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BULLETIN

OF THE

Department of Elementary School Principals

THE SECOND YEARBOOK

The Problem of the Elementary School Principal in the Light of The Testing Movement

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Foreword

Members of the Department of Elementary School Principals decided during the Boston meeting that their Second Yearbook should be devoted to the use which is being made of intelligence and achievement tests throughout the country. Their idea was that a considerable part of the book should deal with the influence of testing in the revision and in the application of courses of study in the elementary school.

This volume, accordingly, takes up the matter of testing rather briefly and is composed principally of material dealing with the organization of schools, with the revision of courses of study, and with the instruction of pupils in the light of the testing movement. Since it was advised that the material dealing with courses of study and instruction should be limited to two or three lines at most, the book deals only with reading, language, and arithmetic.

In arranging for material the editor has been in touch with many educational people throughout the country, and he has benefited greatly from the advice and assistance which they have freely offered. Throughout his work on this volume the editor has kept closely in touch with the President of the Department and has drawn largely on his successful experience in compiling the first volume of this series. The progress of the work has been presented to the members of the Department through the pages of the Quarterly Bulletin and the response from many is gratefully acknowledged. It has been kept continually in mind that this volume should be representative of the work of elementary school principals and that the material chosen for publication should be of the type for which there is a general demand.

Early in the preparation of this volume it became evident that the formulation of a program and the development of the various phases of the subject would require all of the seven months' time in which the work was to be done. While the editorial work may have suffered under time pressure, it is possible that the wider range of topics presented by the various writers compensates by adding a definite element of strength to the volume. As a result of this year's experience, the Department recognizes the necessity of an early selection of the theme for the Third Yearbook. It will deal with the functions of the elementary-school principal.

The members of the Department owe a debt of gratitude to the people who have offered their time and labor for the making of the Second Yearbook. The cordiality with which the editor's request for contributions has invariably been met, and the painstaking labors

37690

of our contributors have transferred the credit for this book to the people whose names appear in its table of contents.

The National Education Association, under whose general supervision this book has been prepared, has liberally subsidized the undertaking. Officers of the Association have been helpful throughout. Copies of this Yearbook are being distributed to all members of the Department and additional copies may be purchased from the Washington office of the National Education Association at the price indicated on the cover.

JOHN L. BRACKEN
Editor of the Second Yearbook
U. S. Grant School, Duluth, Minnesota

Contents

Page

Foreword 3

CHAPTER I—THE CONTRIBUTIONS OF MEASUREMENT TO TEACHING

THE CONTRIBUTIONS OF MEASUREMENT TO TEACHING 155
S. A. Courtis, Director of Instruction, Teacher Training and Research, Detroit, Michigan

CHAPTER II—ACHIEVEMENT TESTING IN THE ELEMENTARY SCHOOL

ACHIEVEMENT TESTING IN THE ELEMENTARY SCHOOL 169
Aymer J. Hamilton, Principal of the Washington Elementary School, Berkeley, California

CHAPTER III—CLASSIFICATIONS AND REORGANIZATIONS INVOLVING TEST RESULTS

THE CLASSIFICATION OF CHILDREN IN THE LINCOLN SCHOOL, OAKLAND, CALIFORNIA 189
W. M. Greenwell, Principal of the Lincoln School, Oakland, California

CLASSIFICATION ACCORDING TO THE PROMOTION AGE 194
Mary C. Flynn, Principal of the Micheltorena Street School, Los Angeles, California

CLASSIFICATION BY INTELLIGENCE TESTS IN THE SMALLER SCHOOLS 210
Helen Davis, Director of Measurements and Special Education, Jackson, Michigan

AN EXPERIMENTAL USE OF INTELLIGENCE TESTS IN CLASSIFICATION 219
F. T. Hardwick, Principal of the Central School, Everett, Washington

SPEED GROUPING IN THE PRIMARY GRADES OF ROCKFORD, ILLINOIS 229
Vera G. Sheldon, Elementary Supervisor, Rockford, Illinois

THE RE-CLASSIFICATION OF PUPILS IN ONE ELEMENTARY SCHOOL 239
Warren K. Layton, Assistant Supervisor, Department of Special Education, Detroit, Michigan

CHAPTER IV—THE EFFECTS OF CLASSIFICATIONS INVOLVING TEST RESULTS

THE EFFECTS OF GROUPING ACCORDING TO INTELLIGENCE IN THE FRANKLIN SCHOOL, PORT ARTHUR, TEXAS..... 249
Leonard Power, Principal of the Franklin School, Port Arthur, Texas

THE NEED AND USE OF TESTING IN THE ELEMENTARY SCHOOL.. 267
Lawrence S. Chase, Principal of the Glenfield School, Montclair, New Jersey

RESULTS OF CLASSIFICATION OF PUPILS BASED ON ABILITY AS SHOWN BY INTELLIGENCE TESTS, TESTS OF ACHIEVEMENT, AND TEACHERS' MARKS..... 276
A. M. Santee, Principal of the Washington Junior High School, Duluth, Minnesota

CHAPTER V—THE TEACHING OF READING

THE OBJECTIVES IN READING AS A GUIDE TO REMEDIAL AND PROPHYLACTIC WORK..... 287
Ernest Horn, Professor of Education and Director of the University Elementary School, State University of Iowa, Iowa City, Iowa

A MASTERY VOCABULARY IN PRIMARY READING..... 296
M. Ethel Brown, Supervisor of Primary Grades, Springfield, Illinois

INCREASING SPEED AND COMPREHENSION OF SILENT READING.. 306
Charles Potter, Principal of the Rainier Elementary School, Seattle, Washington

READING AND LANGUAGE IN THE WINNETKA PUBLIC SCHOOLS.. 313
Marion Carswell, Principal of the Hubbard Woods School
Willard W. Beatty, Principal of the Skokie School, Winnetka, Illinois

CHAPTER VI—REMEDIAL WORK IN READING

REMEDIAL WORK FOR NON-READERS..... 333
Helen Bass Keller, Supervisor of Adjustment Work
Grace M. Fernald, Associate Professor of Psychology, University of California, Southern Branch, Los Angeles, California

THE DISCOVERY AND CORRECTION OF READING DIFFICULTIES.. 346
Elda L. Merton, Assistant Superintendent of Schools, Waukesha, Wisconsin

CHAPTER VII—THE TEACHING OF LANGUAGE

TEACHING LANGUAGE UNDER THE INDIVIDUAL METHOD..... 367
Margaret H. Smith, Principal of the 61st Street School, Los Angeles, California

After-test Value of Language Error Tests 371
G. M. Wilson, Professor of Education, Boston University, Boston, Massachusetts

The Evaluation of Language Errors 380
Clyde A. Brown, Principal of the Corkery School, Chicago, Illinois

Chart of Language Aims with Suggestions and Activities for Realizing Them 385
Clifford Woody, Director, Bureau of Mental Tests and Measurements, University of Michigan, Ann Arbor, Michigan

CHAPTER VIII—REMEDIAL WORK IN ARITHMETIC

Remedial Work in Arithmetic 395
Elda L. Merton, Assistant Superintendent of Schools
G. O. Banting, Superintendent of Schools and Associate Professor of Education, Carroll College, Waukesha, Wisconsin

A Diagnosis Sheet in Arithmetic 421
Leo J. Brueckner, Director of Tests and Measurements, Minneapolis, Minnesota
Amy Souba, Student, University of Minnesota, Minneapolis, Minnesota

CHAPTER IX—AN EVALUATION OF AFTER-TESTING WORK

An Evaluation of After-testing Work, with Bibliography 433
G. A. Yoakam, Director of Teacher Training, Nebraska State Teachers College, Kearney, Nebraska

CHAPTER X—THE PLATOON SCHOOL

Education in a Platoon School 445
Arthur S. Gist, Principal of the B. F. Day School, Seattle, Washington

Auditorium Studies 451
R. D. Chadwick, Principal of the Morgan Park School, Duluth, Minnesota

Proposed Scale for Rating School Principals and Assistant Principals 462
W. P. Burris, University of Cincinnati, Cincinnati, Ohio

Directory of Local Principals' Organizations 465

Directory of the Department of Elementary School Principals 465

CHAPTER I

The Contributions of Measurement to Teaching

S. A. Courtis

CHAPTER I

The Contributions of Measurement to Teaching

S. A. Courtis
Director of Instruction, Teacher Training and Research
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THE AVERAGE MAN, caught in the maelstrom of current events, is swung now this way, now that, by the fads and movements of the day. He is like a weathercock, whose position reveals to the observer the direction in which the wind is blowing at the moment, but which itself neither controls the blowing nor senses the meaning of the constant change in direction. Many teachers and principals serve in similar humble capacity, and the best of us does so at times. The wise man, however, stops now and then to bring before him in orderly array the events of the past, and in the light of such a survey attempts to plan intelligently for the future. Only by so doing is it possible to build and maintain a proper perspective.

The beginnings of the testing movement lie far back in the dim and distant past. More than once it has happened that the teacher, the mathematician, and the scientist have been combined in the same person. Suggestions for objective tests and measurements have been made by many an unsung pioneer, whose contributions died in the borning. Of these, we may take but small account. How far they paved the way, we cannot tell, for recorded history in educational measurement begins with the twentieth century.

For instance, it will come as a surprise to many that the first educational survey in America was a carefully conducted measurement of the Boston schools in 1845.[1] Horace Mann, commenting on the report of the committee, predicted that the use of written tests scientifically constructed, given, scored, and tabulated would bring about a new era in education. He was right in his conclusion, but wrong as to when the new era was to begin.

The thoughtful reader will not fail to ask himself why half a century had to pass before the educational world grudgingly accepted that which in 1845 was self-evident to the genius of Horace Mann. The answer is, of course, that the movement for the scientific study of education is not an isolated social phenomenon. It is an integral part of the general social evolution and could not be widely adopted until the way had been prepared by appropriate social developments

[1] Caldwell & Courtis, "Then and Now in Education." World Book Company.

along related lines. The moral is that even today it is useless to expect teachers, principals, superintendents, or the public generally, to adopt enthusiastically and to support any more of a measurement program than their own scientific development will enable them to understand and appreciate. A period of education and growth is as essential for each individual as it was for society and for the profession generally.

There is neither space nor time to trace here the many influences which have coöperated to make the movement for the use of measurement in education a success in the twentieth century when it had failed of adoption in previous years. The reader will recall, however, the wonderful advances of science in the nineteenth century and the resulting industrial revolution. It was inevitable that research methods should spread to social and civic activities. The time came at last when man turned upon himself those methods of discovery and investigation which had proved so effective in other fields.

Sir Francis Galton merits special mention. He has been called the father of educational psychology because he was one of the first men to apply scientific methods to the study of human behavior. Nearly all work in eugenics, all the attention paid to the determination of the original nature of man and of the relative effects of nature and nurture, as well as many of our effective statistical and graphic methods of handling data involving variation and relationship, may be traced to origins in Galton's contributions.

After Galton, the center of activity shifted to the experimental study of the behavior of men and animals. The old psychology was completely transformed; testing for reaction time, sensory discrimination, fatigue, and the like developed a technique and a point of view which ultimately led to the study of the learning process and to the discovery of its fundamental laws.

At the close of the century, when comparison of school systems by uniform examinations was undertaken by Rice (1897) there were many, both in education and out of it, who could appreciate the meaning of the results secured. For a few years a battle raged as to whether or not educational products were measurable, but by this time a majority, even of schoolmen, had been influenced enough by the general scientific thought of the day to line up on the side of progress. The victory assured measurement a place in education.

The next step was the development of an adequate technique both foı the construction of educational tests and scales and for practical

methods of giving, scoring, tabulating, and interpreting them. Here need be mentioned the names of Stone, Ayres, Starch, Kelly, Judd, and a host of others, but preëminent among them all stands the name of Thorndike, the master genius of the testing movement. Either directly, or indirectly through the pupils whom he has inspired, Thorndike has contributed not only important measuring instruments and procedures, but most of the fundamental principles, theories, and ideals of the movement. To him, more than to any other one man, the success of the movement is due.

Almost as rapidly as practical testing instruments were available the use of tests by schoolmen became general, mainly it must be admitted from the point of view of "try anything once." The sale of the more popular tests quickly rose to millions of copies a year and still continues. This activity, in spite of its superficial nature, was not without its value. It really served to initiate the profession into at least the beginnings of scientific thinking and into the mysteries of statistical and graphic methods. To this day, there is no more effective way of convincing doubting Thomases than by getting them involved in an actual use of testing material.

The development of tests paved the way for a new type of educational survey. To Professor Hanus, of Harvard, the director of the survey conducted by the Committee on School Inquiry of New York City (1912), belongs the credit for the first use of tests for survey purposes. The new school survey popularized not only tests but the application of scientific methods to all phases of educational work. Studies of promotion, elimination, relation of age to grade, costs, and the like became more and more exact, more and more scientific. The information secured by all these activities was of value both as an aid to administration and supervision of schools and as material for annual reports and publicity campaigns. To make such surveys continuous, bureaus of research began to be established. Thus measurement and scientific experimentation gradually passed from the spectacular, faddish phase, which it had first assumed, to an established position of functional worth.

Paralleling the development of educational tests, individual tests for mental capacity had been slowly evolving. The original studies in the measurement of intelligence were made by Binet and Simon (1908), but the work of Terman, Yerkes, Whipple, Otis, Haggerty, and many others made mental measurements possible for teachers. The selection and segregation of atypical children and the development of specialized methods of educating such children was a notable forward step. Then came the war with its development of group tests and their application to more than a million men. The army

popularized the concept of intelligence testing as survey use had popularized the educational test. Sectioning on the basis of intelligence scores became the fad of the hour. Today we are in the throes of the selective struggle of sifting the wheat from the chaff in this field also.

Important as has been the influence of the measurement movement upon curriculum making and teaching, there have been other and powerful influences which need to be considered. Social development has been along not only scientific lines but political lines as well. Throughout the world since Rousseau, democratic ideals have been slowly making their way, and from many points of view, the World War was merely the inevitable outward expression of the conflict of the old and the new philosophies. This phase of the social development has stimulated close analysis of the function of the school in society and has led to a changed concept of what education is for and how it operates. In this field the name of Dewey symbolizes the whole movement for the socialization of school work and the democratization of school procedure. The shift of emphasis from "acquisition" to "purposing," from "preparation for life" to "life itself" is a transition as profound and as meaningful as the development of scientific method in educational procedure. It is the crowning glory of our day and generation that in the changes in curriculum and methods of teaching now taking place, these two mighty currents have fused. Science without philosophy is materialism without a soul, and philosophy without science is as ineffective as sounding brass and tinkling cymbals.

Let us shift our point of view and study the effects these great movements have produced. The most general, the most persistent and the most disturbing contribution of the measurement movement has been the objective revelation and proof of the inefficiency of teaching. In survey after survey, it has been shown that our present educational procedure affects a very small percentage of the children at any one time; that the variation within any one grade for any one ability is enormous; that the overlapping from grade to grade is staggering. No criticism ever formulated by the public has equaled in validity and forcefulness the revelations of survey measurements. The one crumb of comfort in the situation has been that such comparative measurements as could be made with the work of the schools of the past have uniformly shown that, ineffective as our schools are at present, they at least are more effective than formerly and serve a larger number of children. But when all has been said and done, the most ardent enthusiasts must admit that the efficiency of present-day educational procedure is exceedingly low.

When the first storms of rage and disbelief at the revelations from measurement had begun to lose their force, thoughtful investigation and experimental variation of teaching methods began. These have resulted in the discovery of several important lines of advance leading to better conditions. The three outstanding contributions to teaching may be summarized as objective definition of goals, the vitalization of the curriculum through evaluation of subject matter, and the individualization of instruction. Each merits discussion.

Before the advent of measurement, objective definition of aim was not possible. Standards were subjective and varied from teacher to teacher just as they do to this day in most phases of educational work. Whenever a test or scale has been constructed to measure a specific product, however, objective definition has followed. In handwriting, for instance, compare the aim of developing "rapid legible writing" with that of stimulating children to attain in a standard writing test "a rate of 85 letters per minute with a quality of 60 Ayres." Objective definition enables a teacher to measure her pupils at the beginning of the teaching period to see at what stage of development the children are in relation to the standard, and at the end of the period to determine the effect of her teaching. Intelligent planning of teaching procedure is made possible by initial tests and the selection of best methods by final tests. Such measurements also point out the children who are not benefiting by their work and lead the teacher to study the child to discover the cause of failure. Educational diagnosis has thus developed as a new form of teaching activity. Diagnostic tests serve the teacher as a thermometer serves the physician.

The teacher, confronted with proof of inefficiency and the problem of producing standard degrees of knowledge and skill in every child, reacted vigorously by criticizing courses of study. Thorndike was the first to suggest the principle of "limitation of training"; that a child who attained a legibility of 12 or 13 on the handwriting scale has probably achieved optimum development and that further training is waste. This has since been applied to many skills, and although few school people accept the full implications of the principle, it has done much to lighten the childen's burden by tending to abolish useless drill.

Selection of subject matter on the basis of maximum social value is another principle which is greatly modifying curriculum making and which is a direct outcome of the measurement movement. Coffman and Jessup evaluated the contents of arithmetic in terms of frequency of social use, and found much obsolete and useless material which superintendents and teachers were quick to eliminate

from the course of study, once the facts to warrant such action were available. Ayres' investigations in spelling cut the course of study from 30,000 to approximately 3,000 words: 1,000 essential words and 2,000 additional desirable words. Bagley, Charters, Bonser, Rugg, Bobbitt, and many others have made important contributions which have materially changed the popular concept of what the schools should teach. Fundamental revisions of curricula are even now being made in every field of educational activity from kindergarten through college.

The concept of selection of subject matter on the basis of its measured social value, and the formulation of objective standards of minimum essentials seem destined to have far-reaching consequences. Questions of outcome raise philosophic questions of aim and purpose. During the last decade the basis of organization of curricula has shown a strong tendency to change from conventional academic ideals of scholarship and culture to that of virile personal and social efficiency. The force of this movement has only just begun to make itself felt. To measurement is due credit for the larger part of the data upon which such changes are based as well as for the technique by which it will ultimately be decided whether or not the changes are for the better.

By far the most important contribution of measurement has been the discovery and emphasis of individual differences in children. From Galton's original investigation of twins down to the most recent survey, or the results of the last experiment, variation in original nature, and in reaction to nurture, has been the constant and most evident generalization from measurement studies. Teacher after teacher, untouched by statements in textbooks or by the emphatic words of her instructors has nevertheless made for herself from her own test data the generalization that children differ. Rediscovery of essential truths has tremendous stimulating power. Teacher after teacher, finding her discovery confirmed by standard texts in psychology and education, has been moved to do something about it; has been made sensitive to any device or method which promises adequate aid in the handling of individual children.

This explains in part the ready acceptance of group intelligence testing by the educational public. To those who are groping for methods which would enable them to deal adequately with the problem of individual differences, sectioning on the basis of intelligence seems to afford the desired solution. The wide-spread publicity given the use of group tests in the army, and the ready adoption of the same by prominent schoolmen, led great numbers of others to follow in their footsteps. It is difficult at this time to appraise

correctly the contribution made by mental testing, but to the writer it would seem to be chiefly the increase in the attention paid to individuals. Particularly is this true in the junior and senior high schools in which educational testing had not made much headway. Many teachers, through the giving of intelligence tests, and the sectioning of classes on the basis of intelligence, have been led to discover individuals, and to revise their whole scheme of educational thinking and teaching accordingly. Even in college instruction, signs are not wanting, here and there, that the old broadside treatment of individuals in mass formation may yet be displaced by a procedure more in accord with the facts of individual variation and the psychological laws involved.

Sectioning on the basis of intelligence is a device for securing homogeneous groups: yet measurement of the achievements and growths of individuals in sections of supposedly equal intelligence proves that not all the bright children succeed and that not all the dull children fail. There is both success and failure in each group to such an extent that in the highest and lowest fifth of 4,000 first-grade children the number of individuals having identically the same scores in a reading test at the end of the semester were recently found to be one half the total number. Further, there are some data which suggest that for any large group of children the total distribution and the median scores are the same whether the individuals are taught in undifferentiated sections or in classes carefully sectioned on the basis of intelligence. Many teachers are finding similar discrepancies between their expected and their actual results.

The conclusions being drawn from these data are two: first, that intelligence is but one of many factors affecting a child's success, and second, that individual differences are so great that no method of work can be made effective which does not provide for the complete adjustment of assigned tasks to the nature and powers of each child each day. Sectioning on the basis of intelligence scores is apparently proving to be a temporary expedient, a more refined method of grading, but not an ultimate solution.

The first of these conclusions has led to the clear formulation by Baldwin and others of the types of factors which need to be considered in planning work for any individual. They may be roughly grouped in five classes: (1) Physical, (2) mental, (3) emotional, (4) social, and (5) educational.

What the specific elements of these factors are, how each may be measured, and how the results of measurements may be used to advantage by those responsible for curriculum building and by

teachers are questions to which answers are now being found experimentally.

On the other hand, the real solution of all the problems raised by individual differences, and of many problems of method raised by psychology and philosophy, can already be sketched in major outline. The public schools must deal with large numbers; children must be taught in large groups. Yet each child is so specialized by heredity and by training that he must be given an individual program of work and progress. This seeming deadlock of opposing "musts" is easily broken by taking the children into partnership and giving them a larger share in directing their own educational activities.

Burke, of the San Francisco State Normal, many years ago secured individualization of instruction by means of a series of lesson sheets. These were unstandardized and constructed on a subjective basis. As early as 1912, the author of this article, independently hit upon Burke's plan and constructed a series of timed test lesson sheets in the four operations of arithmetic, into the making of which went all the knowledge of standards, difficulties, and methods gained from experimental studies. Such practice lessons constitute a course of study in the development of the four fundamental skills in arithmetic, and enable a teacher to handle a mass of forty or fifty children of every level of ability and yet give to each child the lesson which is for him the best *next* task to be attempted. Moreover each child can progress at his own rate and study in his own way without destroying the mass formation. Much of the valueless routine of conventional teaching is taken care of by the mechanics of the system, and the teacher is set free for individual diagnosis and assistance.

Similar practice tests are now available in algebra, handwriting, and reading. Washburn at Winnetka, and Sutherland at Los Angeles are both developing similar curricular material. The principles involved seem capable of very general application and are sure to come into extensive use as soon as the rank and file of the teaching force become convinced that individualization of mass instruction is an adequate solution of the problem of individual differences. As the complexity of the educational process is continuously revealed by experimental study, as problems and difficulties multiply, the general value of the practice test procedure becomes more evident. For the development in the individual of knowledge, skill, and habits, practice tests seem destined to win a supreme place. Curriculum building for all fields capable of expression in exact objective standards seems likely to resolve itself into a technique of practice

test construction. For the factor of individual differences, both in original nature and in the effects of training, is the supreme factor in education.

Before the advent of measurement, the deliberations of schoolmen dealt with but two factors—subject matter and mode of presentation. Today the informed teacher knows that the changes produced by teaching effort cannot be predicted with certainty from either subject matter or mode of presentation, either considered separately or together; that the most vital factor is the selective and organizing power of the original nature and acquired development of the individual being taught. In a general way it can be said that subject matter determines within limits the kind of knowledge, or the degree of skill acquired; that the mode of presentation affects the attitudes and purposes of the individual trained, but precisely which items of knowledge, skill, attitudes, or ideals will result from the presentation of a given unit of subject matter in a given manner cannot be accurately predicted except in terms of the nature of the individual taught.

One of the early contributions of measurement to education was the objective proof of the inadequacy of the formal discipline ideal as a basis for curriculum building. It was comparatively easy to prove that the habits built up by a study of Latin and other subjects as taught in our high schools were specific and of so little value in other fields of activity as to make their inclusion in the curriculum for their disciplinary value alone indefensible.

But the early experimenters proved too much. They stimulated scientific inquiry on a fact basis, and today schoolmen everywhere are putting to the acid test of measurement and scientific validation every phase of school procedure. How do you know, these scientists ask, that the effects of the experiences in school called "learning to spell" are those which produce actual spelling ability under life conditions? What is the evidence that the procedures emphasized in school under the name of the "teaching of reading" develop those abilities which in life are commonly called ability to read? Is it right to say that a boy has ability in reading if he makes a high score in both rate and comprehension in a reading test, but does not like to read and is unable to benefit in any practical way from his supposed ability?

For such questions there are no satisfactory answers at present. Two things only are certain: first, that the traditional forms of teaching procedure are ineffective, wasteful, foolish; second, that the real goals of educational endeavor promise to be something totally different from the false gods of the past. Many a teacher and super-

visor today stands aghast at the situation her own investigations have led her to comprehend. She looks into the future and sees the conventional foundations crumbling to ruins. Situations more complex, problems more serious, labors more arduous than she suspected existed, loom large on the horizon. There is no possibility of return to the false security of the past; only problems and difficulties can be seen in the future. To what the trail leads is not comprehended. To those without vision the present seems dark indeed.

To those with vision, however, the first faint streamers of the dawn of a new day are discernible. We are in a transition age; we are pioneers blazing a trail. Help is at hand and from an unexpected quarter. The movement for the socialization of school work has emphasized interest, motivation. Out of motivation has emerged the goals of purposing, control, personality. The emphasis in education is shifting. Experience not instruction, interpretation not acquisition, a unified and integrated personality, not results in terms of knowledge and skill, are to be the objectives of the new education, an education for power. Topical organizations, project teaching, activity curricula all tell the story of a new concept of education, of the rise of method and the passing of the day of subject matter. The curriculum of the future will rest upon a solid foundation of threefold measurement. Every element in it will have been selected only after full knowledge of its social usefulness, its suitability to the stage of development of the child that uses it, and its probable effectiveness in use. Further, these elements will not be subject matter units put up in sealed cartons with subject matter labels, but units of purposeful activity chosen for their relation to the life of the child and used to increase the child's power to respond to stimulating situations by masterly achievement. Education will be defined as the process of *helping the child help himself—ever to form more worthy purposes and ever to achieve them more efficiently.*

In the school of the future, the child will be the center of organization. Masses of children will coöperate in social groups in the achievement of social ends. Acquisition of knowledge will occur only as a by-product precisely as in life. Where special development of skill is needed, it will be secured by the use by the child under his own direction of organized drill practice lessons, scientifically constructed. Children will be handled in masses, but there will be individual planning, individual progress, and individual assistance. More children than at present will acquire standard control over essential knowledges and skills, while the results on the side of power and character development will be extraordinary in comparison with those of the present day.

It is safe to make such predictions for two reasons. The first is that the general tendencies of the present are clearly indicated, and here and there under favorable conditions almost incredible results have already been obtained for this, that, and the other single phase of the educational process. When the time comes that all these separate successes are brought under a rational and unified control, the effects of teaching may be reasonably expected to far excel the average result secured at present.

The second is that we have today rational control, a steadily increasing control, over the inductive method applied to education. Day by day we are arriving at truth with greater certainty. When the time comes that before attempting to teach, we (1) measure the child completely: body, mind, and spirit, past achievement, and present tendencies; (2) select the subject matter appropriate to his development on the basis of measured individual and social needs; (3) plan the teaching procedure on the basis of methods proved by scientific experimentation to be the most suitable for the total situation; and (4) take the child into partnership so that he himself has a share in deciding what work he shall do and how he shall do it; then the school will become a democratic Utopian community of children, dominated by high social ideals and coöperating in the achievement of optimum growth and happiness. In that day, the school will exert upon civilization that directing and progressive influence of which we stand in dire need.

Between actual conditions, however, and such potentialities lies a great gulf of ignorance which can be bridged only by the coöperative measurements and investigations of an army of workers. To join this army, to do one's bit in bringing about the better day, and to become thoroughly scientific in thought and practice are the duties and the opportunities which lie before each member of the teaching profession. Great as have been the past contributions of measurement to teaching, they dwindle into insignificance in comparison with those which will be made in the future. For the most important contribution of the movement for the use of measurement is the development of the technique for arriving at truth in education, and of that spirit which is satisfied only with the truth. Where truth reigns progress is certain and lasting.

CHAPTER II

Achievement Testing in the Elementary School

AYMER JAY HAMILTON

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CHAPTER II

Achievement Testing in the Elementary School

AYMER JAY HAMILTON
Principal of the Washington Elementary School
Berkeley, California

TESTING both intelligence and product is no longer in the purely experimental stage, notwithstanding some prominently expressed opinions to the contrary. Even the average schoolman and many laymen recognize the importance of determining objectively a quantitative measure of mentality and of skill in the various school abilities.

The important question in the present stage is not, Shall it be done? but rather, What are the best tools to use in doing it and what are the best uses to make of the results?

Some of the poor results obtained through testing were due to the use of tests put upon the market by over-anxious publicity agents, and perhaps equally due to users of tests untrained in their use. What we want are tests of specific abilities constructed upon scientific bases with trained psychologists to interpret the results.

CRITERIA FOR THE SELECTION OF TESTS

There is not the time or space here to develop all the principles underlying the construction of tests but there should be mentioned certain fundamental principles or criteria, the data for which should be in evidence for all tests before public money should be spent upon them or diagnoses or predictions made upon their results. These are:

1. *Validity.* Is the test valid? That is, does it test what it purports to test? Does it measure the trait or skill that you want measured? "Will the pupil who deals with the test difficulty with a given degree of excellence, deal with the apparently same difficulty when embedded in a real practical life situation with an equal degree of excellence?" If not, then certainly the test is not worth giving. If it does, the test is good and one is safe in basing diagnoses or predictions upon its results. However, before its validity can be assumed there is needed more evidence than the publisher's advertising circular. Moreover, the statement of the author that it correlates highly and positively with a previously used test of his own or some one's else construction is of course not evidence that it is going to be the test by which a specifically desired trait or skill

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can be measured, for, until you have first proved the validity of the criteria against which it was checked, such a statement could mean nothing.

It is a difficult matter to determine just what are the most satisfactory elements in life success against which to check our so-called intelligence tests, yet, notwithstanding some criticism of these tests by individuals who probably know much more about theoretical method than they do of the difference between diagnosis and prediction, all must admit that it is quite within the range of possibilities to select certain elements in school success against which a test can be checked that will, to a fairly high degree of certainty, predict reaction to school procedure. Call such a test an "intelligence test" or what you will, it becomes, when validated properly, a most worth-while test to the school principal.

Neither is it an easy task to build tests that will measure a specific habit, skill, ability, or attitude as it exists among the most desirable school outcomes so that the test will not be, at the same time, measuring some other habit, skill, ability, or attitude. But to the extent to which we know which are the desirable ones upon which to base the pupils' activities, just to that extent are we able to measure them, or at least should be able to measure them. The difficulty, of course, comes in being able to parcel them out. Care should therefore be taken by the builders and users of all product tests to state exactly the product which is measured. That is, that it is seven-digit column addition or bridging the tens or some other of the many habits that go to make up the first of the four fundamental arithmetical processes rather than call the test an "Addition" test. For if two or more of the habits are involved in the test without distinction and the child fails to live up to a set norm what value is there in the result? The failure may be due to not having fixed the one habit or it may be the other.

2. *Reliability.* Is the test reliable? That is, can you count on the test if given a thousand times to the same individual under exactly the same conditions producing the same results? Or if other forms of the same test are given to the same individual under exactly the same conditions will they produce the same results? That is, can you depend upon the test behaving in exactly the same way at all times when subjected to the same conditions?

3. *Objectivity.* Is the test objective? That is, will it give the same result if administered by Miss A. in San Diego as it does when administered by the author or by Miss B. in Poughkeepsie? Are the instructions for scoring such that no matter who follows them

the interpretation will be the same? Objectivity is of very great importance in the testing movement since it is diametrically the opposite to subjectivity which was so common in all former methods of measuring educational product and which was the quality that caused so much dissatisfaction. The personal equation must not enter into a quantitative measure of a quality.

4. *Scaling.*[1] Is the test properly scaled? Is every point on the scale equally distant from the one above and the one below it? Does zero mean "just not any" of the ability? This of course was one of the main difficulties of all attempts at measuring antedating the introduction of standardized tests. Even in so apparently a simple ability as addition of integers it was hard to determine whether the difficulty of one problem was less, equal to, or greater than the difficulty of each of the others; or, if it was apparent, just what the exact measure of the difficulty was.

5. *Standards.* Has the author sufficient data upon which to establish the norms? Have they been established through the right statistical procedure? Are there norms for each chronological year as well as for grade? It is more important that we locate Johnnie or Mary with reference to the central tendency in his chronological group than that we locate him with reference to any position in his grade. This will be developed more completely in another part of the discussion.

There are many other qualities or virtues in tests such as interest, applicability, time required for giving, and cost that should receive careful consideration before selection is made, but none are as important as those mentioned above. It probably would be as difficult to determine just which one is of most importance as it is to say which is of most importance in the construction of a house; the framework or the foundation, since neither is of any use without the other.

Cost has, very often, determined the test to be used when in fact it should be the last item considered. The cheapest test may be the most expensive, for if the selection is to be made between two tests one of which is valid, reliable, objective, scaled, with reliable standards, and the other lacking any one of these then the latter is expensive at any price. Of course, other things being equal the cheaper the test the better. But if you cannot buy the best don't test, for if you do you will waste your time and your money.

[1] McCall, W. A., Measurement in Education. Macmillan Co. March, 1922.

TESTS FOUND USEFUL

A complete testing program for an elementary school will include an intelligence test of each child, and the measurement of the skill of each child in the various school abilities for which there are satisfactory tests. The following tests have been found useful in the experience of the writer and they are all valid, reliable, objective, and properly scaled. They also have very good tentative norms which are being constantly improved. There are perhaps others equally as good but in the experience of the writer these have, among the many tests used, given the best results.

1. Product.

Reading—Thorndike—McCall.
Thorndike—Alpha 2.
Vocabulary—Thorndike.
Arithmetic—Woody.
Mixed Fundamentals—Woody—McCall.
Spelling—Ayres—Buckingham.
Penmanship—Thorndike.
Ayres—(Gettysburg).
Composition—Hillegas.

2. Intelligence.

As far as the writer has been able to determine there are no group tests for each year that will measure successfully "adaptation to new situations" or "reaction to new material" or "intelligence" or "mentality" or whatever that inherent capacity is that we all have but in varying quantities. It is poor economy to admit to the first grade, or receiving class, all children who have reached the chronological age of five or six or seven years just because they have lived that long—just as foolish as it is to admit a child 17 years old to the senior class of the high school because he is 17 years old. Some test of "first-grade readiness" should be the basis for such admission.

First Grade.
Kindergarten Test for First Grade Readiness—Park-Franzen.
Detroit First Grade Intelligence Test.

Such a test of "readiness" is all the more important in schools large enough to maintain two or more divisions of the entering class. It is very essential that children of at least approximately equal mentalities be grouped together at the beginning; otherwise the superior

children will develop habits of slipshod, superficial work. The oft-repeated theory that the keen child will set the pace for the class is decidedly not true, as any live first-grade teacher will bear witness. It's the dull child that sets the pace, and it is he who is subsidized throughout the entire school organization at the expense of the bright one—that is, the keen child from whom society expects and from whom it gets the greatest returns, but seldom ever to the full measure of his capacity.

Second Grade.
Kingsbury.
Haggerty—Delta I.
Third Grade.
Thorndike Vocabulary.

While this test was not designed for an intelligence or mentality test, yet the correlations with the Stanford Revision of the Binet-Simon have shown it to be a good group measure of capacity to learn.

Fourth Grade.
National Intelligence Test, Scale A.
Fifth Grade.
National Intelligence Test, Scale A.
Sixth Grade.
National Intelligence Test, Scale A.
Terman Group may be used successfully in the upper division of the grade and is a good basis for classification when entering Junior High School.

USES OF MEASUREMENT[1]

It may not be out of place at this point briefly to recount some of the more important uses of testing data. Testing as a pastime for the school principal is rather a poor use of public money and a very non-economical disposition of pupil and teacher energy. The care with which data have been gathered, embalmed, and cautiously deposited in pedagogical tombs would lead one to think that it is a strong indictment against, at least, the past administrations if not the present. There is no justification for the cost in money and time consumed in testing unless every possible use is made of the data.

Briefly stated the following may serve as a guide to the uses of testing data as already found helpful in some school systems:

[1] Haggerty, M. E., Specific Uses of Measurement in the Solution of School Problems. Seventeenth Year Book, National Society for the Study of Education, 1918.

1. Classification upon the basis of
   a. Potential ability.
   b. Acquired ability.
2. Experimentation through
   a. Laboratory method.
   b. Statistical method.
3. Diagnosis
4. Prognosis
5. Definitive outline of goals.
6. Comparison of
   a. City with city.
   b. School with city.
   c. School with school.
   d. Grade with grade.
   e. Individual with grade.
   f. Individual with individual.
   g. Individual achievement with optimum achievement.
7. Basis for report to parents.

Classification upon the basis of potential ability as measured by the Stanford Revision of the Binet-Simon test is clearly the most nearly ideal organization in all districts where population is sufficiently dense to make possible a large school. Since this test is an individual one, requiring about an hour for each pupil with specially trained persons to administer it, it is not the most economical. However group tests may be substituted and the Stanford Revision used to check up the outstanding cases at either end of the distribution.

Schools large enough for this organization—that is, large enough to support at least two groups in each half year grade—preferably three groups—should maintain three parallel courses of study. There should be activities through which the less gifted group of children could pass to the high school or out into the world's work; activities through which the normal group could pass to the high school; and activities through which the more gifted children could pass to college with an increasingly enriched content, thus making it possible to care for such children without accelerating them to the extent of being among children whose social activities are fundamentally different.

Such classification is, however, only one step in advance of the usually classified school on the basis of chronological age. If the best work is to be done, does it not follow that within each group classification should be made upon the basis of all such school abilities as correlate highly and positively with potential ability—that

is, ability to learn? However, since classification is fully developed elsewhere in this book this brief statement for purposes of allocating it in a testing program will suffice.

Of the many uses of measurement through comparison, all of which are valuable, the most important is individual achievement in comparison to potential ability. We are not concerned about how far above or below a given grade norm our child is in an intelligence group test since grades overlap in chronological age to a marked degree. In such a test his position with reference to the central tendency within a normal distribution of his own chronological age is of much greater value since such position is a determinant of his stupidity or his keenness—that is, his inherent capacity to learn. Moreover, it is likewise important to know his position in a product test with reference to the central tendency within the same normal distribution of chronological age, since that is a fair measure of his success within a group where age is constant. Now, therefore, since we are able to get his position in a test measuring capacity to learn and also in a test of a specific school ability that correlates highly and positively with ability to learn would it not be fair to expect, because of this correlation, the positions to coincide? If they do not coincide, is it not fair to ask the school why? Of course the reason may be poor home conditions, or adenoids, or tonsils, or doughnuts and coffee for breakfast, but it also may be poor school conditions, such as untrained teachers, lack of proper supplies, poor methods, poor organization, poor textbooks, poor everything that ought to be good. The question is, what is the real cause? Is it home, or health, or school? And is it not the school's province to find out and remedy the cause no matter what it is? One thing is certain and that is the outcome is not caused by stupidity unless it be the stupidity of the school or the home.

Many attempts[1] have been made to find a satisfactory method of

[1] Franzen, Raymond, Accomplishment Rates—Columbia University Contribution to Education, No. 125.

Monroe, W. S., and Buckingham, B. R., A Testing Program for Elementary Schools. Jr. Ed. R. September, 1920, pp. 521-532.

Pintner, R., Marshall, H., A Combined Mental-Educational Survey. Jr. Ed. Psy. January, 1921, pp. 32-43.

McCall, W. A., How to Measure in Education. November, 1922.

Thorndike, E. L., Finding Equivalent Scores in Tests of Intelligence. Jr. App. Psy. March, 1922, pp. 29-33.

Buckingham, B. R., A Human Ladder. Jr. Ed. R. September, 1921, pp. 143-146.

Will, H. S., A Method of Commensurating Mental Measurements. Jr. Ed. R. February, 1922, pp. 139-153.

Chapman, J. C., Convenience and Uniformity in Reporting Test Norms for School Tests. Jr. Ed. R. May, 1922, pp. 406-420.

The weak points of the above methods have been well discussed by William Ray MacNair in an unpublished Master's thesis, University of California, 1922.

determining whether or not a child's position with reference to the central tendency in a product test coincides with his position in an intelligence test or to what extent it does not coincide. These attempts have all been worth while in pointing the way to a better method.[1]

The method induced by Dr. Franzen and used by Mr. MacNair and the writer, which gives, by far, the most satisfactory results, is a method of commensuration of tests through Sigma Indices.

In the application of this method sigma position can be used but since σ is the measure of spread above and below the mean its use becomes too complicated for ordinary school purpose because it involves minus quantities. "In order to get rid of minus quantities and decimals we may call the means of every test 100 in the appropriate age levels. We may call each sigma 20. Then the zero is always located 5σ below the mean. Since individuals varying 5σ from the mean are extremely rare, these zeros are not violent deviations from the truth. A score of 80 on any test for any one age represents a sigma deviation of —1.00 in that age level. A score of 120 represents a sigma deviation of + 1.00 in that age level. A score of 90 represents a sigma deviation of —0.50. A score of 115 represents a sigma deviation of + 0.75, etc. In every test for every age each Sigma Index unit stands for 1/20 of a Sigma and the origin is 5σ below the mean."

Sigma Indices[2] for every test for every age in which the test is applicable are very important, and no test should be considered complete until there has been gathered sufficient data upon which to build this table, and the table should accompany other data sent out with the tests. The process of building such a table is simple after the data have been gathered, as all that is needed are the M's and σ's for a normal distribution (1000 or more) of each age. Such a table, in fact, should be the sixth absolutely essential criteria for the selection of a test.

The formula for the transmutation of any test scale into Sigma Indices on a 10σ base with 100 at the mean is

$$\text{Transmuted score} = 100 + \left(\frac{X\text{-}Mx}{\sigma x}\right)20$$

[1] Franzen, Raymond, Functions of Research in a Public School System. Chapter V—Commensuration of Tests. World Book Company. (In press, to appear about May, 1923.)

[2] Sigma Index Tables in a usable form and their application, for many of the tests mentioned in this article, are in preparation and will be available soon.

When X = the crude score
M = the mean of the crude score
And σ x = the A. D. of the X's.

Sigma Index tables have been built by the writer for ages 8, 9, 10, 11, 12, 13, 14, and 15 for the Thorndike-McCall Reading Test, and for the Woody-McCall Mixed Fundamentals; and for ages 8, 9,

TABLE 1—Sigma Indices for National Intelligence Test—10 Year

1— 29.73	50— 69.09	99—108.44	148—147.80
2— 30.53	51— 69.89	100—109.25	149—148.60
3— 31.34	52— 70.69	101—110.05	150—149.41
4— 32.14	53— 71.50	102—110.85	151—150.21
5— 32.94	54— 72.30	103—111.66	152—151.01
6— 33.75	55— 73.10	104—112.46	153—151.82
7— 34.55	56— 73.91	105—113.26	154—152.62
8— 35.35	57— 74.71	106—114.07	155—153.42
9— 36.16	58— 75.51	107—114.87	156—154.23
10— 36.96	59— 76.32	108—115.67	157—155.03
11— 37.76	60— 77.12	109—116.48	158—155.83
12— 38.57	61— 77.92	110—117.28	159—156.64
13— 39.37	62— 78.73	111—118.08	160—157.44
14— 40.17	63— 79.53	112—118.89	161—158.24
15— 40.97	64— 80.33	113—119.69	162—159.05
16— 41.78	65— 81.13	114—120.49	163—159.85
17— 42.58	66— 81.94	115—121.29	164—160.65
18— 43.38	67— 82.74	116—122.10	165—161.45
19— 44.19	68— 83.54	117—122.90	166—162.26
20— 44.99	69— 84.35	118—123.70	167—163.06
21— 45.79	70— 85.15	119—124.51	168—163.86
22— 46.60	71— 85.95	120—125.31	169—164.67
23— 47.40	72— 86.76	121—126.11	170—165.47
24— 48.20	73— 87.56	122—126.92	171—166.27
25— 49.01	74— 88.36	123—127.72	172—167.08
26— 49.81	75— 89.17	124—128.52	173—167.88
27— 50.61	76— 89.97	125—129.33	174—168.68
28— 51.42	77— 90.77	126—130.13	175—169.49
29— 52.22	78— 91.58	127—130.93	176—170.29
30— 53.02	79— 92.38	128—131.74	177—171.09
31— 53.83	80— 93.18	129—132.54	178—171.90
32— 54.73	81— 93.99	130—133.34	179—172.70
33— 55.43	82— 94.79	131—134.15	180—173.50
34— 56.24	83— 95.59	132—134.95	181—174.31
35— 57.04	84— 96.40	133—135.75	182—175.11
36— 57.84	85— 97.20	134—136.56	183—175.91
37— 58.65	86— 98.00	135—137.36	184—176.72
38— 59.45	87— 98.81	136—138.16	185—177.52
39— 60.25	88— 99.61	137—138.97	186—178.32
40— 61.05	89—100.41	138—139.77	187—179.13
41— 61.86	90—101.21	139—140.57	188—179.93
42— 62.66	91—102.02	140—141.37	189—180.73
43— 63.46	92—102.82	141—142.18	190—181.53
44— 64.27	93—103.72	142—142.98	191—182.34
45— 65.07	94—104.43	143—143.78	192—183.14
46— 65.87	95—105.23	144—144.59	193—183.94
47— 66.68	96—106.03	145—145.39	194—184.75
48— 67.48	97—106.84	146—146.19	195—185.55
49— 68.28	98—107.64	147—147.00	196—186.35

10, 11, 12, and 13 for the National Intelligence Test; and for ages 10, 11, 12, 13, 14, and 15 for the Terman Group Intelligence Test.

