer, J. L. "The vocabularies of ten first readers," *The Twentieth Year-book of the National Society for the Study of Education*, Part II, pp. 127-144.

TABLE 17.—FIRST FIFTEEN WORDS FOUND IN ALL READERS, WITH THEIR FREQUENCIES

Word	Frequency	Word	Frequency	Word	Frequency
the	5246	you	1859	little	1037
and	3375	is	1457	she	804
I	1929	it	1479	will	855
a	1869	he	1015	not	732
to	1856	in	1058	of	707

A Mastery Vocabulary in Primary Reading¹

Purpose. The purpose of this article was to describe the necessity for and methods of developing a basic vocabulary built upon a basal reading textbook series in use in a school system. Teachers frequently feel that story readers are unsatisfactory for use due to the large vocabulary involved. To eliminate this difficulty a vocabulary analysis was made of the basic readers (Winston) in this school system (Springfield, Ill.).

Method. The study involved the checking of each book of the series, listing the different words, scoring their frequency in each book, noting the words which held over from volume to volume, and the final selection of the words comprising the mastery vocabulary from those having the highest frequency in the greatest number of stories. The words in the second reader were scored only as different words, no frequency score being kept. Notes were taken of the words which were repeated from the primer and first reader. The list was finally compared with the list submitted by E. T. Housh in the Seventeenth Yearbook of the National Society for the Study of Education, Part I, Chapter IV. Since this list is based upon the analysis of ten different second readers, presumably a list of words common to his list and an analysis of the Winston second reader would consist of words worth mastering.

Results. 680 different words were selected for mastery in the first three grades, plus 100 more whose root forms were included in the 680 listed but whose endings were sufficiently different to demand attention.

This list was then checked against the five groups of five hundred words each having greatest frequency of appearance in Thorndike's "Teachers Word Book." Four hundred eight of the 680 words selected were found in Thorndike's first five hundred. Great similarity was also found between this list and the list in the Horn-Ashbaugh Speller.

Analysis of the Vocabularies of Ten Second-Year Readers²

Purpose. The purpose of this study was to determine scientifically the vocabulary of ten second readers in common use.

Method. The words of each of the ten readers were first counted, page by page, and each word listed, together with the number of times it occurred

¹Brown, Ethel M. "A mastery vocabulary in primary reading." *Bulletin of Department of Elementary School Principals. Second Yearbook*, Vol. 2, No. 4 (July, 1923), Chap. V.

²Housh, E. T. "Analysis of the vocabularies of ten second year readers," *The Seventeenth Yearbook of the National Society for the Study of Education*, Part I, pp. 40-45.

on the page. From this page list the vocabulary of each book was tabulated in a combination of an alphabetical and group system, together with the frequency of recurrence of each word in the entire book. From these vocabularies a tabulation was made showing the entire vocabulary of the ten books arranged in the same order as the separate vocabularies and containing the word-frequencies.

Results. 1. The vocabulary common to all the readers studied is given together with the frequencies of each word that appeared fourteen times or more. Throughout the study, every difference in spelling is counted as a new word.

2. A critical analysis of the vocabularies of a series of readers seems to give a measure of their value.

3. Such an analysis will aid in selecting supplementary readers for use in connection with a given basic text.

4. The readers in the second grade contain quite different lists of words. Of the thousands of words in the ten readers, only 419 are common to all ten, while when a "method" reader and a "content" reader are compared, the number of words common to the two books is still relatively small, ranging only from 655 to 928 words.

5. Hundreds of the words used in each reader occur only once, twice, or three times in that reader, thus failing to provide drill on these words.

The Reading Vocabularies of Third-Grade Children¹

Purpose. An effort was made in this study to determine the number of words in the reading and spelling vocabularies of third-grade children, the rapidity of growth of these vocabularies from year to year, the frequency of the various words, and the correlation of vocabularies in different texts.

Method. Each word in each book was counted to determine the number of times it was used in that book. Variations of words were listed as different words. Subject matter was not checked unless the child was required to read it or to spell the words it contained.

TABLE 18.—TOTAL FREQUENCIES OF WORDS FOUND IN TEXTBOOKS ANALYZED

	Different words	New words	Used words	Running words
Beacon Primer.....	743	743	0	7,007
Natural Primer.....	503	238	265	6,315
Beacon First.....	804	395	409	8,455
Natural First.....	849	265	584	8,878
Natural Second.....	1,770	861	909	25,332
Natural Third.....	3,304	1,888	1,416	34,855
Hamilton's Arithmetic.....	1,282	529	753	12,574
New World Speller (Reading)	450	58	392	2,705
Total (Reading).....	9,704	4,977	4,728	106,121
New World Speller (Spelling Vocabulary).....	1,453	213	1,240	6,767

¹ Gregory, A. C. "The reading vocabularies of third-grade children," *Journal of Educational Research*, VII (February, 1923), 127-131.

Comment. A list of words of greatest frequency contains 35 of the 50 words of greatest frequency listed in the Ayres Spelling Scale. The first 13 words in this list of 50 words are the same as the first 13 words in the Ayres list of 1000 commonest words with the exception of the eleventh word. *Said* appears for *that* in the Ayres list. These 13 words constitute about 26 per cent of the running words in the third-year reading vocabulary. Approximately one-third of the words in this vocabulary occur but once. Undoubtedly this accounts for the persistence of many of these words as difficulties in the upper grades.

Determination of the Technical Vocabulary of School Subjects¹

Purpose. The purpose of this study was to determine the words absolutely essential or important in school subjects.

Method.

A. Subjects selected for study:

1. The mathematics group—arithmetic, algebra, geometry
2. The language and literature group—English grammar, French grammar, Latin grammar, German grammar, English and American literature
3. The history and civics group
4. The science group—general science, geography, biology, chemistry, physics, physiology
5. The manual arts group—home economics, manual training
6. The art and music group

B. Steps in the analysis of texts:

1. Selected texts in wide use. Number varied with reading matter or diffuseness of vocabulary
 2. Each text read through by at least two readers who copied all words that they thought a child might have difficulty in understanding
- Many readers and many texts were used to compensate for any unreliability of the individual reader.

New words listed at end. More and more readings were listed until three consecutive readings added less than one per cent new terms.

Readings varied from eight in chemistry to twenty-three in history. Two hundred twenty-five were necessary to reach saturation point in all subjects.

3. The procedure outlined in step 2 gave a list of words that varied from 291 for algebra to 1691 for general science. These words were apparently not of equal importance and were therefore rated by teachers of the subjects as follows: (a) Checked twice words absolutely essential to the given subject; (b) Checked once those words important but not essential; (c) Left unchecked unimportant words. The number of teachers checking ranged from 27 in home economics to 103 in arithmetic. The ratings in all subjects totaled 796.

4. Marked lists were sorted according to subject and tabulated as follows: those words checked twice were given two marks; those checked once were given one mark; this gave the complete number of checks for each word in each list. (A word double checked by 50 teachers equalled 100 marks; a word double checked by 9 teachers equalled 32 marks.) Each word in the list received its total marks. In algebra 10,931 checks were tabulated; in arithmetic, 71,180; in general science, 68,731; etc.

¹ Pressey, L. C. "Determination of the technical vocabulary of school subjects," *School and Society*, XX (July 19, 1924), 91-96.

5. Words were divided into four classes.

(1) Essential vocabulary; those words receiving one-half or more of the possible number of checks.

(2) Accessory vocabulary; those words receiving from one fourth to one half of the possible number of checks.

(3) Those words receiving less than one fourth of the total possible number of checks but which had been found in a third or more of the texts—that is, words appearing in the texts but not rated as important by the teachers.

(4) Words not receiving one fourth of the total possible checks nor appearing in one third of the texts. These were eliminated.

The first three classes were kept but differentiated in the printing. The common words in allied subjects were listed. The words common to *all* subjects in a group were separated. The words common to two or more subjects in a group but not to all were indicated by showing in which subjects they were important.

The lists were printed using capitals for essential vocabulary, italics for accessory vocabulary, ordinary lettering for words appearing in texts but not considered necessary by teachers.

Results. The results are summarized in Table 19.

TABLE 19—TOTAL NUMBER OF WORDS FOR EACH CLASS AND EACH SUBJECT

	Essential (Caps)	Accessory (Italics)	Text Words but not impor- tant (Roman)	Total
Common Mathematics list.....	117	26	....	143
Arithmetic	83	274	49	406
Algebra	151	116	....	267
Geometry	196	184	....	380
Common Language list	145	68	....	213
English grammar	11	31	....	42
Latin grammar	22	20	....	42
French grammar	15	69	....	84
German grammar	20	39	....	59
Literature	306	509	21	836
Common Science list	191	24	....	215
General science	916	648	....	1564
Biology	675	677	41	1393
Chemistry	765	488	44	1297
Physics	709	331	....	1040
Geography	313	690	129	1132
Physiology	293	493	80	866
History	542	503	....	1045
Music	279	124	....	403
Home economics	1189	433	32	1654
Manual training	365	390	....	755

The number of common words in each group should be added to the words for each subject in that group to find the total number of words for each subject. For example, the arithmetic words equal 406 plus 143 common words giving a total of 549. The same method is used for other subjects in any group.

Suggested Uses of the Vocabulary Lists:

1. To point out the technical words for the subjects
2. In investigating failing pupils
3. Form a study list for pupils
4. Attempt to find weak spots in pupils' knowledge of the subject
5. Indicate a method for rating the "vocabulary burden" of one text as against another (i. e. What per cent of the words appear in a text?)
6. Basis for tests in special vocabularies
7. Suggest possibility of organizing a subject around the essential vocabulary

A Method for Measuring the "Vocabulary Burden" of Textbooks¹

Purpose. The purpose of this study was to develop a method for measuring the vocabulary difficulty or burden of public school textbooks.

Method. A. Two questions involved in the elaboration of procedure:

1. How many words in a reliable sampling of the vocabulary of a text and how to select this sampling?
2. How can difficulty be measured best?

B. *Steps*—1. A 1000 word unit was chosen as sufficient. 2. Estimated the number of pages at one line each to get a total of 1000 words. (500 pages in a book at 10 words per line using every fifth page.) 3. Every third line used, except in the newspaper, where one page was studied. 4. The different words in each 1000 running word sample were listed alphabetically. 5. Each different word was given the index number from Thorndike's Word Book. The theory was that the higher the median index number the easier the vocabulary. 6. A second sampling taken from third line on similar series of pages. 7. Sixteen types of reading matter studied.

C. *Definitions*—1. Vocabulary range—number of different words in 1000; 2. Zero value words—those words not found in the 10,000 of Thorndike's Word Book; 3. weighted median index number—median index number with zero-value words counted twice.

Conclusions.

A. Limitations pointed out by author

1. Question as to reliability of such a sampling.
2. A summary like the above leaves out important elements. Any average covers up points that a complete distribution would show.
3. Any faults and errors in the Thorndike Word List are involved.

B. Potentialities.

1. Reliability may be increased by using more 1000 word counts.
2. Method useful in finding the vocabulary distribution throughout a text, for example, the first chapter versus the last.

¹ Pressey, S. L. and Lively, Bertha A. "A method for measuring the vocabulary burden of textbooks," *Educational Administration and Supervision*, Volume IX, October, 1923, 389-398.

3. Method is far superior to any guess.

4. Useful in studying overlapping in vocabularies which might be very important, as in general science and chemistry.

Results. The important results are summarized below:

Books	Range		Zero Value Words		Weighted	Median
	1*	2*	1	2	1	2
Second Readers: Jones.....	371	359	4	4	86	88
Horace Mann	412	421	9	9	78	83
Aldine	367	353	7	6	77	79
Fourth Readers: Jones.....	471	454	12	20	71	62
Aldine	450	455	24	11	63	69
Horace Mann	466	472	15	17	65	66
Stevenson: Kidnapped	402	415	21	30	67	65
Thackeray: Vanity Fair.....	490	459	43	34	43	54
Columbus Dispatch	528	581	49	45	33	37
Same without Local Names..	514	560	35	24	38	45
Muzzey: American History.	533	506	24	30	38	40
Clark: Introduction to						
Science	483	491	22	25	52	50
Clark: General Science	480	463	30	30	43	45
Hunter: Elements of Biology	464	467	57	57	28	34
Elementary Chemistry**	399	358	67	69	22	14
Kimball: College Physics..	393	405	60	59	24	32
Howell: Physiology	442	473	108	94	4	10

* Samplings

** McPherson and Henderson

Word Knowledge in the Elementary School¹

Purpose. The purpose of this study was to determine "the frequency of occurrence of words in the talk our pupil and graduate will or should hear, and the books, articles, letters, and the like, which he will or should hear."

Method. The words in a part or all of each of forty-one sources including materials read by children and by adults were counted. A plural formed by adding *s* was not counted separately, but entered under the singular form. "The same procedure was followed, except in certain cases for special reasons, with plurals where *y* is replaced by *ies*, adverbs formed from adjectives by adding *ly*, comparatives formed by adding *er* or *r*, superlatives formed by adding *est* or *st*, verb forms derived by adding *s*, *ed* or *d*, *n*, and *ing*, in cases where the derived form would probably be easily read and understood by the pupil when he experienced it, if he knew the primary word. Adjectives formed from proper nouns by adding *n* are also, as a rule, counted with the noun." The frequency of each word was determined first for each source separately. These frequencies were then added and the result thus obtained was called the "sum of credits" or "credit sums."

¹ Thorndike, E. L. "Word knowledge in the elementary school," *Teachers College Record*, XXII (September, 1921), 334-370.

Results. The study resulted in the most comprehensive usable word list which is available. Ten thousand of these words, together with their "credit sums" are published in the *Teachers Word Book*, published by Teachers College, Columbia University.

The following uses of the word list are suggested by Thorndike: Aids in determining words which merit emphasis in teaching; aids in establishing and clarifying standards for grades and by ages; aids in evaluating textbooks or in determining the suitability of their vocabularies; helps in the grading and selection of readers; aids in determining phonic elements which occur most frequently; suggests a basis or standard vocabulary for use in teaching English to foreigners; suggests additions to existing spelling scales; and aids in improving reading tests.

VIII. The Evaluation of Teaching Techniques

The problem. Current practice in reading has been the topic of much criticism. Many widely prevalent techniques are so manifestly out of line with sound aims that it would seem to be superfluous to submit them to experimental evaluation. Critical writers¹ have long been convinced of the need for a thoroughgoing reconstruction of reading techniques. Judd maintains that the time for minor revisions is over and points the need for embodying fundamental revisions in an experimental program for evaluation.

Meanwhile, although numerous independent studies have provided a scientific basis for fundamental changes, these have only recently been incorporated in an inclusive program of reading instruction.² Certain special techniques have been evaluated with reference to immediate and restricted outcomes. Such studies are less significant to curriculum workers than experiments which eventuate with conclusions of more general import. The increased relative significance of silent reading in grades above the third is quite generally acknowledged, but the traditional techniques of instruc-

¹ Cattell, J. McK. *Mind*. 1886. pp. 65 and 531.

Huey, E. B. "Preliminary experiments in the physiology and psychology of reading." *American Journal of Psychology*, XI, (July, 1898) 1-20.

Dearborn, W. A. *The psychology of reading*. Columbia Univ. Contributions to Philosophy and Psychology, Vol. XIV, No. 1. New York: Science Press, 1906. 136 p.

Thorndike, E. L. "Reading as reasoning." *Journal of Educational Psychology* (June 1917), pp. 323-32.

Judd, C. H., with the coöperation of W. S. Gray, C. T. Gray, Katherine McLaughlin, Clara Schmitt, and A. R. Gilliland. *Reading: its nature and development*. Supplementary Educational Monographs, Vol. II, No. 4. Chicago: Department of Education, University of Chicago, 1918. Pp. 146-155.

² *Twenty-Fourth Yearbook of the National Society for the Study of Education*. Bloomington, Ill.: Public School Pub. Co., 1925. Pp. 200.

tion in oral reading are so comfortably familiar to teachers that they often persist in the face of cumulative evidence¹ of the significance of silent reading. This conservatism is perhaps largely due to the fact that recommendations were not accompanied by specific suggestions as to desirable techniques or preferred procedures.

Contributions of specific studies. The formulation of practical procedures and the evaluation of techniques are, however, a stupendous co-operative task which has been visioned more clearly than it has been realized.² Some factors which determine the comparative desirability of various techniques are psychological. The early investigations of Cattell, Boggs, Huey,³ show that (a) Meaning should be stressed from the very beginning; (b) Words are more readily recognized if presented in context; (c) For beginners especially the procedure should avoid direct emphasis on recognition of words and sounds.

Buswell⁴ compared contrasting methods of beginning reading by a thorough-going analysis of pupil performance and concluded that methods should not be judged by their outcomes at the end of the first grade. Immediate results in skill may have been obtained at the expense of habits which influence later development. Thus it is necessary to evaluate techniques with reference to the nature and range of their ultimate effects on reading development. This study also shows the specific effects of techniques. For example, training in word recognition cannot be assumed to transfer to, or be automatically transformed into, general reading ability. Abilities are general only when the specific elements of training and experience have been varied and inclusive.

¹ Judd, C. H. "Relation of school expansion to reading," *Elementary School Journal*, XXII, (December, 1922), 253-266.

Gray, W. S. "The importance of intelligent silent reading," *Elementary School Journal*, XXIV, (January, 1924).

² Horn, E. *The Twentieth Yearbook of the National Society for the Study of Education*. Introduction. Bloomington: Public School Publishing Co., 1921. Pp. VII-IX.

Horn, E. *The Objectives in Reading as a Guide to Remedial and Prophylactic Work*, pp. 287-96. *Second Yearbook of the Department of Elementary School Principals*, Washington: The Department of Elementary School Principals of the N. E. A.

³ Cattell, J. McK. *Mind*, 1886.

Boggs, Lucinda. "How children learn to read," *Pedagogical Seminary*, XII, 1905.

Huey, Edmund B. *The Psychology and Pedagogy of Reading*. New York: Macmillan, 1908.

⁴ Buswell, Guy T. *Fundamental reading habits: a study of their development*. Supplementary Educational Monographs, No. 21. Chicago: Department of Education, University of Chicago, 1922. Chapter III, p. 103.

The specific nature of reading habits is also strikingly shown by C. T. Gray,¹ and by Judd and Buswell.² In the intermediate grades special sets of habits must be developed to enable pupils to cope with study materials effectively. Teachers should study the effects of instruction and select techniques and organize procedures with reference to their probable outcomes. The purposeful selection of techniques in terms of varied objectives is conducive to flexibility of reactions and the adjustment of reading habits to varying purposes, needs, or content.

Gates³ shows that special reading and study technique can be developed and that the transfer from one type of training to another, while positive, is too small to be depended upon. Training must, therefore, be many-sided. Practice exercises should be so framed that the pupils are conscious of the purpose for which they are reading, and so that all pupils are held responsible for the results. Certain test techniques may suggest economical procedures for such training.

Horn⁴ suggests that speed and comprehension are not the ultimate objectives in teaching reading but that objectives must be stated in terms of needs, situations, and activities in life. He also maintains that techniques must be evaluated broadly and with reference to these objectives, rather than by reference to their effect on standard test scores. That does not imply that comprehension and rate are insignificant but rather that they are too general for the organization and evaluation of specific procedures.

This criticism is particularly significant with reference to the development of abilities which are not taken into account by standardized tests. Dr. Hosic's⁵ study is an example of a direct evaluation of procedure and non-skill outcomes. Theisen⁶ evaluates the effect of extensive reading by correlating amount read with growth in ability. In the same book informal

¹ Gray, C. T. *Types of reading ability as exhibited through tests and laboratory experiments*. Supplementary Educational Monographs, No. 5. Chicago: Department of Education, Univ. of Chicago, 1917. XIII: 196.

² Judd, C. H., and Buswell, G. T. *Silent reading: a study of the various types*. Supplementary Educational Monographs, No. 23. Chicago: Department of Education, University of Chicago, 1922. XIV, pp. 160.

³ Gates, A. I., and Van Alstyne, D. "General and specific effects of training in reading," *Teachers College Record*, XXV, (March, 1924), 98-123.

⁴ Horn, E. "The objectives in reading as a guide to remedial and prophylactic work," 287-96. *Second Yearbook of the Department of Elementary School Principals*. Wash., D. C. Department of Elementary School Principals of the N. E. A.

⁵ Hosic, J. F. *Empirical studies in school reading*. Teachers College Contributions to Education, No. 114. New York: Teachers College Bureau of Publications, 1921.

⁶ Theisen, W. W. "Factors affecting results in primary reading," pp. 1-25. *Twentieth Yearbook of the National Society for the Study of Education*. Bloomington: Public School Pub. Co., 1921.

tests are used to measure the effectiveness of certain techniques.¹ The latter is an attempt to measure the spread of effects in an activity which combines reading with other activities. Hoover² evaluated certain individual phrase card drills with action responses by using the Monroe Standardized Silent Reading Test before and after a three-month training period and found that the drill sections made more pronounced improvement in both comprehension and rate.

Another type of evaluation is represented by classroom studies in which the organization of the work takes account of individual differences. The progress of the pupils along the lines of various individual needs is reported. By such studies³ the relative effectiveness of certain types of adjustment to individual needs and interests is shown. Such adjustments are highly effective when curriculum and materials recognize such needs. These studies also show how the early detection of difficulty is facilitated by the regular use of informal diagnostic tests and checks on extensive reading.

Summary. The aspects of techniques which have adequate experimental sanction are:

1. The presentation of words in context in work with beginners.
2. Emphasis on meaning from the very beginning.
3. Emphasis on silent reading in grades above the third.
4. The use of informal tests as a regular part of silent reading technique.
5. Provision for systematic development of specific reading and study habits through purposeful specific practice.
6. The use of varied techniques adjusted to varied materials and purposes.
7. Continued diagnostic teaching and study of pupil reactions for the purpose of effective guidance.

IX. The Place of Phonetics in Teaching Reading

Three distinct trends are noticeable in the studies bearing on phonetic training: (1) comparisons of children who have received much training in phonetics with children trained primarily in more varied aspects of read-

¹ Greene, H. A. *Measuring comprehension of content material* and Heller, Regina R., and Courtis, S. A. "Exercises developed at Detroit for making reading function." *Twentieth Yearbook of the National Society for the Study of Education*, pp. 114-27, and 153-61. Bloomington: Public School Pub. Co., 1921.

² Hoover, J. H. "Motivated drill work in third grade silent reading," pp. 77-89. *Twentieth Yearbook of the National Society for the Study of Education*, Bloomington: Public School Pub. Co., 1921.

³ Zirbes, L. "Diagnostic measurement as a basis for procedure in reading," *Elementary School Journal*, XVIII, (March, 1918), 505-522.

Carswell, Marion, and Beatty, W. W. *Reading and language in the Winnetka Public Schools*, pp. 313-29.

Keller, Helen B., and Fernald, Grace M. "Remedial work for non-readers," pp. 333-46.

Merton, Elda L. "The discovery and correction of reading difficulties," pp. 346-63, *Second Yearbook of the Department of Elementary School Principals*. Wash., D. C. Department of Elementary School Principals of the N. E. A.

ing to determine their ability to interpret, their spontaneity of attack, and their accomplishment in other phases of reading; (2) the discovery of the individual needs of pupils with regard to phonetic training; and (3) the evaluation of phonetic elements to discover the most essential elements for use in training.

These investigations¹ show that ability to recognize words quickly and independently is essential to continued progress in reading. The question remains as to the degree to which this fundamental habit should be developed in relation to other fundamental reading habits at different grade levels. Studies of eye movements by Judd² show clearly that confusion arises when no satisfactory method of word attack has been developed. He recommends phonetic analysis as a valuable method of attacking new words and of eliminating periods of confusion.

The tendency of many teachers is to question the wisdom of training in word calling at the expense of right attitudes toward reading and of ability to comprehend. Investigators recognize this difficulty but maintain that training in phonetics is legitimate at a given grade level, provided all essential phases of reading are given adequate emphasis.

Waste of time and effort are indicated in the case of pupils who have a keen phonic sense when they are held to routine phonic drills.¹ A large number of pupils need basic phonic training. Foreign children without satisfactory language habits, children with speech defects, and certain remedial cases in reading seem to need more intensive training carefully adapted to their specific difficulties. Investigations show clearly that the amount and kind of phonic training must be adapted to individual needs.

Evaluation of phonetic elements is dependent in part upon agreement as to what constitute such elements. No such agreement exists in the studies³ which have been published. Each investigator has defined and classified the phonic elements somewhat differently. The frequency of each

¹ Currier, L. B., and Duguid, O. C. "Phonics or no phonics," *Elementary School Journal*, XVII (December, 1916), 286-87.

Currier, L. B. "Phonics and no phonics," *Elementary School Journal*, XXIII, (February, 1923), 448-52.

Buswell, G. T. *Fundamental reading habits: a study of their development*. Supplementary Educational Monographs, No. 21, Department of Education, Univ. of Chicago.

² Judd, C. H. *Reading: its nature and development*. Supplementary Educational Monographs, Vol. 2, No. 4, 1918, Department of Education, University of Chicago.

³ Ducker, Mabel L. "The present status of the teaching of phonics as shown by an analysis of eighteen reading manuals," Unpublished Master's Thesis, Univ. of Chicago, 1920.

Osburn, W. J. "The relative value of letter sounds and phonograms," Mimeographed circular issued by State Department of Public Instruction, Madison, Wisconsin, Sept., 1923.

Vogel, M., Jaycox, E., and Washburne, C. W. "A basic list of phonics for grades I and II," *Elementary School Journal*, XXIII (February, 1923), 436-43.

element in the reading vocabulary examined in each investigation has been adopted as the measure of its importance. The application of this method to a local situation appears in the Winnetka study,¹ and its relation to tendencies shown in twenty basic series of readers appears in Ducker's study.²

Needed scientific investigations in the field of phonetics have been summarized by Gray as follows: "A comprehensive study of the frequency of occurrence of all important phonetic elements and of the various combinations in which they occur, based on a word list which shows the frequency of words in common use in primary reading materials; the difficulties presented in teaching various elements; the relative merits of different elements and combinations in unlocking words; the time at which different elements and combinations of elements should be introduced; the amount of training which different types of pupils need; conditions under which training can be introduced to best advantage; the methods most effective in group instruction and with different types of individuals."

X. Provision for Individual Differences

One of the most important educational discoveries of recent years has been the fact that a wide range of abilities is represented in every grade and subject. The existence of individual differences is widely recognized. We know relatively little, however, of the nature, extent, and causes of these differences. The practical problem is to determine as nearly as possible what these differences are and how to deal with them economically. Evidence points to the need of a considerable amount of differentiated instruction whereas mass instruction, except in rare instances, has been the rule.

The nature of individual differences in reading—The first step is to determine the nature and extent of the differences. Such differences as are included by the general terms, "rate" and "comprehension," are relatively easy to measure, if one will only take the necessary pains to give several standard reading tests. Differences in many of the more subtle reading traits are less readily determined. It is even more difficult to determine the extent of such differences. It is likely that the pupils of a grade differ widely in each of the various ways in which a child is called upon to use reading. Children of a given class when reading the same material for the first time exhibit marked differences in such respects as these:

¹ Vogel, M., Jaycox, E., and Washburne, C. W. "A basic of phonics for Grades I and II," *Elementary School Journal*, XXIII (Feb., 1923), 436-43.

² Ducker, Mabel L. "The present status of the teaching of phonics as shown by an analysis of eighteen reading manuals," Unpublished. Master's Thesis, Univ. of Chicago, 1920.

1. Phonetic power or ability to grapple with new words.
2. General word knowledge.
3. Familiarity with the specific vocabulary of the particular selection.
4. Amount of vocalization or lip reading.
5. The number, order, and length of eye pauses.¹
6. Space between position of eye and voice in reading a line orally.²
7. Number of mispronunciations, substitutions, omissions, and insertions of words in oral reading.
8. Rate of reading orally and silently.
9. Ability to reproduce after a single reading.
10. Ability to answer questions of fact based upon the selection.
11. Ability to find specific words, phrases, or ideas.
12. Ability to see relationships or contrasts between facts and ideas set forth in the selection.
13. Ability to adopt a proper reading attitude or to look for the desired things on the printed page.³
14. Ability to answer questions requiring reflection and judgment.
15. Ability to visualize the conditions portrayed in selections.
16. Ability to read "between the lines," to link up with and interpret what is being read in terms of past experience.
17. Ability to resist suggestions or preconceived notions which tempt the child to form wrong conclusions.⁴
18. Interest, mental activity, and emotional reaction.
19. Ability to organize, outline, summarize or select the important ideas.
20. Some do not hear or perceive words in a normal way.⁵

A pupil may exhibit almost any degree of development in any of the various abilities. These abilities probably exist in various sorts of combinations in different individuals. Some are closely related, but others are not. A child may possess superior ability in some, ordinary skill in certain ones, and inferior ability in others. Unfortunately, we know very little as to the possible limits of most of these abilities. Probably no two children in any class are alike, or even approximately so. Probably they are no more alike than two men of the same height, but of different races, might be said to be alike. The importance of making these distinctions

¹ Buswell, Guy Thomas. *Fundamental reading habits: a study of their development*. Supplementary Educational Monographs. Department of Education, Univ. of Chicago, No. 21, 1922.

² Buswell, Guy T. *An experimental study of the eye-voice span in reading*. Supplementary Educational Monographs. Department of Education, Univ. of Chicago, No. 17, 1920.

³ Judd, Charles H. and Buswell, Guy T. *Silent reading: a study of various types*. Supplementary Educational Monographs. Department of Education, Univ. of Chicago, No. 23, 1922.

⁴ Osburn, W. J. *Graded and diagnostic paragraphs for use in silent reading*. Mimeographed Circular of the Wisconsin State Department of Public Instruction. Thorndike, E. L. "Reading as reasoning," *Journal of Educational Psychology*, VIII (June, 1917), pp. 323-32.

Thorndike, E. L. "The understanding of sentences," *Elementary School Journal*, XVIII, (October, 1917), pp. 98-114.

⁵ Gates, Arthur I. *The psychology of reading and spelling*. Teachers College, Columbia Univ., Contributions to Education, No. 129, 1922.

with care in connection with certain of the abilities listed has been indicated by Gates and by Courtis.¹ Remedial instruction will doubtless differ for various types of ability.

The causes of differences—Differences in reading ability are the result of many causes, some of which are suggested by the foregoing statements concerning the nature of differences. Among the more obvious causes of differences may be listed (1) the level of intelligence represented, (2) the methods of teaching employed, (3) interest and mental effort aroused, (4) habitual reading attitudes formed, (5) amount and character of reading done, (6) background of experience and language development, and (7) the extent to which teachers understand the nature of individual differences and the kind of treatment needed. To this list may be added defects of hearing, speech, and vision. The limitations of space make it impossible to discuss more than a few of these.

Levels of intelligence represented—Studies of the relative attainments of classes sectioned according to ability show decided differences in the progress of the different groups in reading.² The actual correlations, however, between reading and intelligence when the latter has been measured by the Stanford-Binet test which requires less reading than the group intelligence tests was not particularly high.³ When group intelligence tests were used Gates found that the correlation increased from the lower to the higher grades suggesting that possibly intelligence in reading manifests itself most largely after the mechanics of reading have been fairly well mastered. Poor readers, however, have been discovered even among children with intelligence quotients of 120 or over. Judd points out that there are undoubtedly pupils of excellent native ability who are perverted by bad methods of instruction, a matter which Gates' findings tend to confirm. It is possible, therefore, that we have attached too much significance to the level of intelligence attained and not enough to other causes of individual differences.

Methods of teaching employed—Haphazard and unsystematized methods of attacking the printed page form an important cause of individual differ-

¹ Courtis, S. A. "Analysis of reading ability," *Journal of Educational Psychology*, IV, (November, 1921), 287-91.

Gates, Arthur I. *The psychology of reading and spelling*. Teachers College, Columbia Univ., Contributions to Education, No. 129, 1922.

² Dickson, Virgil E. "What first-grade children can do in school as related to what is shown by mental tests," *Journal of Educational Research*, II (June, 1920), 475-80.

Keener, E. E. "The use of measurements in a small city school system," *Journal of Educational Research*, III (March, 1921)

Theisen, W. W. "Does intelligence tell in first-grade reading?" *Elementary School Journal*, XXII (March, 1922), 530-34.

³ Gates, Arthur I. *The psychology of reading and spelling*. Teachers College, Columbia Univ., Contributions to Education, No. 129, 1922.

ences.¹ The reading accomplishments of most pupils are the outgrowth of various combinations of good, bad, and indifferent methods. For example, Gates reports that some backward readers whom he has studied have had no training whatever in the perception of words and that others have received inappropriate training. In at least one third of these backward readers lack of training or inappropriate training is responsible for a part of the difficulty in reading.² Some pupils fortunately develop good reading habits in spite of the lack of specific training. Until quite recently little of the so-called "teaching of reading," aside from mechanical phrases, has been worthy of that term. Fortunately many teachers are being trained to teach silent reading. The fact that there is frequently a low correlation between accomplishment records in different types of silent reading probably indicates lack of training in certain types.³

Interest and mental effort aroused—Pupils otherwise equal will develop differences in reading ability on account of differences in interest and mental effort put forth. Zirbes reports that variations in the amount of training and practice needed to correct similar faults in different pupils not only showed differences in native ability but also in mental inertia. "Some pupils never knew their powers because they had not been aroused, but were allowed to putter away at a very low level of attention." The effect of an indifferent attitude is emphasized repeatedly by Gray.⁴ Judd finds that some pupils develop a mental lethargy, as the result of poor methods, which simulates very closely native sluggishness of temperament. Zirbes calls attention to the fact that asking pupils to follow the pace of a poor reader when interest is urging them on causes indolence and works against the formation of good reading habits.⁵

Habitual reading attitude formed—Many pupils appear to develop a certain fixed type of attack in all reading activities, regardless of the purpose for which reading is intended on given occasions. Some read rapidly and neglect details.⁴ Others form the habit of reading every detail with painstaking care. Uhl⁶ found some pupils who made low scores on account of extreme care and others on account of extreme carelessness. Zirbes points

¹ Judd, Charles H. *Reading: its nature and development*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, Vol. 2, No. 4, 1918.

² Gates, Arthur I. *The psychology of reading and spelling*, Teachers College, Columbia Univ., Contributions to Education, No. 129, 1922.

Gates, Arthur I. "A study of reading and spelling with special reference to disability," *Journal of Educational Research*, VI (June, 1922).

³ Theisen, W. W. An unpublished study of the relationship of different types of silent reading ability. Milwaukee Public Schools.

⁴ Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 22, 1922.

⁵ Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918) 505-22.

⁶ Uhl, W. L. "The use of results of reading tests as bases for planning remedial work," *Elementary School Journal*, XVII (December, 1916), 266-75.

out that a preponderance of any one type of reading practice tends to lower the efficiency in neglected types—that is, if careful reading is pursued to the exclusion of rapid silent reading, the reader will lose in ability to scan rapidly material of little value for the purpose of selecting passages which deserve careful reading.¹ Judd and Buswell concluded that reading lessons which require pupils to search every nook and corner of the line for rhetorical intricacies tend to destroy the habit of reading in a straightforward fashion.²

Amount and character of material read—It is a matter of common belief and there is some statistical evidence to show that the amount and character of the material read are significant factors in producing individual differences in reading accomplishment. Zirbes' data show a correlation of 0.53 (Spearman) between home reading and rate. Facts secured by Gray, Theisen, and Woody indicate some correlation between reading ability and the amount read.³ Owing to the fact, however, that some read carelessly it is difficult to determine the real effect of quantitative reading. Furthermore, many pupils probably fail to develop good reading habits because much of the material read is too difficult, poorly written, of little content value, or insufficient in quantity.

Experience—Experience is an additional factor of unknown magnitude in producing differences in children. Lack of experience is a handicap and wide experience a boon to good reading. Gray found that the failure of readers poor in the mechanics of reading to establish fundamental habits of interpretation was due to limited experience.⁴ Kindergarten and pre-school experience has considerable bearing upon early development in reading. The child with a large fund of experience has a larger supply of associations to aid him in comprehending the meaning and significance of what he reads. New ideas are linked up with familiar experiences of the past. Everyone is familiar with the handicaps under which children coming from homes of limited advantages suffer.

The treatment of individual differences—The primary aim should be to develop the reading ability of every child to its maximum. The object is not to level all differences as some have erroneously believed. Classroom teaching should be so planned that each individual will receive the training he needs without receiving attention which rightfully belongs to other children.

¹ Zirbes, Laura. "Diagnostic measurement as a basis for procedure." *Elementary School Journal*, XVIII (March, 1918), 505-22.

² Judd, Charles H., and Buswell, Guy T. *Silent reading a study of various types*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 23, 1922.

³ Theisen, W. W. "Factors affecting results in primary reading," *The Twentieth Yearbook of the National Society for the Study of Education*. Part II. pp. 1-24 (relevant sections).

⁴ Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 22, 1922.

Diagnosis—The first step in treatment is an adequate diagnosis of the child's reading ability and of his intelligence. Since few specialized tests are available, teachers will need to depend upon analyses of the responses of pupils to exercises in standard tests which call forth different types of ability and upon informal tests of their own making.¹

Grouping by ability—In schools of sufficient size pupils may be grouped with profit according to intelligence.² This, however, will solve only a part of the difficulty. Within classes, the teacher will find it advisable to group those needing instruction of particular types for as many lessons as may be necessary.³ During such periods the remaining pupils of the group may be assigned reading from selected library books or given individual reading problems.

¹ Anderson, C. J., and Merton, Elda. "Remedial work in reading." *Elementary School Journal*, XX (May and June, 1920 and January, 1921). 685-701, 772-91, 336-48.

Gray, C. T. *Deficiencies in reading ability*, D. C. Heath & Co., 1922.

Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs. Department of Education, The University of Chicago, No. 22, 1922.

Gray, William S. "The diagnostic study of an individual case in reading." *Elementary School Journal*, Vol. XXI (April, 1921), pp. 577-594.

Gray, William S. "Individual difficulties in silent reading in the fourth, fifth, and sixth grades," *The Twentieth Yearbook of the National Society for the Study of Education*, Part II, pp. 39-53.

Geiger, Ruth. "A study in reading diagnosis," *Journal of Educational Research*, VIII (November, 1923), pp. 285-300.

Osburn, W. J. *Graded and diagnostic paragraphs for use in silent reading*. Mimeographed Circular of the Wisconsin State Department of Public Instruction.

Thorndike, E. L. "The understanding of sentences," *Elementary School Journal*, XVIII (June, 1917), pp. 323-32.

Thorndike, E. L. "The understanding of sentences," *Elementary School Journal*, XVIII (October, 1917), pp. 98-114.

Uhl, W. L. "The use of results of reading tests as bases for planning remedial work," *Elementary School Journal*, XVII (December, 1916), pp. 266-75.

Waldman, Bessie. "Definite improvement of reading ability in a fourth-grade class," *Elementary School Journal*, XXI (December, 1920), pp. 273-80.

Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918), pp. 505-22.

² Dickson, Virgil E. "What first-grade children can do in school as related to what is shown by mental tests," *Journal of Educational Research*, II (June, 1920), pp. 475-80.

Keener, E. E. "The use of measurements in a small city school system," *Journal of Educational Research*, III (March, 1921.)

Theisen, W. W. "Does intelligence tell in first-grade reading?" *Elementary School Journal*, XXII (March, 1922), pp. 530-34.

³ Geiger, Ruth. "A study in reading diagnosis," *Journal of Educational Research*, VIII (November, 1923), pp. 285-300.

Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918), pp. 505-22.

Gradation of materials—Gradation of materials to suit the ability of the children is a rather common practice.¹ Zirbes arranged a collection of library reading material suitable for different ability groups. According to the plan adopted in the upper grades by Superintendent Kircher when at Merrill, Wisconsin, books were arranged in three lots according to difficulty. A somewhat similar plan is in use at Winnetka, Illinois, where every child, regardless of his grade in school, is assigned a list of material appropriate for the grade to which his reading test record corresponds. When he completes the assigned list he is retested and given a new list appropriate for the grade which his accomplishment then approximates. Such plans call for less uniformity and more variety in purchasing books.

Independent reading—Provision of opportunities for independent reading has much to commend it. The classroom bookshelf for reading whenever time permits, supervised home reading, and individual or group problems and projects allow the child to read unhampered at his own pace and according to his own interests. Some teachers use a number of the regular reading periods each week for independent silent reading from library books and magazines. Stronger pupils may be asked to review books for others, or may be given more advanced problems. While such groups are reading independently the teacher may devote his attention to the weaker ones.²

Special help—Special help is always necessary for some individuals and for small groups. Special drills for overcoming particular types of weakness should be given to those needing it. Such drills may be appropriate for any of the specific reading abilities listed in the section describing individual differences. At times, it is necessary to aim at improvement in some phase other than the one in which real improvement is desired.³ The case studied by Gray emphasizes the fact that "A pupil may read slowly because of poor or inaccurate habits in other phases of reading. In such cases the pupil's rate of reading cannot be improved until these related habits have been corrected. Therefore, remedial instruction to improve the rate of silent reading may include exercises in the mechanics of oral reading and in the interpretation of what is read."⁴ Weaknesses common to most members of the class are more profitably treated as class exercises, excusing only such pupils as are clearly not in need of a particular type of training. Rarely should class time be used for drill on exercises

¹Theisen, W. W. "Provisions for individual differences in the teaching of reading," *Journal of Educational Research*, II (Sept., 1920), pp. 560-71.

²Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918), pp. 505-22.

³Buswell, Guy T. *Fundamental reading habits: a study of their development*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 21, 1922.

⁴Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 22, 1922.

needed only by a very few. Suggestions for dealing with many specific types of individual difficulties are to be found in the reports of individual case studies.¹

Exercises to stimulate independent thinking—One of the most readily administered provisions for individual differences is the liberal use of assignments and class exercises which stimulate independent thinking and research. Questions of the problem type which offer possibilities for independent investigation and study are especially suitable for this purpose. Such exercises permit the brighter pupils to utilize their ability to weigh values, to read between the lines, to see relationships and contrasts, to skim and to select the larger units of organization.² Pupils who need training in specific types of interpretation may be assigned problems which require them to exercise the particular type of interpretative ability that is lacking.³ Thus, pupils weak in ability to organize may be given problems requiring organization.

Development of individual interests—Individual needs may be cared for to some degree by properly developing and capitalizing each child's particular interest. Gray points out in connection with his recommendations for remedial treatment of poor readers that "keen interest must be aroused in reading through the use of material directly related to the pupil's interests."³ The teacher's most difficult problem is to find where each pupil's interests lie and how to utilize them. Principal Rohan's development of

¹ Anderson, C. J., and Merton, Elda. "Remedial work in reading," *Elementary School Journal*, XX (May and June, 1920 and Jan. 1921), pp. 685-701, 772-91, 336-48.

Gray, C. T. *Deficiencies in reading ability*. D. C. Heath & Co., 1922.

Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 22, 1922.

Gray, William S. "The diagnostic study of an individual case in reading," *Elementary School Journal*, XXI (April, 1921), pp. 577-94.

Gray, William S. "Individual difficulties in silent reading in the fourth, fifth, and sixth grades," *The Twentieth Yearbook of the National Society for the Study of Education*, Part II, pp. 39-53.

Geiger, Ruth. "A study in reading diagnosis," *Journal of Educational Research*, VIII (Nov., 1923), pp. 285-300.

Uhl, W. L. "The use of results of reading tests as bases for planning remedial work," *Elementary School Journal*, XVII (Dec., 1916), pp. 266-75.

Waldman, Bessie. "Definite improvement of reading ability in a fourth-grade class," *Elementary School Journal*, XXI (Dec., 1920), pp. 273-80.

Zirbes, Laura. "Diagnostic measurement as a basis for procedure," *Elementary School Journal*, XVIII (March, 1918), pp. 505-22.

² Geiger, Ruth. "A study in reading diagnosis," *Journal of Educational Research*, VIII (Nov., 1923), pp. 285-300.

³ Gray, William S. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, Department of Education, Univ. of Chicago, No. 22, 1922.

reading interests around club activities is suggestive of a method of approach.¹ When once the pupil's interest has been aroused in the necessary reading material, he frequently develops rapidly without much assistance from the teacher.

XI. Diagnosis and Remedial Work

The major implication of diagnostic and remedial work for curriculum workers lies in the study of the causes of difficulty. These show how children are diverted from normal lines of reading development and how certain specific types of work correct wrong tendencies. The presence of a large number of remedial cases in a school or school system is indicative of a lack or a wrong emphasis in the curriculum. Reduction of the number of deficient readers and the growth in the reading abilities of deficient readers are most noticeable when causes of deficiency are investigated and brought under control. Deficiencies of long standing are harder to remedy than incipient defects. Thus prompt provision for individual needs is essential.

Diagnostic analysis and remedial practice have not yet been validated by application to a sufficient number of cases. To facilitate such analysis and application and to assist the teacher in work with problem cases a chart² has been prepared from an analysis of outstanding studies.³ The chart,

¹ Rugg, Harold. "The curriculum for gifted children," *The Twenty-third Yearbook of the National Society for the Study of Education*, Pt. I, pp. 105-108.

² Zirbes, Laura. "Diagnosis and remedial work," Chapter X. *The Twenty-fourth Yearbook of the National Society for the Study of Education*. Bloomington: Public School Pub. Co., 1925.

³ Anderson, C. J., and Merton, E. "Remedial work in reading," *Elementary School Journal*, XX (May and June, 1920), 685-701, 772-791; XXI (Jan., 1921), 336-351.

Fernald, Grace M., and Keller, Helen. "The effect of kinaesthetic factors in the development of word recognition in the case of non-readers." *Journal of Educational Research*, V (Dec., 1921), 355-77.

Gates, A. I. *The psychology of reading and spelling with special reference to disability*. Teachers College Contributions, Columbia University, No. 129. New York: Teachers College Bureau of Publications, 1922.

Gray, C. T. *Deficiencies in reading ability*. New York: D. C. Heath and Co., 1923. XIV, 420.

Gray, W. S. "Diagnostic and remedial steps in reading," *Journal of Educational Research*, IV (June, 1921), 1-15.

Gray, W. S., with the coöperation of Kibbe, Delia; Lucas, Laura; and Midler, L. W. *Remedial cases in reading: their diagnosis and treatment*. Supplementary Educational Monographs, No. 22. Chicago: Department of Education, Univ. of Chicago, VII, 208.

Hollingworth, L. S. *Special talents and defects: their significance for education*. New York: Macmillan, 1923.

Lloyd, S. M., and Gray, C. T. "Reading in a Texas city: diagnosis and remedy." *Univ. of Texas Bulletin*, No. 1853 (Sept. 20, 1918). VII, 107. Austin: Univ. of Texas.

Merton, E. "The discovery and correction of reading difficulties," pp. 346-363.

which is too detailed to include in this report contains lists of deficiencies, probable causes, and appropriate remedial measures, is accompanied by the recommendations that:

1. Remedial work be preceded by a thoroughgoing inquiry into the nature and causes of the deficiency.
2. Remedial work be planned with specific reference to individual needs and causes of deficiency.
3. Records of growth be kept.
4. The teacher function as a guide and observer in the primary grades, studying pupil reactions and making prompt adjustments to individual needs before chronic deficiency and discouragement result.
5. The presence of any single deficiency in a large number of pupils be investigated with the purpose of discovering a general cause requiring curricular adjustment.

XII. Time Allotment for Reading

Time allotment—The amount of time which should be given to reading has been and still is an important issue. One of the most important of the earlier studies was made by Holmes¹ who obtained information from fifty American cities. His data showed that an average of 53 minutes was given to reading each day in the first grade and that the total amount of time decreased gradually from the first to the eighth grade inclusive. The important facts revealed in some of the more recent studies will be summarized briefly.

In Indianapolis and other cities—In the reading survey of Indianapolis, Gray² presented the average time allotment for fifty cities as determined by Holmes, the time allotment for Cleveland in 1915, and the time allotment for Indianapolis in 1917. The numbers of hours given to reading in these cities are shown in Table 20. The entries in the table show that In-

The Second Yearbook of the Department of Elementary School Principals. Wash., D. C. The Department of Elementary School Principals of the N. E. A.

Osburn, W. J. "Graded and diagnostic paragraphs for use in silent reading." Mimeographed Bull., State Department of Public Instruction, Madison, Wisconsin, 1922.

Theisen, W. W. "Factors affecting results in primary reading," 1-25. *The Twentieth Yearbook of the National Society for the Study of Education*, Part 2. Bloomington; Public School Pub. Co., 1921.

Thorndike, E. L. "Reading as reasoning: a study of mistakes in paragraph reading," *Journal of Educational Psychology*, VIII (June 1917), pp. 323-332.

Woolley, Helen T., and Ferris, E. "Diagnosis and treatment of young school failures." Bull., No. 1, 1923. Wash., D. C.: Government Printing Office, Department of the Interior, Bureau of Education.

Zirbes, Laura. "Diagnostic measurement as a basis for procedure in reading," *Elementary School Journal*, XVIII (March, 1918), pp. 505-22.

¹ Holmes, H. E. "Time distribution by subjects and grades in representative cities," *Fourteenth Yearbook of the National Society for the Study of Education*, Part I, 1915, pp. 21-27.

² Gray, William S. "Reading in the schools of Indianapolis," *Elementary School Journal*, XIX (January, 1919), p. 347.

dianapolis gave a relatively small amount of time to reading. The results of the standardized tests which were given showed that the pupils ranked low in reading accomplishment. We may reasonably conclude in view of these facts that Indianapolis was not giving sufficient time to reading to obtain satisfactory results. A second explanation is that the time was not used most effectively. It is possible that both factors were operative in this case.

In forty-nine large cities—Ayer¹ reported in 1924 the results of a comparative study of the time allotment for reading in Seattle and 49 large cities. A tabular summary of his data appears in Table 21 in terms of the number of minutes given to reading per week. These findings show clearly that large cities are now giving more time to reading in most grades than was shown in earlier studies, such as Holmes'. Ayer's study revealed also that many large cities are at present modifying their courses of study and time allotments. There is also a tendency in many cities "to give less attention to arbitrary daily time allotments in the primary grades, where the work goes by projects rather than by subjects."

TABLE 20.—NUMBER OF HOURS GIVEN TO READING PER YEAR BY GRADES

City	Grades								Total
	1	2	3	4	5	6	7	8	
Average for fifty cities.	266	235	188	153	126	117	98	97	1280
Cleveland	317	317	279	196	161	136	162	152	1710
Indianapolis	165	105	120	75	60	60	36	36	657

TABLE 21.—NUMBER OF MINUTES GIVEN TO READING EACH WEEK

	I	II	III	IV	V	VI	VII	VIII	Total
Average for									
49 cities.....	421	404	332	245	182	141	142	136	2003
	600	525	425	310	135	135	225	212	2567

In thirty-one first-class schools of North Dakota—Kirk² made a study of the actual program followed in thirty-one school systems and determined the number of minutes per week spent in recitation. A summary of his findings appear in Table 22. The entries in the table show that the schools of North Dakota are not giving on the average as much time to reading as is done in forty-nine cities. They are giving more time, however, than large cities devoted to reading several years ago when Holmes made his investigation.

¹ Ayer, Fred C. "Average time allotments in 49 large cities compared with Seattle," *Second Yearbook*, Department of Superintendence, 1924, Nat'l Educ. Assn., Wash., D. C. p. 140.

² Kirk, H. H. "Time distribution by subject and grade," *Elementary School Journal*, XVIII (March, 1923), pp. 535-41.

In rural schools—Reinoehl¹ made an analysis of the daily time schedules recommended in twenty-six model programs for one year rural schools as published in state courses of study. Information was recorded concerning the number of daily recitation periods and the total number of minutes per week given to reading in each grade. His findings appear in Table 22 and reveal a surprisingly small amount of time given to reading in comparison

TABLE 22.—AVERAGE AMOUNT OF TIME DEVOTED TO READING

Grades	I	II	III	IV	V	VI
Average number of minutes per week.....	325	250	250	125	125	125
Minimum number of minutes per week.....	225	125	75	100	75	75
Maximum number of minutes per week.....	650	450	400	225	275	200

with the time allotment in large cities. This fact doubtless explains in part the relatively poor reading accomplishment of rural pupils described in recent surveys.

Distribution of time between oral and silent reading—Two studies of time distribution between oral and silent reading will be referred to in this report. The first was made in 1917 by Gray² who obtained information from teachers concerning the percentages of time set aside for reading that were given to oral and to silent reading. His findings appear in Table 23. The entries in the table show the number of teachers reporting given percentages of time devoted to (o) oral reading and to (s) silent reading.

TABLE 23.—NUMBER OF TEACHERS REPORTING DIFFERENT PERCENTAGES OF READING TIME GIVEN TO ORAL-READING AND TO SILENT-READING INSTRUCTION IN 702 CLASSROOMS OF INDIANAPOLIS

Grades	I		II		III		IV		V		VI		VII		VIII	
Per cent of time	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
0.....	7	1	6	1	4	2	5	8	2	5	4	4	2	8	14	4
1- 10.....	15	2	15	4	4	6	9	12	6	11	14	6	9	9	15	9
11- 20.....	2	12	2	15	4	4	6	9	12	6	11	14	6	9	15	9
21- 30.....	3	27	5	19	3	14	5	13	8	10	15	11	4	10	15	9
31- 40.....	7	15	11	20	22	26	25	27	11	35	17	20	12	22	16	9
41- 50.....	11	11	27	22	33	27	27	25	15	14	25	27	30	26	18	22
51- 60.....	1	1	14	9	12	7	22	14	34	5	11	10	11	2	8	2
61- 70.....	16	1	15	8	14	9	4	10	2	3	8	6	12	4	2	8
71- 80.....	40	1	19	9	4	11	4	12	8	15	7	12	5	13	15	15
81- 90.....	15	6	2	1	1	1	1	3	2	2	4	2	2	2	6	6
91-100.....	5	1	1	1	1	1	1	1	1	1	5	2	4	4	4	4
Indefinite.....	10	3	3	1	3	1	3	3	3	3	3	3	3	3	3	3

The entries in Table 23 reveal wide variations in practice in each grade. A large majority of the teachers stated that they gave most of their time to oral reading in the first grade and very little of it to silent reading. In

¹Reinoehl, C. M. *Analytical survey of state courses of study for rural elementary schools*, Bureau of Education, Bull. No. 42, 1922, pp. 23-24.

²Gray, William S. "Reading in the schools of Indianapolis," *Elementary School Journal*, XIX (Jan., 1919), 348.

the grades above the first a distinct tendency is shown toward an equal distribution of time which becomes most pronounced in the fourth grade. The greatest diversity of practice is revealed in the grades above the fourth. In interpreting Table 23 two facts should be kept in mind: (a) The data were secured in 1917 before schoolroom practice had been greatly influenced by the recent emphasis on silent reading; and (b) The records are based on teachers' statements of their practice and not on records of the actual distribution of time.

A recent study is reported by McGaughey¹ of the practice in 305 cities. His findings show that both oral and silent reading are taught in most grades from the first to the eighth inclusive. This practice is somewhat more universal in the case of oral than of silent reading.

Concluding statement—Although definite conclusions concerning time allotment for reading cannot be drawn from the studies to which reference has been made, nevertheless, the results of these investigations are suggestive. Quoting from Kirk: "In the absence of all absolute knowledge the practice of the majority would seem to be a more satisfactory standard than no standard at all. A standard that is derived from statistics is better than one that is not derived at all. . . . There ought to be, within certain limits, a time allotment for each subject that would give the most satisfactory results, and it should be at the point where the law of diminishing returns operates most severely."

It is hoped that within the near future standards may be derived which will be applicable to various types of schools and to classrooms which follow different procedures in teaching pupils to read.

¹ McGaughey, J. R. "Distribution of grades in which elementary school subjects are taught," *Second Yearbook*, Department of Superintendence, p. 146.

CHAPTER VI

HANDWRITING

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THE SUMMARY of the studies on the curriculum in handwriting may be prefaced by a brief survey of the kinds of facts which are pertinent to the determination of curriculum standards in handwriting. This will furnish a background upon which to project the studies in question and thus determine how far they have covered the field.

There are at least three classes of facts which have important bearing upon the problem. They are as follows:

1. The degree of skill which children are able to attain at a certain point in their schooling with a reasonable amount of training.

The curriculum standards are sometimes expressed wholly in terms of an external demand. This taken alone is never sufficient. A decision must be based upon considerations which are analogous to those determining one's actions in case of a proposed purchase. Action is determined by both value and purchase price or cost. If it is of little value, even a low cost will not justify its purchase. If it is of great value, it will justify a correspondingly high price. The attainments which children make under various amounts and kinds of training, therefore, must constitute one of the legs which support the curriculum structure.

2. A second pertinent fact is the quality of writing which prevails among persons who employ handwriting for various purposes.

The argument supporting the validity of this type of evidence is that if large groups of persons actually get by with a certain quality or speed of writing, that this writing is sufficient for their purposes. This argument has some weight, though it is of course possible that all the persons in question are writing at a lower quality than would be profitable to them. The argument is perhaps somewhat stronger when it is applied to the relative attainments of different groups of persons. If we find that one vocational group, for example, writes better than another group, this fact is some indication that one vocation makes a higher demand than does the other.

3. The third pertinent factor is a demand expressed more directly in terms of specific requirements set up by certain vocations, or in terms of the opinion of persons responsible for the employment of individuals.

The committee has not been able to discover specific demands in which minimum essentials in handwriting for entrance to particular occupations are set up. It has been able, however, to gather together a considerable body of opinion of employing officials concerning the necessity of different grades of handwriting for employees.

The individual studies will first be reported separately and will then be summarized in the concluding section.

Studies Which Are Chiefly Quantitative

STUDY NO. 1. Freeman, Frank N. "Handwriting." *Fourteenth Yearbook of the National Society for the Study of Education*. Chicago, Univ. of Chicago Press. pp. 61-67.

Problem. The problem of this report was two-fold. In the first place it undertook to estimate the capacity of children to develop various degrees of skill in handwriting under the conditions of public school instruction. In the second place, the problem was to secure evidence concerning the demand which is made upon the employees of various types of business in respect to handwriting.

Method. The method which was used in determining the ability of children to learn to write was an analysis of the results of widespread surveys by means of tests of handwriting. A comparison was made of the attainments of children in a large number of schools and the relationship between the time spent in handwriting and the attainments of pupils was studied. In attacking the second problem a questionnaire was sent to fourteen business firms relative to the kind of work demanded of their employees, the importance of writing, and the quality and speed of writing which they considered necessary.

Summary of Findings. The first findings of the report consist of the scores of about thirty-four thousand children in fifty-six cities in speed and quality of handwriting. In addition to the median in speed and quality for grades two to eight, the median of the schools which represents the upper half and lower half of the entire group, respectively, is given. These median scores are shown in Table 24.

TABLE 24.—AVERAGE SPEED AND QUALITY OF HANDWRITING AND AVERAGE OF UPPER AND LOWER HALVES IN ALL THE SCHOOLS INVESTIGATED

		School grade						
		II	III	IV	V	VI	VII	VIII
Speed	Average of upper half..	35.4	47.7	56.2	64.9	69.2	73.4	77.8
	Average of all.....	30.6	43.8	51.2	59.1	62.8	67.9	73.0
	Average of lower half...	24.4	37.4	43.4	49.9	52.8	58.5	61.2
	Average of upper half...	43.5	46.1	49.3	54.5	58.5	64.7	67.8
Quality	Average of all.....	39.7	42.0	45.8	50.5	54.5	58.9	62.8
	Average of lower half...	36.8	38.8	43.2	47.4	51.5	54.2	57.6

It should be noted that in order to be in the upper half a school must be superior in a combination of rate and quality and not in rate or quality alone.