The preceding 10-year-old Sigma Index Tables of the National Intelligence Test, the Terman Group Intelligence Test, the Thorn-

TABLE 2—Sigma Indices for Terman Group Intelligence Test—10 Year

10— 39.96	63— 81.41	116—122.86	169—164.31
11— 40.74	64— 82.19	117—123.64	170—165.09
12— 41.52	65— 82.97	118—124.42	171—165.87
13— 42.30	66— 83.75	119—125.20	172—166.66
14— 43.08	67— 84.54	120—125.99	173—167.44
15— 43.87	68— 85.32	121—126.77	174—168.22
16— 44.65	69— 86.10	122—127.55	175—126.00
17— 45.43	70— 86.88	123—128.33	176—169.78
18— 46.21	71— 87.66	124—129.12	177—170.57
19— 46.99	72— 88.45	125—129.90	178—171.35
20— 47.78	73— 89.23	126—130.68	179—172.13
21— 48.56	74— 90.01	127—131.46	180—172.91
22— 49.34	75— 90.79	128—132.24	181—173.70
23— 50.12	76— 91.57	129—133.03	182—174.48
24— 50.91	77— 92.36	130—133.81	183—175.26
25— 51.69	78— 93.14	131—134.59	184—176.04
26— 52.47	79— 93.92	132—135.37	185—176.82
27— 53.25	80— 94.70	133—136.15	186—177.61
28— 54.03	81— 95.49	134—136.94	187—178.39
29— 54.82	82— 96.27	135—137.72	188—179.17
30— 55.60	83— 97.05	136—138.50	189—179.95
31— 56.38	84— 97.83	137—139.28	190—180.73
32— 57.16	85— 98.61	138—140.06	191—181.52
33— 57.94	86— 99.40	139—140.85	192—182.30
34— 58.73	87—100.18	140—141.63	193—183.08
35— 59.51	88—100.96	141—142.41	194—183.86
36— 60.29	89—101.74	142—143.19	195—184.64
37— 61.07	90—102.52	143—143.98	196—185.43
38— 61.85	91—103.31	144—144.76	197—186.21
39— 62.64	92—104.09	145—145.54	198—186.99
40— 63.42	93—104.87	146—146.32	199—187.77
41— 64.20	94—105.65	147—147.10	200—188.55
42— 64.98	95—106.43	148—147.89	201—189.34
43— 65.77	96—106.22	149—148.67	202—290.12
44— 66.55	97—108.00	150—149.45	203—190.90
45— 67.33	98—108.78	151—150.23	204—191.68
46— 68.11	99—109.56	152—151.01	205—192.47
47— 68.89	100—110.34	153—151.80	206—193.25
48— 69.68	101—111.13	154—152.58	207—194.03
49— 70.46	102—111.91	155—153.36	208—194.81
50— 71.24	103—112.69	156—154.14	209—195.59
51— 72.02	104—113.47	157—154.92	210—196.38
52— 72.80	105—114.26	158—155.71	211—197.16
53— 73.59	106—115.04	159—156.49	212—197.94
54— 74.37	107—115.82	160—157.27	213—198.72
55— 75.15	108—116.60	161—158.05	214—199.50
56— 75.93	109—117.38	162—158.05	215—200.29
57— 76.71	110—118.17	163—159.62	216—201.07
58— 77.50	111—118.95	164—160.40	217—201.85
59— 78.28	112—119.73	165—161.18	218—202.63
60— 79.06	113—120.51	166—161.96	219—203.41
61— 79.84	114—121.29	167—162.75	220—204.20
62— 80.63	115—122.08	168—163.53	.....

dike-McCall Reading Test and the Woody-McCall Mixed Fundamentals are here printed in order to illustrate some of the values of such indices.

TABLE 3—Sigma Indices for Woody-McCall Mixed Fundamentals—10 Year

1— 40.67	10— 71.18	19—101.69	28—132.20
2— 44.06	11— 74.57	20—105.08	29—135.59
3— 47.45	12— 77.96	21—108.47	30—138.98
4— 50.84	13— 81.35	22—111.86	31—142.37
5— 54.23	14— 84.74	23—115.25	32—145.76
6— 57.62	15— 88.13	24—118.64	33—149.15
7— 61.01	16— 91.52	25—122.03	34—152.54
8— 64.40	17— 94.91	26—125.42	35—155.93
9— 67.79	18— 98.30	27—128.81	

TABLE 4—Sigma Indices for the "T" Scores of the Thorndike-McCall Reading Test—10 Year

7— 1.42	27— 53.38	47—105.33	66—154.68
8— 4.02	28— 55.97	48—107.93	67—157.28
9— 6.62	29— 58.57	49—110.52	68—159.88
10— 9.22	30— 61.17	50—113.12	69—162.47
11— 11.81	31— 63.77	51—115.72	70—165.07
12— 14.41	32— 66.36	52—118.32	71—167.67
13— 17.01	33— 68.96	53—120.91	72—170.27
14— 19.61	34— 71.56	54—123.51	73—172.87
15— 22.20	35— 74.16	55—126.11	74—175.46
16— 24.80	36— 76.75	56—128.71	75—178.06
17— 27.40	37— 79.35	57—131.30	76—180.66
18— 30.00	38— 81.95	58—133.90	77—183.26
19— 32.59	39— 84.55	59—136.50	78—186.86
20— 35.19	40— 87.14	60—139.10	79—188.45
21— 37.79	41— 89.74	61—141.69	80—191.05
22— 40.39	42— 92.34	62—144.29	81—193.65
23— 42.99	43— 94.94	63—146.89	82—196.25
24— 45.58	44— 08.53	64—149.49	83—198.84
25— 48.18	45—100.13	65—152.08	84—201.44
26— 50.78	46—102.73		

SOME USES OF SIGMA INDICES

Since the Sigma Indices in the above tests are transmuted scores with 100 at the mean in each test, therefore, any pupil's index in the Thorndike-McCall Reading Test should be the same as his index in the National Intelligence Test or in the Terman Group Intelligence Test—that is, within the limits of probable error[1] since there is a high and positive correlation between these tests. For example, suppose Johnnie's class has been given the National Intelligence Test, the Thorndike-McCall Reading, and the Woody-McCall Mixed

[1] For a discussion of the P. E. of Sigma Indices, see Franzen, Raymond, Functions of Research in a Public-school System. World Book Company.

Fundamentals, and suppose Johnnie is 10 years old. We find Johnnie's score on the National is 110, on the Thorndike-McCall Reading it is a "T" score of 52, and on the Woody-McCall, 15.

If we arrange the record of the class as follows:

Pupil	Ch. Age	N. I. T. Score	N. I. T. Sigma Index	W.-McC. Score	Acc. R.	Th.-McC. Score	Th.-McC. Sigma Index	Acc. R.
Johnnie ..	10	110	.....	15	.....	52	.....	.....

Then we can readily look up on the Sigma Index Tables the indices of the scores. That is, by referring to Table 1, we will find a score of 110 on the National Test to be equal to an index of 117.28. On Table 3 we will find a score of 15 on the Woody-McCall Mixed Fundamentals to be equal to an index of 88.13, and on Table 4 we will find a "T" score of 54 on the Thorndike-McCall Reading Test to be equal to an index of 118.32. Now, since these indices are comparable measures, then a ratio of accomplishment may be found by simply writing the Subject Index over the Intelligence Index as, $\frac{88.13}{117.28}$ and we get .75 as our Accomplishment Ratio in the Woody-McCall Mixed Fundamentals; or, as $\frac{118.32}{117.28}$ and we get 1.00 as our Accomplishment Ratio in the Thorndike-McCall Reading. Does this not mean to us that we have been able to get from Johnnie in our Arithmetic teaching only 75 per cent of what he is capable of doing? While in our teaching of Reading we have been able to get 100 per cent. (Again, of course, within the limits of probable error.) Then if we fill in our form as begun above we have the following:

Pupil	Ch. Age	N. I. T. Score	N. I. T. Sigma Index	W.-McC. Score	Acc. R.	Th.-McC. Score	Th.-McC. Sigma Index	Acc. R.
Johnnie...	10	110	117.28	15	75%	52	118.32	100%

TABLE 5—High Fifth Class—January, 1922

Cases	Ch. Age	N. I. T. Score	N. I. T. Sigma Index	W.-McC. Score	W.-McC. Sigma Index	Acc. R.	Th.-McC. Score	Th.-McC. Sigma Index	Acc. R.
1	10	112	118.89	22	111.86	.92	35	74.16	.62
2	10	72	86.76	15	88.13	1.01	41	89.74	1.03
3	10	98	107.64	17	94.91	.88	48	107.93	1.00
4	10	66	81.94	16	91.52	1.11	42	92.34	1.12
5	10	48	67.48	14	84.74	1.24	36	76.75	1.13
6	10	75	89.17	14	84.74	.95	42	92.34	1.03
7	10	71	85.95	19	101.69	1.18	41	89.74	1.04
8	9	71	93.37	18	112.27	1.20	38	87.77	.94
9	10	70	85.15	11	74.57	.87	42	92.34	1.08
10	12	75	74.24	19	76.03	1.02	46	93.46	1.25
11	10	73	87.56	17	94.91	1.08	41	89.74	1.01
12	11	72	73.16	16	78.39	1.07	46	97.99	1.33
13	11	82	82.03	13	68.55	.84	44	92.09	1.13
14	10	82	94.79	21	108.47	1.03	41	89.71	.93
15	12	68	68.82	10	41.42	.60	45	91.27	1.32
16	10	70	85.15	14	84.74	1.00	48	107.93	1.26
17	10	61	77.92	15	88.13	1.12	41	89.74	1.15
18	9	96	114.53	23	129.51	1.13	51	123.89	1.30
19	11	99	94.42	25	107.90	1.02	47	100.94	1.00
20	11	96	92.06	26	111.18	1.20	55	124.54	1.35
21	13	81	82.02	13	30.65	.37	55	108.92	1.32
22	11	95	91.27	26	111.18	1.21	47	100.94	1.10
23	10	87	98.81	26	125.42	1.27	49	110.52	1.12
24	11	82	81.03	21	94.78	1.16	49	106.84	1.31
25	11	90	87.33	23	101.34	1.16	41	83.24	.95
26	10	75	89.17	21	108.97	1.21	41	89.74	1.00

or such a table when completed for the class as is found in Table 5. All complicated statistical procedure has been eliminated for the teacher as she has nothing to do but refer to simple tables and divide one number by another.

Accomplishment ratios between Intelligence and the Thorndike-McCall Reading Test or Intelligence and the Woody-McCall Mixed Fundamentals would be 1.00 if there were no errors in the tests, and reading ability and ability to use the fundamental operations in Arithmetic were pushed to the maximum. They are not, of course, in any of our schools—hence the value of achievement testing in units of measure that are comparable.

The great difficulty with tests is not so much one of getting a measure of accomplishment in the various school abilities as it is to know when we get it whether it is as high as it ought to be. Whether Johnnie's score is as high in arithmetic in comparison to his score in reading, or his score in spelling, or to his score in language, or to his score in penmanship as it should be and whether each or all of these scores are as high as they should be in comparison to his potential ability. If not, we have not delivered all that we should for the public money that we have spent. And the school that does not know this relationship does not know whether it is 100 per cent or 50 per cent efficient or less. It may know in terms of grade norms, that it is as high as the published norm or as high as 50 important cities or as high as its neighboring city, but it does not know what type of mentality has gone into the determination of these norms, nor does it know which of its children are among those who brought its score down but who should have helped raise it. Hence the school must still teach by the "shot-gun" method, putting in as big a load as the barrel will permit, closing its eyes and firing, hoping to get the fellow who needs it today; if not today, then tomorrow. The result has been that the ones who need it most are continually escaping.

Reference to Table 5 will reveal the needs[1] of that High Fifth Class. Cases 1, 3, 6, 9, 13, 15, and 21 needed special attention in arithmetic, while cases 1, 8, 14, and 25 need some effective motivation in reading, particularly case 1, as case 1 has a Sigma Index in the National Intelligence Test of 118.89 which becomes the child's I. Q. We have not remeasured this class, but when we do in May, 1923, this child will deviate very markedly from our past experi-

[1] It may be of interest here to state that when our school began the use of the accomplishment ratio as a diagnostic measure in 1920 there were a great many more accomplishment ratios proportionately in each class falling below 100 than occur in this class.

ences if his index on the Reading Scale is not up to that of his Intelligence Index.

While this article is concerned only with achievement testing and not with method, yet it may not be out of place to state briefly how we have treated classes whose accomplishment ratios were markedly below 100, 100 being, of course, the lowest ratio considered satisfactory. As has already been stated, if all school abilities had been pushed to their maximum in all pupils whose scores were used to build the Sigma Index Tables, then the ratios would all be very much nearer 100, deviating from it only to the extent of error in intelligence tests, but since this was not true some ratios as high as 130 or 135 will be a natural consequence. However, they are usually lowered by an analysis of the intelligence testing. For example, case 20 in Table 5 instead of having a Sigma Index of 92.06 when tested by the Stanford Revision has an I. Q. of 110, thus reducing her accomplishment ratio in reading from 135 to 122. It should be noted here that the application of the Sigma Index method of achievement measuring never works a hardship on any child. Its application is always constructive since all children, no matter what their ratios, continue to receive as much instruction as they are capable of absorbing while those whose ratios are low are given increased attention.

A concrete example of our treatment of classes when ratios were low will make clearer our case than theory. The following example is taken from our earlier experiences when our Indices Tables were built upon cases of varying ages making them less authentic than our present ones, but it will serve to illustrate our treatment.

During September, 1920, the Woody-McCall Mixed Fundamentals, Thorndike Alpha 2, and the National Intelligence Test, Scale A, was given to 200 children in grades L4 to H6 inclusive. Sigma Indices were built in each test upon this distribution, and accomplishment ratios were computed for all the pupils taking the tests.

The National scores were distributed on the accomplishment ratios as a base with all pupils receiving Acc. R's of 75 at the lower point on the base and all pupils receiving Acc. R's of 120 at the upper end of the base. The average National Score was computed for each column at each point on the base line, giving us the following:

TABLE 6—Woody-McCall Mixed Fundamentals

1. Number of cases.....	5	16	28	33	29	34	20	21	8	6
2. Accomplishment ratio...	75	80	85	90	95	100	105	110	115	120
3. Average National Test..	96	86	82	92	84	84	75	74	89	71

A glance at Table 6 reveals the fact that as accomplishment ratios decrease the intelligence of the children receiving those ratios increases—that is, children with the lowest Acc. R. (75 per cent) have an average score on the N. I. T. of 96 while the children who have ratios of 120 have an average score on the N. I. T. of 71. And when the Pearson r is computed for row 2 (Acc. R.) with row 3 (Av. N. I. T. Score) we find it to be — .44. Is not this evidence that as schools are organized and conducted (at least as our school is organized and conducted) that the children of less ability are getting more from the school in proportion to that ability than are the gifted children in proportion to their ability? I ask again, Is this fair? Is it democratic? Again, when the distributions are made for the Thorndike Reading, Alpha 2 as explained above for the Woody-McCall Mixed Fundamentals and the Pearson r computed for the corresponding records, it is found to be —.527.

Believing that our gifted pupils were getting less from school than they had ability to get, we called a meeting of the teachers for the purpose of finding a remedy. We analysed the arithmetic test to find the specific habits included in its composition and labeled them, and then each teacher took her own class and carefully studied each pupil's test paper to find which of these specific habits had not been fixed. This was the basis for further drill attacking each child as his weakness appeared from this analysis.

For reading, we first decided upon fourteen specific outcomes that in our opinion seemed desirable, then analysed the reading test of each child to find where his weakness was upon this basis. All formal reading work was done with the objective in mind of clearing up weakness in each pupil as revealed by this study. The accomplishment ratios two months later, of which Table 5 is typical, show considerable gain and to us the worthwhileness of our attack.

As further evidence, a short intensive experiment by one of our teachers of an H 4 class in Arithmetic will be of interest. The following table with a brief note of explanation will serve to make it clear:

TABLE 7—Woody-McCall, Arithmetic

H 4	Form I Given March 1920	Form II Given two months later	Gain
Mean.....	10.8	14.6	3.8

Number of pupils taking tests, 33; number of pupils making no gain, 5; accomplishment ratios of these 5 pupils, .97, .97, 1.03, 1.05, 1.30; accomplishment ratios of 6 pupils making a gain of 7 or more points, 79, 74, 83, 89, 89, 84.

The 5 pupils with accomplishment ratios near 100 or above were all in the lower 25 per cent of the class' distribution of intelligence as measured by the N. I. T., while the 6 pupils with low accomplishment ratios were in the upper 25 per cent of the same intelligence distribution, thus giving further evidence that only those lying above the mean were able to make any gain when the class was pushed to its maximum.

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CHAPTER III

Classifications and Reorganizations Involving Test Results

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CHAPTER III

The Classification of Children in the Lincoln School, Oakland, California

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PROBABLY the most significant advance that has been made in recent years in educational practice as it effects the classroom teacher is the application of standard tests in the study of individual differences in children and in the analysis of results of instruction.

That differences existed among children has of course always been known, and wise teachers have always made allowance for these variations in actual teaching. They could not do otherwise in view of the facts. A mistaken notion, however, of what constituted equality, and an ignorance of the nature and extent of these differences, prevented any thorough-going attempt at a solution of the problem. Even when the really vast extent of these differences was demonstrated by Francis Galton and others, the teaching world continued to treat all individuals alike, group them together, exact of certain of them impossible tasks, while others were allowed to drift along in semi-idleness. On the one hand, there was discouragement, more or less hopeless, depending upon the range of deficiency; on the other, a vast waste of power because the tasks set were too easy to create sufficient mental tension. In the former case, there was the common tendency to "let George do it," and when that grew too unbearably monotonous, to drop out of school; in the latter, a really serious retardation of from one to three years. Who among us is not familiar with that dull, lifeless, hopeless expression on the faces of children who have over a series of years been attempting to do the impossible, whose efforts to produce have been continually thwarted by the brilliant child whose keener mind enabled him to reach the result before his slower classmate could get his mental machinery in motion, for it appears that the amount of time required for a child of a given age to do a certain piece of work is inversely proportional to his I. Q.

It was a long familiarity with conditions such as these, and the advent of mental tests that induced the writer and his faculty to try to find a better way, a fairer way to all concerned to classify and to teach our children. Our school is situated in the heart of the business section of our city. The average enrolment is about 1100, with

a faculty of 31 members. Its patrons live in hotels and apartment and rooming houses; few if any, own their own homes. Naturally, our patronage is largely transient, which adds greatly to the complexity of the problem. A recent study has shown that over 60 per cent[1] of our transients are undergraded both as to mental and chronological age. We therefore, have not alone the problem of individual differences to consider. This exists at all times, in all places. We have the additional factor of a constantly changing patronage.

We decided, after testing several of our primary classes, to try the effect of segregation and adaptation of instructional material to the needs and abilities of the children. Pupils whose I. Q's. ranged below 90 and whose grade work was unsatisfactory were grouped in special classes, limited to twenty-five or thirty children. These classes were put in charge of skilful and sympathetic teachers. An interesting thing happened. For about a month, there was not much doing; everybody sat still, waiting for someone else to do something, but nobody did. After several days of this sort of lethargy, the children began to look around to see what was the matter. In the course of a few days more they discovered that if anything was to be done, they would have to do it themselves.

Then a transformation took place. The children began to work, slowly and timidly but with gradually increasing confidence as they found they could really do something if they were given sufficient time and assistance. What appears more significant, they lost the dull, hopeless, bored expression and became happy cheerful children. One little girl said to her teacher, "You know I like school now. I don't cry any more at night." I think we teachers are not always conscious of the blind tragedies often enacted in the lives of the lower quartile of our children.

The success of these trial classes caused us to expand the work, until at present we have seven of them extending from the kindergarten through the eighth grade. Some of our children continue through school in these classes, and enter the high school without ever having been in a regular class.

[1] A mental test (either individual or group) is given to each transferred child at the time or soon after he enters our school. While nearly 100 per cent of these are over age chronologically for the grade, we have found the more startling fact that 60 per cent of more than 300 children thus studied have revealed a mental age above that which is normal to the grade to which the credential each carried entitled him to enter. Most of these children quickly make up their work in a special class and enter the class where they really belong. The common practice of demoting children who move about from school to school is a serious menace to the educational welfare of many a child.

There were of course, questions to answer and difficulties to face. Fortunately many of the things we expected to happen didn't. In over four years we have only had two cases of objection on the part of parents. These were due to a misunderstanding—one became satisfied; the other removed her child from the school. If the principal had been wiser, these need not have occurred.

We have avoided objections by talking the case over frankly with parents and by making no outward distinction between these and other classes. There is such a thing as social classification which takes into consideration the social age of children. A thirteen-year-old child, who is mentally ten, usually wants to associate with his chronological equals. If graded with small children, he loses his self-respect, becomes unhappy and dissatisfied and wants to quit school. Hence the high percentage of elimination that has formerly prevailed in our sixth grades. Therefore, we have placed these classes alongside of regular classes of the same chronological development. It is a well-known fact that children measure their progress as much by movement within a building as they do by their grading. Moreover, these classes give special opportunity for work, and it is held a privilege to get into them.

At first it was thought best to write a separate course of study for the special classes. A more mature consideration convinced us that a course should be the same for all, and it was agreed that in the special classes the subject or topic should be present in a simpler form. With the scope of the work narrowed, with fewer children to work with, it was possible to spend more time with each child. The larger factor of time tended to balance the smaller factor of ability so that the child when transferred to other schools, even to regular classes, was much better fitted to hold his own than he would have been under the unsegregated class plan.

The course of study in the special classes is therefore based upon material similar to and parallel with that found in the regular classes, the problems and projects being simplified in such a manner as to meet the level of capacity of the children. A few topics or subjects are omitted entirely.

Reading as taught in the primary grades may serve as an illustration of this adaption of the material used in the regular course of study. While phonics is introduced to the normal child in the second or third month of school life, the limited child must have so much more preliminary drill that phonics cannot be introduced with profit till, possibly, his second or even third term. During this preparatory time, he must become familiar with books and their use, he must be stimulated by the constant hearing of stories read

by the teacher, and he must be learning a vocabulary of words and associating them with the object or idea.

While the normal child can struggle with an unfamiliar word and attempt to get the thought of the sentence at the same time, the limited child must absolutely *know* every word in the sentence if he is to get the thought. For this reason much time must be spent in word recognition during the first two years. The emphasis must be on *impression* rather than *expression*. A primer in each child's hands, with the teacher reading and the pupils following with their markers is of great value, and has an immense fascination at this time. Many of the limited first-grade children spent a lot of time learning to hold the primers right side up, and the idea of getting a story from a printed page is new to many of them.

Although the limited first grade is much slower in starting to read than the regular class, when they have reached the third grade they compare quite favorably with regular classes. By this time they have a large enough reading vocabulary to enable them to read with pleasure and profit. It is probably always advisable to hold all class reading material well within the range of the child's experience, the texts whenever possible being free from grade designation. The chances are, he will never find it necessary to read books on abstract subjects, but it will always be a distinct advantage to him to be able to follow printed directions—make a cake from a cook-book recipe, or interpret directions for installing a radio set.

However, the simplification of the subject matter for limited classes should not deprive the child of his right to the best of childhood's literature. No children in our school appreciate a good story more than these children. Through hearing their teachers read again and again the stories which appeal to all children, many a slow child has been stimulated to make the tremendous effort necessary to learn to read himself. The reading material should be such as to give the child both intellectual and emotional training. Our present practice may be said to prepare the child fairly well to meet the demands of his working hours; but the future will require that greater attention be given to that type of training that shall prepare for a wiser use of leisure. There must be increasing emphasis on the education of the emotions. Children must be trained to read for inspiration as well as for information.

What of the expense of running special classes? Considered from an immediate standpoint, they cost more. This extra cost is overcome in a large degree in two ways. The removal of the special cases makes it possible to increase the size of the regular classes. In the second place, many of the special class pupils would have failed

if they had been left in the regular classes. Leaving out of account the spiritual gain, there is a distinct, though variable, saving in preventing the non-promotion, of so considerable a number of children. Our records show that the per cent of failure in our special classes is somewhat less than that in the regular ones. What is even more significant, the holding power of these classes is greater by 2.2 per cent than that of the regular classes of the city.

The reasonable success that we have been able to achieve with the special class plan has caused other schools to adopt a similar one. At present between 1500 and 2000 children are enrolled in these classes in this city. The following rules have been adopted by the Superintendent's Council relative to the formation of Special Limited Classes.

A. Special classes may be authorized in any school whenever there are sufficient pupils and teachers to make it possible to reorganize the classification so that the regular classes from which the limited pupils are removed may be increased in enrolment sufficiently to partially or wholly balance the decrease in enrolment necessary for limited classes. Such limited classes should enroll a minimum of 25 pupils and, except in emergencies, should not exceed thirty.

B. No limited class shall be planned until properly authorized by the Assistant Superintendent in charge.

C. No limited class shall be formed until careful investigation and examination have been made, not only by the principal and teachers of the school, but by the supervisor of special classes.

What do teachers think of special classes? My faculty are practically unanimous in their approval of what these classes are accomplishing; but teachers are human. They naturally prefer to work with superior children. I think all would prefer a class of fifty normal children to one of twenty-five specials. Personally, I think it unwise for a teacher to stay too long in special class work. There is a tendency to lose perspective, to become mechanical and narrow. Probably a plan whereby teachers rotate regularly will ultimately be found best. From another point of view however, it would be better to have the same teachers remain in these grades for the work is highly specialized and requires special training on the part of the teacher if best results are to be achieved.

Classification According to the Promotion Age

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WE HAVE long been cognizant of the fact that many of our children had superior ability and that as a school we were failing in our responsibility to these bright pupils by allowing them in no way to live up to the full limit of their capacity. It is true that we afforded them many opportunities to take part in different types of activities such as orchestra, glee clubs, dramatic clubs, school paper, clerical work in the principal's office, social clubs, student-body government and athletics, which amounted to practically the same as a maximum course of study. Nevertheless, the treatment was much the same for the dull and the bright, in fact any discrimination was in favor of the dull child, and we were neglecting the big opportunity which was ours—that of training for leadership. So we became interested in developing a more flexible system of gradation, one which would take into consideration the needs of the individual rather than of the average child.

A brief history of our attempts to adjust the school program to meet the needs of the individual, together with an understanding of the type of school, may lead to a more intelligent interpretation of results of tests and adjustments made this year.

The school is situated in East Hollywood and the district spreads over a large area, with better class of homes on the hills and poorer ones in the valleys. A recent survey of the occupations of the fathers shows one hundred and seventy-two different occupations distributed as follows: Big business, 9 per cent; professions, 15 per cent; little business, 36 per cent; skilled labor, 37 per cent; unskilled labor, 3 per cent (classified according to Taussig).

The median years schooling of the fathers is 11.8; of the mothers, 10.8. We have on one hand the parents with two and three university degrees and on the other hand those with only five or six years' schooling to their credit. Seventy-seven per cent of our families subscribe for two or more magazines, with the *Saturday Evening Post,* the *Literary Digest,* and the *National Geographic* heading the list.

Our children are practically all American, no colored; with five Japanese in the kindergarten and the first grade. It is interesting to note that 34 per cent of our children come from one-child families, giving us the problem of the over-mothered, irresponsible child.

We represent, therefore, a community with a range, geographically, financially, and socially wide, having little or no cohesion and with but one common interest—the child at school. We find, however, a parent much interested in whatever concerns the child at school, an intelligent parent, coöperating and helpful.

GROUP PLAN NO. 1

Our first attempt at grouping according to like ability was made in September, 1918, and we still follow the general plan then put into effect. The teacher's judgment was the basis of classification at that time. The work of the school as a whole was divided in two divisions, primary and departmental:

Primary division—Grades 1-4 inclusive—There are three groups to a classroom, Group 1 being most advanced. If there are mixed grades in a room (A1-B2), children are grouped according to ability, regardless of regular grading. Each group progresses at its own rate of speed and individuals are advanced from a group to the next higher whenever ready. The high group of the B1-A1 and B2 have in practically every case accomplished the work of three terms in two.

Departmental division—Grades 5-8 inclusive—In this division groups are designated by letters, H being the lowest and A being the highest or graduate groups. Groups correspond to the regular grades on account of transfers in the city system. The program is built around three activities: study, recitation, and play. A physical activity teacher in charge of the yard makes possible a system of group recesses. A credit card system was originated and adopted—credit being given at any time when the pupil accomplished given work of group in any subject. This made subject-promotion possible and did much to reduce the number of repeaters. Figure 1 on page 196 shows a sample card; the teacher's initial and date indicate the completion of group work at the time specified. These cards are on file in the principal's office.

This boy started in the E group and was retarded educationally. He was finally sent to the Opportunity Room where he did two terms' work in one and from this room he was graduated to the ninth grade.

GROUP PLAN NO. 2

In February, 1921, our enrolment had increased to 400, or 33 per cent, and we found it necessary to reorganize our groups. A survey and reclassification was accordingly made with the help of the Research Department of the city schools. The following tests were

Form 190—500—5-2-22

PUPIL'S CREDIT CARD Name Holt, Russell

Group	Reading	Formal English	Arithmetic	Spelling	Geography	History	Music	Drawing	Sloyd	Sewing	Pen Cookery
K											
J											
I											
H											
G											
F											
E	B.M.S. 6/22/20	M.C.S. 6/22/20	R.S. 1/21/21	G.E.P. 1/21/21	L.G.Q. 6/22/20	H.L.J. 4/9/20	G.E.P. 6/22/20	B.M.B 1/21/21	R.M.B. 1/21/21		
D	B.M.S. 1/21/21	M.V.S. 6/17/21	E.L.P. 6/17/21	G.E.P. 1/21/21	L.G.Q. 1/21/21	Wng 6/30/22	G.E.P. 1/21/21	I.M.B 1/21/21	"		
C	B.M.S. 6/17/21	M.V.S. 6/17/21	Cr. Held. 6/30/22	G.E.P. 6/17/21	M.M. 6/17/21	Cr. Held. 6/30/22	G.E.P 6/17/21	I.M.B. 6/17/21	R.M.B. 6/17/21		L.L.M. 6/17/21
B	O.P.P. Cr. 6/30/22	O.P.P. Cr. 6/30/22. H.C.	Opportunity Credit. H.C. 6/30/22	I.M.B. 6/30/22	Opportunity Credit. H.C. 6/30/22	OPP Cr. H.C. 6/30/22	OppCr. H.C 6/30/22	I.M B 2/3/22	R.M.B. 2/3/22		L.L.M. 2/3/22
A	"	"	B.M.B. 6/30/22	I.M.B 6/30/22	"	"	"	I.M.B. 6/30/22	R.M.B. 6/30/22		L.L.M 6/30/22

Remarks:

FIG. 1. *Pupil's Credit Card*

given: Grades 4-8—National Intelligence, Courtis Arithmetic, and Monroe Comprehension; Grades 2-3—Haggerty Intelligence; Grades B1-A1—Holley Completion.

A summary of the tests showed: (1) The school as a whole, while ranking above the standard in reading, was far below in arithmetic; (2) a large per cent of superior children; and (3) twenty-five per cent of chronologically retarded pupils.

It was obvious that there was need for more drill in arithmetic and we decided to stress this drill during the coming year. We invested in some arithmetic equipment—that is, self-corrective and speed test material—such as arithmetic games, Ingersoll watches—and adopted a new method of procedure which we still follow. Daily work is motivated by the use of individual charts kept by each pupil and class charts kept by the teacher. The individual charts have space for all the semester assignments and for all the grades received. This tangible evidence of progress served as an incentive to many of the children.

For the teacher the class chart with the record of tests serves as a convenient index of ability and application. (Page 198).

All work in arithmetic is based on Thorndike's Arithmetic which is our State textbook. In the Departmental Division we assign a month's work in advance, listing the work for each grade on the blackboards. A certain exercise is required each day as a class standard and when finished by all is checked off. The teacher is kept informed as to individual progress by weekly tests on knowledge of arithmetical processes and their application. Many phases of the work are dramatized as insurance, banking, and commission. All games suggested in the textbook are used and they do much to vitalize the work. It is possible for the superior child to finish the work of the group before the end of the term, and in such case one of three courses is opened—(1) the child advances to the next group; (2) he remains in his own group as a teacher's assistant, helping with tests and charts, correcting papers, or assisting pupils; and (3) he elects different work during the arithmetic period such as clerical work in principal's office, bookkeeping in connection with student funds, school paper, operation of projector, or helping with arithmetic records in the lower grades. Children are also allowed to progress at their own rate of speed in penmanship and spelling.

Problem number two was solved to a certain extent by regrouping with the teacher's judgment plus test results as a basis. No attempt was made to work out scientifically an educational or a promotion age as tests were standardized only in terms of grade performance—an unsatisfactory and unreasonable basis for judging ability. Two special rooms were opened to care for chronologically retarded pupils. One was known as the Primary Adjustment and the other as the Opportunity Room.

Primary adjustment—Grades B1-B4 inclusive—There are twenty pupils to a teacher and only those with I. Q.'s above 75 per cent are admitted. The purpose of the room is to enable pupils chronologically and educationally retarded to catch up with their grades by means of individual training. These pupils learn self-confidence and responsibility by directing their own daily program and correcting their own practice sheets. This teaches them to analyze and to remove causes of their errors. A list of retarded pupils is on file in the principal's office and the adjustment teacher, in conference with the principal, passes on the applicant. Especially devised material, concentrating on minimum essentials is given to pupils for a limited period. This room is under the direct supervision of the Research Department of the city schools. In thirty-six weeks' time sixty-two pupils were handled in our Adjustment Room and as a

Fred J.	G. A5	Rm. 9																			
1st mo.																					
Page	61	61	62	63	66	68	69	71	75	76	76	77	78	79				Tests			
Exercise	93	94	95	96	100	103	104	107	112	113	114	115	116	117				1	2	3	4
Grade	70	100	86	70	85	85	75	92	100	85	100	98	70	100	Average		87%	85	90	70	75

FIG. 2. *Individual Record Chart, Micheltorena Street School*

Boys	G. A5																							
															Speed Tests				Tests of Accuracy			
Page	61	61	62	63	66	68	69	71	75	76	76	77	78	79	1	2	3	4	1	2	3	4
Exercise	93	94	95	96	100	103	104	107	112	113	114	115	116	117								
1. John N.	100	50	85	75		60	70		80	81	84	90	96	100	60	75	80	90	45	90	90	80
2. Tom J.	100	100	100	75	80	90	90			100	100	80	60	75	A	A	90	60	85	80	80	90

FIG. 3. *Teacher's Class Chart, Micheltorena Street School*

School Micheltorena A4 Date, Feb. 3, 1923 By M. B.

Binet	I. Q.	Ch. A.	Name of Pupil	Ar. Score	Ar. Age	Re. Score	Re. Age	Sp. Score	Sp. Age	E. A.	Ed. Rank	Ped. Rank	Ped. Age	Int. Score	M. Age	Pr. Age	Pr. Q.	A. Q.	Class	Sec.	Remarks
	123	10.8	Walter B...	23	12.4	58	14.4	20	9.2	12.6	2	5	12.11	107.4	13	12.11	121	96	A5	X	
	116	9.9	Robert C...	23	12.4	41	10.4	39	11.6	11.1	4	7	12.8	89.2	11.5	11.8	120	97	B5	X	Double Promotion

FIG. [illegible]

result most of the retardation in the primary grades (chronological) was eliminated in a year's time.

Opportunity Room—Departmental Division—This room is so named because it offers the opportunity for misfits to find their level or in some way to become adjusted to the regular work of the school. The educationally and the mentally retarded, as well as the child who fails to adjust to the Departmental System and needs the mothering care of one teacher, are assigned to this room. Applications for admittance come from the class teacher and are passed upon by the principal and by the opportunity teacher. There are twenty pupils under the care of an expert teacher whose business it is to diagnose and analyze the individual and to fit the treatment to the case. There is no regular or prescribed method of procedure as is the case in the Adjustment Room. Children are returned to grade work whenever ready in the judgment of the teacher.

GROUP PLAN NO. 3

By September our enrolment was 775, an increase of 100 per cent in two years' time. Four hundred and thirty new pupils entered the school this term representing 77 cities, 14 states, and 3 countries (United States, Canada, and Australia). As a result there were large classes (40 and over per teacher), heterogeneous groups with a wide range of abilities. Uniform achievement was impossible, there was lack of cohesion and the discipline problem increased. A complete reorganization was the only solution of our problem and this time our procedure has been along more scientific lines.

THE TESTING PROGRAM—ANALYSIS OF THE PROBLEM

A school counselor was appointed, whose business it was to conduct a survey giving the tests and tabulating results. Our Primary Adjustment teacher was assigned to this task. Certain requirements are demanded by the Research Department as a preparation for work of a school counselor: (*a*) Successful teaching experience in regular upper and lower grades; (*b*) knowledge of methods of handling special cases, so as to insure intelligent placement and treatment of pupils; (*c*) best available training and experience in giving: (1) Group Educational Tests, (2) Group Intelligence Tests, (3) Binet Tests, (4) Performance Tests, and (5) other tests; (*d*) best available training in the statistical method of handling data and ability to interpret results; and (*e*) temperament, judgment, educational insight, such as to inspire confidence in her ability to give counsel in the conduct of a progressive school.

We decided to regroup according to the Promotion Age as worked out by McCall. Because of McCall's use of the three types of measurements in computing the Promotion Age, we determined it the fairest and most satisfactory basis for classification. By making use of the mental, the educational, and the pedagogical ranking, we are taking into consideration many factors which affect the work of the child at school—that is, native ability, actual accomplishment (industry), and character traits (habits, attitudes) and so attain a fair perspective on the individual case.

In finding the Mental Age the following tests were used: National Intelligence for grades 4-8; Haggerty Intelligence for grades 2-3; and Detroit Intelligence for the first grade. Binet Tests were given to exceptionally superior or inferior pupils and to delinquent pupils.

For computing the Educational Age the following tests were given: Thorndike-McCall Reading for grades 4-8; Los Angeles Reading for grades 2-3; Woody-McCall Arithmetic for grades 3-8; and Ayres Revised Spelling List for grades 3-8. Reading, arithmetic, and spelling ages were determined according to the tentative norms for classification of pupils on the basis of thirteen months for each grade as suggested by McCall and compiled by our Research Department.

Grade	Woody-McCall Arith. Score	Ayres 60-word Spell. Score	Thorndike McCall Reading T Score	National Intelligence Test Scale A	National Intelligence Test Scale B	Age in Months
6.5	23	44.7	.....	99	97	148
6.6	.....	45	.....	100	98	149
6.6	.....	.....	50	101	99	150
6.7	.....	46	.....	102	100	151
6.8	.....	.....	51	103	101	152
6.8	24	.....	.....	104	102	153
6.9	25	47	.....	105	103	154

Believing reading comprehension to be of greater importance than the others and "because it is prerequisite to more of total work of the school than other subjects" we weighted reading doubly. Our formula was then: $\frac{AA + 2\ RA + SA.}{4}$

The pedagogical age was determined by a diagnosis of the individual case. Certain intangible qualities—that is, intellectual, social, physical, emotional, and cultural, are considered in relation

to the extent to which they are improvable by school instruction. Each child was ranked in order under each of these heads:

1. Intellectual
   (1) Rank in order according to achievement
2. Social
   (1) Attitude
   (2) Coöperation
   (3) Leadership
   (4) Initiative
   (5) Habit formation
   (6) Control
   (7) Adjustability
3. Physical
   (1) Sight
   (2) Hearing
   (3) Tonsils—Adenoids
   (4) Posture
   (5) Nutrition
   (6) Teeth
   (7) Skin
   (8) Muscular Coördination
4. Emotional
   (1) Nervous
   (2) Temperament
   (3) Stability
   (4) Responsibility
   (5) Trustworthiness
   (6) Honesty
   (7) Criminal Tendencies
5. Cultural
   (1) Cultural background
   (2) Speech in home
   (3) Cleanliness in home
   (4) Magazines taken.

A composite score was computed by averaging the ranks on these five items. Pedagogical age was obtained by assigning the highest educational age of the class to the pupil averaging highest by the teacher's ranks and so on until the pupil averaging lowest received the lowest ability age. Teacher's judgment or pedagogical age in the departmental division was found by having each teacher rank each child according to his standing in the subject taught and under the five items noted above and these marks were averaged. It is

interesting to note the close correlation between teacher's judgment and the educational age—due, no doubt, to the fact that these teachers have had years of training in test procedure. The classroom teacher corrected the tests (the new teacher being carefully instructed in their correction). A system of re-checks was employed and the National Intelligence Tests were checked three times. The willing coöperation of the teachers, their interest, and eagerness to be of help made possible the accomplishment of the big task of testing and ranking 775 pupils in six weeks' time. In determining the educational and the pedagogical age, we worked out our own formula which is somewhat different from that used by our Department of Research.

The promotion age was computed by giving the mental, the educational, and the pedagogical age equal weight. Lists were made of each class. The child was ranked under these several heads. See Classification Record Sheet, Fig. 4, page 198.

The following Statistical Card was prepared to be kept on file in the principal's office as a permanent record. On back of this card the pupil's rating is shown in a graph.

Name Walter B. Date 1-24-23 A. Q. 96

Date of Birth 4-5-'12 School Micheltorena Grade A4

ARITHMETIC				READING			
Date	Test	Raw Score	Ar. Age	Date	Test	Raw Score	Re. Age
1-9-23	Woody McCall	23	12.4	12-6-22	Thorn. McCall	58	14.4

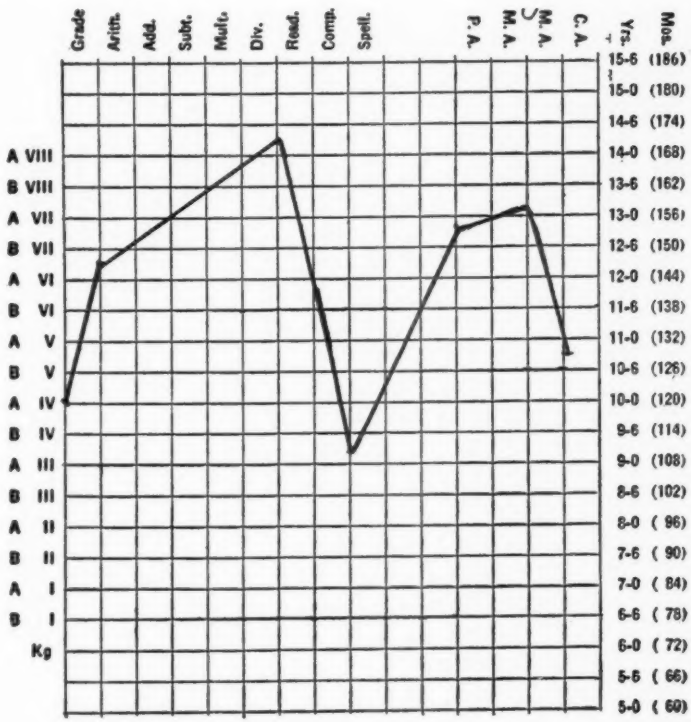
SPELLING				OTHER TESTS			
Date	Test	Raw Score	Sp. Age	Date	Test	Raw Score	Ed. Age
1-11-23	Ayres	20	9.2				12.6
							E. Q. 117

Mental Test Results:

Date	Test	C. A.	Raw Score	M. A.	I. Q.
12-7-23	Nat.	10.8	107.4	13	123

STATISTICAL RECORD CARD—Form 1

FIG. 5. *Statistical Card, Form 1, Micheltorena Street School*



Ped. Age- 12.11

Legend: Pro. Age- 12.9

Remarks:

Double Promotion to A5

Adj. in Spelling.

FIG. 6. *Back of Statistical Card, Form 1*

The 1922-23 survey confirmed our judgment by showing: (*a*) In all classes a distribution over a large number of years, chronologically, mentally, and educationally; (*b*) 58.3 per cent superior children (above 110 National Intelligence Tests); (*c*) The A. Q. rose higher in proportion as the I. Q. fell lower; and (*d*) A decided rise in Arithmetic level as compared with survey of 1920-21.

sD

Summary of Ages—Grade 3–8 (Showing wide range)

B8	Range	C. A.	11.10—16.7
		M. A.	10. 9—18.9
		E. A.	11. 4—17.3
A7	Range	C. A.	11.10—15.6
		M. A.	11. 5—18.5
		E. A.	10. 4—15.1
B7	Range	C. A.	10. 7—15.4
		M. A.	11. 7—17.5
		E. A.	11. 6—16.7
A6	Range	C. A.	10. 3—13.10
		M. A.	11. 6—18.2
		E. A.	10. 7—15.5
B6	Range	C. A.	9.10—13.10
		M. A.	10. 0—18.1
		E. A.	10. 2—15.5
A5	Range	C. A.	9. 0—13.6
		M. A.	9. 1—18.3
		E. A.	9. 5—15.5
B5	Range	C. A.	9. 1—13.4
		M. A.	8.10—16.6
		E. A.	9. 1—15.9
A4	Range	C. A.	9. 2—11.11
		M. A.	8.11—14.8
		E. A.	8. 5—12.10
B4	Range	C. A.	7. 7—12.1
		M. A.	8. 3—13.6
		E. A.	8. 1—11.7
A3	Range	C. A.	8. 2—11.10
		M. A.	6. 0—11.10
		E. A.	5. 9—11.0

Division according to Intelligence Quotient was as follows:

I. Q.....110 or above.....58.3%
I. Q.....90–110.....30.8%
I. Q.....Below 90.....10.9%

[1]I. Q.....140 and above..... 5%

THE SOLUTION OF THE PROBLEM—REMEDIAL MEASURES

Beginning with the new term children were classified into grades and into sections on the basis of Promotion Age. This necessitated 102 double promotions which number plus 60 irregular promotions brought the total of double promotions for the term to 162. A few children with high educational and mental age were not advanced since the teachers decided that on account of physical reasons, immaturity, or recent double promotion it was best for the child to remain in a lower group. It is not our policy to give two double promotions in one year. Children below the standard were not

[1] The division according to the Promotion Quotient for X Group—110 and above—was 41 per cent; for Y Group—90 to 110—45 per cent; for Z Group—below 90—14 per cent.