The question was now raised whether the median of the upper half of the schools might legitimately be taken as a standard of achievement. This would depend upon the causes of superiority. Among the possible causes considered were superior native ability of children, superior ability or training of teachers, a superior method of supervision or of instruction, and a

greater amount of time spent in drill. The first of these explanations was ruled out as being improbable. The last was investigated by comparing the amount of time spent by the twenty-three cities of the upper half and the twenty-three cities of the lower half. The average number of minutes per week spent by the cities in the upper half was 73.4, and by those in the lower half 73.3. The explanation, therefore, must lie in the ability and training of teachers, or in the methods of instruction. It seemed to the author legitimate to adopt as a standard one which could be obtained by superior methods of instruction, not in the exceptional school but in a large number of schools scattered all over the country.

A special situation was found with reference to speed. While the quality advanced uniformly throughout the grades, speed showed a slower advance in the grades above the fifth. By comparing the speed curve with Gilbert's curve in rate of tapping, it was found that the break came at a corresponding point. The diminished gain, therefore, rests upon a natural foundation in the child's slackened development. It was found that certain schools, seven in particular, were able to overcome this tendency to a slower development and to maintain a uniform growth in speed. It was held to be desirable to maintain this uniform growth even at the expense of slightly greater emphasis upon speed in the upper grades.

From these considerations tentative norms or standards were proposed as shown in Table 25.

TABLE 25.—PROPOSED STANDARD FOR QUALITY AND SPEED

	School Grade						
	II	III	IV	V	VI	VII	VIII
Quality	44	47	50	55	59	64	70
Speed	36	48	56	65	72	80	90

The results of the questionnaires to business firms are shown in Table 26. Out of twenty-nine cases in which a quality is mentioned, fifteen are of quality 60, and seven of quality, 70. The others scattered from 30 to 90. It is to be presumed that these are occupations in which handwriting is most important. The prevailing opinion, then, appears to be that 60 is sufficiently good with half as many considering 70 as necessary.

Supplementary data upon the attainment of pupils. In order to determine whether the average attainments which are given in Table 26 are representative of school children in general, a number of other investigations have been consulted and their results brought together in Table 27.

Table 27 indicates that there is considerable variation in the achievement found in the various investigations. In quality, for example, the average attainment at the sixth grade varies from 47 to 58.2.

TABLE 26.—QUALITY OF HANDWRITING REGARDED AS ESSENTIAL BY VARIOUS KINDS OF BUSINESS FIRMS

Kind of firm	Kind of work	Number employed	Quality of writing regarded as essential			Is speed important?
			Vertical	Medium slant	Extreme slant	
Correspondence school....	Clerical.....	15	.....	90	.....	Yes
Department store.....	Clerical and accounting.	19	70	70	60	Yes
Mail-order house.....	Stenography and book-keeping.	500	60	60	60	Yes
Correspondence school....	Entry and bookkeeping.	30	.....	90 or better	.....	Yes
Mail-order house.....	File clerk.....	400	60	60	50	Moderately
Department store, whole-sale.	General.....	.....	60	60	70	Yes
Packing company, railroad department.	Clerical.....	90	60	.....	.....	Yes
Department store.....	General office.....	82	70	60	60	Yes
Mail-order house.....	Addressing.....	200	.....	80	70	Yes
Correspondence school....	Addressing.....	75	70	.....	.....	Yes
Department store claim department.	Clerical.....	50	30	40	40	No.
Packing-house.....	"Distribution".....	38	.....	.....	70	Yes
Packing-house.....	"Account sales".....	53	.....	.....	60	Yes
Mail-order house.....	Stock clerk.....	100	60	60	60	Moderately
Total.....	.....	1,702	.....	.....	.....	.....

TABLE 27.—COMPARATIVE SCORES IN QUALITY AND SPEED OBTAINED IN SEVEN INVESTIGATIONS

Quality on Ayres Scale

Investigator or Source of Data	School Grade							
	II	III	IV	V	VI	VII	VIII	
D. Starch (1915).....	27	33	37	43	47	53	57	
E. J. Ashbaugh (1916).....	28.5	35.7	39.8	44.5	49.1	52.3	61	
L. P. Ayres.....	38	42	46	50	54	58	62	
F. N. Freeman (1915).....	39.7	42.0	45.8	50.5	54.5	58.9	62.8	
Cleveland Survey (1916).....	...	...	...	45	48	50	55	
Grand Rapids Survey (1916).....	29.4	34.5	44.4	51.7	58.2	61.4	68.4	
St. Louis Survey (1917).....	29.9	31.7	36.8	52.1	57.3	62.8	74.2	
Freeman's average of upper half of schools (1915).....	43.5	46.1	49.3	54.5	58.9	64.7	67.8	

Speed

Investigator or Source of Data	School Grade						
	II	III	IV	V	VI	VII	VIII
D. Starch	31	38	47	57	65	75	83
E. J. Ashbaugh	39.2	49.6	61.9	65.5	72.6	75	76.5
L. P. Ayres	32	44	56	64	70	76	80
F. N. Freeman.....	30.6	43.8	51.2	59.1	62.8	67.9	73.0
Cleveland Survey (1916).....	...	...	...	60	70	76	80
Grand Rapids Survey (1916)....	33.5	50.1	59.3	64.9	73.0	77.9	84.3
St. Louis Survey (1917).....	36.7	56.8	64.0	65.6	69.3	74.7	72.8
Freeman's average of upper half of schools (1915)	35.4	47.7	56.2	64.9	69.2	73.4	77.8

In speed the average varies from 62.8 to 73. A similar variation may be found in the scores of the eighth grade. It is apparent that the average scores obtained in some cities is considerably higher than that obtained in others. Surveys have repeatedly shown also that the attainment of pupils in different schools varies widely. The attainments of the children in Grand Rapids and St. Louis and the attainments of the upper half of the schools in Freeman's survey agree rather closely. The average attainment found in the other investigations in speed does not depart from these averages. In quality, however, they fall considerably lower.

STUDY NO. 2. L. V. Koos. "The determination of ultimate standards of quality in handwriting for the public schools." *Elementary School Journal*, February, Vol. 18, pp. 423-446.

Problem. To determine on a basis of objective measurement the demand for handwriting, first in social correspondence, and second, in a series of vocations.

Method. The method of determining the quality of handwriting needed for social correspondence was twofold. First, 1053 specimens of actual social correspondence were collected and scored. Second, the judgment of 826 adults as to what they consider adequate handwriting for social correspondence were collected and tabulated. These adults comprised three groups: students in education, educational workers—mostly teachers and non-teachers. The quality of handwriting necessary for a vocation was determined by measuring or scoring the quality of the writing of 1127 employees in a variety of occupations.

Findings. The findings of the first part of the study, which deals with the requirements of social correspondence, are presented. It will be remembered that these findings are based upon two sources of information. First, the scoring of actual specimens of writing, and second, a tabulation of judgments. The general fact found in the scoring of the specimens is that "only 142, or 13.5 per cent of the total of 1053 correspondents, write better than 60 on the scale, the remaining 86.5 per cent write at the quality 60 or less. The average quality of the 1053 specimens is 49.5." To put the matter in another way, 86.5 per cent of these individuals write at a quality of 60 or less on the Ayres Scale. If the average is to be taken as a standard, 50 must be regarded as the requirement. If the point which a very large majority attain is the standard, 60 should be taken as the standard.

The judgments concerning what degree of excellence is adequate for social correspondence were obtained by supplying the parts of the Ayres Scale separately to 826 adults and asking them to sort the samples into two groups to be designated respectively as adequate and inadequate. These judges were composed of three classes: first, 176 members of classes of education in the University of Washington; second, 414 teachers in Washington and Ohio; and third, 236 other adults, non-teachers. As between these three groups, the teachers, in general, had a lower standard than did

the non-teachers. The non-teachers would, in general, insist on a somewhat higher quality for social correspondence than would the group of students in education and the teacher group. But even the non-teacher group, which set the highest standard, more than 60 per cent consider quality 60 on the Ayres Scale to be satisfactory.

The results are summed up by Koos: "In the light of these facts it is difficult to see why, for the use under consideration, a pupil should be required to spend the time necessary to learn to write better than the quality 60. There is even considerable justification for setting the ultimate standard at 50 as this demand touches every member of society. All the children in the schools should be required to attain the standard set."

The second part of Koos' study dealt with the vocational demand for handwriting. Handwriting specimens were secured and scored from 1127 employees in 24 vocational groups. The tabulation of these scores is represented graphically in Figures 4 and 5. It will be seen that there is large variation in the quality of writing produced by persons in the different vocational groups. Groups 5 to 10 in Figure 4 and most of the groups in Figure 5 write with a quality between 60 and 70. It is obvious that a considerable amount of handwriting is required in the vocations represented by these groups. The elementary school teachers are included in this statement. It is noteworthy that the high school teachers write more

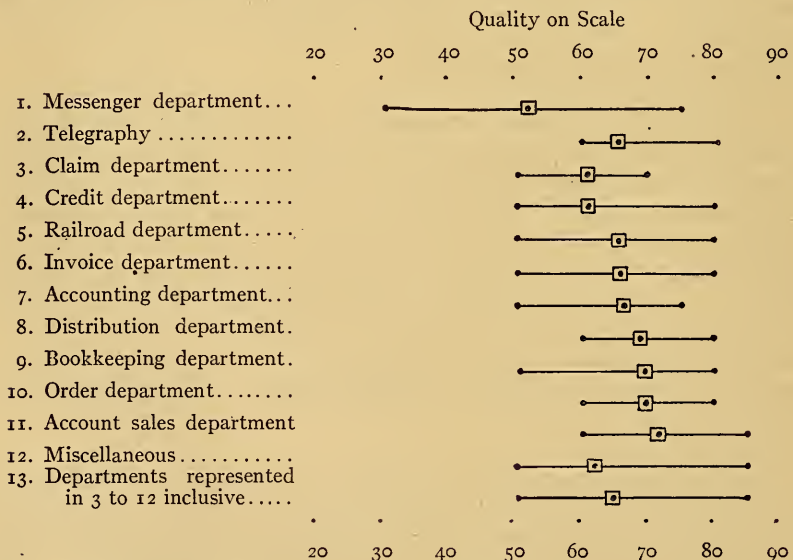


Figure 4.—Ranges and averages of the scores of handwriting done by persons in certain occupational groups. (From Table V. The lines represent the range of quality shown by the specimens; the squares on these lines locate the averages.) (Copied with permission from Koos, *op. cit.* p. 437.)

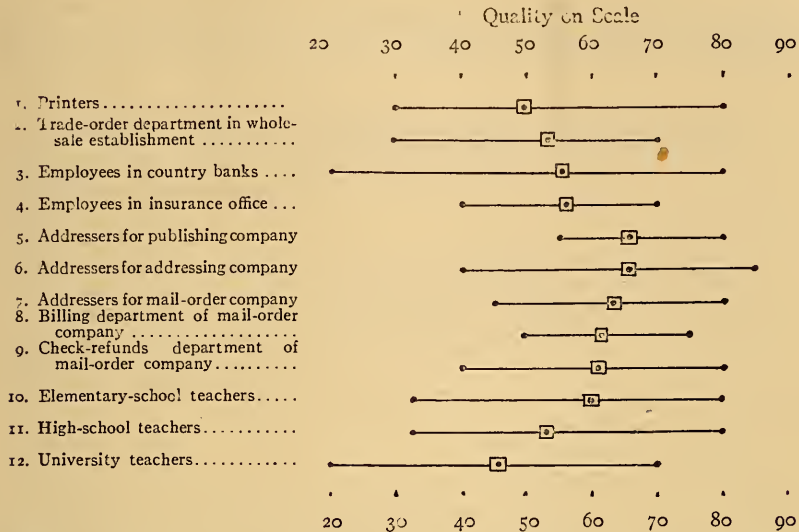


Figure 5.—Ranges and averages of the scores of handwriting done by employees in the offices of two packing companies. (From Table VI. The lines represent the range of quality shown by the specimens; the squares on these lines locate the averages.) (Copied with permission from Koos, *op. cit.* p. 438.)

poorly than the elementary school teachers and the university teachers worse than any other vocational group which was tested. This corresponds with the poor writing of the professional group in the study of social correspondence.

The conclusions concerning the second part of the study are summarized as follows: "The quality 60 on the Ayres Measuring Scale for Adult Handwriting, which we have set up as the ultimate standard of attainment for all school children for purely social purposes, is adequate for the needs of most vocations. This will apply to labor, skilled and unskilled, as well as for the professions, exclusive of teaching in the elementary schools. For that large group who will go into commercial work, for telegraphers, and for teachers in the elementary schools it will be necessary to insist upon the attainment of a somewhat higher quality, but hardly in excess of the quality 70."

The author's further comments concerning the application of this standard may also be quoted. "The fact that some will go into pursuits demanding a quality better than 60 should not be offered as a justification for requiring all pupils to attain that better quality. . . . Since all should be required to learn to write as well as 60 on the scale for purely social use, to train pupils to write this quality is the task of general education; to teach some who are going into commercial or other vocations requiring a higher quality of handwriting to write this better quality is the task not of general but of vocational education."

Harry Houston, supervisor of penmanship in New Haven, Connecticut, reports an unpublished study made in 1924. The results are reported in Table 28.

TABLE 28—AVERAGE QUALITY AND SPEED OF HANDWRITING OF SEVERAL GROUPS OF EMPLOYEES

Occupations	Number tested	Median legibility	Median speed
Bank Employees			
a. Using handwriting exclusively	18	51.66	128.33
b. Using machine writing exclusively	23	51.5	130
c. Half hand writing and half machine writing....	8	54	137.5
Department Store Employees			
a. Office Force	25	63.75	111.25
b. Sales Force	25	49.5	120.62
City Clerk	12	55	132
Insurance Office Employees			
a. Using handwriting exclusively	29	60.5	87.9
b. Machine and hand writing.....	7	64.37	82

Mr. Houston's comment upon his study is, "Very few occupations demand high skill in handwriting. If students in school write well enough for school purposes, it is believed that their preparation will be adequate for social and business uses." It is to be noted that most of these vocational groups wrote at a much higher speed than do school children.

Investigations by the Questionnaire Method

In this section is summarized a number of unpublished questionnaire studies which were designed to ascertain the opinion of business men concerning the value of writing and concerning the type or quality of writing which is demanded by modern business. The studies are taken up chronologically and each is described briefly.

In 1917, Mr. J. A. Savage, supervisor of writing in Omaha, Nebraska, issued a questionnaire to about 200 business and professional men of Omaha. This questionnaire consisted of a letter written by a school pupil and a series of questions formulated by Mr. Savage. The questions were as follows:

Of how much importance is good, rapid business writing in applying for a position or in being promoted to a better position?

Is business affected by the handwriting of employees?

Is economy of time for both the writer and reader considered by the business man in connection with penmanship?

Is the age of penmanship past?

Considering the use of the typewriter and of office appliances, is writing still of much importance?

Is it important that boys and girls learn to make figures well with a pen?

Is good handwriting a valuable enough asset to make it worth the time and effort necessary to acquire it?

Such a questionnaire, especially when sent out by a writing supervisor, unquestionably exerts considerable suggestive force in the direction of

answers favorable to handwriting standards. The answers, however, must be considered as of some value in indicating the opinion of business men concerning the business demand.

The answers contained in 79 letters received in reply to the questionnaire were classified. The classification was somewhat unsatisfactory since most of the answers contained rather general statements instead of the expression of judgment on specific issues. The classification, however, is presented for what it is worth:

Handwriting essential and of major importance.....	11
Handwriting essential and of minor importance.....	2
Handwriting essential but importance not indicated.....	11
Handwriting important but not essential or not stated whether it is essential.....	54
Handwriting important in some positions.....	1
	79

One gains the general impression from reading the letters that legibility is considered of greatest importance among the various characteristics which handwriting may possess. Speed and ease of writing are regarded as important but subordinate to legibility. A large number of the correspondents indicated that good penmanship in an application for a position is an important factor. All who mentioned the fact agreed that legible figures are necessary.

In 1918, Mr. H. C. Walker, supervisor of penmanship in St. Louis, made a somewhat similar questionnaire study. He submitted to 52 business men who employ office assistants a series of specimens of pupils' writing and asked them to answer the following questions, after having selected one of the specimens:

1. Why do you prefer the size and style shown in the specimen you have selected?
2. To what extent do you consider speed important in present day penmanship?
3. (a) Has the introduction of typewriters and adding machines made the value of good penmanship of less importance? (b) If so, should the time devoted to penmanship practice by public schools be reduced?
4. Is the specimen you have selected good enough for use in any department of your establishment?
5. How have you found the penmanship of recent applicants?

The conclusions drawn by Mr. Walker from his study were as follows:

First, the style of penmanship preferred by a majority of those employing office help is more compact than we have heretofore been striving for.

Second, the attempt we have made to develop freedom in penmanship is in keeping with the demands of the business world.

Third, typewriters and adding machines have not supplanted long-hand writing. As one man stated, "The machines have reduced the volume but not the quality of good penmanship." Another man stated, "The machines have made good writing

less important, but they have not made good writing when needed less important."

Fourth, the standard of quality in long-hand writing for business purposes is not high.

In 1922, Miss Florence M. Smith, supervisor of penmanship in East Orange, New Jersey, wrote to eleven firms requesting their opinions concerning the value of penmanship in business. While the number of firms was small, they included some of the largest and best known institutions in the country, such as the National City Bank, the Ford Motor Company, and the National Cash Register Company. The officers of each firm who replied expressed their opinion that handwriting was still important in the preparation of children for business careers.

In 1923, Mr. Arlington Swarts, instructor in penmanship in Washington Junior High School, Rochester, New York, addressed a series of five questions to thirty-four business men. The questions were put in personal interviews and the Ayres Scale was used as a standard of comparison. All but one expressed the opinion that training in handwriting was essential for business. In response to the question "In the writing observed in your office, where is the greater lack, in speed or in good, plain letter formation?" Twenty-nine replied that the greater lack was in letter formation, and only two in speed. Regarding the quality of writing necessary, twenty-four expressed the opinion that a quality of 60 or below on the Ayres Scale was sufficient. Nine considered 70, 80, or 90 as desirable, and one expressed no opinion. Only seven considered writing of a quality below 50 satisfactory.

In 1924, Miss Myrtle Ely, supervisor of penmanship, St. Paul, Minnesota, sent a questionnaire and received replies from 118 business men of St. Paul. Over 100 held that penmanship is still an asset to business men; that in passing upon applications for stenographic positions they would consider favorably one whose penmanship is best, and other things being equal, a stenographer writing well would have better opportunity for advancement than one writing poorly; and that penmanship is important specifically for the following persons: the bookkeeper, billing clerk, entry clerk, shipping clerk, salesman, and office boy. Eighty-four replied that they would pay a higher salary to a stenographer who writes a small, fluent, "plain-as-print" style of penmanship, than to one who writes poorly. The chief characteristic which seemed to be emphasized in the detailed replies was legibility.

In 1924, Mr. H. C. Walker, supervisor of handwriting in St. Louis, had interviews with representatives of six different types of business. These represented wholesale houses, bookkeeping, insurance, railways, salesmanship, and filing. All but the last indicated that speed is necessary, but all but two considered medium speed sufficient. Regarding the quality necessary, one reported 30 to be satisfactory, two 40, two 50, seven 60, and one 70. The consensus of opinion seemed to be that 60 was a reasonable

standard. Most of those interviewed regarded the quality about 20 above the essential as being an asset.

Summary and Recommendations

The conclusions from the foregoing studies and the recommendations which are based upon them are as follows:

1. **Standard of attainment at the end of the sixth grade as determined by children's achievements.** The average of the achievements of children selected at random from various parts of the country is from slightly below 50 on the Ayres Scale to about 55. The achievement of the sixth grade in two large cities and in the upper half of cities taken at random is slightly under 60. With these average or median scores may be compared the distribution of scores in the sixth grade which is given by Ayres on his Gettysburg edition of his scale. This distribution indicates that 71 per cent of the children of the sixth grade write with a quality of 50 or above and that 47 per cent write with a quality of 60 or above.

Conclusion. So far as the achievement of children indicates it would be legitimate to set up as a standard to be attained by the very large majority of children by the end of the sixth grade a quality equal to 50 on the Ayres Scale. It would be legitimate to set up as the median standard for the grades the quality of 60 on the Ayres Scale. The reasonable standard in speed at the end of the sixth grade is the median rate of 70 letters per minute.

2. **Standards of achievement as indicated by social demand.** The social demand may be divided for convenience into three divisions: First, the demand of the school; second, the unspecialized demand of social correspondence and individual needs; and third, the demand of vocations.

a. *The demand of the school*—The demand of the school for legibility is probably about the same as that which arises in social correspondence. The demand for speed is not a definite one but arises out of the needs of economy of time on the part of the individual writer. The child should, therefore, write as rapidly as can reasonably be expected to write without sacrificing quality. The school demand for legibility is the same as that for social correspondence. School demand for speed is set by the achievements of children and may be considered about 70 letters per minute.

b. *The demand of social correspondence*—According to Koos' investigation, 86.5 per cent of adults write in social correspondence with a quality of 60 or less, and sixty-six per cent write with a quality of 50 or less; 81 per cent of the judges consider the quality 60 or more as satisfactory and 60 per cent consider the quality of 50 or more as satisfactory. These facts seem to indicate that 60 is an adequate standard for the median of the class in the sixth grade and that 50 is an adequate minimum standard to be set up for each child to attain.

Conclusion. Fifty is an adequate minimum standard and 60 an adequate median standard of quality to meet the demands of social corre-

spondence. In speed, the same remark holds as was made under the previous section.

c. *The demand of vocations*—In Koos' study it was found that the demand of the different vocations varies considerably. The clerical occupations in which handwriting is an important element demand in general a quality somewhat above 60. The other vocations are satisfied by a quality between 50 and 60. The questionnaire studies which have been made indicate that even in the clerical occupations in which handwriting is required, the quality 60 is the one most commonly demanded, although a quality above this is frequently regarded as an asset. In a few specialized vocations, such as addressing, a still higher quality is demanded. Speed is usually reckoned as less important than legibility, although a fair degree of speed is desirable.

Conclusion. Training for specialized vocational demands is not the part of the elementary school. If the quality demanded by general school life and by social correspondence is met, a sufficient foundation will be laid for special training of vocational groups in the junior and senior high schools. This preparation is made when the child attains the standard already set. Some improvement may be expected in the junior high school even without specialized handwriting drill. It will be safe, therefore, to leave a certain margin for growth between the end of the elementary school period and adulthood.

Final Conclusion. At the end of the sixth grade the child should be expected to write a reasonably fluent and a plain, legible hand. More specifically each child should have set before him as a minimum standard a quality equal to 50 on the Ayres Scale and a speed of 70 letters per minute. Those children who have not attained this standard by the end of the sixth grade should be given continued drill in the seventh grade or the junior high school. The class median standard in quality for the end of the sixth grade should be 60 on the Ayres Scale.

CHAPTER VII

THE SOCIAL STUDIES

Harold O. Rugg, Lincoln School, Teachers College, Columbia University
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WHEN A PERSON attempts to make curricula for training citizens in the schools one may take one of two courses. He may select the content by an *a priori*, haphazard, "guessing" method. He may simply write out what should be taught. Or, he may set up a program of investigation that will seek scientifically to discover what specific information, habits, attitudes, and ideals should be provided. By this method, detailed and careful inventories can be made of the specific things or activities about which one needs information and skill, and the problems with which one will be called upon to deal as a citizen in a democracy, and the qualities that best promote one's participating efficiently in the socially desirable aspects of citizenship.¹

The "guessing" method, although by far the most common method of making courses for the training of citizens, almost inevitably results in the selection and teaching of much content that is either unrelated or rather remotely related to the actual needs of young citizens. Research workers, school administrators, and teachers interested in the revision of the course of study should make use of relatively objective methods for the selection of the content. Even more important, they should demand that authors of textbooks, used as the basic reading materials of the courses in the social sciences, should select their content from the evidence increasingly becoming available concerning the socially valuable activities of citizens. This latter statement is crucial because "under the conditions that are general in American elementary and secondary schools, it is the textbook that forms the basis of instruction. What goes into the elementary textbook is therefore a matter of vital significance. The relative emphasis that is given to various events, the names that are kept alive from generation to generation, the points of view that textbooks reflect, the ideals with which they will tend to indoctrinate their immature readers—all of these factors demand consideration in an adequate study of textbooks."²

One of the greatest problems in curriculum construction is the *selection of content*. Writers of textbooks admit that their great problem also is to

¹ The research studies reviewed in this section were collected and analyzed by Earle Rugg, State Teachers College, Greeley, Colorado. This chapter represents in summary form a part of his forthcoming monograph entitled: *Studies in Curriculum Construction of the Social Studies*.

² Bagley, W. C., and Rugg, Harold O. *The content of American history as taught in seventh and eighth grades*. Bulletin 16, School of Education, Univ. of Illinois, Urbana, Ill. 1916.

decide what facts to include in their books. Tradition has apparently solved the difficulty by including some facts about the entire field of each school subject. A marked characteristic of textbooks is that they are *comprehensive*. Textbooks in the social sciences therefore tend to be encyclopedias; they mention many persons, dates, countries, cities, topics, and problems.

It is obvious that under such an organization that textbooks can not discuss any one fact in great detail. While the mastery of the facts included in the course of study is a learning rather than a curriculum problem, it is nevertheless crucial to revision of the course of study because the use of the socially desirable facts needed in life is hampered when we attempt to teach too many facts and when we do not give sufficient emphasis to the automatization of socially valuable facts.

In times past, the inclusion of much content in the curriculum was justified partly because of a belief in formal discipline. It was asserted that the study of many facts was proper because of the training that this practice gave the various faculties of the mind. It was also assumed that because one might meet a given fact it should be taught.

Research of curriculum makers in various school subjects in recent years has been directed to the study of the most frequent, the most general, and the most crucial content. These students of the course of study, after careful tabulation of the comprehensive curricula used in schools and after analyzing the results of educational achievement tests which show objectively how small is the permanent mastery of the information, skills, and appreciations now taught, have carried on scores of semi-scientific investigations to discover what facts, topics, and problems are of greatest relative use.

The outstanding value of such investigations is to show us by means of impersonal criteria that the facts, topics, and problems of relative value are *only a small part of the sum total of human experience and knowledge in each field* and *also that the socially valuable facts are similarly only a small fraction of the facts, topics, and problems now included in the school curriculum*. When it is shown that we do *include too many facts* and that *pupils retain very little of the content* taught them, is it not a sound hypothesis to experiment by reconstructing curricula and revising teaching procedure so that at least those facts, topics, and problems that have come to be called "the minimal essentials" shall be permanently mastered? This does not imply that other meaningful and needed facts should not be taught or that content aside from that ascertained to be socially valuable for *all* pupils—the common integrating education essential to efficient participation of citizens in a democracy—shall not be given pupils in various localities and of various abilities, capacities, and interests. But we are insistent that the most frequently mentioned, the most generally required, and the most crucial content—the information, habits, attitudes, and ideals—be included and mastered.

This chapter of the Yearbook principally illustrates investigations dealing with facts, topics, and problems that one probably needs to know because he will use them in life. It also indicates relative emphases, for it shows to some degree the relative probability that such facts, topics, and problems are met by the average citizen.

This summary report has been organized to serve seven purposes. The first is to illustrate four methods that have been used by research workers to determine topics or problems. These four methods are illustrated by four studies which show that one may (1) ask laymen concerning problems to be taught, (2) analyze political platforms for such data, (3) use the judgment of "frontier thinkers" concerning problems, or (4) seek statements of problems in periodicals. The second purpose is to supply evidence from ten studies concerning what facts in history, geography, and civics are needed in order to read books and periodicals intelligently. In the third place, the report summarizes seven studies that indicate what facts and topics are stressed in social science textbooks in wide use in the schools. Fourth, there is illustrated the use of the judgments of content specialists. Fifth, other ways that have been used to indicate what social science facts are needed in life are illustrated. Sixth, examples are given of social activities in which people engage. Seventh, the judgments of adults as to the life values of the social subjects and activities that were part of their instruction in school are reviewed.

While the evidence from these studies is even yet exceedingly tentative, it is suggestive to curriculum makers. It probably constitutes a sound basis for the selection of the needed facts, topics, and problems to be included in the social science curriculum.

One should not, of course, accept this evidence as final. Much more research is needed. Many of the experiments should be verified by repeating the technique of the authors of the studies reviewed. One great aspect of citizenship training—the chief province of the social sciences—has not been investigated in any high degree. It is frequently asserted that the chief job of the school is to help boys and girls engage efficiently in socially desirable activities that they tend to engage in any way and also to help them engage efficiently in more desirable activities. Analyses of the major classes of activities all show that citizenship training is an important objective. But the particularized activities of citizenship have not been ascertained except in a small way. Things that citizens do and ought to do should be investigated, and the qualities that citizens should possess must also be discovered.

Curriculum makers should adopt a wider view of the problems of citizenship. To the present time there has been an assumption that citizenship training will be well provided for by the mere organization and teaching of what might be termed "reading" courses in the social sciences—courses in which instruction chiefly emphasizes persons, dates, and events in history, place location facts and data concerning climate, resources, and industries in

geography, and the machinery of government, the powers and duties of governmental officials in civics. A "transfer" has been assumed—namely, that knowledge of such facts will make pupils behave as good citizens. One may well doubt this "transfer" by merely observing citizens about them.

An important step in curriculum making in the social sciences, is to discover the duties, difficulties, and traits of good citizens, and the situations in which such aspects of citizenship are found and best promoted.¹ In the social situations of life, will be found many opportunities for training citizens in school in the things that good citizens should do. School administrators and teachers are trying to make school life like life outside the school—to make school a miniature society. Every individual lives and should live a social life. A large part of one's day is filled with social contacts. To make these contribute most fully to the proper fulfillment of one's duties as a citizen in a democracy, where the obligations for efficient government rest upon every one, is the pre-eminent task in citizenship training.

Brief Questions At Issue in Curriculum Construction in the Social Sciences

What are the objectives or values of the social sciences?

How shall theoretical aims, outcomes, and objectives be verified?

Issue: *A priori* versus semi-scientific methods of selecting the content of the social science curriculum.

What criteria shall be used for selecting the content to be included in the social sciences?

What content in the social sciences shall be required of all pupils and upon what bases shall it be selected?

How can differentiation of curriculum material be made to provide for individual differences in ability and interests of pupils?

How shall one determine the problems of contemporary society?

What criteria should be used in determining minimal essential facts?

What methods shall be employed to determine the things that citizens do?

What facts concerning the learning processes of children must be considered in the program of curriculum revision in the social sciences?

Review of Curriculum Research Studies in the Social Sciences

This chapter of the Yearbook reports summaries of twenty-four semi-scientific studies which give curriculum makers relatively impersonal objective evidence from which to select the content of the curriculum in the social sciences. These studies are classified into four groups:

- I. Studies that Suggest Possible Methods of Determining Problems and Activities of Contemporary Society:
 - a. Discovering problems by analyses of published writings of "frontier thinkers."
 - b. Discovering problems by means of the judgments of representative citizens

¹ Two such investigations are now being made by graduate students in Colorado State Teachers College. These will probably be completed by the summer of 1925.

- c. Discovering problems by means of an analysis of political platforms
- d. Discovering problems by means of analyses of newspapers and magazines
- II. Studies of Minimal Essentials:
 - a. Studies based on a wide range of objective criteria
 - b. Studies that contribute data concerning what facts in history, geography, and civics are needed in order to read periodicals and books intelligently
 - c. Studies that contribute data concerning facts, dates, persons, topics, and problems, stressed in commonly used school textbooks
 - d. Studies that endeavor to use the judgments of experts concerning minimal essentials
 - e. Studies that suggest minimal essentials upon other standards or criteria
- III. Studies That Are Suggestive for Analysis of the Activities of People or Current Modes of Living:
- IV. Studies That Endeavor to Evaluate the Recreative or Leisure Values of the Social Sciences.

I. Studies that Suggest Possible Methods of Determining the Problems of Contemporary Society

- a. *Discovering problems by analyses of published writings of "frontier thinkers"*

STUDY NO. 1. Rugg, Harold O. *Problems of contemporary life as the basis for curriculum making in the social studies.*¹ The Twenty-second Yearbook of the National Society for the Study of Education, Part II, 1922. pp. 260-273.

Problem. To discover the insistent and permanent contemporary problems to be used as a basis for organizing materials in the field of the social studies and for promoting a program of citizenship training.

Method. The theory of Dr. Rugg and his research workers engaged in this task is that the best source for the statement of insistent and persistent contemporary problems is the published works of the so-called "frontier thinkers." Specialists, who have devoted years not only to the detailed intensive study of the theoretical aspects of their specialties, but who, in many cases, have become practically acquainted with these problems in the field, have been deemed by this group of research workers to be best qualified to give an insight into, and a more mature judgment concerning the issues of present-day life.

The published writings of these men have been analyzed partly because they afford a more convenient basis for discovering these problems than

¹ Detailed analyses of the proportion of space devoted to systematic books in each of the major groups of contemporary problems are still being made by the research group engaged in the collection and organization of The Social Science Pamphlets, the proposed Junior High School social science curriculum, now being experimented upon by Harold O. Rugg, Earle Rugg, and Emma Schweppe. The results of the entire investigation, now in its fourth year, are being published as a series of essays and monographs by Harold O. Rugg.

detailed personal interviews and partly because the published writings of such specialists tend to be more critical than the opinions that one would get from personal or oral interviews with them.

To determine who were the competent specialists in each field, first, the books in the social science field were listed that appeared in the *Book Review Digest* for the years 1915-22; and only those books which were rated by competent reviewers as of distinct merit were taken for analysis. Second, more than 200 specialists in the fields of history, government, economics, and sociology and some representative editorial writers were asked to name books from which one might be able to find statements of problems. Each of the specialists was asked only for lists of books within his own special field. Third, these lists were further increased by a critical study of the book reviews in six weekly and several monthly journals over a period of five years following the war.¹ Fourth, a careful canvas of several thousand books in the field of the social sciences on the shelves of the Columbia University Library was made.

From these four lists, over two hundred selected books have been analyzed carefully by this research group for statements of contemporary problems. Over three hundred such problems having to do with issues concerning land, industry and business, population, community life in the American city, education, governmental problems, and world affairs have been listed.

Besides these major types of problems within each major class of contemporary issues, the investigation was concerned with the detailed questions that these writers discuss in connection with their treatment of the problems in their field.

Findings. The books of "frontier thinkers" listed below are typical of those upon which statements of contemporary problems and issues have been based. The authors of these books were selected as competent specialists on the basis of one or more of the criteria for selection mentioned above.

Books of "Frontier Thinkers"

A. Problems of Immigration:

Jenks, J. W., and Lauch, J. *The immigration problem*. N. Y., Funk and Wagnalls.

Kellor, Frances. *Immigration and the future*. N. Y., G. H. Doran Co.

Americanization studies. Allen T. Burns, Editor. N. Y., Harper & Bros.

B. Problems which Deal with Natural Resources:

Mead, E. *Helping men own farms*. N. Y., Macmillan.

Van Hise, C. R. *Conservation of natural resources*. N. Y., Macmillan.

C. Problems of Industry and Business:

Cole, G. D. H. *Chaos and order in industry*. London, Mathuen.

Federated American Engineering Societies. *Waste in industry*. N. Y., McGraw-Hill Book Co.

Gleason, Arthur. *What the workers want*. N. Y., Harcourt Brace.

¹ As a rule, book reviews are written by men competent in the field of the book that they are reviewing. Many of these reviewers possess as high, if not a higher, rating as specialists in the field than the writers of the book setting forth the problems.

- Hobson, J. A. *Evolution of modern capitalism*. N. Y., Scribners.
 Marshall, L. C. *Reading in industrial society*. Chicago, University of Chicago Press.
 Tawney, R. H. *The acquisitive society*. N. Y., Harcourt Brace.
 Veblen, T. *Theory of business enterprise*. N. Y., Charles Scribner's Sons
 Zimmern, A. *Nationality and government*. N. Y., Robert M. McBride Co.
- D. Problems Involved in Developing and Maintaining an Adequate and Efficient Transportation System in America:
 Johnson, E. R. and Van Metrie, T. W. *Principles of Transportation*. N. Y., D. Appleton & Co.
- E. Problems of the American City:
 Fosdick, Raymond. *American police systems*. N. Y., Century.
 Howe, F. C. *The modern city and its problems*. N. Y., Charles Scribner's Sons.
 Whitaker, C. H. *The joke about housing*. Boston, Marshall, Jones.
 Wood, Edith. *Housing of the unskilled wage earner*. N. Y., Macmillan.
- F. Problems of Education and the Formation of Intelligent Public Opinion:
 Lippmann, W. *Public opinion*. N. Y., Harcourt Brace.
 Robinson, J. H. *Mind in the making*. N. Y., Harper & Bros.
 Wallas, G. *The great society*. N. Y., Macmillan.
- G. Problems of Government in the American Democracy:
 Beard, C. A. *American government and politics*. N. Y., Macmillan.
 Bryce, James. *Modern democracies*. 2 vols. N. Y., Macmillan.
 Garner, J. W. *Introduction to political science*. N. Y., American Book Co.
 Lippmann, W. *Preface to politics*. N. Y., Henry Holt.
 Merriam, C. E. *American political ideas*. N. Y., Macmillan.
 Wallas, G. *Human nature in politics*. London, Constable & Co.
- H. Problems of World Affairs:
 Moulton, Harold G. and Bass, John F. *America and the balance sheet of Europe*. N. Y., Ronald Press.
 Bryce, James. *International relations*. N. Y., Macmillan.
 Gibbons, H. A. *Introduction to world politics*. N. Y., Century.
 New Map of Asia, New Map of Africa, New Map of Europe.
 Keynes, J. M. *Economic consequences of the peace*. N. Y., Harcourt, Brace.
 Vanderlip, F. A. *What next in Europe*. N. Y., Harcourt, Brace.

Table 29 gives the space allotment in number of pages to any one question selected at random under six typical major problems presented by writers of twelve books on American community life. The figures in parentheses indicate the total number of pages devoted to each problem.

Table 29 illustrates the results of this method of analyzing the published writings of specialists for their "opinions" on insistent problems and questions.

This study indicates the basic problems and questions in the minds of specialists who are perhaps best qualified to state such problems. The next two studies indicate other sources for problems: Cocking asked representative "lay" citizens for problems and Bassett analyzed political platforms for problems. This study, however, presents the problems and questions that the deepest and keenest students of society, according to their critics, deemed to be of crucial importance to us.

Another contrast to be noted between this study and other studies using such standards as Cocking and Bassett used is that the latter studies furnish the basis for making curricula only for children in life as it is—that is, they tend to ignore the demands of a rapidly changing society. This

TABLE 29A

General problems and illustrative questions taken at random	Bruere, H. The New City Government. 1912	Cooke, M. Our Cities Awake. 1918	Howe, F. The City the Hope of Democracy. 1905	Howe, F. The Modern City. 1915
I. Problem of organizing and maintaining the best form of municipal government. To what extent are corruption or self seeking interests responsible for poor government?	11-12(1)	234-236(2)	1-8(7 $\frac{3}{4}$) 43-60(17) 61-91(30) 92-112(20 $\frac{3}{4}$)	50-51(1) 59-61(1 $\frac{1}{2}$) 92-95(3 $\frac{1}{4}$) 149-163(15)
II. Problem of wise city planning. To what extent does the city plan and the general "lay out" of the city take into account provision for parks and playgrounds. (Why imp.)		279 (6 lines)	245-247(2)	199-200(1)
III. Problem of providing and maintaining efficient public works in the community. How is sewage collected and disposed of?	245(x) 247(x)		57(x)	35($\frac{1}{4}$) 36(x)
IV. Problem of getting the community to organize and properly maintain educational opportunities for all citizens. How and why should communities make wider use of the school plant?				311-312(1 $\frac{1}{4}$) 313($\frac{1}{4}$) 314-316(2)
V. Problem of developing adequate and maintaining proper health agencies in the community. Why are health standards low in the community?	88(x) 314-315(1 $\frac{1}{2}$) 319($\frac{1}{2}$) 401-413(12 $\frac{1}{2}$)		188($\frac{1}{2}$)	265-266(1 $\frac{3}{4}$)
VI. Problem of adequately providing for and improving leisure and recreation by means of directed community opportunities for play and for social opportunities. Is municipal provision for play and social opportunities adequate?	2(x) 21(x) 22($\frac{1}{4}$) 239($\frac{1}{4}$) 240-241($\frac{1}{2}$) 242-243($\frac{1}{4}$)	91($\frac{1}{2}$)		316-317(1) 375-(x)

technique of problem analysis not only attempts to find out problems of the day, but because these specialists have for twenty years, at least, been pointing out these problems and questions, it seems likely that by taking their statements or their opinions, we are more apt to equip children for our rapidly changing society, particularly in the next twenty years. It is interesting to note that problems now being discussed were included in the published writings of these specialists in the 90's and early 1900's.

"Are we not delinquent representatives of that agency (the school) unless besides making our curriculum keep pace with the changes of that society, we anticipate what those changes are going to be and use the curriculum to prepare children to meet them?"

Figure 6 on page 226 indicates how these problems serve as the control for the organization and collection of a wealth of materials in the field of the social sciences. By means of detailed allusions, pupils doubtless will be forced from the organization of material to draw their own conclusions concerning current modes of living and contemporary problems and issues.

TABLE 29B

Wilcox. Great Cities of America. 1910	James, H. Municipal Functions. 1917	Munro, W. Mu- nicipal Admin- istration 1916	Righter, C. City Man- ager in Dayton. 1919	Taylor, G. Satellite Cities. 1915	Wilcox. The Ameri- can City. 1904	Wilcox. The Study of City Govern- ment 1897	Zueblin. American Municipal Progress. 1902
180(x) 244-272(28 $\frac{3}{4}$) 308-309(1 $\frac{1}{4}$) 311-312(1 $\frac{1}{4}$) 381-388(6 $\frac{3}{4}$)	276(x)			149-151(1 $\frac{1}{2}$) 195-196(1 $\frac{1}{2}$) 213-218(5 $\frac{1}{2}$)	20(1 $\frac{1}{2}$) 93(x)	19-21(2)	
53-54(1) 55(1 $\frac{1}{2}$) 213-216(2 $\frac{1}{2}$)	206-207 (1 $\frac{1}{4}$)	57-58(1)		53-54(1) 59-60(1) 121-122(1)			19(1 $\frac{1}{2}$) 246-275(29)
56(1 $\frac{1}{2}$) 222(1 $\frac{1}{2}$) 295(1 $\frac{1}{4}$) 359-360(1)	5(1 $\frac{1}{4}$)10(x) 15(1 $\frac{1}{4}$)22(1 $\frac{1}{4}$) 56(x)84(3 $\frac{3}{4}$) 227-237 (10 $\frac{1}{4}$)	183-206 (23 $\frac{1}{4}$)	129-131(2) 133(1 $\frac{1}{2}$)	183(1 $\frac{1}{4}$)30(x) 234(x) 240(x) 138(x) 166(x) 243(x)	53-54(1 $\frac{1}{2}$)	29-30(1 $\frac{1}{2}$)	105-107(2 $\frac{3}{4}$)
	106-107 (1 $\frac{1}{4}$)	399-402 (2 $\frac{3}{4}$)		218-220(2) 220(1 $\frac{1}{2}$) 122(1 $\frac{1}{2}$)	236-238 (1 $\frac{1}{2}$)		149-155(6) 159-166
44(1 $\frac{1}{2}$) 278(1)	68-70(1 $\frac{1}{4}$)		75-78(3 $\frac{3}{4}$)	56-58(1 $\frac{1}{4}$) 123(1 $\frac{1}{4}$)	191-192(1 $\frac{1}{2}$) 193-194(1) 144(1 $\frac{1}{4}$) 192(1 $\frac{1}{4}$) 192(1 $\frac{1}{4}$) 205-206(1)		(6 $\frac{3}{4}$) 131(1 $\frac{1}{2}$)
	163(1 $\frac{1}{4}$) 169-170 (1 $\frac{1}{4}$)	401-402 (3 $\frac{1}{4}$)	84(3 $\frac{1}{4}$) 237(1 $\frac{1}{4}$) 448(x)	19-20(1 $\frac{1}{4}$) 144(x) 181-182(1 $\frac{1}{2}$) 220(1 $\frac{1}{2}$) 223-224(1 $\frac{1}{4}$)	111-114(3 $\frac{1}{2}$) 158-159(1)		241-246(4 $\frac{1}{2}$)

b. *Discovering problems by means of the judgments of representative citizens.*

STUDY NO. 2. Cocking, Walter Dewey. *The attitude of the public to the teaching of citizenship.* Unpublished Master of Arts Thesis on file in the Library, State University of Iowa, Iowa City, Iowa.

Problem. To show what the layman regards as the topics that should be emphasized in the teaching of citizenship.

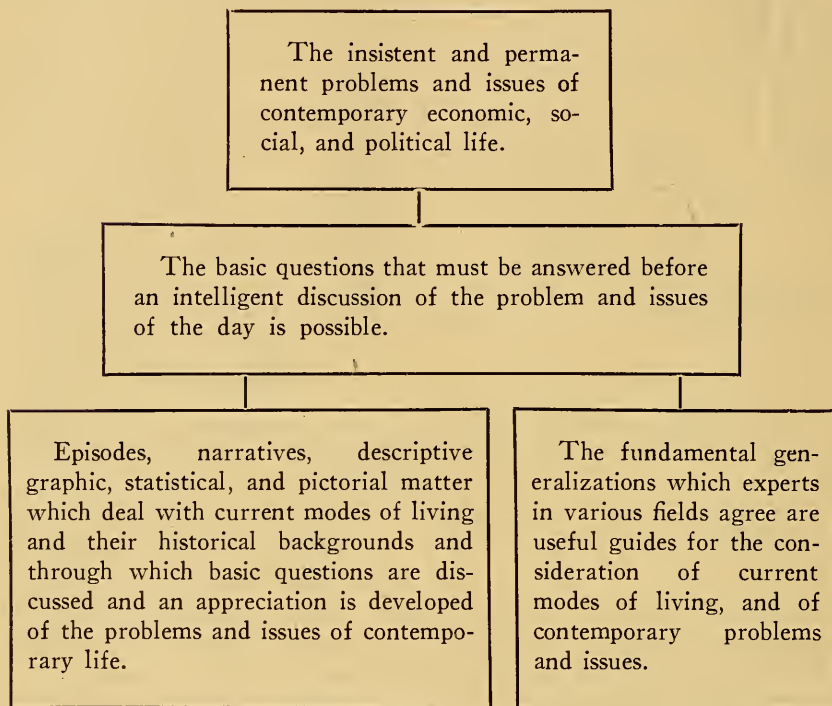
Method. An attempt was made to obtain a cross section of the public opinion of the State of Iowa. To do this, members of representative classes of society were selected. Over eighteen hundred people were selected from the following list:

Buena Vista Grade teachers	Business men
Home makers	Working women
City superintendents	Editors
Buena Vista rural teachers	Common laborers
County superintendents	Bankers
Clergymen	City officials
Civics teachers	State officials
Lawyers	County officials
American Legion men	Farmers
Political scientists	Traveling men

A miscellaneous group

An effort was also made to get a sufficient representation of each group—for example, 500 home makers were chosen to represent the opinion of the mothers of the states. Many of these representatives were members of committees having to do with Americanization and citizenship of their

FIGURE 6.



local woman's clubs. To secure representative farmers, the farm presidents of 99 county farm bureaus were selected. Some such standard was used to secure proper representatives for each of the groups cited above. Of those selected, 593 suggested topics.

Findings. "The 593 people in their replies as to what, in their judgment, should be emphasized in the teaching of citizenship offered 4728 definite suggestions, or an average of 7.97 suggestions per person. It was found that the 4728 suggestions fall into 247 separate and distinct classifications."

¹ Rugg, Harold O. *Problems of contemporary life as the basis for curriculum making in the social sciences*. Chapter XV, Part II, Twenty-second Yearbook of the National Society for the Study of Education.

Table 30 gives the frequency of mention of the ten most frequently mentioned topics and the ten least frequently mentioned topics out of the 247 citizenship topics suggested by these representative groups of citizens.

TABLE 30.—TOPICS SUGGESTED BY LAYMEN TO BE EMPHASIZED IN THE TEACHING OF CITIZENSHIP

Topic	Number of times mentioned
Individual duties, responsibilities, and privileges as a citizen.....	224
Duty to vote.....	221
Respect and obedience for law.....	213
Responsibility of the individual to the community.....	143
Coöperation in community affairs.....	126
Public health	125
Honesty	122
Government, its purpose, importance, growth, benefits, and principles...	116
Payment of taxes willingly.....	102
Respect for the rights of others.....	101
Confidence in men.....	1
Symbolic meaning of our national capitol.....	1
Tolerance	1
Memorizing orations.....	1
Boy Scouts.....	1
Respect for war veterans.....	1
Memorizing oath of allegiance.....	1
Efforts toward advancement.....	1
Pride in local state.....	1
Work a cure for idleness.....	1

A study of Table 30 shows that some curriculum makers obtained from a summary of lay opinion specific points to be taught; for example, duty to vote, public health, and payment of taxes. Other topics require further and more refined analysis. It is probably of little value to know that one should teach individual duties, responsibilities, and privileges of a citizen or responsibility of the individual to the community, unless one discovers specifically by investigation what the detailed duties or responsibilities of a citizen are. Learning is specific, and if one wishes to teach such topics, one must discover the specific items that should be memorized or that should be automatized.

Studies are now being undertaken in Colorado State Teachers College, following the technique of interviewing outlined by Dr. Charters, to discover what duties citizens perform, what difficulties they face, and what qualities citizens should possess.

STUDY NO. 3. Breeze, Retha E. "What constitutes good citizenship?" *The School Review*, Vol. 32, September, 1924, pp. 534-536.

Problem. To determine those traits or qualities that are supposedly essential to being an efficient citizen.

Method. A class in education in Will Mayfield College, Missouri, wrote to four hundred of the leading men and women of the United States whose names appeared in the latest edition of *Who's Who in*

America. These persons represented fifteen occupations and professions in which the majority of the American people are engaged. They also included people from every state in the Union. These people were asked to give five or more traits that they considered most essential to efficient citizenship.

Findings. There were 148 people who replied. Different traits to the number of 212 were found in a total of 819 that were submitted.

Table 31 shows the five most frequently mentioned traits and the five least frequently mentioned traits as indicated in the tables submitted in Miss Breeze's article.

TABLE 31.—TRAITS OR QUALITIES SUPPOSEDLY ESSENTIAL TO AN EFFICIENT CITIZEN

Highest five	Frequency	Lowest five	Frequency
Honesty.....	58	Fairness.....	5
Knowledge of and an interest and participation in national, state, and local affairs.	56	Initiative.....	5
Industry.....	47	Energy.....	5
Religious traits, such as reverence for God, Christianity, etc.	28	Faithfulness.....	5
Loyalty.....	25	Love for others.....	5

The writer of this article says "that the efficient citizen must be honest and industrious, he must be intelligently interested in the affairs of the nation, the state, and the community, and actively participate in them, he must respect and obey the law and advocate its enforcement. Loyalty, patriotism and public spirit must rank high in characterizing him. He must have religious ideals developed within him. To these traits must be added courage, tolerance, intelligence, integrity, open-mindedness, good health, willingness to serve, liberal education, coöperation, unselfishness, and character."

Such a list, although in all likelihood incomplete, is of value for determining specific traits to be promoted in any program of citizenship training. A much more exhaustive study should be made.

(c) *Discovering problems by means of an analysis of political platforms.*

STUDY NO. 4. Bassett, B. B. *The content of the course of study in civics.* Seventeenth Yearbook of the National Society for the Study of Education, Part I, 1918, pp. 63 to 80. His detailed Ph. D. Dissertation, on file in the Library, State University of Iowa, is entitled *Civic instruction of the American electorate.*

Problem. To determine by an analysis of political platforms "what are the most significant and most persistent problems of the American people which seek solution through the machinery of government." This purpose was adopted on the theory that there should be civic instruction in a democracy to prepare pupils for the intelligent exercise of the fran-

chise. Political platforms were selected as a source for the statement of problems on the theory that these platforms would "reflect" the issues of the day. According to Walter E. Weyl, "The platform does not show what the politician wants; but does show what that astute person believes that the people want. The superlative value of the platform as evidence is due to the fact that it is always addressed to a potential majority."

Method. Bassett analyzed the national platforms of all political parties since the first National convention in 1832; State platforms in non-presidential years from 1889 in so far as they deal with National issues; all of the platforms of major parties for 1910; platforms of major parties in certain selected pivotal states—namely, California, Indiana, and New York, since 1850; all platforms of the parties in Iowa since 1889 and the platforms of parties in one southern State.

Three units of measurement were used: (1) The linear inch, (2) frequency of mention—that is, the number of platforms in which a given topic occurs, and (3) single platform proposals, i. e., the number of distinct proposals under each topic.

Findings. After detailed analysis of all the topics and sub-topics within the following major political problems according to these various units and measurements, Bassett was able to rank the problems under the following 26 topics:

- | | |
|-----------------------------|------------------------------------|
| 1. Commerce, Foreign | 14. Monetary System |
| 2. Corporations, Interstate | 15. Moral Reform |
| 3. Constitution | 16. Natural Resources |
| 4. Defense, National | 17. Office, Public |
| 5. Education | 18. Parties, Political |
| 6. Finance, Public | 19. Pensions |
| 7. Foreign Relations | 20. Personal Rights |
| 8. Health | 21. Postal Service |
| 9. Immigration | 22. State Rights |
| 10. Industry | 23. Suffrage |
| 11. Justice | 24. Territories (and Dependencies) |
| 12. Labor | 25. Works, Public |
| 13. Legislation | 26. Miscellaneous |

Table 32 shows the rank of the major problems mentioned by all parties—by the Democratic party, by the Republican party, by the Democratic and Republican together, and also checks the five highest ranking topics in each campaign.

Dr. Bassett's study shows that: (1) Certain problems run back through the platforms of the parties because they are inherent in the structure of government; for example, public finance, foreign relations, etc.; (2) Others are persistent from the economic organization of society—for example, corporations, labor, etc.; and (3) Others are persistent because there always are groups of people who are interested in undertaking social reforms.

TABLE 32.—FREQUENCY RANK OF MAJOR PROBLEMS MENTIONED IN PLATFORMS OF POLITICAL PARTIES

Rank	All parties	Democratic party	Republican party	Democratic and Republican	Highest five in each campaign
1	Finance	Finance	Finance	Finance	Finance
2	Office	Foreign relations	Foreign relations	Foreign relations	Moral reform
3	Foreign relations	Office	Office	Office	Foreign relations
4	Moral reform	State rights	Commerce	Nat'l Resources	Office
5	Immigration	Territories	Nat'l resources	Works	Corporations
6	Nat'l resources	Legislation	Corporations	Labor	Labor
7	Labor	Corporations	Immigration	Territories	Monetary system
8	Monetary system	Nat'l resources	Justice	Defence	Parties
9	Defence	Works	Monetary system	Immigration	Constitution
10	Works	Defence	Defence	Commerce	State rights
11	Legislation	Moral reform	Labor	Moral reform	Territories
12	Commerce	Immigration	Territories	Monetary system	Nat'l resources
13	Territories	Constitution	Moral reform	Pensions	Legislation
14	Personal rights	Personal rights	Suffrage	State rights	Immigration
15	Suffrage	Pensions	Postal system	Constitution	Pensions
16	Constitution	Monetary system	Constitution	Justice	Personal rights
17	Pensions	Commerce	Parties	Personal rights	Industry
18	Parties	Parties	Personal rights	Legislation	
19	State rights	Education	State rights	Parties	
20	Education	Suffrage	Education	Suffrage	
21	Postal system	Health	Health	Postal system	
22	Justice	Industry	Industry	Education	
23	Industry	Postal system	Pensions	Health	
24	Health	Justice		Industry	

The data show that certain matters of vital interest in times past, such as a strict or liberal construction of the Constitution and State rights are being stressed less; while with the rapid changes in industry, political platforms give more and more space to questions having to do with labor and corporations. In the last twenty-five years America has become increasingly a world power, and one finds more attention paid to issues having to do with foreign relations. From the analysis of Dr. Bassett's detailed data, one gets not only a crude check as to the major types of problems summed up in political platforms, but one also obtains in a certain measure the trends or relative emphases to various topics from which it is possible to predict somewhat generally the problems of the next generation.

A difficulty that arises is that the problems listed are not sufficiently defined. For example, there are many problems having to do with labor, with corporations, and with foreign relations. It is therefore necessary to state definitely the problems within each of these fields and then to determine the amount of space given to each subordinate problem in political platforms. More refined analysis, following Dr. Bassett's lead, is needed.

Dr. Bassett's list is valuable as a check upon studies that use other criteria for determining the content of courses in civics. For example, one may well use not only the results of the Cocking study, using the judgments of representative citizens concerning what ought to be taught, and the Rugg study, using the judgment of the "frontier" specialists in various fields of the social sciences, but also the findings obtained by analyzing the platforms of political parties.

(d) *Discovering problems by means of analyses of newspapers and magazines.*

STUDY NO. 5. Davis, Maude Bennett. *Topics to be included in instruction in civics as indicated by an analysis of current periodicals.* Unpublished Master of Art Thesis on file in the Library, Univ. of Chicago, Chicago, Ill.

Problem. To throw light upon the content of a course of civics by making an analysis of current periodicals.

Method. First, an analysis of twenty-one periodicals covering the six months, October, 1920, to April, 1921, was made; and second, a similar analysis of the topics listed in the *Reader's Guide to Periodical Literature* for October, 1920, was made.

The following standards were used for selecting the magazines. A selected list approved by: (1) The American Library Association, (2) the Massachusetts Library Association, (3) *the Reader's Guide to Periodical Literature*, (4) three lists recommended for high school use, and (5) a list believed by the writer to represent extreme radical opinion.

Those magazines dealing with special subjects or devoted to particular interests like juvenile cases and social organizations were rejected. Twenty-one magazines were chosen. Table 33 shows the magazines that were finally selected for analysis.

TABLE 33.—TWENTY-ONE MAGAZINES SELECTED FOR ANALYSIS IN OBTAINING CIVIC TOPICS

Name of magazine	Total Circulation	Number of Issues analyzed	Total Number of pages
American City.....	9,247	2	270
American.....	441,080	5	480
Atlantic Monthly.....	107,776	6	864
Current History.....	40,350	6	1,122
Current Opinion.....	60,000	4	580
Forum.....	15,000	6	762
Freeman.....	.....	5	110
Harper's.....	95,896	6	798
Independent.....	100,589	24	600
Liberator.....	40,000	6	294
Literary Digest.....	900,000	14	1,176
Nation.....	28,960	18	576
New Republic.....	35,000	20	400
North American Review.....	22,008	6	864
Outlook.....	105,340	24	936
Review of Reviews.....	172,552	6	672
Saturday Evening Post.....	2,108,923	5	600
Scribner's.....	97,748	6	768
Searchlight.....	5,530	6	120
Survey.....	13,686	24	696
World's Work.....	126,043	6	558
Total number issues and pages analyzed.....	.....	205	13,246

After considering the methods of measuring linear space, counting pages, and counting frequency of mention, the latter was employed because the scoring is simpler. The writer assumed that the topics most discussed were

most important. The method of reckoning was as follows: Each magazine in which an item or a group of items appeared was credited with one score. Also each topic was credited with one score. A similar method of scoring was used in tabulating the *Readers' Guide to Periodical Literature*.

Findings. These tables are illustrative: Table 34 shows the twenty most frequently mentioned sub-topics relating to all phases of government, economics, and sociology. Study I refers to the analysis of the twenty-one magazines listed in Table 33; and Study II refers to the analysis of the *Readers' Guide*.

TABLE 34.—TWENTY MOST FREQUENTLY MENTIONED SUB-TOPICS OF THE SOCIAL SCIENCES

Topics	Frequencies from Study I	Frequencies from Study II
World state.....	235	26
Congress.....	164	1
Immigration.....	159	12
Bolshevism.....	129	9
Costs.....	111	9
Asiatic exclusion.....	104	0
Expansion and imperialism.....	99	7
Employer's organizations.....	97	6
Unemployment.....	87	2
Taxation.....	76	5
Socialism.....	71	7
Regulation and enforcement of prohibition.....	68	7
Housing.....	66	..
Electoral systems.....	66	3
Electoral representation.....	64	..
Party control.....	64	5
Conservation of mines.....	58	4
Freedom of speech.....	58	3
Recreation.....	56	15
Negro problem.....	55	..

Over three hundred different topics are classified in Table 34 with the total frequency mention under Study I of 5095, and a total frequency mention in Study II of 720.

From these topics one sees that there is a wide range of types of economic, sociological, and political topics to be included in a course of civics if one accepts the theory that these courses are valuable in giving people the necessary background to read understandingly current periodicals.

The great difficulty of such analyses is that the topics overlap. Many of the topics are so broad that before one can determine effectively what should be taught much more refined analysis is necessary. They do suggest, however, that there are outstanding problems connected with many of these topics that might well form the core of a new organization of social science materials.

The study is also of value if one wishes to make use of current periodicals in social science classes, for it gives one relatively objective standards for the choice of topics found in current periodicals to be used as a basis for class discussion.

STUDY NO. 6. Sharon, J. A. *An analysis of problems by the newspaper-magazine method.* Summarized briefly by Ernest Horn in *The application of research to making a course of study in history.* Twenty-second Yearbook of the National Society for the Study of Education. Part II, 1922, pp. 242-243.

Problem. To determine important problems by analysis of newspapers.

Method. Sharon studied two weeks' issues of each of nine representative newspapers on the assumption that important problems will find a place in our newspapers. His measures were: (1) The number of articles, and (2) total length or amount of space in linear inches.

Table 35 reproduces the essential type of topics that are found and indicates the number of articles and number of inches in linear space devoted to them.

TABLE 35.—SOCIAL SCIENCE TOPICS FOUND IN NEWSPAPERS

Topic	Number of articles	Total length in linear inches
Taxation.....	92	1,058.00
Foreign relations (not immigration).....	30	701.75
Suffrage.....	51	559.75
Monopoly and legislation.....	45	551.75
Public service commissions.....	37	450.50
Liquor and prohibition.....	31	339.50
Money and banking.....	14	186.00
Employers and labor.....	7	102.50
Pensions (all kinds).....	7	88.00
Workmen's compensation.....	10	78.75
Conservation of natural resources.....	3	42.00
Child labor.....	1	2.80
Miscellaneous.....	50	760.75

II. Studies of Minimal Essentials

(a) *Studies based on a wide range of objective criteria.*

STUDY NO. 7. Rugg, Harold O., and Hockett, John. *Objective studies in map location.* Social Science Monographs, No. 1. The Lincoln School of Teachers College, New York City, 1924.

Problem. To determine the relative importance in contemporary life of map (geographic) locations of all kinds.

Method. Many objective measures of importance were combined to determine rank order lists of cities, regions, rivers, mountains, countries, islands, etc. Map locations were grouped in the following classes: (1) Cities of the United States; (2) cities of the world; (3) countries; (4) sections and regions within or overlapping countries; (5) rivers; (6) mountains; (7) islands; (8) bodies of water; (9) states of the United States; and (10) railroads, steamship routes, industrial areas, agricultural areas.

The following are the criteria which were used to determine the relative importance of the many map locations within each class listed above.

1. Population. Used as one criterion for determining relative importance of cities, both of the United States and foreign countries.

2. Foreign trade. Total exports and imports averaged for several years. Used as a measure for the commercial importance of countries.

3. Bank clearings. A measure of the commercial importance of the cities of the United States. Not found to be applicable to foreign cities.

4. Area. Used as a minor measure of importance of countries.

5. Frequency of use by "frontier thinkers" in critical magazines. A tabulation was made of every reference to a map location in one hundred issues, of the following critical magazines, during the period November, 1918, to April, 1924: *Our World*, *International Interpreter*, *New Republic*, *Nation*, *Outlook*, *Living Age*, *Manchester Guardian Weekly*. This criterion was applicable to all classes of locations. This analysis gave two measures of relative importance of locations. First, all locations in each class were ranked on the basis of the per cent of the total number of issues in which they were mentioned. Second, the gross frequency of mention of places was used as a less important measure. A total of over 28,000 references to map locations was found.

6. Frequency of use by "frontier thinkers" in critical books. A tabulation was made of every reference to a map location in fifteen recent, outstanding books dealing with world affairs and problems. Such books as the following were used: Bryce, *International Relations*; Angell, *The Fruits of Victory*; Feuter, *World History, 1815-1920*; Keynes, *Economic Consequences of the Peace*; Eckel, *Coal, Iron and War*; and Bowman, *The New World*. The frequency of mention and the space devoted to map locations were used to determine relative importance of locations. This criterion was found to be applicable to all classes of locations, but with varying significance.

7. Number of articles in all important magazines. The number of articles dealing with map locations in four volumes of the *Readers' Guide* and *International Index* was tabulated and the various locations ranked in order of importance on this criterion. The years 1919, 1920, 1922, and 1923 were covered in this analysis. This measure applied to all classes of location. A total of 20,000 articles dealt with 1086 different map locations.

TABLE 36.—THE FIRST THIRTY CITIES OF THE UNITED STATES
RANKED IN ORDER OF IMPORTANCE

1. New York, N. Y.	11. Cleveland, Ohio.	22. Denver, Colo.
2. Chicago, Ill.	12. New Orleans, La.	23. Portland, Ore.
3. Philadelphia, Pa.	13. Baltimore, Md.	24. Omaha, Nebr.
4. Boston, Mass.	14. Kansas City, Mo.	25. Atlanta, Ga.
5. San Francisco, Calif.	15. Brooklyn, N. Y.	26. Newark, N. J.
6. Detroit, Mich.	16. Seattle, Wash.	27. Memphis, Tenn.
7. St. Louis, Mo.	17. Minneapolis, Minn.	28. Columbus, Ohio.
8. Washington, D. C.	18. Cincinnati, Ohio.	29. Toledo, Ohio.
9. Pittsburgh, Pa.	19. Buffalo, N. Y.	30. Louisville, Ky.
10. Los Angeles, Calif.	20. Milwaukee, Wis.	
	21. Indianapolis, Ind.	

8. Washburne's rank order list. Use was made of the investigation of reference to historical and geographic facts found in popular magazines and newspapers, made by Superintendent Washburne, summarized in Study No. 14, on page 251. All map locations were selected from the Washburne rank order list, and reranked for use in this study.

After weights were assigned to each criterion in each class of locations, final rank order lists were determined for each class of locations, examples of which are given below.

Findings. The following tables give a part of the rank order list for several classes of map locations, as determined by the Rugg-Hockett study.

TABLE 37.—RANK ORDER LIST OF FIFTY MOST IMPORTANT FOREIGN CITIES

1. Paris	18. Liverpool	35. Prague
2. London	19. Hamburg	36. Venice
3. Berlin	20. Madrid	37. Glasgow
4. Vienna	21. Smyrna	38. Belfast
5. Rome	22. Munich	39. Stockholm
6. Moscow	23. Dublin	40. Vladivostok
7. Constantinople	24. Buenos Aires	41. Frankfort
8. Petrograd	25. The Hague	42. Angora
9. Tokio	26. Bagdad	43. Mosul
10. Peking	27. Milan	44. Jerusalem
11. Brussels	28. Mexico City	45. Riga
12. Manchester	29. Geneva	46. Montreal
13. Versailles	30. Leipsig	47. Singapore
14. Athens	31. Genoa	48. Hongkong
15. Budapest	32. Toronto	49. Barcelona
16. Warsaw	33. Copenhagen	50. Calcutta
17. Shanghai	34. Vilna	

TABLE 38.—THE FIRST THIRTY COUNTRIES OF THE WORLD
IN ORDER OF IMPORTANCE

(Only countries which are members of the League of Nations or eligible to membership are included.)

1. United States	11. Canada	21. Austria
2. France	12. Poland	22. Czecho-Slovakia
3. Germany	13. Egypt	23. Australia
4. China	14. Greece	24. Netherlands
5. Great Britain	15. Spain	25. Jugoslavia
6. Russia	16. Belgium	26. Bulgaria
7. Japan	17. Ireland	27. Switzerland
8. Italy	18. Mexico	28. Persia
9. India	19. Rumania	29. Brazil
10. Turkey	20. Hungary	30. Sweden

b. *Studies that contribute data concerning what facts in history, geography and civics are needed in order to read periodicals and books intelligently.*

STUDY NO. 8. Bagley, W. C. *The determination of minimum essentials in elementary geography and history.* Fourteenth Yearbook of the National Society for the Study of Education. Part I, 1915, pp. 131-139.

TABLE 39.—THE FORTY MOST IMPORTANT SECTIONS AND REGIONS OF THE WORLD
ARRANGED IN ORDER OF IMPORTANCE

(Countries which are not independent political units are not included.)

1. Europe	14. Near East	27. South Africa
2. England	15. Alsace-Lorraine	28. Palestine
3. America	16. Serbia	29. Shantung
4. Africa	17. Macedonia	30. North America
5. Asia	18. Asia Minor	31. Galicia
6. South America	19. Arabia	32. Silesia
7. Balkan States	20. Manchuria	33. Bavaria
8. Prussia	21. Albania	34. Lorraine
9. Morocco	22. Central America	35. Bosnia
10. Siberia	23. Korea	36. Latin America
11. Mesopotamia	24. Algeria	37. Soudan
12. Far East	25. Syria	38. Ulster
13. Armenia	26. Ukraine	39. East Africa
		40. Bohemia

TABLE 40.—THE TWENTY RIVERS OF GREATEST IMPORTANCE
IN ORDER OF RANK

1. Rhine	8. Yangste	15. Amazon
2. Nile	9. Saar	16. Congo
3. Danube	10. Jordan	17. Somme
5. Mississippi	11. Thames	18. Colorado
5. Hudson	12. Tigris	19. Clyde
6. Volga	13. Scheldt	20. Amur
7. Euphrates	14. St. Lawrence	

TABLE 41.—THE TEN MOST IMPORTANT MOUNTAINS
IN ORDER OF RANK

1. Alps	5. Carpathian	8. Appalachian
2. Caucasus	6. Andes	9. Himalaya
3. Rocky	7. Everest	10. Mt. Blanc
4. Ural		

TABLE 42.—THE TWENTY-FIVE MOST IMPORTANT
BODIES OF WATER IN ORDER OF RANK

1. Pacific Ocean	9. Bosphorus	18. Kiel Canal
2. Atlantic	10. Suez Canal	19. Niagara Falls
3. Mediterranean	11. Panama Canal	20. Caspian Sea
4. Dardanelles	12. Great Lakes	21. Persian Gulf
5. Black Sea	13. North Sea	22. Hudson Bay
6. Adriatic	14. Caribbean Sea	23. Indian Ocean
7. Baltic	15. "The Straits"	24. Lake Superior
8. Arctic	16. Aegean Sea	25. Gulf of Finland
	17. Red Sea	

TABLE 43.—THE TWENTY-ONE MOST IMPORTANT ISLAND
GROUPS IN ORDER OF RANK

1. Philippines	8. Long Island	15. Crete
2. West Indies	9. Sakhalin	16. Sardinia
3. Hawaiian	10. New Guinea	17. Virgin Islands
4. East Indian	11. Cyprus	18. Heligoland
5. Porto Rico	12. Malta	19. Guam
6. Sicily	13. Formosa	20. Aland Islands
7. Samoan Islands	14. Manhattan	21. Madagascar

Problem. The use of newspapers and magazines as a standard for determining the kind of geographical information that the school should teach. The theory adopted was that one important way in which people may use geographical information is to enable them to interpret more adequately references to geographical material in their reading of periodical literature. Specifically, the problem was to find by "samplings" of newspapers and magazines the types of references and the frequencies of mention to geographical material.

Method. Samplings of such magazines as the *Outlook* and the *Literary Digest* for a period of seven years ending with 1913 were taken. Two methods of counting the references were tried. First, counting one for each term such as the name of a place or each statement with a geographical or historical content. Second, taking each article as a unit in which the reference occurs in so far as it concerns a certain type of reference. Dr. Bagley says that actual investigations show that the latter method was to be preferred.

Findings. Table 44 shows the percentage of 2237 references to various types of geographical and historical material in eighteen journals.

TABLE 44.—PERCENTAGE DISTRIBUTION OF GEOGRAPHICAL AND HISTORICAL MATERIAL IN EIGHTEEN JOURNALS

Topics	Per cent
References to facts of location, size, direction, etc., which may be assumed to require for their understanding a knowledge of "place and location" geography	53.5
References to political divisions and facts of government which may be assumed to require a knowledge of "political" geography.....	25.1
References to industries, commerce, products, etc., which may be assumed to require a knowledge of "commercial" geography.....	5.8
References to people, customs, religion, education, etc., which may be assumed to require a knowledge of "social" geography.....	4.8
References to places as scenes of historical events, which may be assumed to require a knowledge of "historical" geography.....	1.7
Other references primarily of local or transitory interest.....	8.9

The relative emphasis to continents with North America arbitrarily assigned 100 was:

North America	100	Africa	4
Europe	73	South America	3
Asia	13	Australia	1

The relative frequency of mention to principal European countries, England being given the arbitrary value of 100, was:

England	100	Italy	32
France	80	Turkey	30
Germany	70	Austria-Hungary	24
Russia	35	Spain	22

The relative ratings of cities, New York being assigned arbitrarily 100, was:

New York	100	Philadelphia	20
London	31	Berlin	15
Boston	27	Rome	12
Washington	27	Constantinople	12
Chicago	26	St Petersburg	7
Paris	26	Vienna	7

The relative importance of rivers, seas and gulfs and straits in order of rank was as follows:

Rivers	Seas and Gulfs	Straits
Mississippi	Mediterranean	Dardanelles
Hudson	Ægean	Bosporus
Ohio	Mexico	Magellan
Missouri	Black	Bering
Rhine	Adriatic	
Nile	Marmora	
Danube	Red	
St. Lawrence	Caspian	
Potomac		
La Plata		
Seine		
Niagara		
Rio Grande		
Columbia		
Amazon		
Congo		

In a similar way historical references were tabulated, although they were mentioned much less frequently than geographical references.

The frequency of reference to persons in American history, Lincoln being given the arbitrary value of 100, was as follows:

Lincoln	100	Cleveland	17
Washington	66	McKinley	17
Jefferson	51	Webster	13
Jackson	24	Franklin	10
Grant	20	J. Q. Adams	10
Clay	20	Buchanan	10

References to wars were more frequent than to any other type of historical events, the Civil War holding first place.

References to civic material in periodicals in order of frequency of reference were as follows: (1) The Constitution, (2) amendments to the Constitution, and (3) the Constitutional Convention.

The Departments in order of frequency of reference were as follows: state, interior, attorney-general's office, treasury, war, post-office, commerce, and agriculture.

In one rather "popular" magazine, a sampling of ten years shows that Napoleon is most frequently mentioned, but other historical characters

such as Cæsar, Louis XIV, Jeanne d'Arc, and Luther are also frequently mentioned. Dr. Bagley comments that in this magazine analysis, Cæsar is referred to more frequently than any American character besides Lincoln, Washington, Roosevelt; Jeanne d'Arc as often as Cleveland, and Napoleon more frequently than any living political or military character.

The writer of this report ventures to suggest that certain aspects of European history are mentioned with sufficient frequency to cause one to consider their inclusion in the socially valuable history to be taught in the schools. The most important in order of frequency of reference are: The Renaissance, the French Revolution, the Middle Ages, and the Elizabethan period.

This is a pioneer study that attempts to "sample" periodical literature in order to obtain data concerning the facts in history and geography that one is likely to encounter in what is probably the preëminent sources of information of the average adult "layman"—namely, newspapers and magazines.

However, there are limitations to this type of study as Dr. Bagley points out in an article in *School and Home Education* for December, 1914. His investigation showed that certain newspapers and magazines with large circulations had relatively few references to geography and history; whereas, those newspapers and magazines "that related and discussed the events and problems of the day on a broad and comprehensive plane, with interpretations and references that involved for their understanding a certain capacity of formal knowledge, appealed in general to a smaller clientele and had in consequence a limited circulation." In other words, one might argue that the level upon which newspapers make their appeal depends much upon the extent to which formal education has benefited their readers. The belief that communication of ideas and ideals in a democracy, if we give all the people the tools of knowledge, will be adequately taken care of through newspapers and other forms of current literature should be scrutinized in much more detail.

The use of allusions in several studies in this section, in all likelihood, is but one means to be utilized in checking the socially valuable basic facts needed for an understanding of present-day society. This method should be further explored.

STUDY NO. 9. Charters, W. W. *A short cut in tabulation.* Summarized in *Curriculum construction.* New York, Macmillan Co., 1923.

Problem. To determine items of place geography to be taught by an analysis of random samplings of newspapers and magazines.

Method. The first number for October of the *Literary Digest* in alternate years from 1899 to 1913, inclusive, was examined for items in place geography. Advertisements, maps, and lists of places were omitted, but cartoons were included, "because they are essential parts of reading matter widely used to make ideas clear."

In the analysis, geographic names, such as England, were included and also the names of people as English in order "to obtain a gauge of the importance of the country, mention of the activities of the inhabitants was as important as mention of the country."

"Every reference was tabulated, in contra-distinction to one reference per paragraph or article as is the rule in some studies. This was done because of the effort to obtain a complete analysis. Places of the most minute sort, as the Arc de Triomphe in Paris, were included. Rivers, mountain ranges, lakes, bays, channels, gulfs, seas, and oceans were not included."

TABLE 45.—FREQUENCY OF MENTION OF CONTINENTS IN SELECTED ISSUES OF LITERARY DIGEST

Continent	Frequency of mention	Continent	Frequency of mention	Continent	Frequency of mention
North America.....	3,112	Europe.....	1,835	Asia.....	597
Africa.....	190	South America..	38	Australia.....	28

TABLE 46.—FREQUENCY OF MENTION OF COUNTRIES IN SELECTED ISSUES OF LITERARY DIGEST

Country	Frequency of mention	Country	Frequency of mention	Country	Frequency of mention
United States.....	2,712	British Isles....	725	Germany.....	257
France.....	205	Japan.....	202	China.....	136
Russia.....	121	Italy.....	108	Turkey.....	82
Canada.....	78	India.....	73	Mexico.....	61
Russia.....	57	Transvaal.....	54	Turkey.....	43
Orange Free States..	34	Spain.....	33	Austro-Hungary	32
Congo Free State...	23	Greece.....	23		

One notes by comparing the samplings of Bagley and Charters a marked resemblance in the relative frequencies of mention of the principal continents and countries of the world. Such studies with other studies listed in this section contribute impersonal evidence upon the crucial problem of relative emphasis to minimal essential facts.

STUDY NO. 10. Horn, Ernest. *Possible defects in the present content of American history as taught in the schools.* The Sixteenth Yearbook of the National Society for the Study of Education, Part I. 1917. pp. 156-172.

Problem. To examine this value of history—namely, that the chief purpose of teaching history in the elementary school is to make pupils more intelligent with respect to crucial activities and problems of present-day life or, as Dr. Horn continues, "this study is planned to determine what the content of the course of study in history would be if all history which is not essential to such intelligence were eliminated and if items which are essential but which do not at present appear in the course of study were added."

Method. Dr. Horn's hypothesis was that he could secure by analysis of books dealing with more crucial modern problems at least the sort of history or reference to historical material which these authors deemed essential to the understanding of modern problems. His point of view was a service point of view—that is, to determine what contemporary historians made use of in their discussion of present-day affairs.

He, therefore, asked the heads of the departments of political science, sociology, and economics of the State University of Iowa to make out a list of such problems and to list the books. Twenty-seven books were listed and analyzed, among them being such books as: Adams, *Science of Finance*; Adams and Sumner, *Labor problems*; Johnson, *American railway transportation*; Seager, *Social insurance*.

The twenty-seven books were then analyzed for the six following things according to the outline used by Langlois and Seignobos, *Introduction to the study of history*. pp. 234-235.

1. The percentage of historical material in each book
2. The specific and approximate dates referred to
3. The historical characters referred to
4. The frequency of reference to each period of history. The periods in this study were made to correspond to the study made by W. C. Bagley and Harold O. Rugg—*The content of American history as taught in the seventh and eighth grades*.
5. The frequency of reference to each of the more important phases of history
6. Movements, events, conditions, problems, etc.

Thirty-eight topics similar to the content of the twenty-seven books were also used in the analysis of articles in the *International Encyclopedia*. One hundred forty-two such articles were analyzed.

The topics examined in this study are as follows:

Accident insurance	Feminism	Pauperism
Ballot	Hygiene	Philippines
Bank, Banking	Initiative, Referendum,	Prisons
Child labor	etc.	Pure food
Crime	Interstate commerce	Roads
Civil-service reform	Life insurance	Rural credits
Conservation	Labor	Railways
Coast defense	Merchant marine	Socialism
Democracy	Monroe Doctrine	Tariff
Divorce	Milk	Temperance
Education	Negro	Transportation
Efficiency	Regulation of public	Tax
Fire insurance	utilities	Woman's suffrage
Family		

Findings. Table 47 shows the percentage of references devoted to each period in the problem books, in the *International Encyclopedia* and in the elementary school histories as analyzed by Bagley and Rugg.

TABLE 47.—PERCENTAGE OF HISTORICAL REFERENCES DEVOTED TO VARIOUS PERIODS

Period	Books	International Encyclopedia	Elementary Texts
Unclassified .....	.....	3.7	.....
Discovery and Exploration.....	0.1	0.67	8.27
Colonization to 1764.....	2.5	2.0	19.62
1764-1783.....	3.8	3.5	13.69
1784-1812.....	1.8	6.0	14.17
1812-1861.....	4.7	11.0	21.00
1861-1916.....	85.7	74.0	24.67

The Study does not indicate the per cent of historical material in each book.

The specific and approximate dates referred to—one hundred ninety-four separate dates were found in the books and one hundred ninety-nine in the *International*; two hundred fifty-three different dates in the two lists.

Reference to persons. The frequency of mention to the persons in the books and encyclopedia articles combined is as follows:

Roosevelt	284	Grant, U. S.....	18
Smith, Adam.....	214	Pitt, Wm.....	16
Mill, J. S.....	174	Wells, H. G.....	16
Malthus	74	Gladstone	16
Napoleon	64	Wagner, A.....	15
Marx, Karl.....	59	Webb	14
Owen, Robert.....	44	Lassalle	14
Gompers	41	Napoleon III.....	12
Ricardo	38	William III.....	10
Wilson	30	Gallatin	10
Washington	29	Jackson, Andrew.....	10
Louis XIV.....	29	Montaigne	10
Rousseau	26	Hamilton, Alexander.....	9
George, Henry.....	25	Wright, C. D.....	7
Jefferson, Thomas.....	24	Shaw, Bernard.....	6

Table 48 shows the distribution of references to political, military, and social and economic history in these books on modern problems and encyclopedia articles as well as in modern history textbooks and the opinions of a proper distribution between the three by the committee of eight.

TABLE 48.—DISTRIBUTION OF REFERENCES TO POLITICAL, MILITARY AND SOCIAL AND ECONOMIC HISTORY

Source	Political	Military	Social and economic
Committee of eight.....	33.0	30.0	37
Modern history textbooks.....	42.0	40.0	18
Books on modern problems.....	18.7	4.7	78
Encyclopedia articles.....	37.0	1.7	60

The most important interpretation to be deduced from the study of these tables is that the historical material that writers of books and articles on modern problems chiefly make use of is relatively recent. The references are principally to dates and persons since the Civil War.

While Dr. Horn points out that we should have a larger number of books analyzed, perhaps one hundred, and also a larger number of articles in the encyclopedias, he does say, however, that the returns from the books and articles analyzed are so consistent that the data would probably be unmodified except in minor items.

Moreover, he points out that while the investigators scoring these books for dates, persons, etc., may have made certain mistakes, nevertheless, because each improved with practice he asserts that the reports represent "a very close approximation to the material actually in the books and articles under these headings." A variation from true description of the data is probably not more than five or ten per cent.

Summarizing, Dr. Horn does not attempt to answer the question as to the complete content of the course but he does say that he has attempted to investigate the implications of the following assertion, namely, "that history should render pupils more intelligent with regard to modern conditions, and problems and activities. If one assumes (1) that this is the function of history, (2) that the method of research here followed is satisfactory, (3) that sufficient data have been collected, then there seems no escape from the conclusion that present elementary and high school courses of study in history are in very serious need of reconstruction."

Obviously, this does not imply that there are not other functions of history from which one could justify the inclusion of certain material that does not seem to be justified from the examination of the data in this study. Dr. Horn, himself, says that while the data suggest emphases to various items, they do not indicate what the organization of the course should be. Hence, we should keep in mind that we need other methods of attack in order to determine additional values of the material taught in American history.

STUDY NO. II. Marston, L. R.; McKown, H. C.; and Bagley, W. C. *The method of determining misplacements of emphasis in seventh and eighth grade history.* Seventeenth Yearbook of the National Society for the Study of Education, Part I. 1918. pp. 90-96.

Problem. To determine more "precisely some of the misplacements of emphasis in the present day and relatively recent teaching of elementary history." It was a sequel to the study made by W. C. Bagley and Harold O. Rugg entitled *The content of United States history as taught in seventh and eighth grades*, that is, both studies were concerned with what are the minimal essentials as revealed by analyses of elementary school history textbooks.

The following criteria were used in measuring present practices:

"1. Are the relative emphases given to events in the textbooks consistent with the emphases given to the same events in standard books of reference?

"2. Are the relative emphases given by the textbooks consistent with the judgment of students of history regarding the events that should be emphasized?

"3. Are the relative emphases given by the textbooks consistent with the need for historical knowledge in interpreting current discussions of national problems as these are revealed in periodical literature?"

This particular study by Marston, McKown, and Bagley was limited to one type of analysis of school histories—the names of persons given prominence by twenty-five elementary textbooks in their treatment of the period between 1765 to 1865 in American history. These names are referred to in the Bagley-Rugg study under the caption, "The Hall of Fame."

Method. The frequency of mention of these names in "The Hall of Fame" was assumed to be a rating of the importance of these persons in American history.

To check these a rating on each of the three criteria above was used.

1. The "Encyclopedia Ratings." Such encyclopedias as the *Britannica*, *The New International*, Appleton's *Cyclopedia of American Biography*, Harper's *Encyclopedia of American History* were used.

2. The "Historian's Ratings." The lists, both civil and military, in the "Hall of Fame" were sent to two hundred and five teachers and students of history in American schools and universities, who were asked to rank these in their order of relative importance. Thirty-three replies were used.

TABLE 49.—RANKING OF THE FIRST TWENTY-FIVE MEN PROMINENT IN CIVIL LIFE BETWEEN 1765 AND 1865

Names	Amalgamated ranking	25 textbooks	8 encyclopedias	33 historians	4 magazines
Lincoln.....	1	1	1	2	1
Washington.....	2.5	2	4	1	3
Jefferson.....	2.5	3	2	3	2
Franklin.....	4	10.5	3	6	4
Andrew Jackson...	5	4	8	8	5
Hamilton.....	6	7	5	4	9.5
Clay.....	7.5	8	10	9	6
Webster.....	7.5	14	7	5	7
John Adams.....	9	5	6	11	12.5
J. Q. Adams.....	10	9	9	12	9.5
Madison.....	11	6	11	7	17
Monroe.....	12	10.5	12	17	8
Calhoun.....	13	14	14	10	17
J. Davis.....	14	20.5	15	18	11
S. A. Douglas.....	15	16.5	20	15	14.5
Buchanan.....	16	18.5	13	21	14.5
Van Buren.....	17	14	22	20	12.5
Henry.....	18	12	21	16	23
Samuel Adams...	19	16.5	18	13	25
Tyler.....	20	18.5	19	22	20
Polk.....	21	20.5	16	19	19
Jay.....	22	24.5	23	14	23
Burr.....	23.5	22.5	24	25	17
W. H. Harrison...	23.5	24.5	17	24	23
Taylor.....	25	22.5	25	23	21

3. The "Magazines' Ratings." "Samplings" from the files of the following four magazines—the *Atlantic Monthly*, twenty issues; *The Nation*, seventy-eight issues; *Collier's*, thirty-eight issues; *Saturday Evening Post*, twenty issues, for a period of ten years (1904-1913) were read and frequencies of mention under the civil and military lists were constructed. The "samplings" were distributed, so that each year was represented by approximately the same number of issues. Each name was credited with only one reference for each article in which it appeared.

Findings. Table 49 shows the ranking of the first twenty-five men prominent in civil life between 1765 and 1865, according to the amalgamated ranking, to the twenty-five textbooks, to the eight encyclopedias, to the thirty-three historians, and to the four magazines.

Table 50 shows the rankings of men prominent in military and naval affairs between 1765 and 1865 according to the same standards as in Table 49.

TABLE 50.—RANKING OF MEN PROMINENT IN MILITARY AND NAVAL AFFAIRS BETWEEN 1765 AND 1865

Names	Amalgamated ranking	25 textbooks	6 encyclopedias	33 historians	4 magazines
Grant.....	1	3	1	2	1
Washington.....	2	1	4	1	3
Lee.....	3	2	3	3	2
Sherman.....	4	4	2	4	6.5
McClellan.....	5	6	7	8	4.5
"Stonewall" Jackson.....	6	12.5	10	5	8
Arnold.....	7	9	5	19	11
Greene.....	8	12.5	6.5	7	18.5
Sheridan.....	9	17	13	9	9.5
A. Jackson.....	10.5	23.5	9	11	6.5
Scott.....	10.5	14.5	11	10	14.5
J. E. Johnson.....	12	7	15	12	18.5
Cornwallis.....	13	5	14	16	18.5
Farragut.....	14	23.5	6.5	6	23
Burgoyne.....	15	11	18.5	17	13
Meade.....	16	23.5	21	14	4.5
Taylor.....	17	14.5	12	15	23
Hooker.....	18.5	23.5	18.5	18	9.5
Clinton.....	18.5	10	18.5	17	13
Thomas.....	20	18	20	13	23
Howe.....	21	8	24	21	23
Schuyler.....	22	19	16	23	23
W. H. Harrison.....	23	23.5	18.5	18	23
Early.....	24	20.5	23	25	23
Gage.....	25	20.5	23	25	23

The displacements of textbooks' *civil* rankings of four places or more from the amalgamated rankings are as follows:

	Displacement
A. Textbooks apparently <i>overemphasize</i> the importance of	
Patrick Henry	6 places
Madison	5 places
John Adams	4 places
B. Textbooks apparently <i>underemphasize</i> the importance of	
Franklin	6.5 places
Webster	6.5 places
Jefferson Davis	6.5 places

The displacements of textbooks' *military* rankings of four places or more from amalgamated rankings are as follows:

	Displacement
A. Textbooks apparently <i>overemphasize</i> the importance of	
Howe	13 places
Clinton	8.5 places
Cornwallis	8 places
J. E. Johnston.....	5 places
Burgoyne	4 places
B. Textbooks apparently <i>underemphasize</i> the importance of	
A. Jackson	13 places
Farragut	9.5 places
Sheridan	8 places
Meade	7.5 places
"Stonewall" Jackson	6.5 places
Hooker	5 places
Greene	4.5 places
Scott	4 places

The study shows more of a tendency to overemphasize or underemphasize the importance of military persons due to the tendency in the past perhaps to stress military history than to overemphasize or underemphasize treatment of political affairs.

STUDY NO. 12. Swisher, J. A. *The historical information essential for the intelligent understanding of civic problems*. Seventeenth Yearbook of the National Society for the Study of Education. Part I. 1918. pp. 81-89. (Summary of unpublished Dissertation Ph. D. State Univ. of Iowa, Iowa City, Iowa.)

Problem. What history is most necessary to the intelligent understanding of modern *political* problems, conditions and activities?

Method. This study is based on the theory, "that if a representative list of the more crucial modern problems could be secured, and if among the books dealing with such problems, those be selected which give the clearest statement of that problem, it might be expected that these books would contain at least the sort of history, or amount of historical reference which, in the judgment of the authors, is essential to a proper understanding of the modern problems that are discussed." Members of the Department of Political Science at the State University of Iowa were asked to list books which deal in a representative way with modern problems.

Twenty-two books were given and were used as a basis for Swisher's study. Examples of these books are the following: Adams, *Science of Finance*; Fairchild, *Immigration*; Haynes, *Child labor*; and Jenks, *The trust problem*.

Also twenty-two articles of similar material were checked in the *Cyclopedia of American Government*.

The material was analyzed for four types of data: (1) Historical persons referred to in each book; (2) specific dates and frequency of reference to various periods in history; (3) the frequency of reference to the leading

foreign countries; and (4) historical movements, events, conditions, and problems.

TABLE 51.—TWENTY MOST FREQUENTLY MENTIONED PERSONS IN BOOKS AND CYCLOPEDIA ARTICLES

Person	Different problems	Number of times mentioned	Product
Books			
Roosevelt, President	10	25	250
Cleveland, President	7	9	63
McKinley, President	5	9	45
Smith, Adam	5	11	55
Taft, President	4	11	44
Jackson, President	4	11	44
Grant, President	5	8	40
Mill, John Stuart	5	8	40
Wilson, President	6	6	36
Garfield, President	4	8	32
Malthus	4	8	32
Montesquieu	3	7	21
Eliot, Charles W.	4	4	16
Hamilton, Alexander	4	4	16
Harrison, President W. H.	3	5	15
Walker, Francis	3	5	15
Hughes, Charles Evans	3	4	12
Lincoln, Abraham	3	4	12
Bryce, James	3	3	9
Clay, Henry	3	3	9
Cobden, Richard	3	3	9
List, Frederick	3	3	9
Washington, President	3	3	9
Cyclopedia Articles			
Cleveland	4	6	24
Taft	4	6	24
Roosevelt	3	4	12
Wilson	2	5	10
Wright, Francis	2	2	4

Table 52 shows the references to dates in books and cyclopedia articles combined.

TABLE 52.—DATES MOST FREQUENTLY MENTIONED IN BOOKS AND CYCLOPEDIA ARTICLES

Date	Different problems	Times mentioned
18 ²²	9	34
1887	14	34
1890	20	66
1893	14	33
1894	14	54
1896	13	43
1897	17	53
1898	16	41
1899	11	35
1900	18	73
1901	21	41
1903	15	36
1904	11	37
1906	10	33
1907	18	61
1908	13	71
1909	12	45
1910	17	78
1911	14	35
1912	19	69

Findings. a. *Persons*—A total of 563 different names were found in the twenty-two books. Table 51 shows the references to the most frequently mentioned persons both in books and in cyclopedia articles.

b. *Dates*—214 dates were found in the books analyzed and 89 in the cyclopedia articles.

The first conclusion that one draws from a study of these tables is that the persons and dates made use of by writers of books on modern problems are quite different from the persons and dates referred to in school histories. While some of the names are common to both lists the majority of the names and dates in these tables are different. A second point to be noted is that the majority of the names referred to and the dates mentioned have to do with recent history—that is, with history of the United States since the Civil War.

c. *Historical periods*—The percentage of space given to various periods of United States history in books and in cyclopedia articles as compared with the proportion of space devoted to these periods in a survey of elementary school histories is shown in Table 53.

TABLE 53.—COMPARISON OF PER CENT OF SPACE GIVEN VARIOUS PERIODS OF HISTORY IN TEXTBOOKS AND BY WRITERS OF CONTEMPORARY PROBLEMS

Period	Books	International Cyclopedia	Elementary texts	Present work
Unclassified.....	...	3.7	.....	.....
Discovery and exploration.....	0.1	0.67	8.27	0.93
Colonial to 1764.....	2.5	2.0	19.62	2.46
1764-1783.....	3.8	3.5	13.69	1.72
1783-1812.....	1.8	6.0	14.17	4.38
1812-1861.....	4.7	11.0	21.00	16.39
1861-1916.....	85.7	74.0	24.67	74.12

It is obvious that the references classified by periods deal preponderantly with those events and movements *since* 1861. In fact, nearly three-fourths of the references deal with recent history as compared with about one-fourth the emphasis to such events in elementary school histories.

The outstanding feature, then, of the historical information essential for the understanding of political problems is that this historical information made use of by writers about *contemporary* problems deals chiefly with materials in relatively recent times, particularly since the Civil War. On the other hand, we should note in Table 53 that whereas most attention by the writers of contemporary problems is given to the history since 1861, 74.12 per cent for example, that elementary textbooks give only 24.67 per cent of the allotment of space to the same period. Such a discrepancy between the history used by writers on contemporary problems and the history set forth in textbooks calls at least for more serious study of the bases upon which crucial materials of the past are selected for inclusion in the social science curriculum.

TABLE 54.—COMPARISON OF BAGLEY'S RESULTS WITH THOMAS' FOR THE MOST FREQUENTLY MENTIONED CONTINENTS

Country	Thomas	Bagley	Actual frequency
North America.....	100	100	11
Europe.....	172	73	19
Asia.....	18	13	2
Africa.....	90	4	10
South America.....	63	3	7
Australia.....	18	1	2

TABLE 55.—FREQUENCY OF MENTION OF VARIOUS COUNTRIES

Country	Thomas frequency	Branom & Reavis score
United States.....	90	30
France.....	71	28
Germany.....	70	28
Great Britain.....	53	28
Austria-Hungary.....	23	28
Belgium.....	22	23
Russia.....	20	27
China.....	14	26
Italy.....	14	27
Canada.....	14	27
Turkey.....	11	20
Holland.....	10	24
India.....	10	28
Brazil.....	9	25
Mexico.....	9	24
Siberia.....	9	0
Japan.....	8	27
Spain.....	7	21
Sweden.....	7	21
Switzerland.....	5	0
Bulgaria.....	5	0
Argentina.....	4	25
Egypt.....	3	20
Australia.....	2	23

TABLE 56.—FREQUENCY OF MENTION OF THE LARGEST EUROPEAN CITIES

City	Branom & Reavis Rank	Thomas frequency
London.....	1	43
Paris.....	2	26
Berlin.....	3	23
Vienna.....	4	4
Petrograd.....	5	9
Moscow.....	6	2
Constantinople.....	7	1
Hamburg.....	8	2
Glasgow.....	9	1
Liverpool.....	10	5
Warsaw.....	11	0
Budapest.....	12	3
Manchester.....	13	0
Brussels.....	14	0
Naples.....	15	1
Madrid.....	16	1
Amsterdam.....	17	3
Stockholm.....	18	4

STUDY NO. 13. Thomas, Joel Bert. *A study in minimal essentials of geography for the elementary schools.* Unpublished Master of Arts Thesis on file in the Library, Univ. of Indiana, Bloomington, Ind.

Problem. To determine a list of minimal essentials in elementary geography.

Method. After a review of other studies that attempt to state the minimal essentials, Mr. Thomas made a comparative study with the Bagley investigation by the reference method of the allusions in a sampling of the following periodicals: *The Indianapolis News*, *The Danville Gazette*, and *Youth's Companion*. Four editions of the first two and six of the latter were selected at random from the period 1911-1918.

Findings. One hundred and eighty-eight pages of printed matter was found to contain 5027 geographical references. The following tables are given herewith for comparative purposes.

Table 55 compares the frequency of occurrence of various countries with the score of each country in the Branom-Reavis study.

Table 56 gives the ranking based upon the scores according to the Branom-Reavis study and the frequency of mention of the largest cities in Europe according to the Thomas study.

Table 57 compares the rank of the chief cities of the United States according to the Branom-Reavis list and the Thomas study. In a similar way Mr. Thomas compares rivers, bays, and mountains with the Bagley study.

TABLE 57.—RANK OF CHIEF CITIES OF THE UNITED STATES

City	Branom & Reavis rank	Thomas frequency	Thomas rank
New York.....	1	93	2
Chicago.....	2	86	3
Philadelphia.....	3	20	9
St. Louis.....	4	23	7.5
Boston.....	5	28	5
Cleveland.....	6	26	6
Baltimore.....	7	14	12
Pittsburgh.....	8	21	8
Detroit.....	9	16	11
Buffalo.....	10	9	15.5
San Francisco.....	11	23	7.5
Milwaukee.....	12	9	15.5
Cincinnati.....	13	25	7
Newark.....	14	2	21
New Orleans.....	15	10	14
Washington.....	16	111	1
Los Angeles.....	17	17	10
Minneapolis.....	18	2	21
Jersey City.....	19	1	22
Kansas City.....	20	10	14
Seattle.....	21	7	18
Indianapolis.....	22	61	4
Providence.....	23	0	0
Rochester.....	24	5	20
St. Paul.....	25	8	16
Portland, Oregon.....	26	2	21
Louisville.....	27	12	13
Denver.....	28	10	14
Columbus, Ohio.....	29	6	19

Table 58 shows the per cent of references to various types of geography in the Thomas study and in the Bagley study.

TABLE 58.—PER CENT OF REFERENCES TO VARIOUS TYPES OF GEOGRAPHY

Types of geography	Thomas Per cent	Bagley Per cent
Place geography.....	45.8	53.5
Political geography.....	18.1	25.1
Commercial geography.....	3.2	5.8
Social geography.....	8.6	4.8
Historical geography.....	0.9	1.7
Unclassified.....	22.8	8.9

Mr. Thomas says, "The striking difference in the figures for the unclassified references is due to the large number of local references in the metropolitan and county newspapers. The large per cent of local references in the newspapers is an indication of the relative importance of home geography." One notes there is a rather marked resemblance between the percentage of distributions for the other types of geography.

STUDY NO. 14. Washburne, Carleton W. *Basic facts needed in history and geography; a statistical investigation.* The Twenty-second Yearbook of the National Society for the Study of Education, Part II. 1923, pp. 216-233.

Problem. To select basic facts in history and geography by an impersonal standard for the elementary school course of study in Winnetka, Illinois. Dr. Washburne assumed that an important function in the teaching of geography and history was to make children familiar with the facts that are commonly known to intelligent people. The facts frequently alluded to in periodicals must be taught if our children are to read intelligently.

Method. The type of subject matter, generality of distribution, and period of time covered guided the investigators in this study.

Four literary periodicals were selected: *Atlantic*, *Bookman*, *Century*, *Scribner's*; five popular fiction periodicals: *American*, *Cosmopolitan*, *Saturday Evening Post*, *Ladies' Home Journal*, *Good Housekeeping*; five news periodicals: *World's Work*, *Literary Digest*, *Outlook*, *New Republic*, *Nation*; and four newspapers: *New York Times*, *Chicago Tribune*, *Chicago Herald-Examiner*, and *Christian Science Monitor*.

Dr. Washburne says in respect to samplings of these periodicals: "We chose about fifteen issues of each of these periodicals, three every third year, in such a way that one periodical or another covered almost every month of every year from 1905 to May, 1922. In this way we avoided seasonal weighting of items, and secured information over a wide enough range of years to avoid the danger of overemphasis of purely transitory material." Every allusion to a person, place, date, or event was recorded. Altogether there were over 81,000 allusions.

TABLE 59.—FREQUENCY RANKS OF FIFTY MOST COMMON HISTORICAL AND GEOGRAPHICAL ALLUSIONS

Allusion	Number of periodical years	Number of years between first and last allusion	Number of articles in which allusions occur	Gross number of allusions
1	2	3	4	5
America (meaning U. S.).....	103	18	1,211	5,903
England.....	103	18	1,155	3,315
France.....	100	18	1,390	3,848
New York City.....	100	18	911	2,386
China.....	98	18	353	750
London.....	95	18	629	1,303
Germany.....	92	18	674	3,015
Boston.....	92	18	297	564
New York State.....	86	18	594	1,090
Paris.....	86	18	516	1,494
Italy.....	86	18	428	1,140
Japan.....	86	18	267	902
Great Britain.....	83	18	400	1,539
Europe.....	81	18	837	1,994
United States.....	81	18	659	1,725
Rome.....	81	18	202	604
California.....	81	18	193	269
Russia.....	78	18	362	1,730
Ireland.....	78	18	288	674
Spain.....	78	18	279	649
Greece.....	78	18	264	761
Washington, D. C.....	75	18	457	899
Chicago.....	75	18	350	618
Indians (American).....	75	18	240	814
Africa (including North and South Africa, etc.).....	75	18	216	441
Roosevelt, Theodore.....	74	18	257	617
Congress.....	72	18	255	632
Scotch, Scotland.....	72	18	216	337
Canada.....	72	18	216	199
Philadelphia.....	72	18	213	354
Lincoln, Abraham.....	72	18	142	160
Harvard.....	70	18	137	236
Switzerland.....	69	18	124	176
Atlantic.....	66	18	172	193
Holland.....	66	18	169	460
Wilson, Woodrow.....	65	18	380	789
India.....	63	18	151	255
Egypt.....	63	18	130	286
Hudson River.....	63	18	124	121
Jew, Jewish.....	63	18	109	460
Australia.....	63	18	103	174
New England.....	63	18	178	247
Taft, President.....	62	18	170	411
Poland.....	61	18	175	281
Berlin.....	61	18	133	219
San Francisco.....	61	18	121	165
Washington, George.....	61	18	109	216
Civil War.....	61	18	148	162
Austria (including Austro-Hungary).....	59	18	193	429
Maine.....	59	..	80	86

The frequency of ranks was determined on the basis of: (1) The number of periodical-years in order to weight the number of periodicals containing allusions year by year; (2) the range of years—that is, the lapse of time from the first year in which an allusion was found to the last; (3) the number of articles containing allusions to the item in question; and (4) the gross number of allusions.

Periodical-years gave an almost perfect index as to the probability of meeting allusions to the item. Therefore, items were ranked according to

their periodical-years. Table 59 shows a few of the most frequently mentioned allusions.

Before such lists are accepted with any great degree of finality, it is probable that other samplings should be taken. Dr. Washburne's list is significant for the range of the sample—namely, over eighteen years—from 1905 to 1922. One might, however, question whether his list of magazines and newspapers is sufficiently representative of the average reading of the public of periodicals. Another investigation of other magazines and newspapers, perhaps with larger circulations, might well be undertaken. If such an investigation agrees in its findings with those of Dr. Washburne, we would be in a more definite position to assert that these are the minimal essential facts in geography and history that one encounters in his reading of periodicals.

STUDY NO. 15. Peters, Charles C. *Detailed analysis of one objective of cultural education.* Published in *Foundations of educational sociology.* New York, Macmillan Co., 1924, pp. 419-424.

Problem. To find what information is necessary for the following item of culture: *At least superficial acquaintance with a wide variety of matters, so as not to be entirely ignorant of practically anything met with in reading or heard about, but also to "place" them at least roughly in their setting.* Peters asserts that this ability to place references and to get satisfaction from it is an important element of culture. The study is included here because it is another check upon the informational facts involving history and geography in popular literature.

Method. Classes of Professor Peters searched through the most widely read contemporary literature to discover references to history, geography, and the like, because "it is in connection with such literature that the typical person will have occasion to get the satisfactions and questions."

A study of Mr. H. F. Jenkins, of Little, Brown and Company, involving what books have been most widely read within recent years, was used. Twenty-six "best sellers," including such books as *Main Street*, *Four Horsemen of the Apocalypse*, *The Shepherd of the Hills*, *Great Heart*, *The River's End*, *Heart of the West*, and *The Inside of the Cup*, were, therefore, analyzed for the allusions in which information concerning history, geography, literature, and so on, was called for. Local references were excluded and duplicates counted only if they occurred in a new setting.

"Besides these twenty-six novels there were covered in the same way twenty-five short stories, four thousand jokes, two thousand comic pictures in the newspapers, and the legends of ten moving picture shows. These lists were then telescoped and the number of times each item occurred thus determined. The most frequently mentioned—New York City—had occurred ninety-six times and the others ranged from that down to one time. Motion picture shows and short stories were added until the highest one stood at exactly one hundred. This ought to give a pretty fair sampling of the reading that the rank and file of people do, and hence indicate rather

TABLE 60.—HISTORICAL AND GEOGRAPHICAL TOPICS IN CONTEMPORARY LITERATURE

Topic	Times mentioned	Topic	Times mentioned
New York City.....	100	Shakespeare.....	19
Germany.....	55	George Washington.....	19
France.....	54	Henry Ford.....	18
England.....	50	Caesar.....	18
The Bible.....	44	New England.....	17
London.....	43	Lincoln.....	16
Paris.....	30	Congress.....	16
Chicago.....	29	Greece.....	16
Europe.....	28	Italy.....	15
Ireland.....	24	Russia.....	15
China.....	23	Scotland.....	15
Boston.....	21	California.....	15
Rome.....	20		

TABLE 61.—AVERAGE PERCENTAGE OF SPACE DEVOTED TO NINE HISTORICAL PERIODS IN TEXTS PUBLISHED IN FOUR DIFFERENT INTERVALS

Historical period	Average percentage of space devoted to historical periods in textbooks			
	Intervals in which textbooks reviewed were published			
	1865-1874	1881-1888	1890-1904	1906-1912
Discovery and exploration.....	5.7	7.9	11.1	8.2
Colonial development.....	21.3	20.0	17.4	15.9
Colonial wars.....	5.6	4.8	3.4	3.6
Pre-revolution.....	3.1	1.8	3.3	4.1
Revolution.....	17.6	17.3	11.9	9.5
1783-1812.....	6.4	8.2	8.7	14.1
1812-1861.....	16.9	15.6	19.1	21.0
Civil War to 1865.....	18.8	14.2	11.9	10.2
1865 to date of publication.....	8.95	11.3	14.9	14.4

TABLE 62.—PERCENTAGE OF SPACE ALLOTTED TO PERIODS OF AMERICAN HISTORY AS GIVEN BY THE COMMITTEE OF EIGHT REPORT, THE STUDY OF W. C. BAGLEY AND HAROLD O. RUGG, AND THE STUDIES OF EARLE RUGG ON: EARLY AMERICAN HISTORY PUBLISHED BEFORE 1860

Period	Committee of Eight report	Study of W. C. Bagley and H. O. Rugg	Study of current histories	Early histories published before 1860
Discovery and Exploration 1000-1607.....	12.90	8.27	5.73	8.09
Colonization 1607-1690.....	21.20	15.95	8.89	28.73
Colonial Wars 1690-1763.....	3.10	3.67	6.48	6.48
Pre-Revolutionary War Period 1763-1775..	2.06	4.11	3.50	4.32
Revolutionary War 1775-1783.....	14.40	9.58	5.67	20.36
Period 1783-1812.....	8.70	14.17	10.82	9.60
Period 1812-1861.....	22.70	21.01	24.28	22.76
Civil War 1861-1865.....	6.10	10.22	7.70	....
Period 1865-1912.....	9.30	14.45	21.69	....
Period 1912 to date.....	....	....	5.86	....

reliably the background of information needed for the maximum appreciation of this reading."

Findings. The most frequently mentioned items are listed in Table 60.

Dr. Peters' study is further substantiation of the basic minimal essential facts that one encounters in another source of reading—namely, most widely read contemporary literature. With the other studies in this field, it should be used to amplify and check attempts to obtain as complete a list as possible of socially valuable minimal essential facts in geography and history.

c. Studies that contribute data concerning what facts, dates, persons, topics, problems, etc., are stressed in commonly used school textbooks

STUDY NO. 16. Bagley, W. C., and Rugg, Harold O. *The content of American history as taught in seventh and eighth grades.* An analysis of typical school textbooks. Bulletin 16, School of Education, Univ. of Illinois, Urbana, Ill. 1915.

Problem. To show the trends and relative emphases given to the basic materials in United States history taught in seventh and eighth grades, by means of analyzing commonly used textbooks in four periods, namely, 1865-1874, 1881-1888, 1890-1904, and 1906-1912.

This study was undertaken under the assumption that the minimal content of geography and history as taught in the elementary school should include the geographical and historical data with which everyone should be familiar, the facts and principles which might be assumed as part of the culture common to all of the people, the need for knowing what elements of historical and geographical knowledge are now, and have been in the immediate past, actually part of the common pabulum of elementary instruction assumed prime importance. It is the textbook that forms the basis of instruction in history in American elementary and secondary schools.

Method. A careful count of the proportion of space devoted to the major periods and to the subordinate topics within each period as well as the frequency of mention of important persons in each period was made. Out of the latter, the so-called *Hall of Fame* of important persons in American history was developed.

Findings. The proportion of space which commonly used textbooks devote to nine periods in American history is shown in Table 61.

The more important facts set forth in this study may be summarized as follows: In so far as can be determined from the material presented in the textbooks, elementary American history as taught in the seventh and eighth grades has been and still is predominantly political and military history.

Within the past fifty years, the emphasis upon military affairs as measured by the proportion of space devoted to wars has declined. In general, battles and campaigns are treated less in detail than was formerly the rule, while proportionately more space is devoted to the causes and the results of wars. The lessening emphasis upon the details of the wars is first

noticed in some of the textbooks published between 1881 and 1888, and the tendency has been general and decided since that time.

The latter books give a perceptibly heavier emphasis to the facts of economic and industrial development than do the earlier books, although political development still constitutes the essential core of elementary historical instruction.

As regards the treatment of specific eras or epochs, the principal increases in emphasis are to be noted in connection with (a) The period 1783-1812 (especially in the treatment of the so-called "critical period" between the close of the Revolution and the adoption of the Constitution); (b) the non-military affairs of the period 1812-1861; and (c) European events preceding and during the periods of discovery, exploration, and settlement.

The persons whose names are most frequently mentioned in the elementary textbooks are predominantly those who have been most intimately associated with political development and with military and naval affairs.

Variations among the several textbooks in respect of persons mentioned are numerous and wide. Most of the books mention a much larger number of names than the average pupil will be likely to remember. Certain names, however, are made to stand out through repetition.

Variations in the topics and events which constitute the chief content of elementary historical instruction are probably less numerous and less wide than variations in names of persons mentioned. There is always a rather distinct "core" of topics common to most of the books, and these topics may be looked upon as constituting the present "standardized" content of elementary American history.

Numerous changes have taken place in the construction of elementary textbooks in history during the past fifty years. The more important of these are: (a) A movement toward a simpler "style" with larger emphasis upon clear statements of causal relationships; (b) the introduction and development of the "problem" as a method of teaching history, and a consequent encouragement of "judgment" as contrasted with rote memory, of rational as contrasted with verbatim mastery; (c) a marked decline in the employment of imaginative pictures as illustrations and an increase in the use of pictures that represent sincere attempts to portray actual conditions; (d) a marked decline in the use of anecdotal materials; and (e) a larger and wider use of maps.

STUDY NO. 17. Rugg, Earle. "An analysis of social science textbooks" taken from a forthcoming publication—*Studies in curriculum construction in the social sciences*. (Unpublished Ph. D. Dissertation on file in the Library, Teachers College, Columbia University, New York City, 1923.)

Problem. To evaluate the extent to which social science textbooks meet social and learning needs of junior and senior high school pupils.

Method. Widely used textbooks were analyzed for references to persons, dates, topics, etc., and comparisons were made to see to what extent

socially valuable materials were included and whether textbook materials were organized in accordance with the laws of learning.

Findings. Table 62 shows the relative emphases given periods in American history by authors of textbooks for nearly one hundred years, and the distribution of emphasis of one of the most influential committees of the American Historical Association—the Committee of Eight.

From Table 62 one may ascertain the relative proportions of space allotted in textbooks in American History for one hundred years. It is evident that historians are giving more emphasis to recent events and that they are stressing military history less.

TABLE 63.—PERCENTAGE OF SPACE GIVEN TO POLITICAL, MILITARY AND SOCIAL AND ECONOMIC HISTORY BY COMMITTEE OF EIGHT AS COMPARED WITH EARLY AND CURRENT HISTORIES

	Political	Military	Social and economic
Committee of eight.....	33.0	30.0	37.0
Early histories, published before 1860.....	38.4	44.3	17.2
Current histories since 1912 (four elementary and four advanced).....	49.9	14.59	35.5
Books and Encyclopedia Articles Dealing with Modern Problems			
Books on modern problems.....	18.7	4.7	78.0
Encyclopedia articles.....	37.0	1.7	60.0

TABLE 64.—NUMBER OF PAGES DEVOTED TO CERTAIN SELECTED SOCIAL AND ECONOMIC TOPICS IN AMERICAN HISTORY TEXT^a BOOKS

Topic	Average number of pages in 8 current texts	Average number of pages in 8 early texts	Average number of pages in 12 elementary texts	Average number of pages in 8 high school texts
Agriculture.....	5.0	0.5	1.4	1.6
Banking and money chiefly history.....	12.0	1.0	2.6	5.0
Canals and roads.....	5.0	1.0	3.7	3.4
Commerce and trade, foreign and domestic.....	9.0	1.0	3.3	4.0
Cost of living.....	x	x	.0	0.2
Education.....	7.0	2.0	x	x
Fisheries.....	0.5	0.5	0.4	0.4
Inventions and patents.....	4.0	0.2	5.3	3.3
Labor.....	9.0	1.0	2.6	7.8
Manufacturing and business.....	11.0	1.0	2.5	2.0
Mining.....	1.0	0.3	2.3	.5
Natural resources.....	10.0	2.0	x	x
Newspapers and literature.....	2.0	0.3	x	x
Population (immigration included).....	14.2	2.0	x	x
Postal service.....	0.3	0.1	0.5	1.6
Railroads.....	6.0	0.1	2.7	5.2
Religion and the church.....	6.0	5.0	x	x
Slavery.....	25.0	1.0	x	x
Tariff and trade restraint.....	8.0	1.0	3.7	8.9
Taxation and debt.....	4.0	6.0	x	x
Telephone and telegraph.....	.5	x	x	x
Miscellaneous: includes general social and economic matter and life of people.....	20.0	21.0	x	x

See: Bobbitt, *The Curriculum*, pp. 110–11.

Table 63 shows that military events are receiving less attention and that political and social and economic matters are increasing in importance in textbooks. On the other hand, one gains an interesting picture of the extent that such texts tend to fall short of presenting the history that is essential to an understanding of modern ways of living and modern problems. The history utilized by writers on contemporary life is preponderantly economic and social history, while writers of recent textbooks give only about one third of their space to social and economic matters. It should also be noted that high school textbooks deal preponderantly with political history.

The totals in this table were, as a rule, scattering references, a few lines on a page here and there in different parts of the book.

Table 64 shows the relatively small amount of space given to basic social and economic matters. When one considers that the history made use of by students of contemporary affairs seems to be preponderantly of a social and economic character, it is evident that we fail to meet social needs in our texts. This indictment is particularly serious when we consider that the study of history constitutes, for a large part of our pupils, their sole opportunity for being made acquainted with the problems and modes of living in the society in which they are forced to live and for whose progress and welfare they are exclusively responsible.