I. Q.

A. Q.	50 69	60 70	70 80	80 90	90 100	100 110	110 120	120 130	130 140	140 150	150 160	160 170	Total
60 70				1	1	1							3
70 80		1			1	4	3	5	9	4	3		30
80 90				4	11	19	27	43	24	19	10		157
90 100	1	1	3	18	20	30	40	29	15	6	4	1	168
100 110			8	13	29	16	21	4	4	1			96
110 120			1	8	3	6	2	2					22
120 130			2	1				1					4
Total	1	2	14	45	65	76	93	84	52	30	17	1	480

FIG. 7. *Relation of A. Q. to I. Q., Micheltorena Street School*

demoted, our plan being to give the child with an average I. Q. the opportunity to find his level, while those below normal were segregated and sent to the Opportunity Room.

In the Primary Division we continued our old plan of three groups to a room, regardless of grade, the only difference being the use of promotion age as the basis of classification. In this division it is possible for group 1 of B1-A1-B2 to cover the work of the course in less than a term and to advance to the work of the next grade, though remaining in the same classroom. At the beginning of the new term credit is given for all work accomplished.

In the Departmental Division, groups are divided into sections 1 and 2, designated as (A8) A1-A2, (B8) B1-B2, (A7) C1-C2, etc. Section 1 is composed of pupils who are above grade standard—this grouping being possible because of our large number of X pupils. This group will be given an enriched course of study and no effort will be made to advance it before next promotion. This enrichment is offered by means of a maximum course in literature, social studies, and English; by development of cultural background for literature; by working out original dramatization of stories; by original stories and poems; by discussion and debates on current events and practice in public speaking; by a course in elementary algebra.

		5– 5½	5½– 6	6 – 6½	6½– 7	7 – 7½	7½– 8	8 – 8½	8½– 9	9 – 9½	9½–10	10 –10½	10½–11	11 –11½	11½–12	12 –12½	12½–13	13 –13½	13½–14	14 –14½	14½–15	15–15½	15½–16	16 –16½	16½–17	17 –17½	17½–18	18 –18½	18½–19
	C. A.														1	2	1	8	13	3	2	3			1				
B8	M. A.												1		1	1			1		2	3	1	4	7	8		4	1
	E. A.													1		3	2	3	2	5	6	6	2		2	2			
	C. A.														1		8	8	4	2									
A7	M. A.													1			2		1	2	2	1	2	4	6	2		1	
	E. A.											2				1	4		6	6	4	1							
	C. A.												1	2	9	7	7	8	8	1	1	1							
B7	M. A.														2	3	2	3	2	4	5	5	6	6	3	4			
	E. A.														1	5	3	6	10	10	5	2	2		1				
	C. A.											1		4	7	2	7	3	4										
A6	M. A.														2	2	3	1	1	1	3	3	5	4	1		1	1	
	E. A.												1	2	3	2	2	3	4	1	5	5							
	C. A.										1	1	5	13	15	5	1	2	3										
B6	M. A.											4		2	1	4		6	7	4	10	2	1	2	1		1	1	
	E. A.											4	4	8	6	5	5	17	1	1	2	3							
	C. A.									1	5	6	7	8	3	2	2	1	1										
A5	M. A.									1	2	2		6	3	3		4	3	4	2	2	1	1			1	1	
	E. A.										4		7	3	7	8	1	2	1	2		1							
	C. A.									2	4	9	12	9	5	1	1	1											
B5	M. A.								1		2	2	5	7	4	4	2	7	2	2	3	1	2		1				
	E. A.									2	4	9	4	6	4	5	2	3	3	1			1						
	C. A.									4	18	9	8	3	4														
A4	M. A.								1	3	3	4	9	7	5	4	6	2	1		1								
	E. A.							1	1	2	11	10	4	9	4		4												
	C. A.						1	1	4	14	11	9	2	2	4	2													
B4	M. A.							3	4	6	5	8	8	5	4	3	3		1										
	E. A.							4	5	5	14	15	3	3	1														
	C. A.							3	11	13	9	3	2		1														
A3	M. A.			1		1		8	4	4	6	7	6	1	4														
	E. A.	1				1	2	5	9	6	11	6		1															
	C. A.						2	6	14	9	2																		
B3	M. A.			1	2	1	2	8	8	3	5	1	1	1															
	E. A.				1	1	3	5	8	10	4		1																

FIG. 8. *Summary of Ages, Micheltorena Street School*

Section 2 is composed of pupils at standard or below standard. There is always the possibility of promotion or demotion between sections, and children understand and profit by the fact.

Our former policy of individual progress in arithmetic, spelling, and penmanship is continued, also our credit card system.

	9½–10	10 –10½	10½–11	11 –11½	11½–12	12 –12½	12½–13	13 –13½	13½–14	14 –14½	14½–15	15 –15½	15½–16	16 –16½	16½–17
A8							2	4	4	12	8	6	4	3	1
B8							2	2	5	6	12	2			
A7						5	3	5	10	4		4			
B7					1	3	5	7	2	7	3	1			
A6			2	4	5	11	15	5	2	3		1			
B6		2	5	2	3	3	2		1			1			
A5	2	12	2	9	12	5	4	1	1						

Section II Section I—Children above standard

FIG. 9. *Promotion Age Range after Reorganization, Micheltorena Street School*

Table Narrowing in Age Range After Reorganizaiion

Grade	Promotion Age
A8	A1—14. 6—17.0
	A2—12.11—14.6
B8	B1—14. 1—15.6
	B2—12. 8—14.1
A7	C1—13. 6—15.6
	C2—12.3—13.6
B7	D1—13. 1—15.5
	D2—11. 7—13.1
A6	E1—12. 6—15.2
	E2—10. 6—12.6
B6	F1—12. 1—15.1
	F2—10. 0—12.1
A5	G1—11. 7—13.8
	G2— 9. 8—11.7

Some readjustment was necessary on account of a large number of children receiving double promotions and we have scheduled adjustment periods. At least one period a day is devoted to giving these children individual help in minimum essentials, thus bridging the gap between groups. The number and the duration of these periods are dependent upon the need. In the Primary Division the individual teacher decides upon the period which is best suited to her program. In Departmental Division the English and arith-

FIG. 8. *Summary of Ages, Micheltorena Street School*

metic teachers use part of each period for adjustment. Definite assignments of the work to be covered together with the lists of references are posted on the board. Individual record books are kept in some groups and work checked off as accomplished. We have observed that in the majority of cases children find little difficulty in making the adjustment, while still maintaining a high standard in the work of the group to which they have been advanced. These periods are in line with our general policy of allowing time for individual instruction with a view to giving the teacher an opportunity for diagnosis of the individual case and so preventing the child from losing his place or marking time on account of some minor difficulty.

This term for the first time, we are planning to enlarge the social viewpoint of the child, by a closer correlation of the basic facts of the story of mankind. To this end we are combining our history and geography and listing them on our program as Social Studies. This work is vitalized to a great extent by the use of our visual education equipment, the ballopticon, the stereopticon, and the projector.

Departmental pupils with an I. Q. below 90 were sent to the Opportunity Room. Because of limited ability the individual in this group needs special analysis in order that he may receive such an education as will fit him for useful citizenship. By grouping these children, it is possible to study each individual carefully in order that the teacher may learn and develop the particular ability in each pupil, checking dominant qualities and encouraging latent ones. A record of the achievements of each child is kept, as well as the records of his school history and any physical or temperamental difficulties. Pupils return to regular classes for penmanship, drawing, sloyd, and some economics and so feel themselves a part of the whole. One period a day is given to social studies and one to literature in which much emphasis is given to the dramatic element. Failures are never discussed, only achievements. Work is accepted as the child's own rate of speed and according to the amount of effort put into the preparation of the lesson. The responsibility is that of each child, and he soon learns his speed is dependent upon his own interest. Graduate children of this room are given a certificate of promotion from the Psychology Department which takes the place of a regular eighth-grade diploma and entitles them to a special vocational course at one of the junior high schools.

We decided not to open a special room for super-brights since the use of the maximum course keeps these children working at full capacity while preventing a too-rapid advancement which is apt to result in social misfits. Courses in Algebra in the eighth grade,

French in the seventh, and Spanish in the sixth grade are offered. Many opportunities for participation in extra-curricular activities are given.

Pupils entering our school are given preliminary placement by means of tests. A month later their promotion age is determined by the addition of the pedagogical age. Our plan calls for a reclassification at the beginning of each term, based on the promotion quotient. The pupil's pedagogical age will differ possibly, but his promotion age can be computed by regular formula.

SUMMARY

In attempting to meet the needs of the individual we have developed a more flexible system of gradation by providing for a plan of homogeneous grouping, a maximum-minimum course of study, subject promotion, adjustment periods, and progress at individual rate of speed. As a result we have succeeded in reducing the number of repeaters to the minimum; in eliminating need for special types of rooms except for pupils with low I. Q.; in allowing the accelerated children to finish the 8-year course in less time (7 or 6 years). We have, moreover, succeeded in equalizing the opportunity by making it possible for both the bright and the dull child to attain a 100 per cent A. Q. After four years' trial we are confirmed in our belief, that a type of organization such as we have inaugurated is not only possible, but both practical and economical.

Classification by Intelligence Tests in the Smaller Schools

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SUPERINTENDENTS and principals of small schools have been somewhat reluctant to adopt a testing program in their schools because they feel that classification is practicable only in the larger school systems. To a certain extent their hesitancy is justified, for it is apparent that the greater the number of children in a grade, the greater the possibilities of grouping them according to abilities. It is true that the smaller school is handicapped by the relatively small number of pupils in each grade, by lack of extra classrooms, by fewer teachers, and usually, by absence of any general organization of special classes to which at least the most needy in the building can be sent. There are, however, certain simple administrative devices for making use of the results of standardized tests which can be put into operation in any small school, or sometimes even in a single room. Five of these have been selected as especially worthy of consideration when classification is undertaken in a small school.

ADMINISTRATIVE DEVICES FOR IMPROVING CLASSIFICATION

1. *Double promotions*—The use of intelligence tests in any school reveals at once the pupils of superior ability. If a child makes a poor score there may be some mistake—broken pencil, language handicap, a headache—which will account for his poor performance, but if a pupil makes a high score he must have ability, barring, of course, the possibilities of copying or coaching. Not infrequently a pupil whose scholarship rating is only average, surprises his teacher by making one of the highest scores in the room. Bright pupils whose ability is not recognized nor given opportunity for expression often grow indifferent in their attitude toward school work, lose ambition, and drop to the level of mediocrity in their scholarship. One of the chief merits of intelligence testing is that it so easily locates pupils of this type and shows the need of special attention to them. If a pupil excels in an intelligence test and in one or more achievement tests he should be permitted to skip a grade even though the teacher's estimate may not accord with this indication. This practice should obtain especially above the third grade. It is obvious that in the first three grades a pupil with superior intelligence cannot

be expected to undertake advanced work if he hasn't acquired the tools of an education. To cite an extreme case, no pupil regardless of his I. Q. and mental age could go directly from kindergarten into the second grade, or even the last half of the first, unless he was able to read as well as the children in those grades. But it should be remembered in this connection that pupils of superior intelligence rather frequently are able to read when they enter the first grade, and for them double promotion at this time is not only permissible but distinctly desirable. Above the third grade, double promotions should be given more freely than is generally the practice in many schools.

2. *Sectioning within a room by subjects*—Another effective way of classifying pupils, which involves only slight administrative changes, is to section pupils within a room for given subjects. For segregation of this sort only achievement tests are essential, although intelligence tests are most helpful in ascertaining some of the underlying causes of difficulties. On the basis of their test scores in a given subject, the pupils in a room may be divided into three groups, the average, those whose performance approximates the median for the room; the superior, whose performance is distinctly above the average; and the low, or 'hospital' group who are in need of special help and remedial work. Pupils in the average, or middle group may progress at the regular pace specified by the course of study; those in the superior group may often be excused from regular recitations and devote their time to supplementary assignments and special reports, while those in the low group should be given individual help with a view to advancing them into the average group as quickly as their performance warrants. Pupils should understand from the outset why the groups have been formed and that the length of their stay in any one group will be determined by their willingness to work and to show improvement. There should be no set time for advancing from one group to another. The standards for each group should be definitely in the minds of the pupils—so many words read or problems worked in a given time—and each pupil should be provided with an individual graph sheet for keeping a record of his own progress. While much is to be gained from group competition, the greatest gain will come when each pupil is striving to beat his own record. Occasional tests should be given to those in the upper group, as well as the others, to make certain that lack of drill or an hypertrophied sense of importance hasn't tended to lower their performance.

A teacher would, no doubt, find it difficult to section all her classes in this manner, but if only two subjects, reading and arithmetic for example, are conducted in this way the results will be well worth the effort.

In buildings where there is more than one group of the same grade or half grade this manner of sectioning is simplified, because it is possible then to assign all the pupils of a given ability to a given teacher.

3. *The special-help teacher*—If funds permit, one effective method of bringing pupils up to grade and of making a room more uniform in achievement is to hire a special-help teacher. This teacher may be a part-time or a full-time instructor whose sole duty is to bring retarded children up to grade. Pupils who are below grade in achievement should leave their rooms and report to her for a given period each day. During that period they should be drilled only in those subjects or phases of subjects in which they are deficient. The teacher assigned to this work must be one well-versed in methods and temperamentally suited to deal with children who are somewhat backward. While pupils should in no sense feel that it is a disgrace to be put in the special-help group, they should understand that they are expected to work up to the regular grade standard as quickly as possible. Frequent tests and individual graph sheets will be found useful again in this connection.

This method of handling children who are not up to grade is excellent for those pupils who have some special disability, or who are behind in their work for some accidental cause. However, it does not properly provide for the feeble-minded. They will derive some benefit from the extra drill, but they cannot hope to gain the most from their school work until they are put in a room by themselves.

4. *Controlling entrance to first grade*—One step toward classification that can be taken without encountering serious administrative difficulties, is to control the admission of pupils to the first grade. The kindergarten or first-grade teacher in the building should learn the procedure for giving the Binet-Simon test, and only those pupils should be admitted to the first grade who reach a certain mental age on the test (ordinarily 5 years and 10 months or 6 years), or those whose chronological age is so advanced that they must be admitted regardless of their mental age. Just what this chronological age limit should be will, of course, depend upon the community and the prevailing practice.

Although this manner of utilizing the results of intelligence tests is comparatively simple to put into operation, it has heretofore been given insufficient attention. Wherever it has been tried, the results

have shown clearly that a large percentage of those pupils who fail in the first grade are children who were permitted to enter the grade before their mental ages were up to the level known to assure reasonable success.[1]

5. *The special room*—Better results can be accomplished with pupils of any given type if they are instructed as a separate group apart from other pupils. If space permits and the number of pupils warrants it, this is the type of organization toward which every superintendent should strive. If only one room is available, it should be given over to the feeble-minded because they can get the least out of the regular course, and there is the smallest chance of caring for them otherwise, since the gifted may be brought nearer to grade by double promotion, but the feeble-minded cannot be demoted. However, in most small schools, a special room with a special teacher is an administrative impossibility. But there may be occasionally a certain grouping of pupils or combination of grades which, with only slight re-organization, will permit the establishment of a special class without employing an additional teacher or furnishing an extra room. An experiment in this type of re-organization was undertaken recently in a seven-room school enrolling between 200 and 300 pupils. In this school there were seven teachers, teaching grades from the kindergarten through the high 6th. The number enrolled in each room ranged from 24 to 42. The school was situated in a very poor section of the city; most of the pupils came from families where the home environment was very bad, and the general level of intelligence in the school was recognized as dull-normal with a more than ordinary number of inferior and feeble-minded. The percentage of retardation in the school was very high, and had gone so long unrelieved that in every room above the first grade, the range in the chronological ages of the pupils was from 3 to 6 years. The superintendent was willing that some sort of re-organization should be effected, but he felt that the small number of children enrolled in the school would not justify the addition of another room and teacher. With these limitations in mind, those in charge undertook to plan some sort of adjustment that might bring about a more homogeneous grouping of the pupils. Accordingly, all the pupils in the school were given two intelligence tests,

[1] Dickson, Virgil E. What First-grade Children Can Do. *Journal of Educational Research*, 2: June, 1920, pp. 475-480. Also, Davis, Helen, The Use of Intelligence Tests, The Twenty-first Yearbook of The National Society for the Study of Education, Part II, pp. 140, 141. Also, Dawson, Charles D., Classification of Kindergarten Children for First Grade, *Journal of Educational Research*, December, 1922, pp. 412-22.

and those above the first grade were given standardized tests in reading and arithmetic. Before the tests were given, the teachers were asked to rate their pupils in intelligence on a scale of five, to give their scholarship records for the semester, and to state the half grade in which they believed each pupil should be placed if only his achievement was considered, regardless of his present grade status, parents' objections, and the like. With all these data assembled, plans for re-organization were considered. The 4B and 5B sections with 11 pupils each were the smallest in the school. If adjustments were to be made, they might most easily be begun in these grades. All pupils in these two grades whose ratings on two or more of the tests were above the median for the next grade, were considered for double promotion. There were four of these in one class and five in the other. Of the thirteen children who remained, one had a percentile rank in the tests of 30, the next highest was 28, and all the others were below, running as low as 7. In achievement tests, these thirteen were either very low in both, or else their performance was very uneven. In almost every case their performance scores were equal to those of a half to two whole grades below their then grade location. In every case their scholarship ratings were from C to failure, with eight conditions among the thirteen. It appeared, then, that all the pupils in grades 4B and 5B were either capable of double promotions or seriously in need of special help. If the superior pupils in these grades were given a double promotion and the slow pupils were taken out and put into a special room, grades 4A and 5A would be eliminated for the following semester, and the teacher and room thus saved could be given over to the proposed special room.

This group of thirteen slow pupils, accordingly, was taken as the nucleus of a special or auxiliary room to which were added the thirteen most needy cases from the other grades above 3B and under 5A. The group as thus re-organized ranged in chronological age from ten to fourteen years and in achievement from 2A to 5A, but no pupil was at grade in the intelligence tests nor in more than one of the achievement tests. The teacher put in charge was instructed to group her children by subjects according to achievement, without regard to previous grade level. It was explained to pupils and parents that the purpose of the room was to provide extra time and facilities for those who were in need of special help, and to restore as many as were capable to the regular grades at the close of the semester. The teachers were particularly careful to state that no pupil had been demoted or failed, and that no pupil would be marking time.

As a result of this re-organization the range of abilities in the special room was, to be sure, as great as it had been in the regular rooms before the change was made, but each of these regular rooms by being relieved of its laggards was made more homogeneous. Moreover, those who were transferred to the special room now stood a better chance of having their needs met. That the pupils appreciated their opportunity is apparent from the fact that their attitude was favorable from the first, and they showed good interest and a willingness to work.

The chief administrative difficulty of this organization is presented in the matter of transfers from outside the building. There is the possibility that pupils will be transferred in who properly belong in a 4A or 5A grade. This experiment is still in progress and to date this difficulty has not arisen. If it should develop, the teachers are planning to meet it by fitting the newcomer into whichever grade best suits his needs, whether it be the special room or the regular grades.

This experiment has been described at some length because it presents a form of adjustment which is not ordinarily used. To discontinue, even temporarily, two half grades in a seven-room elementary school of 250 pupils would seem to most administrators quite impossible. As a matter of fact the distinction between one half grade and the next is much less clean-cut than most persons think it is. Thus in the adjustment just described, no pupil is checked, let alone set back in his school progress by the discontinuance of these two half grades.

ADMINISTRATION OF THE TESTS[1]

If classification or re-organization is undertaken in any of the ways suggested above, a definite program of testing is involved. In every case but that of controlling the entrance to the first grade, both intelligence and achievement tests should be given.

It is advisable to give two different intelligence tests, and there are certain important advantages in having the same person administer both. If there is a wide discrepancy between a given pupil's scores on the two tests, the case should be followed up carefully. If the difference cannot be explained as arising from some accidental cause such as uncut pages, broken pencil, headache, copying, and the like, the pupil should be re-examined with an individual test.

[1] The writer has given a more detailed account of some of the problems arising in the administration of tests in *The Journal of Educational Research* for January, 1922, pp. 1-21.

The teachers can very well give the achievement tests in their own rooms, provided, of course, that they have been instructed previously in the rules for administering, and have been made to understand the importance of uniform procedure and accurate timing. Achievment tests in at least two subjects should be given—reading and arithmetic. If time permits, tests in spelling and other content subjects may be given to advantage.

Both intelligence and achievements tests may be scored by the teachers if they are furnished with keys. It is advisable to check the first few papers that each teacher scores in order to be certain that she has understood directions, and is scoring correctly and accurately.

Teachers' estimates of intelligence and scholarship are a valuable aid in planning re-adjustments. These estimates should be secured before any testing is done, or at least before the teachers have seen the pupils' scores. When teachers are asked to rate intelligence, they should be warned particularly to take the pupils' chronological ages into account. There are certain to be cases in every room where the teacher's estimate and the test score for a given pupil vary widely. In discrepancies of this sort, if the test rating is high and the teacher's rating average, the test rating should be accepted and the pupil given the benefit of the doubt. If the test rating is low and the teacher's rating high, experience has shown that almost always the test rating is the more accurate because teachers too often do not make the proper allowance for differences in chronological age among their pupils, and too often are unconsciously influenced by a pupil's personality, industry, or maturity.

One of the most effective ways of demonstrating to teachers how very significant chronological age may be in the estimate of intelligence is to convert all scores into age percentiles.[1] The use of percentiles makes it possible to locate a pupil with respect to his intelligence among 100 pupils of his own age, or in other words, to indicate his relative intelligence. Thus, for example, to be above the 90th percentile (in the top 10 per cent) is analogous to saying that a pupil has a high intelligence quotient (I. Q.)[2] The use of age percentiles frequently reveals the real capacity of a bright young pupil whose intelligence has been underestimated by the teacher who has compared him with pupils in the same school grade but a year or more older than he.

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[1] For the method of computing percentile rank see Thurstone, L. L., Calculation and Interpretation of Percentile Ranks, *Journal of Educational Research*, October, 1922, pp. 225-236.

[2] For a statement of the analogy between percentile rank and I. Q. see Terman, The Measurement of Intelligence, p. 78.

One item of prime importance in making adjustments is the relation of the pupil's score to the standard for his grade. A pupil's I. Q. is very significant as an index of his native capacity, but it cannot be used as a basis for classification except as an indication of the *rate* at which a child is likely to progress. But whether he will succeed in a given grade depends upon how closely his score approximates the median score for the grade in question. For example, a pupil in 5B makes a score of 85. He is eight and a half years old, and is in the upper five percent of his age group, or his I. Q. is 122 or above. However, the median score for 5B is 87.5. The standard for 5A is 97. This pupil is then *mentally at grade,* and although his I. Q. is quite high he has already been advanced to the point where his mental age indicates that he belongs, and he is not ready to skip a grade.

The opposite situation must also be considered. There is always a group of over-age children whose mental ages are nevertheless sufficiently adjusted to the grade level that they can make ordinary progress in the grade despite the fact that their I. Q.'s are somewhat below the normal. For example, a twelve-year-old pupil with an I. Q. as low as 85 may do average work in a given grade—other things being equal—if his mental age or intelligence score approximates the standard for the grade in which he is found. It should not be argued from this, however, that over-age children are as well off in the regular grades as they would be if special provision were made for them to be instructed in a separate group.

Similarly it follows that an over-age pupil with normal intelligence and an I. Q. of 100 can often be given an extra promotion if his mental age is equal to the mental age for the grade into which he is to be promoted.

Many school administrators feel that one of the most important results of testing is the comparison found between the averages made by their schools and the norms published for the country at large. Comparisons of this sort will show significant differences in levels of ability and grade standards, but for purposes of classification within a given school system the local, and not published, standards should be consulted. If the pupils from more than one school are involved, the city standards should be used. If the pupils in only one school are concerned, and adjustments are to be made within that school, then the standards for that school should be used. The reason for this is obvious. Norms tend to vary widely for different communities and nationalities. A given grade in some sections of the country varies as much as a whole grade above or below the same grade in other sections. Hence, it is exceedingly

important to know how a pupil's score compares with those of the group he is about to enter. In other words, for purposes of classification, the absolute value of his score is not so important as its relative value.

Records—A record should be kept for each pupil in which should appear his date of birth, nationality, address, the name and form of the tests given, the date of each test, the score, the grade in which it was given, the grade and age standards, percentile rank, a column for remarks and any other information of significance that has been gathered. Such data are best kept on cards, one for each child. Sizes 3 x 5 or 4 x 6 are usually found the most convenient for filing. Cards not only admit of alphabetical filing, but they allow for many possibilities in sorting, as for example, sorting for all pupils of a given grade, age, score, etc. These records should be kept in a central office where they will be accessible to teachers, but not to pupils.

Securing Coöperation—In pioneer intelligence testing there may be necessity for exercising a certain amount of caution. If, for example, many of the teaching force are skeptical, the first steps in establishing a testing program may well be limited to those rooms in which the teachers are known to be at least open-minded, if not sympathetic toward the movement.[1] These rooms may be designated as experimental rooms in which a few tests are to be given or a few extra promotions made. It may be explained to the other teachers that they are not asked to assist or coöperate, simply to observe and later form their own conclusions. In general, of course, the best way to convince skeptical or critical administrators, teachers, or parents of the usefulness of intelligence tests is to produce evidence of satisfactory results obtained. In order to do this, one must from the beginning keep sufficiently detailed records. For conclusive arguments it would be desirable to have memoranda not only of the type of adjustments made, but also of the pupils' attitude toward school, their health, and their scholarship both before and after adjustments are made. When explaining the purpose of a testing program to parents and friends, it is well to stress the emphasis that is being placed upon the needs of the individual pupil, to explain the range and significance of individual differences, the importance of keeping the bright child at work and industrious, of giving the less gifted child an opportunity for individual help

[1] For an account of one method of enlisting the coöperation of teachers see Brooks, S. S., Getting Teachers to Feel the Need for Standardized Tests, *Journal of Educational Research*, June, 1920, pp. 425-436.

and a chance to experience the thrill of achievement, to show the advantages of an objective method of grading which the tests afford, and to give accounts of striking cases in your own system (without reference to names, of course) that the tests have revealed and benefited.

Of late, the testing movement has been the object of much comment and criticism, some of which may have been merited by the occasional misuse of tests in the hands of untrained examiners, but most of it is unmerited and particularly to be deplored, because it deters many school administrators from giving classification by intelligence tests a fair trial. As a matter of fact, experience shows that a testing program carried forward intelligently and with reasonable precaution to ensure a sympathetic reception will establish its own case.

An Experimental Use of Intelligence Tests in Classification

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THE FOLLOWING article attempts to outline the procedure and the results of experiments made in the use of Intelligence Tests for arranging pupils in groups, and also the use of standardized tests in comparing the groups thus arranged.

The school—These experiments were made in the Central School of Everett, Washington, a city whose commercial interests center about lumbering and allied industries, and which, situated on Puget Sound, with good shipping facilities by land and water, has rapidly increased in population to about 30,000 inhabitants.

For ten years previous to 1919 the majority of the eighth grades of the city had been assembled, not for educational reasons but for administrative purposes, in the old High School building which was vacant at that time, by which means the pressure on certain of the grade schools in the city was relieved.

This school differed from the conventional eighth-grade organization only in possessing a greater degree of departmentalization and some degree of sex segregation; it did not differ in curricular offering. Here, however, was the nucleus of a Junior High, presenting many peculiar problems but offering a fine opportunity for investigation and experimentation in grouping according to ability. The present

principal, who took charge in 1919, at once proceeded to use Intelligence Tests and to cautiously experiment in homogeneous classification and the introduction of subjects usually taught only in the Senior High School.

In the beginning the teachers were dubious about the project, especially about the grouping together of pupils who made low scores; but when teachers found by experience that pupils whose scores were low were benefited by being grouped together, there were no more objections on that point. All the eighth grades of the city are now assembled in the Central School and number between 450 and 500 pupils. Each regular teacher is responsible for two subjects, the favorite combinations being arithmetic and English, or history and reading. All other subjects are taught by special teachers. So two teachers take care of three classes each, for the four main subjects—reading, arithmetic, history, and grammar. In the morning an attempt is made to place each class for one hour with each regular teacher; one half hour for recitation, the last half hour for study. All other classes not engaged in any class room are placed in the Study Hall. The girls have physical training Mondays, Wednesdays, and Fridays; the boys on Tuesdays and Thursdays. On Wednesdays some classes have drawing. Half the boys have manual training every day for half the semester, when they are succeeded by the other half. Girls in their first half year have cooking for one hour twice a week, and during their last half year for one and one half hours twice a week.

This makes a varied and complicated daily program. A sample program (Monday's) is given in Table 1. In order to fit in all the subjects no two daily programs can be made alike. In reading this program, the classroom is denoted by a Roman numeral read hori-

TABLE 1. Monday's Program in Central School, Everett, Washington

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	D.S.	P.T.	M.T.	Study Hall
9–9.30	1	7	11	10	S.H.	13	4	6	14	3	2	9	5	8	12, 15
9.30–10	1	5	11	S.H.	12	13	4	6	7	3	2	9	15	8	14, 10
10–10.30	5	1	15	14	10	11	8	4	12		3	9	13	2	6, 7
10.30–11		1	S.H.	14	10	11	8	4	13	9	3	5	7	2	6, 12, 15
							Ten	Minu	te R	ec	ess				
11.10–11.40	7	S.H.	13	12	14	15	2	8	11	6	3	5	1	4	9, 10
11.40–12	S.H.	7	13	12	14	15	2	8	1	6	9	5	3	4	10, 11
						N	oon	Inter	miss	io	n				
1–1.30	1	5	11	10	12	13	2	4	7	3	S.H.	15	9	6	8, 14
1.30–2	5	7	13	12	14	S.H.	4	8	1	9	3	15	11	6	2, 10
2–2.30	7	1	15	14	10	11	S.H.	6	3	5	9	13			2, 4, 8, 12
2.30–3	7	1	15	14	10	11	8	S.H.	5	6	2	13			3, 4, 9, 12

zontally to the right. The rooms at the extreme right are domestic science, physical training, manual training, and study hall, respectively. The time is given at the left side and is read downward. A class at any special time is found to the right under same Roman numeral marking the classroom. S. H. in a class space means that the teacher, usually in that room at that special time, is in charge of the Study Hall.

The class is denoted by a class number, odd numbers representing classes composed of girls and even numbers representing classes composed of boys, so that classes 1 to 15, inclusive, are classes of girls and classes 2 to 14 are classes of boys. From this it will be evident that there are no mixed classes but, otherwise, boys and girls freely associate.

Tests used—The first Intelligence Tests used were the Otis Group Tests, but these were exchanged for the National Intelligence Tests as soon as the latter were published. As the main object for using the tests was to group approximately according to ability, the National Tests, in that they required about half the time to administer, seemed very desirable, if only they would fulfill the object for which we were striving. The National Tests, then, were used, and were found suitable for our purpose as they provided us with the pupils of best ability in the group.

Our early experience showed us that age as well as score had to be taken into account in getting the best working groups, so the tentative standards given in the manual were taken and a rough I. Q. established. We recognized this only as an approximate I. Q. and have made some investigations into the I. Q. obtained in this manner, and the I. Q. obtained by the Binet-Simon method; but, as this paper is meant to be a practical rather than a theoretical discussion, the writer is laying that aspect aside. The grouping from the approximate I. Q. leads to a more homogeneous grouping by chronological age, the youngest pupils for the most part being the brightest.

Table of 856 scores—Up to June, 1922, National Intelligence Tests had been given to 856 pupils who had entered the Central School from the other grade buildings. The results are shown in Table 2 where they are arranged to show age and the scores for each age. The age is read in the column on the left hand, while the frequencies of the score for that age are read horizontally to the right. It will be easily seen that 68.5 per cent of the pupils entered the eighth grade at 13 or younger; 37.2 per cent of these were 13 and 27.4 per cent were 12 years of age; 23.2 per cent were 14 years of age, very few older pupils being entered.

TABLE 2. National Intelligence Tests Scores of 856 Pupils, Arranged According to Age, in Central School, Everett, Washington

Age	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	Total	Per cent	Median
11 yrs							1					1	6	6	3	3	3	2		5		3		33	3.9	135
12 yrs		2		1	1		4	2	11	10	17	19	21	32	31	30	28	1	13	1	5	5	1	235	27.4	124.6
13 yrs	1	1	1		1	1	4	15	18	11	38	36	47	33	36	16	30	15	5	7	3			319	37.2	118.4
14 yrs				1	2	2	3	9	20	15	23	17	25	21	20	15	12	6	8					199	23.2	115.8
15 yrs			1			4	4	1	5	5	11	4	8	4	4	7	5		3			1		67	7.8	112.5
16 yrs												1	1	1										3	.35	
Total	1	3	2	2	4	7	16	27	54	41	89	78	108	97	94	71	78	24	29	13	8	9	1	856		

TABLE 3. Scores of 212 Pupils, Arranged According to Age, Central School, Everett, Washington

Age	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	Total	Per cent	Median
11 yrs												1	3	5	2	1	1	1						14	6.6	128
12 yrs		1		1	1		2	1	5	3	7	5	6	9	4	10	4	5	2	1	1	1		69	32.5	126.6
13 yrs	1	1		1	1		2	6	5	7	11	7	8	7	1	5	5	1	2	1	1			77	36.2	116.4
14 yrs				1	1			6	4	7	5	2	4	3	1	1	2		2					39	18.4	111.
15 yrs			1			3	1	1	1	2		1	1			1			1					13	6.1	100
Total	1	2	1	3	3	3	5	14	15	19	23	16	22	24	12	18	12	7	7	2	2	1		212		

TABLE 4. Scores of 212 Pupils, Arranged by Age and Sex

Boys

Age	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	Totals	Per cent	Median
11 yrs												1	1	2										4	3.9	120
12 yrs				1				1	2	1	1	3	2	6	2	4	2	4	2			1		32	31.4	124.6
13 yrs				1			1	1		2	8	3	4	6	4	3	3	1	1	1	1			40	39.2	125
14 yrs				1				1	1	3	3	1	4	2					1					17	16.7	115
15 yrs						2	1	1		2		1	1						1					9	8.8	102
Total				3		2	2	4	3	8	12	9	12	16	6	7	5	5	5	1	1	1		102		

Girls

Age	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	Totals	Per cent	Median
11 yrs													2	3	2	1	1	1						10	9.9	125
12 yrs		1			1		2		3	2	6	2	4	3	2	6	2	1		1	1			37	36.6	117.5
13 yrs	1	1			1		1	5	5	5	3	4	4	1	1	2	2		1					37	36.6	114
14 yrs					1			5	3	4	2	1		1	1	1	2		1					22	21.8	102.5
15 yrs			1			1			1							1								4	4	92.5
Total	1	2	1		3	1	3	10	12	11	11	7	10	8	6	11	7	2	2	1	1			110		

A comparison of the medians shows that the younger pupils had the higher average ability. The median of the 13-year-old pupils differed very little from the average of the whole group. Table 2 is used as a basis of comparison for the classes entering Central School in September, 1922.

On page 222, in Table 3, we have tabulated the scores of the 212 pupils entering September, 1922, according to the age of the pupils who made them. A comparison of the two tables reveals whether the ability of the entering class is up to the average or not.

There is a larger proportion than usual of pupils entering at 11 years of age, but a comparison of the two tables shows that the 11-year-olds entering are inferior, the median for the same age in the whole group being 135, and of the other group 128. The pupils 12 years of age have a median a little higher than the median of the average, but the reverse is the case with pupils who are 13, 14, and 15.

In Table 4 we have the scores of the boys and girls distributed according to age for the purpose of comparison, by which we see the majority of the 11-year-old pupils were girls but distinctly below the average, and by comparing the medians it is evident that the ability of the girls is distinctly below the ability of the boys, whether viewed according to age or as a whole. A study of these tabulations gives us a survey of the mental ability of these 212 entering pupils, and one naturally concludes that the 212 pupils as judged by their scores were below the average as represented in Table 4 and that the girls in this group were inferior to the boys.

Table 5 on the opposite page shows the grouping of the 212 pupils for working purposes. The scores are on the left hand side of the paper, and are read from top to bottom, while the classes are denoted by the Roman numerals running from VII to XIV. Odd numbers denote girls' classes, and even numbers, boys'. Thus VII would be a class of girls and VIII a class of boys, and so on.

From Table 5 it is evident that classes XIII and XIV are the ones with the greatest amount of ability. In these classes the lower scores, 120-130, are made by the younger pupils. One or two high scores are noticed in the classes with lower ability. In such cases the placing was done through former experience with the pupils or from knowledge gained of them in other ways.

Why achievement tests—Intelligence Tests of late have come into almost general use, and there is great danger that they may be regarded as a passing fad, for many educators look upon them in that light, being disappointed that they do not solve all their educational

TABLE 5. Arrangement in Classes of 212 Pupils, Boys and Girls, Based on Intelligence Scores

Scores	VII	VIII	IX	X	XI	XII	XIII	XIV
*60	2							
65	1							
70								
75		2		1				
80	3							
85		2						
90	4	2						
95	10	4		1				
100	6	1	6	2				
105	1	3	11	3		1		
110			3	6	8	6		
115			2	4	6	5		
120		1		1	7	9	3	2
125					2	8	6	7
130					1		5	6
135	1				1		9	7
140							7	4
145							1	6
150				1		1	2	3
155						1	1	
160							1	1
165		1						

* The scores in this group range from 60 to 64.9.

problems. They find little correlation between intelligence scores and scores in other tests and then conclude that the Intelligence Tests are useless and may be easily dispensed with, forgetting altogether that they may indicate defects in our methods, courses of study, and many other things. Far from giving a solution of our problems, they raise question after question which can be solved only by further investigation and experimentation. Their chief use is that they meet a need, not met hitherto in the educational world, a need of having some means of determining the comparative latent ability of pupils which we now discover by trial and error method, a method not very successful, as shown by age-grade distributions, from which we might easily deduce the statement that the schools more easily discover dullness than ability.

The Intelligence Tests give us an opportunity to test out the working capacity of the biological mechanism, that we call mind. They do not register the actual accomplishment of the pupils but furnish us with a statement of the comparative possibilities of a group of pupils. Their achievement may be and generally is as varied as their biological equipment and may not have any correlation with their intelligence. It is our duty, as teachers, to see that there is a correlation between intelligence and achievement, and this is hardly possible without a means of measuring both.

In our early experimental work we were grievously disappointed at both the attitude and accomplishment of the brightest pupils, finding them lacking in good working habits, inattentive and careless. The result was that we found it necessary to ascertain at the start not only their possibilities but their equipment of knowledge and habits. Our first problem, then, was how to train working habits and produce results somewhat in comparison with the pupil's ability. This generally takes five or six months. Our change in procedure this year, then, consists in the use of Intelligence Tests for the discovery of the working capacity and the use of standardized achievement tests for determining how far they fall short of approximating their possibilities so that we may be guided in our methods of dealing with these pupils.

Stone reasoning tests—In these tests the results obtained, not the number of attempts, are tabulated (Table 6), and the results are reduced to whole numbers by dropping decimals below .5 and increasing those above .5 to 1.

The pupils are the same as the ones to whom the intelligence tests were given, with the exception of three. The classes are arranged in order, the Roman numeral on the left hand denoting the class. The scores of 371 pupils are given first, the median of which is 9.4. It will be seen that classes XIII and XIV fall below the general average, and are exceeded by IX, XI, and XII. The results of XIII and XIV seem disappointing in view of their ability, but an examination of the papers showed that they failed in accuracy, not in reasoning.

TABLE 6. Stone Reasoning Tests, Scores of 371 Pupils, Rights

Classes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	No.	Median
		1	2	9	29	29	37	58	44	46	37	21	31	9	11	3	4	371	9.4
Scores of 209 Pupils by Classes																			
VII				1	6		2	4	6	3		1	2					25	8.
VIII					1	4	2	3	4				1				1	16	8.3
IX					4	1	1	3	3	6	2	1	1					22	9.6
X				2		3	2	4	1	1	2			3		1		19	8.5
XI						2	1	6	7	3	2	3	1		1			26	9.5
XII					2	2	3	6	6	3	3	2	3	1				31	9.6
XIII				3	3	1	5	9	4	3	2	1	2		1			34	8.8
XIV					1	6	5	6	3	4	7	1	1	1	1			36	9.

TABLE 7. Courtis Arithmetic Tests

Class	Median Rate of Working	Median Accuracy Per Cent	Per Cent of Pupils Having Accuracy Less Than 50 Per Cent	Per Cent Pupils with 100 Per Cent Accuracy
		Addition		
212 whole group)....	10.3	62	29.2	2.9
XIII.....	10	56	32.2	0
XIV.....	9.4	70	16.6	5.4
		Subtraction		
212 (whole group)....	11.2	75.8	13.7	5.2
XIII.....	12.5	71.6	12.8	0
XIV.....	11	83	2.7	10.8
		Multiplication		
212 (whole group)....	10.07	68.75	18.4	1.9
XIII.....	10.5	65.4	25.7	3.2
XIV.....	10.1	66.6	32.4	5.4
		Division		
212 (whole group)....	9.4	76.5	12.7	8.5
XIII.....	11	82	3.2	6.4
XIV.....	10.2	76.6	10.8	5.4

Courtis arithmetic tests—The Courtis Arithmetic Tests were tabulated for the whole group, and for classes XIII and XIV (see Table 7). A comparison of these results with the results of various cities shows that on the whole these figures are hardly up to the average and there are no outstanding features in the median scores of Classes XIII and XIV. Class XIII, in fact, does not show up as well as the average.

Kelly silent reading tests—The results in the silent reading tests are tabulated for 200 pupils out of the 212 originally tested (see Table 8), and while the median of the whole group is a little below the average, the medians of classes XIII and XIV stand out, and the tables show few poor readers. These two classes were better prepared in reading than in any other elementary subject and had

TABLE 8. Kelly Silent Reading Tests, Form I

Scores of 200 Pupils, Classes XIII and XIV

	0 4.9	5 9.9	10 14.9	15 19.9	20 24.9	25 29.9	30 34.9	35 39.9	40 44.9	45 49.9		Median
200 pupils.....	1	20	35	45	46	36	11	2	3	1		19.8
XIII.....			1	2	13	12	2	1				
XIV.....			1	5	7	12	8	1		1		26.6

on hand ready to produce a vast amount of information that at times was really impressive. In this way we gained an insight into the equipment of the pupils in some of the fundamentals. We needed this more in classes XIII and XIV than in the others, for we knew by experience what they could possibly do, but this information was essential in our brightest classes.

We are making plans to make this procedure complete by giving similar achievement tests toward the end of the year, in order that we may be able to estimate our gains, and to determine as scientifically as we can whether we can justify segregation by ability, even if for only one year. As for our own opinion, derived from contact with these pupils, we would not use any other method of class grouping.

The sequences of intelligence tests—There are arguments and disagreements as to what is actually tested by Intelligence Tests. It is rather unfortunate that the term "intelligence" is in use at all, as it often seems to arouse antagonism. We prefer to use the term "working capacity" when parents are in consultation upon this problem. The writer will leave the disagreements to those who like to theorize and will emphasize the practical bearing that Intelligence Tests put at our disposal an instrument by which we may separate our pupils and place them in homogeneous working groups.

The grouping brings the necessity, especially with the brightest and dullest groups, of adjustments in the curriculum. The brightest pupils present the most difficult problems, and require a teacher of wide and extensive preparation, but also possessed of the ability of taking advantage of any situation that may arise. Mediocre teaching and a mediocre teacher are fore-doomed to failure, but a well-prepared and resourceful teacher will have the delight and satisfaction of seeing the development of the pupils under her training.

Curricular offering—We are making such adjustments in the curriculum as we are capable of doing at the present time. We would like to enrich the curriculum by the addition of Elementary Science, and by giving a wider choice for pupils; especially would we like to give them some short preparatory courses with the view of enabling them to make a better choice of subjects in high school.

We have extended our History course by the use of projects, problems, topics, and debates. Civics is combined with history; we have sent pupils to report on local happenings, and those in naturalization classes, to dramatize what they have seen. Reference books are used to a greater extent, and must be used if interest is to be maintained.

Grammar—Technical grammar is not the bugbear to the brightest pupils that it is to classes composed of pupils of high and low ability, but becomes an exercise with pleasurable accompaniments. Composition will be, in process of time, a delight, for they take pleasure in writing personal incidents, stories, parodies, and sometimes poems. In oral composition the difficulty is not in getting expression, but in repressing the exuberance of those who have much to tell.

These pupils do the work in grammar and composition as outlined in the eighth grade, in a half year, and so we have devoted one half year to English work, and the other half to Latin. We have changed our aims from trying to do high-school Latin to teaching Latin for the sake of a vocabulary, which may function in English work, and in teaching the Latin grammar to teach it in such a way that it will emphasize English grammar. If pupils do not carry their work any further they gain an immediate benefit and have learned what it is to make an attack on a foreign language.

Arithmetic—Our students in these special classes can also complete their arithmetic in half the time assigned for it, and in this subject we have worked out a course which leads directly from arithmetic into algebra and classes XIII and XIV have been doing algebra work in addition, subtraction, multiplication, division, factors, and factoring. They will undoubtedly be able to do a semester's work in algebra, and take up the work of the second semester next September.

Speed Grouping in Primary Grades of Rockford, Illinois

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McCALL maintains that mental age is superior to educational age for classifying pupils in the primary grades. He also advocates mental age for high school and college freshmen classification.

We also believe that educational age is superior to mental age as a basis for classification of pupils in the intermediate grades because the educational age reveals the pupils of equal status educationally. A pupil's educational status is a resultant not only of his mental age but also of his health, attendance, industry, and attitude toward his school work.

Grouping in the primary grades—In Rockford there is a growing interest in classification of pupils in the primary grades according to mental age: not for purposes of segregation, but for greater teaching efficiency. There are twenty elementary schools in Rockford. Scientific classification has not been forced upon any primary teacher. The policy used in supervision was to fully acquaint and interest the teachers in group-intelligence tests and the advantages of grouping pupils who could progress at about the same rate. This was accomplished through conferences with teachers.