In a similar way, a study was made of the persons and dates referred to most frequently in textbooks and by writers on problems of modern society. Space prevents the reproduction of these tables. The important conclusion to be noted is that the historical personages and dates made use of by writers on present-day problems are chiefly those persons and dates in recent history.

Table 65 illustrates what two investigations using varying criteria of social utility indicate as to relative importance of countries to be included in the curriculum. Table 65 combines the rankings of the twenty most frequently mentioned countries according to two standards: first, the frequency ranking in terms of the Branom-Reavis criteria (Area, population, imports and exports, imports into and exports from the United States), and the second, (the frequency indicated by figures in parentheses to the

TABLE 65.—TWENTY MOST FREQUENTLY MENTIONED COUNTRIES
RANKED ACCORDING TO TWO STANDARDS

Rank	Country	Rank	Country
1	United States (1)	11	China (3)
2	Great Britain (7) ^a	12	Brazil (36)
3	Germany (4)	13	Argentina (44)
4	France (2)	14	Netherlands (13)
5	India (14)	15	Mexico (28)
6	Austria-Hungary (17)	16	Belgium (21)
7	Russia (8)	17	Australia (16)
8	Canada (11)	18	Spain (9)
9	Italy (5)	19	Sweden (19)
10	Japan (6)	20	Egypt (15)

^a England instead of Great Britain would rank second in allusions.

right of the countries) is according to their frequency of reference in newspapers and magazines in Washburne's study.

It should be noted that fourteen of the twenty most frequently mentioned countries are common to the two lists and that thirteen have a displacement of five or less. These countries, at least, are in all likelihood countries about which children should be taught detailed, socially valuable, facts. And further studies are now under way to guide curriculum makers in the choice of these detailed facts to be selected and taught.

To what extent do textbooks meet learning needs?

Careful analysis reveals the encyclopedic character of the textbooks.

Table 66 presents the number of pages allotted to a few of fifty-eight civic and economic topics in representative and widely used social science textbooks.

Obviously with fifty-eight main classes of topics it is impossible, when books are expected to be comprehensive, to give much space to any one topic. It should also be borne in mind that these space allotments are totals for the books, and in the main they represent a few lines here or a paragraph there in the text.

To quote Bobbitt: "If any one believes the average treatment of these topics to be sufficient, he can easily test the matter. Let him send the five pages on banks and banking to a list of prominent bankers requesting their judgment whether it presents an adequate revelation of the growth of banking in our country, and as its outcome, an adequate picture of its present status. Let him send the three or five pages on railroad development to prominent leaders of the railroad world with a similar request. Let him inquire of labor unions if the two or three pages devoted to them present a satisfactory account of the development of their present status and relations. It is not difficult to predict the character of the replies.

"For each of these topics, and for many others, there is demonstrable need of a full historical treatment. Justice is not to be done to the railroad situation, for example, short of two hundred or five hundred pages. This should present in concrete, vivid narrative a reconstruction of experiences

TABLE 66.—PAGE ALLOTMENTS TO CIVIC AND ECONOMIC TOPICS IN CIVICS TEXTBOOKS

Topic	Community Civics			Advanced Civics			Problems of democracy	
	Book A	Book B	Book C	Book A	Book B	Book C	Book A	Book B
Citizenship: Who are citizens and what is citizenship.....	1	3	7½	4¾	2¼	5½	2¾	5
Conservation.....	7¾	12¼	12½	1¼	4	0	20½	5¼
Business Life.....	1¼	1	19	¼	4	8	17	20¼
Foreign affairs.....	½	¼	7½	4	3¾	6½	3	29½
Housing.....	5	0	4½	0	1¼	0	3¼	5¼
Recreation and leisure.....	½	22½	6	0	2	0	¼	7
Rural life.....	1½	0	17	4½	¼	0	1	8½
Transportation.....	10	21	14	0	5¼	¾	6½	17

involved in the development of railroads, beginning with the early inventions and experiments, and tracing the expansion of lines and systems to the present. The story should fully present the personal experiences of railroad leaders and groups; only as the 'human element' is central in the story can the reader actually re-live the experiences. But at the same time it should reveal fundamental processes and relationships of all kinds; the social influences that called railroads into being; kinds and amounts of service rendered to different regions; modes of organization, financing, regulation, wages, conditions of work, and the like. The story should be so written that the reader can see and appreciate the valiant national service that the railroads have rendered in pushing back the frontiers and opening up the wilderness for civilization; in carrying the means of civilized life to every corner of our land; in breaking down isolation, provincialism, and sectionalism; and in promoting the central intra-national welfare. The story should be presented so vividly and sympathetically that the reader can enter whole-heartedly into the action. This provides right conditions for leaving large residues of information acquired through living rather than memorizing; and the materials and experiences out of which the abstract general principles are to be distilled."

It is obvious that from present textbooks children do not get adequate concepts of common civic and economic matters.

Table 67 shows the amount of space in pages (or lines where less than one fourth of a page is given) that five representative social science textbooks give to the discussion of four housing standards presented in Harap's study.

Table 67 not only shows the small degree to which social needs, objectively determined, are taught but also the fact that only forty or fifty lines at most are devoted to the host of facts about any one standard is some evidence that few real meanings about these standards can be established in the minds of children.

Because of the demands that textbooks shall be comprehensive—shall include everything in the field—so many facts are included that details about each fact, topic, or principle cannot be given. Writers of textbooks give literally their generalizations based upon their own study and research. They give chiefly the "texts" connected in narrative form.

TABLE 67.—SPACE IN PAGES GIVEN TO DISCUSSION OF HOUSING STANDARDS IN FIVE SOCIAL SCIENCE TEXTS

Topic	Social Science Texts				
	A	B	C	D	E
Facts one needs to know in buying a home.....	1	1¼	¼	0	½
Facts one needs to know in order to determine how much to pay when renting a home.....	2 lines	0	1 line	0	¼
Facts one needs to know about housing standards and the extent they are complied with.....	1½	1½	½	2	½
Regulative factors of housing.....	1	1¼	½	1	¾

If we could assume that every school would use textbooks as guides and would also provide the detailed supplementary material, present practice in the use of textbooks could in some measure be justified. They could then be used as convenient reference books. But practice in our public school is preponderantly to use scarcely any reading materials besides the text. We ask pupils to spend several hundred hours reading material that any normal reader could read in twenty hours at most.

The authors of textbooks tend to include most facts in the field. For example, careful examination of school textbooks show that the typical history textbook mentions about four hundred different persons one or more times and every date (year) since 1775 one or more times. Also a careful frequency count reveals the fact that eight current histories mention 1409 different persons but that *only 109 of these historical characters are common to all eight textbooks*. Stating this another way, each book tends to emphasize many persons in history that in the opinion of the authors of other textbooks should be not mentioned.

The proportion of content that is socially valuable in terms of frequent, universal, or crucial use is relatively small compared to the sum total of human knowledge in that field. Objective evidence must be employed in determining relative values. We then probably will not tend to teach too many facts. And we will be in a better position to give details about these socially valuable facts so that pupils will have opportunities, in terms of the laws of learning, to make such content a permanent part of their equipment in the great task of being efficient, intelligent, and informed citizens. Finally, when we do this, we can demand the permanent mastery of every activity involved in engaging efficiently in the duties of citizenship, and we can demand that pupils exhibit skill in handling the problems, issues, and questions of contemporary society.

d. *Studies that endeavor to use the judgment of experts concerning minimal essentials.*

STUDY NO. 18. Whitbeck, R. H. "Where shall we lay the emphasis in teaching geography?" *Education*, Volume 31, pp. 108-116.

Problem. To prepare a list of locational facts to be thoroughly taught and permanently learned in the field of geography.

Method. Some seventy-five teachers, principals, and superintendents from twenty or more states, representing all kinds of schools, acted as judges to prepare the list of locational facts.

Committees were chosen to decide upon the cities in a given continent to be included. No city was to be included unless it stood for more than one important thing. The lists of these cities were then passed over to a group of textbook writers in the field of geography consisting of Professors Tarr, Brigham, C. A. McMurry, Philip Emerson, George D. Hubbard, and R. H. Whitbeck.

The following list shows the cities that the committee deemed important enough to be thoroughly taught and permanently mastered on each continent; the numeral after the name of each city indicates the number of votes out of the six faculty votes that the city received.

The United States (25)

New York (6)	Washington (6)
Chicago (6)	Denver (6)
Philadelphia (6)	Louisville (2)
St. Louis (6)	Minneapolis-St. Paul (6)
Boston (6)	Kansas City (2)
Baltimore (2)	Indianapolis (2)
Cleveland (3)	Duluth-Superior (5)
Buffalo (3)	Salt Lake City (3)
Pittsburgh (6)	Puget Sound Cities (4)
San Francisco (6)	Scranton-Wilkes-Barre (3)
Cincinnati (2)	Galveston (4)
New Orleans (6)	Lowell (3)
Milwaukee (2)	

Europe (16)

London (6)	Rome (6)
Liverpool-Manchester (6)	Naples (3)
Edinburgh (6)	Athens (6)
Glasgow (6)	Constantinople (6)
Madrid (4)	St. Petersburg (6)
Berlin (6)	Paris (6)
Hamburg (6)	Marseilles (3)
Vienna (4)	Venice (4)

Asia (8)

Bombay (6)	Hongkong (5)
Calcutta (6)	Jerusalem (6)
Canton (5)	Tokio-Yokohama (6)
Pekin-Tien-tsin (6)	Mecca-Medina (3)

Western Continent—Exclusive of U. S. (6)

Montreal (6)	Buenos Aires (6)
Quebec (5)	Havana (6)
Rio de Janeiro (6)	Mexico (6)

Africa, Australia, and Scattered Islands (8)

Cairo (5)	Sydney (3)
Cape Town (5)	Manila (6)
Johannesburg (3)	Batavia (3)
Melbourne (4)	Honolulu (6)

The significant conclusion to be drawn from this study is that only a relatively small number of place location facts out of a rather large total list found in geographies are endorsed by even specialists in geography.

STUDY NO. 19. Wooters, James E. "Elementary American history standards; results of an investigation carried on to determine the most important dates for memorizing in the elementary school." *School and Home Education*, 1914, Vol. 34, pp. 152-155.

Problem. To ascertain a standard list of dates to be memorized in American history.

Method. A long list of dates and events rather commonly presented in elementary school histories was included in a questionnaire sent to one hundred fifty members of the American Historical Association. These included high school, normal and college teachers of history, city superintendents, and authors of leading school histories.

These people were asked to rank the twenty most important dates out of the list suggested, marking the most important date first, the next important, second, and so on. Provision was made for omission or addition of dates. Seventy-three replies were used in the final summary.

In tabulating the ranks, the following arbitrary scheme was adopted for evaluating dates: Each rank of one was valued at twenty points, rank two was given nineteen points; down to rank twenty, valued at one point; for each zero vote, ten points were deducted.

Findings. Table 68 shows the twenty dates which ranked highest.

Only five dates—1492, 1607, 1776, 1789, 1812—received no votes for elimination. The “experts” were also asked to add dates to the lists submitted. Five hundred thirty-nine additions were suggested but only six—1618, 1828, 1860, 1890, 1898, 1902—received four or more votes.

“The most striking conclusion to be drawn from the investigation is the lack of agreement among those who may be considered specialists in history as to what constitutes the fundamentals of elementary work.”

TABLE 68.—DATES, RANKED AS TO IMPORTANCE FOR MEMORIZING IN THE ELEMENTARY SCHOOL

Rank	Date	Evaluation index	Rank	Date	Evaluation index
1	1776	1,323	11	1812	752
2	1492	1,261	12	1765	629
3	1607	1,163	13	1783	618
4	1789	1,100	14	1865 (Apr. 9)	601
5	1620	961	15	1850	591
6	1803	955	16	1854	590
7	1861 (Apr. 14)	901	17	1775	585
8	1787	821	18	1781	584
9	1863 (Jan. 1)	808	19	1823	526
10	1820	793	20	1846	470

e. Studies that suggest minimal essentials upon other standards or criteria

STUDY NO. 20. Branom, M. E., and Reavis, W. C. *The determination and measurement of the minimal essentials of elementary school geography.* Seventeenth Yearbook of the National Society for the Study of Education, Part I. 1918. pp. 27-39.

Problem. To use certain objective criteria for the selection of a list of the minimal essentials in the field of geography. The writers stated that the list should emphasize relational facts as well as facts of place. They, therefore, set up certain standards for the selection of the facts to be learned and for the relations to be recognized and appreciated. They also had in mind that these minimal essentials should tell whether or not the aims of this subject are being realized. The aims of geography teaching as listed by Branom and Reavis are:

1. To impart the more important facts of conventional and practical value
2. To secure on the part of the pupil the ability to interpret properly the geographical factors that enter into the time and moment
3. To develop an appreciation of the importance of the United States intrinsically, and its relational aspects to the world as a whole.

They, therefore, had in mind the requirement of general knowledge about the following:

1. The relative location of the large land and water bodies
2. The location of the more important countries of the world
3. The location of the more important cities of the world
4. The physical conditions of the more important countries
5. The occupations of the people and the conditions of transportation
6. Our commercial relations with these countries
7. The fundamental relations between the physical factors and human activities.

TABLE 69.—FIFTY-TWO COUNTRIES RANKED AS TO RELATIVE IMPORT-
ANCE

Country	Area	Popula- tion	Total imports	Imports from U.S.	Total exports	Exports to U.S.	Total*
1. United States.....	5	5	5	5	5	5	30
2. Great Britain.....	3	5	5	5	5	5	28
3. Germany.....	3	5	5	5	5	5	28
4. France.....	3	5	5	5	5	5	28
5. India.....	5	5	5	3	5	5	28
6. Austria-Hungary.....	4	5	5	5	5	4	28
7. Russia.....	5	5	5	4	5	3	27
8. Canada.....	5	4	4	5	4	5	27
9. Italy.....	2	5	5	5	5	5	27
10. Japan.....	3	5	4	5	4	5	26
11. China.....	5	5	4	4	4	4	26
12. Brazil.....	5	4	3	4	4	5	25
13. Argentina.....	5	4	4	4	4	4	25
14. Netherlands.....	1	3	5	5	5	5	24
15. Mexico.....	5	4	3	4	3	5	24
16. Belgium.....	1	3	5	5	5	4	23
17. Australia.....	5	2	4	5	4	3	23
18. Spain.....	3	4	4	4	3	3	21
19. Sweden.....	3	3	4	4	4	3	21
20. Egypt.....	4	4	3	2	3	4	20
21. Turkey.....	4	4	3	2	3	4	20
22. Switzerland.....	1	2	4	4	4	4	19
23. Chile.....	4	2	3	3	3	4	19
24. So. African Union.....	4	3	3	3	4	2	19
25. Philippine Is.....	2	4	2	4	2	4	18
26. Peru.....	4	3	2	3	2	4	18
27. Cuba.....	4	3	1	3	2	4	17
28. Denmark.....	1	2	4	4	4	2	17
29. Norway.....	3	2	3	3	3	3	17
30. Algeria.....	4	3	3	2	3	1	16
31. New Zealand.....	2	1	3	3	3	3	15
32. Persia.....	4	4	2	1	2	2	15
33. Portugal.....	1	3	3	3	2	2	14
34. Roumania.....	2	3	3	2	3	1	14
35. Venezuela.....	4	2	1	3	1	3	14
36. Bolivia.....	5	2	1	2	2	1	13
37. Uruguay.....	2	1	2	2	3	3	13
38. Siam.....	3	4	2	1	2	1	13
39. Greece.....	2	2	2	1	2	2	11
40. Morocco.....	3	3	2	1	1	1	11
41. Serbia.....	1	2	2	1	2	2	10
42. Bulgaria.....	2	2	2	1	2	1	10
43. Equador.....	3	1	1	2	1	2	10
44. Haiti.....	1	2	1	3	1	1	9
45. Tunis.....	2	1	2	1	2	1	9
46. Honduras.....	2	1	1	2	1	1	9
47. Costa Rica.....	1	1	1	2	1	3	9
48. Guatemala.....	2	1	1	2	1	2	9
49. Panama.....	1	1	1	2	1	2	8
50. Salvador.....	1	1	1	1	1	2	7
51. Paraguay.....	2	1	1	1	1	1	7
52. Liberia.....	1	1	1	1	1	1	6

* An arbitrary perfect score of thirty points has been assigned to the United States because it is the home country of the pupils.

Method. The following standards or criteria were employed: (1) The area of the country in square miles, (2) population, (3) total value of imports, (4) total value of imports from the United States, (5) total value of exports, and (6) total value of exports to the United States.

The writers assert that "these criteria not only offer objective data of great significance in the study of particular countries, but also afford a means of measuring the relations of the United States to other countries."

Using as their source of data the *Statistical Abstracts of the United States*, 1915, fifty-two countries were ranked according to their relative importance with respect to each of the six criteria above.

The fifty-two countries were then divided into quintiles and the rank in the first quintile was given five points, in the second, four points, etc., for each of the six criteria. The total score of a country on the six criteria indicates the relative importance of that country among the countries of the world.

Findings. Table 69 indicates the total score of each country and its rank in the quintile on the six standards.

The value of these rankings is that it tends to make one critical of the relative importance of certain countries to be studied. Without sufficient time to cover all countries adequately, the teacher using this and other criteria, such as the criterion of Washburne in his investigation of allusions in newspapers and magazines, may make more certain of covering what is likely to be the most socially valuable subject-matter in the field of geography.

STUDY NO. 21. Alderman, Grover H. "What the Iowa layman should know about courts and law." *The School Review*. 1922. Volume 30. pp. 360-364.

Problem. To determine the legal facts with which a citizen should be familiar.

Method. A study was made of causes of litigation as filed in petitions of the office of the County Clerk, Johnson County, Iowa, for the years 1907, 1908, and 1909. This was done on the hypothesis that if one could examine the causes which bring the layman in contact with the courts and the law, one could determine what knowledge an Iowa layman should have about the courts and law.

Findings. Table 70 shows the number of types of action involving 758 cases which were brought into the District Court within this period of three years.

These court cases were classified and 50.3 per cent of all cases had to do with contracts, particularly such as promissory notes, implied contracts, oral contracts, mortgages, leases, wills, etc.; 44.8 per cent with court writs involving such topics as quieting titles, writ of attachment, decree of divorce, writ of injunction, and estates; and 4.8 per cent had to do with damage claims, such as slander, assault and battery, trespass, etc.

TABLE 70.—TYPES OF LITIGATION IN JOHNSON COUNTY, IOWA FOR
1907-1909

Types of Court Cases	Number
Written contracts.....	199
Quieting titles.....	190
Divorce cases.....	79
Damage cases.....	65
Implied contracts.....	50
Oral contracts.....	46
Suing for an undivided interest in an estate.....	34
Injunction.....	30
Writs not otherwise mentioned.....	11
Garnishments.....	10
Cases asking for writs of replevin.....	8
Attempt to break or set aside wills.....	8
Slander.....	7
Writs of attachment.....	3
Appeal from boards of review or council on assessment.....	3
Habeas Corpus.....	3
Naturalization.....	2
Partnership cases.....	2
Bastardy.....	1
Tax case.....	1
Appeal bond.....	1
Alimony.....	1
Contempt of court.....	1
Deeds.....	1
Assault and battery.....	1
To incorporate a town.....	1
Total.....	758

We find that laymen should understand the general principles involving written contracts, quieting titles, divorce, damage cases, implied contracts, oral contracts, settling estates and court writs. Alderman checked this type of needed legal information against similar material found in twenty textbooks in civics. Assuming that in courses in civics the layman gets his preparation for any possible legal information that he needs, Alderman points out that there is a wide disparity between the type of information that the analysis of the courts' records shows is important and the type of material that textbooks present about the courts. Textbooks discuss chiefly such topics as how laws are made, federal laws, constitutional laws, and the like, relatively abstract points that the average layman will have little use for.

STUDY NO. 22. Goss, Ralph Ross. *What civic knowledge is needed by an Indiana layman.* Unpublished Master of Arts Thesis, on file in the Library, Univ. of Indiana, Bloomington, Ind.

Problem. To determine what civic knowledge is most needed by the child in his life outside the school, or to discover the types of transactions in life outside the school which require civic knowledge.

Method. Problems involving civics with which the average individual in life is actually confronted were obtained by asking several classes in certain public schools to collect and bring to school a record of any such transactions that any members of their family had had during the day. An outline of instructions for collecting such data was prepared for the pupils. A list of some twenty typical ways in which civic knowledge might be required was suggested in the instructions, such as recording a deed, taking

TABLE 71.—CLASSIFICATION OF EVERYDAY CIVIC TRANSACTIONS

Divisions of government	Number of transactions	Per cent of total
National.....	282	15.80
State.....	204	11.10
Municipal.....	690	38.90
County.....	348	19.40
Township.....	260	14.80
Total.....	1,784	100.00

TABLE 72.—PER CENT OF TEN TEXTBOOKS DEVOTED TO SIX DIVISIONS OF GOVERNMENT

	Gamer	Munro and Orzanne	Ashley	Woodburn and Moran	Magruder	Forman	Stickles	Guiteau	Harrison and Reed	Hughes	Average	Median
International.....	4.1	14.3	5.6	9.8	5.0	4.8	3.4	2.7	2.3	3.0	5.50	4.45
National.....	56.0	65.3	72.4	65.2	59.4	66.2	75.0	56.4	52.9	48.2	61.70	57.90
State.....	25.0	7.4	9.5	10.0	20.1	14.8	7.0	27.5	28.4	15.4	16.51	15.10
Municipal.....	7.4	9.3	6.9	9.3	8.3	4.7	7.0	7.9	11.6	11.1	8.35	8.10
County.....	3.4	2.9	1.5	2.3	2.4	4.7	4.4	2.7	2.4	2.5	2.92	2.60
Township.....	4.1	.8	4.1	3.4	4.8	4.8	4.8	2.8	2.4	19.8	5.02	3.75

TABLE 73.—COMPARISON OF MEDIAN PER CENT DEVOTED TO EACH DIVISION OF GOVERNMENT IN TEXTBOOKS AND CIVIC TRANSACTIONS

	Inter-national	National	State	Municipal	County	Township
Textbooks.....	4.45	57.90	15.10	8.10	2.60	3.75
Civic transactions in life outside of school.....	0.00	15.80	11.10	38.90	19.40	14.80

out naturalization papers, taking up a matter with a Congressman, etc. Eighteen civics classes in nine different schools in Jackson County, Indiana, cooperated.

The answers received were analyzed and classified under the major heads of conventional civics material, that is, material having to do with the following divisions: national, state, municipal, county, and township government.

As a check to determine the extent to which this knowledge was provided for in civics textbooks, ten textbooks were classified under similar heads.

Findings. The total number of specific situations in which civic knowledge was required by the layman were 1784.

Table 71 shows the number of answers to each main division of government and also the percentage to each major division.

Table 72 shows the per cent devoted to each division of civic materials and the average and median per cent for ten commonly used civics books.

Table 73 compares the median per cent devoted to each division in the textbooks with civic transactions in life outside the schools.

The type and frequency of civic transactions in life outside of school classified under national, state, municipal, county, and township government were as follows:

NATIONAL		STATE	
War Savings Stamps	100	Insurance	74
Income Tax	40	Auto License	34
Pension	34	Organization of Corporation	30
Civil Service Examination	30	Wrote to State Representative	26
Naturalization Papers	30	Election	12
Election	20	Transaction with Governor	6
Recorded Copyright	8	Business with State Supt.	6
Liberty Loans	6	Matter with State Officer	4
Army	6	Administratorship	4
Crop Report	2	Wrote to State Senator	2
Timber Report	2	Fire Marshal	2
Census Report	2	Examined Tax Law	2
Red Cross	2		
Total	282	Total	204

MUNICIPAL	
Health	118
Bank	78
Election	72
Charity	68
Beautifying City	66
Notary Work	60
Police Protection	58
Improvement of Property	54
Transaction with Council	42
Taxes	32
Fire Department	15
Property Sale	8
Court	6
Lawyer	4
Will	3
Building and Loan	2
Dog License	2
Moving Permit	2
Total	690

TOWNSHIP	
Transactions with Trustee	100
Bank	68
Notary Work	24
Justice of Peace	10
Farmers Federation	10
Taxes as Related to Assessor	8
Assessment of Property	6
Made a Note	6
Bought Bonds	4
School Enumeration	2
Election	2
Will	2
Total	242

COUNTY	
Deed Recorded	100
Business with Co. Supt.	60
Matter with Court	34
Mortgage	32
Taxes	26
Matter with Clerk	24
Matter with Co. Officer	22
Business with Truant Officer ..	8
County Surveyor	8
Election	6
County Treasurer	4
Assessed by Assessor	4
Examine Deed	4
Business with Road Supt.	4
Estate Settled	2
Insured Property	2
County Coroner	2
County Judges	2
Lien Notes	2
Contracts	2
Total	348

Transactions of a local nature are the ones that people use or that the average layman uses most. For example, nearly three fourths of the transactions reported by citizens have to do with local matters such as the aspects of city, county, or township affairs. Only about one sixth of the space in the commonly used civics books is given to local government.

While this study is limited to some three hundred pupils in a few schools in one county, it does give one some evidence of specific situations in civic knowledge needed by the layman. It is but another means of finding out how the layman uses social science.

Obviously, these methods should be employed over a larger territory. With such results, writers of school courses in social science could well consider revision of their materials in terms of the obvious need of training and knowledge having to do with local government.

III. Studies That Are Suggestive for Analysis of the Activities of People or Current Modes of Living

STUDY NO. 23. Harap, Henry. *Education of the consumer*. New York, The Macmillan Company, 1924.

Problem. To discover the things that people do or the economic activities in which they engage—the essential habits, skills, knowledge, and attitudes involved in certain economic aspects of life, particularly having to do with unspecialized practical activities in the household.

Method. Information was gathered as to important household needs. An effort was made to discover what is wrong with the habits of selection and purchase of household articles. Census reports and various reports summarized in trade journals, were used as well as an analysis undertaken by the United States Department of Labor on the selection and purchases involved in a nation-wide survey of 10,000 families of the most important household articles. The research of students of home economics concerning food, clothing, and household materials was utilized.

Findings. There is a great discrepancy between the economic habits and information that one ought to possess about household matters and the actual information and habits that surveys of consumers' needs in the household show that householders possess. Quantitative data concerning the educational needs of the consumer are presented. These topics illustrate the kind of data gathered:

FOOD CONSUMPTION

The chief foods of the nation

Food selection based upon quantity consumed

Food selection based upon the amount of money spent for chief food commodities

Food selection to meet the daily energy requirement

Selection of food to furnish the requirements of proteins, fats, and mineral salts

The buying of food:

 In large quantities

 In packages

 For cash or on credit

Waste in the use of food

HOUSING

The housing conditions of the nation as revealed by surveys
Housing standards
Home ownership
Tenements and education
Overcrowding
Rent and education:
 Rent and income
 What is fair rental
 Rent and taxes
 Rent and the budget
Ventilation

HOUSEHOLD MATERIALS

The chief household commodities
Building materials
Furniture
Paint and varnish
Metal products, tools, and hardware
Paper products
Leather goods
Floor coverings
Cleansing and polishing preparations
Brushes and brooms
Phonographs
Automobiles

HOUSEHOLD SKILLS

How household skills were determined
Household skills discovered in surveys
Skills suggested by the chief commodities consumed in the home
Skills having to do with:
 Carpentry
 Painting
 Plastering
 Glazing
 Plumbing
 Housecleaning
 Decoration
 Gardening

FUEL CONSUMPTION

The chief household fuels and their comparative importance
Relative cost of fuels
Relative heating values
Fuel measurement and calculation

CLOTHING

Comparison of the actual with standard consumption of clothing by the people of the United States
Clothing in the budget
Qualitative standards of clothing

In the main, two classes of material were utilized: First, standards of what we ought to know and do about consumers' needs; and second, scientific studies of what we actually do know and do concerning these same needs. In brief, he implies that the curriculum will consider specifically in each instance the economic habits and information that will permit the school to "move" pupils from ascertained deficiencies up to ascertained

TABLE 74.—RELATION OF THE QUALITY OF VEGETABLES CONSUMED TO THEIR FOOD VALUE AND PRICE

Vegetable	^a Value of product (Thousand Dollars)	Rank	^b Composite food value	Rank	Price per pound (cents)	Rank
Potatoes.....	639,441	1	414	4	4.0	2
Sweet Potatoes.....	124,844	2	374	5	8.0	6
Tomatoes.....	38,675	3	192	11	...	..
Cabbages.....	21,848	4	367	7	5.0	3
Onions (dry).....	21,387	5	295	..	6.0	4
Cantaloupes.....	10,767	6	...	..	...	..
Watermelons.....	10,466	7	...	..	...	..
Celery.....	9,462	8	350	8	15.0	10
Cucumbers.....	8,579	9	153	12	...	..
Lettuce.....	8,535	10	299	10	7.0	5
Beans (green).....	8,031	11	472	3	10.0	8
Peas (green).....	7,165	12	475	2	10.0	9
Asparagus.....	5,102	13	368	6	...	..
Peppers (green).....	3,079	14	...	..	...	..
Spinach.....	1,716	15	810	1	3.3	1
Carrots.....	1,563	16	338	9	8.0	7

^a Value of products taken from United States Census Reports, Volume X, pp. 62-82.

^b Composite food value from Sherman, H. C. and Gillett, L. H.: Adequacy and economy of some city dietaries, p. 25. The composite value was obtained by assigning energy 40 points and 15 each to protein, phosphorus calcium, and iron. The emphasis here is on mineral salts.

standards in so far as the abilities will permit. Table 74 illustrates the discrepancy between what people actually eat and what they should eat.

Note that the cheapest vegetable having the greatest food value—spinach—ranks next to the last in the actual consumption and that peas and beans, that rank second and third in food value, rank eleventh and twelfth in consumption. On the other hand, potatoes rank first in consumption, fourth in food value, and second in cheapness.

Table 75 shows the relation of quantity of fruits consumed to food value.

Note that apples rank first in consumption but twelfth in food value; and that figs which rank first in food value and dates which rank second,

TABLE 75.—RELATION OF QUALITY OF FRUITS CONSUMED TO FOOD VALUES

Fruit	^a Value of products consumed in 1920 (Dollars)	Rank	^b Composite food value	Rank
Apples.....	241,911,000	1	156	12
Grapes.....	102,344,000	2	266	5
Peaches.....	96,000,000	3	177	11
Oranges.....	58,039,000	4	228	9
Strawberries.....	38,000,000	5	355	3
Pears.....	24,798,000	6	228	10
Plums and prunes.....	20,962,000	7	337	4
Bananas.....	19,088,000	8	236	7
Apricots.....	9,700,000	9	...	..
Currants.....	6,076,000	10	...	..
Cranberries.....	5,700,000	11	...	..
Figs.....	4,883,000	12	1,782	1
Dates.....	2,088,000	13	1,240	2
Lemons.....	1,717,000	14	228	8
Pineapples.....	1,423,000	15	253	6

^a Value of products taken from the United States Department of Agriculture. Weather, Crops, and Markets. May 13, 1922. p. 402.

^b Composite food value taken from Sherman, H. C. and Gillett, L. H., Op. cit. p. 25.

are respectively twelfth and thirteenth in consumption—that is, the most nutritive fruits are very much underconsumed.

In a similar way, other violations are disclosed of what scientific dietary studies indicate we should eat. For example, there is a marked underconsumption of vegetables and marked over-consumption of meat.

One of the most valuable things about this study is that out of it arises definite, specific objectives in terms of scientific evidence.

These are among the objectives concerned with the consumption of vegetables and fruits as illustrated by Tables 74 and 75:

To give the vegetables their proper place in the thinking and habits of the food plan of the people of our nation.

To use and to think of potatoes primarily as starch foods.

To use and to think of the green vegetables primarily as foods rich in calcium, phosphorus, and iron salts.

To use and to think of the legumes as rich in protein foods, with an abundance of calcium and iron.

To cultivate the habit of using spinach as a rich and cheap food.

To use tomatoes less in bulk and more for flavoring.

To use more dried beans and peas.

To know the effect of home and commercial canning on beans, peas, and tomatoes.

To know exactly what place fruits occupy in the food plan.

To use and think of raisins and prunes as foods rich in iron.

To consume more figs, dates, raisins, and prunes.

To know the relation between fresh and dried fruits as well as their comparative quality and economy.

To know the relation between fresh and canned fruits as well as their comparative quality and economy.

In like manner the data relative to furniture woods show that “the average consumer has no notion of the materials which commonly go into the manufacture of a chair or a bookcase.”

The data also show a marked discrepancy between actual trade practices in the manufacture of furniture and the advertisements as to what furniture contains. They illustrate the fact that these are probably some of the necessary objectives:

To know the common woods which enter into the furniture of the nation—namely, oak, sap gum, red gum, maple, birch, chestnut, and poplar.

To know the relative cost of the chief furniture woods.

To identify a veneer.

To adjust the budget so as to be able to buy durable furniture instead of cheap furniture.

To know the relative durability of the chief furniture woods.

To know what constitutes a complete equipment of furniture in the dining-room, living room, bedroom, and kitchen.

The most important thing that can be said about this study is that it gives one detailed, semi-scientific information by which one can determine specifically the particularized bits of information, habits, skills, and attitudes that must be taught about household matters. It is an important theory

of the curriculum making that a careful study of known standards of habits and information should be made and the degree to which persons possess or do not possess these basic skills and information should also be discovered. The curriculum consists, according to this point of view, of that body of knowledge and those skills, attitudes, and appreciations by which pupils can be made ready to engage efficiently in socially desirable activities.

STUDY NO. 24. Bobbitt, Franklin. *How to make a curriculum*. The Social Studies. Boston, Houghton Mifflin, 1924. Chapter VII.

Problem. To set forth the abilities involved in the things that citizens do. Bobbitt says a good citizen "is one who can perform the fifty, the five hundred, or the five thousand things which the good citizen is called upon by his social position to perform." His problem was to discover what are the things that a citizen has to do in terms of the abilities that we should be conscious of for the efficient performance of these citizenship duties.

Method. Twelve years of coöperative effort on the part of some fifteen hundred members of graduate classes in "The Curriculum" conducted by the writer at the University of Chicago, resulted in the compilation of a list of abilities. After critical examination by twelve hundred high school teachers, this list was used as a basis for determining the objectives in the Junior and Senior High School Departments in Los Angeles, California. It represents, then, the group judgment of nearly three thousand rather experienced people plus the judgment of one of the foremost students of the curriculum.

Findings. The following excerpt illustrates the detailed abilities listed:

Ability to think, feel, act, and react as an efficient, intelligent, sympathetic, and loyal member of the large social group. Large-group or citizenship consciousness. Sense of membership in the total social group, rather than in some special class. Large-group local consciousness when dealing with local problems; large-group state consciousness when dealing with state responsibilities; large-group national consciousness when dealing with national matters; large-group world consciousness when dealing with mankind's responsibilities for world coöperation and management.

The ability of the citizen to do his individual share in performing those social functions for which all citizens are equally responsible in the establishment, organization, maintenance, protection, oversight, and control of the specialized groups and agencies into which society is differentiated for effectiveness of action. The young citizen-in-training is to acquire those abilities which, when adulthood is reached, will enable him to perform the following things in connection with the several specialized social agencies:

- a. Sharing fully in an informed and impelling public opinion, which looks to the general welfare in its control of each service agency.
- b. Setting up in public opinion and maintaining the standards of results to be achieved by each service agency.
- c. Seeing that each service agency aims at the standards of results that are sanctioned by public opinion.

d. Seeing that the service agency employs procedures which are effective in producing the desired results and which are economical in social costs.

e. Seeing that the material working conditions necessary for the most effective and economical procedures are supplied.

f. Seeing that each service agency is provided with personnel and organization of the kind required by the procedures to be employed; and properly rewarded.

g. Directly or indirectly selecting or approving the selection of the personnel of the agency.

h. Supplying the funds necessary for the efficient, and in all ways proper, conduct of the agency.

i. Currently or periodically examining, directly or through publicity reports, or both, into the results achieved by the agency, and the degree of economy employed.

j. Where results achieved and degree of economy employed comply with standards of expectation, approving and properly rewarding the labors of those who have thus given good service.

k. Where results do not reach the standards of expectation, or where there has been waste, finding the causes of the deficiency, and removing them as expeditiously as practicable.

The abilities which should be acquired are:

Ability to organize and use social facts effectively in arriving at conclusions. The ability to use general principles in analyzing and considering economic, political, and other social problems.

Ability to discern one's individual rights in the quantity of one's services to the general group. Ability to read one's rights as things earned.

Ability to see social relations so clearly as to discern the *duties* of others, individuals and groups, within the social whole.

Ability to see social relations so clearly as to discern the *rights* of others within the social whole.

Ability, disposition, and habit of diversified *observation* of men, things, and affairs as an enjoyable and fruitful leisure occupation.

Ability, disposition, and habit of abundant and diversified *reading* as a means of enjoyable and fruitful *indirect observation* of men, things, and affairs; of *vicarious participation* in those affairs; and of entering into the thoughts and moods of others.

Ability to participate in the more formal public discussion of matters of current interest as an enjoyable and fruitful spare-time occupation.

Ability, habit, and disposition to follow the leadership of the world's men of vision.

Ability to read the written or printed expression of others with proper ease, speed, and comprehension.

Ability to use dictionary, encyclopedia, atlas, handbooks, card catalogues, reader's guides, indexes, and other library and reference helps in finding facts or materials wanted.

Ability to read and interpret facts expressed by commonly used types of graphs, diagrams, and statistical tables.

Ability to express facts by means of graphs, diagrams, and statistical tables.

Ability to use maps with ease and understanding.

Besides these "abilities" Bobbitt lists in detail the general principles and assumptions of the activities involved in the training of citizenship. This analysis of activities of citizenship is a helpful list for curriculum makers to start with.

IV. Studies That Endeavor to Evaluate the Recreative or Leisure Values of the Social Sciences

STUDY NO. 25. Horn, Ernest. "A study of library withdrawals and books published," found in *The application of methods of research to making the course of study in history*. Twenty-second Yearbook of the National Society for the Study of Education, Part II. 1914. pp. 235-239.

Rugg, Earle. "A further study of library withdrawals and books published," found in *Studies in curriculum construction in the social sciences*. Unpublished Ph. D. Dissertation on file in the Library, Teacher's College, Columbia University, New York City. 1923.

Problem. To check the theory that the "layman" reads history for recreation or voluntarily. The proportion of books published was sought on the theory that publishers tend to restrict the number of books of a given class, such as history or science or fine arts, etc. to the "buying" demands of the public. An analysis of book withdrawals from libraries was made to see in what proportion people voluntarily read books in the various fields of knowledge.

Method. To ascertain what books were withdrawn, an examination was made of the records of the central and branch libraries of New York City for 1913, a year which was free "from unusual influences which might increase or decrease the amount of history normally read." An analysis was made of the proportion of books published of various classes (1913) as summarized in *The World Almanac* for 1915.

Jordan in his investigation of *Children's interests in reading* lends evidence to the theory that there is an interest in reading history voluntarily for he shows that in the reading of such books, aside from fiction, the number is large when compared to other types of non-fiction.

Rugg sent out a question blank to fifty representative public libraries throughout the country asking for their circulation statistics for one year in each of these three groups: a. A year before the war such as 1911, 1912, or 1913; b. A year during the war such as 1915, 1916, or 1917; and c. A year after the war such as 1920, 1921, or 1922.

Most public libraries are classifying their books according to the so-called Dewey-Decimal System. According to this system the books numbered in the 100's pertain to philosophy; in the 200's to religion; in the 500's, natural science; 600 to applied science; 700 to fine arts; 800 to literature; and it also so happens that the books on phases of social science—history, government, economics, sociology, are classified for the most part within either the 300's or the 900's. Hence, librarians filling in the number of books under each of the Dewey-Decimal classes were asked to present the evidence from which could be determined the percentage of books in various classes read.

In order to exclude as much as possible the reading of such books required by schools of high school and college pupils two other questions were asked:

1. In your opinion, is any considerable proportion of the social science books in the 300's and 900's withdrawn by school pupils for required readings or by persons

gathering information for programs in civic organizations? If so, estimate the percentage of such withdrawals.

2. In your opinion, would your circulation statistics for books in the 300's and 900's compared with the other classes such as the 100's, 200's, 500's, etc. warrant the conclusion that the "lay" public in your community voluntarily reads history, geography, economics, government, and sociology?

Findings. Table 76 compares the number of books published and withdrawn for reading for the years 1913 and 1921.

In the study of books withdrawn from public libraries, fiction was excluded so the tables below indicate only non-fiction. About 60 per cent of the books withdrawn from public libraries are fiction. Hence, this study included about 40 per cent of the entire number of books withdrawn from public libraries.

TABLE 76.—COMPARISON OF BOOKS (NON-FICTION) PUBLISHED AND AND WITHDRAWN FROM REPRESENTATIVE CITY LIBRARIES, CLASSIFIED ON THE DEWEY DECIMAL SYSTEM

Subject	Average per cent of non-fiction total library withdrawals	Average per cent of books published 1913 and 1921
Philosophy.....	4.3	3.0
Religion.....	3.9	7.4
Philology.....	1.7	2.8
Natural Science.....	5.6	7.0
Applied Science.....	11.5	17.2
Fine Arts.....	9.8	4.0
Literature.....	22.0	11.5
Social Science.....	40.2	29.2

Fourteen out of sixteen public libraries, in answer to the question, Do withdrawals represent required reading of students?, replied "Yes, in about 51 per cent of the cases." Sixteen out of seventeen libraries announce that the "lay public" voluntarily read social science books.

This study shows that about four out of the every ten non-fiction books withdrawn are books dealing with the social sciences and that half of these, in the opinion of the librarians, represent what might be termed voluntary reading. All librarians except one tend to support the claim that there is a leisure value or objective to be sought in the teaching of the social sciences. There is a marked similarity between the proportion of books withdrawn in each class of the Dewey-Decimal and the proportion of books published in these classes.

Major Conclusions to Be Drawn from a Study of This Report

1. Those facts, topics, and problems that are seemingly required frequently or universally, or are crucial to life needs are, relatively speaking, only a small fraction of the sum total of possible facts, topics, and problems.

2. There is a better basis for including specific facts, topics, or problems in the school curriculum when they are discovered to be socially valuable by two or more investigations than when such facts, topics, or problems are included principally on the judgment of the author of a textbook.

3. While these investigations deal principally with evidence concerning useful facts, topics, and problems, one should bear in mind that certain materials may be valuable for other reasons. But any one who wishes to justify the inclusion of content besides that selected upon standards of social needs herein illustrated should be obligated to report objective evidence to show why such content should be taught. This specifically applies to the justification of material for disciplinary, for cultural, or for conventional values.

4. The rather marked similarity of the evidence of independent investigations, made upon differing criteria, gives one relatively impersonal evidence to state what content should be included in the social science curriculum.

5. The studies in Section I of this chapter give examples of how one may discover problems of contemporary society. While the school is obligated to train citizens to meet problems and activities of today, it is further obligated to equip individuals to adjust themselves to a dynamic society. It is probable that the school should endeavor to predict not only the training that citizens need now but also that training which they will require to meet the problems, issues, and modes of living some twenty or thirty years hence. The best source for statements of persistent and insistent problems and issues in a dynamic society is to be found in the published works of specialists in the study of society, in the investigations and conclusions of the men and women who have both detailed theoretical acquaintance and practical knowledge of their field.

6. The relative probability with which one meets references to facts, topics, and problems is probably best evidenced in analysis of the chief and almost the exclusive reading of the layman—the periodical press. Although there are limitations in the use of this method, such as the fact that widely read periodicals tend to contain few allusions to these facts, is it not the obligation of the school to give young citizens detailed analyses and practice in generalization about facts, topics, and problems, so that they can interpret them more wisely and form better judgments? These citizens make up the mysterious something that we call public opinion. Their analyses and opinions tend to determine what is done to promote or hinder the progress of civilization.

7. Not only must curriculum makers provide for practice in problem solving about socially valuable content but also they must provide opportunities for the development of sufficient skill in the performance of the duties and the activities of a citizen. There is available some evidence concerning what citizens should do that should be included in the curriculum.

8. The studies that tell in some detail what is now taught should be studied so that one will have sound criteria bases for the rejection or continued inclusion of content of the social sciences. The curriculum consists of that information, those skills, attitudes, and ideals that should be taught in a way to move pupils from known deficiencies to scientifically determined standards, in so far as their abilities, interests, and capacities permit.

CHAPTER VIII

LANGUAGE AND GRAMMAR

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MOST OF the curriculum studies in language and grammar are reported in Part I of the Sixteenth Yearbook of the National Society for the Study of Education, in a section by W. W. Charters entitled *Minimum Essentials in Elementary Language and Grammar*. To these are added a few others reported in *Curriculum Construction*, by the same author. An additional number, which have appeared since the publication of the foregoing, are added in this report.

For purposes of clarity, we shall adopt the question and answer form and proceed without preliminary discussion to the description of the studies.

1. What are the objectives of elementary language and grammar courses?

In the studies, no distinction has been made between elementary and advanced courses. The assumption seems to have been that those courses which deal with common errors should be considered elementary courses.

One statement and two studies of objectives are reported. The assumption is made by Charters in the *Sixteenth Yearbook of the National Society for the Study of Education* that the function of the course in grammar is to give a rational basis for the elimination of the language errors of school children.

One study of the objectives of language has been made by Searson, which is summarized in Study No. 1. His object is to determine just what sorts of language skills seem necessary for men in various occupations. Another study of objectives of English is reported by Charles Pendleton, and is described in Study No. 2. A third study is reported by Franklin Bobbitt in his book *How to Make a Curriculum*. These are the objectives derived by the high school teachers of Los Angeles by the use of methods somewhat similar to those used by Pendleton. These are described in Study No. 3.

2. What is the technical content of language and grammar?

On the assumption that one function of elementary language is to correct errors of oral and written speech, several investigators have studied the errors of school children. These are tabulated in Table 77.

The methods of collection varied in some details and are described in the *Sixteenth Yearbook* and in *Curriculum Construction*, except the study of Sunne, which follows as Study No. 3. The general conclusions concerning oral errors are as follows:

"1. All the investigators agree in the finding that errors in verbs are most frequent, constituting as they do about sixty per cent of the grammatical errors, except Randolph, whose stenographic reports show the verbs to be about ten.

"2. Because it is a well-known fact that when errors become very common they cease to be thought serious and in course of time are accepted as good form, the query naturally arises as to whether or not the most common are considered to be the most serious. Obviously, the most common are serious from the point of view of frequency, but they may not attach so deep a stigma to the user as do some much less common errors.

"With this in mind, the teachers of Pittsburgh were asked to list the ten errors which each considered to be the worst. These were compiled. The relative frequency with which each was mentioned by teachers and the proportional percentage which each was of the total 'worst list' was compiled.

TABLE 77.—LANGUAGE AND GRAMMAR STUDIES

Investigator	School	Oral or written	Language or grammar	Oral errors	Written errors		Method of collection
					Pages	Errors	
Wilson.... Charters and Miller	Connersville, Ind... Kansas City, Mo..	Oral Both	Grammar Grammar	226 5,883	 4,819	 10,554	By teachers. By teachers. and from written work.
Thompson..	Northern Illinois...	Both	.....	.....	.....	.....	By teachers and from written work.
Meek.....	Boise, Idaho.....	Oral	Both	.....	.....	.....	By teachers with preliminary study.
Sears and Diebel.	Cincinnati, Ohio...	Oral	Both	2,268	.....	.....	By teachers.
Randolph..	Speyer School, N.Y.	Oral	Both	2,954	.....	.....	Stenographic report.
Barnes....	Several.....	Both	Grammar	Not given	.....	.....	By himself.
Betz and Marshall	Kansas City, Mo...	Written	Both	.....	112	.....	From written work of third grade.
Fillers....	Bonham, Texas...	Both	Grammar	500	.....	.....	By teachers and from written work.
Jones.....	Columbia, Mo....	Oral	Grammar	500	.....	.....	By teachers and from written work.
Richardson	Hibbing, Minn....	Oral	Grammar	10,191	.....	.....	By teachers.
Charters...	Detroit, Mich.....	Oral	Grammar	11,207	.....	.....	By teachers.
Charters...	Pittsburgh, Pa....	Oral	Both	25,376	.....	.....	By teachers.
Johnson...	Kansas City, Mo...	Written	Both	.....	5,538	2,947	From written work.
Sunne....	Louisiana.....	Both	Both	.....	.....	.....	By teachers and from written work.

This percentage was compared with similar percentages of frequency of occurrence of the error. It was found for 41 specific items that the correlation between the frequency of mention by teachers as being one of ten worst errors, with frequency of occurrence, was .63 by the Spearman Foot rule. This is fairly high and suggests that, in general, the gravity follows the frequency when measured in this rough way.

"The twelve errors in which there was the widest divergence between frequency of occurrence and frequency of mention by the teachers may be divided into two classes. Five errors were, in the opinion of the teachers, much worse than they were frequent. The use of *was* for *were* was ranked 30.5 in the frequency of error list, but in the teachers' opinion was second

to worst; *learn* for *teach* (18) frequency, (36.5) gravity; *that there* (4), (15.5); double comparatives (26), (34.5), and *them there* (20), (27). In seven extreme cases the reverse was true. The teachers regarded the errors not as bad as they were frequent. *Ain't got* ranked twenty-eighth in seriousness in teachers' opinions, but ninth in frequency of occurrence; *give* for *gave* (31.5), (15.5); *is* for *are* (16), (6); misuse of *me* as in *It is me* (22.5), (14); wrong sequence of pronouns as in *Everyone must do their work* (36), (28); *come* for *came* (18), (11); and *will* for *shall* (31.5), (24.5).

"3. In Pittsburgh, twenty-three specific errors with a frequency of over 200 constitute 56 per cent of the total. These, with their frequencies in a total of 25,676 errors, are seen in Table 78.

TABLE 78—THE TWENTY-THREE MOST FREQUENT ERRORS IN PITTSBURGH

<i>was</i> for <i>were</i>	1555 errors
<i>seen</i> for <i>saw</i>	1513 errors
<i>ain't</i>	1361 errors
<i>can</i> for <i>may</i>	1150 errors
<i>done</i> for <i>did</i>	895 errors
<i>is</i> for <i>are</i>	777 errors
<i>don't</i> for <i>doesn't</i>	721 errors
<i>this here</i>	684 errors
<i>John, he went</i>	671 errors
<i>didn't have no</i>	531 errors
<i>them things</i>	479 errors
<i>that there</i>	472 errors
<i>ain't got</i>	443 errors
<i>have got</i>	439 errors
<i>ain't got no</i>	435 errors
<i>come</i> for <i>came</i>	350 errors
<i>it was (is, ain't) me</i>	340 errors
<i>why, there was</i>	330 errors
<i>didn't do nothing</i>	302 errors
<i>lay</i> for <i>lie</i>	280 errors
<i>off</i> for <i>from</i>	276 errors
<i>went</i> for <i>gone</i>	245 errors
<i>give</i> for <i>gave</i>	202 errors

"4. Comparison between percentages of error in Kansas City, Detroit, Hibbing, and Pittsburgh is given in Table 79. The two items which are listed in Pittsburgh alone are due to the fact that errors in language rather than errors in grammar were reported by the teachers. The three items mentioned in Hibbing alone present certain interesting facts. The use of adverbs instead of negative verbs is illustrated by *I never done it* for *I didn't do it*. Words omitted are found in such sentences as, *I go basement* and *Mother went Chisholm*.

"This table should be read as follows: The error, 'The subject of the verb not in the nominative case,' constitutes 4 per cent of the total of 5883 errors reported in Kansas City, 4 per cent of the 11,207 errors reported in

TABLE 79.—COMPARISON OF PERCENTAGES IN ORAL ERRORS IN KANSAS CITY, DETROIT, HIBBING, AND PITTSBURGH

	Per cent			
	K. C.	D.	H.	P.
Subject of the verb not in the nominative case.....	4	4	3	3
Predicate nominative not in the nominative case.....	2	1	1	2
Object of the verb or preposition not in the objective case....	1	1	1	1
Wrong form of pronoun.....	2	2	3	2
First personal pronoun standing first.....	2	1	2	2
Failure of a pronoun to agree with its antecedent.....	0	1	1	1
Confusion of demonstrative adjective and personal pronoun.....	3	3	2	2
Failure of a verb to agree with its subject in number and person.....	14	12	9	13
Confusion of past and present tenses.....	2	12	7	3
Confusion of past tense and past participle.....	21	14	8	14
Wrong tense form.....	5	3	5	5
Wrong verb.....	12	18	20	18
Incorrect use of the mood.....	0	0	0	0
Confusion of comparative and superlative.....	1	1	1	1
Confusion of adjectives and adverbs.....	4	2	2	2
Misplaced modifiers.....	0	0	1	0
Double negatives.....	11	9	8	10
Confusion of preposition and conjunction.....	0	0	0	0
Syntactical redundancy.....	10	15	21	16
Wrong part of speech due to similarity of sound.....	1	1	0	0
Confusion of prepositions.....				2
Pronunciation and enunciation.....				3
Adverb instead of negative form of verb.....			2	
Words omitted.....			1	
Miscellaneous.....			2	
Total number of errors.....	5,883	11,207	10,190	25,676

Detroit, and so forth. Any type of error given 0 percentage appeared with a percentage of less than .5.

"Randolph, in his stenographic report of the speech of children, given in Part I, of the Sixteenth Yearbook, lists 1412 errors in sentence structure out of a total of 2954 errors. None of these are collected from teachers in the other studies. This is a significant difference, and although incomplete answers may have constituted a large part of Randolph's list, other errors not belonging to this class were present. It is, therefore, quite certain that the stenographic report is superior to collection of errors by teachers.

"5. The grammatical rules and definitions included in the course of study based on the errors of Kansas City children may be summarized as follows:

A. Nouns

- (a) Definition
- (b) Inflection (1) number (2) case (possessive) (3) gender (slight use)
- (c) Common and proper
- (d) Syntax—(1) subject of a verb (2) subjective complement (3) object of verb of preposition (4) the indirect object. (These are chiefly of use as an aid in the understanding of pronouns.)

B. Pronouns

- (a) Definition
- (b) Personal pronouns (case and person, gender, number)
- (c) Compound personal pronouns
- (d) Relative pronouns (gender, case)

C. Adjectives

- (a) Definition
- (b) Demonstrative adjectives
- (c) Cardinal and ordinal adjectives
- (d) The derivation of proper adjectives
- (e) Comparison of adjectives

D. Verbs

- (a) Definition
- (b) Transitive and intransitive verbs
- (c) Person
- (d) Number
- (e) Tense (particularly present, past, and past perfect)
- (f) Shall and will
- (g) Can and may
- (h) Mode (very slight)
- (i) Voice
- (j) Past participles
- (k) Infinitive (very slight)—split infinitive

E. Adverbs

- (a) Definition
- (b) Comparison

F. Prepositions

- (a) Definition
- (b) Government of case

G. Conjunctions

- (a) Definition
- (b) Classification

H. Misplaced modifiers

I. Double negatives

J. Syntactical redundancy

K. Spelling—when explainable by reference to grammar:—to, a preposition; two, an adjective; and too, an adverb

L. Sentence structure

- (a) Definition
- (b) How to write it
 - Begins with capital letter
 - Ends with a period, exclamation mark, or interrogation mark

M. Parsing and analysis

- (a) Definition of both
- (b) Division of sentence into parts
- (c) In general, the parsing will follow the elements outlined in the foregoing outline
- (d) The extent to which the parsing will be carried should be determined by the errors of the children

"Barnes, in general, agrees with the foregoing items. Differences are as follows: He adds collective nouns, although the one who listens to a speaker can only infrequently tell that he has made a mistake in number. He also adds appositives in nouns, none of which were noted in the Kansas City study. He also adds the plural of demonstrative adjectives, which was an oversight in the Kansas City study. He adds gerunds but omits negatives and syntactical redundancy, which are possibly not strictly grammatical in nature.

"6. An examination of these lists shows that grammar is greatly simplified as to both the complexity of the sentences used and the narrow range of facts to be learned. Much of the difficulty of grammar is eliminated. Unusual tenses, gerundives, infinitive constructions, and most of the mood forms are among those in which mistakes are infrequently made or not made at all.

"In the Kansas City study, it was found that the following could be omitted from the course of study which was in operation in the schools at the time of the investigation: the exclamatory sentence, the conjunction, the appositive, the nominative of address, the nominative by exclamation, the objective complement, the adverbial objective, the indefinite pronoun, the objective used as a substantive, the classification of adverbs, the noun clause, the conjunctive adverb, the retained objective, the moods (except, possibly, the subjunctive of to be), the infinitive (except the split infinitive), the objective subject, the participle (except the definition and the present and past forms), the nominative absolute, and the gerund.

"It is evident that some of the items in this list could not have been revealed by this method. For instance, one can not tell from reading whether or not the writer should have used an exclamation mark to convey the meaning he intended. Again, the material read did not include instances of the nominative of address where the comma was not used correctly; in fact, the use of the nominative of address was very slight. The oral sentences reported by the teachers did not include noun clauses, and the children's themes which were read seldom used the complex sentence, the preference seeming to be for the compound sentence.

"It is quite clear that a much more simple set of sentences could be used for analysis and parsing than are presented to children when it is necessary for them to learn to analyze and parse sentences involving subtle rules in grammar which they do not naturally break.

"7. W. J. Richardson and Charters (Pittsburgh) classified the errors by grades to see what natural eliminations occurred during progress through the grades. Clearly, no absolute standard could be set up, because certain errors may be stressed more heavily and, therefore, noticed more sharply by teachers in the upper grades. But, if a type of error has completely disappeared, the fact is of some significance. None such, however, were noticed except the use of quite childish incorrect forms of the past and perfect tenses; and in many cases, due to the reason just mentioned, some errors increased in number or total per cent."

Concerning written errors, Johnson gives the following order of teaching emphasis for high school students:

"(1) Mistakes in capitalization. (2) Mistakes in the use of the apostrophe. (3) Mistakes in punctuation. (4) Mistakes in the use of adjectives and adverbs. (5) Mistakes in spelling. (6) Mistakes in pronouns, not including case. (7) Careless omissions and repetitions. (8) Mistakes in the use of verbs. (9) Mistakes in the use of prepositions and conjunctions. (10) Sentence meaning not clear. (11) Sentence structure not

grammatical. (12) Mistakes in the use of quotation marks. (13) Mistakes in the case of pronouns."

3. How is technical grammar derived?

The rules broken were stated negatively as, "failure of subject to agree with predicate." Then the rules which were broken were stated positively. When this had been done, the investigators discovered in connection with each rule the definitions necessary to understand it. The rules and definitions thus combined indicate the technical content of the grammar which is necessary to give comprehension of the reasons for correct grammatical speech. The results of this method of derivation are given above.

4. What is the technical content of letter writing?

Johnson's investigation is reported as Study No. 5. It deals with the letters of college students and is reported because of its direct usefulness in the elementary grades.

5. What carrying content is used in the teaching of the technique of language and grammar?

The distinction between the technique of language and grammar and carrying content is this: The carrying content is the material that is used in order to teach the facts and forms of language and grammar. The carrying content may be of many kinds: games, reproduction stories, drill exercises, picture studies, and the like.

Two studies are reported: (1) Paul and Charters collected a large number of language games used in the classrooms in many cities in the United States. These have been published by the Bureau of Education as Bulletin No. 43, 1923, under the caption, Games and other Devices for Improving Pupils' English (price 10¢). (2) C. S. Dike, in *Education*, for September, 1924, describes the method by which he has constructed 92 sets of drill exercises, one set for each of the errors which he lists. He has constructed his own exercises and uses them after he has made a diagnosis of the English difficulties of each pupil. This method is significant because the sets of exercises can be made and used by the teachers of any school system.

6. How should the subject material of language and grammar be graded?

No studies of gradation have been reported. However, attempts to fit the instruction to the common errors of the class or to the outstanding errors of the individual have been made. This is done by the use of one or more of the diagnostic tests which are given to the children whose individual errors are noted. The frequency of the error, its persistence, and its seriousness determine the emphasis to be placed upon it.

7. What differences in vocabulary are found among children?

Vocabulary studies have not been included in this synopsis because of the fact that vocabulary has been construed as being less a matter of language proper than of history, arithmetic, and the other subjects in connec-

tion with which the vocabulary is used. Attention should be called, however, to two interesting vocabulary studies which have been submitted. W. J. Osburn, in the State Department of Instruction in Wisconsin, has examined the vocabularies of immigrant children, as has Miss Nina Joy Beglinger and her assistants in the Detroit public schools. These are both in mimeographed form.

STUDY NO. I. Searson, J. W. "Determining a language program." *English Journal*, February, 1924, pp. 99-114.

This is the report of an investigation in which Mr. Searson attempts to determine what language skills seem necessary for men in various occupa-

TABLE 80.—LANGUAGE SKILLS NECESSARY FOR ORDINARY SUCCESS IN LIFE (7,752 PERSONS FROM 42 STATES)

[illegible]

tions who desire to make at least an ordinary success of their work. He seeks to determine what is the irreducible minimum of language skill needed and desired by men and women in different vocations. He listed twenty-seven language skills and consulted 7752 persons in forty-two states. The method used in obtaining the information is not given. The gist of the report is presented with the accompanying table, which reads as follows:

Of the 714 merchants questioned, 527 stated that they needed skill in accurate pronunciation, etc.

STUDY NO. 2. Pendleton, Charles S. *The social objectives of school English*. Published by the author at George Peabody College for Teachers, Nashville, Tenn. pp. 3, 4, 36, 37, 38.

The investigation reported in this volume is a contribution toward a definition of English as a school subject. Scientific in method, it endeavors to present a statement of the precise ultimate social objectives which are actually set up as goals by present-day teachers of English.

The study comprises four undertakings. First, it brings together, from widely diverse sources, a particularized catalog of those objectives which have recently been stated by teachers as the outcomes which ought to be attained from school English. This list of objectives almost completely describes present practice and ideals.

Secondly, the investigation checks and supplements this catalog derived from teachers' statements of their aims. To this end, it examines specifically the English used by many adults in their daily life. The list of objectives which it sets forth is thus verified for actual social validity by being compared with the linguistic abilities of mature leaders in many communities.

The inquiry undertakes, thirdly, to arrange the items in its catalog according to their importance as judged by teachers. It therefore obtains appraisals from eighty instructors in English and, by means of a statistical combination of these individual ratings, arranges the long list in a sequence.

Fourthly, in support of this evaluation of the specific objectives of English, it studies carefully the range and competence of the eighty teachers upon whose several judgments its accepted order is based.

In both the accumulating and the appraising of the goals of school English, the investigation depends upon personal judgments. It does not set up an impersonal, objective scheme for ascertaining the facts.

Method. Several sources of material of this general sort were drawn upon to make up this catalog: (1) Direct statements from 272 teachers of English, contributed personally to the investigation; (2) similar direct utterances from about 100 educators, not teachers of English but in contact with the problem; (3) all the articles, editorials, notes, and advertisements pertaining to English which were published in eleven important educational periodicals during five recent years; (4) the relevant portions of 67 standard general writings on education; (5) 118 standard volumes about English or the teaching of English; (6) 49 state or city courses of study, or

teachers' manuals, in English; and (7) 62 widely used school textbooks on various phases and educational levels of this subject.

To supplement and check the social validity of the catalog thus secured, the actual linguistic usages of many adults were also studied. The group thus investigated consisted of 2759 individuals residing in 99 widely scattered communities. All were educated persons, considered to be leaders. The many linguistic abilities listed during this inquiry were collated with those put forward by teachers as school objectives, with the result that no important omissions in the teachers' lists were discovered.

In all, 1581 objectives were listed. These were then evaluated by 80 teachers enrolled in classes in the teaching of English in the University of Chicago. A detailed analysis of the contribution of these judges is given by the author. The 1581 objectives fell into six categories: (a) language, (b) conversation, (c) public speaking, (d) oral reading, (e) writing, and (f) reading. The first forty-eight objectives, "the *sine qua non* of public school English, follow, the numbers in the margin indicating the ranking of each objective within the respective categories:

1. The ability to spell correctly without hesitation all the ordinary words of one's writing vocabulary E. 1
2. The ability to speak, in conversation, in complete sentences, not in broken phrasing B. 1
3. The ability to write—in ordinary writing situations and without great concentration of attention—English which is grammatically correct.... E. 2
4. The attitude of prompt, effective abolishment of any error in one's written English as soon as it is first called to one's attention..... E. 3
5. The ability to spell—without great concentration of attention—during one's straightforward writing, all the common words of English written intercommunication. (The common words have been determined scientifically by a number of recent scholarly investigations)..... E. 4
6. The ability to use intellectual economy in expression—few words, not many; a thing said well once, not poorly and then supplemented by restatement A. 1
7. The ability to capitalize speedily and accurately in one's writing.... E. 5
8. The habit of reading for enjoyment literature of the better sort..... F. 1
9. The ability to think quickly in an emergency..... B. 2
10. The ability, in conversational situations, to speak the truth tactfully and efficiently B. 3
11. An attitude of genuine desire to be constructive, not destructive, in one's human relations B. 4
12. A taste for reading books (not merely magazines) of an excellent sort F. 2
13. The attitude of maintaining the integrity of one's spoken word as one's bond—of "keeping one's word" B. 5
14. An attitude of alert interest in the world and all things in it, and a desire to increase one's knowledge..... F. 3
15. Command over an adequate writing vocabulary E. 6
16. The habit of listening attentively and thoughtfully when being addressed B. 6
17. The ability to use in conversation only forms of expression which are grammatically correct B. 7
18. An attitude of intelligent consciousness regarding one's use of language as a means of expression A. 2

19. The ability automatically to speak grammatically correct English in one's public address C. 1
20. An attitude of genuine desire to accomplish through all one's abilities social service, not mere personal aggrandizement B. 8
21. The ability to punctuate accurately and speedily while writing..... E. 7
22. The ability to spell—without great concentration of attention—during one's straightforward writing, all the words of one's writing vocabulary E. 8
23. The ability to write effectively simple, straightforward business letters in the routine of daily life E. 9
24. The ability to use fluently and accurately a wide, accurate, and expressive speaking vocabulary B. 9
25. A perennial, never-failing interest in people; the habit of studying them sympathetically F. 4
26. The attitude of *expecting oneself* without hesitation or doubt to *write good English* E. 10
27. The ability to refrain from marking or marring in any way a borrowed book F. 5
28. An attitude of avoidance of all affectation and lack of genuineness in manner of speaking B. 10
29. Habitual realization that good physical and mental health is fundamental to really profitable reading F. 6
30. A taste for reading the better class of magazines, not the inferior fiction sort F. 7
31. An attitude of open-mindedness, in conversational situations, and the ability and willingness to change one's mind frankly..... B. 11
32. The ability to rest oneself and divert one's mind from business or social perplexities through the enjoyable reading of literature F. 8
33. The ability to determine quickly and accurately from a dictionary the *pronunciation* of a word F. 9
34. The habit of keeping oneself accurately informed upon a considerable number of topics of wide interest and suitability for conversation B. 12
35. The ability to think rapidly and accurately while speaking before an audience C. 2
36. An attitude of democracy rather than snobbishness in a conversation B. 13
37. The habit of striving to excel one's own best records of attainment in various phases of mastery of vocabulary A. 3
38. An attitude of never injuring in any way library books which one is consulting F. 10
39. The ability to write one's thoughts fluently in acceptable sentences.... E. 11
40. Command of so ready and wide a vocabulary that one is not forced into grammatical awkwardness and incorrectness by lack of the right word to use in speech B. 14
41. The habit of attentiveness and of dynamic purpose to refer to a dictionary as soon as possible, whenever one meets in any language situation a word of which one lacks the mastery A. 4
42. A genuine, deep-seated interest in the world of books F. 11
43. A mastery of the spirit and technique of good fellowship—the fine art of being a social creature B. 15
44. Habitual substitution, whenever possible, of an hour's enjoyment of an ennobling book for an hour's intercourse with a degrading person.... F. 12
45. Habitual facility in recognizing any familiar printed word..... F. 13
46. The ability to find quickly and accurately in a dictionary the meaning of a word one meets. (This involves many specific abilities.) F. 14
47. An attitude of avoidance, in a public speech, of all affectation and lack of genuineness in *manner* of speaking C. 3

48. The ability to use literature as a window through which to look out upon human experiences as a lifelong leisure occupation of maximum fruitfulness F. 15

STUDY NO. 3. Bobbitt, Franklin. *How to make a curriculum*. New York. Houghton Mifflin Co., 1924, pp. 246-255.

The problem was to determine the objectives that should be sought for in the teaching of English expression in the high school. This study is included because it presents a technique which can be applied in the grades equally as well as in the high school.

Professor Bobbitt presented the English teachers of the high schools of Los Angeles with his well-known list of objectives, guiding principles, and assumptions, and pupil activities and experiences. These are listed in full in *How to Make a Curriculum*. The English teachers were then to draw up lists which would apply to English expression in the Los Angeles situation. The statement follows:

"As a starting-point only for the curriculum-maker, we suggest the following series of general principles and assumptions as practical guides in his work. Let him modify it as he will, or draw up another. But he should take some position regarding each of the problems here suggested; and hold to it consistently.

Guiding Principles and Assumptions

1. One's expressed language is the objective manifestation of one's thought; at the same time the language is the subjective instrument of one's thought.

2. In all language expression, the thought is the primary thing, and the language the vehicle; caring for the thought adequately involves caring for the vehicle adequately. The latter is done, however, not for the sake of perfecting the vehicle, but for the sake of perfecting the thought.

3. Every school department that is developing power to think in some field should develop power to express thought clearly and sequentially in that field. This is to be done not for the sake of the expression but for the sake of adequate thought. At the same time this is the type of experience which normally develops one's powers of expression.

4. In every department of the school there should be much English expression—for the sake of the thought or content side of the department's work. The expression should be carefully organized and adequate—for the sake of the thought. There should be as much oral expression by each individual pupil as the limited time will permit. There should also be a reasonable amount of written expression in each department.

5. The distinction which the student himself often draws between expression in his English classes and expression in the classes of history, science, mathematics, etc., is injurious to his attitudes and powers of expression. There should be no possibility of such distinction.

6. The major experience in developing one's powers of expression is normal participation in the thought-life and language-life of school, home, and general community, under circumstances where one is mainly conscious of human experiences and of things objective, and relatively unconscious of the language-vehicle itself.

7. Language activities should be as unconscious and automatic as possible.

8. One should be made conscious of only those aspects of his language of which he must be watchful for the sake of exactness and correctness.

9. One should be left unconscious of those aspects of language which one uses properly as a result of unconscious learning.

10. A diagnostic study of the language-abilities of each individual student needs to be made. Where he reveals weakness, he is to be trained; where he is already sufficiently strong, he is not to be trained.

11. Spelling drill for each individual should be centered upon the errors which he makes.

12. Handwriting drill for each individual should be centered upon the errors in his handwriting.

13. Pronunciation drill for each individual should be mostly centered upon the errors in his pronunciation.

14. Grammatical drill for each individual should be mostly centered upon the grammatical errors which are to be eliminated.

15. In discovering the language errors and defects of individual pupils, the oral-speech defects of pronunciation, enunciation, voice quality and placement, etc., are to be looked after as carefully as any others.

16. In each aspect of his expression, the student should keep a record of the types of error against which he should be on guard. His major task is to eliminate these errors.

17. Only as the pupil is brought to be watchful of himself, without prompting on the part of the teacher, is his training accomplished.

18. Students should be stimulated to attain each objective as expeditiously as practicable, and with a minimum of teacher-labor. The more it is done without teacher-assistance, through pupil self-direction, as proven by measured results, the greater the credit that should be given.

19. After the pupil has mastered the elements of formal correctness, all departments should consider it their function to see that he permits no exception to occur in his use of the correct forms.

20. In the main, matters of form should be made clear only as the difficulty arises. So far as no difficulty arises in the undirected language-life of the individual, he may better remain relatively unconscious of the technical language forms and relationships.

21. Focusing attention upon the thought is a mode of keeping the language in the background.

22. All teaching relative to matters of formal correctness will be done by the department of English. Holding pupils responsible for correctness of expression will be a responsibility of departments where expression is a portion of pupil experience.

23. In matters of formal correctness, the major effort of teachers will not be teaching but rather holding pupils responsible for self-direction in keeping their expression adequate and correct.

24. Only those facts and principles relative to language should be taught which are necessary for rendering thought and communication more effective.

25. The way to learn to express one's self effectively in English is to express one's self within normal situations where one greatly wants to express one's self well.

26. The auditor is as necessary for normal expression as the speaker; the reader, as necessary as the writer.

27. As one expresses one's self orally, one must feel that there are others before him who are accepting his communication in the spirit in which it is intended. If they are merely sitting critical of his expression, the whole situation is deranging.

28. Written expression can be made sufficiently serviceable for training purposes only when the writer is conscious that his production is to be read by or to others whom he desires to please, convince, instruct, or impress. He must write within a normal expression-situation. These cannot be manufactured; they must be discovered. Make-believe will not serve the purpose.

29. When one is expressing himself normally in writing, he must be filled with the consciousness that what he writes is to be read by some one, in the spirit intended by the writer. If he is merely conscious that it is to be examined by a critical-minded teacher, usually the situation is so deranged that the expression is not, and cannot be, normal.

30. Deficiency in normal expression opportunities under school control is one of the greatest obstacles to effective training in the active use of language.

31. The English department has not control over a sufficient quantity of normal expression situations to give pupils enough practice in normal written expression.

32. The student who does not realize the values of proficiency in expression, and who lacks a desire to attain it, is not prepared to profit from the training. Mere driving him will be of little avail. Results gained are but apparent and soon lost after the driving season. The training must begin with laying the proper foundation in attitudes, valuations, and desires. Foundation must precede superstructure.

33. The most difficult single problem is how to bring pupils to want to use a good quality of English.

34. In the language itself, the two major things to be cared for are vocabulary and sentence structure.

35. Normally, the vocabulary *grows* up almost unconsciously out of one's diverse experiences in which language is a relatively unconscious accompaniment and vehicle of thought. The training problem therefore is not one of direct teaching of words, but rather provision of diversified normal experiences which are accompanied in normal ways by the verbal element.

36. Normally, one's sentence-sense and power to construct complicated sentences *grow* up for the most part unconsciously out of one's normal thought experiences. As these grow complex, the sentences keep the pace in complexity.

37. Paragraph structures will develop naturally from the divisions in the thought itself. One who thinks clearly, adequately, and sequentially will break his thought into its natural paragraph divisions with little attention to the matter.

38. The organization of the larger unit of discourse is at bottom but an organization of the thought-content.

39. Because of the sensitiveness of one's associates to matters of formal correctness, errors in language-forms of every kind are to be weeded out as completely as is consistent with a due amount of training effort. The standards will vary greatly among individuals according to original natures and to their social situation.

40. In general education, literature is to be used mainly for its content or experience values. It is not to be used as a basis of training in English expression any more than history or science.

41. There is no more reason for tying the English expression up with the literature than with the history or the science.

42. Training for amateur literary production is to be given only to those of proved capacity, aptitude, and industry—and who require no great amount of teacher effort and assistance.

43. The general training in English expression is not for vocational literary production, nor for any special type of English expression in any vocation. It is only for the ordinary oral and written expression of everyday life.

44. Only those are to be trained for vocational literary production who have definitely chosen this as their work; whom studies of capacity show to be fitted for it; and who are capable of a large degree of self-direction in achieving the skills and understanding.

45. Special vocations require special forms of writing; training to use these, however, should be a portion of the vocational courses and given only to those who are taking these courses.

46. The basic aspects of English expression are the same whether it be oral or written. This being the case, it should be taken care of as one thing; but a thing of many aspects, each one of which should be adequately cared for.

Objectives of English Expression

1. Ability to use language in all ways required for proper and effective participation in the community life.

2. Ability effectively to organize and present orally one's thought to others: (a) In conversation; (b) In recounting one's experiences; (c) In more serious or formal discussion; (d) In oral report; (e) In giving directions; (f) To an audience.

3. Ability to pronounce one's words properly.

4. Ability in speech to use the voice in ways both agreeable and effective.

5. Command over an adequate reading, speaking, and writing vocabulary.

6. Ability to use language which is grammatically correct.

7. Ability effectively to organize and express one's thought in written form: (a) Memoranda; (b) Letters; (c) Reports, news items or articles, systematic discussion of questions; (d) Giving directions; (e) Written addresses.

8. Ability to write with proper legibility, ease, and speed.

9. Ability to spell the words of one's writing vocabulary.

10. Ability to use good form, order, and arrangement in all of one's written work: margins, spacing, alignment, paragraphing, capitalization, punctuation, syllabication, abbreviations, etc.

214. Ability to organize and express one's ideas clearly and effectively in the discussion, formal or informal, of social problems.

312. Ability to converse agreeably and effectively upon a variety of topics and in a mood and manner suitable to the situation.

405. Ability to utilize conversation as a profitable and enjoyable means of participating in the thought of the world.

406. Ability and disposition to give expression to one's thoughts and experiences in proper ways and under proper circumstances.

502. (25-a) Ability to use language efficiently as the vehicle of one's thoughts.

Pupil Activities and Experiences

"What should a pupil do in order that he may come to use his mother tongue easily, effectively, and correctly? The curriculum-maker will probably begin by formulating the statement of the general types of pupil activity and experience. Some of the things that he will include are probably the following:

1. The pupil will hear much English of the type which he is expected to use.

2. He will read much English of the type which he is expected to use.

3. He will associate much with individuals who use the types of English which he is expected to use.

4. He will have experiences under conditions which impel him to report or to discuss those experiences.

5. In every department of the school in which he has opportunities for oral or written expression, he will utilize these opportunities for practice in expressing himself as clearly, effectively, and adequately as practicable.

6. He will discover the kinds of language errors and deficiencies which appear in his English.

7. He will keep himself on guard against each known type of error until it has been eliminated and right habits formed.

8. He will master the technical language information necessary for guidance and judgment in eliminating undesirable language forms.

9. Employing the method devised by the school, he will assist his associates in the discovery of their language errors and shortcomings.

10. He will utilize the assistance of his associates in discovering his own language errors and shortcomings.

11. He will express himself frequently and sometimes at length under circumstances where he desires to express himself well.

12. He will acquire ease and fluency in the use of oral and written English through abundance of experience in using the oral and written forms.

13. Before expressing himself he will organize the elements of his thought so that the latter may be in proper order, sequence, and relation.

14. He will have diversity of experiences with innumerable things under circumstances where the experiences are verbalized.

15. In his pronunciation, spelling, and all of the other aspects of oral and written expression, he will use the best forms of which he has knowledge.

16. He will permit no exception to right language forms, so far as possible.

17. He will frequently revise and rewrite, sometimes several times, his written productions.

18. He will, etc.

"Before this list is ready for use, it should be indefinitely extended; yet it should present only the general types of pupil activity and experience and not enter into the details. It is to be an instrument for guidance in

TABLE 81.—FORM ERRORS
(Relative Order of Frequency)

	Grades					
	III	IV	V	VI	VII	VIII
Punctuation at end of sentence:						
1. No period.....	1	1	1	1	1	2
2. No question mark.....	6	12	11	16	18	20
3. Question mark for period.....	11	19	20	24	24	22
4. Period for question mark.....	12	13	15	15	13	12
5. Extra period.....	15	11	14	13	17	21
6. Extra comma.....	23	23	23	23	23	23
Comma:						
7. Series.....	17	15	16	12	11	11
8. Address.....	13	14	12	17	12	14
9. Comma for period.....	16	17	13	9	8	5
10. Period for comma.....	21	16	17	18	19	17
11. Comma omitted with loss of clearness.....	14	8	9	11	14	15
12. Appositive comma omitted.....	22	22	21	19	16	16
Quotation:						
13. Quotation marks omitted.....	5	6	5	7	9	9
14. Wrong quotation.....	25	21	22	22	22	24
Singular-Plural:						
15. Singular for plural form.....	10	9	10	8	10	10
16. Plural for singular form.....	20	20	19	21	21	18
Capitalization:						
17. No initial capital.....	2	2	2	2	2	1
18. Proper name.....	7	7	7	5	7	4
19. Pronoun I.....	18	24	25	25	25	25
20. Wrong capitalization.....	4	4	4	4	3	6
Possessive:						
21. Wrong possessive form.....	9	5	6	6	6	7
a. No apostrophe and s.						
b. Plural for singular possessive and vice versa.						
c. No apostrophe.						
Clauses:						
22. and clauses.....	3	3	3	3	4	3
Sentences:						
23. Incomplete sentence.....	8	10	8	10	5	8
Abbreviation:						
24. Incorrect form of abbreviation.....	24	25	24	20	20	19
Hyphen:						
25. Hyphen omitted.....	19	20	18	14	15	13

formulating the details of the curriculum. With a completed and finished statement in the hands of the curriculum-making group, they can then reduce the activities to the specifics of experience for first-grade pupils, second-grade pupils, and so on through all the grades to the end of secondary education."

STUDY NO. 4. Sunne, Dagny. "The effect of locality on language errors," *Journal of Educational Research*, Volume VIII, pages 239-251, 1923.

The problem of the writer is to parallel in Louisiana the studies of language errors made in the North by a number of writers and to discover the variations and similarities of errors.

The written work of 4237 children in seven parishes of Louisiana was collected for one week. In addition, the written work of 4381 students in New Orleans schools was collected, and the oral errors of pupils in six parishes were observed by the teachers for one week.

Table 81 gives the classification of written errors. The frequency rankings for each class is given by grades.

The conclusions of the author follow:

"In general, this survey of language justifies the following statements. (1) The larger groups of syntactical errors hold relatively the same order in different localities, verb errors taking first rank, next pronoun errors, and next adjective-adverb confusion and redundant expressions. (2) Language errors of children are at least of two types, (a) those peculiar to the community and (b) those generally prevalent. Hence it is not practicable to limit language drill to a definite set of rules. A survey of all written work for two weeks will show concretely the specific abuses that must be remedied. (3) There are indications from this study that syntactical errors may be more readily combated than form errors. The latter, though apparently more simple, are perhaps to a greater extent correlated with mental ability and clear thinking."

STUDY NO. 5. Johnson, Roy Ivan. "Letter-writing: a curriculum study in English composition," *Journal of Educational Research*, Volume VI, pages 423-437, 1922.

This is a study of the standards by which a good letter may be judged and an analysis of defects of students' letters when judged by these standards.

These problems are solved by the following methods to determine the standards of a good letter. Approximately one hundred and fifty letters were contributed by women of recognized leadership throughout the country—letters taken from their private correspondence files and submitted as samples of "good letters." To these was added a collection of literary letters as a basis for an analysis of student errors as judged by these standards. About 1000 letters from young women of approximately Freshman standing were examined. The letters of women were studied in both cases because the investigation was made for Stephens College which is a junior college for women.

The characteristics of these letters when analyzed by the investigator were found to be: courtesy, informality, humor, opinions about events, optimism, a few centers of organization, and good form. These were presented in at least fifty per cent of the letters examined.

In analyzing the student letters, 250 social letters and 750 business letters were studied. The social letters were written by young women of college Freshman standing; the business letters were written by high school seniors who were considering entering college. The category of errors is similar to that used in another study reported by Mr. Johnson (Table 82), which ran as follows:

TABLE 82.—THE RELATIVE PREVALENCE OF ERROR IN 250 SOCIAL LETTERS WITH A TOTAL OF 90,530 WORDS
(106 Unclassified Errors Not Included in this Table.)

Error-types	Number of errors	Rank
I. Punctuation.....	899	1
II. Sentence Structure.....	517	2
III. Spelling.....	308	3
IV. Adjectives and Adverbs.....	269	4
V. Letter Form.....	223	5
VI. Capitalization.....	131	6
VII. Diction.....	97	7
VIII. Apostrophe.....	88	8
IX. Careless Writing.....	61	9
X. Verbs.....	59	10
XI. Prepositions and Conjunctions.....	47	11
XII. Case.....	25	12
XIII. Pronouns (not case).....	22	13
XIV. Quotation Marks.....	9	14
Total.....	2,745	

TABLE 83.—THE RELATIVE PREVALENCE OF ERROR IN 750 BUSINESS LETTERS WITH A TOTAL OF 60,610 WORDS

Error-types	Number of errors	Rank
Punctuation.....	2,242	1
Letter Form.....	402	2
Capitalization.....	273	3
Sentence Structure.....	263	4
Spelling.....	242	5
Verbs.....	222	6
Apostrophe.....	80	7
Diction.....	56	8
Careless Writing.....	53	9
Prepositions and Conjunctions.....	47	10
Adjectives and Adverbs.....	28	11
Quotation Marks.....	10	12
Pronouns (not case).....	9	13
Case.....	7	14
Total.....	3,934	

A study was also made of the content of the letter according to the other six standards of good letters. These findings could not be tabulated. They were expressed in the following terms:

"When the social letters were examined from the standpoint of content and general style instead of from the standpoint of mechanical correctness, five obvious weaknesses appeared. The characteristics of excellence estab-

lished by a study of the letters submitted by prominent women (Group I) and of literary letters (Group II) have been used as a standard of judgment. It was not possible, however, to draw reliable conclusions in regard to courtesy in student letters. While there were few noticeable instances of discourtesy recognizable, the majority of the letters seemed to lack that thoughtfulness and consideration for the reader which was so obvious in the letters of Group I. A too frequent focusing on self (quite natural and excusable in youth) seemed to exclude completely a consciousness of the interests of the 'other person,' with only a peripheral margin of attention at best.

"Of optimism there was no lack. The objection, if any, would be the seeming perversion of a healthful cheerfulness into an unballasted hilarity—a superlative gush—innocent of all adequate considerations of fact and circumstance.

"Crudeness in letter-writing is the miscarriage of informality. The use of a slangy phrase that offends the sense of propriety, the continuous use of beheaded sentences, the excessive use of nicknames and familiar epithets, the hilarious and unrestrained treatment of personal experience, and over-indulgence in the 'emotional superlative' may spring from a mis-directed attempt to achieve informality in letter-writing—and there can be no doubt that informality is the result—but it is an informality not pleasing to a discriminating mind. This is the first notable weakness of student letters. Evidently the cure lies in the development of good taste, a sense of fitness, and in the careful study and application of the common devices of informality used by good letter-writers.

"Inferior humor was evident in most of the student letters in which humor was attempted. The two most prevalent humor devices employed were (1) interpolated laughter, and (2) the comedy of 'tragic' occurrences such as the failure of recipes or of attempts to foil the teacher. Many of these instances contained humor possibilities which were ruined in the telling. Interpolated laughter is, of course, inane and intolerable. A few rare instances of it can be found in literary letters which are otherwise unobjectionable. The improvement of the quality of humor employed in student composition can be accomplished through more definite attention to the subject of humor. A sense of humor needs educational direction as much as the capacity for musical appreciation.

"Few opinions, other than exclamatory outbursts indicating approval or disapproval, were found in the student letters. Actual count showed fewer than ten per cent of them to be opinionative. They were primarily 'newsy,' a complete gossip repertory, a catalog of 'she-did's' and 'we-went's.'

"Lack of organization about central themes was another prominent weakness of the student letters. Instead of few centers of organization, there were many. The tendency to 'tell-everything' is probably a natural juvenile trait, since everything in one's experience is invested with a certain interest; but it is contrary to the best practice as found in the letters of Groups I and II. The value of *dominant themes* in letters should be stressed."

CHAPTER IX

ELEMENTARY SCIENCE

*Elliot R. Downing, Associate Professor of Natural Science, School of Education,
University of Chicago, Chicago, Illinois, Chairman*

Major Problems in the Formation of the Curriculum in Elementary Science

What attainments and mental attitudes in nature study should be expected of a third-grade pupil? A sixth-grade pupil?

What fundamental principles of life and interrelation of plants and animals and their physical environment should be common knowledge for everyone?

Can methods be devised for determining relative social values of topics which might be included in a course in nature study?

What part of this knowledge should be acquired before the pupil enters senior high school or leaves school entirely?

What is the order of development of a child's ability to profit by varying sense stimuli? Can we hope to teach children to recognize animals or plants in detail? Or is the recognition merely that of the whole? If the latter, what are the most important elements in the whole? To illustrate, in teaching children to recognize birds, should attention be directed primarily to color or to form?

To what extent can we hope to cultivate the *habit* of scientific thinking—that is, the *habit* of observing carefully and accurately, drawing warranted conclusions or generalizations, and abiding by the results of testing these conclusions?

How far can a curriculum provide for acquiring such knowledge and such habits?

How can the curriculum be adjusted to the growth of the child? At what age level does the child acquire accuracy and a sense of form, color, and relationships, and the ability to analyze and discriminate? How do his interests change from age to age? Can the curriculum be adjusted to such changes?

What are the errors the child is most likely to make in scientific thinking? Can the curriculum be so formulated so as to avoid these?

Can we depend upon the native curiosity of the child to uncover worthwhile problems and projects? In how far must the teacher hold his attention to the problem at hand and how far must she supervise the child's selection of pertinent elements? How does this change with advancing age?

Can we so guide and direct that all we wish the pupil to acquire shall come through projects worked out by him?

How early does the child acquire esthetic appreciation of form, balance, symmetry of relations? What elements can be introduced into the curriculum to develop these and other esthetic phases?

How much appeal should be made to the emotional side directly? Indirectly?

How prominent should be the economic or useful phases?

At what stages should the various phases, economic, esthetic, etc., be emphasized?

What should be the relation of nature study and general science to reading, literature, drawing, art, etc., and how should these relationships be recognized in the curriculum?

What is the proper grade placement of pictures and of poems illustrative of nature? What are the relative merits of pictures, lantern slides, and motion pictures, and is there a change in this at various grade levels?

Review of Research Studies in Elementary Science

STUDY NO. 1. Mau, Laura E. "Some experiments regarding the relative interests of children in physical and biological materials in the kindergarten and primary grades." *The Nature Study Review*, Volume VIII, No. 8. November, 1912.

Object. To determine whether children are most interested in animal, plant, or physical materials in nature study and in what phases of these materials they are most interested.

Method. In the kindergartens, first, second, and third grades of eight schools in and about Chicago, Illinois, two tests were conducted, the second like the first but with different materials. The results are based on the returns from some two thousand children in each test.

The materials used in the first test were: a cat, a pepper plant, and a toy engine; for the second test, ring doves, sensitive plants, and magnets and filings were used.

The objects were taken into the room and placed on teacher's desk. The children were asked: "If you could have one of these for your very own, which would you choose?" Replies were whispered to Miss Mau or her assistants and recorded. In the second test, children fed and gave a drink to the hungry, thirsty doves; each child touched the leaf of the sensitive plants and saw the leaflets fold together, the whole leaf drop to its sleep position; and two children held the magnets near the filings and all saw the filings jump up to the magnets.

Miss Mau then said she could not stay that day to answer questions but she would come back in ten days and answer such as they might like to ask. On her return, questions were whispered to her or her assistants and recorded. She then hastily grouped them and gave a talk to answer them. It was hoped that the less interesting materials would fade out of the child's mind, the more interesting would remain, and the number and kinds of questions would disclose the answer to the problems investigated.

Findings. In test one, the children's preferences were: first, the toy engine; second, the cat; and third, the pepper plant. It was feared the results were hardly fair, for the choice lay between a toy and non-toys. Hence, the experiment was repeated with materials that were equally active.

In test two, the expressed preferences were: first, the ring doves; second, the sensitive plants; and third, the magnets and iron filings. The per cent of all questions asked for the animal was 46; plant, 30; and physical material, 24. The questions dealt almost exclusively with identification and the activities of the objects. Identification: Dove, 40.3 per cent; plant, 36.8 per cent; magnet, 34.2 per cent. Activities: Dove, 41 per cent; plant, 47.3 per cent; magnet, 49.9 per cent.

Questions implying activity on the part of the child exceeded all other activity questions in the kindergarten and declined to grade three. Questions about the activity of the object were least in the kindergarten and increased to grade three where they exceeded the former sort.

Questions implying motor activity on the part of the child exceeded those implying sensory activity in the kindergarten and grade one: the two sorts were about equal in grade two, but the latter exceeded the former in grade three.

STUDY NO. 2. Downing, Elliot Rowland. "Children's interests in nature materials," *The Nature Study Review*, Volume VIII, No. 9. December.

Object. To determine whether children are most interested in animal, plant, or physical materials in nature study, and in what phases of these materials they are most interested.

Method. A study was made of the questions and observations by boys and girls published in the Science Department of *St. Nicholas Magazine* under, "We Will Ask St. Nicholas About It." Questions were classified, and interests indicated by the number and character of the questions.

Findings. Of the 742 questions and observations, 61 per cent were on animals; 20.6 per cent on plants; and 11.6 per cent on physical materials. Boys asked a larger per cent of questions about animals and plants; and girls, about physical materials. The average age was 11.9 years for boys, and 12.08, for girls. The most absorbing items under each head were: (1) Animal life, of these questions 24.95 per cent concerned insects; 24.27 per cent, birds; and 18.54 per cent, common mammals. (2) Plants, of these questions 36.60 per cent concerned wild flowering plants; 8.5 per cent, garden flowering plants; 23.53 per cent, trees; and 14.38 per cent, fruits and vegetables. (3) Of the total questions 24.39 per cent concerned physical material; of this material, 42.28 per cent related to elementary physics, and 16.26 per cent astronomical topics.

Questions on activities and identifications were the dominant sort; there was 62 per cent on the former, 20 per cent on the latter.

STUDY NO. 3. Trafton, Gilbert H. "Children's interests in nature materials." *The Nature Study Review*, Volume IX, No. 6. September, 1913.

Object. To test the child's knowledge of plants and animals, and to see Nature from the child's standpoint.

Method. Nearly a thousand children of Passaic, New Jersey, were asked the following questions: First, make a list of all birds, insects, and other animals that you have seen in Passaic, except in a menagerie. Describe briefly the most noticeable feature about each of the animals, and tell which you like best, and why? Which ones do you dislike and why? What interests you most about a plant? Make a list of the trees that you know, and of the flowers. Which flower do you like best? What animal, after man, knows most? Give reasons for your answer.

Findings. The acquaintance of children with wild plants and animals is very limited. Color was the feature which they noticed most; next, sounds; and next, size. The activities of animals appeal more strongly in upper grades than do appearances. Favored animals in order of preference: (1) Dog, (2) horse, (3) cat, (4) wild birds, and (5) rabbit. Sixty per cent of the boys expressed no dislike for animals. The animals disliked in order are: (1) Mice and rats, (2) snakes, (3) cats, (4) dogs, (5) mosquitoes, and (6) pigs.

STUDY NO. 4. Patterson, Alice J. "The present status of nature study." An analysis of Courses of Study. *Nature Study Review*, Volume IX, No. 8. November, 1913.

Thompson, Clem O. *Science materials used in instruction in the first six grades*. Masters Thesis. Univ. of Chicago, Chicago, Ill.

Object. To analyze courses of study in elementary science to see what subjects are most commonly treated and in what grades.

Method. Analysis of thirty-two state courses of study; nineteen from large cities, and thirty training school courses from small cities.

Findings. In the eighty-one courses of study, there were 4812 items of animal study, 4588 of plant, and 1548 on physical materials, exclusive of geography. The most frequently recurring group of animal studies were insects, birds, and the common mammals; of plants, wild flowers, trees, and garden plants; of physical topics, fuels, the warming of our homes, thermometers, evaporation, condensation, air movements, air machines, and magnetism.

STUDY NO. 5. Ayer, Fred C. *The psychology of drawing with special reference to laboratory teaching*. Warwick and York, Baltimore.

Bryson, Olive Flora. *The extent to which diagrammatic drawings contribute to an understanding of scientific facts*.

Object. To discover whether a diagrammatic drawing fixes in mind the facts to be taught better than the customary sketch.

Method. To experimentally try out various types of drawing with several classes of pupils in the high school science classes to see which type fixed facts in mind best regarding the set up of apparatus, structure of plants and animals, and the like.

Findings. The diagrammatic drawing is more economical of time than is the picture-sketch, and also, even with less time put upon it, is superior in fixing in the pupils' minds the facts to be retained.

STUDY NO. 6. Finley, Charles W. "Some studies of children's interests in science materials." *School Science and Mathematics*. Volume 21, January, 1921, pp. 1-24.

Object. To secure data on children's interests in plant and animal life and physical phenomena.

Method. In grades one to eight in thirteen different school systems, a "water dog" or "mud puppy" in a glass aquarium was taken into the classroom. After viewing the animal for a definite period and without discussion, the pupils in grades three to eight returned to their seats and in writing asked all the questions they desired to have answered about the animal. In the first and second grades, the pupils whispered their questions, and the teachers recorded them. This experiment involved 1718 pupils.

A second experiment was tried in five school systems, grades three to eight, and involved 827 pupils. A thirty-minute lesson was divided equally in a presentation of a topic in animal life, one in plant life, and one in elementary physics. For the first, a bird was used; for the second, a potted plant; and for the third, a pendulum. On the second day, following the experiment, the pupils were asked to write an essay concerning one of the things presented. The topics chosen were considered as indicative of interest. In the second experiment, animal life received most attention in all grades; plant life, second; and the pendulum, third.

Findings. 8328 questions were asked about the animal. These were accepted as showing types of interests, and were classified under twenty headings, such as, identification, life, history, adaptation, etc.

STUDY NO. 7. Finley, Charles W., and Caldwell, Otis W. *Biology in the public press*. Bulletin of the Lincoln School, Teachers College, Columbia University.

Object. To determine what biological knowledge is referred to in newspapers.

Method. The complete issues of eleven prominent newspapers for the month of June, 1921, and six for the month of November, 1921, were carefully reviewed. A total of 13,796 newspaper pages afforded 3061 articles pertaining to biology.

Findings. Out of the total 3061 articles pertaining to biology found in newspapers, 897 dealt with health; 775 with animals; 660 with plants; 533 with food; 81 with organizations of producers; 74 with general nature; 47 with evolution; and 14 were fictitious.

"The conclusion can not be drawn that, since these biological articles have been found and since they are clearly grouped into certain definite headings, therefore these are necessarily the topics toward which all high school instruction in biology should be directed. It may be that there are types of available biological information which should be presented which are omitted in the newspaper articles. Possibly, also, some needful biological information is as yet unknown to biologists, or if known has not been made available to the public press. Possibly the press would publish, and the public would like to read, much more biological material of much wider

range, if it were made available. These are questions which the present study does not determine, but which should receive later attention.

"It seems safe to conclude further that since these types of biological knowledge are going to the public in such large quantities all over the whole country, the course in school biology should consider them as part of the legitimate foundation upon which to proceed in constructing a course of study. Other evidences when developed should also be used in whatever ways those new evidences may justify."

Otis W. Caldwell and W. H. Meier have been experimenting in the organization of a course of study materials for use in elementary science with fifth and sixth grade pupils. One principle of guidance has been to select those major science topics which are simple enough to be interpreted fairly well by young pupils. The problems selected are those relating to the use of science in common experiences. Their selection is not primarily because of usefulness but being useful and thereby desirable, they also add a meaning which stimulates work and thought. The course materials thus selected have been tried and corrected through use with considerable number of pupils in different types of schools and in the hands of different teachers. The topic headings under which this body of course of study material is now organized are: Some common problems of living; fire and its uses; light and its uses; fire control; the water supply; household wastes; fire in the preparation of foods; factors in food requirements; production, use and care of milk; animals which injure foods; regulation of the food industry; sources and qualities of materials for clothing; home grounds and garden; home equipment; hygiene of the home; transportation; communication and recreational science.

CHAPTER X

HEALTH AND PHYSICAL EDUCATION

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SECTION I. EDUCATIONAL RESEARCH IN THE FIELDS OF HEALTH AND PHYSICAL EDUCATION

In gathering the data for this report, about 150 letters of inquiry were sent to a list which included (1) all state superintendents of public instruction, (2) about forty city school systems known to be actively interested in health and physical education, (3) schools of education in certain universities and colleges, (4) a miscellaneous list of organizations and persons. The selection was made in groups (2), (3) and (4) from the records of the American Child Health Association and Joint Committee on Health Problems of the National Education Association and the American Medical Association which indicate with reasonable comprehensiveness those localities where intensive work is being done in health and physical education.

In addition, the *Readers' Guide, International Book Review*, and similar bibliographies were searched for printed reports of research.

The subcommittee wishes to acknowledge its indebtedness to the many persons who have willingly coöperated in the collection of the materials of this report. Some of the valuable data submitted to the committee could not be included in this report due to the necessary limitation of the scope of the report to research in curriculum construction. The committee nevertheless gratefully extends its thanks to all who participated in this coöperative undertaking.

A. Research in Health Education

The questions which confront the makers of curricula in the field of health education can not in any instance be completely and fully answered by available research. Nevertheless, it is important to indicate what some of the most important questions are, in order to encourage research workers in the future to direct their efforts towards the solution of these fundamental problems.

1. What should be the criteria for selection of subject matter and activities in health education?

2. What standards of achievement in terms of habits, attitudes and knowledge may be reasonably set up for completion of the sixth grade? Junior high school? Senior high school?

3. Health needs are continuous throughout life, without much fundamental variation; e. g., it is always necessary to care for the teeth. Should the subject matter of the health education curriculum be arranged to deal with all health needs every year? Or, with only a few each year?

4. How may other school subjects and activities best be utilized to teach health lessons?
5. In a plan where several school subjects are used to teach health lessons, how may supervision be exercised to prevent useless duplication?
6. How may the results of health education be adequately measured?
7. What methods are effective in securing the interest and coöperation of the home?
8. What is the proper place of dramatic materials, fairy stories, games, and other special devices and entertainment features in a program of health education? What is their function; what contribution do they make?
9. What factors in the curriculum affect the permanency of health habits?
10. What factors in the curriculum affect the formation of attitudes related to health?

The following research studies have a direct application to curriculum making in the field of health education. They are arranged in chronological order.

STUDY NO. 1. Wood, Thomas D., and Reesor, Mary. *A study in the child's health interests.* (Reported as part of an article, "Health instruction in the elementary school"), Teachers College Record, Vol. XIII, No. 3, May, 1912. pp. 10-13.

Purpose. The problem was to discover the child's health interests.

Method. A list of questions bearing upon the subject of health, its meaning, means of attaining it, etc., were submitted to pupils in the Speyer School, New York City, and to pupils in the fourth grade of a New York City East Side Boys' School. In the first four grades in the Speyer School, the questions were put orally and to individual children, so there was no opportunity for one child to be influenced by the answers of others. In the other grades, the answers were written and no names were placed upon the papers. No previous preparation had been made, and no suggestions were given them during the time they wrote.

Findings. "In no answer is there any suggestion that the child is interested in health in the abstract or as a future beneficial state. His sole health concern exists in application and relation to the immediate present. Interest in growing well and strong is nowhere indicated save as this state gives increased power and capacity for present enjoyment."

STUDY NO. 2. Hunt, Jean Lee; Johnson, Buford J.; and Lincoln, Edith M. *Health education and the nutrition class.* New York, E. P. Dutton & Co. 281 pp.

Purpose. This experiment was undertaken "to explore the possibilities of the nutrition class in a public school; to determine how far a school can successfully employ the nutrition class procedure, and in particular how far the procedure itself can be expected to reinforce the school's general program of health education."

Method. Classes of underweight children were organized during the three years of the experiment in grades 1, 4, 5, 6 and 7. A moderately extensive program of health examination, and correction of defects was carried out. Weekly weight records were made, and instruction was given to the children, (a) individually at the time of weighing and (b) in class sessions, once a week. The first year, the class sessions were conducted by physicians; the second and third by nutrition workers with some teaching skill. The second year, the underweight groups formed separate classes, working together in all of their school work.

Findings. The study presents more conclusive evidence in regard to control of environment, organization, and administration than in regard to courses of study.

The measurable results of the experiment were expressed in the weight records.

However, the various experiences of the three years during which the study was conducted lead the experimenters to draw certain conclusions regarding the teaching program.

Four general statements are made as follows:

1. Gains have been largely dependent on initial physical status and proportionate to the relatively superior or inferior condition of the individual considered.
2. Gains have been largely influenced by the technique employed for enlisting coöperation from the children.
3. Other conditions being equal, gains have been in direct proportion to the influence exerted on the home and the resulting parental coöperation.
4. Gains appear to have been appreciably increased when favorable conditions directly affecting the nutritional processes have been introduced within the school environment.

In regard to the second of these points, more detailed statements are made.

1. It is necessary to provide sufficient stimulus to insure the child's coöperation in carrying out the prescribed régime at home and elsewhere away from school.
2. "Evaluation of success and failure for the child must be measured by his coöperation and by individual gain in fitness rather than by his comparative gain in relation to that of his fellows."
3. ". . . the child must be held responsible only for his coöperation in such activities as his environment affords."
4. "Thus the success of the school program of health education is dependent on a serious program of education in the community."
5. Analysis of the activities provided in the nutrition class shows two types, (a) those affecting the child experiences at first hand, and (b) those affording informational (verbal) experiences. The true place of subject matter is to reinforce and interpret first-hand experiences in a program where health habits are the objectives.

STUDY NO. 3. Davis, Walter W. "The questionnaire method in health education." Chicago. *The Elementary School Journal*, Vol. 23, January. 1923. pp. 373-386.

Purpose. "The main purpose of the investigation was to get at the real facts about the children's health and surroundings. These facts were to

form the basis of a practical course in hygiene for each teacher, for, it was presumed, the answers of each group of pupils would determine the instruction which that group needed and therefore, the instruction which the teacher should emphasize."

Method. In February, 1920, a set of hygiene questions was submitted to the pupils of 12 grade schools in Seattle. The results were so promising that the list, slightly revised, was submitted to Grades IV to VIII in all the schools of the city in October, 1920; May, 1921; October, 1921; and May, 1922. About 22,000 pupils answered the questions each time they were submitted. The list of questions included 24 questions about simple habits and health conditions, phrased to be answered by "Yes" and "No."

The method of compiling records was simple. The teacher computed for her room the percentage of "Yes" answers to the various questions and the central office then computed school and city averages from the teachers' reports.

No systematic specific attempt to base the course of study immediately upon the results of the questionnaire is reported. The results of the questionnaire seem to have offered guidance in curriculum construction only in a general way.

Findings. a. There was improvement in practice of health habits as a result of the work done.

	100 per cent basis	Fractional basis
Average gain-----	2.7	11
Personal health habits-----	4.5	18
Health conditions -----	.9	4.5

Note: The "fractional basis" means that the percentage of gain is reached by using the number of pupils who needed to improve as a basis (this would be only a fraction of all the pupils) and computing what percentage of this number actually did improve. The "100 per cent" basis means that the total number of pupils was used as a basis for computing percentage of improvement.

Mr. Davis concludes that "the questionnaire has proved helpful to the teacher, indicating to her what phases of hygiene to stress."

b. Since the use of the questionnaire method in surveying health conditions is coming constantly into more general use, it is an important question whether or not the questionnaire submitted directly to the pupils gives reliable information. Mr. Davis concludes that the replies given by the children were fairly reliable, "since the reported results were consistent and supported by general knowledge and experience, and by our specific knowledge about the individual schools."

STUDY NO. 4. Committee, Early Elementary Department, Kalamazoo Public Schools. *Tentative revision of achievements section course of Study: Health achievements.* Published by Kalamazoo Public Schools. 8 pages.

Purpose. The problem of this research was to ascertain what achievements in health, practical efficiency, citizenship and leisure may be expected of children of various stages of development. Only health achievements are here reported.

Method. The "Achievements" were grouped and listed carefully and passed out to the forty-six teachers in the department. Three different groups of children were then measured:

Group 1. 519 children just entering kindergarten from their homes. These children were observed and checked during their first two weeks of kindergarten experience.

Group 2. 635 children just passing into first grade from kindergarten, who were measured just before promotion.

Group 3. 638 children passing from first grade into second grade, who were also checked just before promotion.

In order to determine whether or not a child had achieved a habit, skill, knowledge, or appreciation, close observation and study of each individual child was necessary. A habit was considered to be properly established when the activity was repeated four or five consecutive days with no transgressions.

A skill was considered achieved when a child showed ability in any given activity in keeping with his stage of development. Knowledge was not difficult to measure with children's free conversation, record summaries, and child study charts for reference. The matter of appreciations were checked by the child's emotional response to specific situations.

Findings. The statistics from the eleven different schools and thirty-three groups were then compiled and the percentages of total number of children in each group having achieved the given habits, skills, etc., were tabulated. In most instances, growth in achievement from that of children of little kindergarten experience to that of children having had both kindergarten and first-grade experience may be noted. The results are summarized in Table 84. As a result of revision, a list of home achievements which may be expected of a child on his entrance to kindergarten is in the process of development.

Note: The committee of Kalamazoo teachers who are carrying on this work expressed some reluctance to have these tentative results published, since they are still being worked over, and a new revision will appear in January, 1925 or soon thereafter. However, upon request, they submitted their findings to the Yearbook with the statement that this is not to be regarded as a finished piece of work, but as a beginning.

TABLE 84. PERCENTAGE OF PUPILS ACHIEVING HEALTH HABITS IN
KALAMAZOO, MICHIGAN

Group I. Percentage of total number of children who upon entering kindergarten had achieved health habits, skills, etc.

Group II. Percentage of total number of children passing into first grade who had achieved health habits, skills, etc.

Group III. Percentage of total number of children passing into second grade who had achieved health habits, skills, etc.

	Group I 519 per cent	Group II 635 per cent	Group III 638 per cent
Number of children			
Habits			
1. Drinks plenty of water.....	48	67	94
2. Eats with mouth closed and does not talk while eating	24	55	48
3. Does not bring candy to school.....	68	53	73
4. Comes to school clean.....	79	84	81
5. Washes hands before eating.....	42	63	76
6. Uses handkerchief properly.....	68	66	78
7. Engages in vigorous activity, out of doors if possible	66	65	88
8. Maintains good posture at all times.....	56	43	64
9. Retains self-possession when hurt or in emergencies	46	61	66
10. Covers sneeze or cough.....	23	51	58
Skills			
1. Makes proper use of drinking apparatus.....	62	82	91
2. Manipulates eating utensils properly during school lunch (bottle or cup).....	36	82	76
3. Is able to wash own hands and face.....	61	72	97
4. Makes proper use of toilet.....	65	83	95
5. Has proper control of body.....	63	70	85
6. Relaxes during rest period.....	46	69	79
7. Retains cheerful demeanor.....	66	74	86
8. Avoids getting wet or cold.....	39	52	69
Knowledge			
1. Plenty of water is necessary to health.....	30	52	99
2. Clean wholesome food is necessary to health..	45	75	93
3. Fast and irregular eating is harmful.....	27	58	80
4. Milk, eggs, cereals, fruits, coarse bread and butter are wholesome foods.....	43	79	94
5. Personal cleanliness is necessary to health....	49	69	81
6. Wholesome exercise is necessary to health....	26	50	75
7. Going to bed early, with windows open, is necessary to good health.....	39	75	88
Appreciation			
1. Enjoys cold pure water.....	67	83	92
2. Enjoys the feeling of cleanliness.....	64	77	82
3. Enjoys exhilaration following wholesome vigorous activity	67	64	94
4. Keenly enjoys fresh air.....	49	55	94

STUDY NO. 5. Payne, E. George. *The measurement of social values—A scale for measuring health.* Chapter XV—Yearbook for the New York City Association for Scientific Study of Education. Yonkers, N. Y. World Book Company. 1924. pp. 160-172.

Purpose. The problem was to devise a scale for measuring not merely what the child knows, but primarily for measuring the extent to which skills, knowledges, and attitudes function in the individual in his social relationships. This study deals with measurement of one group of social values—that is, those related to health.

Method. (a) The first step in the construction of the scale was the determination of the health practices which are essential to the individual's

health. The health régime of the open air school, the literature and experience of experts were the sources from which the tentative list of desirable health practices was compiled.

(b) The next step was to estimate the value to be assigned to each item in the scale. This was first decided upon by judgment of those engaged in health work.

(c) At this point, experimental work began. Three hundred children were selected from the children in elementary and junior high schools. Half of these children were selected from the best conditioned pupils, and half from the worst conditioned. The selection was made by medical inspectors or nurses. The children were examined to determine whether a positive correlation appeared between their practices and their health conditions.

The correlation was marked. Eighty-five per cent of those rated as good or excellent in health by the doctors and nurses were distributed in the upper range of the scale, or received more than 124-178 out of a possible 247-355 points, while a similar proportion of those rated unsatisfactory by these experts ranged in the lower half or below 124-178 points.

(d) Following this preliminary experimentation, the scale was used with fifty thousand school children of the elementary and high schools, with the result that standards of achievement were set up for each grade, and the points were arranged in the light of experience to make a five-hundred point scale. The standard of achievement was determined not by the median, but by the accomplishment of the best conditioned children.

Findings. a. The correlation between health practices and the actual health of the individual is high enough to warrant the conclusion that there was a close relationship between the health practices as outlined in the scale, and the health condition of the children as determined by the medical examination.

b. "The possibilities of measurement of social values of education by use of the health scale are best indicated by the values of its use already appearing from the experiments so far carried out. Some of these are summarized in the following statements from those using the scale:

- (1) "The scale acquaints the pupil with clear, definite concise facts, indicating what practices are essential for health.
- (2) "Because the scale can be scored and the results compared with standards, the scale motivates health instruction.
- (3) "The scale provides a valuable outline for the teacher to follow, and provides her with a standard for judging the health practices of children. It makes her conscious of health needs.
- (4) "Since the emphasis is upon practices, the hygiene work will carry over into the home, resulting in closer cooperation at home and school.
- (5) "The scale turns the attention of the teacher from the immediate school objectives to life's practices, with a general beneficial effect not only on instruction in health, but other instruction as well.

"It is safe to generalize from the experience in the use of the health scale (1) that the methods of measurement may be refined to the point of adequate tests of instruction; (2) that appropriate standards may be set up for guidance, and that similar scales may be constructed which will measure the social results of instruction and provide standards for other social objectives."

STUDY NO. 6. Payne, E. George. *Survey of health needs of San Antonio, Texas, as a basis of the reconstruction of the curriculum in health and safety education.* Unpublished manuscript in possession of author, Professor of Educational Sociology, New York Univ., New York City.

Purpose. The problem was to determine the health and safety needs of children in San Antonio, Texas, as a basis of the requirements of the reconstruction of the curriculum in that city, and insofar as the facts are typical the reconstruction for the whole state in health and safety education.

Method. The method was a survey of three typical schools, each representing a stratum of the population, namely: the negro school, the school for Mexican children, and the school for native-born white children. The method of gathering data was through the use of: (1) the Payne health scale; (2) statements of children as to the food consumed during one day, as a check up against the data gathered from the scale; and (3) teachers' observations. The attempt was made to discover the practices of the children relating to food, air, drink, exercise, sleep, posture, cleanliness, cleanliness of clothing, safety and civic practices.

Findings. The results indicate that a study of an examination of children's needs in health and safety is necessary in any community before the educational process can go on intelligently and profitably. The survey discovered that on the whole the white children showed the best health practices, the Mexicans next, and the negroes, the worst. However, in certain items such as sleep and exercise the needs of the white children were greater than those of either the colored or the Mexican. While it was found that approximately 50 per cent of the children fail to observe health practices necessary to normal growth, both mentally and physically, it is necessary to discover in any particular school, grade, or room which of the children are engaging in unsatisfactory practices and center instruction upon those having different needs. The conclusion from this study is that before education in health and in safety begins, at least the specific needs of children should be determined. So far as any general conclusions may be drawn they are to the effect that the conclusion from any survey of this kind may be used as a starting-point for the determination of the needs of children of other communities, but the needs of any community must be discovered, as they vary greatly. The health practices also vary according to local customs and conditions.

STUDY NO. 7. Strang, Ruth. *A health information test.* To be published in 1925. About 100 pp.

Purpose. To construct a test of general health information and through the test to find out, among other things, what health knowledge children of different grades have acquired.

Method. The test thus far has been given in two New York City schools in grades 3-8 to approximately 350 children and the per cent of correct responses to each exercise has been calculated.

Significance in curriculum construction:

If the tests are given in schools in various parts of the country where good instruction in health has been given, and if the children in a certain grade fail to acquire knowledge of certain facts, this would indicate that these facts are not suitable to the learning capacity of children of that age. This information would give an experimental basis for placing a given fact or group of facts in a certain grade.

A few of the specific facts found to be most difficult for the group tested were:

The common house fly is usually hatched in manure.

Pneumonia is directly caused by bacteria.

Cold baths are good for most people.

The average number of calories in a glass of whole milk is 150.

The gastric juice begins the digestion of meat.

The man who did the most to establish the germ theory of disease was Pasteur.

Protein is needed for building muscle.

In general, the more difficult facts were physiological facts, bacteriological and the technical aspects of an adequate diet, specific knowledge such as the distance away from the eyes one should hold a book and the best temperature for a room.

Some of the facts found to be easiest for this group of children were:

The best food to eat with cereal is milk.

Just before meal time the most important thing to do is to wash hands and face.

At meal time we should sit down at the table and eat slowly.

Fruits and vegetables are good for us because they help keep us well.

The same towel can safely be used by only one person.

A good food to choose for breakfast is hot cereal.

There is less danger of your giving a cold to some one else if you cover your face when coughing and sneezing.

Which do you think is best for a child to drink—coffee, soda, tea, milk, cereal coffee? (to be answered by underlining correct word).

Three good foods to choose for lunch are hot soup, baked potato, and milk.

In general, the easiest facts were a statement of the simple fundamental health habits, a knowledge of which are good foods to choose, and general statements such as fruits are healthful, and "a kitchen should be kept clean."

B. Physical Education Studies

Some of the important questions which the maker of a curriculum in physical education must meet are as follows:

1. Has the "job or community analysis" been applied to the specific situation in order that definite objectives or needs may be revealed?

2. Have all phases of the program been subjected to scientific investigation and selected on their merit instead of being accepted because of traditional use?

3. Does the program fit into the plan of general education in your community, i. e., are they properly correlated and coördinated?

4. Has sufficient time been provided to assure a reasonable achievement of objectives?

5. What plan has been adopted for training the classroom teacher to effectively carry on the program in the elementary school?

6. Is the program of activities well balanced so as to avoid an overabundance of any one particular phase of the work?

7. Has provision been made for after-school activity?

8. Can the objectives be effectively measured?

9. Is the program so constructed as to eliminate the possibility of nervous or muscular strain?

10. Is the program graded in keeping with psychological age interests?

11. Do the activities "lead on" or are they merely "ends in themselves"?

The following research studies have a direct bearing upon curriculum construction in physical education. They are arranged in chronological order.

STUDY NO. 8. Post, L. M. *Grouping children for physical efficiency test.* Reports of the National Committee on Standard Physical Efficiency Tests for Elementary Schools. City and Rural, pp. 10-11.