Haggerty, Delta I, was given to all the children in the first three grades. This was done by the supervisor in the presence of teachers. Conclusions were discussed, and, as a result of this preliminary work, teachers in many schools expressed a desire to do some experimental grouping. In every growing system, modern methods should be studied and tried out. If found productive of good results, all teachers should benefit thereby. Such has been Rockford's experience in speed grouping in the primary grades.

The judgments of the respective teachers was considered as well as the results of Haggerty, Delta I. The Pressey Primer Scale added data, and, in some instances, the Stanford Revision of Binet was used. Yerkes maintains that at least three group intelligence tests should be given in order to determine classification, and those falling very much above or below a certain standard should be given the Stanford Revision of Binet.

Administration of speed groups in primary grades—The administration of speed groups in the primary grades has varied according to the enrolment and the building conditions. In general we have three types of administration: (1) The enrolment that is sufficient in size to permit one teacher to each half-year group. Thus, the teacher may have only a 1B group and classify these into superior, average, and slow groups according to the findings of the tests, plus the teacher judgment. In case of a building fortunate enough to have a remedial teacher, the remedial teacher may aid the regular teacher with the slow group. (2) Some buildings with very large primary enrolments have found it expedient to devote an entire room to one type of pupil, as, "slow first." (3) Where teachers have both beginning and advanced classes in the room, the best teachers are securing results by re-classifying according to ability.

What are the advantages of speed grouping in the primary grades?—May I list some of the advantages of speed grouping as revealed by actual practice and later submit concrete illustrations?

(1) An enlargement of opportunity and enrichment of curriculum for the superior children; (2) teachers realize the need for guidance goals and accomplishment quotients; (3) additional emphasis on minimum essentials for slow groups; (4) an enlarged opportunity for the study of individual differences; and (5) speed grouping is an actual money saver.

1. *Enlargement of opportunity and enrichment of curriculum for the superior children.* The bright children grouped together have an opportunity to work at their maximum, thus preventing habits of dawdling and idleness, so common when bright children are grouped with slow children. Reading reports submitted by teachers show marked differences in the number of books read by superior and slow groups. The following is taken from a report of the beginning first grade in the P. R. Walker School. These are group, not individual, reading reports.

September, 1922, to February, 1923.

Superior Group: Stories based on children's experiences; Beacon Chart; New Beacon Primer to page 31; Free and Treadwell Primer; Story Hour Primer, Story Hour—Book One; Holton Primer—50 pages.

Average Group: Stories based on children's experiences; Beacon Chart; New Beacon Primer to page 31; Free and Treadwell Primer; Story Hour Primer.

Slow Group: Stories based on children's experiences; Beacon Chart; New Beacon Primer to page 26; Free and Treadwell Primer.

Need for guidance goals and accomplishment quotients—One of the most encouraging results of speed grouping is that teachers are realizing the need for courses of study providing guidance goals and curriculum content to meet the needs of the different groups. With this end in view, Rockford teachers, on their own initiative, are working on such a course of study in English. The real need to know how to enrich the curriculum for the superior child is motivating this piece of constructive educational work.

Testing at the beginning and again at the close of a semester for accomplishment is an important factor in speed grouping. The following is an illustration of work done in a beginning fourth grade in the P. A. Peterson School during the last semester. By standardized tests the pupils were grouped into three groups—good, medium, and poor. The poor group was coached daily for six weeks by the special help teacher, the other groups were taught by

the room teacher according to their greatest needs, some in oral reading, others in silent reading. Informal speed tests were given weekly. At the close of the semester, standardized tests were again given for accomplishment. A marked improvement in reading had been made as may be seen in Table 1.

TABLE 1. Courtis Silent Reading

Good Group

Standard 46	Gray's Oral, June, 1922	Rate Standard 113		Index of Comp. Standard 78		Number Library books read Sept., 1922 to Feb., 1923
		June, 1922	Jan., 1923	June, 1922	Jan., 1923	
Harry	52½	120	193	77	88	3**
Eva	60	140	193	78	90	4
Evar	53¾	151	193	33	75	4
May	48¾	111	171	85	72	28
Paul	48¾	126	156	50	89	5
Francis	n. d.*	193	193	87	90	4
Kenneth	50	117	181	90	95	0
Raymond	48¾	130	n. d.	65	n. d.	3
Charlotte	55	101	145	86	93	8
Irene	n. d.	193	193	54	70	19
Santo	52½	193	134	80	96	5
Donald	n. d.	188	193	88	90	6
Erma	n. d.	173	193	85	95	22
Elvira	n. d.	142	193	75	72	19
Anna	n. d.	128	154	66	97	8
						138

* n. d. means no data.
** Harry read 3 books in 20 weeks; Erma read 22; etc. Average was 9 books.
In January, 1923, nine out of the fifteen were up to standard or above in comprehension for a 4A Grade. The 4A standard is 89.

Methods used for the improvement of comprehension—The following methods were successfully used with the slow group for the improvement of comprehension: (1) The informal "Yes-No" test. This was first administered by the teacher who gave the questions to the group; the pupils were permitted to read or re-read the paragraphs assigned in order to secure the answers. Later, members of the group composed their own "Yes-No" questions for others to answer. (2) Questions were asked by the teacher and the answers were read by the pupils using the exact words of the book. This method closely correlated comprehension with vocabulary which was very desirable as many of this group were slow oral readers. This exercise soon became socialized by members of the group asking the

questions. (3) Pupils were asked to write answers to questions put on the blackboard by the teacher after the lesson had been studied. Then the pupils were permitted to take books and to verify their answers or to exchange papers and to verify answers. (4) Pupils were given a time limit to study a page. Then each pupil wrote a question about what he read. The questions were collected in a box

TABLE 2. Courtis Silent Reading—Medium Group

Standard 46	Gray's Oral, June, 1922	Rate Standard 113		Index of Comp. Standard 78		Number Library books read Sept., 1922 to Feb., 1923
		June, 1922	Jan., 1923	June, 1922	Jan., 1923	
Myrtle	45	79	148	25	64	2
Inger	47½	86	146	62	83	16
Margaret	46½	138	180	57	72	0
Leroy	42½	93	193	0	41	5
Vernet	48¾	94	156	63	52	0
Lillian	50	93	100	0	58	6
Eunice	50	87	140	38	96	9
Lois	46½	113	193	53	75	12
Harold	48¾	71	143	55	22	0
Agnes	n. d.	91	n. d.	77	n. d.	7
Florence	n. d.	n. d.	193	n. d.	26	0
Melvin	36¼	n. d.	152	n. d.	70	6
Clyde	n. d.	93	102	63	90	0
						63

Average number of books read = 5.

TABLE 3. Courtis Silent Reading—Slow Group

Standard 46	Gray's Oral, June, 1922	Rate Standard 113		Index of Comp. Standard 78		Number Library books read Sept., 1922 to Feb., 1923
		June, 1922	Jan., 1923	June, 1922	Jan., 1923	
Oliver	48¾	67	186	65	46	13
Eleanor	45	47	117	92	96	0
Norman	43¾	79	167	10	66	9
Mildred	40	64	117	58	52	12
Esther	47½	66	107	64	86	2
Flora	43¾	93	160	70	50	1
Kenneth F	n. d.	74	143	50	11	0
Arne	n. d.	51	90	16	90	0
Paul G	n. d.	n. d.	106	n. d.	41	0
						37

Average number of books read = 4.

and then distributed. Each pupil read the question and gave the answer. If no one could answer a given question, all opened the books and read to find the answer. (5) Much benefit was derived from oral reproduction which involved words or phrases descriptive of a certain character. This also enlarged the vocabulary of the group.

This experiment seemed to indicate the value of grouping. Such classification tends to make the children happier for every one has an equal chance to do all that he is capable of accomplishing.

Speed grouping saves money—Some one has computed that forty millions are spent annually in re-teaching pupils. No one can estimate the loss to the retarded pupils. The following data, secured from Rockford schools where classification according to mental ability has been successfully tried is of interest. The primary grades in Church School during 1920 and 1921 cost Rockford an additional $281.82 on account of repeaters. During 1921 and 1922 the same school saved $172.12. P. R. Walker School made an unusual record, saving the city $2338.77 during 1921 and 1922. The same school has saved the city during the last semester $2275.11. The saving of Garrison School in June, 1922, was $602.42, for the last semester, $1204.47. Last June, Kishwaukee School showed a saving for the year of $387.27 against $35.23 for 1920 and 1921. Kent School, located in a southern European district, has done much in speed grouping. The last semester's work shows a saving to the city of $133.83. The advanced third grade in the same school scored 45.1 against a standard of 46 in Gray's Oral Reading test showing a good standard of work for Italian children. Brown School closed the semester with a saving of $356.88 and Highland School, $1070.64. The above figures are based on the fact that a year's elementary instruction costs Rockford $85.05, each semester costing $42.53.

Were the results in the educational work lowered because of this grouping? On the contrary these groups showed progress through measured results in reading, much in advance of other schools both in quality and amount read.

A study of a first-grade group in Garrison School illustrates this. The first-grade children were tested in September with the Pressey Primer Scale before groupings were made. Ten of the September beginners covered a year's work in five months with the following

scores in Gray's Oral Reading test given January 22, 1923. Their scores are included with the 1A group submitted as they had been found so efficient that they had been grouped together.

Gray's Oral Reading—1A Standard, 31

	Pupil Score		Pupil Score
Lois	67½	Mary	60
Ruth	65	Alice	55
Barbara	65	Junior	55
Lois B.	60	John	61¼
Anna	60	Audrey	60
Robert	60	Kenneth	58¾
Barbara B.	60	Phyllis	56
Minnie	60	Richard	56
Roger	60	Victor	55

The following is a report of the group readings in this first grade. This does not include books read by individual pupils.

1B

Group 1. Beacon Chart; Studies in Reading Primer; Rhyme and Story Primer; Winston Primer; Free and Treadwell Primer; Beacon Primer; New Barnes Primer; Story Hour Primer.

Group 2. Beacon Chart; Studies in Reading, p. 78; Rhyme and Story Primer; Winston Primer; New Barnes Primer.

Group 3. Beacon Chart; Part of Studies in Reading.

1A

Wide Awake Junior; Edson-Laing Introductory; Playtime Stories; Aldine—Book One; Elson—Book One; Studies in Reading—Book I; New Barnes—Book II; Circus Reader.

Subjective measurement is liable to error. There is a tendency among teachers to confuse conduct with achievement. They sometimes fail to take age and emotional differences into account. Teachers are not likely to rate dull pupils as average or superior, but they are likely to rate superior children as average.

Speed grouping and its relation to remedial work—Speed grouping is the corner-stone for remedial work. If we are to awaken within our teachers a desire for the greatest service to society, we must lead all teachers away from mass treatment toward a study of individual differences. As they do this they will capitalize the individual differences for the benefit of the group. The following study of a 2B room will show that even in a primary grade other factors, as well as mental age, need to be considered. This B second grade was grouped into three sections, the remedial teacher working with the slowest section. This grouping was based chiefly on ability to

read although each child had been given Stanford Revision of Binet as well as Haggerty, Delta I, and Pressey Primer Scale. Gray's Oral Reading test had been administered.

A Seating Plan for a II B Group Indicating I. Q.'s and Grouping Based on Reading Ability

Good Division			Slow Division		
	F 94.2	L 83.1			
A 91.1	G 77.6	M 87.9	R 87.1	V* 83.8	AA 78.5
B 102	H 87.3	N 88.8	S 84.6	W 90.5	BB* 78.8
C 88.1	I 91.9	O 78.6	T* 88	X* 85.7	CC* 81.3
D 91.7	J 89.1	P 97.6	U 74.7	Y 76.5	DD* 91.9
E 94.2	K 79.1	Q 90.8		Z 88.3	EE 93.7

Names starred form the slowest group. They work with the remedial teacher.

K is very deaf.

R's father died of tuberculosis before R was born.

G is a sickly boy from an irresponsible home but he can read.

V suffers from mal-nutrition.

T neurotic background; mal-nutrition.

EE good mentality—long absence because of illness.

Above is a seating-plan which shows the I. Q.'s and the grouping according to ability to read. This study is plainly proving to the remedial teacher and other members of the faculty that other factors as well as innate mental ability must be considered in our grouping. Physical characteristics and defects, emotional tendencies, as well as environmental conditions, must have their place in diagnostic and remedial work.

Every effort is being made to improve physical and environmental conditions through coöperation with the parents.

Just what measures is the remedial teacher using to improve the slowest group? All of the following are constantly used:

1. A maximum of phonetic and oral-reading.

2. A variety of plans for building up meaning concepts for the printed words, phrases, and sentences.

Dramatization proved the most helpful medium for building these concepts. Re-telling in the pupil's own words or relating the words of the book to his own previous experiences did much to reduce failure in the interpretation of thought. Many times failure was due to an insufficient background of experiences.

3. Emphasis on phrasing.

4. Use of flash-cards.

5. Very simple reading materials until the pupils have improved in fluency in oral reading and in grasp of content.

As speed grouping leads to group remedial work so group remedial work may lead to the teacher realizing a need for individual remedial work. May I present two cases?

Case 1. Eleanor. Eleanor was presented to the supervisor in December, 1920, for special study because of her inability to read. She made no score in Gray's Oral Reading test and was unable to make any progress in her regular class work. She was presented to the school psychiatrist for the Binet examination. Her chronological age was 7 years, 11 months; mental age, 8 years, I. Q. 100+. It was decided to give her special help in a phonetic class. This was done, and, in May, 1921, she was again tested with Gray's Oral Reading test and scored 38¾ against a standard of 43. Help given by her grade teacher and the remedial teacher brought her score up to 45 in January, 1922. In January, 1923, she scored 117 against a standard of 113 in the Courtis Silent Reading test and 96 against a standard of 78 in comprehension. She has just been promoted to 4A.

What factors were important in saving Eleanor? (1) The teacher gained the child's *complete* confidence. The element of fear attendant upon failure was entirely removed. Her successes were capitalized and she was encouraged to take a library card and do home reading. (2) Her parents became active partners in the remedial campaign. (3) Intensive phonetic work reduced certain technical difficulties.

Case 2. John. A boy in the P. R. Walker district was presented to the school psychiatrist, October 31, 1922. His teachers pronounced him hopeless in reading. His parents were Italian; one brother was both mentally and emotionally defective. This lad in advanced third grade had a chronological age of 8 years, 11 months, and a mental age of 10 years, 2 months, an I. Q. of 114. On learning his I. Q. we determined to use every possible means for improving his reading. November 3, 1922, he scored 15 on Gray's Oral

Reading test against a standard of 36. Vocabulary and phrasing were hopeless, but it was discovered that he could secure thought from the printed page although unable to recognize words. The teacher gained the boy's confidence and coöperation and has done some excellent remedial work. January 9, 1923, he was again tested with Gray's Oral Reading test and scored 35. He had gained twenty points since November 3. In Sigma I, Haggerty Silent Reading, he scored normally for his age and only three points below 3A standard. His arithmetic work previously was normal.

John's reading difficulties were due chiefly to non-recognition, gross and minor mispronunciation, the last being caused by wrong accent and inaccuracy in word elements. The boy used his finger in pointing and vocalization was very marked.

What remedial measures were most successful? (1) His confidence was secured; he was made to feel that we wanted to help him. (2) He was made conscious of finger pointing and lip movement and asked to help himself. Vocalization was decreased and finger pointing entirely abandoned. The marker was used for a time to lessen this habit. (3) Intensive phonetic drills were given when needed. (4) Plenty of simple reading material within the experience of the boy. (5) Attention to words which caused confusion because of similarity in form; as, thought, though, and through. The words were sometimes used in sentences before they were presented in quick-perception drills. If unusual difficulties were encountered, words which were similar in form were presented together so that their differences could be studied. (6) Phrasing and flash-card drills played an important part.

John is not yet cured of his reading difficulties but he is learning how to help himself. These two children were not only saved from retardation but given a new lease on school life; for real school joy came to them as they became conscious of the power of achievement. What has a more stimulating effect on a child than for him at last to realize that he can do it?

Is there a danger in speed grouping—Grouping in the primary grades must provide for flexibility. There may be a danger here unless the teacher is conscious of the need for transferring a child to another group when he has reached the proper stage of development.

Some say that the bright child is an inspiration to the slow child. This must be emphatically denied. When slow children are grouped together leaders develop among them—an opportunity for the de-

velopment of initiative that could never have been while they were members of a group containing children of superior ability.

Summary—1. The fundamental purpose of speed grouping is the improvement of classroom instruction and the development of such educational procedure that the child may advance according to his mental and educational status.

2. Speed grouping should be scientifically administered by means of intelligence tests and standardized educational tests which supply the guidance tools in the determination of aims for curricula. These tests furnish the guidance goals in the working out of a sliding scale of accomplishment which will adjust the load to the capacities and abilities of the pupils.

3. Speed grouping offers an enlargement of opportunity and an enrichment of curriculum for the superior children as well as an opportunity for the development of initiative among the slower children.

4. Speed grouping develops a scientific attitude on the part of the teacher.

5. Grouping according to mental ability together with remedial measures prove an economic investment as well as a conservation of child resources.

The Re-classification of Pupils in One Elementary School

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THOUGH the Detroit public schools have adopted a plan of classification of all elementary-school pupils on the basis of intelligence tests[1] and are now engaged in trying out the scheme in actual practice, the classification is effective at this writing only as far as the third grade (examining was started in September, 1920). The discussion in this chapter has nothing to do with the "X-Y-Z" classification, but merely with the re-sectioning of one elementary school and with some of the results obtained.[2]

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[1] Berry, Charles S., Classification by Tests of Intelligence of Ten Thousand First-grade Pupils, *Journal of Educational Research*, October, 1922.

[2] The writer is indebted to Mr. Guy Bates and Miss Evelyn Hubbard, principal and assistant principal, respectively, of the James Dwyer School, and to Mr. Russell Doney, of the Psychological Clinic staff for valued assistance in the assembling of the data for this study.

The tests were conducted in October, 1921, by representatives of the Psychological Clinic of the Detroit public schools, in the James Dwyer School, a platoon elementary school of 36 divisions. The pupils examined numbered 1184, not including the first-grade pupils who had already been rated by the Detroit First Grade Intelligence Test. Tests used in the examining were the Detroit Primary Test "X" and the Detroit Army Test "E," the former a non-verbal group test not unlike the "Beta" Test used in the United States Army, and the latter an adaptation of the Army Alpha Test, both standardized for Detroit children. The "X" Test was used in Grades 2 to 4, inclusive, and the Detroit Army "E" in Grades 5 to 8, inclusive. Letter ratings and group ratings were assigned on an age basis as shown in the following table.

TABLE 1. Per Cent of Pupils Assigned the Various Ratings

Per Cent	Rating	Group
8	E	Z
12	D	
18	C−	
24	C	Y
18	C+	
12	B	X
8	A	

Thus it will be seen that a "Y" pupil means one whose intelligence rating places him in the middle 60 per cent of the distribution for his age, an "X" pupil is in the highest 20 per cent and a "Z" pupil in the lowest 20 per cent; this arrangement is consistent with the plan followed in the first-grade classification, referred to above.

Before reorganizing the school at the beginning of the second semester, conferences were held with the authorities of the Dwyer School and the decision was reached to utilize both the intelligence ratings and the teachers' marks in making the re-classification. By averaging these, a single index was obtained, and the new sections for the second semester were made up so far as possible of pupils who were alike according to the combined criterion.

In a platoon elementary school in Detroit, the entire membership of the school is divided into two large groups, one of which is ac-

commodated in the home rooms where the three R's are taught, while the other group is engaged in the special activities such as the auditorium, gymnasium, and instruction in art, literature, and other subjects on a departmentalized basis.[1] The two groups alternate in the home and special rooms, each group having one and one half hours continuously in the home rooms and also in the special activities, throughout the six-hour day. Thus, each teacher of home rooms has two divisions, usually of the same grade, though not always so; one of the divisions assigned to one teacher may be B4 and the other A4, for example. Where there are several divisions in any one grade, sectioning on some definite basis is not particularly difficult; it usually takes the form of arranging the pupils in an order of rank according to whatever criterion is selected and placing the highest pupils in the first section until that is filled, and so on. In the first-grade classification, for example, but few schools have sections consisting exclusively of X, Y, or Z pupils, but many schools have divisions that are X's and high Y's, low Y's and Z's, and many that are all Y's, since the Y pupils constitute 60 per cent of the total.

In the Dwyer School, an effort was made wherever possible to place together in divisions the pupils of like standing according to the test and the teacher, as explained above, though in some grades little change was made over the situation the previous semester. There were six double promotions made. In the following table are shown the results of the test in the Dwyer School, by intelligence groups, compared to the distribution of such groups in the city as a whole.

TABLE 2

Group	Per Cent in Dwyer School	Per Cent in City
X	10	20
Y	59	60
Z	31	20

The reason that the Dwyer School had an intelligence distribution so much lower than that of the city as a whole is almost certainly due to the fact that the school is largely foreign, only 13 per cent of the membership consisting of Americans and Canadians. That the distribution of nationalities in the Dwyer differs markedly from that in the city is shown clearly in Table 3.

[1] Spain, Charles L., The Platoon School in Detroit, *The Detroit Educational Bulletin*, Research Bulletin No. 2, Detroit Board of Education.

TABLE 3

Nationality	Per Cent in Dwyer School	Per Cent in City
American and Canadian	13	53
Austrian	2	2
Italian	15	5
Polish	20	9
Russian	41	7
Miscellaneous	9	24

There seem to be marked differences in the performance in intelligence tests of the different nationality groups. Of course the language handicap tends to reduce the test scores to some extent in the case of all foreign-speaking pupils, this tendency to score lower varying inversely with the time that has elapsed since the arrival of the children in this country, or, in the case of those born here, with the time required for them to learn ordinary conversational English. But there are still differences which seem to persist, and for which it is difficult to find an explanation. Some of these differences are revealed in Table 4.

TABLE 4. Percentage of Foreign-Speaking Pupils in Groups X, Y, and Z

Nationality	X	Y	Z
Austrian	4	70	26
Italian	6	50	44
Polish	8	54	38
Russian	13	63	24

The standing of the various nationalities as shown in Table 4 is about the same relatively as the standings determined for the same groups in Dr. Berry's study of ten thousand first-grade children in Detroit, made in 1920-21, and referred to at the beginning of this article.

The writer was interested in determining the extent to which the re-sectioning, though accomplished on a basis representing both test ratings and teacher's marks, had actually tended to make more uniform the intelligence levels in the different divisions. To this end tabulations of the ratings of the pupils according to the intelligence tests, by divisions, were made for the first and second semester, separately, of 1921-22, and the results of these tabulations are shown in Table 5.

TABLE 5. Ratings of Pupils by Divisions

Divisions	First Semester	Second Semester
X only	0	1
Y only	0	2
Z only	0	1
X and Y	1	2
Y and Z	5	8
X and Z	0	0
X, Y, and Z	30	21

The following shows the distribution, by intelligence ratings, of the pupils who failed to be promoted at the end of the first semester: 1 rated X; 47 rated Y; and 66 rated Z.

Of interest, also, is the failure situation before and after the re-sectioning of the pupils, revealed in Table 6. It is apparent from the information in Table 6 that the number of failing pupils was reduced considerably after the re-sectioning of the school. That the reduced number of failures is to be attributed mainly to the fact that the pupils were sectioned according to ability, cannot be shown definitely, of course. About 115 pupils were transferred to another school where an addition had been opened at the beginning of the second semester, and it was thought at first that perhaps a considerable number of the failing pupils were in the transferred group, but the fact was disclosed that the reason for the transfers was a geographical one and that the pupils going to the other school were reported by their new principal as being for the most part of average ability. It is probable that the sectioning of the pupils the second semester had some effect on the number of failures; the teachers had assisted in making the classification and were doubtless stimulated to take more interest in individual cases; at least it is the feeling in the Detroit schools that extensive examining of pupils causes more child study, so that the influence, if indirect, is very good. There has been an effort in Detroit, as elsewhere, in recent years to reduce the "flunkage," so of course every one has in mind to some extent that everything possible should be done to enable pupils to pass regularly from grade to grade. This factor of course has had its influence on the situation. In the first three grades, in fact, where the X-Y-Z classification is in effect, there was a particular effort made to promote as many pupils as possible at the end of the first semester of 1921-22. This pressure was not exerted in the remaining five grades.

TABLE 6. Percentage of Failures

Grade	February, 1922	June, 1922
B1	15.7	15.5
A1	28.3	7.6
B2	14.0	11.0
A2	12.9	0.0
B3	15.4	4.8
A3	5.4	1.8
B4	16.9	4.9
A4	5.5	2.9
B5	11.9	2.2
A5	7.0	0.0
B6	5.8	1.6
A6	2.2	2.8
B7	3.6	0.0
A7	3.9	3.4
B8	0.0	0.0
A8	5.0	0.0

Most investigators find that the coefficient of correlation between intelligence test scores and scholarship marks is about .4, which indicates presumably that the teachers' marks reward attitude, industry, and the like as well as native ability—or perhaps instead of native ability in some instances. In Table 7 is shown the relation between the intelligence ratings of the Dwyer School pupils and the marks

TABLE 7. Relation Between Intelligence Ratings and Teachers' Marks in Dwyer School

Teachers' Marks	Intelligence Ratings							Total
	E	D	C−	C	C+	B	A	
1	2	9	7	13	13	6	7	57
1.5	8	19	22	26	14	8	8	105
2	31	61	62	99	71	37	24	385
2.5	35	51	56	90	54	14	8	308
3	49	72	82	68	36	17	4	328
3.5	24	35	17	25	8	2		111
4	10	17	13	8	4			52
4.5	5	2		2				9
5	9	2	2					13
	173	268	261	331	200	84	51	1,368

given them by their teachers. Detroit pupils are marked on a scale running from 1 to 5, 5 indicating failure. The median mark given the Dwyer pupils in the first semester of 1921-22 was 2.23, the median intelligence rating was C— (median for the city is C), and the coefficient of correlation between the test ratings and the marks is .39 (P. E. is .01).

This study has provided, in addition to other information, data on language spoken at home and ratings of teachers on health and attitude toward school, which are shown in Tables 8, 9, and 10, in relation to the intelligence ratings of the pupils.

TABLE 8

Language Spoken at Home	X	Y	Z	Total
English	42	165	73	280
Polish	13	114	103	230
Italian	11	89	96	196
Russian	11	50	37	98
Jewish	47	266	103	416
English and Polish	2	17	6	25
English and Italian		10	3	13
English and Russian	1	3		4
English and Jew	5	28	4	37
Miscellaneous	9	54	24	87
	141	796	449	1,386

TABLE 9

Health	X	Y	Z	Total
Good	127	688	370	1,185
Fair	26	108	54	188
Poor	4	20	6	30
	157	816	430	1,403

TABLE 10

Attitude toward School	X	Y	Z	Total
Good	116	592	280	988
Fair	7	105	127	239
Poor	3	29	20	52
	126	726	427	1,279

SUMMARY

1. An elementary school with a membership of approximately 1400 was re-sectioned in an effort to place together so far as possible those pupils in a given grade who were alike or nearly alike according to a combined criterion representing scores in an intelligence test and marks assigned by their teacher.

2. As a result of this re-alignment, the number of divisions containing pupils of the extremes of mental ability was materially reduced, while several divisions consisting of pupils homogeneous as to mental ability within the limits of the group rating (X-Y-Z) were created, where none had been in existence before.

3. The per cent of failure was reduced considerably after the re-sectioning, probably due in part to the influence of the pupils being more homogeneously grouped.

4. The tendency of the teachers' marks to agree with the ratings by the intelligence tests is represented by a correlation coefficient of .39. This is in harmony with results of other investigators.

5. The level of mental ability in the school is lower than the level of the city as a whole, the median for the city falling in the middle 24 per cent of the distribution while the median for the particular school is in the C— rating, comprising the 18 per cent just below the C rating.

6. The lower mental level of the school is probably accounted for by the large amount of foreign nationality found in its membership.

7. Tabulations of the intelligence ratings with relation to nationality (which means in Detroit country of birth of the father) and also with respect to language spoken at home, indicate that there are probably fundamental differences of some kind which cause a wide variation in the scores of the different groups.

8. The results in general seem to indicate that a re-alignment of pupils such as was accomplished in the Dwyer School does not present unusual difficulties administratively and that it serves the purpose of interesting teachers in the study of individual children and may have other good effects.[4]

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[4] Another study, now being made by Mr. James H. Voorhees, is concerned with the actual improvement in instruction in the Dwyer School and another school in the same neighborhood which was not re-sectioned. This study is not complete, but the preliminary results indicate that the Dwyer showed as great gains in final over initial educational tests as did the other school and in many instances somewhat greater improvement, though the differences in the educational test scores are not large.

CHAPTER IV

The Effects of Classifications Involving Test Results

Leonard Power
Lawrence S. Chase
A. M. Santee

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CHAPTER IV

The Effects of Grouping According to Intelligence in the Franklin School, Port Arthur, Texas

LEONARD POWER

Principal of the Franklin School, Port Arthur, Texas

THIS ARTICLE is written primarily to tell the results as expressed in a modified curriculum. It is fortunate that we can begin this paper *after* the tests had been given. If the author were to tell all of the handicaps one labors under when trying scientifically to test a whole school, most readers would not think the results justified the work necessary to obtain them. In just a sentence I would advise no one to undertake using either the Binet-Simon individual test or the Otis Group test (Form A) unless he knows not less than thirty minutes can be given to each child. It took two complete years to test the children of this school. The first year a tester gave her full time to the individual tests. The second year a full time group tester was added. The story of those two years is interesting locally, but for the Yearbook we can jump over it to what happened next.

By the close of the term, 1921-1922, we had tested the children. The entire faculty had taken both of the intelligence tests and had read and studied and heard lectures on testing until we felt sure all knew the meaning of the mysterious I. Q. We felt that all was ready. "On the mark," we were. "Get set," yes. Then three months later, "Go." It is just as impossible for a school to stay "set" for three months as it would be for a runner. When we could "GO" at the beginning of the next year, twenty-two new teachers were "On the mark," six hundred new untested children were "On the mark," and not any of them were set—not any of them knew the goal or the kind of race. To twelve of the teachers, I. Q.'s were words to conjure with.

Experience had taught us to expect many new children and several new teachers to be on the mark at the beginning of the new year. We made sure that those who had been with us and who would return would have a place to go. The school is large enough to have 200 or more children in each half grade. The children were ranked, in each half grade, according to their I. Q.'s. All classes are held to a maximum of forty. After the children were ranked in a long

column, the column was divided into five as nearly equal parts as possible—leaving less than forty in the lowest group. That is how we had all of the children who had been here "On the mark, 'set,' and ready to 'Go.'" Each child was given the program of the class to which he was assigned. In the extremes, the highest and lowest I. Q. groups, we made no change when school opened. We did squeeze the three intermediate classes into two and created another class for the newcomers until they could be tested and properly placed.

With the exceptions of children who were in the same family with different I. Q.'s, children who "had always been in the same class" with different I. Q.'s, and with the exception of a few children who were "such good neighbors and, Mr. Power, I just don't think it would be right to separate them," and with the exception of a few more we had all of the children grouped according to their I. Q.'s.

We soon learned that we were not sorting inanimate objects. These objects were animate and magnetic. Their assortment attracted their friends and their parents. We were forced to make due allowances, and after these were made we found only a few actual changes in the extremes—the dull children generally had dull friends, dull brothers and sisters. The bright children came from bright families and had bright friends for neighbors. There was a marked difference in the economic status of most of the children at the extremes. We did not hold to the rule of homogeneous grouping so strongly that it brought unhappiness to a single child or to his parents. After all of the adjustments were made—ten days after the opening of school—the children were ready to "Go."

The faculty is divided into academic and non-academic groups. This classification about evenly divides the faculty of 68 teachers. There are five academic teachers to each grade. Through the fifth grade each teacher teaches all of the academic work of a low or beginning class and all of the work of a high or advanced class. The children come to her for four 45-minute periods daily for their reading, writing, spelling, numbers, language, and geography. They go to other teachers for their physical education, nature study, literature, music, handwork, and auditorium. For the first year of our experiment we decided to study the academic needs for adjustment to the various groups.

Above the fifth grade the academic work is departmentalized with five teachers for each grade. They teach arithmetic, language, geography, history, and science. Above the fifth grade writing is taught only to those who write below quality 50 on the "Gettysburg" scale. They have a special teacher. Above the fifth grade reading

changes to "Library" one period daily under a trained librarian and assistant in a large library. In the seventh grade (the last elementary grade in Texas), geography changes to elementary science.

It has been necessary to give a brief outline of the organization of the school in order that later statements may be understood. It will be necessary, later, to refer to the work of some of the special departments as it refers to testing. We do not think of a school as a collection of classrooms where each room is in charge of one teacher.

To get the faculty ready to "Go," it was necessary to reorganize it slightly at the opening of school. Three transfers were made in the academic group. We made sure that the slow groups were always taught by teachers who had been with us the year before. This was, of course, impossible in the upper grades which were departmentalized. The middle groups were assigned to new teachers of greatest experience; the bright groups, to our own teachers. By taking care of the extreme groups with our "old" teachers we felt that we were ready to "Go."

"Where were you going?" you may ask. We were going through the year with the children while holding as closely to the old course of study as we desired. We had hoped the course of study might be enriched for the bright children and we had hoped to find the minimum essentials for the dull children. The entire course of study was made by the teachers who revise it annually in the light of their experience. It was not therefore a fixed standard which must be attained.

The lowest group was selected from the first four grades and put into an opportunity class in a near-by school which had been abandoned when this one was built. This class of eighteen had been in school from 2 to 11 years. All were less than seven years old mentally. This, however, was nothing new to the school system. While we were giving so many tests we were forced to take care of these children with the others. Their teacher was our most expert individual tester.

Every two weeks, conferences of the teachers of the extreme groups were called. There was much general talk. We were all soon convinced that we had too many dull children. Teachers began to learn more than ever before about the other Q.'s of these children.

If Q. is an abbreviation for a quotient which tells how the child relates to the normal in one or two aspects, let's use it for as many other aspects as possible. The Physical Education Department (eight teachers) astonished us when they said perhaps the low I. Q. was caused by eight or ten quotients that could be figured in their department. Just here let me say that this department does no

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academic teaching but drills each child for two forty-five-minute periods daily. We asked them what quotients they would like to figure. They came back with several. The N. P. B. Q. (number of persons to each bed in the home quotient): the N. P. R. Q. (number of persons to each room in the home quotient): the V. C. Q. (vital capacity quotient): the H. Q. and the W. Q. (height and weight quotients): the ratio of the number of children living to the number of children dead: the D. Q. (diet quotient) and the medical history quotient. Their reports, now covering about one half of the dull children, lie before me. Without careful study, I agree with the physical director that forty per cent of the dull children are struggling against great handicaps in environment and heredity. We believe we can raise about half of the dull children to a much higher level when dental and surgical needs are met; when correct health habits are formed; and when just half as much time is given to their bodies as is now given to their minds. Unseeing eyes are to be opened; unhearing ears are to be unstopped; cramped lungs are to be expanded, and sources of poison (diseased adenoids and tonsils and decaying teeth) are to be removed. Already much has been done in this direction but a comprehensive statistical report will not be available for another year.

The first result of grouping was to segregate our borderline cases. The second result was to make a careful study of the child's environment and physical condition. Neither of these was new. We had been examining children each year for six years. The grouping had only called the most urgent needs to our immediate attention.

The third result came immediately at the time we were ready to say, "Go." It came from all of the shops (twelve teachers). They had been asked, while our "Opportunity" teacher was giving full time to testing for a year and a half, to carry the very dull children for the greater part of their school day. Although rather resenting the idea that dull children could do better in the shops than elsewhere, they were willing to try out our theory that possibly these were motor-minded children. They told us forcibly, after a year and a half of trial, that the very dull children could not do shop work any better than they could do any other work and that they were not any happier in the shops than elsewhere. So we took those children out of the shops at once. They may become manual laborers but they can never become skilled manual laborers. They will operate automatic machines successfully but the machines of the school are not automatic. We therefore have opened special shops for them where they may make the same articles over and over at looms, with sloyd tools and with scissors, needle, and thread.

The dull groups were kept together for their shop work just as they were kept together for their academic work. The shop instructors all agree that this is wise. They are not so sure that all of these dull children should take shop and so we have made the shop elective with less than two per cent of the boys withdrawing and less than one per cent of the girls withdrawing.

In the departmental work of the sixth and seventh grades the group plan failed, miserably and utterly. All of those dull fellows, those over-age fellows, those "lazy" fellows, those "bad" boys were grouped together. They would test the patience of a Job. One does not reasonably expect to find twelve Jobs even among twelve teachers, although teachers may claim that, taken as a class, they are all Jobs.

The problems of discipline were most severe for the teachers; the principal was most worried over other matters. Here were the teachers each teaching four groups of children in the low half grade and four classes in the high half grade. The arithmetic teacher planned (theoretically) four lessons for the low classes and four lessons for the high classes. Each special subject teacher (theoretically) did the same. The facts were different. One period, say the first period of the school day, the brightest group of a half grade recited to Miss A. The next period the dullest group came in. They were in the same half grade but were different in many ways. There should have been a separate lesson plan for each—a difference in content and attack.

Those bright boys and girls have a hearty dislike for drill. They belong to the lazy group that is always inventing. They love to solve problems. They are inclined to leave accuracy to machines. They like to make investigations. Their naturally inquiring minds soon discover that the teacher is not the source of all knowledge. They make her dig for supplementary sources. They like type studies and projects. But how can one carry on projects with eight classes daily? What kind of a project can make much progress in forty-five minutes? What projects are confined to a single subject? Does not your departmental plan break down when it attempts to handle projects? These and other questions were raised at the teachers' meetings.

We decided to departmentalize only a part of the time. At first, we decided to have just one day a week of non-departmental work. The programs of the children were not affected. The programs of the teachers were changed so that each teacher met but one low class and one high class on that day. She met each of these classes for four 45-minute periods. She was encouraged to undertake projects. The arithmetic teacher's projects naturally ran mostly to numbers;

the history teacher's to history—each teacher to her favorite subject. But on that day no attempt was made to teach any particular subject in the formal way. The teachers like this. The bright children like it. Each teacher mothers two groups; each group has a mother to whom all confessions can be made weekly at least. Socialized recitations and projects are the rule on that day: committees fairly buzz about from room to library and laboratory; but the needs of the dull children had not been met adequately.

The dull children needed more mothering. So we gave one teacher in each of the upper grades the two dull groups. We selected the teacher who was most like Solomon and Job combined. Discipline troubles disappeared. The other groups proved better than the year before. The teachers of the dull sections soon asked all other teachers to help them determine minimum essentials. They agreed that the dull children liked to do anything they knew perfectly how to do. They liked repetition, drill. They disliked making applications of principles and solving problems. They liked the informal tests of fundamentals in arithmetic and grammar. They liked to think of themselves as doing the things they could do. Before they were segregated they were always competing with much brighter children. Then they were sure to be the ones who failed. They had almost acquired the habit of failing. Segregation was good for them.

To determine the minimum essentials in grammar two studies of oral errors were made. Each study covered a three-day period. The results of the studies were almost identical and were very close to Charter's study in Kansas City. We read bulletins and yearbooks and magazine articles on minimum essentials. Then we decided to embody these minimum essentials in informal tests which were to be given every six weeks. The dull groups were expected to make as great relative progress as the bright groups—all progress to be relative to the level of beginning. Naturally, the dull groups spent more time on practice tests much like the test for the entire school.

All teachers agreed that the fundamental operations in arithmetic should be as nearly mastered as possible. Certain tests which we had been using were approved. These tests were given each six weeks. Each test was similar to the others but not identical in figures used. We also worked out a little device in addition and subtraction and in multiplication. The dull groups like devices of all kinds. See pages 256 and 257, which show front and back of drill card.

Each of the subjects of the curriculum is now being given careful study. Spelling has been more carefully worked out for us than any

other subject. We are using Tidyman's list made from a study of the "Writing Vocabularies of Children." In each grade careful tests are given weekly. Records of the progress of each child are kept. Records of the number of times each word was missed on the first and second spellings, on the review, and on the six weeks' test are kept. Teachers of slow groups give more time to drill than teachers of rapid groups. The slow groups may need two spelling lessons daily to cover the ground covered by the rapid groups. Twenty-four words a week is arbitrarily set as the pace of all above the second grade.

We learned that we wanted a more detailed course of study. Each grade group set to work on its problems. The work of the first- and second-grade teachers will be briefly described. The first-grade teachers decided to determine a vocabulary of 200 words. Not any of the nineteen first-grade readers and primers had been carefully studied for vocabulary content. The teachers decided to use a list of their own until their study could be completed. Their choice was most largely influenced by the frequency of the words in the basal primer. Each child was tested on 100 words for his half grade each six weeks. A special form of card for testing was devised. Special test blanks were worked out. At the end of the year the teachers knew how to attack the words the next year. As an illustration of the amount of drudgery required for the scientific word study of nineteen books—a study in which each word was listed according to its frequency in each book—I wish to state that the study extended over eleven school months, took 80 hours for each of seven teachers, then the results took 35 hours each for two stenographers. The new list is much better than the old. It was worth the trouble.

The teachers of the first two grades soon concluded that grouping on a basis of word recognition was more practical than grouping on intelligence. A combination was made whereby the former is the guide and we find that in about three months the sorting has been about right according to intelligence. To test the plan, the intelligence tests were not given to the beginners this year until they had been resorted at three six-weeks' intervals. The tests then showed some variations for individuals but the rank of the class as a whole was not changed. Nine classes were tested.

The problem of the second grade was to use the words of the first grade and to add 300 words to them. A study of "Measurement of Silent Reading," by May Ayres Burgess, was made by all of these teachers. The Burgess test was in use in the third grade and above. These teachers devised their own test for the second grade. In the second grade the teachers were more anxious to hold to classification

PORT ARTHUR INDEPENDENT SCHOOL DISTRICT

MULTIPLICATION TABLE DRILL CARD No. 1

Patent Applied For

Name of Table		Table		Table		Table		Table	
6		4		8		10		11	
4		11		11		2		3	
7		3		3		5		12	
10		12		12		8		9	
2		9		6		11		6	
5		7		9		3		4	
8		6		4		12		7	
11		10		7		9		10	
3		2		10		6		2	
12		5		2		4		5	
9		8		5		7		8	
Score		Score		Score		Score		Score	

INSTRUCTIONS:

1. Be sure children have proper heading—Name, section and date on their papers.
2. Lay this card on tablet so that its top edge is on the first line of the tablet.
3. To supply "Name of Table" blanks use numbers at head of columns on reverse side.
4. Allow one minute for the children to supply all products. Have each child underscore his last product written. Say "Start" and "Stop".
5. Turn card over and check by comparison.
6. Encircle each wrong product.
7. Ask each child to score. Eleven is a perfect column score and 55 is a perfect test score.
8. Have each child write his column scores and his total score.
9. Write total score on line just below your name.

PORT ARTHUR INDEPENDENT SCHOOL DISTRICT

DIVISION TABLE DRILL CARD

No. 1

Patent Applied For

6	7	5	3	4
36	28	40	30	44
24	77	55	6	12
42	21	15	15	48
60	84	60	24	36
12	63	30	33	24
30	49	45	9	16
48	42	20	36	28
66	70	35	27	40
18	14	50	18	8
72	35	10	12	20
54	56	25	21	32
Score	Score	Score	Score	Score

INSTRUCTIONS:

1. Move card one-half inch to the right, thus covering what you have written.
2. Write quotients for one minute after your teacher says "Start" Underscore the last quotient you write.
3. Turn card over and check by comparison.
4. Encircle each wrong quotient.
5. Ask each child to score. Eleven is a perfect column score and 55 is a perfect test score.
6. Each child write his total column scores and his total score.

Public School Print Shop

based on reading ability than classification based on general intelligence tests. In both the first and second grades reclassifications are possible each six weeks. Each grade thus has six steps of accomplishment instead of two (highs and lows) as formerly. The reclassifications each six weeks are based upon carefully obtained results and there is much less shifting after the first time or two than one would imagine. As I stated when speaking of the first-grade tests, the bright children soon get together, the dull children soon get together, with this possible advantage; the dull child who is willing to work harder may be with the bright child who is lazy.

Such carefully devised accomplishment tests have not been worked out for the other grades but all the teachers are more favorably inclined to accomplishment tests as classifiers. The teachers consider their major problem is to determine *what to teach.*

Another result which we regard as excellent is seen in the eagerness with which we are attacking specific difficulties. Method plans and devices are growing out of studies of Freeman's "Experimental Education." The number of demonstration lessons by teachers has increased.

Our organization was flexible before we undertook special grouping. Promotion by subjects begins in the fifth grade. We have always made it possible for the child to succeed in a few things and he always moves on in his successful studies. Retention, that terrible word, has been robbed of its terrors except in the specific study in which the child fails.

There are 72 classes in the school. Should the school break the course of study into 72 parts and base the accomplishment record of each child entirely upon the mastery of these steps? This would allow the bright children to complete the course of study in less than seven years, which course, instead of enriching the curriculum, would reduce it to mechanical routine. Then each teacher would be like a factory operative, yet there are certain advantages of modern factory methods which the school needs. Products are standardized; production is greatly increased per workman-hour. The school wants standards in each of its subjects, for standards are absolutely necessary where there are measurable quantities. The ability of a child to add, subtract, multiply, divide, read, spell, write, or locate places can be measured. Without question standards may be applied to these things. By applying these standards the units can be constantly reduced and more minutely defined. By offering special instruction, by a specialist, in each of these units, they can be mastered more quickly—more can be produced per teacher-hour. As one part is mastered, progress to the next may be made immediately;

there should be no long wait due to a breakdown in another part of the plant. We conclude that children should master these tools as rapidly as they can but this does not mean that they should be passing through school at the same rate.