Purpose. A study of age, grade, weight, and height classification.

Method. The performances of 25,000 boys in eleven athletic events were taken. The height, weight, age and grade were recorded.

Findings. The competition placement of any pupil is best determined by taking his age in months plus two times his weight in pounds. Classification figures will result from this formula.

STUDY NO. 9. Reilly, Frederick J. "A rational classification of boys and girls for athletic competition." *American Physical Education Review* Vol. XXIII, No. 1. January, 1918. pp. 13-14.

Purpose. To provide a rational classification for boys and girls in elementary school athletics. Each pupil to be classified according to an exponent derived by adding his age, grade, height, and weight. After being placed in a respective group he is encouraged to strive for individual proficiency toward a standard, arbitrarily set up for his respective group, and by means of averaging group scores to compete with all other groups. The grades included are 5A, 5B, 6A, 6B, 7A, 7B, 8A, and 8B. These are divided into two divisions, Juniors, 5A to 6B, and Seniors, 7A to 8B.

Method. a. In fifteen minutes it was possible to classify a class of forty pupils, by adding the age, grade, height, and weight of each pupil.

b. This determines the pupils' classification for the ensuing year.

c. A system of handicaps was arbitrarily established based on classification.

d. Following several years of practice a system of standards for each event has been arranged for boys and girls. These standards are not fixed but are changeable. The object is always to keep them practically within reach of all, yet high enough to serve as an incentive to the best.

e. In all activities there is a maximum beyond which no credit is given. With the full program the total number of points attainable is 200.

Findings. a. There is little difference in the distribution of height and weight between the sexes in the last four years of the elementary school.

b. Mr. Reilly believes that the absolute satisfaction of the pupils after many months of extensive competition is conclusive proof that the scheme is fundamentally correct.

STUDY NO. 10. McCloy, C. H. "Comparison of athletic activities." *American Physical Education Review*, Vol. XXVI, pp. 1-13, 1921.

Purpose. To derive a statistical and mathematical method of devising athletic scoring tables.

Method. By means of athletic almanacs for the last ten years, Mr. McCloy plotted data for all meets. The pound probability curve was smoothed by arithmetical means. Likewise, a standard deviation curve was plotted. Tables have been worked out showing the amount of kinetic energy used in running, jumping, etc., according to velocity. Through algebraic expressions he determined the formula of the curve.

Findings. Only 270 individuals out of one million fell out of the range of the curve.

STUDY NO. 11. Williams, Jesse Feiring; Atkinson, Ruth V.; and Brace, David K. "A comparison of formal gymnastics and play." *Teachers College Record*, Volume XXIII, pp. 327-360. 1922.

Purpose. A comparative study of the relative value of formal gymnastics and play for fourth grade pupils.

Method. Two fourth grade-classes of equal ratings were selected. One class received instruction in formal gymnastics and the other in a program of play and games. They were tested in October and again in May in posture, skill, alertness, and obedience. Later, statistics were obtained regarding weight, height, girth of chest, strength of right and left forearm, and lung capacity. A highly trained supervisor, skilled in both types of work, taught both classes throughout.

Findings. The results showed that the Play Group made greater progress in all points except the thrusting test with wooden foil, which was one of the tests of skill.

STUDY NO. 12. Judelsohn, Samuel J. *The comparative ability of mentally retarded and normal children in track and field work.* Division of Physical Education, Board of Public Education, Philadelphia, Pa.

Purpose. a. What are the results, in actual measurements, of the participation of the mentally retarded child in this type of work?

b. How does the mentally retarded child compare with the normal child in track and field ability?

Method. The records of 1524 mentally retarded boys and of 638 mentally retarded girls were gathered, using the four standard events—standing broad jump, ball throw overhead, 50 yard dash, and chinning for boys and knee raising for girls. The schools involved were 8 concentration centres, where each child receives a daily 30- or 40-minute period in the gymnasium. The performances in each event were recorded monthly and the best record during the school term was used in the investigation.

To make the comparison with normal children the records of 1210 boys and 814 girls were secured under conditions, as far as was possible, the same as those in the special concentration centres; i.e., time allotment, equipment, type of teacher, play space, etc.

From the data secured three sets of tables were formed—one set based upon age, one upon height, and one upon weight. Results were tabulated on the basis of average performance and on the basis of 70 per cent passing performance. (The latter being the point on the distribution table which, if set as an aim, 70 per cent of those measured would pass.)

Findings. As far as the data in this investigation shows, the following conclusions may be drawn:

a. Mentally retarded boys are shorter in height and lighter in weight than normal boys; the girls are shorter in all ages and lighter up to the age of 12, but are about same weight as the normal girls from 13 to 15.

b. Mentally retarded boys jump and throw farther and run faster than mentally retarded girls.

c. Mentally retarded boys are from one and a half to three years lower in average performance than normal boys in the four events used; mentally retarded girls are from two to seven years lower than normal girls.

d. Ability in track and field events should be taken into consideration as one index of the physical age of the child.

These findings are significant in adjusting the physical education curriculum to individual needs.

SECTION II. RELATIONSHIP OF OTHER KINDS OF RESEARCH TO CURRICULUM CONSTRUCTION IN THE FIELDS OF HEALTH AND PHYSICAL EDUCATION

Educational researches in the fields of health and physical education are very limited and represent only a beginning of the studies and carefully conducted experiments which are requisite for any adequate basis for the makers of curricula in these subjects. Many types of research must be carried on before the activities in these fields can be placed on a firmly scientific basis. There are already available, however, the results of research studies which, while they do not deal directly with curriculum

construction, nevertheless have an important bearing upon that task. The attention of those who are making curricula in these fields is called to the importance of the following kinds of research:

A. *Growth studies.* Studies which attempt to ascertain standards of normal growth and development have significantly influenced the content of courses of study in health and physical education by the fact that they set up objective standards of achievement, both for pupil and teacher.

The "Revised Weight-Height-Age Tables" of Bird T. Baldwin, and Thomas D. Wood, are widely used. They were published by the American Child Health Association in a pamphlet issued in 1923.

Similarly, studies which seek to discover whether there are correlations between physical and mental achievement, or between height-weight and school classification, have an indirect bearing upon curriculum making, especially in connection with the tendency to place pupils of the same grade in school in x, y, z groups according to the rapidity with which it is presumed that they will advance in their studies.

The replies to the inquiries of this subcommittee indicate that there is a relatively large amount of research being carried on in studying the relationships of physical condition and mental achievement.

B. *Laboratory research.* The accuracy of much of the subject matter in health and physical education has been or should be ascertained through laboratory research in physiology, physics, biochemistry, bacteriology, nutrition, etc. For example, the discoveries concerning vitamins within ten years have radically changed teaching regarding selection of foods. The investigation of the New York Commission for the Study of Ventilation has changed our teaching about proper heating and ventilating, and has thrown doubt upon some points hitherto unquestioned.

C. *Nutrition class experiments.* Nutrition class experiments, usually give more guidance in problems of supervision and administration, coöperation with the home and methods of efficiently reducing malnutrition than in curriculum construction, but they point to certain principles in selection of subject matter, as illustrated in Study No. 2, reported in preceding pages.

D. *Health supervision studies.* One of the generally accepted though not practiced principles in health and physical education is that the activities of the course of study should be adapted to the needs of individual children as well as to the groups as a whole. The health examination is one of the most reliable ways of ascertaining individual needs, and health examination records of a class should be consulted as one source of guidance in directing classroom activities in health education. Studies made as to the best ways of making and recording health examinations therefore have an indirect bearing upon the course of study.

E. *Dental education studies.* Experience with dental education over a period of ten years in Bridgeport, Connecticut, gives evidence that classroom education is an effective method in reducing the number of children

who have defective teeth, thus justifying the inclusion of mouth hygiene in the course of study.

F. *Hygiene of the school plant.* Research in this field has an indirect bearing upon course of study activities. For example, what we teach regarding open window or open air rooms, may be either supported or contradicted by actual school room conditions. There is still doubt regarding the best procedure in many instances; more research is needed here.

G. *Hygiene of instruction.* Very little conclusive research exists in this field, but whatever study has been made, affects our procedure with regard to formation of healthful mental habits of work, study, social relationships, control of emotions in classroom, instruction, etc. These mental habits, while not a part of a formal course of study are an extremely important factor in health education.

Incompleted Studies, Reports of Which Are Not Yet Available

The Subcommittee has received notices of the following studies, related to curriculum construction in health and physical education, which are not yet completed, but which will for the most part, be completed within a year. A list of these studies follows:

Berry, Elmer. *Ethical content in physical education*—now in preparation as graduate thesis at Harvard.

Brim, Orville G. Ohio State University. *A survey of health conditions, personal and family habits and attitudes in certain rural communities in eight counties in Ohio.*

Cairns, Laura. *Critical study of content of health education in secondary schools*, with regard to its adequacy in dealing with the chief causes of mortality, morbidity, and disability. To be presented in fulfillment of requirements for the degree of Doctor of Education, at Univ. of California,—probably to be completed in June, 1925.

Child health demonstrations are now being carried on in Joliet, Ill., Fargo, N. Dak. and Athens, Ga., which include health and physical education programs, but reports are not yet available. Findings will be published by Commonwealth Fund and American Child Health Association.

Cook, Inez M. *Physical development and academic achievement.* Unpublished thesis for M. A. degree, Univ. of Nebraska.

Department of Medical Inspection, Trenton Public Schools. *Relation of physical defects and progress in school.* To be published in July, 1925.

Goodrich, I. V., Director of standard tests, Public Schools, Lincoln, Nebraska. *Relation Between Extreme Underweight and School Work.*

Hetherington, Clark W. (Under auspices of the State Charities Aid Association and the Milbank Memorial Fund.) *Experimental development of a school program in teaching health.*

Psychology of teaching health. A special research program with children and teachers in New York City with cooperation of workers in other cities.

McCurdy, James Huff. International Y. M. C. A. College, Springfield, Mass. *Research on motivation of physical education.* Now in progress.

Norton, H. J. Director of Health Education, Public Schools, Rochester, New York. *Results of four years of nutrition class work.* To be published in 1925.

Rowe, Floyd A. Department of Physical Welfare, Cleveland Public Schools, Cleveland, Ohio. *Study of needs of entire field in physical welfare in Cleveland for the formulation of a course of study.*

Turner, C. E. Professor of Public Health, Massachusetts Institute of Technology.

a. *Development of methods of health education into a unified program for all ages.*

b. *Measure of health improvement resulting from health education program.*

Wolfe, Katherine K., M.D. *Effect of a nutritional program on physical and mental improvement of underweight children.* Lincoln, Nebraska.

SECTION III. SUMMARY

A. General Summary of Trend of Research Findings in Health Education

1. A survey of the local community health needs and of the health needs of individual children is the most valid basis for the construction of the curriculum in health education. The submission of a questionnaire to the pupils themselves, at the beginning of the year, gives information to the teacher which is helpful in placing the emphasis where it is most needed.

2. It is necessary for the school, the home and the community to cooperate if the health education program of the school is to be effective.

3. The tendency in health education is to measure and evaluate results in terms of its effectiveness in solving the actual health problems of the individual and the community rather than in terms of knowledge alone. Study No. 5 reports the construction of a scale based upon this principle and states that the use of such a scale "turns the attention of the teacher from the immediate school objectives to life practices, with great benefit not only on instruction in health, but other instruction as well."

The acceptance of the criterion of social utility makes a profound change in the presentation of subject matter as well as in the measurements of results.

This is not indicated in any of the research studies reported, but is very apparent in courses of study in which an attempt is made to limit subject matter to the materials which boys and girls can actually use in life. Several such courses of study were brought to the attention of this committee, but have not been indicated in this report, since they do not represent the results of controlled research although they are the outcome of extensive and scholarly work.

4. Although the final measurement of health education values consists in evaluation of its usefulness in solution of health problems, it is also necessary to devise measures of the informational or knowledge aspects of the health education program. Health information tests should be made and tried out to give an experimental basis for placing information in suitable grades. One such test has been constructed.

5. Available research does not enable the committee to make a definite statement regarding standards of achievement for any grade.

Study No. 4 indicates that achievements in health habits, skills, knowledge, and appreciations, show appreciable growth from entrance into kindergarten till the time of completing the first grade. More extensive studies along the same line are needed before minimum standards of achievement can be set up.

6. The subject matter of health education should not emphasize the value of health as an end in itself so much as the value of health as a means to accomplishing interesting and worth-while things. With elementary school children the emphasis should be on the relationship of health to the activities of the immediate present rather than the distant future.

Note.—Although so little actual research is available in the field of health education, a considerable body of experience points to certain principles which are generally accepted as sound. A discussion of these principles falls outside the scope of this report. The most recent and comprehensive discussion of them is to be found in the report on "Health Education" of the Joint Committee on Health Problems of the National Education Association and American Medical Association, "A Program for Public Schools and Teacher Training Institutions," published in June, 1924, and available from the National Education Association headquarters at Washington.

B. General Summary of Trend of Research Findings in Physical Education

The research studies in physical education point out several definite factors which should be carefully considered in a program of curriculum construction. They are as follows:

a. A study of age, grade, weight, and height is suggested as a satisfactory means of classifying students for physical education activities.

b. The use of a four-point classification (age, grade, height, and weight) has proven a satisfactory means of grouping high school boys for inter-scholastic athletics.

c. The relationship of physical efficiency may be a potent factor in adjusting pupils to the correct grade placement.

d. One study points out that a child's physical ability and development should be considered in classifying him as to acceleration or retardation in school progress.

e. An experiment shows that play is more effective than formal exercise as a means of reaching the objectives laid down in a physical education program.

f. Group competition is desirable whenever possible for two chief reasons:

1. It stimulates pupils to increase their individual achievement.

2. It is socially effective in that the individual is urged to greater self realization in keeping with the best group interests.

g. Little difference exists between height and weight between the sexes in the last four years of elementary school.

h. The amount of kinetic energy used in running, jumping, etc. has been calculated. From data thus obtained it has been found that only 270 individuals out of one million tested, fell out of the distribution curve.

i. A plan has been evaluated which is physiologically sound whereby basketball tournaments may be conducted, limiting the physical strain of the contesting athletes.

j. A plan has been evolved for grouping physically defective high school pupils into similar groups for corrective work.

k. Underweight causes a lessening of motor efficiency, equivalent to from one half to one year of retardation.

1. A study of mentally retarded pupils yielded the following interesting results:

1. Mentally retarded boys are shorter in height and lighter in weight than normal boys. The girls are shorter in all ages and lighter up to the age of 12, but are about the same weight as normal girls from 13 to 15 years.

2. Mentally retarded boys jump and throw farther and run faster than mentally retarded girls.

3. Mentally retarded boys are from $1\frac{1}{2}$ to 3 years lower in average performance than normal boys in the four events (standing broad jump, ball throw overhead, 50 yard dash and chinning for boys and knee raising for girls). Mentally retarded girls are from 2 to 7 years lower than normal girls.

CHAPTER XI

HOME ECONOMICS

Henrietta W. Calvin, Director, Division of Home Economics, Board of Public Education, Philadelphia, Pennsylvania, Chairman

Major Problems in the Formation of the Curriculum in Home Economics

What emphasis should be placed on the knowledge of textile fabrics; color harmonies; hygiene of clothing; relation of foods to health; and of the effect of cleanliness of person, dwelling, and surroundings upon health?

To what extent should manipulative skill be stressed?

For what coördination with English, arithmetic, geography, and civics, should the home economics curriculum provide?

Are results most satisfactory when the home economics curriculum consists of short intensive units?

Should projects selected in home economics be of a type that can be completed before the interest of the pupil wanes?

Since home economics should contribute to home helpfulness and the formation of health habits, to what extent should the curriculum be based upon home experiences?

To what extent should curriculum modifications be encouraged in order that the school activities in home economics may be varied to meet the different social and economic needs in the different sections of the larger cities?

To what extent should home projects be included in the curriculum?

To what extent should the home economics curriculum be modified to meet the needs of the overaged or subnormal girl?

What time allotment is essential to adequate instruction in home economics, recognizing as we must, that the curriculum is affected by the time set aside for such instruction?

RESEARCH STUDIES IN HOME ECONOMICS EDUCATION IN GRADES 1 TO 6

STUDY NO. 1. Trilling, Mabel Barbara, Miller, Ethelwyn, and others. *Home economics in American schools*. Supplementary Educational Monographs. Department of Education, Univ. of Chicago, 1920. pp. 122.

Purpose. To report the findings of a survey of the status of home economics in public schools of the United States, as a basis for helping to determine the curriculum in elementary and secondary schools.

Method. Question blanks were sent to 300 cities including two in every state, to discover subjects taught in home economics and the books influencing the curriculum. An analysis was made of these courses of study and of the text and reference books found to be most commonly used. A study was also made of the literature dealing with home economics in search of objectives. In addition the report gives the preliminary organization of

tests in measuring skill in machine sewing and content and reasoning tests in textiles and clothing.

Findings. A. There is a dearth of adequate elementary school material evidenced by the fact that certain books written for the high school and college are being used as texts and reference books in the grades. Only 15 per cent of the elementary schools are using texts; 21 per cent reference books. The textbooks used are stressing the acquisition of information and skill with little consideration given to the development of power and judgment.

B. Emphasis in the elementary school is placed on the technical processes involved in food preparation and clothing construction with insufficient consideration given to other important phases of home economic work.

C. There is little evidence of a continuous course of study in the grades suited to the various stages of growth of children. This is shown (a) by the general practice of introducing into the schools in the early grades the study of clothing construction, deferring the work in food for two or more years, (b) by the fact that courses are not arranged on the basis of increasing difficulty to the learner, (c) by the custom of introducing hand sewing into the grades previous to machine sewing. In 14 per cent of the schools the teaching of machine sewing is not mentioned.

D. The preliminary use of educational tests shows their value in helping to establish minimal essentials and in developing a critical attitude toward the curriculum. It seems safe to predict that the use of the scale for measuring machine sewing will lead to the setting of definite standards of attainment, will give the inexperienced teacher a definite guide and will be a means of diagnosing difficulties in machine sewing.

STUDY NO. 2. Trilling, Mabel Barbara. *A study of objectives in the teaching of textiles*. Thesis for Master's degree. Unpublished, 1923, 90 pp. University of Chicago Library.

Purpose. The purpose of this study is to offer a contribution toward helping to determine the important topics that should be included in textile courses in typical public schools.

Method. The material has been obtained from two sources: (a) Facts have been collected from consumers regarding the information they desire when purchasing textiles. The method used was to observe consumers when shopping and to record the questions they ask of salespersons regarding the qualities and facts they desire to know about the materials purchased. (b) Material has been obtained from an analysis of twelve of the textile books most commonly used in the public schools; this study is based on the assumption that the problems possessing sufficient value to be included in the school curriculum are to be found in textbooks.

Findings. 1. The study shows that there is sufficient social need for textile information to warrant more time being devoted to this phase of home economics than is at present being given in the majority of elementary and secondary schools.

2. The qualities demanded in fabrics by consumers when in agreement with the facts emphasized by experts may profitably be used to formulate minimal essentials for a beginning course in textiles in the public schools. Such material is:

- (1) Knowledge of *fibers*; kinds and properties
- (2) A study of *yarns*
- (3) Simple processes of *cloth construction*, such as spinning and weaving
- (4) *Finishing* processes
- (5) *Imitations* and *substitutions*
- (6) Simple methods of *dyeing*
- (7) Simple *physical* and *chemical tests*
- (8) Study of *fabrics* and how to use them
- (9) *Hygienic* aspects of clothing

3. Those topics which recent books are showing a tendency to eliminate, and which have received no emphasis by consumers should be given little emphasis in school courses. Such material is:

- (1) Historical data
- (2) Detailed technical study of spinning, weaving, and other processes of construction
- (3) Too detailed study of certain finishing processes, such as bleaching and dyeing
- (4) Emphasis on botanical aspects of fibers

4. There is a body of material included under the topic economics of clothing which has received almost no consideration from consumers of textiles but which has been given certain emphasis in textbooks. It is suggested that a study of the material be continued in textile classes, the emphasis given to this material to be determined through further studies. Certain typical problems are: Clothing budgets, pure fabric laws, standardization of styles in fabrics and garments, responsibility of consumers for certain labor conditions, and ethics of shopping.

5. It is apparent that important contributions for establishing textile objectives are obtained from each of these studies; neither can be used as the sole source of material, but each should be supplemented by material of the other.

STUDY NO. 3. Williams, Florence. *Standards of attainments for ability in machine sewing.* Master's thesis. University of Chicago Library, Chicago, Ill., 1922.

Purpose. It is the purpose of this investigation (1) to further in a small degree the scientific measurement of achievement in home economics education; (2) to set up standards of attainment in machine sewing for different grades and ages.

Method. A large number of samples of machine-made hems and French seams, 3117 in all, averaging 300 to the grade, were collected from different school systems in 11 different cities under as carefully controlled conditions as possible. The samples were scored on the Knapp and Wil-

liams scale. This is a scale for measuring ability in machine sewing. It consists of photographic reproductions of samples of machine-made hems and French seams. The scale is analytic in character. Five factors which contribute to a well made French seam or hem are judged separately, and the scale shows three different qualities for each factor. A reproduction of the scale can be found in the University of Chicago Educational Monograph Home Economics in American Schools, Mabel Trilling and others. Each sample was judged separately for each of the five factors. Next the average score for each sample was found. The samples were scored for standards of attainment for both different grades and different ages.

Findings. 1. Only a small number of samples were obtained from the fifth grade. The average score for both the French seam and the hem was low. Because of the small number scored it is impossible to determine whether the score is significant or not. If such a low score had been obtained from a large number of samples it would indicate that fifth-grade children could not be expected to attain much skill in machine sewing.

2. There is a steady rate of increase in ability shown in the average scores for the different grades.

3. It is interesting to note that the increase in ability for the different ages is not so steady as in the standard of attainment for the different grades. The range of scores in the different grades is almost the same for every grade.

STUDY NO. 4. Winchell, Florence E. *How can household arts teaching be made more effective?* Lincoln School of Teachers Colleges, New York City, 1923. 24 p.

"Results of a study made through personal interviews with nineteen women who formerly taught household arts in elementary and secondary schools and are now married and in their own homes."

Fourteen definite questions were asked, such as: Does it still seem to you that there is a logical sequence which you would always follow in presenting household arts subjects? What specific education for boys do you recommend that would make their attitude in the home better, and woman's work in the home easier? Where have you felt weaknesses in your training, etc.? The answers were tabulated descriptively.

The most important conclusion was that household arts teachers be urged to "give the weight of their influence to the establishment of ideals of simple and systematic housekeeping that may free the homemaker for the educational and recreational phases of her family life."

Other summaries were: (1) Need of early home training of both boys and girls; (2) food interest the most vital to family; (3) insufficient preparation among homemakers for child care; (4) interest, a child factor in elementary school home economics subject matter; and (5) accuracy advantageous, but it is possible for home economics teachers to overemphasize precision in processes.

STUDY NO. 5. Harap, Henry. *The education of the consumer: a study in curriculum material.* Macmillan, 1924. 360 pp.

"A study in curriculum material; analysis for educational guidance of the elements of an effective relation between man and his economic environment as it expresses itself in the consumption of food, shelter, fuel, and clothing."

This study compares the actual present economic habits of our nation with approved standards of consumption in the light of reliable standards of living.

The studies used in collecting materials were direct surveys of habits of people, statistical reports, and data obtained from many sources. The conclusions reached were essentially those of objectives concerned with the acquisition of information, development of habits, and development of attitudes which give approval or disapproval of economic conditions and proposals. The question is raised, Can economic habits be modified?

The definite objectives set up for the social significance of food, clothing, shelter, etc., are of distinct value to all home economics teachers. The study as a whole suggests the need for home economics materials to be in line with actual conditions of life as they are found in American homes today. See review of this study on page 269 and on page 334.

STUDY NO. 6. Fulton, Lucy. *Home economics materials in the elementary curriculum.* Teachers College, Columbia Univ., Office of Research in Household Arts Education, 1924.

The problem as stated was what are the trends or evolutionary tendencies in regard to home economics materials offered in the elementary curriculum (grades one to six)? It was assumed the evolutionary tendencies could be seen in field practices shown in printed courses of study, in reported practices, and by theories as expressed in the best thinking.

The data were collected from courses of study of one hundred cities of varying types, superintendents' reports, and special school programs. The validity of this is being checked by previous studies and the theories of general educators, specialists, and reviews of selected judges.

The conclusions reached are of value in three ways: (1) They are suggestive to general grade teachers; (2) they serve as basic materials for grade home economics tests; and (3) they afford a clarification of home economics' share in the elementary curriculum.

Tabulated data of this study were not quite complete at the time this report was made but will be available in the near future.

STUDY NO. 7. Roman, Mata. *A study to determine the extent to which the food work with fifth grade children functions in their daily living.* Elementary School, University of Chicago. In progress.

Both boys and girls of the fifth and sixth grades of the University of Chicago elementary school have work in foods. The real purpose of the work is to teach children to select their own food wisely. A study has

been undertaken to determine what the children need to be taught and to what extent the children's practices are influenced by the food lessons.

Method. At the beginning of the year the teacher has a private conference with each child during which they make a record of the child's likes, dislikes, prejudices, and all available facts about his present diet. This is supplemented by information gained from the mothers at a group meeting at which the purposes and methods are explained. The course is planned to meet the needs as found. After the end of the course a second record will be taken and findings compared with the first. In order to check the permanency of results, records will again be obtained at the end of the year for comparison.

It is planned to continue this study with similar groups for several years and to adapt subject matter and methods to suit the needs as revealed by the study.

STUDY NO. 8. Robertson, Annie L. *Basic study of home economics educational problems.* Teachers College, Columbia Univ., Office of Research in Household Arts Education (typewritten form), 1924.

An attempt to discover the "trend of the times" and to secure a working organization on which to base later research—the major purpose was to bring together a program of coöperative thinking and to take cognizance of the field condition. If home economics educational research is to assist course-of-study makers and curriculum thinkers, then studies made should show up facts and figures relative to the problems or in other terms, shortages in the field.

An objective study was made through interviews and reviews of published writings. The definite question put in the interviews or considered in the reading was "What do you consider some of the outstanding or most insistent problems in public school home economics?" Not more than five problems were recorded from one person. The question was asked of selected personnel from the following groups: (1) General educators and administrators, (2) home economics teachers and supervisors, (3) mothers and homemakers, (4) social thinking laymen, and (5) social workers.

Three hundred and fifty problem assertions were obtained, analyzed, filed, and charted. Problems of curriculum materials, child learnings, and instruction were most frequent. The chart "showed-up" the field with its present ills needing diagnostic treatment. The study was not considered finished. It should be carried on to approximately one thousand statements so that the frequency study could be of more value.

Home economics in the elementary school: A professional group study.

For more than a year the household arts group of Teachers College, Columbia University, have been meeting, discussing home economics in the various school levels. The conclusions of this group study have been put into form for the elementary school as they relate to (1) purposes, (2)

organization of work, (3) methods of study, (4) outcomes, (5) relationships to other subjects, as follows:

1. Purposes of the work stated with reference to several supplementary bases:

A. Purposes stated in terms of social or practical objectives

a. The consumer purposes

- (1) Health-usage as affected by habits and by meaningful information.
- (2) Economic selection with reference to values in terms of both need and cost.
- (3) Art, or aesthetic selection with reference to qualities of beauty.

b. The citizenship purposes

- (1) Social control regulations with reference to conditions and practices which can be had only by coöperation—problems of health, exploitation, economy, and art.
- (2) Social aspects of personal and family problems relative to food, clothing, and shelter.

c. The occupational participating purposes—home-participation by helping with:

- (1) Food—preparation and service, and care of utensils and implements
- (2) Clothing—care, laundering, and simple repair.
- (3) Housekeeping—bed-making, care of rooms, arrangement and care of furnishings, care of floors, walls, doors and windows.
- (4) Home upkeep—simple repairs of woodwork, furniture, doors, locks, windows, screens, curtain and shade rods and rollers, picture frames, heating plant, plumbing, lighting systems and labor-saving devices and implements, both indoors and outdoors.
- (5) Child care—simple kinds of care relative to the health and happiness of young children.
- (6) Recreation—social life of the home and entertainment of guests.

B. Purposes stated in terms of psychological objectives

- a. The formation of good habits relative to the use of food and clothing and to participation in home life generally.
- b. The development of intelligence and insight relative to the production and usage of food, clothing and shelter materials, and of the simpler social or citizenship problems connected with them.
- c. The development of critical judgment for the selection of food, clothing and shelter materials with reference to standards of value in health, economy, and art.
- d. The development of an appreciation of, or a liking for, that which is aesthetically of fine quality.
- e. The development of that general dexterity in the manipulation of materials, tools, and machines connected with the upkeep of the home which should be common to all boys and girls of twelve years of age.

2. *Organization of the work.* The work should be distributed throughout the elementary school from the first grade on the basis of capacity in relationship to interests and needs. Some work in each year for each aspect of the whole subject of home life will contribute to the development of habits, intelligence, appreciations, and interests.

3. *Methods of study.* Investigative activities, frequently initiated by manipulative or constructive work, and very generally carried forward by

its use, constitute the more significant elements of method. Excursions, readings, home participation and exhibits should all be used. The hand work is a means to clarify ideas, to aid in experiments, and to express original ideas of design or planning in concrete form. Hand work has its maximum value for growth in both practical efficiency and character when it is employed in achieving some worth-while purpose.

4. *Outcomes.* Outcomes for the elementary school period for each respective grade should be stated in specific detail as a means of evaluating the work. This is a problem not yet adequately solved.

5. *Relationships to other subjects.* As the life problems included in other subjects largely grow out of the practical arts needs, the work in household arts will incorporate many elements from both biological and physical science, from mathematics, from design, from industrial and commercial geography, and from history. Many of the elements of these subjects find their most common applications and uses in the problems of household arts.

STUDY NO. 9. Rose, Mary Swartz. *Food lessons for nutrition classes.* Teachers College Bureau of Publications, Columbia University, New York City, 1921. 26 p.

A series of food lessons for children from eight to ten years old. These are the results of experiments conducted by students of nutrition at Teachers College in a nutrition centre and Public School No. 43.

The purpose was to determine the most suitable subject-matter and the best way of presenting it. The material was especially serviceable to the nutrition teacher.

Summary of Findings

That home economics is usually limited to the upper two grades—i. e., the fifth and sixth grades.

That home economics instruction in elementary schools is often narrowed down to include sewing only, whereas all phases of home life should be represented to the extent justified by the intelligence, interests, and abilities of the child of a given age or grade.

That hand-work is over-emphasized and projects selected are not arranged so as to insure progressive knowledge and skill.

That ability in home economics work progresses with grade rather than with advance in age.

That home economics instruction should be in line with actual conditions of life as they are found in American homes today.

There have been few research studies in home economics in elementary schools. In part this is the result of a lack of interest in elementary school problems by those in colleges and universities directing research projects. So great has been the demand for high school home economics teachers and so small has been the supply of well-trained women that the higher institutions of learning have interested themselves in high school problems only.

There are relatively few textbooks in home economics adapted to elementary school work.

Since home economics instruction must be based, to some extent, on climatic, economic, and social conditions and since these vary so greatly in the different sections of the United States, it has been difficult for any textbook writer to include material universally adaptable.

CHAPTER XII

INDUSTRIAL ARTS

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Major Problems in the Formation of the Curriculum in Industrial Arts

How far should a course in industrial arts emphasize the cultivation of appreciation in art, in motor skill, or both?

To what degree should a project in industrial arts be selected because of its life values? Because of its value to develop skill?

Shall a separate course of study in industrial arts be set up?

How far should a course in the common elements of industrial arts serve for an entire city rather than units within a city.

To what extent shall the varying and transient interests of children dictate the content of the industrial arts course?

To what extent should the selection of subject matter in industrial arts be determined by the needs of the consumer in after life?

In a school of limited resources should the course of study provide for industrial arts, music, etc., as well as the fundamentals?

What responsibility and obligations shall the general supervisor, such as the assistant superintendent, principal, or primary supervisor, have in the organization of the course of study in industrial arts, and in determining the content of the course?

To what extent should home conditions serve as one basis of content in the the course of study in industrial arts?

Should the subject matter for boys and girls be identical? If so, up to what time? Where should differentiation begin and what should be the nature of it?

What attention should be given to methods of teaching in the making of a course of study in industrial arts?

To what extent should standards be developed to test motor skill in industrial arts?

Review of Research Studies in Industrial Arts

STUDY NO. 1. Kent, Ernest B. *The constructive interests of children.* New York, Bureau of Publications, Teachers College, Columbia Univ., 1903. 78 pp.

This is probably the first attempt to obtain a really scientific basis for selecting constructive work for the elementary school. The purpose of the study was to find the natural constructive interests of children by ascertaining what kinds of constructive projects they made voluntarily outside of school.

The data were obtained by asking children to write, on a blank provided, answers to questions covering: Articles made voluntarily outside of school

during the preceding twelve months; for what purpose they were made; and for whom they were made. Answers were obtained and used from 148 children, 63 boys and 85 girls, of from eight to fifteen years of age, in the Horace Mann and Ethical Culture Schools of New York City.

From the study of results, the objects reported were classified as to materials used, kinds of projects as to use, and for whom made. Age and sex differences were noted.

For the average boy, about half of the projects are those used in play, and about three-tenths for real use—two-tenths as gifts, and one-tenth for his own use. For the girls, dolls and toys relating to dolls are the dominant motives for voluntary constructive projects, with the gift interest second.

The study includes also the kinds of constructive activities and interests reported by 72 talented engineers as they remembered their years of boyhood between eight and sixteen. Comparisons are made with the results obtained from the school boys. The selected group of engineers show from their remembered interests somewhat more constructive activity in mechanical projects than the school boys.

In this brief note, mention can not be made of the numerous interesting points and the suggestive questions raised by the study. The number of children was too small and the limitations of environment too great to permit of generalizations from the investigation. But it is of interest as a pioneer study, using a method which, with the refinements since developed, may be, and is, profitably employed today. The author recognizes fully that voluntary interests, as expressed outside of school are but one factor in determining kinds of industrial arts work. They do represent one factor and an important one—how important, the study does not reveal.

STUDY NO. 2. Edgerton, Alonson H. *Industrial arts in our elementary schools*. Peoria, Ill., The Manual Arts Press, 1922. 31 pp.

This study reviews the industrial arts work in 141 city public school systems, distributed among nineteen states, in 1920-1921. The material is presented in three parts, treating respectively of: (1) The purposes and content of industrial arts; (2) the relationships of industrial arts to other subjects; and (3) methods of presenting industrial arts units of study.

The Purposes and Content of Industrial Arts

The chief reasons reported for offering industrial arts instruction in the first six grades were as follows:

1. To give a basis for judgment in the selection and use of industrial products and service. (This reason was given by 51 cities.)
2. To develop an appreciation for the economic and social phases of industry. (This reason was given by 39 cities.)
3. To offer sufficient experience in industrial processes to meet the pupil's needs and to illustrate the industry. (This reason was given by 32 cities.)
4. To vitalize geography, history, arithmetic, oral and written expression, and other subjects of the curriculum. (This reason was given by 19 cities.)

"Although it was discovered that a few of these claims were expressions of future plans rather than the present status and conduct of the work, nevertheless, only about six per cent of these public school systems have made practically no change in the methods of organizing and conducting their elementary industrial work during the past few years Over eighty per cent show every evidence of having undergone desirable reorganization in methods and procedure."

The newer organization tends to abandon the separate lines of work under the terms, manual training, domestic science, domestic art, and some phases of drawing and design, and to combine all studies of processes and values of materials under the one term, industrial arts, for the first six grades. Defining the subject as "the study of the changes made by man in materials to increase their values for usage," the emphasis is changed from that of mere manipulation of materials and tools to a study of values for the selection and use of products, using hand work as a means and not alone as an end in itself. The work centers about the needs of everyday life in selecting and using the products of the industries with reference to health, economy, art, and social values, leaving training in productive skills to vocational education. Much hand-work is used in developing these values and in promoting the growth of general dexterity. Comparative data for the 141 school systems offering instruction in each type of work, indicate that the greatest emphasis is upon studies of: (1) Shelter and furniture, (2) textiles and clothing, and (3) foods and allied activities. Only five and eight-tenths per cent of the 141 cities give hand work, as such. One descriptive type study of an industrial arts unit for each of the six grades is given to illustrate the meaning of the study as organized to represent educational values.

The Relationship of Industrial Arts to Other Subjects

The intimate relationships of industrial arts to other subjects are discussed in the report, and illustrations of their profitable use are included. There is found, however, great variation in practice—from practically no use of relationships to very extended use of them. The study includes a report of the methods used by 352 grade and special teachers to utilize the relationships of industrial arts work and English. Eleven descriptive accounts of typically good units of work showing profitable correlation are given. The values in saving time, simplifying instruction, and enriching experience as shown by these examples are briefly summarized and discussed.

Methods of Presenting Units of Study for Industrial Arts

The merits of the project method as against the assignment of a fixed series of exercises are summarized from the reports of teachers. Of the 141 school systems, approximately 91 per cent of the special and grade teachers reporting favored the use of the project method in presenting industrial arts work. Perhaps there is no other subject in which the use of the project

method seems so immediately natural. Twelve illustrative projects in industrial arts are included from among reports by teachers.

About 41 per cent of the schools reporting offer all work in common for boys and girls through the first six grades; about 29 per cent offer separate courses in the sixth grade; and about 22 per cent begin differentiating the work for boys and girls in the fifth grade. Only seven per cent make any differentiation for boys and girls below the fifth grade.

In a brief summary, it is stated that, "Over two-thirds of the special teachers and supervisors questioned agree with a large number of classroom teachers that, in general, the attendant skill and the related information acquired through the elementary school period are to be justified mainly by resulting growth in thinking power and industrial intelligence." They are convinced that the work "will help pupils to establish those habits and attitudes that contribute most to their daily conduct as intelligent consumers and citizens."

The report is compactly organized, and, with its 29 illustrative units of industrial arts work reported from the practice of teachers in various grades, it is suggestive to both curriculum makers and teachers.

STUDY NO. 3. National Education Association. "The elementary school curriculum," *Second Yearbook*, Department of Superintendence, Washington, D. C., 1924, pp. 139-172.

Facts on the public school curriculum. *Research Bulletin of the National Education Association*, Vol. I, No. 5, 1924. pp. 325-336.

Industrial Arts in Forty-nine Cities Compared with Seattle

In the *Research Bulletin*, it is shown that the total average time allotment for the first six grades for industrial arts in minutes per week is 214 for the 49 cities; for Seattle, 258. The average time allotments by grades in the cities from the 49, offering industrial arts are as follows:

Grades-----	I	II	III	IV	V	VI
Minutes per week--	60	60	60	67	70	81
Number of cities---	18	18	20	22	35	39

It is evident about twice as many cities include industrial arts work in their fifth and sixth grades as in the first and second.

Manual Arts in Sixty Cities

The tables in the *Research Bulletin* show that 38 of the 60 cities allot definite time to manual arts. Averaging this on the basis of the 60 cities, it is shown that 126 minutes per week are given to manual arts. This is one and four-tenths per cent of the total allotted time in minutes per week for the elementary schools. The wide variation will be apparent in the fact that the lowest per cent of time allotted to manual arts in any city is four-tenths of one per cent, and that the highest per cent is five and five-tenths.

As only 38 of the cities report time allotments, it would appear that in 22 of the 60 there is no work in manual arts offered. However, differences in terminology make inferences unsafe. Reference to this is made later.

Distribution of Grades in Which Industrial Arts is Taught in 375 Cities

Tables of grade distributions contain no work on "industrial arts," but they do include "sewing," "cooking," and "wood work."

Sewing. Of 205 cities reporting sewing, 121 offer work in some of the first six grades, distributed as follows:

In grades one to six,	2 cities
In grades three to five,	1 city
In grades three to six,	7 cities
In grades four to five,	1 city
In grades four to six,	21 cities
In grades five to six,	31 cities
In grade six,	58 cities

Cooking. Of 218 cities reporting cooking, 62 offer work in some of the first six grades, distributed as follows:

In grades three to six,	2 cities
In grades four to six,	1 city
In grades five to six,	19 cities
In grade six,	40 cities

Wood Work. Of 231 cities reporting wood work, 136 offer work in some of the first six grades, distributed as follows:

In grades three to four,	1 city
In grades three to six,	1 city
In grades four to six,	11 cities
In grades five to six,	45 cities
In grade six,	78 cities

Since "drawing" is a term known to cover all work with materials in the lower grades in some cities, and since the number reporting drawing is so large for all grades, the distribution of grades in which drawing is taught is included.

Drawing. Of 312 cities reporting drawing, 309 offer work in some of the six grades, distributed as follows:

In grades one to four,	1 city
In grades one to five,	3 cities
In grades one to six,	293 cities
In grades two to six,	10 cities
In grades three to six,	2 cities

In these studies, the most striking thing is the lack of apparent standards of time allotment or grade placement. Inference is almost forced upon one that variability in content is as great as in time allotment and gradation. The very terminology is so confusing that little can be derived from the reports relating to industrial arts other than a sense of need for bringing

order out of the chaos. In the study of Seattle and the 49 other cities, the term "industrial arts" is used and "drawing" is given a separate place; in the study of the 60 cities, "manual arts" is used and "art education" receives separate treatment; and in the grade distribution study of 375 cities we have neither "industrial arts" or "manual arts," but "sewing," "cooking," "wood work," and "drawing." Other terms not included in these reports for work about the same as that indicated by the terms in these reports are "hand work," "drawing and design," "fine arts," "applied arts" and some others used by some city school systems. That there is overlapping or duplication of work under these several terms cannot be known from the data presented, but that there is great variability is evident from an examination of the details of courses of study.

In all the studies, comparisons of time allotments and grade placements of the art subjects, by whatever name indicated, and the three R's offer suggestions for thought about educational content and values, time expenditures, results obtained, and results possible.

In addition to the really secondary questions of time allotment and grade placement, the studies suggest strongly the need for the education of curriculum makers and teachers in the fundamental character of the industrial arts field as developed in its most highly educative form in recent years. The possibilities of integration of vitally related parts of the curriculum, hitherto formally separated, should be scientifically studied to find whether it may not result in great economy of both time and effort. These studies are very stimulating in revealing the need for bringing order out of the chaos that exists relative to the industrial arts.

STUDY NO. 4. Harap, Henry. *Education of the consumer: A study in curriculum material.* New York, Macmillan, 1924. 360 p.

This study is an attempt to ascertain the objectives of American economic life with special reference to the consumption of food, shelter, fuel, and clothing. The major portion consists of evidence of the present economic habits of the people of the United States and an evaluation of these habits in the light of reliable standards of living.

The study "is partial to no special theory of education." It is an endeavor to present the facts as they are in order that curriculum makers may have an unbiased and reliable source upon which to base selections of materials. The adaptation to any age, grade, or level of experience may be made as the particular school may require.

Objectives for each particular field are specifically stated—that is, what one should know and be able to do with reference to food, shelter, fuel, and clothing. The numerous government studies and studies of special commissions on standards of living have been carefully analyzed and the findings stated. All available scientific and statistical studies of production, total consumption, and per capita consumption are summarized and comparisons are made with such standards of what is desirable as we now have. Costs, methods of purchase, and problems of preservation and conservation

are included. Much material of very high value that has hitherto been inaccessible because of its technical form of presentation, or because of its fragmentary distribution, has been made easily available. An extended bibliography makes possible references to the original sources of data.

This book is an especially useful reference for material in those phases of industrial arts for the elementary school relating to food, shelter, and clothing. See review of this study on page 324.

The Trend in Industrial Arts

As is evidenced by the number of studies included, little work has yet been done in industrial arts which can qualify as "scientific research." Studies have been of a practical type, dealing with the formulation of purposes, selecting materials to make courses harmonize with the purposes, and organizing the material selected into usable form for teachers. Little has been attempted by way of evaluation through scientific testing.

But much has been done in establishing a new point of view and in developing a content of materials and procedure for teachers. The recent books and courses of study in industrial arts show changes under way which statements of mere presence or absence of the subject in the curriculum, or of time allotments, could not do.

Where changes are evident, they are in the direction of including studies that relate to the use of industrial products with reference to health, economic, art, and social values along with manipulative or constructive work with materials. The subject is tending more and more to become a study of the industries including hand work as a means instead of a course in mere hand work as such. It is becoming a subject with a content of thought and experience.

The relationships of the work to other subjects is also receiving greater attention, particularly the relationships to fine arts, to industrial and commercial geography and history, and to arithmetic. The increasing use of the project method is leading to greater attention to the study of the interests and activities relating to food, clothing, shelter, and other material supplies with which children are in direct contact.

Among the courses of study in industrial arts published within the last five years which illustrate well these tendencies are those of Atlanta, Georgia; Baltimore, Maryland; Los Angeles, California; Okmulgee, Oklahoma; Passaic, New Jersey; Seattle, Washington; and St. Cloud, Minnesota. Denver, Colorado, also has such a course in preparation. These courses of study are quite unlike the older courses in "manual training" or "hand work" in that they contain a large body of thought content relating to the everyday needs of life for the use of industrial products. Even more hand work than formerly is provided, but its purpose is in relationship to definite values which it may contribute.

Among the books on industrial arts for the first six grades which offer work on this basis and show this trend are:

Winslow, Leon. *Elementary industrial arts*. New York, Macmillan, 1922, 335 p.
Welling, Jane B., and Calkins, C. W. *Social and industrial studies for the elementary grades*. Phila., Lippincott, 1923. 331 p.

Bonser, F. G., and Mossman, L. C. *Industrial arts for elementary schools*. New York, Macmillan, 1923. 491 p.

Books giving accounts of work done by the use of the project method include much material illustrating this newer conception of industrial arts. Among these are:

Wells, Margaret E. *A project curriculum*. Phila., Lippincott, 1920.

Collings, Elsworth. *An experiment with a project curriculum*. New York, Macmillan, 1923.

Burke, Agnes, and others. *A conduct curriculum for kindergarten and first grade*. New York, Scribner's, 1923.

Salisbury, Ethel J., and others. *An activity curriculum for the kindergarten and primary grades*. San Francisco, Harr Wagner, 1924.

Books recently published in geography and history for the elementary school include much more material than formerly relating to industry. Sources of material for the study of the industries are becoming increasingly available. In fine arts, more attention than in former years is given to the study of products used in daily life from the standpoint of beauty in relationship to utility, making for improved taste in selection and use. To such an extent is this vital relationship appreciated that in some curricula fine and industrial arts are combined into one study.

Summary. Standing out most prominently then, two tendencies seem evident in courses in industrial arts: (1) An increasing emphasis upon content relating to health, economic, and art values in the use of the material supplies and equipment of life; and (2) a recognition and use of the parts of industrial arts and other subjects closely related, making for economy of time and effort in the teaching of all of these related subjects.

CHAPTER XIII

ART EDUCATION

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THE IDEAL elementary school course of study is, perhaps, one in which the entire curriculum is administered on a plan of perfect articulation of the various subjects. In such a course, the inspiration for handwork is adequately furnished by the other school subjects. The mission of the subject of art in such a scheme would be quite largely the providing of illustrative and creative handwork. There is no race, no political division, no literature, no history, no science which is not intimately associated with the topics about which such an elementary art course is organized. In the elementary grades, at least, art as a subject is at the disposal of all other subjects.

The importance of the work of the elementary school in the scheme of art education is sometimes underestimated. If the secondary school courses in art are to function as they should, it is essential that a foundation be laid in the elementary schools. A subject designed to meet the aesthetic needs of the elementary curriculum has already earned a place on many school programs. This subject attempts to combine drawing and construction and to substantiate and reinforce this drawing and construction by a content closely related to the industries.

Plans for elementary art education consequently include elements from the fields of manual training and fine arts, so-called, and they aim to provide content and experience which shall be of the maximum educational worth. The strength of the best programs consists largely in their adherence to the belief that all work in drawing and construction should contribute to the pupil's personal and social efficiency at the time when the instruction is given.

Since the teaching of art in the schools cannot cover effectively the whole field of art but must concentrate on problems of immediate value to the pupils, it follows that such teaching must function largely through the projects that the pupils undertake. An art project consists of a lesson or a complete series of lessons which has taken into account the necessary thought content, handwork, or appreciation, or all three, to the end that the general development of the pupil is assured. Expression should be the result of a definite purpose calling for it. The selection of problems and of activities should always be made on the basis of the general educational values as opposed to the restricted training values.

A proper use of the project method presupposes training on the teacher's part, and it often includes such things as problems, investigations, assignments, reference reading, lesson plans, and textbooks. If other subjects are worthy of systematic organization and of sustained intellectual effort on the teacher's and the pupil's part, the subject of art is also worthy of them.

The project method of instruction has been accepted by most of the teachers of art in elementary schools as the inevitable method to be followed. Art as a school subject, therefore, includes not only drawing and art appreciation but also design, color, lettering, and construction, as well as a clearly defined background of elementary science and economics which makes the work more valuable from the general educational side.

Most of the existing studies in educational measurements dealing with art apply more specifically to drawing, which probably bears somewhat the same relationship to art that penmanship, or writing, bears to literature. The term drawing is certainly not comprehensive enough to include today all that is included in the field of art education. The most valuable studies investigated by the committee were consequently not those concerned with drawing only but those that were concerned with constructive problems in art education which have been developed more recently by a number of leaders in the field of art teaching.

There is apparently a consensus of opinion among school administrators and directors of art that the purpose of art instruction in the schools is the development of aesthetic appreciation, which implies taste, and the power to produce beautiful things, which implies skill. It is also generally agreed that courses in art may be included in curricula as a part of general education or as a part of special training. In general education, the courses contribute primarily to the pupil's all-round ability to conduct himself as a user of art products; in special training, they contribute to his ability to conduct himself as a producer of artistic products. The elementary school is concerned with appreciation as an aim.

The mission of the elementary school teacher of art, be he a grade teacher or a specialist, is, therefore, an extremely important one, for all people today are users of art. They are called upon to employ art principles in the selection of clothing, in the furnishing of homes, in business, in professions, and in all walks of life. But aside from the more practical necessities which call for instruction in art, there are also the needs for appreciation and for enjoyment of leisure.

Greater educational returns have been realized where elementary school art is taught as a general subject by the regular grade teacher and where there has been special supervision, constructive, suggestive, and coöperative in character. Under such administration, art has not failed to become an important and integral part of the curriculum. The success of art teaching in the future will doubtless be dependent on the successful solving of such problems as those raised by the subcommittee. These are given below, followed by a more detailed presentation of the problems from the standpoint of the child, the subject matter, the other subjects in the curriculum, and the teacher and supervisor.

Major Problems in the Formation of the Curriculum in Art

1. How does the child's interest in art manifest itself?
(Different periods to be specified.)

2. In what does the child's interest in art consist? His enjoyment of pictures?
3. What general objectives should be realized through the teaching of art in the elementary school? Special objectives?
4. To what extent should art be taught as a distinctive subject?
5. What should be a fair and adequate time allotment for the subject of art in elementary schools?
6. In developing a course in art instruction, what proportion of time and effort should be given to each of the following: (a) Representative drawing, (b) design, (c) color study, (d) handicrafts, (e) art appreciation, and (f) related content information?
7. What is the purpose of handwork in the subject of art?
8. What art problems should be given in each grade?
9. Should the elementary school subject of art include a study of the industrial arts?
10. To what extent should art instruction be correlated with other school subjects?

**Statement of Problems with Special Reference to Their Effect on Pupil,
Teacher, and Curriculum**

A. From the standpoint of the child:

1. What are the child's needs that are to be supplied by art education?
2. What are his natural, inherent abilities for judgment and choice. For expression?
3. What are his interests? From which phases of art does he most readily get satisfaction? Which phases demand more drill? More effort on the part of the child?
4. What is the place of the talented child in an art course planned to suit the needs of the average child?
5. At what age is a child sensitive to fine gradations of colors, in hue, and intensity as well as in value?
6. To what extent should the curriculum in art provide for individual differences in children?

B. From the standpoint of the subject matter:

1. What changes should be made in aims and objectives of art education? What eliminations should be made from the present subject-matter? What changes should be made in methods of teaching?
2. What phases of art should an elementary course cover? Which should be most stressed in relation to the needs of children?
3. What standards of judgment (i.e. choice and appreciation) should be expected of sixth grade children?
What skills in art expression (i. e., attainments, technical skills, such as technic in drawing, measuring, and all drill phases) should be expected of sixth grade children?
4. What are the purposes and relative contributions of various phases of art instruction and their uses in other subjects, i.e., illustration and its use in other subjects? perspective drawing? lettering? color study? poster making? design? construction and handwork, etc.?

C. From the standpoint of other subjects in the curriculum:

1. What connection should be made between art and other subjects in the curriculum, i.e., geography, history, reading, spelling, arithmetic, industrial arts, etc.?
2. How can art strengthen the other subjects in the curriculum?

D. From the standpoint of teacher and supervisor of art:

1. What is lacking in the present training of special art teachers and supervisors?

Studies in Drawing and Art Appreciation

The psychological studies that have been made contribute little of value to the curriculum maker in respect to elementary school art. Several studies do throw some light, however, on drawing and art expression from the standpoint of the child, while all of the more serious studies demonstrate the adaptability of art instruction to further scientific investigation which should eventually bear results from which the art teacher will be able to formulate guiding principles of practice for which there is at the present time great need.

STUDY NO. 1. Lukens, H. T. "A study of children's drawing." *The Pedagogical Seminary*, October, 1896.

In 1896, Lukens carried out a study of children's drawings in which the child's mental attitude toward pictures and drawings were carefully investigated. Over 3000 drawings by children were studied.

Findings. Although no final conclusions were reached, it was found that:

1. Very young children's drawings of people are automatic, aimless scribbles. By degrees, the aimless tangle of lines is reduced to a few bold telling lines. This seems to correspond to a clarification of the mental image in the child's mind by a gradually greater discrimination on his part between the motor elements, resulting outwardly in mere scribble, and the strictly visual elements, producing lines definitely suggestive of form.

2. Young children draw "out of their own heads" and not "from the object." This is shown by the test made by having people pose as models for the children. No matter how the models sat, the child always drew full-face views. A review of drawings also showed that children of ten draw sounds and other invisible things such as the mind. Secondly, the little child draws from his own consciousness, and he puts his own consciousness into the pictures. A large proportion of the human figures drawn by children have childish features.

3. Pictures properly chosen will develop the natural desire "to know what the picture says" or, as the children often express it "to read the picture," and this seems to be one of the natural, wholesome, and properly stimulating ways of beginning reading.

4. Drawing can be used to supplement language in tests of the contents of children's minds.

5. When drawing to please themselves, children draw objects that they love, and at first mostly as a substitute for those objects when absent. A tabulation of the subjects of 1232 spontaneous drawings of children under ten years show: human beings, 76 per cent; stories, 12 per cent; animals, 7 per cent; plants, 3 per cent; and geometrical figures, ornament and scribble combined, 2 per cent. Chil-

dren's drawings show slight traces of any interest in mere decoration before eleven years of age.

6. Little children are much more apt to express themselves through drawings than are adolescents. This is probably due to wrong methods of teaching drawing in which excellence of technique is demanded.

7. Strong, striking, colors; red, blue, and yellow, and sharp contrasts in combinations are favorites with children, and the softer tints and more harmonious combinations are later effects that have to be learned. The early period of loud colors and gaudy ornament cannot be skipped, if the development is to be natural and healthy. Artistic appreciation of color is a matter of slow growth.

STUDY NO. 2. Sargent, Walter, and Miller, Elizabeth E. *How children learn to draw*. Boston, Ginn and Co., 1916.

Sargent and Miller, through a series of experimental lessons in which opportunity was given children to draw freely, found in 1916 that interest in "telling something" often furnishes a motive sufficient to inspire good drawing. They also definitely determined that industrious drawing directly from objects unaided by other sorts of study and practice has not proved to be the most effective way of learning to represent objects. Children between the ages of seven and fifteen learn to draw, if at all, largely by aid of memories of the way others have drawn the things they themselves are attempting to represent. For this reason, a collection of pictorial reference material is a necessary part of the equipment in drawing. The description by another person sends one back to nature with a new capacity for analysis and appreciation. It was also found that progress in ability is not general but specific. Increase in ability to draw means increase in ability to draw those particular things upon which one has been practicing.

STUDY NO. 3. Thorndike, Edward L. "The measurement of achievement in drawing." *Teachers College Record*, Columbia Univ., November, 1913.

The pioneer effort to measure a person's ability in drawing was made by Thorndike in 1913 when he constructed a scale which attempted to measure the child's achievement. To do this an objective scale for drawing, the use of which is reasonably free from subjective judgment factors, was constructed. Rankings of 45 drawings by 376 competent judges were secured; and a scale formed from 14 selected specimens ranging by more or less unequal units from zero to 17 in merit. Later this original scale was extended and revised by securing the ratings of 4000 drawings by five to 15 judgments, together with the ratings of 303 selected drawings by 75 to 100 judgments. The revised scale was formed from 70 specimens ranging from zero to 17 in merit. In 1922, Kline and Carey devised a more elaborate scale which they revised in 1923.

STUDY NO. 4. Kline, Linus W., and Carey, Gertrude L. *The Kline-Carey measuring scale for freehand drawing*. Baltimore, Johns Hopkins Press, 1923.

Purpose. The object of the studies carried on by Kline and Carey was to construct a scale which would measure drawing achievement of pupils in

the elementary grades. Sample drawings, 5214, were collected under standard conditions upon four themes; house, rabbit, figure in action, tree, from the kindergarten and twelve grades of the public school. All samples were drawn by the pupils from memory. The first edition was scaled by 92 judges, and the steps between the samples in the scale were determined by the statistical methods now applied to educational problems. The revised edition No. 5a, was scaled by 152 judges, the same themes being used as in the original edition. The judges were teachers and supervisors of art as well as professional artists. The larger number of judges gives stability to the position assigned to the samples in the scale and a high degree of reliability.

Directions for using the scale are given to both pupils and teachers. Those for the pupils are as follows: Move your drawing along the scale folder until a sample is found that appears to match it. Read the description (a critical description is printed under each sample) given below the scale sample, and notice if it describes your own drawing as well. If the description does not apply so well to your own drawing, read that of the sample next below in the scale and compare your drawing with this sample. Now, if your drawing matches the sample and fits the description, write on your drawing the number in the scale. But if the second sample and its description is not so good as the first, move your drawing to the sample that is just above the first that you used and make a similar comparison. If this is more satisfactory than either of the other two, write on your drawing the number of the scale drawing. This number is the score of your drawing. Again, should your drawing have some features that match one sample and other features that match an adjacent sample give to your drawing a score equal to the average of the two adjacent scale values.

Part II of the Kline-Carey scale, now ready for publication, is a scale in Design and Composition, based upon some 40,000 drawings collected under standard conditions from nearly all parts of the United States and scaled by 54 judges, the greater number of whom are supervisors of drawing. The themes comprise illustrations, designs, posters, and borders.

STUDY NO. 5. McCarty, Stella A. *Children's drawings*. Mount Royal Avenue, Baltimore, Md., William and Wilkins, 1924.

McCarty and the Child Study Committee of the International Kindergarten Union in 1923 made a study of interests and abilities as expressed in the drawings of children. Their book is the report of an investigation of the drawings of children of the kindergarten, first and second grades, and of the years four to eight inclusive.

Purpose. The objectives included: (1) A study of children's interests as indicated by the subjects selected for drawing; (2) the construction of a series of scales especially designed for the measurement of abilities in the early stages of education; (3) the application of the scales as a means of arriving at a number of psychological and educational inferences; and (4) an investigation of the trend of development of certain aspects of technique.