Between certain ages children should be in school, provided the school offers them an opportunity for complete development. The recent development in larger units of subject matter and in the socialized recitation will take care of classroom time that is not used in the factory method of mastering the tools of learning. The newer type of building, with its shops, its auditorium, its conservatories, its library, its gymnasiums and swimming pool and its musical organizations, trains the body and soul quite as consciously as it trains the mind. Of this we are sure; the old classification was but little better than no classification at all. The accomplishment tests found whole classes more advanced than classes a half grade or more above them. They found individuals in each class more advanced than individuals a year or more ahead of them in grade.

Table Showing Rank of Seventh-grade Classes on One General Intelligence Test and Four Reading Tests

Rank Int. Test	Monroe Comprehension		Monroe Rate		Sigma 3 Haggerty		Thorndike-McCall	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Low VII								
1	1	1	1	1	1	1	1	1
2	3	2	2	3	2	2	2	3
3	2	3	3	2	3	3	4	4
4	4	4	4	5	5	4	3	2
5	5	5	5	4	4	5	5	5
High VII								
1	1	1	2	1	1	1	1	1
2	3	3	3	4	2	3	3	3
3	2	2	1	2	3	2	2	2
4	5	4	4	3	5	5	4	5
5	4	5	5	5	4	4	5	4

The highest rank held in fifteen out of sixteen rankings.
The lowest rank held in ten out of sixteen rankings.

We are at least getting away from the old form of standardization which ran all the pupils through a mold of mediocrity.

SUPPLEMENTARY TO RESULTS OF GROUPING

An experiment—In order to determine how closely the intelligence tests correlated with other tests this experiment was given. All of the children in the seventh grade (five low classes and five high classes) were given three reading tests. The entire seventh-grade faculty helped score the papers in twelve two-hour meetings after school. The table on page 259 shows the comparative rank of each class on each of the tests. The best class ranks 1; the poorest class ranks 5.

We can say, perhaps, that the reading tests are also good intelligence tests, or that the intelligence tests are good reading tests. Our classification held for the actually extreme individuals in 62 out of 70 cases.

SAMPLES OF TESTS AND DEVICES USED IN THE FRANKLIN SCHOOL, PORT ARTHUR, TEXAS; LEONARD POWER, PRINCIPAL

First-grade vocabulary test—The 200 words on which the first-grade pupils are tested are listed below. These words are printed in large type on heavy cardboard three by fourteen inches in dimension, three strips being required for the words used in each half-grade.

Five columns appear after the words, the date of each test being entered at the top of the columns. Frequencies of non-recognition by all the pupils in the class are entered in the proper column after each test. Individual records are kept by clipping to the cards strips of paper bearing similar columns and spaces for the pupil's name and the date of each test.

WORDS USED IN THE LOW FIRST GRADE

a	fly	little	she
at	girl	mama	their
bird	have	no	they
catch	him	ran	us
does	is	said	who
all	for	live	sister
baby	give	may	there
boy	he	not	this
chick	his	read	want
doll	it	saw	will
an	four	look	some
ball	glad	me	them
book	hen	out	throw
come	horse	ride	we
dog	kitty	say	with

and	gave	made	that
be	go	mother	then
can	here	play	throw
do	I	roll	we
father	kite	see	with
are	get	make	the
big	has	my	these
came	her	pretty	up
did	in	run	what
feed	like	shall	you

WORDS USED IN THE HIGH FIRST GRADE

again	far	Mr.	soon
because	found	night	talk
by	grass	one	think
cried	heard	over	try
each	laugh	same	west
always	farmer	Mrs.	south
before	from	nine	teacher
child	green	once	though
day	just	party	two
east	lay	should	while
asleep	field	much	sure
began	game	north	ten
children	grow	only	time
dress	keep	please	under
eight	man	sky	woman
beat	find	never	table
black	goes	now	thank
could	head	other	took
drink	knew	put	until
ever	many	sleep	would
been	flower	next	take
but	gone	off	things
count	hear	or	today
eat	know	ready	very
every	more	so	yet

A TEST IN THE ELEMENTS OF ENGLISH

Results for section ..... Date .....

To the pupil:

This sheet is not to have any marks upon it that are made by you. Your teacher will need to put certain marks on one of these sheets to be returned to me for your section.

You are about to check the results of your own work. Be fair to yourself by carefully and accurately checking your errors. This test will be given each six weeks. Your papers will be preserved and your score should get larger each time until you score 100.

Question I

		Wrong
Our	possessive *pronoun*	.....
noble	adjective	.....
soldiers	common noun	.....
who	relative pronoun	.....
fought	verb	.....
so	adverb	.....
bravely	adverb	.....
in	preposition	.....
France	proper noun	.....
deserved	verb	.....
		Wrong
much	adjective	.....
praise	noun	.....
for	preposition	.....
their	possessive pronoun	.....
great	adjective	.....
courage	noun	.....
under	preposition	.....
the	article	.....
enemy's	adjective	.....
fire	noun	.....

Directions for scoring Question I:

On your own paper, encircle each word which you did not correctly define. Let each correct word count one and write the total score in the left margin of your paper.

Question II

		Wrong
4 Kind of sentence:	*complex*	.....
4 Grammatical predicate of independent clause:	*deserved*	.....
4 Grammatical subject of dependent clause:	*who*	.....
4 Direct object of deserved:	*praise*	.....
4 One prepositional phrase: (Any one of three given here)	*in France* *for their great courage* *under the enemy's fire*	.....

How to score Question II:

Score 4 on your paper for each of these that is correct. Any one prepositional phrase, but not all, may count. Add your scrore and write the total in the left-hand margin of your paper.

Question III

	Wrong
5 James is older than *he*. (He or him)	.....
5 Have you and *he* (he or him) exchanged papers?	.....
5 Was it *he* (him or he) whom you called?	.....
5 He never *did* (done or did) the task as he was told.	.....

Directions for scoring Question III:

Score 5 for each of these that is correct. Write the score in the left margin of your paper.

Question IV

			Wrong
	5	Number and Street	.....
	5	Port Arthur, Texas	.....
	5	November 28, 1922	.....
SKIP A LINE	5		.....
Dear Mr. Power,	5		.....
I am writing——	5	. Period	.....
	5	Yours truly	.....
	5	Name	.....

Instructions for giving and scoring Question IV:

To give the question ask the children to write a very brief letter to me. There are eight things to score on this letter. On your paper write five for each of the above that you have correctly written and properly placed. Add your 5's and write your score in the left-hand margin of your paper.

To the Teacher:

You will carefully go over every part of this test and ask the children to hold up hands when you record the number who missed each detailed part of each specific question in columns headed Wrong. Keep this on one sheet and send to the office after you have made a copy from which to teach. This is primarily a diagnostic test and is very carefully made. You will send the following results for your class to the office:

Number of children taking the test	.....
Number of perfect papers	.....
Total wrong on Question I	.....
Total wrong on Question II	.....
Total wrong on Question III	.....
Total wrong on Question IV	.....

Rank your papers according to the scores of the pupils. Put the best on top. Send me the best, the median, and the poorest papers.

Best paper, grade	.....	Written by .....
Median paper, grade	.....	Written by .....
Poorest paper, grade	.....	Written by .....

Write the test on the board exactly as the questions are arranged on this score sheet. Allow *thirty minutes* for giving the test and take fifteen minutes for scoring it. If the time for scoring is not long enough, carry it over into the work of the next day.

ERRORS IN ORAL ENGLISH OBSERVED FROM NOVEMBER 27 TO 29, 1922

For three days the entire faculty gave particular attention to the errors that were heard in the school. Each teacher turned in a list of all that she had recorded. In the upper grades the children themselves turned in what errors they had recorded. Each error was then classified. The classification of all of the errors (950) follows:

In all of our teaching of English we try to *form correct speech habits.* This study shows that we need only to concentrate our efforts upon a few errors.

In May, 1923, a similar study will be made for a period of three days, and it is hoped that some of these errors will disappear entirely in the meantime.

Teachers will please take time to go over these results with the children. Give plenty of time to this study. Put some of the study results on the board and then tell the children to watch for them. Call them "Enemies."

A plan that may be followed advantageously is to write these errors on the board and erase them when they are not heard in a room for a week.

A study of this kind is valuable to the extent that it is made clear to the children.

Errors in the Use of Verbs

Verb	Number of Verb Errors	Per Cent of Verb Errors	Per Cent of All Errors
to see	70	19.0	7.0
to do	67	18.0	7.0
to be	32	9.0	4.0
to come	31	8.0	3.0
to take	30	8.0	3.0
to go	19	5.0	2.0
to get	13	4.0	1.0
to write	12	3.0	1.0
to give	10	3.0	1.0
to begin	9	3.0	1.0
to run	8	2.0	1.0
to have	8	2.0	1.0
to eat	7	2.0	1.0
to fall	6	1.0	.6
to sing	5	1.0	.6
to burst	4	1.0	.4
to know	3	1.0	.3
to ring	3	1.0	.3
to bring	3	1.0	.3
to fly	3	1.0	.3
to teach	2	.5	.2
to buy	2	.5	.2
to say	2	.5	.2
to grow	2	.5	.2
to build	2	.5	.2
to hear	2	.5	.2
Miscl	14	4.0	2.0
	369	100.0%	39.0

Total Errors

Kind of Error	Number of Errors	Per Cent
I Verbs	369	39.0
II Use of ain't	217	22.7
III Double negative	120	12.6
IV Redundant	93	10.0
V Wrong words	81	8.0
VI Case forms	35	4.0
VII Mispronunciations	28	3.0
VIII Wrong comparison	5	.5
IX Prepositions	2	.2
	950	100

FOURTH-GRADE ARITHMETIC FUNDAMENTALS TEST

Section ..... Date .....

Number taking test ..... Number of examples missed .....

Average missed ..... Number of perfect papers .....

INSTRUCTIONS FOR GIVING TEST

Allow twenty-five minutes after the children have their papers properly headed. Be sure the work is all put on one sheet of paper. Hand this sheet to the children at the close of the test period with instructions to the children as follows:

Each child will check his own work. Draw a ring around each wrong answer. Count the number of right answers and write the score above your name. Turn your test paper over and copy the correct form for the example or examples you missed. Ask your teacher to help explain what you do not understand.

1. Add
457
394
483
197
483 Wrong
2014 .....

2. Add
493
547
387
493
184 Wrong
2104 .....

3. Subtract
48321
29623 Wrong
18698 .....

4. Subtract
48321
9211 Wrong
39110 .....

5. Multiply
497
x 6 Wrong
2982 .....

6. Divide
6)2988 Wrong
498 .....

7. Add
½ of 80 = 40
¼ of 36 = 9 Wrong
49 .....

8. Add
1/3 of 90 = 30
1/6 of 78 = 13 Wrong
43 .....

9. Add
7 1/4 = 7 3/12
5 1/3 = 5 4/12 Wrong
12 7/12 .....

10. Subtract
8 2/3 = 8 8/12
6 3/4 = 6 9/12 Wrong
1 11/12 .....

Teacher:

Please write the number of wrong answers for each example just under the word *wrong* by that example. To get this number you ask the children how many missed each example and count hands. Keep a copy of this report and send one to the principal. Be sure to tell the children to put no marks on their copies of this sheet.

Class per cent ..... **Section .....**

.....
(Date)

ACCURACY TEST IN ARITHMETIC

(Fifth, Sixth, and Seventh Grades)

1. Add 8756; 4567; 429; 7618; 8692.
2. From 387654 take 261489.
3. Multiply 2968 by 276.
4. Divide 37088 by 8 (using short division).
5. Divide 470592 by 86.
6. Add 14 2/5; 27 3/4; 8 5/8.
7. From 32 2/3 take 17 7/8.
8. Multiply 26 3/7 by 5 2/7.
9. Divide 5 2/3 by 5/6.
10. Divide 10 4/9 by 6 3/4.

Report on Test

Examples	Number Tested	Number of Correct Answers	Per Cent Correct
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Total			

Number of perfect papers .....

INSTRUCTIONS

You will please write the above examples on the blackboard. Let your report come in on this tabulated form.

Allow thirty minutes, then please tell the children to lay down their pencils and take up their pens. The teacher will then have the correct answer read out. Tell each child to encircle each incorrect answer.

After this has been done for all ten of the examples, go back to the first example and ask each child who has this example right to hold up his hand. Count the number of hands and write it in the column headed "Number of Correct Answers." Then pass to example No. 2 and repeat for each of the other examples.

To get the "Per cent Correct," divide the number taking the test into the number of correct answers. When the papers are sent to me let the papers be arranged according to the score of each child, putting the perfect papers on top. Each child will write his score in the middle at the top of the first page.

I shall return the papers to you after I have examined them. If your class falls below 70 per cent on any one of these examples you will please take class time for teaching that particular process. If your class is above 70 per cent you will please have those who understand help others who do not.

The Need and Use of Testing in the Elementary School

LAWRENCE S. CHASE

Principal of the Glenfield School, Montclair, New Jersey

THE GROUPING and rating of pupils in the past has largely depended on the personal standards of the individual teachers. The term "personal standards" is used advisedly as there can be no standard of achievement without a standard examination and scoring method. As a result of the personal element in judging and the inability of the teachers to get at the real mental calibre of their pupils we have had pupils grouped in the same classes with very different mental ability.

It has been accepted in the past that if several teachers taught the same children different subjects they would, on the whole, rate the individual children about the same. For instance; if Miss Smith gave Tony a mark of 75 per cent in English, it was thought that Miss Jones' mark of 75 per cent in arithmetic meant that Tony's ability in English and arithmetic was about the same. Whatever variation there was in the marks would be due to the unequal ability of the child in the different subjects. As a matter of fact, recent studies with standard tests show that the interpretation of the school marking system varies more than the ability of the individual children in the different subjects.

In order to convince the departmental teachers in the Glenfield School[1] that we needed the help of educational and mental tests in

[1] The Glenfield School, located in Montclair, New Jersey, has its enrolment divided about as follows: Italian, 50 per cent; Colored, 38 per cent; Swedish, 4 per cent; Jewish, 4 per cent; Irish, 2 per cent; others, 2 per cent.

properly grading and grouping, a study was made of the marks of these six teachers for the first three marking periods of the year for a group of fourth, fifth, and sixth grade pupils. The three special teachers (music and literature, industrial arts, and physical training) had marked all the pupils while the home teachers (teachers of arithmetic, spelling, reading, etc.) had marked about one third each. The scale of marking was—A, excellent and E and F failure, etc. The curve made by combining the marks of all the six teachers was very satisfying. The A's and failures balanced, the B's and D's balanced and the largest group was the C group which was as it should be. The total number of marks was 4965.

Below are the graphs made in this study. Figure 1 is the composite graph of all the marks; figure 2 shows the marks of the individual teachers.

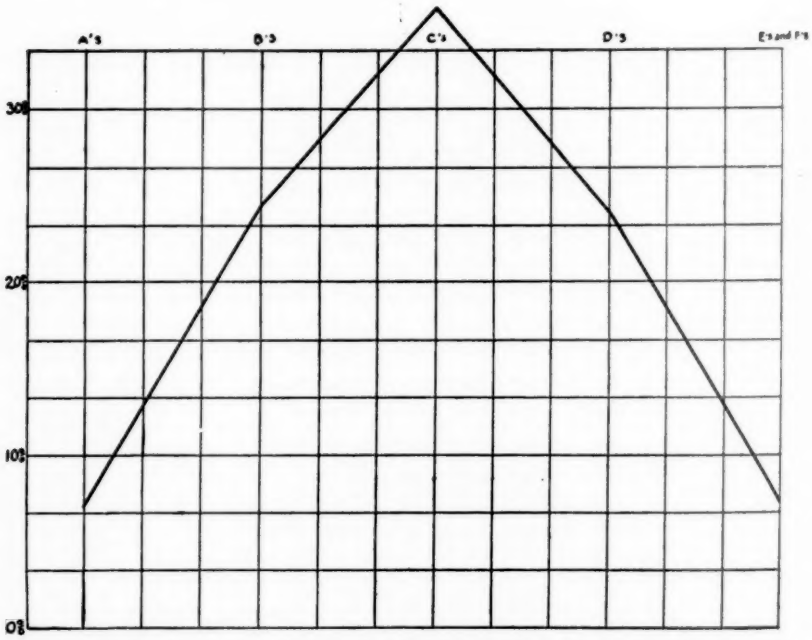

FIG. 1. *Composite Graph of Six Teachers' Marks for Grades 4, 5, and 6 Through the First Three Marking Periods*

Not only do teachers find it difficult to agree about standards of marking but they find it equally hard to get at the real mental ability of the pupils. That is, the thoughtful teacher finds this one of her gravest problems. True, some schoolmasters and teachers and

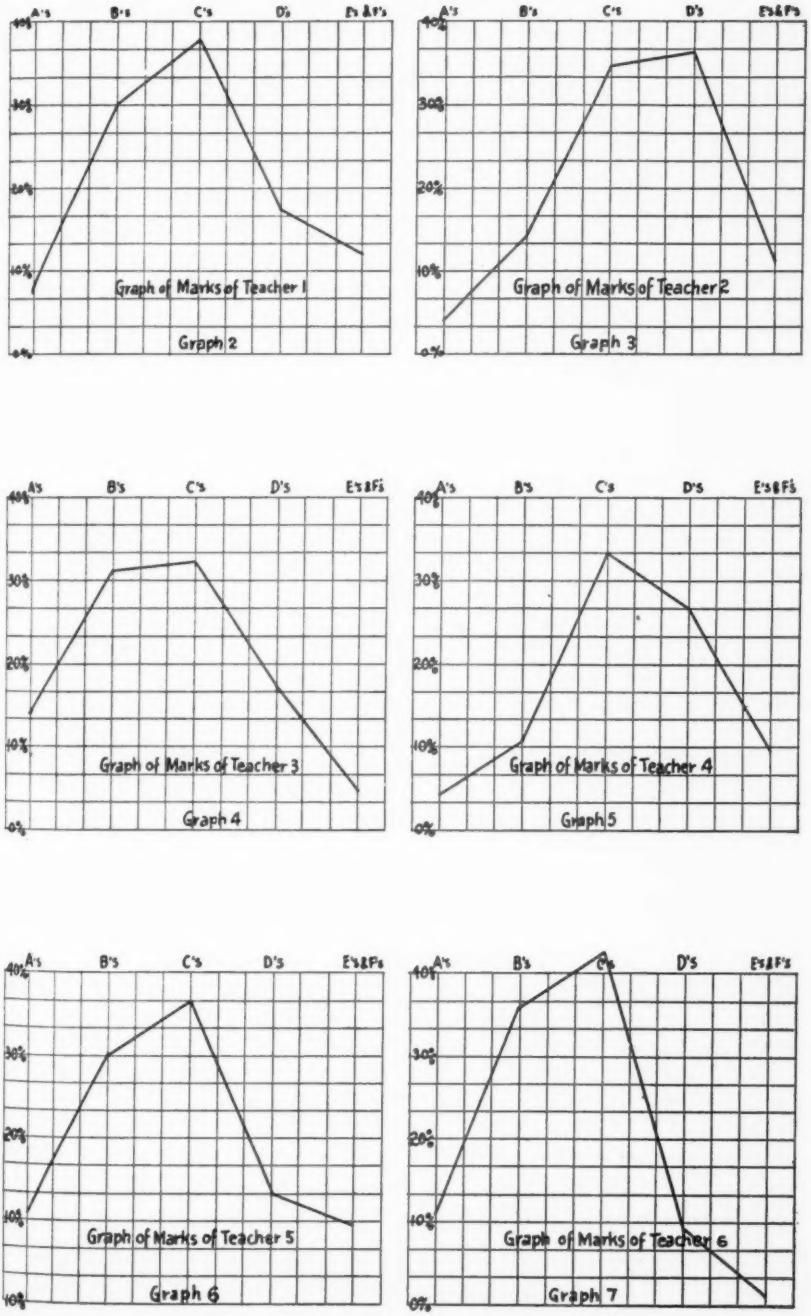

FIG. 2. *Marks of Six Teachers*

many laymen think that the average teacher can soon arrive at a fair estimate of the brain power of the thirty or forty individuals in the class, but my teachers had many cases on which they were glad to get help. For instance, one restless individual in the fourth grade was doing poor work and the teachers were not sure whether it was due to lack of ability or lack of properly directed effort. At the end of the year he had not come up to the standard so he was asked to repeat the grade. During the next year through intelligence tests we found that he scored highest in the class. With this "tip" his new home teacher and the special teachers demanded better work from him and they have received it ever since, though he has done it grudgingly.

It is true, of course, that those with the highest intelligence rating do not always do the best work because effort and other factors enter in but we need to know the possibilities of the child in terms of some standard of measurement. The intelligence test supplies this need, although not to the extent we might wish.

After considerable experience in the Glenfield School with both standard educational and mental tests, the principal and teachers decided in the spring of 1921 to make use of these modern tools in order to produce more scientific grading and grouping. Intelligence tests were given to all grades from one through six by use of group tests and unusual cases were checked up by use of the Binet-Simon. The city psychologist helped with these tests. Achievement was investigated by tests as noted below.

GRADE 1	GRADE 2	GRADE 3
Speed and comprehension in reading	Speed and comprehension in reading. Speed in addition combinations.	Speed and comprehension in reading. Speed in addition and subtraction. Sentence ability.

GRADES 4, 5 AND 6

Standard tests in arithmetic, reading, spelling
Use of composition and writing scales

When the educational and intelligence records were in, we agreed upon the following points as a basis for promotion and grading to be emphasized in this order:

Promotion to next grade—1. Educational achievement; 2. Teachers' estimate; 3. Intelligence and age.

Grouping within the grade—1. Intelligence rating; 2. Teachers' estimate; 3. Educational achievement.

The practical working out of the scheme was as follows: in the matter of promotion children who showed that they had reached the standard agreed upon were promoted unless the teacher judged that they had not come up to the mark in subjects not tested. Pupils who had been two years in a grade were promoted or placed in special classes for sub-normal children. Pupils greatly over-age were also given a chance in the next grade if they were near the standard. For grouping in divisions within the grade, the intelligence rating was used unless the teacher's judgment and the educational results showed the pupils' achievement and effort were below pupils with lower intelligence in which case the pupil with the lower intelligence rating was placed in the higher group. As there were two divisions in each grade the median was found and those who fell in the upper half were placed in the A group and those below in the B group.

It is interesting to note that in this changing about of pupils that there were few complaints from the parents and that those few who came to inquire were satisfied when they found that the tests had been carried on so impersonally and that the results seemed to represent the ability of the child. The records are on file and are constantly referred to. Of course the *intelligence ratings* were not given out to either parents or pupils but were held in confidence by the principal and teachers. The results of the *educational tests* were used to inform both pupils and parents of progress and failure.

In carrying on the regular work in the classrooms educators are coming more and more to see the value of the project or purposeful method. In directing the activities toward definite goals, however, definite standards of learning can well be used as they motivate the work. Is it unreasonable to demand from the school that it administer the work so that the child will know from day to day the progress he is making in the learning process? Scales and standards, if put before the children of the grammar grades, at once change their attitude toward their work. The teacher ceases to be a driver but instead becomes an aid in reaching the goal. If the Ayres' Writing scale is placed in a room where the children have a chance to compare their writing with the printed sample, progress in writing will soon be noticed not only by the teacher but by the children themselves. Some of the aids we have used are in

Reading—Standards for speed and comprehension.

Arithmetic—Standards for speed, accuracy, and problem solving.

Spelling—Use of standard lists and scales.

Writing—use of scale by pupils themselves.

Composition—Use of Hillegas composition scale.

Geography—Minimum of essential facts.

Scales, graphs, and charts containing pupil's records are now becoming as much a part of the classroom as the thermometer is, and the dunce cap and birch rod used to be. The necessary drill in the classroom largely becomes individual as each child has his own particular problem to solve. This avoids the waste of time and the evil effects which come from either expecting too much or too little from the child. The class time is thus divided between the general conference period and an individual working period.

From the point of view of a supervisor testing with standards is of course, a more scientific way of investigating classroom progress than the examination made out by the teacher or principal. Such informal tests have teaching value, but they are not so accurate as standard tests in showing the increasing power of pupils or class. For instance, a child may do better on one arithmetic test than on a previous one but in the ordinary examination we have no standard showing improvement except the teachers' mark which we know is not accurate measurement. It is also true that unstandardized tests do not give basis for comparing classes or schools although the mistake is common to use them as such.

Below are some records similar to those found in many principal's offices today:

Record of Silent Reading progress in grade 4 from October, 1922, to March, 1923—tests made in March to help a substitute teacher gain an accurate knowledge of her problem. The scale used was the Ayres-Measurement of Silent Reading—P. S. 3.

October median—40.
March " —46.

Most pupils showed progress during this period. Some, however, made a lower rating in March than in October. These few, therefore, become a special problem for the new teacher, if an additional test or two prove the original diagnosis to be correct. She will form two or three reading groups in her reading periods and try to adapt the reading material and drill to the needs of each.

Figure 3 illustrates what can be done by practice—The heavy black line shows medians for first test. The dash line is standard and the dot and dash line medians for second test—same words as in first test but given two weeks later. Figure 4 shows the correlation between reading and spelling, Ayres scales being used in each case.

Some of the beneficial results we have observed from the use of standardized tests are:

1. Fitting the detail of class work such as drill, in with the general purposeful atmosphere of the classroom by use of definite and known goals.

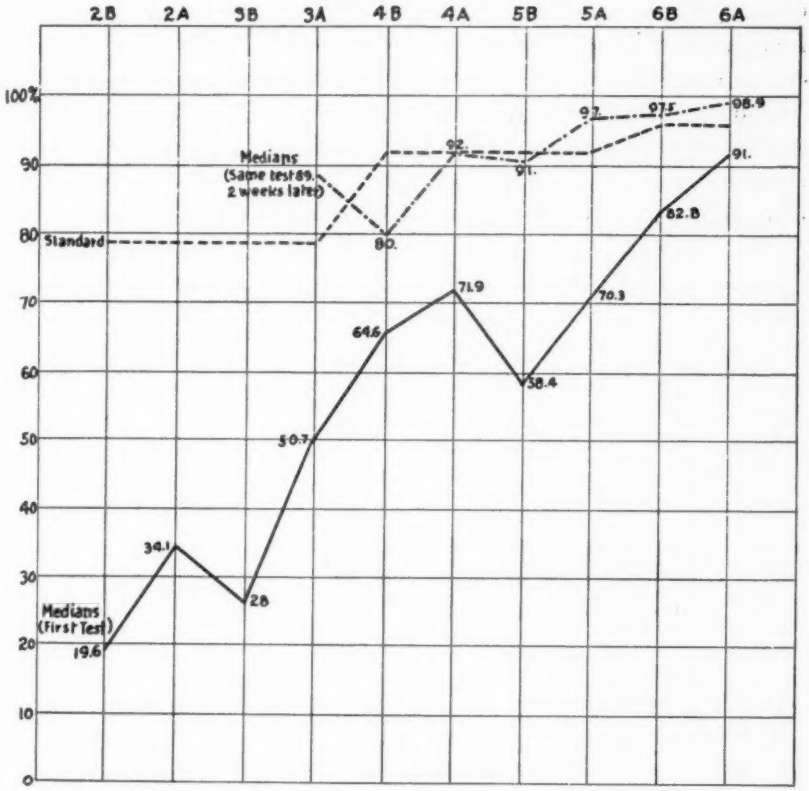

FIG. 3. *Effect of Two Weeks' Practice with Ayres' Spelling Lists*

2. The excellent effect upon the child's learning.

3. The improved attitude of parents and pupils toward the teacher through the lessening use of the personal standard of the teacher in the matter of achievement and promotion.

4. Easily selecting the children of one grade who are educationally equal to the average in the succeeding grade and giving such ones the needed promotion.

5. Accurate record of progress of pupils and efficiency of teachers, if the intelligence of the children is given correct consideration.

6. Diagnostic work in teaching.

The value of standardization in education may be more commonly accepted than the every-day value of intelligence tests and records. To those who have used both educational tests and intelligence records, doubtless they are equally important. More and more the

data being published on intelligence tests show that such tests are invaluable. Recent reports from Brown University and Princeton concerning the use of intelligence tests show that such tests are better indices for selecting Freshmen than either college entrance examination or high-school marks. Perhaps their importance was and is being exaggerated but at least the intelligence quotient tells us something more than we have previously known. The average teacher

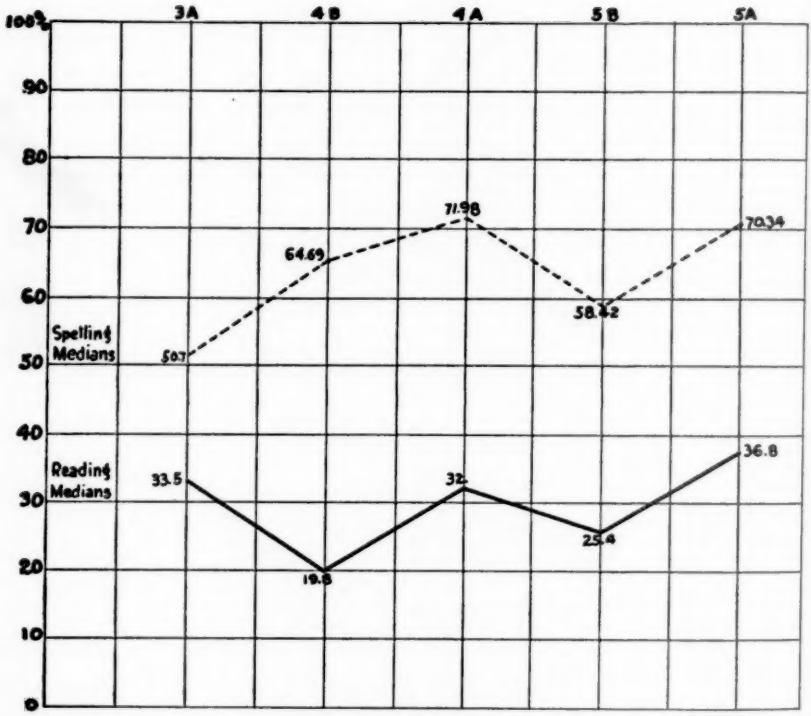

FIG. 4. *Correlation between Spelling and Reading. Ayres' Spelling Scale and Silent Reading Scale*

wants such information as she feels her lack of knowledge of her pupils.

Some results of intelligence tests my teachers would agree, are:

1. Better knowledge of the child—although it is conceded that intelligence tests do not accurately gage *every* child.

2. Glenfield teachers freely acknowledge that intelligence tests make more uniform grouping than either the teacher's marks or her judgment.

3. Approximate grouping of pupils of the same intelligence causes better teaching for both the dull and the more alert. Our teaching in the past has been entirely in the interest of the slow-minded. The slow go as fast as they can without so much scolding under the new grouping and the quicker minds are allowed to accomplish more.

The records of the voluntary-after-school-reading group in the Glenfield School show that from two to three times as many A's (upper I. Q.'s) report for this reading consistently than do the B.'s Pupils who can read well like to read, of course. The interest of both the slow and quick pupils would seem to show that the reading at least should be taught separately.

Is it undemocratic to place pupils with the same or similar mental tastes in the same groups? Recently a teacher told me that it was an unwritten rule in the school in which she taught that the bright and dull children *must* be properly mixed so that the dull might receive the benefit of contact with the brighter minds. What benefits the brighter minds were to receive was not made clear. Yet in some schools the teachers are forbidden to have those of similar ability recite together.

The effect of grouping by intelligence tests is excellent upon the teacher. The teacher of the slow groups is not expected to produce the same progress as the A class teacher. This relieves her of the strain of too high a standard for her class, so a wise teacher gives her energy to adapting the work to the needs of her class rather than worrying about the progress of the other divisions.

At Glenfield we have found that both the bright and the slow profit by going at different paces. There is little or no tendency to allow the slow to go too slowly. A careful study of a group of defective boys showed that most of them had effort quotients above normal (effort quotient equals educational age divided by mental age). An investigation of pupils kept after school for extra help showed that they were largely from the slower groups. If we know pupils are working up to their ability, keeping them after school becomes a doubtful practice.

Further discussion would probably not make clearer that a two years' trial with intelligence tests has convinced me, and I believe my faculty as well, of their importance in the efficient administration of a school. The technique will be improved for some time, but no educator can afford to wait longer before making a start.

Results of Classification of Pupils Based on Ability as Shown by Intelligence Tests, Tests of Achievement and Teachers' Marks

A. M. SANTEE
Principal of the Washington Junior High School
Duluth, Minnesota

IN FEBRUARY, 1919, an investigation was made of the number of pupils failing to be promoted in the Junior High Schools of Duluth. This number was found to be very large, especially in the seventh grade where 40 per cent of certain classes had failed of promotion in the preceding semester. The Junior High School teachers were requested to study the problem and to report the causes of failure together with suggestions for their elimination.

Among the causes reported were the unequal preparation of pupils entering the same grade and differences in ability of pupils placed in the same class. This disadvantage is recognized by every experienced teacher. The pupil who is slow to comprehend sits and listens to meaningless explanations if the pace is not set for him. If the pace is set for this pupil, those who understand the subject must listen again and again to that which is well known and is becoming tiresome.

The first attempt at grouping pupils according to ability in Washington Junior High School was made by placing in special classes the pupils whose work showed that they were failing in arithmetic. Three such classes were formed, the number in each being limited to eighteen. The work, elementary in character at first, was adapted to the ability of the group by determining the extent of knowledge of each pupil and using this as a basis for instruction. It was soon evident that many of these pupils were failing, not because of mental incapacity, but through a lack of knowledge of the fundamental processes in arithmetic. When this was supplied, they were able to do fairly good work, if given sufficient time. At the close of the term about fifty per cent of the pupils of the three classes were able to take up the regular work of the next higher grade. This result was very satisfactory as only those who were failing had been placed in these groups.

The removal of the failing pupils from the regular classes was immediately evident in the quantity and quality of work done by those remaining. All pupils were now able to profit by the instruction given and the work of teaching the class by sections was no longer necessary. One teacher remarked, "That class acts like a

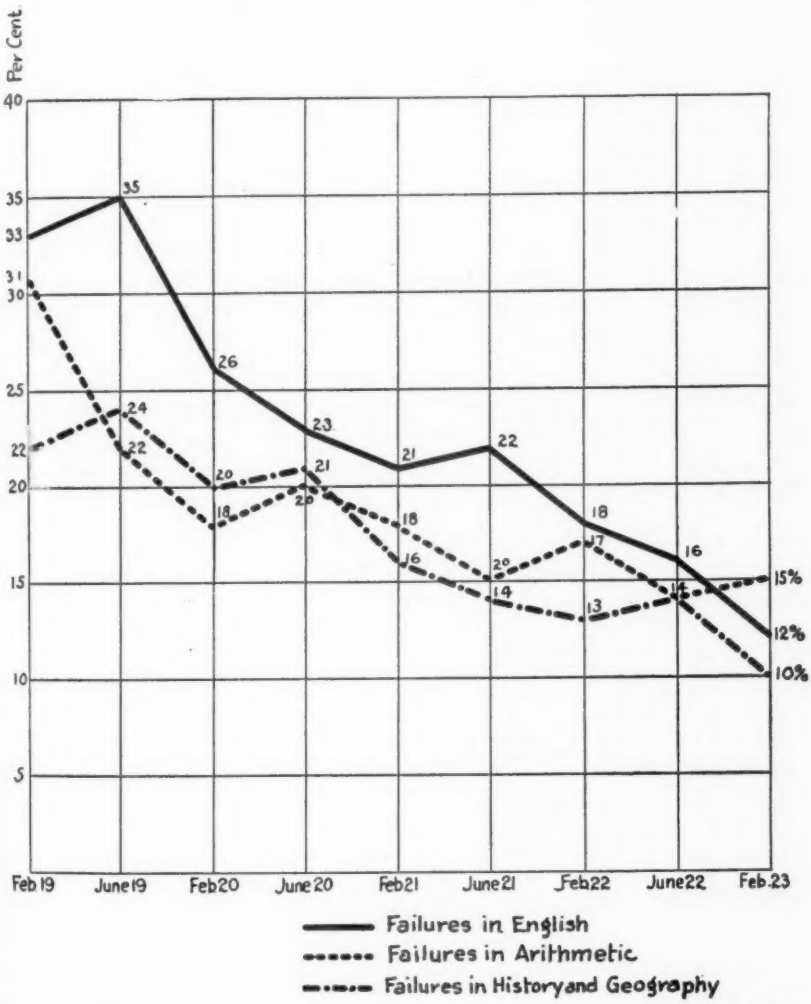

FIG. 1.—*Per Cent of Failures at the Close of Each Semester, February 1, 1919, to February 1, 1923*

different one entirely. The work goes ahead with a snap now as if a brake had been released." It is probable that the greatest harm in teaching mixed groups comes to the pupil who, although he grasps an explanation readily and is able to do the required work in a few minutes, must wait until his slower classmates have accomplished the same task. He forms the habit of idling, of taking an hour to do what he could do in a few moments. This most pernicious habit has changed many a pupil of marked ability into a failure.

At the close of the term the failures in arithmetic dropped from thirty-one to twenty-two per cent while the per cent of failures in English and those in history and geography, which were taught together, were slightly increased during the same period. No attempt at grouping had been made in these subjects.

The teachers agreed that classification was well worth a continued trial on a larger scale and the grouping was extended to include about one third of the school with special classes formed in all academic subjects. The results in English and in history and geography were about the same as those in arithmetic had been in the preceding semester. Failures in English dropped from 35 to 26 per cent, in history and geography from 24 to 20 per cent. Those in arithmetic fell from 22 to 18 per cent. Classification into groups was continued and extended until the entire school, with the exception of a few mixed classes, was included. The results obtained each term may be seen in Figure 1, page 277.

The plan of classification used at the present time is as follows: Pupils entering the school for the first time are classified on the basis of intelligence tests which are given in the sixth grade and of teachers' marks when the two are available. Pupils enrolled the preceding semester are classified on the basis of teachers' marks. These include achievement and other tests. These groups are assigned, according to the course elected, to session rooms which accommodate two classes. The session room groups are then divided into classes on the same basis used in the first classification. Each class is kept together in all subjects when possible. If a group has elected the prevocational course, the pupils take the academic subjects with their class, while the boys of the two classes unite in art and shopwork, the girls in art and home economics. The entire room must have the art and industrial work at the same periods to avoid conflicts in programs.

There are many things that make the matter of classification difficult. Among them are differences in standards of teachers who mark the pupils, and differences in preparation of pupils entering the same grade. A pupil may have low marks owing to absence on account of sickness and, when health is regained, be able to do superior work again. Maturity often makes possible good work in some subjects. Pupils who are repeating a subject are sometimes able to make rapid progress the second time it is taken. These make adjustments necessary to correct mistakes in assignment. The plan provides that a pupil who shows superior or inferior ability in class be reported by the classroom teacher who recommends his transfer to

another group in which he can work to better advantage. It is sometimes impossible to place him in the proper class on account of his program. All changes are to be made within the first few days of the semester if possible. Pupils who do superior work in one subject are likely to do well in all others, and those who find the work of one subject difficult are quite sure to have difficulty in all. There are exceptions in both cases, possibly most frequently found in shop and home training work.

In classification it seems probable that about 70 per cent of the pupils of the entire school could work without serious disadvantage if assigned to the same group. The Course of Study should be made to meet the needs of this group, but should be elastic enough to provide for classes at either extreme. In preparation for the work of the semester, the teachers of each subject meet in conference and select for each grade those topics outlined in the Duluth Course of Study, which are necessary to be taught as a basis for more advanced work in this subject.

Teachers use tests at the first of the semester to determine what basal work is most needed by the groups assigned to them. Often these show that it is best to use integers, avoiding fractions and decimals until the necessary principles are established. All groups study those topics which have been selected by the teachers as basal, the difficulty of the problems in arithmetic, for example, being adapted to the ability of the class by increasing the number of problems to be solved and the magnitude of the numbers involved. Only simple fractions such as $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{5}{8}$ and decimals not to exceed three places are used in the slower groups until ability to work with these is developed.

Pupils who show superior ability are often permitted to take five major subjects, thus completing the course in a shorter time, while those who are unable to carry four subjects sometimes do creditable work by giving full time to three. Uniform examinations based on the topics selected by the teachers are given to all groups of a grade. These count one third of the term grade. The teacher gives frequent tests on special and extra work and credit is allowed for this.

A few classes showing special ability in certain subjects have completed the work of two semesters in one. This was satisfactory in French, but in some other subjects the double work was difficult. It seems better to offer a wider range of topics within the term's work, and to permit the more capable to elect an additional subject, than to condense the work of two terms into one. Tests show that the double work has been covered too quickly for the pupils to understand it thoroughly.

Special groups are assigned to those teachers whose abilities and preparation have fitted them to teach successfully pupils of this type. A special group of twenty boys ranging from sixteen to twenty years of age was formed in the second semester of last year. Many of these boys had left school before completing the work of the eighth grade and had been working for a year or two in the shops. The program set for this class consisted of shop English, shop mathematics, mechanical drawing, and machine shop work. This program required eight forty-five minute periods each day, four of which were spent in the machine shop.

The course offered in shop mathematics is similar to that recommended by the Mathematics Committee of the Department of Superintendence of the N. E. A. at the Chicago meeting and is as follows:

OUTLINE OF SHOP MATHEMATICS

Arithmetic

- Review of the fundamental operations of arithmetic.
- Tables of weights and measures in practical use.
- Emphasis on simple fractions: 1/2, 1/3, 2/3, 1/4, 3/4, 1/5, 1/6, etc.; others to have less attention.
- Simple short cuts in multiplication and division.
- Percentage. Finding any per cent of a number. What per cent one number is of another. Finding a number with the per cent given. Simple applications of percentage.
- Arithmetic of every-day life.
- Personal accounts, thrift, insurance, taxes, banking, saving accounts, checking accounts.
- Arithmetic of investment, real estate, stocks, bonds, postal savings.
- Drill on fundamental operations. Shop problems.

Intuitive Geometry

- The direct measures of distance and angles by linear scale and protractor.
- Areas of squares, rectangles, parallelograms, triangles, and trapezoids.
- Surfaces and volumes of solids.
- Construct perpendicular bisector, bisector of an angle, parallel lines, etc. Simple constructions only.
- Familiarity with such forms as the equilateral triangle, the 30° — 60° right triangle, and the isosceles right triangle. Use of these in construction.
- Use of the slide rule.
- Problems and constructions related to shopwork.

Algebra

- The formula: its construction, meaning, and use
  - As a concise language
  - As a shorthand rule for computation
  - As a general solution.
- Graphs and graphic representations in general—their construction and interpretation in—
  - Representing facts (statistical, etc.)
  - Representing dependence
  - Solving problems of shopwork.
- Positive and negative numbers—their meaning and use.
- The equation—its use in solving problems—
  - The linear and the "pure" quadratic equation in one unknown, their solutions and applications.
  - Simple problems of proportion. Shop problems.

Algebraic Technique

The fundamental operations in algebra. Factoring, the only cases that need be considered are: Monomial factors. The difference of two squares. The square of a binomial. Simple algebraic fractions. Exponents and radicals. The work done on exponents and radicals should be confined to the simplest material required for the treatment of formulas.

The course in shop English consists of topics selected from the seventh, eighth, and ninth years of the Duluth Course of Study adapted to the needs and interests of the class.

SHOP ENGLISH

Letters and Forms

Applications for positions
Friendly letters
Orders for supplies
Common business forms
Courtesy in the business world and every-day life

Punctuation

Use of the periods
comma
semicolon
colon

Spelling and Punctuation

Words most frequently used
Business and shop terms
Abbreviations

Oral Composition

Hunting, fishing, etc. Three-minute talks on: Current events, salesmanship, debate. Newspaper reports, magazine articles.

Written Composition

Theme work based on shopwork
Development of steel industry
Other shop themes
Reports on outside reading

Grammar

Common uses of nouns, pronouns, and verbs
Correct uses of words, phrases, and clauses

Class Reading

The worker and his work
Captains of industry
Short stories
Character sketches
Literature of industry
Study of classics

Memory Work

My creed
If
Gettysburg address
Memory gems
Other selections chosen by pupils

The results obtained in this class were very satisfactory. The boys became interested in the work and about eighty per cent were promoted. Three pupils maintained a place on the honor roll throughout the term. About one half the class decided to continue school and were able to take up the regular work of the 9A grade in English and mathematics the following semester. A class was organized during the last semester with about the same results, and a large class is being taught at the present time. The demand for work of this type is so great that it will be necessary to form additional classes in September.

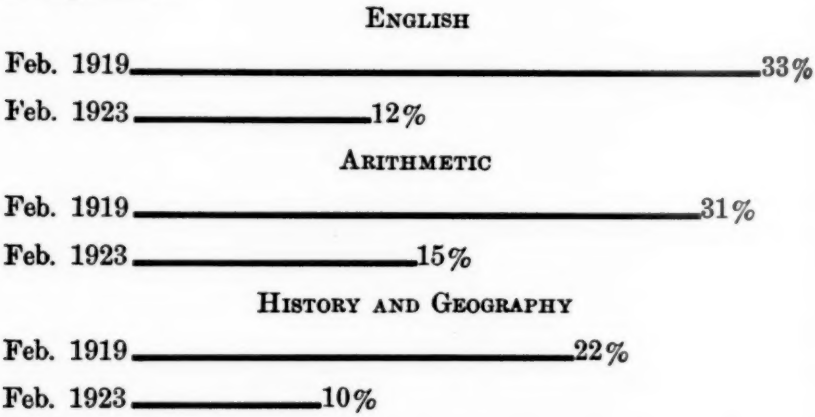

FIG. 2—Comparative Failures Stated in Per Cents, of Terms Closing February, 1919, and February, 1923, of 1100 Pupils Enrolled in Washington Junior High School.

Figure 2 shows the comparative failures in English, arithmetic, and history and geography in the terms closing February 1, 1919, and February 1, 1923. Few changes have been made in the teaching force in those departments involved in this study during the four years covered by it. This has reduced the possibility of error through the entrance of new teachers with different standards of promotion and failure. Uniform examinations and tests of achievement are given to all classes of a grade to determine promotion. This figure indicates that the best school work is possible when the pupils who are about equal in ability are placed together and the work adapted to their knowledge and ability.

In adapting the work to a backward group there are four things which are essential:

First. An inventory should be taken of each pupil's knowledge and ability.

Second. Those things should be taught which are not known but which must be used as a basis for other things.

Third. Proceed slowly at first, gathering speed as ability is acquired.

Fourth. Avoid difficult numbers or sentences and other elements that confuse, until principles are firmly established.

CHAPTER V

The Teaching of Reading

Ernest Horn
M. Ethel Brown
Charles Potter
Marion Carswell
Willard W. Beatty

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CHAPTER V

The Objectives in Reading as a Guide to Remedial and Prophylactic Work

ERNEST HORN

Professor of Education and Director of University Elementary School, State University of Iowa

THIS CHAPTER in the Yearbook is concerned with the whole program of the improvement of reading. It is especially concerned with the proposition that remedial and prophylactic work can be carried on efficiently only when the objectives in reading are kept clearly in mind. Since another chapter of this Yearbook is devoted to remedial work with individuals, such objectives as are concerned primarily with the removal of special disabilities will not be discussed here. The objectives here set up are those which should be reached by all pupils, and for the most part, the attack on these may be made by children working as a group.

When we speak of remedial work, we usually have in mind exercises intended especially for children with rather serious special disabilities. It is now a well-known fact that there are children in most elementary schools who suffer so seriously from one or more reading disabilities that they are incapable of progressing in anything like a satisfactory manner. Often these disabilities are so influential that a pupil whose intelligence quotient would seem to warrant normal progress is retarded several years not only in reading, but also in all subjects which must be learned from a book. It is clear that such pupils should be given immediate and skillful diagnosis followed by remedial treatment.

Although this work is in its infancy, we already have had several very important contributions based on experimental studies of special deficiencies. The whole problem is well opened up in C. T. Gray's "Deficiencies in Reading Abilities."[1] Additional material is given by Gates in his book "The Psychology of Reading and Spelling."[2] The most complete and the most detailed description of case studies in remedial work is to be found in W. S. Gray's "Remedial Cases in Reading: Their Diagnosis and Treatment."[3] The diagnoses made by Dean Gray are particularly helpful, and his remedial treatments show admirably the great progress which has been made in adapting

[1] Published by D. C. Heath & Co., Chicago.
[2] Published by Teachers College, Columbia University, New York.
[3] Published by University of Chicago, Supplementary Educ. Monograph 22.

school procedures to individual students. In fact, it is to be doubted whether, in the case of any complicated diseases in the field of medicine, the diagnosis and treatment of the physican is more accurate or more successful on the average than that shown in Dean Gray's results.

To continue the analogy in the case of medicine, it might be well to point out that modern medicine is interested not merely in curing the sick, but also in preventing sickness and in the improvement of the vitality and physical happiness of people who are not by any means bed-ridden. The curing of the sick is, of course, the part of the practice which is of an immediate and rather critical nature. Yet these critical conditions would often not have arisen had prophylactic measures been taken by earlier medical advisors or by the patients themselves.

The modern practice regarding the remedial work in reading parallels very closely this best modern practice in medicine. We must, of course, regard the individual who has serious special difficulties as a case for immediate and critical attention. So far as reading goes and so far as his ability to study from a book is concerned, he is a hospital case. There are, however, large numbers of pupils who get along in their reading pretty well but who, because of one or more disabilities, fall far short of what they are capable of doing. Even students who make scores distinctly above the present standards for their age and grade are usually capable of considerable improvement. In fact, the very exercises suggested by Dean Gray and others for the improvement of pupils with special disabilities can be used with profit in the improvement of the scores of children who are already superior. These exercises also constitute a most excellent program for prophylactic work in preventing special disabilities from arising. In other words, most of the exercises which have been found to be helpful to actual hospital cases in silent reading are also helpful to students whose ability is fair or even superior. Even in the case of pupils who in any given month have proceeded about as well as we can expect for the time they have been in school, such exercises afford a wholesome stimulation to normal growth.

How can one tell when remedial work is especially needed, or when abilities which are already fairly efficient should be improved? The cautions which have just been urged are repeated here for emphasis. Even when a child may be able to read with a fair degree of speed, with a fair degree of accuracy, of comprehension, with a fair degree of ability to organize, and with a fair knowledge of the technics by which he may remember what he has read, it does not mean that he is to be excused from reading exercises. What we de-

sire is to perfect still more these desirable abilities. In order to do this, we must first know what his reading abilities are. The first step then must be to determine his reading status.

This clearly involves some form of diagnosis. What shall this diagnosis be? The most common method of class diagnosis is that made through the means of the standard reading tests. These are supposed to measure, in a more or less satisfactory way, some rather general abilities in the type of reading covered by the test. The oral-reading test is supposed to give a measure of general ability in oral reading; the vocabulary test a general idea of the pupil's knowledge of words; the silent-reading test a measure of general ability in silent reading.

Silent-reading tests do very little to show in what particular the individual has deficiencies; in fact, we are coming more and more to believe that the scores made on these tests should not be taken too seriously. The improvement shown on some of them after brief practice is certainly greater than the improvement in actual general reading ability. On the other hand, it has been shown that it is possible to make unmistakable improvement in certain important types of reading abilities commonly needed in life without showing any corresponding improvement on certain silent-reading tests. In general, it is probably true that the Monroe test, when applied to measure the results of specific drill in silent reading, usually exaggerates the improvement which actually took place. On the other hand, the Thorndike test probably underestimates the improvement actually made in such practice exercises.

The qualities which have been emphasized in most of the silent-reading tests are speed and comprehension. These, of course, are important and they are involved in all the reading which one does. No matter how well one can accomplish a given reading task it now seems that he would profit from obtaining still more of these qualities provided no other quality were lost in the process. It is a great mistake, however, to regard these two qualities as the ultimate objective in teaching reading. These ultimate objectives must be stated in terms of needs, situations, and activities in life outside the school.

These objectives must, of course, be stated in detail. They fall under the following heads: (1) those needs and activities bound up with locating data; (2) those abilities involved in selecting, comprehending, and evaluating data in the light of the purpose at hand; (3) those abilities involved in organizing these data for any given

purpose; (4) those abilities and technics involved in perfecting one's grasp of the material read, in reacting to the material as a whole, and in providing for remembrance.

It will be seen that comprehension is basic in all these activities. One cannot skim, or use the table of contents, or refer to the index, or consult the dictionary without a certain amount of ability to comprehend. By comprehension is not meant mere mechanical association of meanings. It involves selection, weighing of values, and many other rather technical and complicated abilities.

It is also clear that speed is involved in each of these objectives as a desired condition of efficient work. Such a plan, however, keeps speed where it properly belongs—namely, always within the limits of the requirements of the job to be done. What is desired is not speed in reading, but the ability to be able to find material quickly, to select relevant data quickly, to organize these data in the solution of a problem quickly, to know the most economical methods by which one may clinch what has been read and provide for its permanent retention. There is ample evidence from our experiments in silent reading that time pressure as a condition for practice exercises in silent reading must always be regulated in the light of the purpose for which the selection is to be read. It is one thing to tell a child to read as fast as he can. It is another thing to ask him to discover as quickly as possible from a given page the accurate answer to a question. In the latter case the pupil has a criterion by which he may judge whether or not his reading is too rapid. Furthermore, he works under the advantage of having his mind on the question at hand, rather than upon his reading processes.

The final diagnosis of the status of the reading ability of pupils probably needs to be made in two ways: (1) by testing the pupil's ability to do each of the important types of reading which have to be done in working with books; (2) by testing the related essential abilities involved in such work.

Both of these main and subordinate classes of skills or abilities must be developed regardless of what kind of scores one makes on a standard silent-reading test, or upon a test of some special phase of reading, such as that of phonics. It is therefore important to keep before the teacher a chart or outline of these essential abilities. Such a chart is published in Rochester for the course of study in reading. The following chart, prepared by Miss Maude McBroom, of Detroit Teachers College, is of a similar type.

READING THE SOCIAL AND PEDAGOGICAL OBJECTIVES IN THE COURSE OF STUDY

I. Recreatory Reading
  A. Oral
    1. Social values—
      a. To read aloud to others for social and recreatory purposes (as with friends)
      b. To read aloud for one's own personal enjoyment, as in reading a lyric
      c. To read as a part of the preparation of or participation in dramatics. (These are types of situations in which we read. Involved in these types are, of course, certain incidental values such as the development of ideals, the enriching and satisfying of emotions, etc.)
    2. Skills, habits, and technics involved in these objectives—
      a. Proper interpretation
      b. Proper attitude toward audience, including posture, etc.
      c. Expression of appreciation through inflection, etc.
      d. Pronunciation
      e. Enunciation
      f. Voice training, including proper breathing, tone quality, etc. (At time of actual reading for the above purposes, the class-room atmosphere should be social and recreatory. Training in these essential skills is kept incidental to recreatory purposes. The actual drill lessons fall under the work type of oral reading as described under IIA below.)
    3. Types of material to be used—
      a. Short stories
      b. Poems
      c. Travel
      d. Plays
      e. Novels
      f. Essays
      g. Science
      h. History
      i. Biography
      j. Myths and legends
      k. Fables
      l. Newspaper and magazine articles
    4. Tests, informal
  B. Silent
    1. Social values—
      To be able to select and enjoy proper books and articles according to one's mood. This implies the necessity for humorous, exciting, thoughtful reading, and reading for the general widening of one's interests. This reading is done silently for recreatory purposes, and hence without such compulsion as may exist in silent reading of the work type.
    2. Skills or technics involved in—
      a. Interpretation
      b. Appreciation
    3. Types of materials to be used—
      While practically every type of literary material may be read silently, certain types are particularly suited for such reading, such as I A 3. Other types, such as poetry, necessitate oral reading, if full appreciation is to be made possible. In general, the longer selections would be assigned to silent reading.
    4. Tests—
      Tests should probably be limited to informal tests. It is doubtful whether a formal standard test of literary appreciation is either possible or desirable.

II. Work Type of Reading

A. Oral

1. Social values—
   a. To inform others (announcements, minutes, news items, etc.)
   b. To prove a point, as in recitation or debates
2. Skills or technics involved—
   a. Proper interpretation
   b. Enunciation
   c. Pronunciation
   d. Voice training
   e. Learning to recognize words through phonetics. (The actual drill for purposes of developing these abilities is to be distinguished from the incidental practice obtained in ordinary recreatory or social oral reading.)
3. Types of material—
   a. Minutes, announcements, etc.
   b. Material from texts in geography, history, etc., read in connection with class discussion or debates
4. Tests—
   a. Standard oral-reading tests
   b. Special diagnostic tests
   c. Special informal tests devised to show improvement in any specific ability, such as enunciation, voice training, pronunciation, etc.

B. Silent

1. Social values—
   a. To get information
   b. To solve problems
   c. To understand situations, opinions, etc.
   d. To verify facts, opinions, etc.
   e. To form opinions for use
   f. To satisfy curiosity
   g. To inform on questions of the day
   h. To make judgments
   i. To stimulate new problems
2. Skills, habits, or technics involved—
   a. Speed—eye movements, span, etc.
   b. Comprehension, understanding, interpreting, etc.
   c. Organization, assigning topics to proper order, summarizing, outlining, etc.
   d. Remembrance
3. Types of material used—
   a. Phrases—flash cards
   b. All sorts of informational material as is furnished in geography, history, science, nature study, etc., in large and small units
4. Tests—
   a. Standard silent-reading tests
   b. Special tests of progress in achieving special abilities

C. Use of Books

1. Social results—
   a. To find material quickly
   b. To find the meaning and use of words
   c. To find reference material
   d. To understand tables, keys, maps, etc.
   e. To use and care for books well
   f. To evaluate material

2. Skills involved—
   a. Use of index
   b. Use of content table
   c. Use of dictionary
   d. Use of library
   e. Use of reference tables, charts, maps, etc.
   f. Skimming
   g. Care of books
3. Types of material—
   a. Any book with index
   b. Any book with table of contents
   c. Telephone directory or other alphabetical arrangements
   d. Dictionary
   e. Card file
   f. Magazine articles
   g. Readers Guide
   h. World Almanac
   i. Encyclopedias

Miss McBroom's chart does not show which objectives are to be accomplished in a given grade. The Rochester chart gives the outline of objectives grade by grade, but it does not represent so skillful an analysis of the ultimate abilities which are desired. It is clear that, regardless of a pupil's score on any general standard test, the teacher must still inquire concerning the degree to which the pupil has achieved the social and pedagogical objectives as outlined in Miss McBroom's analysis or in the Rochester chart.

Important beginnings have been made in the analysis of the abilities related to such objectives as are outlined in these charts, and in the discovery of exercises for the development of these abilities. An interesting example of a test for related abilities is the word-element test devised by Dean Gray and used by him in connection with his remedial work. This test, with the exception of the cards used in it, is given below with Dean Gray's permission. He asks that the reader keep in mind that this is not a standardized test.

Word-element test—This test consists of three lists of phonetic words and three packages of cards with these same words on them.

The first list is presented to the child on cards, one word at a time. If the child gives the word correctly, the examiner checks the word on the list. If he fails, the examiner makes a cross after the word on the list and asks the child to turn the card over. On this side of the card there is a sentence using the word. If the child can recognize the word in the sentence, the examiner makes a check under the cross. If the child fails again, the examiner makes another cross under the first one.

The second list consists of words belonging to the same family; two words in each family being given. These words are presented to the child on cards; one family on each card. The examiner tells the

child the *first* word and the family to which it belongs, then asks the child to give the other word. If he gives it correctly, the examiner makes a check after the word on the list; if not, a cross. The child is then asked to name other words in the family; the examiner indicating number thus—3, etc.

The third list consists of words having the same initial sound; two words with the same initial sound on each card. The words are presented to the child on cards as before. The examiner gives the first word and tells the initial sound. He then calls the child's attention to the fact that the following word begins with the same initial sound and asks what the word is. If the child gives the word correctly, the examiner makes a check after the word in the list; if not, he makes a cross. The child is then asked to give other words having the same initial sound. The examiner indicates the number as before.

Sight-word test—The examiner gives the child the word list and asks him to pronounce the words checked. When the child makes a mistake, the examiner tabulates the word that should be given and the word the child gives. When the child fails to respond in any way to a word, the examiner tabulates the word.

WORD-ELEMENT TEST

Name .....

LIST 1

back	small	in	chick	five
all	still	dog	flat	line
at	trick	gum	felt	hush
fed	splash	race	jump	grew
went	threw	queen	hole	scold
ill	bring	yet	twig	glide
king	drum	side	cake	spin
now	knot	rock	an	that
cut	cup	glide	eat	shrill
sale	would	price	pen	strive
west	lamp	skip	big	black
clip	tail	snake	kind	crack
old	came	swing	hop	frog
luck	and	when	fun	boil
place	jell	spring	mash	like
shell	tick	vest	new	hug

LIST 2

back	smack	big	wig
tail	snail	ill	spill
cake	flake	in	twin
all	fall	kind	grind
came	shame	king	fling
an	plan	five	thrive
at	vat	clip	skip
and	stand	side	pride
lace	trace	line	shrine
mash	splash	dog	hog
sale	whale	hop	drop
eat	treat	now	plow
fed	shed	old	scold
jell	swell	rock	frock
ten	when	gum	chum
seen	queen	fun	shun
went	sent	cut	strut
new	drew	luck	cluck
west	crest	hush	blush
yet	whet	not	trot
tick	thick		

LIST 3

bake	bent	fret	frame
call	could	glow	glide
den	dog	grow	grand
fed	fame	place	pluck
get	gum	pride	prop
hand	hut	queen	quail
jail	jut	scold	scan
kind	keen	shake	shun
log	luck	skin	sill
meet	mop	slip	slew
neat	nest	smell	small
pen	pale	snake	snow
ran	rock	spin	spun
sand	sum	stew	stale
vat	vest	swing	swell
wind	wick	thing	thine
tail	tent	twig	twine
yet	yell	while	wheat
black	blind	shrine	shrill
brace	brush	track	trick
chin	chum	splash	spleen
clock	clog	spring	sprig
crack	crush	strive	strip
drop	drive	thrash	threw
flat	fled	knell	knack

A moment's consideration of such a chart as the Rochester chart or that prepared by Miss McBroom shows clearly that there must be some provision for coördinating in the various grades the attack on these objectives. The charts are intended to represent a complete outline of the task which must be performed *by the school as a whole.* Each grade teacher has her part in this work. Her best service

cannot be rendered unless she keeps in mind the relations of her work to that of the teachers in other grades. Here is an opportunity for the school principal, for it is he who must follow the progress of the pupils from grade to grade, who must discover hindrances to proper progress, and who must see that each step is thoroughly and efficiently mastered.

A Mastery Vocabulary in Primary Reading

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THE TEACHERS of primary reading are indeed fortunate in having such interesting material to use as is today available in the various story readers. The story readers and story method have made primary reading a natural life-situation—reading to discover something of interest—and have made the learning to read child-like, in the sense that children learn to read by rote as they learn to talk.

Necessity for vocabulary study—Some teachers object to the story readers because the vocabulary in each text is too large for the children to learn and they feel that the children slip along from grade to grade with no real word power. To obviate this objection and make our story reading a success in our schools we began a year or more ago a vocabulary study in connection with our basal texts, the Winston Readers. The primer has a vocabulary of 321 different words; the first reader, 612; the second reader, 1495; and the third reader, 2786. This counts every word appearing in each book regardless of its appearance in an earlier volume. This vocabulary consists (1) of words having a high per cent of frequency in reading matter for children, and (2) of words of less frequent usage yet needed in a particular story or so. It seemed to us that a certain number of the common words should be mastered semester by semester to give the children word power, while the major part of the vocabulary could be caught with the thought for the time being and not drilled upon. To find which words belonged in the mastery class was the purpose of our study.

General plan of vocabulary study—My general plan for this vocabulary study consisted of checking each volume in our series of books, listing the different words, scoring their frequency in the primer and first reader and noting which words held over from volume to

volume; then to select for mastery the words of highest frequency in the greatest number of stories. For the second reader I would not score frequency but list the different words, note which words were repeated from the primer and first reader, and then compare the list with the one made by E. T. Housh and reported in the Seventeenth Yearbook of the National Society for the Study of Education, Part I, Chapter IV. His list comprised words common to ten different second readers. The words on our list which were also on his would be well worth mastering. For the third reader we would do as above except select the words for mastery on the basis of local teacher opinion as I knew of no third-reader vocabulary study to use for comparison.

Results of the study—I did the work, personally, upon the primer and first reader and with that as a basis turned the second and third reader studies over to committees. At that time I discovered the primer and first-reader lists had been done a year before by my predecessor and a local teacher. Since their study was in the hands of the teachers we used it instead of making copies of mine. Committees with my help continued the work.

When we were through we had selected only 680 different words for mastery in the first three grades plus one hundred more whose root forms were included in the 680 listed, but whose endings were different enough to require attention. This seems a very short list but it was all we could undertake then, though we plan to increase it as time goes on.

Checking vocabulary by Thorndike's Teacher's Word Book—The interesting part of our word study came after the publication of The Teacher's Word Book by Edward L. Thorndike, which lists alphabetically 10,000 words occurring most widely in a count of some four and a half million words from forty-one different sources. At the end of the book Dr. Thorndike lists in sets of 500 words each the 2500 words having the most wide and frequent occurrence.

I checked our lists for the various semesters by this list of 2500 words and found that 408 of our 680 words selected for mastery in the first three grades are in his list of the 500 words of widest use and highest frequency. The balance of our list was distributed throughout his list of 2500 with the exception of the following 21. These do not appear in his list of 2500 words, though the italicized parts are in the first list of 500.

bumblebee	*anyone*	chin
she's	*anywhere*	core
awoke	*could*n't	pretended
rap (rapped)	*does*n't	queer
threw	*is*n't	shelf
anybody	obey	thumb
pussy	apron	wrinkled

Mastery words—Below are listed the 680 different words we have selected for mastery. The different forms of the same word, as "ask" and "asked," are not included. The figures after the words indicate if the word or some form of it is in Dr. Thorndike's first list of 500; his second list of 500, etc. The table should be read as follows: the word "afraid" is to be mastered in the first semester of the first grade. The word appears in the second 500-word group in Dr. Thorndike's Teacher's Word Book. The x used in the following list is placed after words that are not on the 2500-word list given by Thorndike:

Reading Word Mastery List for First Semester—First Grade

Figures show from which of Thorndike's 500-word lists, each word is taken

a	1	heard	2	run	1
afraid	2	help	1	said	1
after	1	hen	3	saw	1
again	1	her	1	shall	1
along	1	him	1	she	1
and	1	his	1	she's	x
are	1	home	1	sleep	1
away	1	I	1	so	1
back	1	in	1	some	1
bed	1	is	1	soon	1
began	2	it	1	stop	1
big	1	jump	2	tail	2
boy	1	little	1	that	1
bumblebee	x	lived	1	the	1
but	1	looked	1	then	1
can	1	man	1	there	1
came	1	may	1	till	1
cat	3	me	1	to	1
catch	2	met	2	took	2
caught	3	my	1	under	1
chair	2	no	1	up	1
could	1	not	1	voice	1
did	1	nothing	1	walk	1
do	1	of	1	want	1
dog	2	old	1	was	1
eat	1	on	1	water	1
for	1	one	1	went	1
fox	3	out	1	what	1
get	1	over	1	where	1
give	1	pig	3	who	1
go	1	please	1	why	1
goat	3	pussy	x	will	1
got	1	put	1	woman	1
grass	2	rabbit	4	woods	1
grow	1	ran	2	you	1
had	1	red	1		
he	1	right	1		

Overlapping of our vocabulary and Thorndike's 2500 words—It is interesting to note in detail how our mastery list distributes itself over the 2500 words listed by Thorndike. The table following tells the story. It should be interpreted thus: of the total of 109 words to be mastered in the first semester of first grade 87 are in Thorndike's first five hundred; 12 are in his second five hundred; 6 are in his third five hundred; one is in his fourth five hundred; none is in his fifth five hundred, and 3 are not in the 2500 list.

Semester	Grade	Thorndike's 500-Word Lists					2500 List	Total
		1	2	3	4	5		
1	1	87	12	6	1	0	3	109
2	1	76	21	6	4	0	2	109
1	2	90	20	5	2	0	1	118
2	2	68	26	4	2	1	0	101
1	3	73	46	15	7	4	8	153
2	3	14	27	19	17	5	8	90
		408	152	55	33	10	22	680

In figuring by per cents we find 60 per cent of our mastery vocabulary is composed of words listed by Thorndike as the 500 most frequently used; 22 per cent appear in the second list of 500; 8 per cent are in the third list of 500; 4 per cent are in the fourth list of 500; 1 per cent is in the fifth list of 500, and 3 per cent are words not listed in the first five sets of 500 each.

It has meant much to us to have the opportunity to check the results of our local study by means of such an extensive study as Dr. Thorndike's. It has given us faith in our own list and much more enthusiasm in working for its mastery.

Aids in mastering the vocabulary[1]—The Board of Education has bought and the teachers have made much material to assure the mastery of these words. The 109 primer words we had printed on tag board for use as seat work cards. These the children can arrange in sentences emphasizing the thought of the story in the text or to make original stories. We also had all the mastery words printed in type the size of the readers, on book paper, to be made into home-made dictionaries by all children in the first three grades. These are used in word drill exercises and as reference in written work.

[1] Full details of these various aids are given in the Springfield, Illinois, Course of Study with Suggestive Method for the Primary Grades.

Reading Word Mastery List for Second Semester—First Grade

Figures show from which of Thorndike's 500-word lists, each word is taken

all	1	found	1	rap	x
am	1	garden	1	sat	2
an	1	girl	1	see	1
another	1	going	2	sheep	2
around	1	gold	1	small	1
as	1	gone	2	something	1
ask	1	good	1	star	2
at	1	hair	1	supper	3
ate	4	happy	1	take	1
awoke	x	hard	1	tall	2
ax	4	have	1	their	1
bag	2	here	1	them	1
be	1	hide	2	this	1
before	1	horse	1	Thursday	4
blow	1	house	1	tired	2
breakfast	2	if	1	too	1
by	1	into	1	tree	1
cake	2	Jack	3	tried	3
children	1	just	1	two	1
come	1	leave	1	upon	1
coming	2	let	1	us	1
corn	1	made	1	very	1
day	1	make	1	wait	1
door	1	morning	1	way	1
down	1	mother	1	we	1
every	1	mouse	3	well	1
face	1	Mr.	2	were	1
fairy	3	Mrs	2	when	1
farmer	2	much	1	white	1
fast	1	nice	2	window	1
fat	2	now	1	wish	1
feet	1	oh	2	with	1
fell	2	once	1	wolf	3
find	1	open	1	yes	2
fine	1	our	1	your	1
fish	2	play	1		
flew	4	rain	1		

The teachers printed the same words in large type on cards 3 by 8 inches and in phrases on cards 3 by 18 inches. These are used in class drills and by groups of children, one of whom plays teacher. Again these words have been printed in charts so each grade can review the words of the past semesters.

Some teachers have made sets of silent reading flash cards incorporating the vocabulary. Examples as follows:

Put the cat under the bed.
Jump over the chair.
Run and get a pig for me.
Put a tail on the dog.
Can a man walk?
Do rabbits eat grass?
Are you a goat?

Reading Word Mastery List for First Semester—Second Grade

Figures show from which of Thorndike's 500-word lists, each word is taken

about	1	ground	1	ready	1
across	1	hands	1	sad	2
air	1	has	1	safe	2
always	1	head	1	sail	1
angry	3	hear	1	say	1
any	1	high	1	seen	1
basket	2	hill	1	sent	1
bear	1	himself	1	set	1
been	1	hold	1	should	1
behind	1	how	1	side	1
black	1	I'll	4	since	1
bread	1	keep	1	six	1
brook	2	kept	2	sky	2
brothers	1	kind	1	stay	1
called	1	know	1	such	1
cannot	2	large	1	talk	1
carry	1	last	1	tell	1
climb	3	lay	1	ten	1
cook	2	left	1	thank	1
cried	2	listen	2	these	1
dark	1	long	1	things	1
does	1	meat	2	think	1
don't	2	middle	2	those	1
each	1	might	1	three	1
ever	1	mind	1	threw	x
far	1	mine	1	through	1
farther	3	must	1	today	1
father	1	near	1	together	1
field	1	need	1	told	2
fire	1	neck	2	until	1
flower	1	nest	2	watch	1
fly	1	nor	2	which	1
from	1	off	1	wind	1
full	1	often	1	wings	2
fun	3	only	1	wise	2
gave	1	or	1	would	1
glad	1	other	1	year	1
goes	4	picked	2	yourself	3
great	1	poor	1		
great	1	pretty	1		

Two committees have worked out what we call supplementary stories. Each story is limited to the vocabulary learned up to the use of the story. These stories, one of which follows, are written on the board or a copy is written for each child to read. This gives him practice in using known sight words to discover unknown thought long before he has word power enough to use a supplementary reader for the same purpose.

Story to supplement—"The Old Woman and Her Pig."
"Fire! Fire! Fire! said the pig.
"Where is it?" said the rat.
"In the old woman's home," said the rope.
They went to help.

Reading Word Mastery List for Second Semester—Second Grade

Figures show from which of Thorndike's 500-word lists, each word is taken

alone	1	food	1	silver	1
among	1	follow	1	sing	1
anything	2	foot	1	shoes	2
awake	3	forget	2	shouldn't	1
bad	1	gentle	2	show	1
barn	3	golden	2	slept	5
beautiful	1	green	1	soft	1
beside	2	guess	2	sometimes	1
best	1	hay	3	song	2
better	1	hope	1	stand	1
bird	1	hour	1	still	1
blue	1	indeed	2	strings	4
bright	2	lady	2	strong	1
bring	1	learned	1	summer	1
brought	1	lift	2	sun	1
brown	2	light	1	thought	1
book	1	many	1	top	1
can't	4	money	1	touch	2
care	1	more	1	town	1
child	1	moved	1	true	1
clothes	2	name	1	turned	1
cold	1	noise	2	warm	1
covered	1	own	1	whether	2
cross	1	perhaps	2	while	1
crying	2	place	1	whole	1
dear	1	pointed	1	wide	1
deep	1	rest	1	winning	2
dress	1	ride	1	winter	1
drive	1	river	1	work	1
eggs	1	road	1	wrong	2
everything	2	room	1	written	3
eyes	1	rose	2	yellow	2
felt	2	round	1	young	1
first	1	sell	2		

The old woman was in bed.
They called her.
The rope said, "Do not jump till I tell you."
They went in to get some chairs.
The pig took out the beds.
The dog took out the tables.
The stick put some water on the fire.
The old woman said, over and over,
"Thank you! Thank you!"

As soon as possible supplementary readers are used. The teacher holds the children responsible for the words mastered to date but tells the other words if the children do not know them through the thought of the story.

Mastery words used in other subjects—We checked our reading word lists with the words used in our penmanship outline, "A Course in Handwriting" by F. N. Freeman. The majority of the penman-

Reading Word Mastery List for First Semester—Third Grade

Figures show from which of Thorndike's 500-word lists, each is taken

against	1	even	1	really	4
also	1	evening	2	remember	1
almost	1	everywhere	5	ripe	4
although	2	except	2	same	1
anger	3	fair	1	sang	4
answer	1	farm	2	save	1
anybody	x	feeds	2	seconds	1
anyone	x	fight	2	send	1
anywhere	x	finished	2	servants	3
apple	1	fish	2	shine	2
arms	1	floors	1	shoulder	2
asleep	3	free	1	shouted	2
because	1	friend	1	short	1
became	3	giant	3	shut	2
become	x	happily	3	sigh	3
begged	3	happened	2	sister	1
begin	1	heavy	1	son	1
being	1	held	2	sorry	3
believe	1	herself	2	south	1
between	1	hurry	2	speak	1
bone	2	hurt	2	sprang	5
both	1	ice	2	stood	2
break	2	isn't	x	story	1
broke	4	kindness	4	sure	1
build	1	knew	2	surprise	2
burn	1	knock	3	swallow	3
buy	1	land	1	sweet	1
certain	1	laugh	1	swim	3
church	1	lost	1	table	1
city	1	matter	1	than	1
close	1	mean	1	they	1
coat	2	meet	1	time	1
color	1	most	1	tomorrow	2
couldn't	x	music	2	traveled	2
country	1	myself	2	twelve	2
crown	2	neighbors	2	used	1
cut	1	next	1	visit	1
dead	1	nine	2	waist	4
didn't	5	none	2	wall	1
doesn't	x	obey	x	walks	1
dinner	2	ourselves	5	wash	2
done	1	pair	2	week	1
dream	2	party	2	west	2
drop	1	passed	1	wheat	2
drowned	3	people	1	whom	2
early	1	person	1	whose	2
ears	1	piece	1	women	3
earth	1	pulled	2	world	1
easy	2	quarrel	4	worse	3
else	2	quick	1	writing	1
enough	1	raise	1	yard	2

Reading Word Mastery List for Second Semester—Third Grade

Figures show from which of Thorndike's 500-word lists, each word is taken

already	2	finger	2	promise	2
animals	2	firmly	2	queer	x
apron	x	folks	3	quiet	2
bones	2	fright	4	real	2
born	2	front	1	received	1
bow	2	funny	3	remain	1
brass	4	grapes	3	ribbon	4
brave	2	hammer	4	ring	2
breeze	5	heart	1	rise	2
buttons	4	honest	3	rush	2
cherry	4	hundred	1	scratch	5
chickens	3	islands	2	scream	5
chin	x	knees	2	sea	1
clear	1	lame	5	shelf	x
clock	2	lead	1	shook	4
clouds	2	leather	3	silent	3
collar	4	lessons	2	spelling	4
companions	3	loud	2	springs	1
core	x	maiden	4	start	1
cottage	4	mighty	3	steal	3
danger	3	paid	3	step	1
different	2	paper	1	stove	5
drove	4	parents	3	thick	2
drum	4	partly	4	thread	3
duty	2	pencil	4	thumb	x
earn	3	perfect	2	trade	2
easily	4	plant	1	trouble	2
faithful	3	pocket	3	twenty	2
fault	3	pot	3	vine	4
fear	1	pretended	x	wrinkled	x

ship words are in our word mastery list. We, therefore, have another means of drilling upon them.

We checked our word mastery list with the Horn-Ashbaugh Speller lists for grades one and two and found great similarity. If the words appeared in both lists we took them for spelling words in those grades. This gave added drill on over 200 of the mastery list. The third grade vocabularies in reading and spelling were so different that we did not try to harmonize them, realizing that they must differ since one grows so much faster than the other can.

In the group and individual composition work we find the majority of the words needed by the children are in their home-made dictionaries. These the children can find for themselves and are inspired to learn as soon as possible so to save time hunting them up. In this way correlation helps the mastering of our basal words.

Testing the achievements—The teachers have various games they play with the printed word and phrase cards that test the children's knowledge of the isolated words. They use the supplementary

stories they have written for content tests on the vocabulary. They have also selected parts of books containing mainly our mastery words and these selections serve as tests. We need more and more testing material and are compiling it as fast as we can.

Cautions—Throughout this paper I have emphasized *words* but I would not have any reader think that we do it at the sacrifice of thought. We begin teaching the child to read by having him read something he knows the thought of. This is perfectly legitimate but if he never begins to read material containing new thought he will not get independence in reading.

He cannot read material new as to thought without a vocabulary. Part of this vocabulary he must get as sight words. Later he can gain more words by comparing or grouping words of similar spelling or sounds. We believe in helping the child do this. So we lead him to group the similar words as he learns them, learn the similar parts, and later build more and more words so to increase his vocabulary beyond that which is composed of sight words. We, in this sense, teach phonics, but try to keep word mastery, word drill, and phonic drill in their right places.

Summary—1. The story readers contain interesting material but have extensive vocabularies.

2. The vocabularies consist of (*a*) words having a high per cent of frequency in reading matter for children, (*b*) words of less frequent usage but needed in a particular story or two.

3. There are certain words necessary in reading, many of which have no particular meaning. These should be mastered for reading purposes.

4. These mastery words may be discovered through a detailed study of the vocabulary of the basal text or by the use of similar studies made by other people. The Thorndike Teacher's Word Book serves as a good guide.

5. The words selected for mastery must be mastered and this requires equipment, devices, and much repetition. Printed words and phrases for seat work and class work are needed. The vocabularies of past grades must be kept reviewed while the new words are being taught. Content material must be obtained containing the vocabulary to be mastered.

6. The penmanship and spelling vocabularies will contain many of the mastery words and these exercises will help master them.

7. The home-made dictionaries are very helpful in word mastery.

8. The children need testing on the mastery lists from time to time. The testing should take the form of content tests when possible.

9. A brief course in phonics based on known sight words helps the child increase his vocabulary.

10. Although words must be mastered yet the attention of the child during reading work must always be directed to the thought and not the word.

Increasing Speed and Comprehension of Silent Reading

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THE READING work described in the following article was carried on in the Lawton School, Seattle, Washington. During the year 1920-1921, Dr. Gray's Silent Reading Test was used in grades 4, 5 and 6. The test was given the first time about the middle of the first semester and repeated near the close of the second semester. Between the two tests, teachers were encouraged to use their best efforts to improve their pupils in silent reading. From the second test, I drew the following conclusions: (1) That there had been some increase in the speed of reading; (2) That the fastest readers wrote the best stories and answered the greatest number of questions correctly; (3) That average speed of the class as a whole about equaled the standard in speed set by Dr. Gray; and (4) That 21 per cent of pupils in fourth grade, 19 per cent of pupils in fifth grade, and 49 per cent of pupils in the sixth grade were below Dr. Gray's standards in silent reading.

After reading O'Brien on Silent Reading, I planned to try out the method used in that study to increase the speed of reading. In the December number of the *Elementary School Journal* (1921) there was published an article upon the Burgess Picture Supplement Silent Reading Test. I secured enough copies of this test for my school. The first test was given January 17, 1922. P. S. 1 was used for this test. All the pupils in grades 4 to 8 inclusive were given the test. A second test was given on March 9. For the purposes of this article, the scores of only those pupils (133) who took both tests are used. A résumé of the results of the test Picture Supplement 1 showed that 100, or 75 per cent, of pupils taking the test needed drill upon speed, that only 30 or 22 per cent of the pupils made more than 2 mistakes, and therefore needed drill in accuracy. Second, that 111 or 83.4 per cent of the pupils made scores of 50 or below according to the Burgess scale; and that only 22 pupils or

16.6 per cent made scores above 50. To conform to the Burgess scale 56 per cent of the pupils should have made scores from 0-50 and 44 per cent above 50. Third, this test showed more conclusively than ever that much work needed to be done with these pupils to increase their speed and comprehension in silent reading.

Directions for work on silent reading—The following directions were given to teachers in this school:

Inasmuch as the results of the Picture Supplement Test in Silent Reading given a short time ago seem to indicate that the pupils of this building are as a whole slow readers, I desire you to conduct the work in silent reading with your pupils in such a way as to place special emphasis upon speed of reading. Once pupils learn that they can speed up in reading and at the same time comprehend what they read it will make it possible for them to accomplish more in such subjects as history, geography, and literature. The period of training will begin February 13 and end March 10. It will replace the regular work in reading. The method should consist essentially of alternate reading and reproduction. The reading should be timed and a measure of the amount read in the time allowed should be regularly taken. Pupils should be kept informed of their speed in reading. For the purposes of this test you will record the amount each pupil reads for the space of three minutes. Take this sample of their reading at the beginning of the exercise. The total length of time to be devoted to reading will be thirty to thirty-five minutes.

Reproduction should consist both of free paraphrase—oral—and of answers to specific questions based on the text. The length of the reading period and of the reproduction period should vary with the grade of the pupils and with the subject matter. In general, however, the reproduction should not occupy more than one third to one half of the total time allowed for the exercise.

Recognizing that reading in actual life situations is for a great variety of ends, the reproduction should assume a variety of forms. It may take the following forms: (1) Reproduce the main thought; (2) specific items of information, and (3) important facts—names, causes, and the like. The development of a single, narrow type of reading ability should be guarded against, and a rather well-rounded, many-sided reading activity should be brought into play.

Prepare your questions and plans for testing in advance so that no time will be lost. Scatter questions promiscuously among the class members rather than call upon volunteers. The reproductions should be short and brisk—just sufficient to convince you that the pupils have grasped what they have read. In order to assist the pupils in covering as much reading matter as possible, a definite

preparation may be made consisting: (*a*) of thought preparation, or (*b*) of word preparation, or (*c*) of both. The thought preparation should consist of such an introduction by commentary or by the question-answer process as will arouse interest and enlist the attention of the pupils. This preparation should never be long. For the word preparation, the teacher should select such words as in her judgment would be unfamiliar to the pupils, and should present them briefly, explaining their meaning. The preparation—both thought and word—may be abridged or even omitted when the material is such as to give no difficulty. In no case should the preparation occupy more than five minutes of the thirty assigned to the exercise.

Directions to pupils—Point out to the pupils the advantages of rapid efficient reading. Make them feel the need for such training by awakening in them the consciousness of their present slowness and inefficiency. Let them understand that in the measure in which they enter earnestly and enthusiastically into the undertaking, just in that measure will they reap results.

Each pupil should keep a chart of his daily performance, and a complete chart of the daily class performance should be displayed in the classroom. It is desirable that the directions to pupils given by each teacher concerned in this investigation be substantially the same. The following points are suggested indicating the nature of the direction. Literal adherence to them is not required. Their spirit, however, should be maintained.

Carefully direct them where to begin the assignment of the day. See that they all begin at the same time and at the same place in the text. Say in substance: "Read it as fast as you can. I want to see how much you can read in two (or three) minutes. But remember that I am going to ask you to tell me about what you have read so do not skip anything. Try to read faster today than you did yesterday." See that the pupils have a pencil at hand and direct them to stop reading at once as soon as you say "stop." Direct them then to mark the end of the line which they are reading when told to stop. Pupils may now reproduce what they have read as indicated above. In a similar manner, reading and reproduction are to be continued till the end of the thirty minutes assigned.

As part of your preparation for the exercise you will be expected to know the average number of words per line in the matter which is being read and the number of lines per page. Or better still, record in the margin of your book the number of words opposite each line as far as you think the fastest one will read. Pupils will report the last line which they read and you can record the number

of words read. Each pupil should figure out his own score and should immediately enter it upon the chart, which will then serve as a record of his daily progress in silent reading.

Materials used—Readers best suited to Silent Reading words were selected from those available in our stockroom. (Bibliography at the close of the article indicates the books used in each grade.) These books were carefully selected beforehand because they contained the best selections for thought work. Each pupil was supplied with a card upon which to keep a record of the number of words read per minute each day—and a sheet of squared paper upon which to make a graph each day showing the number of words read. Then each teacher was supplied with a large sheet of cross-section paper which she fastened to the wall in her room, upon which she made three graphs—one, showing highest number of words read per minute by any pupil; one, showing the lowest number of words per minute by any pupil, and one, showing the average number of words read per minute by all the pupils. The teacher also kept a record of the selection read each day.

This work was carried on for exactly sixteen days. On March 9 the day following the close of the period, Picture Supplement Test 2 was given to all of the pupils participating in this work.

TABLE 1. Distribution of Pupils by Grades Taking Burgess Picture Supplement Test 1 Before the Training Period

Scores in Burgess Scale	Pupils in Grades					Total Number of Pupils	Per Cent Making Each Score	Per Cent Burgess Standard
	4	5	6	7	8			
2								1−
8			2			2	1.5	1+
14	1	2	1	1		5	3.7	3
20	1	1	0	0	1	3	2.2	4
26	1	0	3	5	1	10	7.5	6
32	3	4	2	8	4	21	15.8	8
38	8	5	4	6	2	25	18.8	10
44	9	4	8	4	0	25	18.8	11
50	6	6	4	1	3	20	15.0	12
56	4	2	4	1	1	12	9.0	11
62		3	1	1	1	6	4.5	10
68		2	0	1		3	2.2	8
74			0			0	0.0	6
80			1			1	.8	4
86								3
92								1+
98								1−
100								
	33	29	30	28	13	133		

Median 38.24.

TABLE 2. Distribution of Pupils by Grades Taking Burgess Picture Supplement Test 2 After the Training Period

Scores in Burgess Scale	Pupils in Grades					Total Number of Pupils	Per Cent Making Each Score	Per Cent Burgess Standard
	4	5	6	7	8			
2								1−
8								1+
14								3
20			1			1	.8	4
26			0			0	.0	6
32	1	2	0		1	4	3.0	8
38	4	3	1	1	0	9	6.7	10
44	2	2	2	5	0	11	8.2	11
50	2	5	2	1	2	12	9.0	12
56	6	1	3	5	2	17	12.8	11
62	5	1	5	4	0	15	11.3	10
68	5	7	3	2	0	17	12.8	8
74	5	1	1	2	1	10	7.5	6
80	1	3	4	0	0	8	6.0	4
86	1	0	3	2	1	7	5.2	3
92	1	2	3	2	2	10	7.5	1+
98	0	1	0	2	4	7	5.2	1−
100	0	1	2	2	0	5	3.7	
	33	29	30	28	13	133		

Median 61.2.

A comparison of the results of these two tests shows that 83.4 per cent of the pupils did not score above 50 on the first test, while in the second test this number was reduced to 27.8 per cent. Only 16.8 per cent of the pupils exceeded the score of 50 in the first, while 72.2 per cent exceeded a score of 50 in the second test. This is a wonderful gain in speed. The median score on the first test was 38.24; in the second test the median was raised to 61.2.

Figure 1 compares the scores made in each of the two tests with the standard set by the Burgess scale. This graph shows very plainly that the greater per cent of the Lawton pupils were very slow readers when the P. S. 1 was given. When P. S. 2 was given conditions had been reversed and the greater per cent of the pupils exceeded the score of 50 the median point set by Burgess scale. The median score made upon P. S. 1 was 38.24; upon P. S. 2 was 61.2. A study of the graph indicates a more even distribution of scores in the second test than in the first test.

Table 3 is a compilation of the total number of paragraphs read by each grade, number of paragraphs correctly marked, average number of paragraphs read per pupil, and the percentage of gain made in the second test over the first test, both in speed and accuracy. This

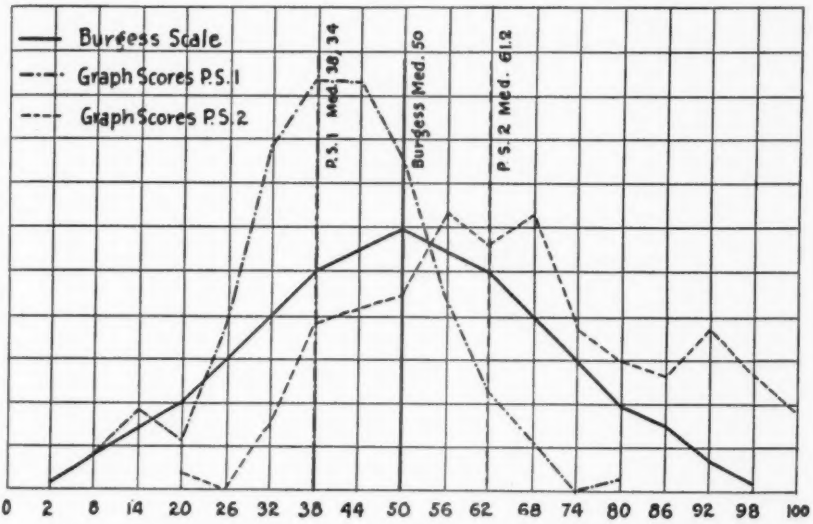

FIG. 1.—*Comparison of Scores Made in Two Tests with Burgess Scale*

table shows that there was an average gain of 58.7 per cent in speed and a corresponding gain in accuracy of paragraphs marked of 56.6 per cent. These results bear out the contention of O'Brien that comprehension will keep pace with the speed of reading.