Method. The Committee based its report on the examination of over 31,000 free drawings of school children of the ages and grades included which were assembled from representative cities of all parts of the United States. These were first examined to discover the subjects drawn, which showed a range of about 1000 different ideas, a complete list of which is presented showing ages and sexes. The ideas were then classified into a few generic groups, from which general trends of interest might be inferred. Human beings led, having been represented by sixteen per cent of all the children. Then follow, in this order, houses, trees, furniture, vehicles, parts of houses, animals, toys, flowers, etc.

Findings. It was found that the general tendency of selection changed with age, especially by a notable increase in nature scenes and objects and an equally notable decrease in drawings of human beings. While sex differences were not great, they appeared with some constancy. The boys had a higher percentage of portrayals of historical events, adult social relations, and mechanical concepts. The girls had a higher percentage of portrayals of child activities, domestic life, and the more esthetic aspects of nature.

Three scales were constructed, the subjects of which were human beings, houses, and compositions including trees. The scales were then used in evaluating all the available drawings which were comparable to them. Tentative forms were established for the several ages and grades. It was found that, while average ability increases with age, there are, as in other abilities, such overlappings that numbers of four year olds reach or exceed the median for eight year children. In general, the ability to draw increased also with psychological age: the six year old children in first grade made a higher average score than those in kindergarten, etc.

Comparison of the several cities represented showed that school training is responsible for much of the difference in drawing achievement. The per cent of children reaching or exceeding the median for all children varied from 27.8 in one city to 85.6 in another, and these differences are fairly constant for the three subjects of the scales and for the three school grades represented.

A correlation of drawing with general intelligence was computed by a comparison of the drawing scores of 1420 children with their intelligence quotients by the Stanford-Binet tests. The correlation varied considerably with age, but the coefficient for the group as a whole was .35. It was found that correlation was closer at the lower end of the scale, indicating that some factors of general intelligence are indispensable to drawing.

The study of technique generally corroborated the findings of previous investigators. Profile drawings were rare with younger children, the per cent increasing from one and four tenths at four years to 32.4 at eight years. The assumption that a mixed type, partly full face, partly profile, is commonly transitional was not confirmed, as only about five per cent of the children employed this form at any age. Outline drawing gradually gave place to mass drawing, the proportion at four years being 73.9 to 25.6

per cent, at eight years 34.5 to 67.9 per cent. In proportion in the relative size of objects, there is evidence of development from two and nine tenths per cent at four years to 26.7 per cent at seven years, with a marked decline at eight years. In balance, or symmetry or arrangement, there appears to be little interest during these years. Perspective is also slightly in evidence with no instances at four years and only one and four tenths per cent at seven years. The mental retardation of the eight year children in the lower primary grades is indicated by the fairly consistent decline in the scores for this year in the employment of balance, proportion, and perspective, and for the 8-6 group in the rating by the scales. Significant sex differences are noted in the greater number of boys employing profile, proportion, and perspective, and of girls employing balanced arrangement.

Findings. The McCarty study closes with a statement of certain educational inferences from the investigation—notably, the necessity of recognizing individual differences in drawing ability, as fundamental to effective teaching and the equally significant necessity of recognizing that the development of ability to draw is susceptible to training, is dependent upon factors of enriched experience on one hand, and upon direct stimulation, with judicious guidance toward technique, on the other.

STUDY NO. 6. Williams, Florence. "An investigation of children's preferences for pictures." *Elementary School Journal*, October, 1924.

An interesting experiment to ascertain the preferences of children for pictures was made in 1924 by Williams which points the way toward a somewhat different kind of study which aims to determine the types of pictures that children like best. The report of Miss Williams' study is the account of an experiment made in the Public Art Gallery of Richmond, Indiana. It is not assumed by the author of this study that sufficient data were collected to form the basis of reliable conclusions as to the types of pictures which children prefer.

The collection of portraits on exhibit included thirty-two oil paintings, twenty-eight colored prints, and a number of miniatures, tintypes, and daguerreotypes. Classes of fifth, sixth, seventh, and eighth grade children were brought to the gallery to see the exhibit, making a total of 939 children. The children were asked to look at all of the portraits carefully and pick out the ones they liked best. This was to be done without communication on the part of the children in order to prevent one or two strong-minded members of the class from influencing the vote. Each child handed to the teacher a slip of paper on which he had written the catalog number of the pictures he liked best. The group of miniatures, tintypes, and daguerreotypes were each given one catalog number.

A second exhibition of paintings by Richmond artists included seventy-four oil paintings, water colors, and pastels. Most of the artists were known personally or by reputation to many of the children. However, each artist exhibited more than one picture and many of the pictures were not legibly signed. Therefore, it is safe to assume that each child made a

selection independent, to some extent, of his liking for a particular artist. Fifth, sixth, seventh, and eighth grade children visited this exhibit and followed the same procedure as was described for the exhibition of portraits.

A third exhibition of paintings by Indiana artists consisted of one hundred oil paintings, water colors, and wood-block prints. One thousand and ninety-two children visited the exhibit and voted for their favorite picture. When the children visited this exhibition, the pupils in some of the classes were not asked to select the picture which they liked best until after a lesson was given in which the teacher tried to emphasize the merits of certain pictures. Pictures numbered 15 and 98 were discussed; yet each of these pictures received less than fifteen votes. Evidently, the instruction had little to do with the choice of pictures. In every class, there was a large vote for "Mussell Rocks," which was not mentioned in any of the lessons.

Findings. Miss Williams found that there is a marked tendency for the majority of children to like the same pictures. Most children show a tendency to choose pictures which are examples of good painting. Children like pictures of people, places, or incidents with which they are familiar. Children show some interest in pictures of children. It has always been assumed that children like pictures of other children, but this fact has probably been exaggerated. In the portrait exhibit, the picture which received the highest percentage of votes was not a picture of a child. Pictures of things unfamiliar to the children, but about which they have read and heard are popular. Pictures which tell a story appeal to children to some extent. This is a fact which art teachers have always assumed to be true. However, it may not be so great a factor in awakening appreciation for pictures as has been supposed. Children like pictures in which there are a few large, easily distinguished objects in the foreground. Instruction influences only to a small extent a person's liking for certain pictures. A study of the technique and composition or facts about the artist apparently contribute little to the enjoyment of the picture.

STUDY NO. 7. Manuel, Herschel Thurman. *Talent in drawing.* School and Home Education Monographs, No. 3. Bloomington, Ill., Public School Publishing Co., 1919.

In 1919, Manuel made a study of talent in drawing which contains much of value to the art teacher who would direct the inclination and capacity of pupils toward graphic artistic expression. The objects of this study were to discover what are the essential characteristics of persons talented in drawing and to determine how the test method may be used in the diagnosis of talent. A number of individuals were selected for their recognized talent in drawing. To these persons mental and physical tests were applied, and other information of a non-experimental character, particularly bibliographical, was gathered from different sources.

Findings. The investigation revealed great individual differences in the

mental and physical characteristics of persons who are talented in drawing. These were some of the findings:

1. A certain elementary ability in graphic representation, such as is required for success with elementary school drawing, is independent, or partially independent, of general intelligence.

2. General intelligence conditions the ability of drawers: (a) To acquire the advanced technique into which conceptual factors enter; and (b) to create original drawings of merit.

3. The motor ability which underlies talent for drawing is specific rather than general; talent for drawing does not presuppose a general motor superiority.

4. Achievement in handwriting and ability in drawing are relatively independent of each other.

5. The ability to discriminate fine differences in visual magnitudes varies in persons talented in drawing.

6. Tests of memory for visual forms have value in determining the characteristics of one's drawing ability; but one may have a certain ability in graphic representation without a good memory for visual forms, other than the immediate memory required in looking from the object to the drawing surface.

7. Quality of performance in graphic representation and quality of performance in æsthetic judgment are independent, or at least partially independent variables.

8. Interest may indicate either a superior innate ability or merely a high development of a rather ordinary endowment; but it is of immense practical importance as an index of the energy which one is willing to expend in the development of one's ability and in practical achievement.

9. There is no one psychological constitution for talent in drawing; the essential characteristics vary with the type of talent possessed.

Manuel also found that the following characteristics, each an independent or partially independent variable, seem closely related to ability in drawing:

1. The ability mentally to note a visual form, and by certain lines and areas, to reproduce it or significant features of it
2. Ability to observe
3. Ability to select from a complex visual situation the most beautiful aspects
4. Memory of visual forms
5. Ability mentally to manipulate visual forms
6. Ability to control hand movements in accordance with visual percept or image
7. Ability to invent or to bring together into new artistic combinations the elements of different visual experience
8. Ability to judge the beautiful in line, form, color, and composition
9. Ability to discriminate differences in color
10. Ability to discriminate differences in visual magnitude
11. Acuity of vision
12. Interest in the act and products of drawing
13. General intelligence

The test method and diagnosis of drawing talent are summarized by Manuel as follows:

1. A diagnosis of talent in drawing must be based upon an analysis of the talent and a measurement of the constituent psychophysical factors.

2. The following program of tests is recommended for the diagnosis of talent in drawing:

- a. Tests of the elementary ability to represent, by lines and areas, the figures and objects observed
- b. Tests of the ability to observe
- c. Tests of ability to select from a complex, visual situation the most representative and most beautiful aspects
- d. Tests of memory for visual forms
- e. Tests of ability to control hand movements in accordance with visual precept and image
- f. Tests of ability mentally to manipulate visual forms
- g. Tests of ability to invent, to bring together into new artistic combinations the elements of different visual experiences
- h. Tests of ability to judge the beautiful in line, form, color, and composition
- i. Tests of ability to discriminate differences in color
- j. Tests of ability to discriminate differences in visual magnitude
- k. Tests of acuity of vision
- l. Tests of general intelligence

3. Interpretation of the results of the tests necessitates standards of achievements with which the performance of a given individual may fairly be compared.

4. Every child should be given a many-sided opportunity in drawing, and an attempt should be made to develop corresponding interest.

5. Biographical and personal data of a non-experimental character should be used to assist in the diagnosis of talent in drawing.

6. It is recommended that tests which are used for the purpose of estimating the possibilities of improvement in any given factor be conducted as *instructed-learning* tests.

7. The measurement of many different abilities not primarily related to drawing is necessary to the most effective educational and vocational use of measurements of ability in drawing.

STUDY NO. 8. Gibson, Katherine. *An experiment in measuring the results of fifth-grade class visits to an art museum.* Cleveland, Ohio, Unpublished Study in Files of Educational Department of Cleveland Museum of Art, 1924.

Last year, Miss Katherine Gibson carried on an interesting experiment in measuring the results of the visits of fifth-grade classes to the Art Museum in Cleveland, Ohio.

Purpose. The problem was to find, if possible, the effect of art lessons on three different groups of children: "X" classes, those made up of the most intelligent, as measured by standard tests; "Y" classes, those of average intelligence; and "Z" classes, those of least intelligence.

Questions were made out in mimeographed form on seven lessons given in the galleries. The subject in general was colonial art, since fifth-grade classes in Cleveland have both American history and picture study. The questions were given to 59 classes from 26 schools, totaling 2024 children. The results were scored and statistics arranged on the basis of "X," "Y," and "Z" groups; first, as to intelligence in response to the tests; second, on the basis of home environment; and third, on racial differences.

Findings. The questions were answered *relatively* better by the "Y" and "Z" children than by the "X" children. The "X" child did not score high. The "Z" child scored higher than one would be led to expect from other comparative studies of "X," "Y," and "Z" groups. This suggests the conclusion that the child of low intelligence profits by the touch with the concrete objects which he gets in museums. The "X" child evidently was not offered enough chance for original thinking and sufficient richness of material in the lessons given.

The experiment is being continued this year with a view to finding the right type of lesson for the "X" child. Obviously the same lesson can not be given to the three groups of children. Home environment and racial differences, as they appeared in this experiment, were factors subordinate to that of the "X," "Y," "Z" grouping—that is, to general intelligence as measured by standard tests.

The studies in drawing and art appreciation that have been made help the elementary teacher to provide instruction which is in some measure appropriate both from the standpoint of the child and of the curriculum as a whole. Little children draw to express themselves. Their earliest efforts are scribbles meaningless to the adult. Their later drawings are more purposeful and begin to have meaning even for the adult. Genuine art instruction can and should begin with very young children. This is most often accomplished when pupils are given opportunity to draw to express themselves and to interpret for themselves beautiful pictures by reading, directly from the pictures, the stories that the pictures tell. Children drawing to please themselves most often represent people, houses, trees, furniture, vehicles, animals, toys, flowers, and other things that they love. The drawings of young children always tell a story. They often show people and things *in action*. Children prefer strongly contrasting colors to weak colors of similar hue, value, or chroma.

Telling something often furnishes a motive sufficient to inspire good drawing. Young children should not be required to draw from objects. In the elementary school, design should be stressed far more than representation if the instruction is to be of any value in the field of art appreciation. However, in the teaching of drawing as a part of the elementary school subject called art, a generous supply of good pictorial reference material should always be at hand. By means of this material æsthetic ideals can be developed which will become standards for artistic expression and selection.

In the subject of art, methods of teaching similar to those advised for other elementary school subjects should be used. Opportunity should be offered continually for genuine experience in purposing, planning, executing, and judging. Critical, fair judgment of one's own work and the work of others makes for a much needed social and emotional stability. Knowing how things are done, the amount of time, effort, and labor involved in production makes for better social and emotional adjustment. The results and

conclusions of scientific investigation should be made use of in art as in other phases of education. The development of tests for factual information relating to art should be encouraged as well as the development of tests for the measurement of skill in drawing. A distinction should be made between the æsthetic phase of art instruction and the technical phase that necessitates drill in execution. On the content side the subject of art should be made to connect closely with the other subjects of the curriculum. The project method should be used. Problem solving should play an important part.

There is need for careful and scientific analysis of the content of the subject of art, the aims of instruction, and the principles underlying instruction in design, representation, color, construction, and lettering. If these principles are applied only in drawing as a school subject, the results will be unsatisfactory. The principles must be so taught as to apply to all situations in order that they may function in the life of the child, and so that the subject of art may contribute much to every other subject in the course of study. Consequently, art education should be given an important place in the normal-school training of every grade teacher, and it should also be given more emphasis in the elementary curriculum, more time, and the needed equipment and supplies.

STUDY NO. 9. Riker, Olive M. *Color preferences of elementary school children.* A master's thesis on file in the Library of the University of Wisconsin.

Problem. (1) Do children prefer intense or saturated colors, or do they prefer a tint or shade of those colors?

(2) In this, are there any sex differences?

(3) Is there any difference in choice as children increase in age?

(4) Is their choice affected by their environment or the locality in which they live?

Method. Four colors with one tint and one shade of each were used: red, blue, yellow and green, making twelve colors in all. Four charts were used from which the children made their choices. On these charts no color was in the same position on the chart twice, and no color was next to any other color twice. This was to avoid the influences that colors have on each other. The chart itself was neutral gray, 26 by 22 inches. Colored papers were used, each three inches square. Each color had a black letter of identification under it.

To correlate with English experiments in the same field, the child was given a printed card with places for six choices. Six points were given for the first choice, five for the second, four for the third and so on to the sixth, which received but one point, and averages computed.

The children were questioned as follows: Which color on this chart do you like best? Put on the first line the letter under the color. Similar procedure followed for the remaining five choices and the same process ap-

plied to the four charts. A total of 1199 elementary school children in Wisconsin, including grades one to eight, were tested.

Findings. First choice was given to intense or saturated color as was the second choice, red ranking first, followed closely by intense blue, with a tint of red for third choice. Girls preferred a tint of red for first choice.

Summary of first choices arranged in order:

General	Girls	Boys
1. Red	Red Tint	Red
2. Blue	Blue	Blue
3. Red Tint	Red	Green
4. Green	Red Tint	Blue Tint
5. Blue Tint	Green	Red Shade
6. Red Shade	Red Shade	Blue Tint
7. Blue Shade	Green Tint	Blue Shade
8. Green Tint	Blue Shade (7)	Green Shade
9. Green Shade	Green Shade	Green Tint
10. Yellow	Yellow	Yellow
11. Yellow Tint	Yellow Tint	Yellow Tint
12. Yellow Shade	Yellow Shade	Yellow Shade (11)

Answering the questions included in the statement of the problem:

(1) In the first eight grades, children seem to show an inclination towards the saturated colors.

(2) There seems to be a slight desire for girls to like more tints and shades than do the boys.

(3) With changing age, there seems to be a steady change of choice. Red is constant for boys with a tint of red remaining with the girls. Both boys and girls show a steady increase in favor of blue. A tint of blue shows an increase with girls, but a slight decrease with boys. The shade of blue seems to be unpopular with boys of all ages and shows a steady decline in favor with girls. Boys and girls have a growing appreciation for green. Appreciation for tints of green decline accompanied by a growing desire for green shades. Yellow remains constant with girls but drops with boys. A tint of yellow shows an upward trend with both boys and girls. Children in the lower grades indicate a slight preference for pale colors.

(4) Social conditions were marked by decided changes in the color preferences.

STUDY NO. 10. Stewart, Lillian V. *The correlation of drawing and handwriting.* An unpublished thesis on file in the library of the University of Wisconsin. 1922.

Problem. Since it seems that writing has developed through the channels of drawing, and because a child follows the course of primitive man in his learning process, the question naturally follows whether there is any

direct relation between the drawing act and the writing act, and conversely if he writes poorly will he draw poorly? The following questions were considered:

1. Does large freehand drawing have the advantage of establishing a poise and muscular control which will facilitate the acquisition of penmanship?
2. Will drawing give fundamental muscles the development needed for writing?
3. Should the child learn to draw and write at the same time or would it profit him to learn the former first?
4. Does drawing which is healthful and hygienic prepare in an easy and natural way for the more exacting task of writing?
5. Do the habits of neatness, care in execution, and good forms established in drawing aid in the teaching of writing?
6. Is there any sex difference in the ability to draw? In the ability to write?

Method. Test in Grade One. Pencils and paper were passed and the following preliminary statement was made: "Today we are going to have a new writing game. I shall read some sentences to you. You will write them as nicely as you can, but instead of writing the last word, draw a picture." A typical sentence begins: This is a bird.

In Grade Two. The sentences increased in difficulty while two pictures drawn from memory accompanied each sentence, as "I saw a (boy) playing (ball)." In grades three and four each pupil was given a sheet of paper upon which were drawn geometric figures. They were given drawing paper and told to reproduce these figures as nearly like the copy as they could. A writing sample accompanied each drawing. The tests for grades five, six and seven, excepting increasingly difficult drawings to reproduce, including vase and other forms, were similar to grades three and four.

Scoring. The rank method as recommended by Fred C. Ayer in his *Psychology of drawing* was adopted, necessitating a careful comparison of the drawings and arranging them in the order of ability shown in each. The same plan was used for ranking the writing ability. The average and chance differences were estimated by the Ayre's formula. The numerical value of the correlation was found by the use of Pierson's method adapted to rank differences.

Findings. From the coefficients worked out, the obvious conclusion is that a direct, positive correlation exists between drawing and writing, higher in the lower than in the upper grades. In the lower grades, the degree of correlation is higher among the boys than among the girls while in the higher grades the reverse is true.

It has been noted that the young child displays excess muscular activity while attempting to write, but if the same child is watched while he draws, these movements are absent. It is because his drawing is large and free. It would therefore appear to be a good plan to train the hand through drawing and develop a steadiness of attention and sureness of eye before teaching writing, which involves very complex and finely coördinated movements. Meumann advocates that little writing should be done when the

child first begins, and that little should be acquired as unconsciously as possible. However, the child should be allowed to express himself freely on large surfaces in drawing. Drawing is healthful and hygienic and prepares in a natural and easy way for the more exacting task of writing.

It would profit the child to learn to draw first because the large free work he does in drawing will make the more difficult task of writing easier to acquire.

If the correlation is direct and positive as between the abilities to write and to draw, then training in the essential habits of neatness, care and observation for drawing must be factors in that correlation since they are dominant factors in the ability to draw well.

Bibliography—Studies in Art

- Ayer, Fred C. *Psychology of drawing with special reference to laboratory teaching*. Baltimore, Warwick and York, 1916.
- Bach, R. F. "Art in industry illustrated." *School Arts Magazine*, January, 1924.
- Bailey, Henry Turner. *Art education*. Boston, Houghton Mifflin Co., 1914.
- Barnes, Earl. "Study of children's drawings." *Pedagogical Seminary*, December, 1893.
- Beard, Florence. "Beauty in education." *School Arts Magazine*, October, 1922.
- Bennett, C. A. "Art training that will function." *Industrial Education Magazine*, December, 1923.
- Boas, Belle. *Art in the school*. New York, Doubleday, Page Co., 1924.
- Bonser, Frederick G. "Some educational deductions from the art of the great periods." *Addresses and Proceedings of the National Education Association*, 1908.
- *The elementary school curriculum*. New York, Macmillan Co., 1920.
- Bonser, Frederick G., and Mossman, L. C. *Industrial arts for elementary schools*. New York, Macmillan Co., 1923.
- Brown, Elmer Ellsworth. *Notes on children's drawings*. Univ. of California, 1897.
- Clark, A. B. *The child's attitude toward perspective problems*. Stanford Univ., Studies in Education.
- Cooke, Ebenezer. "Art teaching and child nature." London, *Journal of Education*, 1885.
- De Garmo, Charles, and Winslow, L. L. *Essentials in design*. New York, Macmillan Co., 1924.
- Dewey, John. "Culture and professionalism in education." *School and Society*, October 13, 1923.
- Dobbs, Ella Victoria. *Illustrative handwork for elementary school subjects*. New York, Macmillan Co., 1917.
- Dow, Arthur W. *Theory and practice of teaching art*. Teachers College, Columbia University, 1912.
- Edgerton, A. H. "Industrial arts in our elementary schools." Peoria, Ill., *Industrial Education Magazine*, 1922.
- Farnum, Royal Bailey. *Art education*. U. S. Bureau of Education, Bulletin 1923, No. 13.
- *Present status of drawing and art in the elementary and secondary schools of the United States*. U. S. Bureau of Education, Bulletin 1914, No. 13.
- Gibson, Katherine. *An experiment in measuring the results of fifth grade class visits to an art museum*. Cleveland, Ohio, Unpublished Study in Files of Educational Department of Cleveland Museum of Art, 1924.
- Haney, James Parton. "Art education in the public schools of the United States." New York, *American Art Annual*, 1908.

- Howells, W. D. *A little girl among the old masters*. Boston, J. R. Osgood and Co., 1884.
- Kline, Linus W., and Carey, Gertrude L. *The Kline-Carey measuring scale for freehand drawing*. Baltimore, Johns Hopkins Press, 1923.
- Lukens, H. T. "A study of children's drawing." *The Pedagogical Seminary*, October, 1896.
- Major, David R. *First steps in mental growth*. New York, Macmillan Co., 1906.
- Manuel, Herschel Thurman. *Talent in drawing*. School and Home Education Monographs, No. 3. Bloomington, Ill., Public School Publishing Co., 1919.
- Mathias, Margaret E. *The beginnings of art in the public schools*. New York, Charles Scribner's Sons, 1924.
- McCarty, Stella A. *Children's drawings*. Mount Royal Avenue, Baltimore, Md., William and Wilkins, 1924.
- Niles, Helen R. "Aesthetic appreciation and intelligence." *School Arts Magazine*, June, 1924.
- O'Shea, M. V. *The child, his nature and his needs*. Valparaiso, Indiana, The Children's Foundation, 1924.
- Riker, Olive M. *Color preferences of elementary school children*. An unpublished thesis on file in the Library of University of Wisconsin.
- Russell, James E., and Bonser, Frederick G. *Industrial education*. Teachers College, Columbia Univ., 1912.
- Sargent, Walter. "Problems in the experimental pedagogy of drawing." *Journal of Educational Psychology*, 1912.
- — — *Instruction in art in the United States*. U. S. Bureau of Education, Bulletin 1918, No. 43.
- — — and Miller, Elizabeth E. *How children learn to draw*. Boston, Ginn and Co., 1916.
- Stewart, Lillian V. *The correlation of drawing and handwriting*. An unpublished thesis on file in the Library of University of Wisconsin, 1922.
- Thorndike, Edward L. "The measurement of achievement in drawing." *Teachers College Record*, Columbia Univ., November, 1913.
- Welling, Jane Betsy. "School art and the department store." *Everyday Art Magazine*, June, 1924.
- — — *Social and industrial studies*. Philadelphia, J. B. Lippincott, 1923.
- — — *Suggestions on art education for elementary schools*. U. S. Bureau of Education, Industrial Education Circular, No. 21, October, 1923.
- Whitford, W. J. "A brief history of art education in the United States." *Elementary School Journal*, October, 1923.
- Williams, Florence. "An investigation of children's preferences for pictures." *Elementary School Journal*, October, 1924.
- Winslow, Leon L. "The art education we need." *Educational Review*, 1923.
- — — *Organization and Teaching of Art*. Baltimore, Warwick and York, 1925.

CHAPTER XIV

MUSIC

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Suggested Major Problems in the Formation of the Curriculum in Music

1. What standards of achievement in music should sixth-grade children meet?
2. To what extent should the course of study in music recognize individual differences? Should there be uniform curricular requirements for all students?
3. Should the course of study in music be built upon music as a science or music as an art?
4. To what extent should makers of courses of study recognize the sensory handicaps and variations in children? Should a special curriculum be devised for selected groups?
5. When shall the teaching of music as a science begin in the elementary schools?
6. How shall a course of study in music provide for training in musical appreciation and memorization?
7. To what extent shall scientific testing and standardization be a factor in the making of a course of study in music?
8. What time allotment should be considered in making a course of study in music?
9. In what form should the course of study be prepared: printed book, leaflets, special bulletins?
10. Has assembly singing a place in every course of study?
11. To what extent should technical exercise, in distinction from songs, be used in a course of study?
12. Most effective methods of training monotones?
13. Should music be approached through rhythm? What place should rhythm work have in the music curriculum?

"The art of music and the graphic and plastic arts are far behind other academic subjects in the attempt to apply the scientific method to their problem of subject matter, theory and pedagogy. This is due to two principal causes: first, that the typical artistic mind is seldom interested in the scientific aspect of the art; and second, that these arts have not yet been thoroughly stabilized and assigned their proper places in the public school curriculum. To this should be added the fact that even today the real artist and musician are primarily engrossed in the art interest and leave to the pedagogue and educational administrator, such as the supervisor of art and music, the task of effecting pedagogical adjustments.

"Because of the extravagant claims made by enthusiasts for music education, and their indiscriminate attempts to force a flat universal music requirement upon every child in the public schools regardless of his innate capacities or abilities to profit by such education, the wholesome growth of music in the public schools has been seriously impeded. Little wonder that many leaders in the field of education

have shown indifference and even hostility at times, to some of the naive claims made for music education.

"In attempting to apply the scientific procedure to the content and pedagogy of music, the pioneer faces the attitude of indifference on the part of educational administrators; aloofness and suspicion on the part of creative musicians; and amused tolerance on the part of the school music supervisor. As a result, the meager contributions which have been made, have fallen as crumbs from the tables of other interests, such as psychology of individual differences, and the psychology of music."—*Carl E. Seashore*.

Experimental Studies in Music Education

Probably more scientific work has been done on problems 1, 2, 4, and 7, than upon any others in public school music education. Little or no work of a scientific nature has been done on the other problems listed. It is necessary, therefore, that this report be limited to a discussion and critical evaluation of those experimental studies which have a bearing on the problems enumerated.

I. Measurement of Talent

A. *The Seashore measures of musical talent*.¹—Probably the most epoch-making work in the history of music education is that of Seashore and his associates in the State University of Iowa on the analysis and measurement of musical talent. On the sensory side, musicianship is analyzed into its irreducible elements. For each of these elements, such as the sense of pitch, the sense of rhythm, etc., specific quantitative measurements are devised.

These tests make it possible for us to discover the exact musical nature of the child. They make it possible for the teacher to conserve musical talent. With the aid of these tests, music education may now be adapted to utilize the child's innate capacities. The tests reveal the magnitude of individual differences in endowment. If the teacher realizes fully the significance of these differences, it will enable her to give each child a musical opportunity commensurate with his actual capacity. In order to facilitate the discussion of this work, it may be divided advantageously and treated under three headings—namely, value to the child, value to the teacher, and value to the schools.

1. *Value to the child*—(a) The Seashore Measures of Musical Talent tests may be used for the discovery of talent hitherto unrecognized and undeveloped. The measures referred to are the sense of pitch, time, intensity, consonance, rhythm, and tonal memory. Frequently, the possessor of talent in music is entirely unaware of its presence and therefore may make no ef-

¹This review is based upon C. E. Seashore's *Psychology of musical talent* and numerous articles such as *Recent progress in the psychology of musical talent*, Music Teachers' National Conference Proceedings, 1920. "A survey of musical talent in public schools," *Studies in Child Welfare*, Vol. I, No. 2, "Avocational guidance in music," *Journal of Applied Psychology*, December, 1917, Vol. 1, pp. 342-348.

fort to develop it. Investigations reveal that children are not always given music lessons because they are gifted. No defense need be made for the proposition that to the talented should go the opportunities for musical education and development.

(b) The tests show the magnitude of individual differences. It is erroneously assumed that musical endowments are fairly equally distributed. There is an enormous difference in the musical capacities of individuals, as is revealed by these tests. In the same pitch alone, for example, it is the common experience of examiners to find children in the average schoolroom who have one hundred times more sensitiveness in this specific capacity than the poorer members of the class. What is true of the sense of pitch is true of the other five capacities.

(c) They reveal deficiencies that may or may not be suspected. A child may be entirely unaware of the exact nature of his musical make-up, and discover after much painful experience that his musical disabilities are such as to disqualify him for music study. This condition could have been revealed instantly by testing.

(d) These tests may reveal ear defects that may need immediate attention. The writer's experience with a boy in high school seems apropos. The boy was a violinist and reported to both the orchestra and the harmony class. He held a responsible position in the orchestra and filled it capably, but his sense of hearing that originally controlled his finger movements was substituted by kinaesthesia and motor imagery. His intonation was apparently as good as it had ever been, but his ears were not functioning. The test revealed that his hearing was equal to that of the lowest five per cent. A medical examination followed. Treatment restored the hearing that might have been lost, had it not been detected in its early stages.

(e) These tests may aid the pupil in selecting an instrument. It often happens that a child gets an obsession for an instrument for which he is entirely unsuited by nature. Such an undertaking always results in great disappointment for the child and a changed attitude toward music thereafter. It is patent that a child with a low pitch discrimination is disqualified from studying the string instruments, where fine discrimination is constantly demanded. This obstacle may not hinder the child as much if he can be persuaded to study an instrument that does not involve so much auditory sensitivity.

2. *Value to the teacher*—(a) The Seashore tests may aid the teacher in adapting the training in music to the nature of the child. It must be remembered that nothing that the teacher may attempt to do can create musical talent where it does not exist. The music teacher may only utilize it where it is found. This musical axiom does not seem to be very well understood. It is as impossible for the teacher to create talent as it was for the alchemist to transmute the baser metals into gold. The teacher should know the proficiencies and deficiencies of each child in order to best develop each individual.

(b) They may serve the teacher as placement tests. Public school music as it is administered today is oblivious to the fact that all children are not equally endowed, and often a bright child who has done little or no work is commended for his accomplishment, whereas the dullard who has worked up to his highest level of achievement, but who has not attained what his more gifted classmate attained, is roundly censured. The difficulty is attributable to the fact that the music groups are not homogeneous in respect to their capacities or accomplishment. Some way must be found to take care of the superior in music. The superior child is often retarded, because the music instruction, designed as it is to educate the inferiors in the class, is not sufficiently ambitious to make the superior work. If children were grouped according to their innate capacity and ability to achieve, much more progress could be made with music instruction in the public schools.

(c) These tests may be employed by the teacher as a check on what the child is doing and what the child is *capable* of doing. This would aid the teacher in discovering those who are working and those who are not applying themselves. Such a procedure would aid in replacing a very inadequate system of grading by a more adequate one.

3. *Value to the school*—There can be no doubt that music education can be facilitated and made more effectual and economical by the employment of talent and accomplishment tests. We are in the midst of a campaign to universalize musical education. This campaign gives music to larger and larger numbers of unfit and tends to underrate and neglect the gifted. It is not the purpose of the writer to speak disparagingly about the attempts of educators to universalize the teaching of music, but it is necessary to show that this movement has resulted in maladjustment and great economic waste.

It is recommended that the measures of music talent be introduced in the fifth grade first, for this is the earliest age for which music talent testing can be made satisfactorily, and it is early enough to make serious arrangements for a musical education. The tests should then be repeated again in the eighth grade, just before the great sorting of children into vocations of practical life, and into elective courses in high school.

Brief as this review is, it nevertheless gives the reader some idea of the scope and value of talent testing. Already educators are beginning to ask to what extent the sensory handicaps and variations of children should be recognized in making courses of study. As music education is being administered today, little or no attention is given to this condition, but as educators realize more and more the magnitude and significance of individual differences, special courses of study in music will be devised for the more homogeneous groups, and uniform curricular requirements for all grade school children will be a thing of the past.

B. *Révész tests*—The following paragraphs, taken from "Recent literature on the psychology of the musician," by Max Schoen,¹ review the

¹ *Psychological Bulletin*, Vol. 18, No. 9, September, 1921.

works of Révész, Schüssler, and Pannenburg. These men have made significant contributions to the psychology of the musical mind.

"In 1913, Révész made a preliminary report on an analysis of a boy especially gifted musically, but it was not until 1916 that the full report appeared, and not until 1920 that he published an inventory of musicalness based on his study of the boy prodigy. The problems with which Révész concerns himself in the 1920 study are: 1. Can a method be devised which will identify the musical mind before the beginning of instruction, even in cases less exceptional than that of the boy examined? 2. Could such a method be applied to adults and to the musically trained? His aim, then, was to find a method of identifying the musical, adapted to children and adults, and to the musically trained and untrained. For this purpose he devised eight tests, based upon musical and acoustical factors, and gave these to 63 boys and girls from seven to twelve years of age. The tests are as follows: 1. The rhythmic sense. Twelve rhythmic groups were arranged in order of difficulty. In the first part of the test the rhythms were presented monotonically and the children were asked to reproduce the rhythm with handclaps. In the second part of the test the same rhythmic forms were presented melodically and a like response was called for from the children. 2. Absolute pitch. For the second test the experimenter sounded a tone on the piano and the observers were called upon to reproduce the tone on the instrument. 3. Octave recognition and transposition. This test Révész found too easy for his observers. 4. Relative pitch. He first produced an interval and then sounded any tone on the piano and asked the child to reproduce vocally the given interval, with the new tone for its basis. 5 and 6. The harmonic sense. In these tests the children were asked to reproduce vocally the constituent tones of chords. 7 and 8. Melodic memory and playing by ear. The seventh test deals with memory for melody, and the eighth with the ability to play by ear a known tune.

"Révész assumed the vocal reproduction of a melody to have the greatest diagnostic value, and by correlating the other tests with the seventh test, he concluded that the sense of rhythm does not possess great musical significance, but that the spontaneous instrumental reproduction of a known melody, absolute pitch, vocal transposition of an interval, and also the ability to analyze simultaneous intervals, are characteristic manifestations of musicalness. Révész's investigation has two great merits—his inventory has an empirical basis, and his test material has musical significance. The number of his observers was too small, however, for the establishment of norms.

"In his study on the earliest appearance of talent, Révész claims that musical talent necessarily makes its appearance in early youth; at first appears technical equipment, or virtuosity, later, power of interpretation, and then creative power. An examination of the great composers shows that the full development of the creative powers is reached between the twentieth and thirtieth years.

"Several briefer studies are available that help to throw light upon specific factors in the more extensive treatments of Révész and Seashore. Schüssler attempts to account for the unmusical child in a paper based upon historical and statistical material. In the first part of the paper, he reviews briefly the works of Billroth, Max Meyer, Stumpf, Von Meyer, Rupp, Révész, and several others, as well as the contributions of the anatomical and physiological bases of musicalness. His own contribution consists of a statistical examination of two hundred unmusical children, the criterion for unmusicalness being attainment of a certain grade in school singing. Schüssler's conclusions, based upon the historical review and his statistical data, are as follows: 1. There are between five and ten per cent of unmusical people. The majority of the unmusical, if not all, are not beyond profiting by musical instruction, and should, therefore, not be neglected, but rather given well-planned and intensive instruction. 2. For musical or unmusical capacity, interval memory is of greatest significance. 3. Absolute pitch is of significance only for outstanding musical gift. The unmusical, as compared with the musical, are as a whole less gifted than the musical, i.e., they are not only inferior musically, but also in other mental capacities. 4. Forty-one per cent of the unmusical, fifty-seven per cent of the half musical, and seventy-nine per cent of the musical, make satisfactory progress in school. The school work of the musical is fifteen per cent superior to that of the unmusical.

"Schüssler's findings on the relation between intelligence and musicalness are in accord with those of Stumpf, who found that musical children are, as a whole, better students than the unmusical.

"The Pannenburgs examined 3860 children, 423 musicians, and the biographies of twenty-one composers in an attempt to derive the intellectual and emotional characteristics of the musician. Their conclusions agree with those of Schüssler and Stumpf. Of all the children, 342 boys and 152 girls were designated as musical. The musical children were advanced in their school work beyond their years, while the musician was found to have extensive intellectual interests and to be widely gifted, particularly in languages, literature, history, geography, mathematics, natural history, and drawing."

II. Rhythm and Training

Great interest has been shown recently in rhythmic training. For years it had no place whatever in our schools, but now it is being stressed by most music teachers and supervisors, as being basic. Music, they claim, must be approached through rhythm. Dalcroze believes that an individual may be made *musical* by rhythmic training. Absurd as this claim is, it is shared by many music educators. But does rhythmic training improve one's sense of *rhythm*? This question can be answered only by experimental investigation. In 1923, Miss Naomi Klauer undertook to study the effect of training on the sense of rhythm.¹ The Seashore Rhythm Test was given

¹ *The effect of training in rhythm upon rhythmic discrimination in the intermediate grades*, Thesis, State University of Iowa.

to seventy-five children in grades four, five, and six. This was followed by intensive rhythmic drill for a period of two months, in which every defensible rhythmic device was used.

Such exercises as marching to music; beating time, by swinging the arms synchronously with a beat; breathing in such a way as to maintain a concurrence between beats and inhalation of breath; clapping the hands so as to give the child tactual, kinaesthetic, auditory and visual experience; tapping out some of the actual rhythms found in the rhythm test; rhythmic exercises in discrimination; these and many more were used in an attempt to give the child as rich an experience in rhythm as could be afforded. The average gain in the second scores over the first was found to be 3.4 per cent.

Seventy-five intermediate grade school children in another school were tested twice in a period of three days without any intervening rhythmic training in order to ascertain the maximal effect of improvement due to the repetition of the test alone. The average gain for these three grades was found to be 3.9 per cent.

Miss Klauer concludes that "this capacity is relatively fixed. The children remained substantially where they were, in spite of the intensive rhythmic drill to which they were subjected. In this sense, as in the other basic music senses, the music educator must be cognizant of the extent and magnitude of individual differences. Furthermore, the teacher must know definitely the amount of the capacity possessed by each child and devise a program of procedure that will make it possible for each child and realize all that he can on the rhythmic endowment he possesses."

A. Rhythm and Past Musical Training

In order to ascertain the influence of past training, on the sense of rhythm, DeGraff¹ measured 464 university sophomores, part of whom had had training and part of whom had had no training. Each individual was asked to record the number of half hour lessons he had taken in music. The scores of the trained were then correlated with the scores of the untrained in an attempt to show statistically the influence of music training. The Seashore Rhythm Test was used in this study. The mean of the trained scores was found to be 75.50 while the mean of the untrained group was 75.51, which gives the trained group no advantage. That is, the sense of rhythm is more or less innate. Those who have it may utilize it in their music study, but those who are devoid of any great amount of it do not acquire it by training.

III. Musical Accomplishment Testing²

The Kwalwasser-Ruch musical accomplishment test—This test was devised last year by the writer in collaboration with Professor Giles M.

¹ DeGraff, Mrs. L. H. *Norms on the sensitiveness to rhythm*, Thesis, State University of Iowa.

² Kwalwasser, J. "Scientific tests and measurements applied to music," *Music Supervisors Journal*, May, 1924.

Ruch. This test measures musical knowledge acquired from the fourth to the twelfth grade inclusive. A thorough analysis was made of the most representative courses of study in music in the United States, in order to ascertain the nature of the material to be included in such a test. Ten subjects were derived from the analysis of these courses of study, and a test measuring each formulated. They are:

1. Knowledge of musical symbols and terms.
2. Recognition of syllable names from the staff notation.
3. Detection of pitch errors in the notation of a familiar melody.
4. Recognition of time errors in the notation of a familiar melody.
5. Knowledge of pitch or letter names of base and treble notes.
6. Knowledge of time signatures.
7. Knowledge of principal major and minor keys.
8. Knowledge of note values and their symbols.
9. Knowledge of rest values and their symbols.
10. Recognition of ten familiar melodies from the notation alone.

All of the accomplishment tests in music are group tests and as such furnish us with a convenient method of ascertaining what has been achieved in music by the individual, the grade, or the school as compared with other individuals, grades, and schools. The author states that the standardized test is, at the present time, one of the best aids the music teacher can employ to raise the standards of school music.

What constitutes sixth-grade achievement in music? How does sixth-grade differ from fifth or eighth grade achievement? Is fifth-grade achievement in music the same all over the United States or do we find what is achieved in the fifth grade in one school attained in the third grade elsewhere? These questions and many others may be answered by applying a reliable test to the different grades. With the aid of norms, the music supervisor may easily discover how her particular group compares with groups of the same age and grade elsewhere and, by the same token, whether the instruction she is giving is superior or inferior to that given elsewhere. Scores of a reliable test have definite meaning and permit of definite comparisons. Those needing special training may be discovered and weak points in the music course detected. Remedial methods may then be applied in an effort to bring the music work up to the level of attainment indicated by the norms.

Accomplishment tests¹ may help to improve the standards of music and music instruction in our schools. They show objectively both progress and retardation. They aid the teacher in giving her adequate knowledge of what the individuals have accomplished. Above all, the exceptional student may be discovered and given an opportunity to develop commensurate with his endowments. It is to the credit of the music educators of this country that they are encouraging and fostering scientific testing in their subject.

¹ Other music accomplishment tests, now available, are the Beach, Mosher, Gildersleve, Torgerson, and Hutchinson.

B. Sight-singing Testing

Early last year, a sight-singing test by E. K. Hillbrand, professor of education, Dakota Wesleyan University, appeared which was the first attempt to measure objectively, the ability of the intermediate grade school child to translate musical symbols into sounds. This test attempts not only to determine one's proficiency as a sight-singer but also to diagnose difficulties in the deficient performance. The test is an individual test, for according to the author "group tests in sight-singing are impracticable."

The test contains six short songs. The pupil is permitted to study the songs a few minutes and then is asked to sing them, without any help or accompaniment. Each pupil is tested singly in a quiet room. The various errors made by the pupil while singing are recorded on a copy of the songs.

Aside from the fact that this test is an individual one and requires too much time to give, it is difficult to score. This test, however, does suggest a procedure that is important for the future of public school music. Sight-singing is a most important part of the music course, yet this is the first attempt to measure objectively sight-singing proficiency. It is conceivable that within the next few years a number of good group sight-singing tests will be produced.

C. Music Appreciation Testing

Probably the most elusive trait to measure is one's appreciation of music. No one has yet succeeded in measuring the aesthetic response to music successfully. Two Courtis Standard Research Tests on music attempt to measure one's ability to associate experimental facts with music—an ability which may be entirely foreign to genuine music appreciation. The first test measures one's ability to associate life activities with music in which the rhythm predominates, and is incorrectly called "Recognition of Characteristic Rhythms." The second test measures one's ability to recognize "Mood from Melody." It has long been a fad in teaching music appreciation, to give every composition presented in the course, a program. Many of these programs are manufactured for the occasion and have no integral relationship to the music presented. This method may stimulate the imagination, but it evokes a response that may be extraneous to the intention of the composer. The ability to describe or name a composition is no index of one's appreciation of music.

Under the title "Scales for Measuring Judgment of Orchestral Music," M. R. Trabue reports an interesting investigation on musical "taste."¹ Mr. Mohler planned the investigation and completed the field work in 1920. Phonograph records of sixteen different musical compositions were used. The relative merits of these compositions were judged by expert musicians and other intelligent adults, and each composition was assigned a numerical value designating its comparative worth. The test was administered in

¹ *Journal of Educational Psychology*, December, 1923.

such a manner that the individuals detecting the smallest differences in general merit received the highest scores.

The most significant finding of this study was "that the characteristics measured by these tests are easily improved by training. There seems to be an unusually large opportunity for improvement of taste for orchestral music through musical training and experience. In almost every case, the group that received training increased its median score ten or more times as much as the untrained group.

In concluding this report, Trabue presents statistical evidence on the relationship of ability measured by these scales, and general academic ability. The coefficient of correlation between the musical judgment scores and the mental ability scores, based on 39 cases was only .16, although the quadrant of the correlation table indicating low academic ability and high musical judgment, contained but one individual. He concludes, therefore, that one must have a sufficient amount of academic ability to make 70 points on the Miller ability test before he can learn to judge orchestral music successfully, but that high general academic ability does not at all imply high ability to judge orchestral music.

While the results of this study are significant in themselves, the important contribution of this investigation is in its method of attacking a most difficult problem, that of æsthetic response.

IV. Curriculum Practices in Junior High School and Grades 5 and 6¹

This authoritative work covers the curriculum practices of fourteen educational centers. No effort was made to test the results achieved in the fourteen school systems. The report arrives at one perfectly clear conclusion—namely, that "the periods of time devoted in various school systems to a given subject of instruction and to sub-divisions of that subject are impressively different. The scientific determination of the results of teaching is leading in all of these centers to a scientific evaluation of the materials of instruction. A scientific analysis of the materials of teaching must in turn lead to an analysis of the objectives of instruction. If objectives are to be scientifically established, they must be based upon a scientific study of the needs of pupils as revealed in modern society and of the skills, abilities and attitudes conditioning useful citizenship."

In averaging the number of minutes a week allotted to each constant by the fourteen school systems, it appears that less time is spent on music than on any other junior high school subject. Seventy minutes is spent on music in the seventh, sixty-seven in the eighth and seventy-three in the ninth grade. The average proportional allotment of the school week to the constants of the curriculum in the fourteen school systems for the junior high school reveals that only 4.3 per cent of the school time is devoted to music

¹ Glass, J. M. Supplementary Educational Monographs, No. 25, November, 1924, Univ. of Chicago.

in the seventh grade, 4.0 per cent in the eighth and 4.4 per cent in the ninth grade.

How to make a curriculum,¹ by Franklin Bobbitt, contains much evidence of a tendency to ascertain the social values of music. "Music electives are, therefore, entering the program of studies as club activities, as major electives in a fine arts curriculum, and as electives supplementary to other major electives or as additional enrichment courses for pupils who can carry extra work. The important socializing effect of the expansion of music courses, both required and elective, should be recalled in an evaluation of the development."

V. Sixth Grade Achievement

At the fourteenth annual meeting of the Music Supervisors' National Conference held in St. Joseph, Missouri, 1921, members of the Educational Council submitted a standard course of study for graded schools. This course was formulated for the "good or average school representing an easily attainable and a desirable ideal for all schools." This course received the unanimous endorsement of the members of the Council after it had been "thoroughly analyzed, section by section, phrase by phrase, word by word." The purpose of the course was to direct the attention of educators to standards of attainments toward which the music work in schools generally should go.

Attainments to be realized, year by year, are to be found at the end of each school grade. At the end of the sixth year, which "marks the close of the primary period, and the end of the sensory and associative stages in the child's life," the Council recommends eight definite attainments. Seven of these attainments were made the basis of a series of investigations, undertaken by Miss Estelle Windhorst.² This research was made possible by the generous grant of a fellowship to the State University of Iowa by the Julliard Musical Foundation of New York City. Objective measurements were devised and applied to each of the seven attainments formulated by the Council, in an effort to ascertain the feasibility, and the extent to which each is being realized. Five large cities, highly distinguished for their public school music work, were used in making this study.

First attainment—This attainment recommended by the Council for the sixth grade is that "every child shall have acquired the use of his singing voice and pleasure in song as a means of expression." This attainment was not reached by all cities. While it is probably true that most children derive pleasure from singing, to other children it was plainly an irritant. Many children showed utter indifference in singing, revealing that their

¹ Bobbitt, Franklin. *How to make a curriculum*. Boston: Houghton Mifflin Co., 1924.

² A Study of the Sixth-Grade Attainments Stated in the Standard Course of Study adopted by the Music Supervisors National Conference in 1921. To be published in the University of Iowa Studies in Psychology. Vol. IX.

musical imagination or emotion had not been aroused. Monotones were found, showing that there was a small percentage of children in the sixth grade who had not acquired "the use of their singing voices." It might be added that all children were measured and rated on accuracy in intonation and sustaining the pitch. The examiner concludes that this attainment may be feasible, but is not realized by all.

Second attainment—"Every child shall have acquired a repertoire of songs which may be carried into the home and social life, including "America" and the "Star-Spangled Banner." The measurement of some 500 children show that those who have found their singing voice were able to sing "America" and on the whole quite accurately, but to the great surprise of the examiner, "Silent Night" was even more universally known from memory. Due to its difficulty and unnatural range, "The Star-Spangled Banner" was sung well only by children with exceptional voices. Many children were afraid to attempt it at all, and it was sung very inaccurately by the larger number who tried it. Songs learned in previous years and not frequently reviewed were sung inaccurately either rhythmically or melodically. While this aim is feasible, it, too, is not being generally achieved. Some school systems stress repertoire songs, while others neglect this phase of music instruction almost entirely.

Third attainment—"Every child shall have developed the aural power to know by sound that which he knows by sight and *vice versa*." This attainment is apparently too difficult. Less than 50 per cent of the children measured could recognize "The Star Spangled Banner" from notation; only 18 per cent could recognize "Silent Night" by sound. A distorted version of "America" was presented to the children in which five measures were wrong melodically. Only 9 per cent of the 486 sixth grade children measured could detect all the wrong measures; 21 per cent were able to detect four wrong measures. "America," probably the best-known song both by sight and sound, revealed how few children have attained this ability.

Fourth attainment—"Every child shall have the ability to sing at sight, using words, a unison song of hymn tune grade, and the easiest three-part songs; these to be in any key; to include any of the measures and rhythms in ordinary use; to contain any accidental signs and tones easily introduced; and in general to be of the grade of difficulty of folk songs such as the "Minstrel Boy"; also knowledge of the major and minor keys and their signatures." Forming a tonal image from a notational symbol is a basic skill in sight-singing. Test I of the Kwalwasser-Ruch Accomplishment Test measures one's knowledge of musical terms and symbols. It consists of twenty-five items. The mean score of the children measured 13. Evidently, many of the most common symbols and terms are not understood by sixth-grade pupils. The chromatics give children most trouble. The knowledge of key and time signatures is not noticeably acquired. The minor key signatures are hopelessly beyond the sixth-grade child, if we may depend upon the results of this investigation.

Fifth attainment—"Every child talented in musical performance shall have opportunity for its cultivation." This attainment is both desirable and practicable. Most schools encourage participation in choruses, orchestras and bands. The talented are thus afforded an opportunity to develop their musicianship.

Sixth attainment—"The children shall have developed a love for the beautiful in music and taste in choosing their songs and the music to which they listen for the enjoyment and pleasure which only good music can give." In spite of the fact that this attainment is very difficult to measure, it is, nevertheless, a most important one.

Seventh attainment—"The children shall have acquired the ability to appreciate the charm of design in songs sung; to give an account of the salient features of structure in a standard composition after a few hearings of it; to identify at least the three-part song form from hearing; and to recognize and give titles and composers of a reasonable number of standard vocal and instrumental compositions." Only one item of this attainment was measured, namely "the recognition of standard vocal and instrumental compositions." In this less than half of the children came up to this standard formulated by the educational council.

This survey of five schools which are far above the average in musical attainment, shows the difficulty of realizing some of the attainments of the standard course of study. It demonstrates the ease with which the "intangible" subjects of music may be measured objectively. It suggests a new method of procedure for making public school music surveys. It reveals the shortcomings of our present efforts to make music more effective and more influential in the lives of our children. It aids the music educator in applying the remedial measures necessary to improve both the teaching and the content of the subject.

Before concluding this report, a word concerning the future studies in public school music seems apropos. The arts are not easily subjected to the experimental procedure. Yet it is unlikely that music will be systematically and efficiently taught without the application of the experimental procedure. The results already obtained more than warrant the expenditure of time and money on refining the methodology of music teaching. Finally, it promises to give to music education, a science of music pedagogy.

ANNUAL REPORT OF THE EXECUTIVE SECRETARY

Cincinnati Meeting, 1925

To the President, Executive Committee, and Members of the Department of Superintendence:

In accordance with the provisions of the constitution, adopted at the Chicago convention in 1922, the third annual report of the activities of the Department of Superintendence is presented herewith. It covers the period from January 1, 1924, to December 31, 1924.

The year in review—The 1924 convention in Chicago, which emphasized "Next Forward Steps in American Education," set a high standard of constructive thinking. Small topic group meetings replaced two general sessions and provided unusual opportunity for intimate discussion of important problems. Chicago is handicapped by lack of a convenient exhibit hall. The plan of locating the exhibits in hotel rooms does not well adapt itself to our needs. The second Yearbook, which reviewed current elementary school curriculum practice, was distributed to members at Chicago. An official report of the convention proceedings was issued in May.

The preparation of the 1925 Yearbook has been under the direction of the Commission on the Curriculum. The appointment of this Commission was authorized by vote of the Department in 1923, at Cleveland. The Commission met in Washington, June 30, and determined to collect and review research studies in the field of the elementary school curriculum. The Division of Research of the National Education Association undertook active responsibility for this task. Dr. Margaret M. Alltucker, assistant director of the division of research, secured much valuable material and assistance in the course of a series of conferences with curriculum specialists in Columbus, Chicago, New York, Pittsburgh, Iowa City, Denver, California, and elsewhere. At a second meeting, held October 23 and 24, the Commission outlined a comprehensive plan of coöperative effort for curriculum reconstruction, with a view to its consideration and adoption at the Cincinnati convention. Many people have contributed liberally of time and effort in the preparation of the 1925 Yearbook. Especial attention is called to the twelve sub-committees listed at the beginning of Part III. Without their assistance, this volume would have been impossible.

The *Research Bulletin of the National Education Association* has been mailed to all members of this Department during the year. These bulletins have dealt with teachers' salaries, retirement laws, the curriculum, tenure, and facts on the public school for American Education Week. It was originally intended to issue a Quarterly of the Department of Superintendence, but on further consideration it seemed better to adopt a program of coöperation, thereby securing for our members the excellent publications of the Division of Research.

A small beginning has been made with the Educational Research Service, which was authorized two years ago. Forty cities are enrolled thus far. Subscribers are furnished with printed or multigraphed copies of recent educational studies, information is secured in response to individual inquiries, special tabulations are made involving problems, such as teachers' salaries, and an effort is being made to assist subscribers in solving the questionnaire evil. On account of the newness of the venture and the meagerness of our staff, only enough subscriptions were solicited to afford a fair test of the undertaking. If all goes well, a much greater number can be accepted next year.

The executive committee—The Executive Committee consists of seven members. The president and the first and second vice presidents are members ex-officio and are chosen annually. Four members chosen by election, hold office for terms of four years, one member retiring each year. Three meetings of the Executive Committee were held during 1924, the first being in Chicago on February 24. Members present were Superintendents Smith, Beveridge, Clark, Cody, Condon, Ballou and McAndrew. Business transacted included approval of appointments for the Audit Committee, Resolutions Committee, Tellers and Yearbook Committee. It was voted to contract for copies of the *Research Bulletin of the National Education Association*, to be mailed to all members of the Department, and to abandon the plan for the proposed Quarterly of the Department of Superintendence. In a resolution Dr. Randall J. Condon was commended for his excellent work in conducting the building exhibits at the last two conventions.

The Executive Committee met again in the Auditorium Theater, Chicago, Thursday afternoon, February 28. All members were present. The Executive Secretary was authorized to pay convention bills when approved by the retiring president. The vacancy caused in the membership of the Executive Committee by the election of William McAndrew as president of the Department, was filled by the appointment for the unexpired term of Frank D. Boynton, superintendent of schools, Ithaca, N. Y.

The third meeting of the Executive Committee was held in the Gibson Hotel, Cincinnati, Saturday, April 26. Members present were Superintendents McAndrew, Maddox, Condon, Ballou, Clark, and Boynton. The first vice president, Payson Smith, was absent on account of illness. The budget for the year 1924 was submitted and adopted. It showed estimated income of \$16,000, and estimated expenditure of \$15,995.81. Applications from various organizations for recognition in connection with the winter meeting were received, and on motion, the Executive Secretary was instructed to advise the officers of all such organizations that the Department of Superintendence regretted its inability to secure the necessary hotel and other accommodations for additional groups. The publication in the *Educational Review* of suitable articles and news items was authorized.

Mr. Edwin C. Broome, chairman of the Commission on the Curriculum,

was present and reported progress. Following a discussion of the magnitude of the undertaking, the following resolution was adopted:

"The executive committee approves the suggestion that paid experts and clerical assistance be secured to aid the Commission, provided funds for the purpose can be secured. Inasmuch as no funds are available, a donation will be welcomed, with the understanding that the Department be entirely free to act as it sees fit."

In behalf of the Commission on the Curriculum, grateful acknowledgment is made to the Carnegie Corporation for \$5000, made available in accordance with the above resolution for payment of travelling expenses and clerical service.

The Executive Secretary reported that a vote of members of the Department on the question of time and place of the winter meeting had been taken by mail. The number who voted for the present date, during the last week of February, was 1232, while 281 asked for a change. To the question, "Would you wish to have the Department meet in the same city each year," 578 voted "Yes" and 1216 voted "No." For the 1925 Convention, a great majority favored a city in the Middle West, preferably one in which the Convention had not been held recently. The Executive Committee thereupon considered invitations for the 1925 Convention. After a recess for the purpose of visiting the Cincinnati Music Hall and hotels, Cincinnati was selected as the convention city.

Financial statement—The budget allotments adopted by the Executive Committee have been closely observed. The income exceeded the estimates by \$1,637.93. The expenditures were \$589.74 less than the budget allowance, thus making the balance at the close of the year over \$2,000 more than at its beginning.

The principal source of revenue is the \$5 annual membership fee. Twelve hundred and sixty-three members were enrolled for 1922, 1650 for 1923, and 2136 for 1924. We have set our goal for 1925 at 3000 members. By 1926 this should be increased to 4000, since there are at least that many eligible persons who attend the conventions more or less regularly.

By agreement with the National Education Association, the net income from the commercial exhibits at the winter meetings is divided equally between the Department and the parent association, each organization thus deriving funds for convention expenses. The active work of organizing and managing the exhibit is done by the Business Division of the National Education Association.

Other income was received from the sale of Yearbooks, which was unexpectedly large, from the Educational Research Service, and from a donation to the Department of the balance remaining in the convention fund contributed by the Chicago hotels.