TABLE 3

Grades	Number of pupils	Paragraphs read P. S. 1	Paragraphs read P. S. 2	Average per pupil P. S. 1	Average per pupil P. S. 2	Gain per cent	Paragraphs right P. S. 1	Paragraphs right P. S. 2	Average per pupil P. S. 1	Average per pupil P. S. 2	Gain per cent
4	33	245	368	7.4	11.1	50.2	186	287	5.6	8.7	55.4
5	29	245	396	8.4	13.6	61.6	203	287	7.0	11.0	57.1
6	30	275	417	9.2	13.9	51.7	237	364	7.9	12.1	53.1
7	28	245	410	8.7	14.6	67.3	219	361	7.8	12.9	65.4
8	13	128	215	9.8	16.5	68.0	121	198	9.3	15.2	62.5
Total...	133	1,138	1,806	8.5	13.6	58.7	956	1,497	7.2	11.2	56.6

Table 4 shows the number of pupils by grades for both P. S. 1 and P. S. 2 who did not equal the standard speed set by the Burgess Test. One hundred pupils who were below the standard speed on the first test were reduced to 22 on the second test. On the second test there was an increase of 20 pupils who made more than two mistakes.

This does not seem a serious matter when you consider the great increase in the number of paragraphs read and the number right.

TABLE 4

Grades	Speed Number pupils need drill upon speed		Accuracy Number pupils who make more than two mistakes	
	P. S. 1	P. S. 2	P. S. 1	P. S. 2
4	23	6	10	13
5	21	6	7	17
6	21	3	9	8
7	25	7	3	10
8	10	0	1	2
Total.	100	22	30	50
Per cent.	75	16½	22½	37½

Conclusions—Immediately following this special work in reading each teacher was asked to answer a series of questions on the work just done. The answers to the questions were calculated to summarize the results of this intensive period of silent reading work.

The following is a résumé of the answers:

Speed of reading has been greatly increased. With few exceptions, comprehension has increased with the speed. The controlled period has done much to concentrate the thought. A better attack for comprehension has developed. These results have carried over finely in a supervised period and to some extent in any study period. Emphasis may be placed upon thought getting without materially reducing the speed by the use of well-planned questions which should follow the reading.

Interesting stories, the subject matter of which is familiar to the children and those stories that contain much conversation are best for rapid silent reading. Detailed description cannot be read so rapidly.

Silent reading methods should be used regularly in reading, geography, and history. Four phases of the work are (1) getting the principal thought from the paragraph, (2) finding answers to definite questions, (3) topic name for paragraph, (4) reproduction.

Certain mechanical details, such as the development of new words and their pronounciation and meaning, must be cared for before silent reading begins.

In conclusion I wish to say that I am convinced that silent reading can be effectively speeded up in a short period of time, that comprehension need not suffer if methods of testing are used consistently. This controlled period has taught the pupils how to read faster and how to get the thought. It has inspired them to attack other reading material with vigor. It has made their studying more efficient.

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Reading and Language in the Winnetka Public Schools

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THE MOST important single "fundamental" which the schools are called upon to teach is reading. The mastery of the ability to read simple prose with rapidity and understanding is the necessary prerequisite to any kind of an education. Lacking this ability to read, the doors are closed to arithmetic (beyond the fundamentals), literature, history, geography, and science. Modern life with its stores, transportation systems, newspapers, and amusements assumes this ability to read as axiomatic. Our schools, responding to the general assumption with regard to reading, place considerable effort upon the teaching of reading in the first three grades, and frequently for the rest of the school course take the ability to read for granted.

The modern trend in our schools has been away from oral reading, and toward much greater emphasis upon silent reading, in recog-

nition of the predominance of silent reading in after life. With this tendency there can be no quarrel, for it is eminently practical. But while the tendency is sound there are pitfalls to be avoided on either side.

In attempting to adjust the problem of the teaching of reading to the requirements of individual instruction in Winnetka, we have striven to keep the above facts in mind. Our problem therefore presents itself in this manner: (1) To satisfy the children's natural desire to read by supplying the mechanical elements, including, of course, phonics; (2) to review and expand these mechanical abilities; and (3) to supply quantities of simple reading material for both oral and silent reading, increasing in difficulty throughout the grades; (4) to base grade promotions upon both amount and quality of silent reading done; (5) to check the reading done: (*a*) For the story content and (*b*) to see that the child is master of the vocabulary. (6) To study the reading habits of the slower readers and supply corrective work throughout the grades, which shall tend to increase eye-span, eliminate lip-movements, and enlarge vocabulary.

In order to accomplish these six things, a certain technique has been developed which shall place the reading in consonance with the individual progress possible in other subjects. But in developing this technique we have not hesitated to profit by the work of others, and owe much to the reading experiments of Gray, Judd, and Buswell at the University of Chicago. For the sake of simplicity it would seem best to take up each of the points in its natural order.

Mechanics of reading—In the first grade the work varies greatly from room to room, because several methods are in use with a view to determining that which is best suited to individualization. In general, the children are introduced to reading by the story-telling method. The story is told first as a whole, then sentence by sentence as the printed text is presented. The entire group is usually started together, then divided as individual differences appear—first into smaller groups, and then as each individual acquires the ability of independent effort, he is allowed to progress at his own natural rate. In some of the rooms, means are being developed for speeding up this opportunity for individual activity, but it is as yet too early to report upon their success.

In the later grades, further emphasis is placed upon the perfecting of the mechanics of reading to the end that the children as they pass on into the higher grades may have mastered correct reading habits.

Beginning with the first grade, the children are encouraged to read as much as they will. A variety of simple books, suited to their varying reading skills are placed in each classroom library, and the children are urged to use them for both classroom and home reading. Comprehension is carefully checked by oral tests, oral reading with the teacher, and oral book reports to make sure that the child does not develop the habit of sliding over the more difficult words without comprehending their meaning.

In order that the habit of much fluent reading be firmly established, the grade promotions are based upon both the quality of oral and silent reading, and the amount of silent reading actually accomplished. A goal card for reading in the fifth grade is shown later, in which it will be seen how these points are emphasized.

Silent reading—Buswell's experiments at Chicago have served to substitute fact for assumption, with regard to much of the silent versus oral reading discussion. The correlations of eye-movement photographs with the reading voice, showed conclusively that after about the fifth grade the eye attains a permanently more rapid comprehension span than it is possible for the voice to keep up with. This proved that the retention of much oral reading above this point materially slowed up the natural reading rate. These experiments also demonstrate that the good reader is one whose eye moves rhythmically across the page, stopping or "fixating" for several short periods in each line, and seldom going back to reconstruct the thought. They showed, on the other hand, that the poor reader is one whose eye travels jerkily across the page, stopping frequently for relatively long fixations, and returning often to connect the thought or puzzle out disturbing intricacies.

In other words, good readers read in word groups; poor readers read in words or parts of words. The good readers naturally possess growing vocabularies, constantly enriched from the new contexts in which they meet old friends or new acquaintances. The poor readers, on the other hand, struggle with limited vocabularies and frequently are lost upon the highways or in the by-paths of a strange and unfamiliar language.

The best exercise for the good reader is plenty of reading; and, with some almost pathological exceptions, the best medicine for the weak reader is plenty of reading, provided it is simple enough to be suited to his capacity, and will tend to give him a heartening familiarity with the process of reading, and not leave him stranded as a derelict upon strange coasts.

Reading goal sheets—Our reading goals for each grade, therefore, demand that a number of books be read each year. From one to

three points is allowed for each book read and reported on, but the "points" are not over-emphasized. Goal cards in reading for the First and Second Grades, and a Fifth-Grade card, typical of the other grades, are reproduced herewith:

FIRST GRADE READING GOALS

EXPLANATION

WORD LIST

A "common word list" has been prepared from the words most frequently used in primers and first readers. These words are so thoroughly mastered that they are recognized instantly without sounding.

BOOKS

First Grade children read enough books to score 5 points. A primer scores 1 point; an average-sized first-grade book scores 2 points; an unusually long or hard one, 3 points.

READING POWER TEST

This is a test of a child's ability to read at sight new material made up of words from the common word list and of new words composed of the phonics he has studied.

ORAL READING TEST

Dean William S. Gray, of the University of Chicago, has devised the most successful test of children's ability to read orally, and has secured data from the tests of tens of thousands of children. When one of our children makes 31 points on Gray's scale, the average number scored by children at the end of the first grade the country over, he is promoted to second grade in oral reading.

CHILD'S GOAL SHEET

I.	25 common words learned	
	50 " " "	
	75 " " "	
	100 " " "	
	125 " " "	
	150 " " "	

II. Required Reading — 5 points.

Title	Points	Title	Points
1.		4.	
2.		5.	
3.		6.	

III.	a. Reading power test — phonics and common words	
	b. Oral Reading Test (Gray) 31 points	

Course begun.....192....

Promoted to Grade 2 Reading.....192....

.....

Teacher

SECOND GRADE READING GOALS

EXPLANATION

WORD LIST

A "common word list" has been prepared from the words most frequently used in primers and first readers. The list contains 266 words. Children have learned to recognize 150 of these at sight in first grade. Test I is a review of this 150. Test II carries the children through 200 words. Test III covers the entire list.

BOOKS

Second-grade children read enough books to score 20 points. One book scores 1, 2, or 3 points according to length and difficulty.

READING TEST

Before promotion to grade 3 in reading a pupil is able to read at the rate of at least 520 words in 10 minutes, and to answer three out of four questions on what he has read.

CHILD'S GOAL SHEET

I. Word list 1 (150) ..... | .....
Word list 2 (200) ..... | .....
Word list 3 (266) ..... | .....

II. Required Reading 20 Points.

Title	Points	Title	Points
1.	.....	9.	.....
2.	.....	10.	.....
3.	.....	11.	.....
4.	.....	12.	.....
5.	.....	13.	.....
6.	.....	14	.....
7.	.....	15.	.....
8.	.....	16.	.....

III. Gray's Oral Reading Test—47 points ..... | .....
Burgess Test—4¶ ..... | .....
Phonics Test ..... | .....

Course begun .....192....,
Promoted to Grade 3 Reading .....192....,

.....
Teacher

FIFTH GRADE READING GOALS

EXPLANATION

A credit of from 1 to 3 points is given for each book read. A fifth-grade pupil must make 30 points, of which 4 must be literature, 4 history, 4 geography, 4 science, and the rest chosen by the pupil, subject to the approval of the teacher. Promotion is based on the Burgess picture test and Gray's Oral Reading Test, which is given

after the required books have been read, and also during the school year to ascertain the progress made by the pupil. When the required books have been read and the minimum goal of 9 paragraphs in 5 minutes has been reached in the Burgess test, and a score of 48 points on the Gray Oral Reading Test, the pupil is promoted to the next grade in reading.

CHILD'S GOAL SHEET

Books read:

Title	Points	Title	Points
1.—Hist.		16.	
2.—Hist.		17.	
3.—Geog.		18.	
4.—Geog.		19.	
5.—Sci.		20.	
6.—Sci.		21.	
7.—Lit.		22.	
8.—Lit.		23.	
9.		24.	
10.		25.	
11.		26.	
12.		27.	
13.		28.	
14.		29.	
15.		30.	

Silent reading test—9 paragraphs in 5 min. .....

Course begun.....192....

Promoted to Grade 6 Reading.....192....

.....
Teacher

Space is provided in which to record the name of each book read, with provision for the teacher's "O. K." when she has established by a test that the book has been read with comprehension. That the reading may be varied, two at least of the books demanded for each year must be geographic in nature, two historic, and two in the field of science. After the silent reading goal has been achieved, the child must pass a form of the Burgess silent reading test with a score equal to the grade standard. In grades 1 through 5 the Gray Oral Reading Test is also demanded. The point requirements in reading, and the Burgess standard for the different grades, is as follows:

Grade	Points Required	Gray Oral Reading Standard	Burgess Standard (in Number of Paragraphs Read correctly)
I	5	31	.....
II	20	47	4
III	30	47	6 in 5 min.
IV	25	47	7 in 5 min.
V	30	48	9 in 5 min.
VI	30	.....	10 in 5 min.
VII	15 books by different authors	.....	12 in 5 min.
VIII	15 books by different authors	.....	13 in 5 min.

Room and school libraries—In the lower grades, each classroom is equipped with a small room library, from which the children borrow books. Instead of buying thirty readers for the grade—one per child—we buy thirty different books, suited to the age and grade of the children in the room, and the children use them in rotation. The children are also encouraged to bring in books of their own for the use of others in the class, and a loan library is created, which changes each year. A small appropriation each year serves to add constantly new titles to each room library making more alluring the feast of reading. The reading ability of any roomful of children naturally varies greatly, so in each room there will be found some books well suited to the grade below, and some mature enough for the grade above, thus catering to the reading ability of practically every child in the room. If a teacher finds that some child is an exception and can find nothing on her shelves suited to his needs, she may call upon any other teacher for the loan of the necessary books.

In the junior high school (limited to seventh and eighth grades) we have a school library, in which all of the reading books, reference books, and texts not required to be in the hands of the pupils for constant use are kept. Last fall (the first term in our new building) the teachers each gave voluntarily their free time to keep the library open for constant use, and now a program readjustment has freed one teacher to operate the library, and it is crowded all day with earnest workers, excused from their various classes to secure books, or to do necessary reading. The same money which would have gone into duplicate readers for these grades has been put into worthwhile fiction, donations have been received from parents, and the beginnings of a full and variegated library assembled.

At this point it may be well to emphasize a new departure in book buying, which is based upon a statistical check of use. When the ordinary school orders any title in fiction from a publisher or bookseller, without comments, the people who fill the order automatically pick out the cheapest edition to be found. Small type, cheap binding, and lack of illustrations typify such books. They sell at about 75 cents each. We have gone to the opposite extreme. We specify the editions which are printed in large type upon good paper; which are well and artistically bound; and wherever possible, those profusely illustrated in color. Such editions cost us to begin with from $1.75 to $3.00. But they circulate three or four times as much. The purpose of having a book in a school library is to have it read, and anything which will double or treble the circulating power of a book is worth considering. A statistical check of the comparative circulation of different editions of the same work made by the author in another school system, justified us in adopting this policy and our own experience amply confirms the finding.

Book reports—Where such a large and various amount of reading is done in a classroom, and it is desired that the children be checked up upon the quantity and quality of what they read, some device must be prepared. Three different devices are in use in Winnetka. The oral book report, the written book report, and the test. Each child is expected to present one or more oral book reports per term. These usually consist of a sketch of the plot, the description of a good scene in some detail, and perhaps the oral reading of some particularly interesting portion. Such a report takes not more than five minutes, and must be so given that it shows that the child reciting has read the book understandingly and at the same time interests the other children without telling them so much of the story as to kill their own desire to read the book. Many times several children who have read a book combine to dramatize a portion of it to stimulate the interest of others, and serve as their own "book report."

Some children enjoy writing a summary of their reading and are encouraged to do so; some delight to retell portions of the story in their own words, and this is also encouraged. But these three methods cannot possibly care for the vast amount of reading which is done. A short individual oral quiz by the teacher enabled many books to be checked as to familiarity with content, but was difficult to administer, because few teachers had read or could remember the hundreds of books which thirty different children would read and report on. This problem has been partially solved.

Testing for content—Graded book lists were first prepared, containing as many titles as were considered thoroughly satisfactory.

The titles on these lists were then divided among the grade teachers, each of whom assumed responsibility for preparing a set of questions upon the given books. Two types of questions were prepared for use in different ways. The first or oral type was in the form of a series of questions covering the important points of the book in such a way that they afforded almost an outline of the story, and phrased in such a way as to allow for but a single short answer—preferably one or two words. These questions were written upon 5″ x 8″ cards in hectograph ink, and then duplicated for each of the teachers. In testing any given child the teacher would not use all of the questions, but would select enough to satisfy herself that the child had read and understood the book. She would then be able to use an entirely or partially different set of questions for the next child who reported the same title. Several typical sets are here given to illustrate more clearly the method.

In the following two examples the question is asked the child orally and is so phrased that he can give but one right answer—which, for the benefit of the teacher unfamiliar with the book, appears in parentheses in this test.

Second Grade—The Cherry Tree Children (Mary Frances Blaisdell)

1. What was Polly Robin building in the cherry tree? (A nest)
2. What did the farmer make to scare Blackie Crow in the cornfield? (Scare crow)
3. What was Puff, the kitten, doing when Muff found her in the basket of hay? (Sleeping)
4. To what did Polly Robin invite the squirrels, ducks, chickens and all the robins? (To a concert)
5. Who went to school? (All good rats)
6. What came out of the green frog's mouth? (Water) (He was a sprinkler)
7. Where did Polly Robin go with her family after her nest was too small? (To the pine trees)
8. What was the worm which the chickens had? (Fire cracker)
9. Of what did West Wind make a nest for Speckle? (Leaves)
10. Where did the two squirrels hide their acorns? (In the scare crow's pockets)
11. Who rapped at the door when Papa Bunny was telling the story? (Jack Frost)

Fourth and Fifth Grades—The Story of Roland (James Baldwin)

1. Where were Roland and his mother living after his father's death? (Cave)
2. Where did Roland go to tell Charlemagne who he was? (To the feast)
3. How did Charlemagne honor Roland? (Made him page-feast in his honor)
4. When did Roland become a knight? (Battle with Saracens)
5. Name two things the king gave Roland? (Hector's sword and ivory horn)
6. After fighting long with the Knight of the Red Plume, Roland finds he is (Oliver—boy friend)
7. Roland goes to Far East through enchanted region to get what? (Remainder of Hector's armor)
8. Name two things he slew in Gardens of Falerina. (Dragon, siren of lake)
9. What good deed did Roland do in Ireland? (Slew sea monster—saved maiden)

10. When Roland became ill and lost his mind what did he do with his armor? (Scattered it through woods)
11. Where was he healed and given good clothing? (Charlemagne's camp)
12. What did Ganelon and Marceleus plot to do? (Kill Roland)
13. When Roland, in charge of rear guard, is set upon by Moors, how many are killed? (All)
14. When Roland is dying where does he hide his sword and horn? (Under his body)
15. What made Charlemagne turn around, come back and look for Roland? (Roland blew horn when all seemed lost)

The second type of questions are prepared to allow for written testing. Several forms of test are prepared for each book and mimeographed. The form of question used is one in which four possible answers are provided to a question or incomplete statement. One answer is right and the other three are wrong. The child is to cross out the incorrect statements. The order of the correct and incorrect answers is so alternated that chance does not favor any position. This form of test is one with which the children are familiar, and the thing that they are required to do—that is, pick one correct answer and cross out three wrong ones is always the same, so that the form of the test is no handicap. Samples of such tests are here shown. The correct answer is here italicized simply to illustrate the alternation of position.

White Fang—Form A

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. White Fang was born in a—House, *Den*, Tepee, Barn
3. His first master was—Kind, Gentle, Firm, *Cruel*
4. His Indian master sold him for—*Whisky*, Gold, Food, Clothing
5. His first white master compelled him to—Eat, Work, Sleep, *Fight*
6. He learned to—Despise, Hate, *Love*, Fear—his new master
7. Later he saved the life of his master's—Cousin, Wife, *Father*, Daughter

White Fang—Form B

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. White Fang's first master was an—Eskimo, White Man, *Indian*, Negro
3. He was taught to pull a sled by—*Boy*, Man, Girl, Woman
4. He was taken to the—Great Lakes, *Yukon*, Panama Canal, Labrador
5. He was almost killed while fighting with a—Collie, Mastiff, *Bulldog*, Airedale
6. He was saved by a—Doctor, Lawyer, Indian Chief, *Mining Engineer*
7. With his new master he went—East, North, *South*, West.

The Jungle Books—Form A

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. Who wanted to kill Mowgli?

Shere Khan, the tiger
Bagheera, the panther
Akela, the Lone Wolf

3. With what did Mowgli frighten the wolves and Shere Khan at the Council Rock?
   A gun
   The red flower
   A bow and arrow
4. Where did Hathi, the elephant, tell the story of "How Fear Came"?
   By the river
   In the field
   At the Council Rock
5. Who helped Mowgli to kill Shere Khan, the tiger?
   The priest
   Buldea, the hunter
   The Buffalo-herd and wolves
6. Who followed after Mowgli when he went to live with Man?
   Bagheera
   Gray Brother
   Baloo, the bear

The Jungle Books—Form B

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. Where did the wolves hold their meetings?
   By the trees
   In a cave
   At Council Rock
3. Where did the monkeys carry Mowgli?
   To the hill top
   To the Lost City
   To the Man pack
4. Who gave orders to let in the jungle on the village?
   Mowgli
   Kaa, the snake
   The panther
5. What did Mowgli finally do with the king's Ankus that he took from the white Cobra?
   He kept it
   He left it buried
   He gave it back
6. Who won the battle against the Red Dogs?
   The wolf pack
   The Bander Log
   The people of the village

Wonderful Adventures of Nils—Form A

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. In what language was it originally written? .....
3. Nils was changed into an elf because
   he tried to be dishonest with the elf he had caught
   he didn't study his Sunday-school lesson
   he went to sleep over the Bible
   he wanted to ride with the wild geese to Lapland
4. When the white goosie-gander was tired and thought of turning back, he kept on because
   he wanted very much to go to Lapland
   he was angry because Nils thought he couldn't fly
   Akka asked him to keep up with the flock
   the other geese were sorry for him and wanted him to stay with them

5. The geese and other small animals began to like Nils because
   Nils tried hard to help them in every way he could
   he was so small he couldn't hurt them
   Smirre Fox wanted to kill him
   he laughed at all their jokes
6. When the farmer heard how Nils had carried the squirrel's babies to her he was
   very angry that he hadn't caught Nils too
   glad Nils had brought the babies so he would have more squirrels
   ashamed of himself for keeping the squirrel in a cage
   sorry he hadn't seen Nils carrying the baby squirrels
7. The black rats had always been able to keep themselves in Glimminge Castle because
   they didn't eat as much wheat as the gray rats
   the old castle had such secure walls and so few rat passages that they could defend them easily
   the gray rats were satisfied elsewhere
   Herr Ermenrich, the stork, had a nest in the garret
8. The crane dance at Kullaberg was important for Nils because
   the cranes danced very beautifully
   all the animals became acquainted with Nils
   he was the only human being who had ever seen the animals play
   Smirre Fox was expelled from Skane, and swore revenge
9. When Thumbietot found the gray goose with the broken wing he pulled her wing
   to hurt her because he was jealous
   because he wanted to kill her so that the white goosie-gander would go away and leave her
   because he thought he could snap the bone back into place and mend her wing
   because she asked him to
10. Thumbietot was a pet name for
    the white goosie-gander
    Akka of Kabnekaise
    the leader of the crows
    Nils Holgersson
11. When Nils was taken by the crows to open the crock, he made fun of the birds and beasts whom he passed so that
    they would be angry
    they would remember that he had passed
    the crows would be teased
    he could find his way back

Wonderful Adventures of Nils—Form B

Name ..... Grade ..... Date .....

1. Who wrote the book? .....
2. In what language was it originally written? .....
3. Nils jumped onto the white goosie-gander's back because
   he wanted to fly with the geese to Lapland
   he wanted to keep him from flying away
   he was afraid of the cows
   he was afraid of what his parents would say when they found him so small
4. When the wild geese saw Nils they wanted to send him home because
   he had been a human being and they were afraid of him
   they thought he would starve to death if he stayed with them
   they thought he was too heavy to carry
   they thought it was so cold he would freeze

5. When the boy and girl caught the white goosie-gander Nils followed them because
   he was afraid he would be lost without the goose
   he wanted to see where they were going
   he wanted to see the inside of the castle of Vittskovle
   he wanted to help the goose to escape from them
6. Akka asked the elf to change Nils back to his human form
   so that Nils would go home again
   because she wanted the white goosie-gander to go back to the farm with Nils
   because she wanted to repay Nils for saving the goose's life, and for other good things he had done
   because she was afraid that Nils would go to Lapland with her if she didn't
7. Akka saved Glimminge Castle for the black rats because
   the gray rats were afraid of the geese
   she poisoned the wheat the gray rats ate
   the black rats got back in time to defend the castle
   the gray rats followed Nils' piping and left
8. While the geese were flying in the blinding sea fog, the other birds called out directions to them so as to
   help them on their way
   mix them up
   persuade them to turn back
   warn them of danger ahead
9. Out on the island of the three foxes, the white goosie-gander limped over the open ground because
   he didn't know the foxes were there
   he was hurt, and was trying to get back to the flock
   he wanted the foxes to follow him and be killed
   Thumbietot had thrown a stone at him
10. The crows wished to open the earthen crock because they believed that
    there was food inside
    they were simply curious
    Smirre Fox told them there was silver money in it
    there was something to drink in it
11. The farmer was kind to Jarro, the wild duck because
    he wanted to use him to fool the other birds
    he was kind to all living things
    he wanted a playmate for his baby
    his wife was sorry for the wounded duck

It will be seen that these tests, while probably none of them perfect, will allow for a rapid determination of the child's familiarity with the story which he has read. They are not presented as finished product, but as examples of the manner in which we are attempting to meet the problem. The questions are constantly being revised and improved, and to this end a careful record of the responses to each question is being kept. On a basis of this record, we hope to make them clearer and more understandable, while retaining the simplicity of administration and correction.

Remedial reading groups—Despite the careful attention of the lower grade teachers, a few slow readers still manage to creep up into the upper grades. Some of them seem to possess an almost uncanny ability to glean the "story" element from the page, while baffled by

the maze of unfamiliar words. The glibness with which they can tell the story in detail is often deceptive—especially to an inexperienced teacher. Of course this slowness is usually revealed in the Burgess test—and a recent study which we have been making indicated a close correlation between immature reading habits—that is, bad eye movements, as described by Buswell, and a low score on the Burgess test.

As a result, we have been organizing small special groups among the children in the upper grades with low reading scores, and offering various forms of corrective work. Each individual in such a group is personally analyzed to determine if possible what is responsible for the difficulty. Many times it is found to be an incapacity to analyze words into component parts, which can be aided by phonic drill. Sometimes slow recognition may be aided by a recognition drill. We are preparing in our print shop a series of flash cards, carrying words, groups of words and phrases for drill in group associations, for the purpose of attempting to lengthen the recognition span.

A large part of the difficulties are intimately connected with vocabulary deficiencies, which many times are traceable to home environment. Words which do not play a part in the conversation with which the child is surrounded do not function when they are encountered in silent reading. We are attempting to remedy these deficiencies in small somewhat homogeneous groups which meet for vocabulary drill, and discussion and analysis of the words encountered in the reading assignments of the content subjects. Many times words which prove stumbling blocks have been used in oral class discussions by other children to whom they were familiar, and have been passed over by the regular classroom teacher, who had no means of knowing what proportion of the class understood the usage. The child who did not understand, carefully disguised his ignorance, and prayed that he might never be exposed. We are gradually overcoming this reticence, and encouraging children to demand an understanding of the work which they are expected to read and discuss. Only by such an attitude is it possible to successfully determine the relative difficulty of the books in use, or the actual comprehension ability of the children. While the Burgess and other silent reading tests are undoubtedly an index to reading ability, they must never be assumed to be more than that, and the real check to efficient reading must come by establishing a coöperative and self-helpful attitude upon the part of the child himself.

Teaching language by the individual system—Very little that has not previously appeared in print in one form or another can be said about the Winnetka work in language. We present a brief sum-

mary for those who may not have seen previous statements with regard to the language work.

To make the operation of this individual work concrete, let us consider for a moment what you would find if you were to step into a fifth-grade room in Winnetka some morning when most of the children were studying language. You would find one child working on the latter part of his fourth-grade language work. Most of the children would be scattered through different parts of the fifth-grade work. If you were to watch one of these, you would see that he has before him a mimeographed practice book. He is seen to read first the development material on, say, "commas in series." He then practices writing sentences containing series, placing commas in their proper places, referring to the answers in the back of his book, and correcting his own work. After this specific practice in commas in series he takes a practice test. This is a part of his practice book and consists of a paragraph with all capitals and punctuation omitted; it requires knowledge of every element up to and including commas in series. He copies this paragraph in the correct form, and compares it with the correct copy in the answer part of his book. This correct copy is keyed to show in what elements the child is weak. A sample test and keyed answer sheet is reproduced herewith:

FIFTH GRADE LANGUAGE BOOK—p. 8.

Cumulative Practice Test—16-A

a walk in the woods

one day marys mother told her she might ask francess mother to let her go nutting the girls mothers packed a lunch for them and off they started it was a sunny october saturday the girls lived in winnetka illinois dont you think the childrens holiday was a happy one they met mr jones and he walked home with them. The girls brought nuts bright leaves and fall flowers.

Cumulative Practice Test—16-A—Answer Sheet

A Walk in the Woods.

7 7 7

One day Mary's mother told her she might ask Frances's mother to let her go

4 6 8 6 8

nutting. The girls' mothers packed a lunch for them and off they started. It was a

1 4 14 1 4

sunny October Saturday. The girls lived in Winnetka, Illinois. Don't you think

12 11 1 4 5 13 5 1 4 9

the children's holiday was a happy one? They met Mr. Jones and he walked home

15 3 4 10 2 6

with them. The girls brought nuts, bright leaves and fall flowers.

16

Analysis·

Goal 1....4 times.	Goal 9....1 time.
Goal 2....1 time.	Goal 10....1 time.
Goal 3....1 time.	Goal 11....1 time.
Goal 4....6 times.	Goal 12....1 time.
Goal 5....2 times.	Goal 13....1 time.
Goal 6....2 times.	Goal 14....1 time.
Goal 7....1 time.	Goal 15....1 time.
Goal 8....2 times.	Goal 16....1 time.

If he finds that he has forgotten his apostrophe for contractions (9), he turns back to section 9 of his practice book and practices on that and on each other error that he has made, and then asks the teacher for a test. This test is another form of the practice test. After taking the test, he hands it to the teacher for correction. The next morning she returns it to him with all the errors marked. He turns back to his practice book and practices specifically on each point missed, and then gives himself a second form of practice test which he finds in his practice book. After correcting this, he asks for a second form of the regular test. If he gets it all right, he is marked O. K. in this topic in his "goal book," an abbreviated course of study stated in terms of specific achievement and placed in the hands of pupils. If he still makes errors, he repeats the first procedure. After receiving an O. K. in commas in series, he proceeds to the next goal, which happens to be "commas in address."

Moreover, it is sent home monthly in lieu of a report card. Parents therefore as well as pupils know exactly what has to be accomplished. Opposite each page of goals is a page of explanation to the parents. The language page of the fifth-grade goal book looks like this:

FIFTH GRADE LANGUAGE GOALS

Fourth Grade cumulative review — test 1	
Fourth Grade cumulative review — test 2	
13. Simple Possessives	
13a. Tricky Possessives	
14. Plural Possessives, boys'	
15. Plural Possessives, children's	
16. Comma in series	
17. Comma in address	
18. Comma—yes, no, oh	
19. Simple Quotation	
20. Exclamations	
21. Capital for Deity	
22. Paragraphs	
Use of Dictionary	

Course begun.....192....

Promoted to Grade 6 Language.....192....

.....
Teacher

During the last year we have been preparing other practice work

in language, presenting the teaching material in a direct rather than a "correction of error" form, and hope during the spring term this year to put this new material into classroom groups and parallel with the "correction of error" material. In this way we hope to obtain statistical evidence as to the relative desirability of the two methods of presenting the language elements. This material is not yet in such shape that we consider it ready for publication.

CHAPTER VI

Remedial Work in Reading

Helen Bass Keller
Grace M. Fernald
Elda L. Morton

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CHAPTER VI

Remedial Work for Non-readers[1]

HELEN BASS KELLER and GRACE M. FERNALD
University of California Southern Branch

AMONG the various types of poor readers probably the most striking are those of normal mentality who, after one or more years of instruction have practically no ability to recognize the printed word, and who profit very little by intensive application of the usual methods of instruction in reading. In the diagnosis of individual cases brought to our attention we have found this type to occur not infrequently. For a time, remedial work with other types of poor readers was set aside so that we might concentrate our efforts upon securing accurate and reliable data, and eventually a teaching method for these non-readers.

Characteristics of non-readers—The subjects diagnosed in our work have been, in many instances, strongly motor. Several have possessed exceptional ability in drawing and handwork; one who was talented in music played the piano with unusual skill. These children seem to have made no association whatever between sounds and their printed symbols, though they have no difficulty in repeating sounds or words after the teacher gives them. Most of the non-readers lack confidence in themselves, evince no interest in reading, are unable to concentrate, and seem nervous and unstable in every way. Due to months of practice, they have developed a tendency to guess at words, to memorize sentences and stories, and to use many other means of camouflaging their deficiency.

CASE HISTORY

The following typical case is described in detail as a means of illustrating concretely the steps in the diagnosis and in the remedial work:

Boy M. Chronological age—8 years 6 months
Mental age—9 years
(Binet-Stanford Revision)
I. Q.—106
Grade—Low second

[1] This article is a continuation of a similar report which appeared in the *Journal of Educational Research*, December, 1921.

M attended public school two years and six months. His teacher reported that he was totally unable to read with his group. He was nervous, unable to concentrate, and lacked interest in everything except handwork, in which he excelled.

His mother reported that she could not help him at home because of his unwillingness to work. She was advised to have his tonsils removed but had delayed doing so. While his attendance in school had been somewhat irregular, he never had been absent for a long period of time.

His report card bore unsatisfactory marks in numbering, language and dramatization, reading and phonetics, writing and spelling.

He showed a mischievous playful spirit during the first few days in our room and was indifferent as to his failure in his school work.

Before the remedial work was begun a record of his reading accomplishment was secured by the following standardized tests:

M. February, 1922

Gray Oral Reading	No score
Monroe Silent Reading Test 1 Form 2	No score
Haggerty Reading Examination Sigma 1:	
Test 1	1
Test 2	0
Jones Vocabulary Test, Phonetic	4

Because of the remedial method to be used, a measure of his spelling ability was taken also, with the following result: Ayres Spelling Scale, Columns A, B, C, D—5 words correct; score 27 per cent; Second grade standard 94-99 per cent. (Fig. 1.)

Additional data were secured through the use of informal tests in reading and spelling. The following sentences were dictated to the subject and were written by him with crayola on a paper which had been attached to the blackboard (Fig. 2 on page 336):

Dictated—I see a cat. He wrote—I see a cat.
Dictated—I am a boy. He wrote—I na a loy.
Dictated—I like to play ball. He wrote—I o to po B.
Dictated—I can run. He wrote—I can rnu.
Dictated—I can see a girl. He wrote—I can see a ——.

M had a well-developed habit of spelling unfamiliar words letter by letter after which he guessed at them using the pictures as a cue. He spelled "chair" and pronounced it "table" since both objects were shown in the illustration and either word made a sensible statement.

We were still trying to break this habit of guessing at the pronunciation of unfamiliar words after two months' work on word

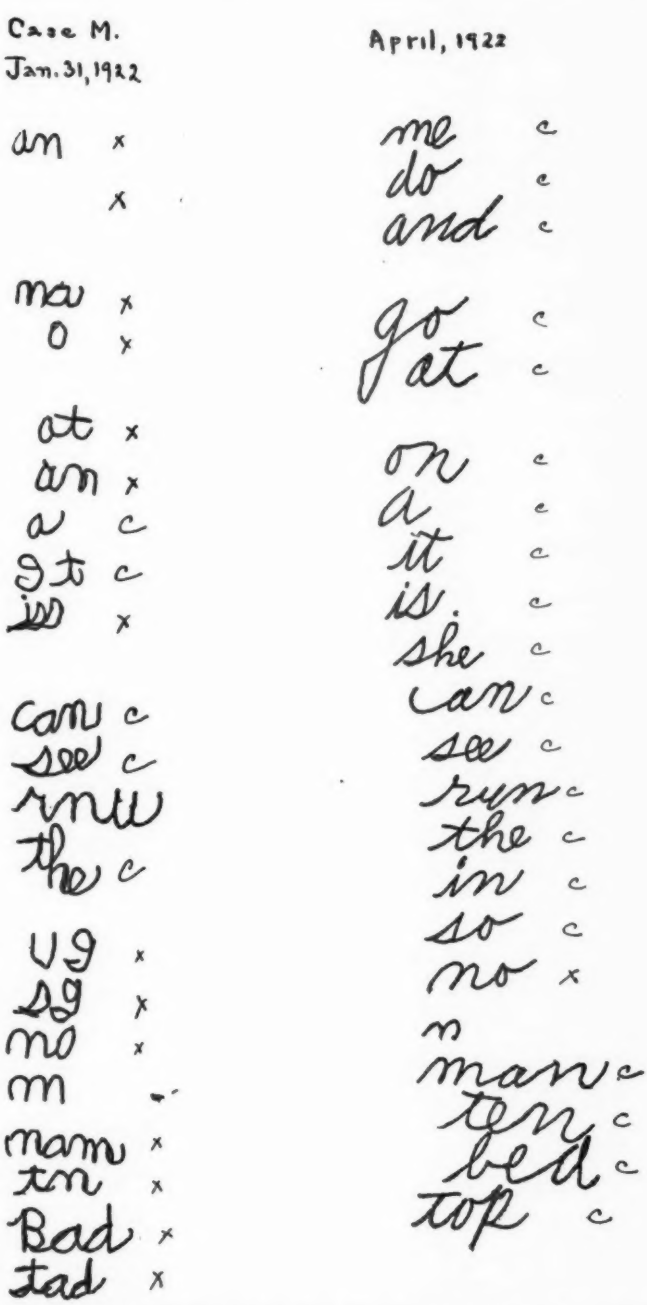

FIG. 1.—*Result of Spelling Tests on January 31, 1922, and April, 1922*

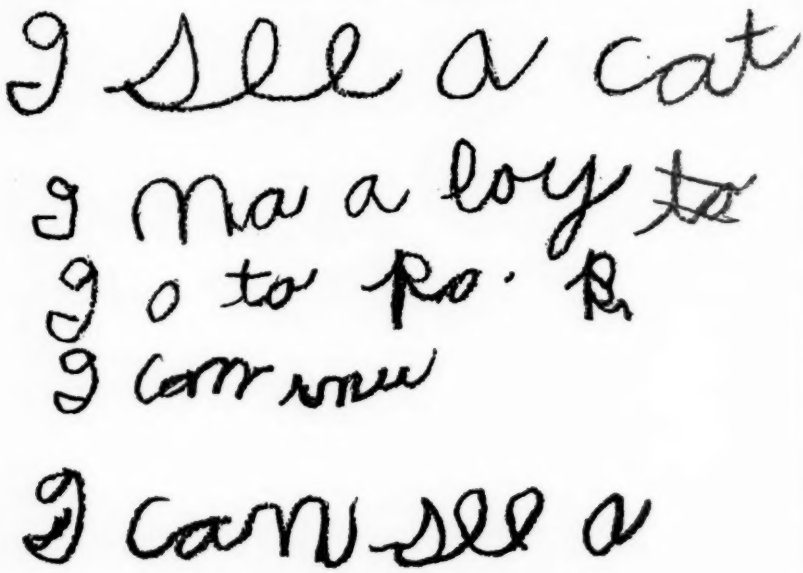

FIG. 2.—*Written by M from Dictation*

recognition had been given, and after oral spelling habits had been entirely broken up. The following is a partial list of words miscalled while M read a selection from a second reader:

For the word *country* he said *careful*
For the word *wanted* he said *went*
For the word *asked* he said *as*
For the word *our* he said *us*
For the word *send* he said *son*
For the word *answer* he said *ask*
For the word *great* he said *grew*

As a part of the diagnosis a cue to the child's chief interest was sought. M showed no inclination to read or write and for a few days seemed fascinated with the activities of the other children and of the teachers in the room. He was furnished with crayolas and a large paper and was asked to draw something. His first drawing was that of a stripped auto, or "racer" as he called it. This was the starting point for the work which preceded the formal reading in our remedial measures.

Teaching procedure—M was asked to write "racer" under his picture and of course replied that he could not do so. The word was written on the board for him by the teacher, M being told to trace the letters with the first and second fingers while saying the word, not the letters. After the tracing was repeated several times

the word was erased and the child was asked to write it on the board. He wrote "rnacer." This incorrect work was quickly erased and another opportunity was given him to trace the correct word, after which the writing was repeated with complete success. He wrote the word correctly several times, each time without the copy before him. He then wrote it with crayola above the picture which he had drawn. He next asked for the word "now." After tracing it twice, with two fingers, he wrote "na" and said, "I've forgotten the rest." After another tracing he wrote "naw" and after the next tracing he wrote it correctly. "How" was the next word he asked for. After the first tracing he wrote "h." The next trial was successful. No reason could be discovered for this peculiar choice of words.

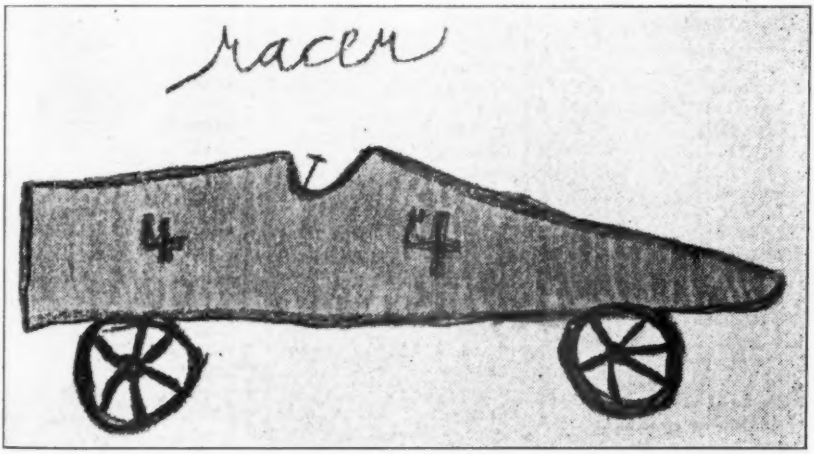

FIG. 3.—*M's Drawing, February, 1922*

His attention shifted many times during this first short lesson. He examined spots on the board, the teacher's ring, a notebook on the table, work which the other children were doing, rulers, erasers, chalk, and the like, asking "What's this for?" and "What's he doing?" and various other questions showing his natural curiosity and exhibiting a keen and alert mind.

This lesson was followed by others of similar nature. The tracing was omitted whenever the child felt that he could look at the written word and write it without tracing. Very often it was necessary to resume the tracing again.

Words Learned by M During Formal Reading Work, March–June, 1922.

(Figures indicate number of times each word was written before final recognition secured. * indicates words not recognized on re-test, March, 1923.)

a

accident....2
almost....6
along....1
afraid....6
ask....2
after....1
across....5
again....1
another....4
also....1
around....1
age....2
arms....2
away....9
asked....3

b

baker....5
blackberries....3
beans....1
birds....3
buttons....3
breakfast....3
broke....5
bowl....2
brown....3
baking....1
back....1
blossom....2
bright....5
before....2
bow....2
buttoned....2
blew....1
bought....1*
bite....1
broken....1
butterflies....3
black....2
boat....1
best....1
behind....1
busy....2
boiling....1*
both....1
breast....1
bonbons....1
better....1
believe....3*
bark....2
brought....3

c

cotton....4
cabbages....4
cried....2
carrying....4
children....4
couch....3
caught....4
cream....2
crash....3
catch....1
couldn't....3
care....3
came....1*
covered....2
carried....4
cover....2
careful....2
conductor....4
cents....1
costs....3*
carry....2
close....1
captain....2
chickens....2
chimney....1
cherry....2
could....1
changed....3
chased....2
crept....3
cheese....1
chance....1
curls....1

d

down....9
days....1
danced....2
ducks....2
drive....1
drink....1
dresses....2
dinner....1
dearly....1
dare....2
dooryard....1
deal....1

e

eyes....1
each....1
easy....2
eight....1
ever....1
else....2

f

feel....1
fern....1
floor....1
fast....1
face....1
front....2
filled....4
five....1
fine....1*
flew....2
fur....2
friend....7
fell....1
fun....1
fetched....1
farm....4
from....3
few....1
first....1

g

going....1
gather....2
gate....1
give....4
grew....4
gave....1
gray....2
games....1
gentle....3
great....2
growing....1
glad....1
ground....8
gnaw....3*
gay....2
giving....1

h

heard....3
hide....2
here....1
hollow....2
home....1
head....1
him....2
horse....1
high....4
hills....1
hopping....1
hour....1
honeysuckle....5
haste....1*
heart....3*
hard....1
holds....2
harm....4

i

I'm.... 1

j

jacket....6
just....2
jungle....1

k

kind....2
kitty....2
kitchen....2
kennel....2

l

large....7
lamp....1
lay....1
leave....3
left....5
lying....2
legs....1
lost....1
leaf....1
ladder....1
lawn....1
loft....5
locked....1
looked....1
laughed....3
lined....3
lamp....1

m

morning....3
may....2
much....2
month....4
Monday....2
many....3
must....3
mooley....1*
merry....2
more....2
motorman....2
motor....1
March....1
market....1
moonlight....2
mower....1
mama....3*
meadow....2
minute....1
mean....1

n

naughty....4
never....5
net....1
night....1
near....2
nose....2
nodded....4
next....1
not....1
nutting....1
noise....1

o

onions....1
one....1
out....1
oven....2
over....2
off....1
o'clock....2
other....2
once....2
outdoors....1
opened....2

p

pie....4
parsley....3*
planting....2
pulled....6
pillow....1
pole....1
play....2
picnic....2*
pile....1
pretty....2
perhaps....2
pleasant....3
pigeons....2
picture....3
porch....2
peas....1
pet....3
papa....1
pattering....1
people....1
pocket....1
piece....1
proud....1

q

quench....2

r

radishes....2
rest....1
rug....3
rapped....3
rolled....1
red....1
roared....2
robin....1
rock....2
replied....1

s

sewing....3
soon....4
something....2
spy....2
squirming....1
stile....1*
shan't....1
sister....1
sure....1
side....2
shed....1
story....3
since....1
stay....1
sure....1
shoulder....2
suffer....2
sheet....1
sound....1
sung....2
shower....2
strong....1
spread....1
sly....2
slung....1
stole....1
snug....1
squeezed....3
sick....2
shoes....2
some....3
sang....5
shed....3
scratch....6
slipped....3
Saturday....2
Sunday....2
stay....5
skip....2
sitting....2
speak....5
swim....1
snap....4
softly....2
sweet....2
songs....1
spring....1
sunshine....2
shone....2
stands....3
strong....1
same....1
shook....2

t

tail....2
there....3
thief....3
tried....3
these....2
tired....3
Tuesday....2
Thursday....3
tied....1

top	1	until	1	wide	4
trunk	3	used	1	world	2
thank	2			wire	1
three	1	*v*		water	2
time	2			waves	1
tap	1	very	2	windmills	1
turn	2	voice	4	wet	1
tugged	1	violets	2	warmer	1
tightly	4	velvet	2	wear	1
thin	1	vegetables	2	wakened	3
tall	1			won't	2
through	3	*w*		wonder	2
trotting	3			whole	1
trouble	1	with	4		
tracks	2	went	4	*y*	
they	1	white	3		
that	2	window	1	yellow	3
threw	1	Wednesday	2		
tiny	2	were	2*	*z*	
		which	5		
u		what	5		
		while	1		
under	5	wise	2		
		wind	1		

As soon as M had gained the ability to write words in this manner, work in formal reading was begun, and an accurate record of each lesson was kept in a notebook.[1]

Results of the remedial work—Work was begun in February, 1922, and was continued until June, 1922, averaging an hour a day. The child was brought from zero scores in reading tests to those of the average second-grade pupil. The word-recognition record shows that during his lesson periods he learned 368 words which he did not know at the start. There is no means of estimating how many more words he learned incidentally. In September, 1922, after five and one-half months of remedial work, M was placed in the high second-grade class, where he did better reading work than the average pupil. In February, 1923, five months later, he was promoted to the third grade. His teacher reports that he will probably cover a year's work by June, enabling him to enter fourth grade by next September. He will then be 10 years, 2 months old.