The financial statement submitted herewith covers the calendar year 1924. It includes expenses of the Chicago convention and the preliminary expenditures for the 1925 meeting in Cincinnati. The details follow:

Receipts

Annual dues, 1533 members 1924.....	\$7665.00
Annual dues, 494 members 1925.....	2473.50
Yearbooks sold	1364.13
Commercial exhibit, Chicago	5142.81
Miscellaneous	33.49
Research service	525.00
Balance Chicago convention fund.....	434.00
Total receipts	\$17,637.93
Balance, January 1.....	275.84
	\$17,913.77

Expenditures

Chicago Convention:	
Publicity	520.30
Building reports	295.00
President expense.....	55.00
Secretary expense.....	505.51
Programs	496.05
Registration	516.09
Stenographic report.....	155.05
Honorariums	267.86
Projection service.....	25.00
Chicago railroad certificates.....	85.50
Badges	35.70
Music	40.00
Educational exhibit.....	60.00
Total Chicago convention.....	3,057.06
Other Items:	
Salary, Executive Secretary.....	6499.96
Second Yearbook.....	2250.38
Bulletins and Official Report.....	354.60
Other printing.....	174.25
Postage and Stationery.....	1281.24
Stenographic and clerical.....	60.37
Telephone and telegraph.....	200.62
Secretary expense.....	384.97
President expense.....	32.47
Executive Committee expense.....	319.85
Expense, Audit Committee.....	25.97
Research Assistant.....	537.01
Commission on Curriculum.....	86.34
Surety bonds.....	30.00
Collection fees.....	.40
Cincinnati railroad certificates.....	85.50
Office supplies.....	25.08
Total general expense.....	12,349.01
Total expense for the year.....	\$15,406.07
Balance, December 31, 1924.....	2,507.70
	\$17,913.77

In conclusion—The work of the year has again demonstrated the importance of the help and good-will of friends. The headquarters staff of the National Education Association have rendered willing and competent assistance whenever opportunity offered. The school organizations and the chambers of commerce of our convention cities, Chicago and Cincinnati, have diligently served our interests, frequently at great personal inconvenience. Our yearbook and our civic and art exhibits place us under new obligations of gratitude.

The superintendent of schools has no light responsibility. Public finance, business matters, school buildings, curriculum construction, records and reports, methods of organization, teachers' meetings, are a few of the subjects with which he must concern himself. Moreover, these are but items in the great work of guiding and guarding the childhood of America. Upon the successful accomplishment of this task depends the future of our Nation and the preservation of its ideals. The Department of Superintendence, through its great winter meeting and year-round service, offers to superintendents of schools a comradeship of common interests and brings inspiration for renewed effort.

Respectfully submitted,

S. D. SHANKLAND,
Executive Secretary.

REPORT OF AUDITING COMMITTEE

WASHINGTON, D. C., *January 15, 1925.*

We, the Auditing Committee of the Department of Superintendence of the National Education Association, have this day examined the accounts of the Department of Superintendence from December 31, 1923, to December 31, 1924, as presented to us by Secretary S. D. Shankland, and find them to be correct.

H. V. HOLLOWAY,
W. J. BICKETT.

List of Members

The Department of Superintendence

of the

National Education Association of the United States

Corrected to January 10, 1925

- Abbott, Winthrop, A. B. '93, Dartmouth;
Supt. of Sch., 36 High, Greenfield, Mass.,
since 1912.
- Ackley, Clarence E., A. B. '10, A. M. '13,
Oberlin Col.; Supt. of Sch., Ashland, Ky.,
since 1922.
- Adams, Emerson L., A. B. '89, A. M. '92,
Bowdoin Col.; Assist. Com. of Ed.; State
House, Providence, R. I., since 1917.
- Adams, E. Ray, Supt. of Sch., Tarkio, Mo.
- Afferbach, Calvin E., Rural Supervisor, State
Dept. of Pub. Instr., Georgetown, Del.
- Agnew, Walter D., M. A. '21, Ph. D. '23,
Columbia U.; Pres. Womans Col. of Ala.,
Fairview Ave., Montgomery, Ala., since
1922.
- Akers, A. E., Supt. of Sch., Roanoke Rapids,
N. C.
- Alan, John S., A. B. '93, A. M. '00, Thiel
Col.; Supt. of Sch., 529 McKinley Ave.,
Salem, Ohio, since 1913.
- Alcorn, M. O., M. S. '20, Univ. of Ark.;
Supt. of Sch., 213 E. North St., Magnolia,
Ark., since 1924.
- Alderman, Grover H., B. A. '13, Iowa State
Teachers Col.; M. A. '19, Ph. D. '20, State
Univ. of Iowa; Prof. of Ed., Univ. of Ind.,
525 N. Park Ave., Bloomington, Ind.,
since 1922.
- Alderson, W. C., A. B. '89, Willamette Univ.;
Co. Sch. Supt., 642 Courthouse, Portland,
Ore., since 1916.
- Aldrich, McCall, Supt. of Sch., Chino, Calif.
- Alexander, Carter, B. S. '05, A. B. '06, A. M.
'08, Univ. of Mo.; Ph. D. '10, Columbia
Univ.; Research Asso., T. C. Columbia
Univ., Div. of Field Stud., New York, N. Y.
- Alexander, Claude C., Supt. of Sch., Hib-
bing, Minn.
- Alexander, James W., Supervisor, Greenwood
Sch., Trenton, N. J.
- Alfriend, Kyle T., Prof. Education & Psy-
chology, Bessie Tift Col., Forsyth, Ga.
- Alger, John L., A. B. '90, A. M. '95, Brown
Univ.; Ed. D. '21, R. I. State Col.; Pres.
of R. I. Col. of Ed., Providence, R. I.,
since 1908.
- Allan, Harold A., A. B. '06, Bates Col.;
Director Business Division, N. E. A., 1201
Sixteenth St. N. W., Washington, D. C.,
since 1923.
- Allen, A. T., Ph. B. '97, Univ. of N. C.;
D. C. L. '24, Elon Col., N. C.; State Supt.
of Pub. Instr., Raleigh, N. C., since 1923.
- Allen, C. H., Supt. of Sch., Idaho Springs,
Colo.
- Allen, I. M., A. B. '96, Lawrence Col.;
LL. B. '02, Harvard Univ.; Student in
Tchrs. Co., 509 W. 121st St., New York,
N. Y.
- Allen, J. H., A. B. '09, Univ. of N. C.;
Supt. of Co. Sch., 33 N. Main St., Reids-
ville, N. C.
- Allen, Philemon A., Supt. of Sch., 510 W.
Washington St., Bluffton, Ind., since 1881.
- Allen, R. W., Supt. of Sch., Wadesboro,
N. C.
- Allman, H. B., B. S. '10, Tri-State Col.;
Supt. of Sch., Rushville, Ind.
- Allsworth, B. H., Supt. of Sch., Primero,
Colo.
- Alltucker, Margaret M., B. L. '14, M. A.
'19, Ph. D. '22, U. of Calif.; Asst. Dir.,
Research Div., N. E. A., 1734 N St.
N. W., Washington, D. C., since 1923.
- Ames, A. F., Co. Supt. of Sch., Riverside,
Ill.
- Anders, R. G., Co. Supt. of Sch., Hender-
sonville, N. C.
- Anderson, A. S., Supt. of Sch., 220 S. Fifth
Ave., La Grange, Ill.
- Anderson, C. J., Asst. State Supt. of Sch.,
Madison, Wis.
- Anderson, David Allen, B. A. '08, M. A.
'10, Ph. D. '12, U. of Iowa; Head Dept.
of Ed. and Psycho., Pa. State Col., 306
S. Gill St., State College, Pa., since 1917.
- Anderson, Earl W., A. B. '18, Univ. of Ill.;
Supt. of Sch., Charleston, Ill., since 1919.
- Anderson, Ernest B., B. A. '09, Gustavus
Adolphus Co.; Supt. of Sch., 115 Third
St., Cloquet, Minn., since 1923.
- Anderson, Homer W., B. A. '10, Des Moines
U.; M. A. '15, State U. of Iowa; Asst.
Supt. of Sch., 414 Fourteenth St., Denver,
Colo., since 1923.
- Anderson, J. A., Supt. of Sch., Hawley,
Minn.
- Anderson, John A., A. B. '97, A. M. '98,
Lake Forest; Supt. of Sch., Miles City,
Mont., since 1919.
- Andrews, Edwin C., A. B. '89, Williams;
Supt. of Sch., P. O. Drawer 292, Green-
wich, Conn., since 1910.
- Andrews, J. O., Asst. Supt. of Sch., 2825
May St., Ft. Worth, Tex.
- Andrews, L. G., '08, Howard Payne Col.
A. B. 18, Univ. of Texas; Supt. of Sch.,
Navasota, Tex., since 1919.
- Andrews, M. B., A. B. '14, M. A. '16,
Trinity Col.; Supt. of Sch., Box 622,
Payetteville, N. C., since 1921.

- Andrews, Sterling M., B. S. '04, Valparaiso U.; Supt. of Sch., Walsenburg, Colo., since 1908.
- Andrews, T. Wingate, A. B. '08, Univ. of N. C.; Supt. of Sch., Box 271, Salisbury, N. C., since 1917.
- Angel, W. H., A. B. '95, A. M. '99, Ohio Northern Univ.; Supt. of Sch., 823 N. 2nd St., Dennison, Ohio, since 1905.
- Antrim, Eugene Marion, A. B. '96, U. of Denver; S. T. B. '00, Boston U., Sch. of Theology; Ph. D. '04, Boston U.; Pres. Okla. City U., 1218 W. 21st St., Oklahoma City, Okla., since 1923.
- App, Isaac D., B. S. '05, M. S. '10, Susquehanna Univ.; Co. Supt. of Sch., Harrisburg, Pa., since 1922.
- Appel, Frank, A. B. '94, Ohio Wesleyan; Supt. of Sch., 840 8th St., Portsmouth, Ohio, since 1908.
- Appenzellar, J. L., Sup. Prin. of Sch., Wyomissing, Pa.
- Apple, S. B., A. B. '07, Baker Univ.; Supt. of Sch., High School, Baxter Spring, Kans.; since 1920.
- Appleby, Flavius Thompson, B. S. '01, Univ. of Tenn.; Supt. of Sch., Box 382, Florence, Ala., since 1917.
- Aquinas, Sister Thomas, O. S. D., A. B. '12, A. M. '13, Ph. D. '15, Catholic U. of America; Dean Rosary Col., River Forest, Ill., since 1923.
- Arendell, J. E., Supt. of Sch., 324 A. S. E., Miami, Okla.
- Armstrong, T. H., 500 Duffy-Powers Bldg., Rochester, N. Y.
- Arnett, Frank E., Supt. of Sch., White Sulphur Springs, W. Va.
- Arnold, E. H., 1466 Chapel St., New Haven, Conn.
- Arnold, E. J., B. S. '17, Wilmington Col.; M. A. '23, Ohio State U.; Supt. of Sch., Huntsville, Ohio, since 1920.
- Arnold, E. O., Supt. of Sch., Marengo, Mich.
- Arps, George F., A. B. '04, Leland Stanford Jr. U.; A. M. '05, Indiana Univ.; Ph. D. '08, Leipzig, Germany; Dean Col. of Ed., Prof. of Psycho., Ohio State U., Columbus, Ohio, since 1912.
- Ash, Willoughby Ross, B. S. '18, Heidelberg U.; Supt. of Sch., Box 38, Napoleon, Ohio, since 1918.
- Ashbaugh, E. J., A. B. '12, A. M. '13, Ind. U.; Ph. D. '19, U. of Ia.; Asst. Dir. Bur. of Ed. Research, Orton Hall, Ohio State U., Columbus, Ohio, since 1921.
- Ashfield, Nora, Asst. Supt. of Sch., Richmond, Calif.
- Ashley, Frank L., B. S. '11, Young-Harris Col.; A. M. '13, Newberry Col.; Supt. of Sch., Hamlet, N. C., since 1923.
- Atwell, Floyd, Supt. of Sch., 2106 7th Ave., Beaver Falls, Pa.
- Austin, George W., B. S. '06, Grayson Col.; Pres. Okla. Col. for Women, Chickasha, Okla., since 1914.
- Avery, Lewis B., A. M. '80, Tabor Col.; Asst. Supt. of Sch., 1112 City Hall, Oakland, Calif., since 1913.
- Avery, M. C., B. S. '10, Wooster; Supt. of Sch., Wadsworth, Ohio, since 1924.
- Avery, William J., Supt. of Sch., Drawer 603, Alexandria, La., since 1919.
- Axtelle, George, Dept. of Ed., Honokaa, Hawaii.
- Ayer, Fred C., Prof. of Ed., Univ. of Wash., Seattle, Wash.
- Babb, H. A., B. S. '11, Univ. of Ky.; Supt. of Sch., Mt. Sterling, Ky., since 1920.
- Bachrodt, Walter L., A. B. '20, A. M. '21, Stanford; Supt. of Sch., San Jose, Calif., since 1921.
- Bacon, Willard H., A. B. '00, Brown Univ.; Supt. of Sch., Westerly, R. I., since 1913.
- Baer, Joseph A., Asst. Co. Supt. of Sch., 3840 Mayfield Rd., Cleveland, Ohio.
- Baggett, John E., Supt. of Sch., Lake Forest, Ill.
- Baggs, Louise D., Supt. of Sch., Bristol, Pa.
- Bagnall, Francis Asbury, A. B. '90, A. M. '00, Wesleyan Univ.; Supt. of Sch., Adams, Mass., since 1901.
- Bailey, D. L., Supt. of Sch., Harbor Springs, Mich.
- Bailey, Edward L., Supt. of Sch., Box 135, Jackson, Miss.
- Bailey, John H., Jr., '82, R. I. Col. of Ed.; Supt. of Sch., Box 533, Anthony, R. I., since 1919.
- Bailey, R. E., A. B. '20, Univ. of Nebr., Newman Grove, Nebr.
- Bair, Carl M., Supt. of Sch., 650 4th Ave., Berlin, N. H.
- Baker, Chilton Clyde, B. S. '96, A. M. '13, Ohio Northern Univ.; Dist. Supt. of Sch., Grand Rapids, Minn., since 1920.
- Baker, Edna Dean, B. A. '20, M. A. '21, Northwestern U.; B. E. '13, Nat. Kindergarten Col.; Pres. Nat. Kindergarten and Elem. Col., 2944 S. Michigan Ave., Chicago, Ill., since 1920.
- Baker, Frank E., A. B. '05, Allegheny Col.; A. M. '08, Harvard U.; A. M. '13, Allegheny Col.; Pres. Milwaukee St. Normal, Milwaukee, Wis., since 1923.
- Baker, George Marshall, B. A. '13, Univ. of Minn.; M. A. '14, Columbia Univ., 536 S. Clark St., Chicago, Ill.
- Baker, N. R., Co. Supt. of Sch., 101 Court House, Birmingham, Ala.
- Baker, Oscar R., Supt. of Sch., 322 E. Franklin St., Winchester, Ind.
- Baker, Sam A., Ed. Director Grolier Society, Jefferson City, Mo.
- Baker, W. D., A. B. '93, A. M. '94, Univ. of Mich.; Supt. of Sch., Clifton, Ariz., since 1918.
- Baker, William Elwood, A. B. '16, A. M. '20, Colo. St. Tch. Col.; Supt. of Sch., 311 E. Kiowa St., Fort Morgan, Colo., since 1924.

- Balch, Frank A., '88, Bridgewater Normal Supt. of Sch., 201 Jane St., Weehawken, N. J., since 1914.
- Balcom, A. G., Asst. Supt. of Sch., New Providence, R. I.
- Baldrige, Chloe C., Co. Supt. of Sch., Court House, Fullerton, Nebr., since 1915.
- Baldwin, William A., B. S. '97, Harvard U.; Prin. State Normal Sch., Hyannis, Mass., since 1897.
- Baldy, Edward Vincent, A. B. '85, A. M. '86, Mercer U.; M. T. '89, Southern Baptist Theo. Sem.; Pres. of Judson Col., Marion, Ala., since 1923.
- Ballard, Agnes, Co. Supt. of Sch., West Palm Beach, Fla.
- Ballard, N. H., State Supt. of Sch., Atlanta, Ga.
- Ballou, Frank Washington, B. S. '04, Teachers Col. Columbia Univ.; M. A. '08, Univ. of Cincinnati; Ph. D. '14, Harvard Univ.; Supt. of Sch., Washington, D. C., since 1920.
- Balsbaugh, E. M., B. S. '01, M. S. '05, Lebanon Valley Col.; Supt. of Sch., 236 S. Eighth St., Lebanon, Pa., since 1914.
- Balveat, F. A., B. A. '11, M. A. '18, Univ. of Okla., Supt. of Sch., 220 S. Hill St., Hobart, Okla., since 1919.
- Bambesberger, Velda C., A. M. '19, Univ. of Ill.; Dir. of Gr. and Ed. Stats., 613 N. Grand St., Okmulgee, Okla., since 1920.
- Bank, A. M., Supt. of Sch., Park Rapids, Minn.
- Banks, Charles, B. S. '10, State Teachers Col.; M. A. '14, Univ. of Wis.; Supt. of Sch., Kirksville, Mo., since 1922.
- Banks, L. F., Asst. Supt., 2030 Park Ave., Birmingham, Ala.
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- Banting, George Orton, Ph. B. '15, Univ. of Chicago; Supt. of Sch., Waukesha H. S. Bldg., Waukesha, Wis., since 1920.
- Barber, Charles Emory, A. B. '04, A. M. '05, Univ. of Nebr.; Supt. of Sch., Alhambra, Calif., since 1915.
- Barber, F. W., A. M. '10, Columbia; Supt. of Sch., Newfield, Middletown, Conn.
- Bardwell, C. M., Supt. of Sch., 429 Fox St., Aurora, Ill.
- Bardwell, R. W., Supt. of Sch., 6th Ave. and 21st St., Rock Island, Ill.
- Barker, H. L., Supt. of Sch., Bangor, Mich.
- Barker, J. F., Asst. Supt. of Sch., 306 Municipal Bldg., Rochester, N. Y.
- Barber, J. M., Supt. of Sch., Depew, N. Y.
- Barker, V. H., Supt. of Sch., Chenoa, Ill.
- Barnes, C. H., Co. Supt. of Sch., Court House, Duluth, Minn.
- Barnes, Harold, A. B. '92, Kans. Univ., A. M. '11, Tch. Col., Columbia Univ.; Sup. Prin. Elem. Ed., Girard, Col., Philadelphia, Pa., since 1911.
- Barnes, Percival S., B. S. '17, A. M. '18, Columbia Univ.; Supt. of Sch., East Hartford, Conn., since 1919.
- Barnes, W. C., Supt. of Sch., 518 W. Chestnut St., Carthage, Mo.
- Barnett, D'Arcy C., A. B. '98, A. M. '07, Univ. of Md.; A. M. '11, Columbia Univ.; '13, Columbia Univ. Diploma; Sup. Prin. of Sch., 7 Cleveland St., Caldwell, N. J., since 1911.
- Barr, A. S., Dept. of Supvn., Bd. of Ed., Detroit, Mich.
- Barr, Oscar O., B. S. '18, Teachers Col. Columbia Univ.; Supt. of Sch., South Amboy, N. J., since 1914.
- Barrett, H. J., A. B. '00, Univ. of Wooster; A. M. '16, Dickinson Col.; Supt. of Sch., 409 Walnut Street, Hollidaysburg, Pa., since 1913.
- Barrett, Harry M., B. A. '90, M. A. '93, Allegheny Col.; Litt. D. '14, Univ. of Denver; Dir. Col. of Ed., Univ. of Colo., Boulder, Colo., since 1920.
- Barry, A. G., B. A. '17, B. C. S. '16, Albion; Supt. of Sch., Box 299, Nora Springs, Iowa.
- Barthelmeh, Charles, B. S. '22, Kent St. Norm. Col.; Co. Supt. of Sch., New Philadelphia, Ohio, since 1914.
- Bartlett, Paul B., B. A. '15, Grinnell Col.; Supt. of Sch., Box 52, Gilmore City, Iowa, since 1922.
- Barton, James Richard, B. A. '13, Hendrix Col.; M. A. '21, Tch. Col., Columbia Univ.; Supt. of Sch., 613 N. Grand Ave., Okmulgee, Okla., since 1924.
- Bash, Eugene H., B. S. '20, N. E. Mo. State Tchrs Col., Kirksville; Prin. Henry C. Kumpf School, Kansas City, Mo., since 1923.
- Bass, E. E., Supt. of Sch., Greenville, Miss.
- Bass, O. W., Co. Supt. of Sch., Fayetteville, Ark.
- Bassette, Alfred S., A. B. '13, Syracuse U.; Supt. of Sch., Walden, N. Y., since 1923.
- Batcheller, D. E., Supt. of Sch., 120 Payne Ave., North Tonawanda, N. Y.
- Bate, William G., B. A. '10, M. A. '15, Ripon Col.; Supt. of Sch., 8th and North B Sts., Richmond, Ind., since 1921.
- Bates, H. L., B. S. '24, Kent St. Col.; Supt. Co. Sch., I. O. O. F. Bldg., Caldwell, Ohio, since 1915.
- Bates, Horace Freeman, A. B. '98, Harvard; Union Supt. of Sch., Swansea, Mass., since 1922.
- Bauer, Nicholas, B. S. '97, M. A. '99, Tulane Univ.; Supt. of Sch., City Hall Annex, New Orleans, La., since 1922.
- Bauman, D. H., Ph. B. '06, Grove City, Pa.; Suprg. Prin., Meyersdale, Pa., since 1920.
- Baumgardner, G. U., B. S. '12, Wooster; County Supt. of Sch., Court House, Wooster, Ohio, since 1914.
- Baumgartner, John, M. S. '20, Univ. of Ark.; M. A. '22, Univ. of Chicago; Supt. of Sch., Brinkley, Ark.

- Bawden, William T., A. B. '96, Denison Univ.; B. S. '10, Tch. Col., Columbia U.; Ph. D. '14, Tch. Col., Columbia Univ.; Asso. Supt. Sch., Board of Ed. Bldg., Tulsa, Okla., since 1923.
- Bay, James C., Supt. of Sch., Easton, Pa.
- Baylor, Adelaide Steele, Ph. B. '97, U. of Chi.; M. A. '18, Columbia U.; Chief of Home Economics Ed. Serv., Fed. Bd. for Voc. Ed., since 1923.
- Bayne, Stephen F., Pub. Sch., No. 1, Van Alst Ave., and Ninth St., Long Island City, N. Y.
- Beach, M. F., Supt. of Sch., Moberly, Mo.
- Beals, R. G., A. B. '07, Earlham Col.; M. A. '09, Indiana Univ., Supt. Twp. H. S., DeKalb, Ill., since 1922.
- Bear, Harris V., A. B. '03, Otterbein Col.; A. M. '10, Harvard Univ.; Supt. of Sch., 301 S. 5th St., Miamisburg, Ohio, since 1915.
- Beard, R. B., B. S. '18, Bucknell Univ.; Supr. Prin. Pub. Sch., Portage, Pa., since 1919.
- Beatty, Edward, Supt. of Sch., Warrensburg, Mo.
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- Becker, C. F., Ph. B. '08, Mt. Union Col.; M. A. '17, Columbia Univ.; State Normal, Clarion, Pa.
- Bedwell, R. L., Ph. B. '10, Miss. Col.; M. A. '17, Univ. of Miss.; Supt. of Sch., 220 Jackson Ave., Yazoo City, Miss., since 1919.
- Beede, F. H., B. A. '83, Yale; Supt. of Sch., 169 Church St., New Haven, Conn., since 1899.
- Belisle, Hector L., Supt. of Sch., Fall River, Mass.
- Bell, H. C., Supt. of Sch., Luverne, Minn.
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- Bender, L. S., Supt. of Sch., Cokeville, Wyo.
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- Bennett, J. M., A. B. '10, Western Md. Col.; Co. Supt. of Sch., Salisbury, Md., since 1917.
- Bennett, Robert K., Supt. of Sch., 110 Cross St., Central Falls, R. I.
- Bennett, Thomas G., A. B. '09, West, Md. Col.; A. M. '22, Tchrs. Col.; Supt. of Sch., Centreville, Md.
- Bennett, Ulric J., A. B. '09, Univ. of Ga.; Supt. of Sch., P. O. Box 69, Fitzgerald, Ga., since 1921.
- Bennion, Milton, B. S. '97, Univ. of Utah; M. A. '01, Columbia Univ.; Dean, School of Ed. Univ. of Utah, Salt Lake City, Utah.
- Benson, Nelson P., B. S. '08, Washington Square Col.; M. A. '14, Ph. D. '19, N. Y. Univ.; Supt. of Sch., Lock Haven, Pa., since 1920.
- Benson, W. W., Supt. of Sch., Decatur, Ala.
- Bentley, J. H., A. B. '03, Wesleyan U., Middletown, Conn.; M. A. '16, Columbia U.; Y. M. C. A., 2 W. 45th St., New York, N. Y.
- Berg, B. C., Supt. of Sch., Newton, Iowa.
- Berg, Selmer H., B. A. '17, St. Olaf Col.; M. A. '24, U. of Minn.; Supt. of Sch., Stoughton, Wis., since 1924.
- Berry, L. J., B. S. '05, Trinity U., M. A. '22, Columbia U.; Supt. of Sch., Box 203, San Marcos, Tex.
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- Bersagel, E. L., Supt. of Sch., Wakonda, S. Dak.
- Beu, Frank A., A. B. '20, Northwestern Univ.; Supt. of Sch., Hebron, Ill., since 1921.
- Beumer, Edward H., A. B. '14, B. S. '14, Univ. of Mo., Supt. of Sch., Urbana, Ill.
- Beveridge, John H., B. Pd. '97, Ohio Univ.; M. A. '15, Columbia Univ.; M. A. '15, D. Pd. '17, Ohio Univ.; Pres. Dept. of Superintendence, 1922; Supt. of Sch., 601 City Hall, Omaha, Nebr., since 1917.
- Bickett, William J., Ph. B. '01, Ph. D. '22, Grover City; Supt. of Sch., 9 S. Stockton, Trenton, N. J., since 1920.
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- Biester, Fred, 538 Turner Ave., Glen Ellyn, Ill.
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- Binnion, R. B., Pres., East Tex. State Tchrs. Col., Commerce, Tex.
- Birkhead, Edward F., M. A. '12, Columbia U.; Ed. M. '23, Harvard U.; Supt. of Sch., Hickman St. School, Winchester, Ky., since 1923.
- Bishop, Charles C., A. B. '06, U. of Wis.; M. A. '19, Columbia Univ.; Supt. of Sch., Oshkosh, Wis., since 1921.
- Bishop, Fred G., '05, Oshkosh Normal; A. B. '15, Univ. of Wis.; Supt. of Sch., Two Rivers, Wis., since 1920.
- Bishop, Martha V., Dist. Supt. of Sch., 7208 Bennett Ave., Chicago, Ill.
- Bishop, W. H., Supt. of Sch., Stillwater, Okla.
- Bixby, Herbert D., Asst. Supt. of Sch., Cleveland, Ohio.
- Blackwell, John C., B. S. '16, Geo. Peabody Col.; Supt. T. C. I. Sch., 1210 Brown, Marx Bldg., Birmingham, Ala., since 1917.
- Blair, Francis G., State Supt. of Pub. Inst., Capitol Building, Springfield, Ill.
- Blair, Hale B., B. S. '12, Ottawa Univ.; Supt. of Sch., 408 S. 8th St., Humboldt, Kans., since 1924.

- Blair, John L., Supt. of Sch., East Dubuque, Ill.
- Blair, Parr Dalton, Co. Supt. of Sch., 580 Walnut Park, Meadville, Pa.
- Blanchard, Charles A., A. B. '70, A. M. '73, Wheaton Col.; D. D. '90, Monmouth, Ill.; Pres. Wheaton Col., Wheaton, Ill., since 1882.
- Blanton, Annie Webb, B. Lit. '99, M. A. '23, Univ. of Tex.; Adj. Prof. of Ed. Admin., Univ. of Tex., Univ. Sta., Austin, Tex., since 1923.
- Blanton, R. S., M. A. '14, A. B. '13, L. I. '05, Univ. of Fla.; Co. Supt. of Pub. Inst., Clearwater, Fla., since 1921.
- Bleecker, H. L., Supt. of Sch., Hart, Mich.
- Bliss, D. C., Normal Sch., Trenton, N. J.
- Bliss, Walton B., A. B. '15, Heidelberg Univ.; Asst. St. Dir. of Ed., State House Annex, Columbus, Ohio, since 1920.
- Blodgett, Frank D., A. B. '93, A. M. '96, LL. D. '18, Amherst Col.; Pres. Adelphi Col., Brooklyn, N. Y., since 1915.
- Board of Education, Franklin, N. J.
- Bocock, C. E., Pres., State Norm. Sch., Albion, Idaho.
- Bodwell, E. J., Supt. of Sch., Ames, Iowa.
- Bohlander, J. J., Supt. of Sch., Moorhead, Minn.
- Bolcom, Winfred G., M. A. '15, Univ. of Minn.; Supt. of Sch., H. S. Bldg., Rochester, Minn., since 1919.
- Bonar, Hugh S., M. A., '24, Univ. of Chicago; B. A. '18, B. Acc'ts. '16, Mt. Morris Col.; Supt. of Sch., 626 North Park St., Richland Center, Wis., since 1923.
- Bonar, J. S., Asst. State Supv. Rural Sch., 3 Arlington Court, Charleston, W. Va.
- Bond, G. G., Supt. of Sch., Athens, Ga.
- Bonner, E. J., Prin. City Norm. Sch., Rochester, N. Y.
- Bonner, G. H., A. B., '01, Dickinson Col.; Supt. of Sch., P. O. Box 246, Kit Carson, Colo. since 1923.
- Booker, W. R., A. B., '16, Indiana Univ.; Supt. of Sch., 610 S. Franklin St., Greenville, Mich., since 1918.
- Boone, D. J., B. S. '98, Mt. Union Col.; Supt. of Sch., H. S., Lorain, Ohio, since 1914.
- Borden, Walter W., B. S. '12, Ohio State; Supt. of Sch., Admin. Bldg., South Bend, Ind., since 1919.
- Bosley, L. C., A. B. '91, L. L. B. '98, Centre Col.; Supt. of Sch., 219 So. 4th St., Danville, Ky., since 1918.
- Boucher, C. W., Supt. of Sch., Valparaiso, Ind.
- Bourgard, Caroline B., State Dir. of Music, 1151 E. Broadway, Louisville, Ky., since 1923.
- Bowden, R. D., Supt. of Sch., H. S., Havana, Ill.
- Bowers, E. V., Supt. of Sch., Galion, Ohio.
- Bowlby, R. S., Supt. of Sch., 285 W. Clinton St., Dover, N. J.
- Bowlus, Edgar S., A. B. '11, St. John's Col.; A. B. '12, Univ. of Md.; A. M. '16, St. John's Col.; Supt. of Sch., Brookhaven, Miss., since 1922.
- Bowman, George A., A. B. '17, Western Reserve Univ.; Supt. of Sch., P. O. Box 343, Chillicothe, Ohio, since 1923.
- Bowman, Grover Chester, B. A. '06, Williams; M. A. '12, Yale; Supt. of Sch., City Hall, North Adams, Mass., since 1922.
- Bowton, R. C., A. B., '11, Ind.; M. A. '15, Wis.; Supt. of Sch., 323 So. Fairfax St., Alexandria, Va., since 1923.
- Boyce, Ella Ruth, Dir. of Kdrgrtns., 705 Fulton Bldg., Pittsburgh, Pa.
- Boyd, Paul E., A. B. '16, Centre Col., Danville, Ky.; Supt. of Sch., Lancaster, Ky., since 1920.
- Boyden, Arthur Clarke, A. M. '83, Amherst Col.; Prin. State Normal Sch., Box 55, Bridgewater, Mass., since 1906.
- Boyden, Wallace C., A. B. '83, A. M. '86, Amherst Col.; Prin. Tch. Col. of Boston, Huntington Ave., Boston, Mass., since 1900.
- Boyer, Charles B., Supt. of Sch., Atlantic City, N. J., since 1890.
- Boyes, Walter F., County Supt. of Sch., Court House, Galesburg, Ill.
- Boynton, Frank David, A. B. '91, Middlebury Col.; A. M. '94, Hamilton, Col.; Ped. D. '03, Syracuse Univ.; Supt. of Sch., Box 96, Ithaca, N. Y., since 1900.
- Bracken, John L., A. M. '22, Univ. of Chicago; Supt. of Sch., Clayton, Mo., since 1923.
- Bradford, Mary C. C., Litt. D. '14, Univ. of Denver; State Supt. of Pub. Instr., 127 State Capitol Bldg., Denver, Colo., since 1913.
- Bradner, J. W., B. S. '94, Tri. State Col.; A. B. '08, Ind. U.; A. M. '24, Tch. Col. Columbia U.; Supt. of Sch., Middlesboro, Ky., since 1922.
- Brady, W. A., Supt. of Sch., Wakefield, R. I.
- Bragdon, Frederick E., B. A. '91, Wes., Conn.; M. A. '05, Brown; Supt. of Sch., Egypt, Mass., since 1918.
- Bragg, Mabel C., Asst. Supt. of Sch., 80 Madison Ave., Newtonville, Mass.
- Braham, W. J., A. M. '13; Supt. of Sch., North Platte, Nebr., since 1922.
- Braman, W. J., B. S. '15 Columbia U.; Supt. of Sch., 9 Chestnut Ave., Dansville, N. Y., since 1919.
- Brame, S. M., A. B. '02, La. State Univ.; Prin., Bolton H. S., Alexandria, La., since 1910.
- Brandenberg, W. A., A. M. '03, Ph. B. '22, Drake Univ.; Pres. Kans. State Tch. Col., 1801 S. Broadway, Pittsburg, Kans., since 1913.
- Brandon, R. H., Supt. of Sch., New Paris, Ohio.

- Brandt, Rose K., A. B. '14, U. of Wis.; M. A. '23, Columbia U.; State Super. Rural Sch., State Dept. of Pub. Inst., Helena, Mont., since 1923.
- Branigan, John, B. Sc., '15, Univ. of Nebr., Supt. of Sch., Gilbert, Ariz., since 1924.
- Broughton, Garnett, Co. Supt. of Sch., Hot Springs, Ark.
- Breckner, Elmer L., A. B. and B. S. '13, Univ. of Mo.; Supt. of Sch., H. S. Bldg., Olympia, Wash., since 1920.
- Brendlinger, Margaret R., A. B. '95, Vassar Col.; Prin. of Hillside Sch., Norwalk, Conn., since 1908.
- Brennan, P. Frank, Supt. of Sch., 1557 Oneida St., Shamokin, Pa.
- Brennan, P. M., Supt. of Sch., Dickson City, Pa.
- Brewer, A. L., L. I. and A. B. '02, Peabody Col. for Tchrs., Supt. of Sch., Tallapoosa, Ga., since 1917.
- Bridges, D. W., Supt. of Sch., 9 Crescent Ave., Fort Thomas, Ky.
- Bright, Ira J., B. S. '16, State Norm. Col.; M. A. '18, Tch. Col. Columbia U.; Supt. of Sch., Times Bldg., Leavenworth, Kans., since 1919.
- Bright, Orville T., Supt. of Sch., Dolton, Ill.
- Brinkley, E. S., Asst. Supt. of Sch., 1 Pelham Pl., Norfolk, Va.
- Brinsler, Ira S., A. B. '20, Franklin & Marshall Col.; Ed. M. '21, Harvard U.; Supt. of Sch., Lewes, Dela., since 1921.
- Bristow, William H., B. S. '20, Mo. State Tch. Col.; A. M. '22, T. C. Columbia U.; Supg. Prin., Milford, Pa., since 1923.
- Brock, George William, A. B. '00, LL. D. '23, Univ. of Ala.; LL. D. '17, Howard Col.; Pres. State Norm. Sch., Livingston, Ala.
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- Brooks, Maro S., A. B. '92, Tufts; Supt. of Sch., Medford, Mass., since 1921.
- Brooks, R. E., Supt. of Sch., 812 Highlow Ave., Albany, Ga.
- Brooks, T. Latimer, B. A. '06, Dickinson; M. A. '15, Columbia; Supt. of Sch., Somerville, N. J., since 1921.
- Brooks, W. G., B. E. '07, Nebr. State Tchrs. Col.; A. B. '10, York Col.; A. M. '15, Tchrs. Col., Columbia U.; Supt. of Sch., 917 Platte Ave., York, Nebr., since 1922.
- Broomer, Edwin C., Ph. B. '97, A. M. '98, Brown Univ.; Ph. D. '02, Columbia Univ.; LL. B. '07, St. Lawrence Univ.; Supt. of Sch., Philadelphia, Pa., since 1921.
- Brothers, C. A., A. B. '11, Lake Forest U.; Supt. of Sch., H. S., Dwight, Ill.
- Brown, Bertram D., Supt. of Sch., 141 Central St., Hudson, Mass.
- Brown, C. W., Supt. of Sch., Albert Lea, Minn.
- Brown, Emmett, B. A. '96, Univ. of Nashville; Supt. of Sch., H. S., Chambers Bldg., Cleburne, Tex., since 1913.
- Brown, Frederic N., A. B. '99, Harvard U.; Supervising Prin., Verona, N. J., since 1903.
- Brown, George Earl, A. M. '19, Denver Univ.; A. B. '13, Colo. State Tchrs. Col.; Supt. of Sch., Greeley, Colo., since 1916.
- Brown, Harry Alvin, A. B. '03, Bates Col.; A. B. '07, A. M. '23, Univ. of Colo.; Pres. State Norm. Sch., 440 W. New York Ave., Oshkosh, Wis., since 1917.
- Brown, Helen L., Co. Supt. of Sch., Tombstone, Ariz.
- Brown, Howard E., A. B. '10, Syracuse Univ.; A. M. '23, Columbia Univ.; Supt. of Sch., 517 Ohio St., Medina, N. Y., since 1918.
- Brown, J. Stanley, A. B. '89, LL. D. '14, Denison Univ.; Pres. State Col. for Tch., Col. Bldg., De Kalb, Ill., since 1919.
- Brown, R. L., Supt. of Sch., Marshall, Minn.
- Brown, Raymond N., B. S. '09, Amherst; Supt. of Sch., Box 256, Thomaston, Conn., since 1921.
- Brown, Roy W., '16, State Normal Diploma; Super. Prin. of Sch., Bergenfield, N. J., since 1919.
- Brown, Stella E., B. S. '18, Tch. Col., Columbia U.; Supr. Norm. Elem. Dept., Md. State Normal, Seven Belmar Ave., Baltimore, Md., since 1924.
- Brown, T. N., A. B. '13, Ohio State U.; Supt. of Village Rural Schs., Reynoldsburg, Ohio, since 1920.
- Brown, V. I., Supt. of Sch., Watseka, Ill.
- Browning, F. L., Pres. State Tchrs. Assn.; Trenton, Tenn.
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- Brubacher, A. R., B. A. '97, Ph. D. '02, Yale Univ.; Pres. N. Y. State Col. for Tch., State Col., Albany, N. Y., since 1915.
- Bruce, C. H., A. B. '92, Emery; Supt. of Sch., Macon, Ga., since 1912.
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- Bruner, Herbert Bascom, A. B. '13, Central Col., Fayette, Mo.; A. M. '15, Mo. Univ.; Supt. of Sch., Okmulgee, Okla., since 1918.
- Brunyate, E. R., A. B. '03, A. M. '06, Dickinson; County Supt. of Sch., Court House, Cape May, N. J., since 1922.
- Bryan, James E., A. B. '90, Johns Hopkins Univ.; Ph. D. '08, Univ. of Pa.; Supt. of Sch., 412 Linden St., Camden, N. J., since 1899.
- Bryan, William L., Pres. Ind. Univ., Bloomington, Ind.

- Bubeck, Allan E., Ph. B. '13, Dickinson Col.; A. M. '24, Columbia Univ.; Supvg. Prin. Public Sch., H. S. Bldg., Schuylkill Haven, Pa., since 1921.
- Buchner, Edward Franklin, A. B. '89, Leander Clark Col.; Ph. D. '93, Yale Univ., LL. D. '24, Univ. of Ala.; Dir. of Col. for Tchrs., Prof. of Ed., Johns Hopkins U., Baltimore, Md., since 1908.
- Buck, Frank P., A. B. '04, Univ. of Mich.; Supt. of Sch., P. O. Box 295, St. Johns, Mich., since 1910.
- Buckley, Horace Mann, A. B. '08, Northwestern Univ.; M. A. '12, Columbia Univ.; B. D. '13, Univ. of Chicago; Supt. of Sch., 6701 Delmar Ave., University City, Mo., since 1916.
- Bu Dahn, L. A., B. S., M. A., Columbia Teachers Col.; Supt. of Sch., Asbury Park, N. J., since 1922.
- Buell, R. A., B. A. '01, Beloit, Wis.; Supt. of Sch., H. S., Watertown, Wis., since 1924.
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- Bugbee, L. H., Supt. of Sch., West Hartford, Conn.
- Buker, W. H., Supt. of Sch., Meredith, N. H.
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- Day, C. E., B. Ph. '10, Drake Univ.; M. A. '23, U. of Ia.; Supt. Co. Sch., Aurelia, Ia., since 1922.
- Deahl, J. N., A. B. '93, Harvard U.; Ph. D. '06, Columbia U.; Hd. Dept. of Ed., Prof. of Ed., W. Va. U.; 442 Park St., Morgantown, W. Va., since 1901.
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- Decker, Chas. E., M. A. '19, U. of Wis.; Supt. Wethersfield Sch., Kewanee, Ill., since 1920.
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- Dellicker, Helen Maude, B. S. '18, M. A. '24, T. C., Columbia U.; Gram. Supvr., 16 Miller Stile Rd., Quincy 69, Mass., since 1918.
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- Dement, Mrs. Nettie B., Co. Supt. of Sch., Bloomington, Ill.
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- Denison, H. S., Supt. of Sch., Zeeland, Mich.
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- Dennison, Gertrude, B. A. '98, Alfred Col.; Supv. Elemen. Gr., Sioux City, Ia., since 1913.
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- Densberger, Frank C., A. B. '08, Syracuse Univ.; A. M. '21, Teachers Col., Columbia Univ.; Supt. of Sch., 82 Tremaine Ave., Kenmore, N. Y., since 1915.
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- Dessureau, Dora, Co. Supt. of Sch., Court House Bldg., Antigo, Wis., since 1923.
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- Erickson, Arthur G., A. B. '11, A. M. '16, Univ. of Mich.; M. Ed. '22, Mich. State Normal Col.; Supt. of Sch., Ypsilanti, Mich., since 1919.
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- Erwin, Robert L., A. B. '92, A. M. '07, Yale Univ.; Sc. D. '18, Ohio Univ.; Supt. of Sch., Steubenville, Ohio, since 1907.
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- Evans, L. B., Co. Supt. of Sch., Augusta, Ga.
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- Furry, W. D., A. B. '00, M. A. '04, Notre Dame Univ.; Ph. D. '07, Johns Hopkins Univ.; Dean and Prof. of Phil. and Ed., Shorter Col., Rome, Ga., since 1919.
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- Gamertsfelder, C. C., A. B. '09, Northwestern Col.; Supt. of Sch., Decorah, Iowa, since 1921.
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- Ganders, Harry S., B. Ed. '20, A. M. '22, Univ. of Wash.; Prof. of Ed. Admin., State Tchrs. Col., 4 Lafayette Apts., Greeley, Colo., since 1924.
- Gannon, John F., B. A. '96, M. A. '02, LL. D. '23, Holy Cross, Col.; B. L. '12, Northeastern Univ.; Supt. of Sch., Room 10, City Hall, Pittsfield, Mass., since 1920.
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- Gentry, Charles B., A. B. '11, Warrensburg Norm. Sch.; S. B. '12, Univ. of Chicago; M. S. '19, Cornell Univ.; Dean, Div. Tchr. Tr. Conn. Agr. Col., and State Super. Agr. Ed., State Bd. of Ed., Storrs, Conn., since 1920.

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- Keith, John A. H., A. B. '99, A. M. '00, Harvard; D. Pd. '19, Miami Univ.; Prin. State Normal, Indiana, Pa., since 1917.
- Keith, W. P., A. B. '06, Ouachita Col.; Supt. of Sch., Court House, Pine Bluff, Ark., since 1919.
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- Kelley, Roy B., B. S. '19, Syracuse, Supt. of Sch., H. S. Bldg., Lockport, N. Y., since 1921.
- Kelly, B. W., B. S. '02, Earlham; Supt. of Sch., H. S. Bldg., Greencastle, Ind., since 1921.
- Kelly, Daniel James, B. S. '04, Pd. D. '19, Syracuse; Supt. of Sch., Binghamton, N. Y., since 1912.
- Kemp, W. W., Ph. D. '12, Tchrs. Col. Columbia; Dean Sch. of Ed., Univ. of Calif., 417 Library Bldg., U. C., Berkeley, Calif., since 1923.
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- Kenna, J. M., Supt. Agr. H. S., Summit, Miss.
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- Kennedy, James Wilmer, A. M. '92, N. Y. Univ.; Asst. Supt. of Sch., Bd. of Ed. City Hall, Newark, N. J., since 1907.
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- Kern, Ella M., Co. Supt. of Sch., Grand Island, Nebr., since 1920.
- Ketler, Frank C., A. B. '11, Grove City Col.; Super. Prin., Midland, Pa., since 1921.
- Keyes, Charles H., A. B. '08, Amherst Col.; Ed. M. '24, R. I. Col. of Ed.; Supt. of Sch., Box 61, Barrington, R. I., since 1919.
- Keyworth, M. R., Supt., 232 W. Grand St. Hamtramck, Mich.
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- Kies, Harry D., M. A. '20 State Univ. of Ia.; Ph. B. Drake Univ.; Supt. of Sch. Mankato, Minn., since 1923.
- Kimball, Justin F., Supt. of Sch., Dallas, Texas.
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- Kinney, F. H., Supt. of Sch., Evart, Mich.
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- Kircher, H. W., M. Ph. '04, Ph. B. '03, Univ. of Wis.; Supt. of Sch., H. S. Bldg., Sheboygan, Wis., since 1924.
- Kirk, John R., LL. D. '07, Mo. Wesleyan Col., Park Col.; Pres. State Tchrs. Col., Kirksville, Mo., since 1899.
- Kirk, W. H., B. A. '87, M. A. '90, Baldwin-Wallace Col.; Supt. of Sch., E. Cleveland, O., since 1891.
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- Klapper, Paul, B. A. '04, Col. City of N. Y.; Ph. D. '09, N. Y. Univ.; Prof. of Ed., Dean Sch. of Ed., Col. City of N. Y., New York, N. Y., since 1921.
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- Knodel, J. C., A. B. '08, A. M. '22, Univ. of Nebr.; Supt. of Sch., H. S. Bldg., Laramie, Wyo., since 1921.
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- Kocher, Walter L., A. B. '20, Muskingum; Supt. of Sch., H. S. Bldg., Mingo Junction, Ohio, since 1922.
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- Lawrence, C. G., Pres. Southern State Norm. Springfield, S. Dak.
- Layde, J. B., Prin., W. De Pere, Wis.
- Leach, G. Sidney, B. A. '03, LL. B. '05, Yale; M. A. '21, Tchrs. Col., Columbia Univ.; Supervising Prin., 5 Iona Pl., Glen Rock, N. J., since 1918.
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- Littel, C. L., Supt. of Sch., Centralia, Wash.
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- Longanecker, F. M., B. A. '99, Hiram Col.; M. A. '04, Univ. of Mich.; Supt. of Sch., Box 103, Racine, Wis., since 1918.
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- Lutes, O. S., M. A., State Univ. of Ia.; Research Asst. State Univ. of Ia., 924 E. Wash., Iowa City, Ia., since 1924.
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- McAlister, R. D., B. A. '17, Univ. of Me.; M. A. Columbia; Supvg. Agt., State Bd. of Ed., Box 492, Putnam, Conn., since 1922.
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- Stansbury, V. E., A. B. '19, S. W.; A. M. '20, Univ. of Chi.; Supt. of Sch., Mt. Vernon, Ia., since 1923.
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- Stanton, Mrs. Marion W., Supt. of Sch., 8 Woodland St., Worcester, Mass., since 1922.
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- Trabue, M. R., B. A. '11, N. W. Univ.; M. A. '14, Ph. D. '15, Columbia Univ.; Prof. of Ed. Admin., Univ. of N. C., P. O. Box 431, Chapel Hill, N. C., since 1922.
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- Tuggle, Larkin A., Co. Supt. of Sch., Court House, Danville, Ill., since 1923.
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Index

SUBJECT INDEX TO AUTHORS OF RESEARCH STUDIES

ARITHMETIC		SPELLING	
	Page		Page
Adams, H. W.....	61	Andersen, W. N.....	118
Arps, George F.....	98	Ayres, L. P.....	112, 117
Ballard, P. B.....	96	Barthelmess, Harriet M.....	136
Banting, G. O.....	92	Bauer, Nicholas	135
Beach, Leander	53	Byrne, Mary B. C.....	150
Beatty, W. W.....	97	Capps, A. G.....	141
Breed, F. S.....	93	Cesander, P. K.....	143
Camerer, Alice	57	Chancellor, W. E.....	111
Charters, W. W.....	55	Clarke, W. F.....	122
Chase, Sara E.....	44	Cook, W. A.....	115
Clapp, Frank L.....	104	Crowder, Cora	124
Coffman, L. D.....	43	Curtis, Ethel	127
Connard, H. F.....	98	Dewey, Godfrey	144
Davies, G. R.....	91	Graham, L. J.....	145
Gallaway, Mrs. T. T.....	59	Henmon, V. A. C.....	149
Gaylord, Harry D.....	46	Horn, Ernest	123, 127, 145
Gray, P. L.....	96	Houser, J. D.....	121
Hackler, John Monroe.....	38	Jones, F. W.....	135
Hansen, Einar A.....	56	Kaeding, F. W.....	147
Hanus, Paul H.....	46	Kansas City Schools.....	137
Heilman, J. D.....	103	Lester, John A.....	142
Holloway, Harry Vance.....	102	McKee, Grace M.....	140
Huffaker, Carl Leo.....	101	Nicholson, Anne	114
Hunkins, R. V.....	93	O'Shea, M. V.....	115
Jessup, W. A.....	43	Phares, Mary L.....	146
Johnson, T. J.....	97	Pressey, Luella C.....	151
Knight, F. B.....	39, 100	Pryor, H. C.....	120
McClelland, William W.....	97	Studley, C. K.....	114
Mead, C. D.....	96, 98	Thorndike, E. L.....	144
Mitchell, H. Edwin.....	48	Tidymann, W. F.....	138
Moore, Ernest C.....	55	Ware, Allison	114
Myers, G. C.....	94, 99	Warning, Winifred C.....	126
Newcomb, R. S.....	92	Yocum, A. D.....	150
Noon, Philo G.....	50		
Osburn, W. J.....	99, 104		
Sears, Isabel	96, 98		
Setzafandt, A. O. H.....	100		
Shultis, Frank W.....	103		
Smith, Nila B.....	60		
Stevenson, P. R.....	93		
Stone, John C.....	94		
Taylor, Joseph S.....	37		
Uhl, W. L.....	99		
Williams, L. W.....	58		
Wilson, Guy M.....	42, 47		
Winch, W. H.....	97		
Wise, Carl T.....	49		
Woody, Clifford	50, 52, 53		

READING

Abbott, Allan	178
Anderson, C. J.....	162, 197, 199, 200
Ayer, Fred C.....	202
Beatty, W. W.....	190
Bobbitt, Franklin.....	173
Boggs, Lucinda	188
Brown, Ethel M.....	181
Brown, H. A.....	165
Buswell, Guy T.....	155, 157, 158, 159, 163, 188, 189, 191, 193, 198
Carswell, Marion	190
Cattell, J. McK.....	187, 188
Cavins, L. V.....	177

	Page
Courtis, S. A.....	163, 194
Currier, L. B.....	191
Dearborn, W. A.....	187
Dickson, Virgil E.....	194, 197
Ducker, Mabel L.....	191, 192
Duguid, O. C.....	191
Dunn, Fannie W.....	165, 166, 172
Fernald, Grace M.....	190, 200
Ferris, E.	201
Garnett, Wilma Leslie.....	176
Gates, Arthur I.....	162, 189, 193, 194, 195, 200
Geiger, Ruth	162, 197, 199
Gilliland, A. R.....	187
Gray, C. T.....	158, 159, 187, 189, 197, 199, 200
Gray, William S....	153, 154, 155, 156, 157, 159, 160, 162, 163, 164, 173, 187, 188, 195, 196, 197, 198, 199, 200, 201, 203
Greene, H. A.....	190
Gregory, A. C.....	182
Hawley, W. E.....	163
Heller, Reginia R.....	190
Herriott, M. E.....	168
Hollingworth, L. S.....	200
Holmes, H. E.....	201
Hoover, J. H.....	190
Horn, Ernest	188, 189
Hosic, James F.....	177, 189
Housh, E. T.....	181
Huey, E. B.....	159, 187, 188
Jaycox, E.	191, 192
Jordan, Arthur M....	165, 166, 171, 176
Judd, Charles H....	155, 156, 159, 161, 163, 164, 187, 188, 189, 191, 193, 195, 196
Keener, E. E.....	194, 197
Keller, Helen B.....	190, 200
Kibbe, Delia.....	200
Kirk, H. H.....	202
Leland, Bernice	162
Lively, Bertha A.....	185
Lloyd, S. M.....	200
Lucas, Laura.....	200
Lyman, Rollo L.....	177
McGaughey, J. R.....	204
McGrath, Jane	156
McLaughlin, Katherine	187
McLeod, L. S.....	168
Mackintosh, Helen K.....	176
Merton, Elda L....	162, 190, 197, 199, 200
Midler, L. W.....	200
O'Brien, J. A.....	158, 159, 161
Osburn, W. J.....	191, 193, 197, 201
Packer, J. L.....	180
Parsons, R. B.....	154
Pendleton, S. C.....	154
Pressey, L. C.....	183

	Page
Pressey, S. L.....	185
Reinoehl, Charles M.....	153, 203
Rugg, Harold O.....	200
Schmidt, W. A.....	157, 158
Schmitt, Clara	187
Selke, Erich	179
Selka, G. A.....	179
Starch, Daniel	167
Stone, R. E.....	168
Theisen, W. W....	162, 164, 189, 194, 195, 196, 197, 198, 201
Thorndike, E. L....	186, 187, 193, 197, 201
Trabue, M. R.....	178
Uhl, W. L.....	162, 165, 166, 169, 173, 195, 197, 199
Van Alstyne, D.....	189
Vinal, William G.....	167
Vogel, M.	191, 192
Waldman, Bessie	197, 199
Washburne, Carlton W.....	191, 192
Wooley, Helen T.....	201
Zirbes, Laura.....	165, 190, 195, 196, 197, 198, 199, 200, 201

HANDWRITING

Ely, Myrtle	214
Freeman, Frank N.....	206
Houston, Harry	212
Koos, Leonard V.....	209
Savage, J. A.....	212
Smith, Florence M.....	214
Walker, H. C.....	213, 214

SOCIAL STUDIES

Alderman, Grover H.....	265
Bagley, William C....	217, 235, 243, 255
Bassett, B. B.....	228
Bobbitt, Franklin	273
Branom, M. E.....	263
Breeze, Retha E.....	227
Charters, W. W.....	239
Cocking, Walter Dewey.....	225
Davis, Maude Bennett.....	231
Goss, Ralph Ross.....	266
Harap, Henry	269
Hockett, John	233
Horn, Ernest	240, 275
Marston, L. R.....	243
McKown, H. C.....	243
Peters, Charles C.....	253
Reavis, W. C.....	263
Rugg, Earle	217, 256
Rugg, Harold O....	217, 221, 226, 233, 255
Sharon, J. A.....	233
Swisher, J. A.....	246
Thomas, Joel Bert.....	250

	Page
Washburne, Carleton W.....	251
Whitbeck, R. H.....	261
Wooters, James E.....	262

LANGUAGE AND GRAMMAR

Bobbitt, Franklin	289
Johnson, Roy Ivan.....	294
Pendleton, Charles S.....	286
Searson, J. W.....	285
Sunne, Dagny	294

SCIENCE

Ayer, Fred C.....	300
Caldwell, Otis W.....	301
Downing, Elliot R.....	299
Finley, Charles W.....	301
Mau, Laura E.....	298
Meier, W. H.....	302
Patterson, Alice J.....	300
Trafton, Gilbert H.....	299

HEALTH AND PHYSICAL EDUCATION

Atkinson, Ruth V.....	313
Brace, David K.....	313
Davis, Walter W.....	305
Hunt, Jean Lee.....	304
Johnson, Buford J.....	304
Judelsohn, Samuel J.....	313
Kalamazoo Public Schools.....	306
Lincoln, Edith M.....	304
McCloy, C. H.....	313
Payne, E. George.....	308, 310
Post, L. M.....	312
Reesor, Mary.....	304
Reilly, Frederick J.....	312
Strang, Ruth.....	310
Williams, Jesse F.....	313
Wood, Thomas D.....	304

HOME ECONOMICS

Fulton, Lucy.....	324
Harap, Henry.....	324
Miller, Ethelwyn.....	320
Robertson, Annie L.....	325
Roman, Mata.....	324
Rose, Mary Swartz.....	327
Trilling, Mabel Barbara.....	320, 321
Williams, Florence.....	322
Winchell, Florence E.....	323

INDUSTRIAL ARTS

Edgerton, Alonson H.....	330
Kent, Ernest B.....	329
Harap, Henry.....	334
N. E. A. Department of Superin- tendence	332

ART EDUCATION

	Page
Ayer, Fred C.....	352
Bach, R. F.....	352
Bailey, Henry Turner.....	352
Barnes, Earl.....	352
Beard, Florence.....	352
Bennett, C. A.....	352
Boas, Belle.....	352
Bonser, Frederick G.....	352, 353
Brown, Elmer Ellsworth.....	352
Bureau of Education.....	352
Carey, Gertrude L.....	341, 353
Clark, A. B.....	352
Cooke, Ebenezer.....	352
De Garmo, Charles.....	352
Dewey, John.....	352
Dobbs, Ella Victoria.....	352
Dow, Arthur W.....	352
Edgerton, A. H.....	352
Farnum, Royal Bailey.....	352
Gibson, Katherine.....	347, 352
Haney, James Parton.....	352
Howells, W. D.....	353
Kline, Linus W.....	341, 353
Lukens, H. T.....	340, 353
Major, David R.....	353
Manuel, Herschel Thurman..	345, 353
Mathias, Margaret E.....	353
McCarty, Stella A.....	342, 353
Miller, Elizabeth E.....	341, 353
Mossman, L. C.....	352
Niles, Helen R.....	353
O'Shea, M. V.....	353
Riker, Olive M.....	349, 353
Russell, James E.....	353
Sargent, Walter.....	341, 353
Stewart, Lillian V.....	350, 353
Thorndike, Edward L.....	341, 353
Welling, Jane Betsy.....	353
Whitford, W. J.....	353
Williams, Florence.....	344, 353
Winslow, Leon L.....	352, 353

MUSIC

Bobbitt, Franklin.....	364
DeGraff, Mrs. L. H.....	360
Glass, J. M.....	363
Klauer, Naomi.....	359
Kwalwasser, J.....	360
Pannenberg	358
Révész	357, 358
Schoen, Max.....	357
Schüssler	358
Seashore, C. E.....	355
Trabue, M. R.....	362
Windhorst, Estelle.....	364



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