A re-test of the 368 words learned during his last year's reading instruction was given in March, 1923, nine months after his last individual lesson. It resulted as follows:

Test for Recognition of Isolated Words—March, 1923

Total number of words learned—February to June, 1922	368
Recognized nine months after they were taught	352
Not recognized on first trial	16
Per cent of recognition	95

[1] A detailed description of the teaching method is given in the latter part of this article.

The educational tests which were given in February were again given in June, 1922, at the close of the remedial work. The table below shows the results of these tests.

Educational Tests

Pupil M.	Age 8-6, February, 1922		Age 8-10, June, 1922	
Name of Test	Score	Grade Level	Score	Grade Level
Gray Oral Reading	0	.....	42.5	Second
Haggerty Read. Sigma 1				
Test 1	1	.....	13	Second
Test 2	0		5	1st-2nd
Monroe Silent Read				
Rate	0		61	Third
Comprehension	0	.....	9	Third
Jones Phonetic	4		117	
Ayres Spelling Col. A–D	27%		100%	

Thorndike McCall Read	March, 1923	Score-35	Third-Grade Level.
Haggerty Reading Sigma 1			
Test 1	March, 1923	Score-16	Third-Grade Level.
Test 2	March, 1923	Score-14	Third-Grade Level.

From the above record it can be seen that M's comprehension reaches the norm for the third grade in all tests. His comprehension is not comparable to his ability to pronounce words. He read orally the following paragraph from the Thorndike McCall Reading Scale, Form 2, mispronouncing only the five words in italics.

Read this and then write the answers. Read it again if you need to.

There are two *methods* by which one might make himself *acquainted* with anything made up of related parts; as, for example, a watch. He might take the watch apart, piece by piece, and while doing so study the details of its structure and the relation of its parts one to another. An operation like this, which begins with the whole and descends to the parts which compose the whole, is called *analysis*. The word means a taking apart or separating. Or he might begin with the parts, after some experiment and study, get an excellent *knowledge* of the watch by putting its parts properly together. An operation of this kind is called *synthesis*.

He was unable to define such words as relation, details, structure, descends, experiment, and compose, though he had pronounced them all correctly. He was of course unable to answer any of the questions which test the comprehension of the paragraph.

This bears up the statement made above, that his comprehension is not comparable to his ability to recognize and pronounce words. It must be noted, however, that his comprehension is *not* below the norm of the grade in which he is working.

The educational tests furnish a reliable record of M's progress in his reading but only those who observed him during the period of remedial work can estimate the complete change in his attitude toward his reading and toward school in general.

A TEACHING METHOD

Teacher's attitude—In beginning this work with the non-reader the teacher must first give up her various theories as to the value of learning letters and their sounds, and her belief in the necessity of phonic drills for all children. She must be mindful of the complexity of the problem and must be willing to bide her time.

Preliminary writing work—The underlying principle involved in this method is that the child learns to recognize words through the writing of them. Before any formal work in reading is done, therefore, three steps in preliminary writing work must be taken.

Among the non-readers one finds all degrees of ability to recognize words. A relatively small number of poor readers are at the zero stage, which is the beginning point in describing the method.

The writing work is usually begun at the point where the child's interest lies. If he shows an inclination to draw, his drawing work is used as motivation. He is usually anxious to write a label for his drawing. Work is sometimes begun, however, by asking the child what he would like to write. The success which is inevitable is sufficient motivation for many children.

Step 1. The word chosen is usually written on the blackboard by the teacher, but it may be written on paper with crayola in large blackboard-size writing. The word is pronounced by the child. He then traces the letters with the first and second fingers, after which he tries to write the word on the board without the copy before him. If he is unsuccessful he repeats the tracing, then writes again. It is not unusual for four, five, or even six tracings to be made at first but the child soon gains the ability to write with but one tracing. One lesson may be sufficient to reveal the fact that the tracing is unnecessary, and that the non-reader is able to begin with the second step of the preliminary writing work. A child is never asked to trace if he feels that it is not necessary, unless his performance shows that it is essential.

Step 2. Most of the children quickly learn to glance at the written word, pronounce it, then write it without tracing or without the copy. *The copy is never exposed to the child while he is writing.* After sufficient practice in this work the child is ready for the last phase of the preliminary writing work.

Step 3. The third step involves the ability to look at the *printed* word and then write it. This is the most difficult part of the work

and requires the longest time to perfect. At first the teacher makes the transfer to script for the child if necessary. After he has written the word successfully he identifies it in print. Proper nouns, titles printed in capitals, hyphenated words, and other irregularities should be avoided at first, since they complicate the problem.

Formal reading—As soon as the child is able to write any word which he sees in print he is ready for the formal reading work.

Before the reading of a story is attempted the child is tested on the difficult words in the first paragraph. When a word is not recognized it is written by the child after having been pronounced for him by the teacher. The child is not asked to work out the word by himself. Records show that this writing of the word enables the child to recognize it thereafter. Rarely does a child need to write a word more than upon three separate occasions.

The following is a copy of the first page of a reading notebook which was kept during the remedial work with the subject M described in the first part of this article.

Pupil M.

Word Recognition Record

Winston Reader Book I	1922					Retest Mar., 1923
Page 114	Feb. 23	Feb. 24	Mar. 1	Mar. 14	May 18	
cotton	4	0	0	0	0	0
tail	2	0	0	0	0	0
roots	4	0	0	0	0	0
under	5	0	0	0	0	0
with	3	0	0	0	0	0
Page 115	Feb. 24	Feb. 27	Mar. 1	Mar. 14	May 18	
morning	3	0	0	0	0	0
going	1	0	0	0	0	0
baker	5	1	0	0	0	0
may	1	1	0	0	0	0
accident	2	1	0	0	0	0
there	2	0	0	0	0	0
pie	1	1	1	1	0	0
Page 116	Feb. 27	Mar. 1	Mar. 14	Mar. 22	May 18	
garden	1	0	0	0	0	0
blackberries	3	0	0	0	0	0
naughty	4	0	0	0	0	0
went	4	0	1	0	0	0
down	3	0	0	0	0	0

FIG. 4.—*Copy of the first page of a reading notebook*

On February 23, 1922, the pupil did not recognize the word "cotton." The word was pronounced for him by the teacher. After pronouncing the word and studying it the child attempted to write it. The figure 4 shows that the child made four efforts before the word was written correctly; in other words, that four exposures of the word were necessary. "Roots" was exposed four times, "under" five times, etc. The second column shows that on February 24th, the words of the day before were again presented out of context, but in print. The zero after each word indicates that the isolated word was recognized, therefore was not written again by the pupil. It required four separate lesson periods and four writings of the word "pie" to secure recognition. This is probably due to the fact that he reverted to his old habit of saying letters.

Notice that the intervals between recognition tests were gradually lengthened, the first period being a day, the second two weeks, the third one month, and the last one year.

For a time the child recognizes the words which he has written and knows few others. Suddenly he seems to see similarities in words such as "pen" in "pencil" and "pen" in "happen." This is the beginning of the process which eventually enables him to work out the pronunciation of words which he has never seen before. When he has had considerable practice in this last stage he is usually superior to the average child in his ability to recognize new words.

No phonic drill is ever given and no conscious analysis of phonetic elements is necessary on the part of the child.

In addition to the problem of word recognition, those of rate of reading, comprehension, expression in oral reading, and others, must be given their proper emphasis. Pupils who have had serious difficulties with word recognition are deficient in these other phases of the work and show considerable progress in them as this work goes on. This method is not considered a panacea for all reading ills, however, and should not be adopted as such.

Study work—Children who have passed through the three steps in the preliminary writing work are able to carry on study work with very little assistance. They read until they find an unfamiliar word. If unable to work it out alone they ask the teacher or anyone near by to pronounce it for them, after which they write it on a study slip. When the child is tested on the reading work which he has prepared he presents his study slip and is given an opportunity to pronounce the words. The study slips are kept on file by the child and are used by the teacher in reviewing the words. One twelve-year-old boy wrote 363 words on his study slips between Feb-

ruary and June, 1922. In addition he wrote 317 words during his recitation periods. These words were recorded in the notebook kept by the teacher.

Group work—It is not difficult to use this method with any group of children who need remedial work in word recognition. The preliminary writing work can be done with a group. Each child in the group must be able to look at the printed word, pronounce it after the teacher, then write it *without the copy*. Except for the tracing this can be taught to the group as a whole. It is the basis for efficient spelling and should become a part of the regular schoolroom procedure.

General results—It is evident that the preliminary writing work gives practice in written spelling and equips the child with a study technique which is helpful to him in all future work. Writing always improves in form, and freedom of movement is gained though nothing is ever said about either in the course of the instruction. A decided improvement in enunciation is invariably noticed as an indirect result of the work.

The gain in the general attitude of the child is probably greater than the sum total of all the special abilities in the various school subjects. The self-confidence, the joy of accomplishment, and the anxiety to make further progress are the things immeasurable which result from such work as has been described above.

STEPS SUMMARIZED BRIEFLY

TRACING

1. Teacher writes word for which child asks, on board or on large piece of paper. (If paper is used the writing must be blackboard size.)
2. Child pronounces word and traces with first and second fingers.
3. Word is erased or covered.
4. Child tries to write word on board or on paper *without copy before him.*
5. Repeat the above steps until word is written correctly. Do not call attention to errors.

WRITING FROM SCRIPT

1. Teacher writes word as before, pronouncing it and underlining each sound unit. Do not divide the word.
2. Child pronounces the word slowly, looking at each sound unit as he pronounces it.
3. Child tries to write word, without tracing and *without the copy.*
4. Repeats the above process until successful.

(Words written by the teacher on large pieces of paper may be used over and over again by the children.)

WRITING FROM PRINT

1. Teacher pronounces printed word for the child.
2. Child pronounces it while looking at the word.
3. Child tries to write word without copy before him.
4. Teacher writes word for the child if he is unable to make the transfer from print to script.
5. Child writes again then identifies the word in print.

RECOGNITION OF WORDS WITHOUT WRITING THEM

1. Child works out new words in print on basis of familiar elements learned through former writing.

FORMAL READING WORK

After the words in a paragraph or story have been studied as described above, and are familiar to the child, he is given the privilege of reading without interruption. This is a part of every day's lesson and offers an opportunity for work on other phases of reading.

POINTS TO BE REMEMBERED BY THE TEACHER

1. Words are never spelled orally.
2. Words are never broken up into syllables in the writing. "Remember" is never written "re mem ber." The word is written in its natural form and the sound units underlined.
3. The child *never* writes with the copy before him.
4. Errors are never pointed out to children. Wrong forms are erased or covered without comment upon them.
5. Words written incorrectly are written correctly several times by the child before leaving them. Each writing is covered or erased before the word is re-written.

The Discovery and Correction of Reading Difficulties

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UP TO THE TIME when scientific investigations revealed the fact that oral and silent reading each require specific reading abilities, teachers frequently failed to understand why fluent oral readers, to all appearances "good readers," failed to do satisfactory work in content subjects such as history and geography. Today, however, we recognize the importance of definite training in silent reading, by which is meant the "Art of Study." We also recognize the possibility of ovecoming pupils' reading difficulties by remedial instruction following and guided by diagnosis.

The following steps may be taken to locate reading difficulties satisfactorily and accurately:

(1) Formal testing. A standard test will inform the teacher of pupils who are below the standard required for their grade. Intelligence test scores will determine the pupils on whom time may profitably be spent with remedial instruction. The mentally deficient child should be dealt with in a special room, rather than in a grade with normal children.

(2) Informal testing. The teacher should supplement the standardized test with informal tests of her own as a means of following up certain suspected difficulties. She should test carefully the oral reading of her pupils to discover whether their silent reading difficulties are due to insufficient mastery of the mechanics of reading.

(3) Diagnosis of both formal and informal tests. Careful investigation should be made of the nature of the errors and possible causes of each. Errors due to like causes should be located and their seriousness determined by comparative frequency.

(4) Grouping of pupils. Pupils should be grouped according to their reading defects. In this way each group may receive intensive work especially planned to eliminate the common difficulty.

The first remedial experiments were conducted with individual pupils during recitation periods so that accurate and detailed records could be kept. Because of this some teachers have come to associate remedial work with the use of highly specialized materials and the keeping of elaborate records. Believing it necessary to use class time for this intensive individual instruction, they have failed to see how they could find time for individual remedial lessons, for the necessary records of improvement, for keeping the other pupils profitably occupied, and at the same time covering their year's work in reading. As a teacher once stated, "I can see where the one pupil receiving remedial instruction will profit, but what of the 'ninety-and-nine'?"

The main purpose of this report is to describe a method of administering remedial instruction which does not lose sight of the "ninety-and-nine" and which is not too elaborate for the busiest of classroom teachers. The remedial work done in the Waukesha, Wisconsin, schools has been done largely, not in recitation periods, but in study periods, where group assignments have been of such a nature as to overcome the reading defects of pupils with common needs. The record keeping has been done almost entirely by the pupils and consequently teachers have not felt the work a burden.

When work is first presented to the group needing special work, it must be taken up in the recitation. After the children understand what is to be required of them, however, they can continue work independently, coming to the teacher only for correction and checking of work. In this way class periods may be used for the presentation of the new work of the grade and for *preventive work* and the development of new reading abilities, rather than for the remedying of defects acquired in previous grades. When primary teachers realize that the teaching of reading is preventive, leading to the formation of correct reading habits from the start we shall find much less need of remedial work in our upper grades.

The cases about to be described deal with common reading defects which have been overcome in group instruction administered in the majority of cases in the study period. The absence of elaborate records is due to the fact that they are not required of the Waukesha teachers. Those which are included, however, show growth which has been encouraging to both teachers and pupils and which has given the writer confidence in recommending the remedial measures employed.

I. Inability to Summarize Material Read

Much of the reading done in adult life involves material in which facts relating to a subject accumulate as a paragraph progresses. Moreover, in the schoolroom as well, the ability to summarize details is called for daily in the preparation of assignments in subjects such as history, geography, and hygiene. Without special drill in summarizing details pupils often retain only a small per cent of the points made in the paragraph and seldom reach a high state of proficiency.

The teacher who attempts to remedy this defect by asking questions which require the summary of details from material found in texts is frequently handicapped because of poorly written paragraphs. It is advisable, therefore, to collect good summary paragraphs from numerous sources, copying them, if necessary, from sources unavailable for daily use. A list of available books together with pages on which desirable summary paragraphs may be found should be kept for teacher and pupil reference. The value of the remedial method about to be described lies in the fact that the pupil can increase his per cent of retention of accumulating details with a minimum of teacher guidance and supervision.

Any paragraph meeting the requirements may be cut from magazines or old books and mounted, assigned directly from a text, or copied upon the blackboard and concealed by a curtain until it is to be used. The pupil in need of drill trains himself in the following manner:

(1) He reads the paragraph through once, silently.
(2) Without referring to the paragraph, he lists all the points he can remember after this one reading.
(3) He re-reads the paragraph in an attempt to locate points omitted, checking his list with the points of the paragraph.
(4) He re-lists the points without referring to the paragraph.
(5) He re-reads and re-checks, continuing his work on the paragraph until he has obtained a 100 per cent list.

For example, in the paragraph:

"All aspects of Nature doubtless react upon man to some extent. The factors, however, which affect most directly his mode of livelihood are: the character of the soil; the topography or surface features of the earth; the coast line; the climate; and the natural resources, notably fish, forests, minerals and water power."

What are the factors which affect most directly man's livelihood?

A 100 per cent accuracy list would be:

Factors which affect most directly man's livelihood:

1. Character of the soil
2. Surface features of the earth
3. The coast line
4. The climate
5. Natural resources
   - *a.* Fish
   - *b.* Forests
   - *c.* Minerals
   - *d.* Water power

The pupils of the Waukesha schools are overcoming their inability to retain and summarize accumulating details. Large numbers of summary paragraphs have been supplied them in mimeographed form. The teachers have coöperated by making this material available to all. They send to the office paragraphs which they have found in magazines or books not available to all teachers in the system, thus adding to the mimeographed collection already in use.

To supplement the daily work informal tests are prepared at the office and copies mimeographed for each pupil. In this way a check on the improvement of every child in the city is made possible. The following tests are typical of those given and are taken from a series sent out to fifth and sixth grade pupils during December, 1922. The pupils fold the test sheet so the horizontal crease will divide the question from the paragraph. With the question turned under in this way, they read the paragraph through once, turn to the side containing the question and list the points without returning to the paragraph. In this way the pupils' ability to summarize details after one reading is determined.

TEST 1

Name ..... School ..... Number of correct points .....

Date ..... Grade ..... Per cent retained .....

"Some insects are very lively in their sports. The ants, industrious as they are, have their times for play. They run races; they wrestle; they run after one another, and dodge behind blades of grass just as boys dodge behind trees and posts; and sometimes they have mock fights together. Does it not seem strange to think of ants engaged in these sports?"

In what sports do the ants engage?

TEST 2

Name ..... School ..... Number of correct points .....

Date ..... Grade ..... Per cent retained .....

"The schoolhouses of colonial days were small and uncomfortable, consisting usually of one poorly-lighted room furnished with long, backless wooden benches. The hours were long, the books few and uninteresting, and the discipline was severe. On the whole, there was a striking contrast between the school life of those "good old times" and that of the present day."

How did the schools of colonial days differ from the school you are attending today?

TEST 3

Name ..... School ..... Number of correct points .....

Date ..... Grade ..... Per cent retained .....

"The cool, pure air, with a preponderance of sunshine, the attractive scenery, the many beautiful, clear lakes, the cold, well-stocked trout streams, of which there are 5,000 miles in the State, the abundance of game, and the health-giving pine forests make Wisconsin a famous summer resort region. Every year in summer thousands of people from the cities and regions farther south seek the lakes and islands of Wisconsin to rest and recuperate."

Account for the fact that Wisconsin is a summer resort region.

TEST 4

Name ..... School ..... Number of correct points .....

Date ..... Grade ..... Per cent retained .....

"Did you ever stop to think of how this earth is covered with gold on a summer's day? The shining gold is scattered all over the meadow in big yellow dandelions. It is half hidden among the round green leaves of the marsh marigolds at the edge of the pond. It is scattered through the woods in bright yellow buttercups and tiny bits of it look out of the eyes of beautiful blue violets. Some of the bright tulips growing along the garden paths are as yellow as the sun at midday. Beside the garden fences are great beds of daffodils. Tiny yellow butterflies flit in and out among the flowers. It seems as though hundreds of tiny suns have dropped all over the meadow and woods."

What things have been mentioned that look golden on a summer's day?

TEST 5

Name ..... School ..... Number of correct points .....

Date ..... Grade ..... Per cent retained .....

"In the United States, which is the leading agricultural country in the world, several causes have combined to encourage this industry. Of these factors, the more important are the fertility of the soil, the variety of climate and other conditions of environment, the energy of the people, the encouragement lent by the government to scientific agriculture, and the unrivaled transportation system for marketing crops. Again, land has been very cheap in this country and wages have been high in other industries. It has therefore been difficult to get farm hands, and this has led to the invention of machinery by which one man can do the work of many. There is no country in the world where machinery is used so extensively in agriculture as in the United States."

What causes have combined to make agriculture a leading industry in the United States?

Figure 1 shows the improvement of two 6B pupils taking the above five tests. These cases are reported by Miss Marguerite Buckley.

While Test 5 shows no improvement over Test 4 in the record of Case 2, a comparison of the difficulty of Test 1 and Test 5 will indicate actual improvement in the per cent of retention, since the graph shows a larger per cent of retention on Test 5 (difficult material) than on Test 1 (simple material).

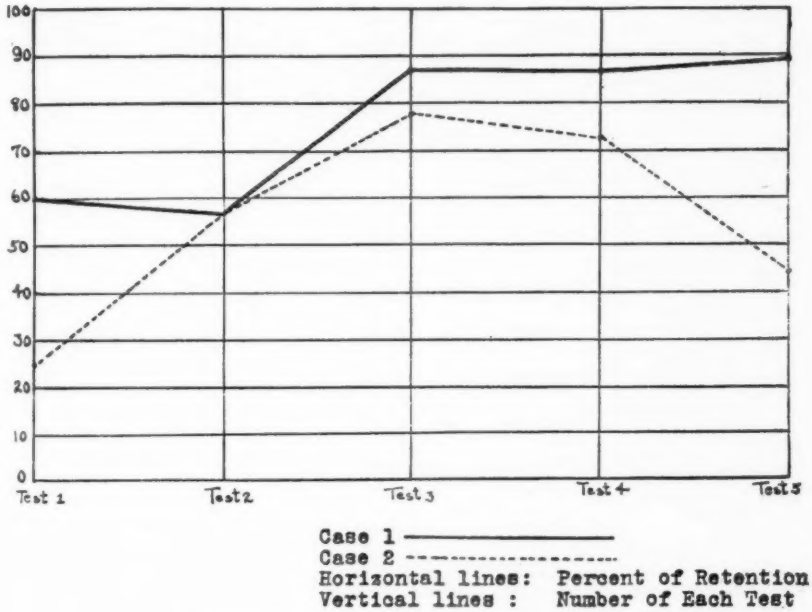

FIG. 1.—*Per cent of retention of two 6B pupils*

Miss Buckley found that pupils up to standard in general reading ability often failed in dealing with summary material because their power of concentration was not equal to that required for this intensive work. She therefore read summary paragraphs to her pupils, requiring them to organize the facts after one hearing. She found many pupils weak in this work, but she gradually trained her pupils to become skilful in organizing material of considerable difficulty. The extent to which this work aided pupils in summarizing material which they read themselves has not been scientifically determined, but it was evident in a number of cases that the ability to organize what is read was aided to no small extent by the ability to organize what is heard, since both require concentrated attention.

Figure 2 shows improvement made in less than one month by four 6A pupils as revealed by the first four of the above tests. These cases were reported by Miss Florence Esterly.

When asked to summarize briefly the method she employed in securing these results Miss Esterly stated, "In attempting to increase the per cent of retention I used the following devices:

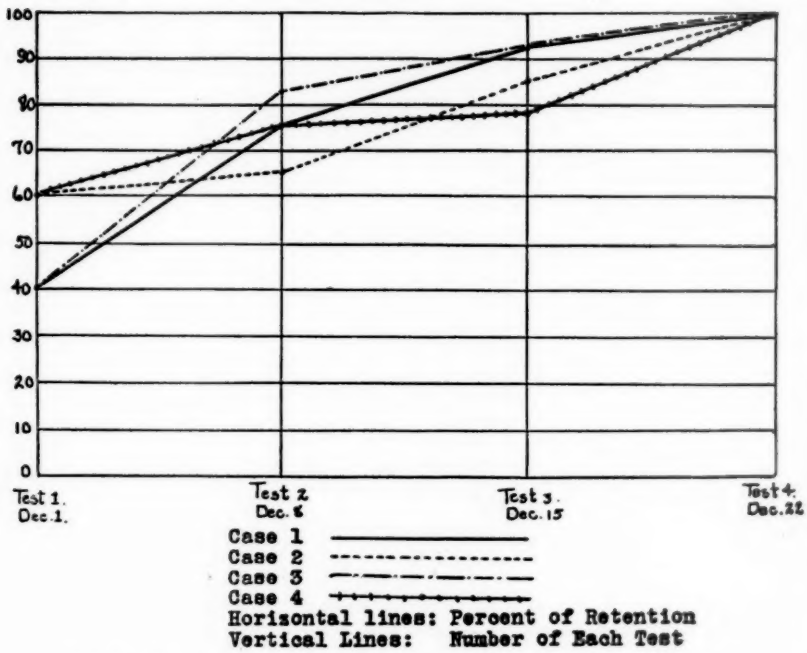

FIG. 2.—*Per cent of retention of four 6A pupils on summary tests*

1. Wrote paragraphs on the board and showed pupils how to enumerate the facts required to answer the question, calling their attention to the extent to which punctuation may assist in determining facts.

2. Showed pupils the importance and need of the adjectives accompanying many of the facts.

3. Drilled pupils in summarizing details by writing paragraphs on the board and requiring them to work independently.

4. Showed pupils where they were making serious mistakes.

5. Tested pupils on their ability to organize facts whenever we came to suitable material in our reading.

6. Handed out printed paragraphs for individual work."

The pupils of the Waukesha schools have made the following discoveries while working on summary material:

1. That *they* are able to increase their percentage of retention by practice.

2. That a slower reading rate is necessary when reading summary material than when dealing with material which they are reading to find a specific reference, to obtain a general view point, or to get new ideas about a familiar topic.

3. That it is wise to organize these points while they are reading, trying to picture the order of the heads, sub-heads, etc., and numbering the details in their minds as they proceed with the reading of the paragraph.

4. That concentrated attention is an essential factor in reading material which calls for the summarizing of details.

II. INABILITY TO DRAW VALID CONCLUSIONS FROM MATERIAL READ

No distinction is made by many teachers between the ability to answer specific or fact questions and the ability to answer thought questions. The latter is often neglected by the average teacher because she has not made a clear distinction between these two types of questions. A fact question may be answered in the exact words of the passage which has been read and *requires the ability to retain facts* in order to answer it. A thought question is not to be answered in the words of the passage, but *requires the use of facts contained therein* in the drawing of valid conclusions.

For example, in the paragraph,

"The streams were dry. The grass was brown, and the little plants were drooping and dying. Birds were flying about with their bills open. The people stood watching the clouds hoping for something."

For what were these people hoping?

The child's line of thought would be similar to the following:

Streams are dry when there has been little rain.
Grass is brown when there has been little rain.
Plants droop and die when there has been no rain.
Birds fly about with their bills open when they are hot and thirsty.
People were watching the clouds, and clouds bring rain.
Therefore, the people were hoping for rain.

While the paragraph does not state that the people were hoping for rain, a thoughtful reading of the facts in the paragraph leads the child to conclude that rain is the correct answer.

In attempting to correct this disability in slow pupils, the writer has found nothing which brings results more rapidly than the use of riddles. It is best to begin with very simple riddles which will require pupils not only to form conclusions but also to change them frequently while reading. For example:

It is large.
It has two eyes.
It has four legs.
You see it at the circus.
It has a trunk.
What is it?

A teacher about to assist a pupil weak in comprehension wrote the above riddle upon the board in reverse order, thus:

What is it?
It has a trunk.
You see it at the circus.
It has four legs.
It has two eyes.
It is large.

She then concealed it by a roller shade. When work was to begin she raised the curtain so that only the bottom sentence could be seen. The child read silently: *It is large.* He then listed for the teacher several possible answers. His list included: house, tree, mountain, city, man, farm, and automobile. The teacher then raised the curtain so that an additional statement could be read. After reading silently, *It has two eyes,* the pupil found it necessary to eliminate a number of his answers. He then added to his list: man, eagle, cow, elephant, and lion. The third statement was now exposed, *It has four legs.* The pupil found it necessary to eliminate again, but proceeded at the same time to add to his list: cow, elephant, lion, and horse. The exposing of the fourth statement required further revision of thought. *You see it at the circus.* The list was now greatly extended: rhinoceros, elephant, lion, horse, giraffe, and hippopotamus. The fifth statement, however, required the omission of all but one name. *It has a trunk.* The pupil then reached the conclusion that an elephant had been described. He had drawn a valid conclusion from the data before him.

After pupils have thus learned how to use this material, remedial work may be transferred to the seat work period by supplying pupils with riddles accompanied by the direction, "Write its name," and pupils may improve their thought work independently, requiring a teacher's time only for the correction of answers. In the upper grades riddles may apply to facts learned in geography, history, and hygiene, and this work will furnish an incidental review of these facts.

When material of this nature gives no further difficulty attention should be directed to passages similar to those found in the texts used in preparing daily assignments, an example of which was taken up in detail at the beginning of the discussion of thought work. These thought tests should cover a variety of subjects, should include all types of reading material, and should call for the drawing of valid conclusions from given data.

The Waukesha teachers are supplied with as many of these thought tests as they can use. The same collection of numbered "tests" is furnished each elementary grade teacher in mimeographed form. The numbers do not indicate the order of difficulty, but merely the order in which they were prepared. For this reason No. 115 in the collection may be less difficult than No. 9. Each teacher mounts the selections on oak tag slips and groups them according to difficulty for her particular grade. In this way she is supplied with material ranging from that which is simple enough for the poorest reader to

that which is difficult enough for the best reader in her room. The following are taken from this collection of thought material:

14.

"The barn owl has been called a night prowler. It lives near the abodes of man, and is often found in the neighborhood of farmyards, where it feasts on the mice which do much damage to the harvest fields and stored grain."

Is the barn owl the farmer's friend or his enemy? Why?

20.

"Jack sat on a stone wall. An old apple tree, covered with pink and white blossoms, leaned over the wall close beside Jack. Into one of the blossoms crept a fat, brown fellow, humming to himself. He came out a moment later, covered with yellow pollen, and flew away. Jack watched him as he crossed the meadow and was lost to sight."

What was it Jack had seen? How do you know?

40.

"Plants and trees breathe by means of their leaves. The part of the air taken in by the leaves is a poisonous gas which men and animals breathe out; the other part, which is useful to animals, is breathed out by the leaves. Men and animals breathe in oxygen and breathe out carbonic acid gas."

Do plants breathe in oxygen? How do you know?

84.

"I am a shepherd. I wander on high,
Across the blue pastures far up in the sky,
And the stars are my sheep, with fleeces of gold
That shine as they come from the heavenly fold."

Who is this shepherd? How do you know?

95.

"Sunshine and shower have gone out to tell the flowers that the sun is on his way from the south and will soon want to see them all."

What season do you think this is? Why?

122.

"I know a little insect that flies about in the summer night. He is not afraid of the dark. He carries his own little light with him."

Who is this?

137.

"He watched the sun go down and the gold sink from the mountains. The red died out of the west and the gray shadows crept out to meet the twilight."

What time of day was it?

As the questions are correctly answered they are checked off by the teacher and pupil on check sheets similar to the following, and progress is closely watched:

WAUKESHA PUBLIC SCHOOLS

Informal Thought Tests in Reading

Name_____ Chronological Age_____

Grade_____ M. A._____

Reading Test_____ My Score_____ Standard Score_____

1		26		51		76		101		126		151
2		27		52		77		102		127		152
3		28		53		78		103		128		153

Frequent drill in finding answers to fact questions does not insure the ability of pupils to pass a standard test containing thought questions. It has been found in the Waukesha schools, however, that much drill in answering thought questions requires careful comprehensive reading which permits pupils to be prepared to answer fact questions with great accuracy.

Figure 3 which follows represents the entire 3B grade taught by Miss Myrtle Lawler, teacher of the 2A and 3B grades of the Union School. Miss Lawler has spent little time on concentrated drill involving fact questions but much time on intensive work with thought material. The graph shows the record made by her pupils on the Thorndike-McCall Reading Scale, Form 3, given January, 1923. It must be remembered that this test measures the ability to answer fact questions rather than the ability to answer thought questions.

The grade norms for the Thorndike-McCall Scale are:

3 B	33.7
3 A	37.3
4 B	39.6
4 A	41.8
5 B	44.9
5 A	48
6 B	50.9
6 A	53.7

It will be observed that the grade median for this 3B grade was above that of a 5B grade and that every pupil was up to the standard required for his grade.

When asked to sum up her method of handling this material, Miss Lawler stated:

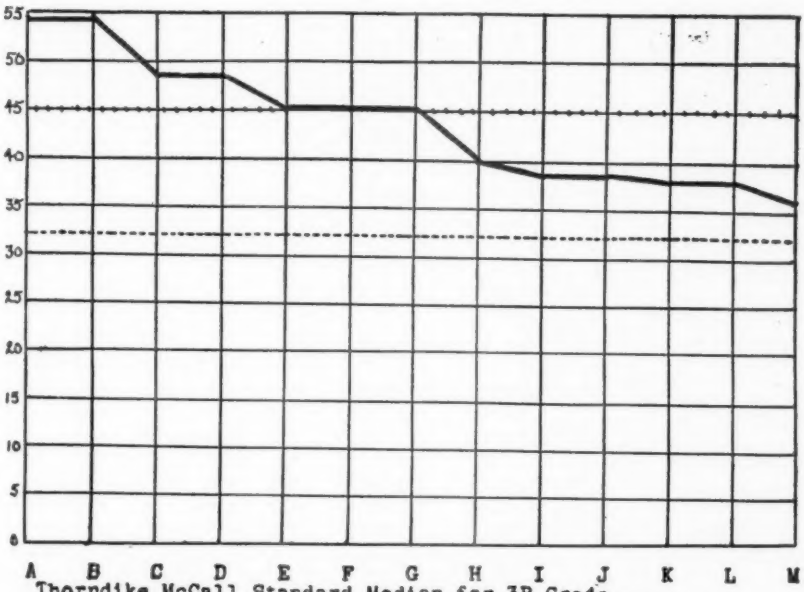

FIG. 3.—*Record made on Thorndike-McCall reading test by 3B pupils*

1. The mimeographed paragraphs were mounted and arranged in three groups according to difficulty.

2. Envelopes (supplied all teachers in the city) were used for convenient handling of the paragraphs.

3. Four paragraphs were placed in each envelope.

4. These envelopes were passed to the children, those poor in thought work receiving the more simple paragraphs.

5. When work in an envelope was completed, pupils placed the paragraphs and answers in the envelopes and returned them to me.

6. I corrected the work by means of a chart of answers and placed a child's name on the envelope if his work was correct. In this way no child repeated work in any envelope after he had once finished it correctly.

7. After each assignment we checked the numbers of the correct paragraphs on our check sheets.

A study of the intelligence scores of the pupils of this grade will reveal that the group was of average intelligence and similar to the majority of classes of third-grade pupils.

Intelligence Scores, 3 B Grade, Union School, October, 1922

Pupil	Rating According to Haggerty Intelligence Examination, Delta I			
	Score of Pupil	Haggerty Score at end of Grade 3	Age of Pupil	Haggerty Score for Pupil's Age
A	60	70	8½	58
B	50	70	7½	43
C	58	70	8½	58
D	45	70	7	35
E	49	70	8	50
F	50	70	9½	70
G	46	70	7½	43
H	53	70	8	50
I	41	70	9	65
J	46	70	8½	58
K	42	70	8	50
L	58	70	8	50
M	44	70	7½	43

III. Inability to Select the Essential Idea

Closely related to the summarizing of details is the selecting of the essential idea and supporting details, work more commonly termed outlining. A child is required not only to summarize points but also to decide which are the essential ideas and which the supporting details. This ability does not come without training, a statement which high-school teachers of history and English will readily verify. Dr. Woody,[1] in preparing his new standard test for the measurement of this ability, found high-school students very poor in naming simple brief editorials. He also found them unable to select the essential ideas in many of the paragraphs which he had selected for experimental purposes. It is evident that careful instruction, planned in steps according to difficulty, is necessary to overcome this defect.

The following brief, well-written topic, will serve the purpose of illustration of treatment:

"To supply their needs men draw upon the storehouse of the earth. Beneath the surface is found a wealth of minerals—coal, iron, copper, zinc, lead, gold, silver, and many others—all of which are used in hundreds of different ways. On the surface of the earth is a loose, earthy material which is known as soil. This makes possible the growth of all the important foodstuffs and the clothing fibers as well as the great forests which provide lumber for building purposes. Flowing over the lands are the rivers, which furnish water supply for cities and towns, fish for food, and power to turn the wheels of the

[1] These facts were given by Dr. Clifford Woody, Director of the Bureau of Mental Tests and Measurements, University of Michigan, in a lecture delivered at the National Education Association meeting, Cleveland, February, 1923.

mills. All these things with which man is supplied by nature are called natural resources, and they constitute the source of supply for all his necessities and luxuries."

STEP 1

The teacher must prepare a blank outline[1] similar to the following, and place it upon the board for class study.

I. Natural Resources
  A. Beneath the surface
    1.
    2.
    3.
    4.
    5.
    6.
    7.
    8.
  B. On the surface
    1.
    2.
    3.
  C. The rivers
    1.
    2.
    3.

Pupils are told to find the missing points by reading silently from their books the material from which the blank outline has been made. As points are located they are inserted into the outline by the pupils. This is done in class with all pupils contributing, criticisms being made which will assist them in doing this work independently.

STEP 2

The teacher erases the points filled in by the pupils, leaving the blank outline as it was originally placed upon the board. She assigns as seat work the filling in of this same blank outline, each pupil working independently.

STEP 3

Blank outlines of new material are placed upon the board. Pupils are required to fill them in as seat work without previous class help. These outlines are then brought to the next class and checked, the correction forming part of the work of the reading-class period.

[1] The writer is indebted to Dr. Ernest Horn for this suggestion. While visiting the University of Iowa Elementary School she saw the excellent results which had been obtained with the use of this device.

STEP 4

Pupils are assigned material for outlining without blank outlines or class help. This now becomes a valuable type of silent reading assignment.

Steps 1, 2, and 3 should form a part of the regular work of the third and fourth grades making it possible for the teachers of the fifth and sixth grades to use Step 4 without resorting to the remedial measures of the first three steps except in cases of unusually poor readers.

IV. Inability to Attack New and Unfamiliar Words

A striking example of remedial instruction administered to a group of boys with a common need is that of the "special group" taught by Miss Grace Watt, fourth-grade teacher of the Blair School. This last semester Miss Watt found in her room a group of five boys unable to read simple primer material. They scored zero on all reading tests administered, including the Haggerty Achievement Examination in Reading, Sigma 1, and the Monroe Revised Silent Reading Test, Form 2. They also scored zero in the Buckingham Scale for Problems in Arithmetic, due to their inability to read the problems. They were able to solve problems in class, however, provided they were stated for them by teacher or pupils, showing that the difficulty was one of reading rather than arithmetic. Their spelling was also the poorest in the room, practically zero. Mistrusting mental deficiency the teacher had these boys examined by the state psychologist who pronounced four of them to be of normal intelligence with a special reading disability.

As soon as their intelligence was assured these boys were placed in a group and for the past semester have been known as the "special group." They take considerable pride in the title and have been most happy in school work throughout the year. Once a day this special group meets for a twenty-minute period which is devoted primarily to the power of attacking new words.

An abbreviated phonic plan, worked out by Miss Carolyn Gove, one of the primary teachers of the city, has been followed with this special group. This plan includes the teaching of the following facts:

1. The consonant sounds.
2. The short vowel sounds.
3. The long vowel sounds.
4. The blends th, wh, ch, sh, kn, wr, gn, ck, qu, etc.
5. Three rules of phonics.
   (*a*) A vowel at the beginning or in the middle of a syllable or one-syllable word not ending in "e" is usually short, for example, *an, let, plenty.*

(*b*) An "e" on the end of a syllable or one-syllable word is silent and makes the vowel before it tell its name, for example, *late, home, fireflies.*

(*c*) When two vowels come together in a word the first vowel tells its name and the second vowel listens, for example, *goat, people.*

6. Irregular families not covered by the above rules.

ind—find, kind	ar—barn, farmer
ay—gray, play	old—cold, gold
ow—cow, flowers	aw—claws, crawl
ow—blow, snow	ir—girl, third
oo—moon, cool	ur—turn, curl
er—her, under	oo—brook, woods
or—horn, north	ang—sang, hang
ou—round, sour	ead—bread, spread
ing—sing, morning	air—hair, chair
igh—light, high	y—by, sky
all—small, ball	eigh—weigh, eight

This phonic plan was prepared in an attempt to reduce the number of facts to be memorized as a means of independent word recognition. The three rules alone were found by Miss Gove to cover from 45 to 50 per cent of all the words children meet in their reading.

With the above phonic facts as a basis of remedial instruction, Miss Watt began work with the "special group." When work was begun these boys, who had been neglected and passed on from year to year for some unknown and inexcusable reason, knew nothing of phonics, being unable to give the sounds of many of the consonants. Gradually the work in the above plan was presented and many words were worked out with the help of the facts listed. At the same time work was begun in primers, then in first readers, finally in second readers, and now these boys read any third reader either orally or silently with a satisfactory rate and comprehension.

Since the real test of attacking new words lies in *applying phonics to words of more than one syllable* Miss Watt has given much drill on such words. The following is typical of the words used in these drills: starting, forest, dreamland, garden, duckling, raindrops, fireflies, springtime, upstairs, and sunflower. At first the words were divided for the pupils by means of short vertical lines: *start | ing.* The pupils unlocked the word with the help of the family "ar" and the family "ing," and by sounding it in parts as indicated. The remaining words were unlocked as follows:

for|est	Family "or"; Rule 1
dream|land	Rule 3; Rule 1
gar|den	Family "ar"; Rule 1
duck|ling	Rule 1; Family "ing"
rain|drops	Rule 3; Rule 1
fire|flies	Rule 2; Rule 3
spring|time	Family "ing"; Rule 2
up|stairs	Rule 1; Family "air"
sun|flow er	Rule 1; Family "ow"; Family "er"

At the close of the semester after this intensive phonetic training and its application to reading in primers, first, second, and third readers, this "special group" took all the standard tests with the other pupils in the room. While not up to the fourth-grade standard the following tables will show that this group is on its way to normal reading ability. Had this remedial work been neglected they would still be in the unfortunate state in which they were discovered last year. The pride that these boys take in their present achievements is alone ample reward for the remedial work which has been given them.

Table Showing Record Made by Special Group on Thorndike-McCall Reading Scale

Form 3

Following Remedial Work

Standard Score for Grade 3B	Standard Score for Grade 3A	Frank	Abner	Harvey	Robert
33.7	37.3	39	38	36	35

Table Showing Record Made by Special Group on Buckingham Scale for Problems in Arithmetic (First Division)

Following Remedial Work in Reading

Standard Score for Grade 3	Standard Score for Grade 4	Frank	Abner	Harvey	Robert
39	45	51	51	45	45

Table Showing Record Made by Special Group on Iowa State Spelling List

Following Remedial Instruction in Reading

Standard Score for Grade 3B	Standard Score for Grade 3A	Frank	Abner	Harvey	Robert
73	79	80	66	72	88

This phonetic training has not only improved reading ability but spelling and problem work in arithmetic as well. By the end of this semester these boys will, without a doubt, pass satisfactorily all fourth-grade tests which will be administered in the school system. The writer would recommend the above phonic plan to any teacher

of the higher grades who finds pupils unable to read because of inability to attack new and unfamiliar words. In the higher grades the plan may be supplemented by the following rules:

1. W before "r" is silent. (Write, wrong, wrapper.)
2. G before "n" is silent. (Gnat, sign, gnome.)
3. K before "n" is silent. (Knife, knit, know.)
4. Ph has the sound of "f." (Elephant, telephone.)
5. C before "e," "i," or "y" has the sound of "s." (Cent, city, fancy.)
6. G before "e," "i," or "y" has the sound of "j." (Gentle, ginger, gypsy.)
7. When "ed" comes at the end of a word it adds a syllable and says "ed" as in red when preceded by "d" or "t." (Planted, loaded; replied, obtained.)
8. In words ending in "tion" or "sion" the accent falls on the next to the last syllable. (Graduation, promotion, notion, ascention.)
9. A vowel followed by a double consonant is usually short. (Summer, battle, bonnet.)

For further reports of experiments, which have resulted in recommendations and suggestions for remedial instruction, the reader will find the following references helpful:

Anderson, C. J., and Merton, Elda. Remedial Work in Reading; published in the *Elementary School Journal*, May and June, 1920, vol. 20, pp. 685-701, 772-791. A third article on this subject is published in the January, 1921, number of this Journal by the same writers.

Gray, William S. Individual Difficulties in Silent Reading in the Fourth, Fifth, and Sixth Grades; published in the *Twentieth Year Book of the National Society for the Study of Education*, Part II, pp. 39-53.

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Judd, Charles H. Reading: Its Nature and Development, Chap. V. Educational Monograph, University of Chicago Press.

Stone, Clarence R. Silent and Oral Reading. Houghton Mifflin Co. (Remedial work discussed in this book.)

Germaine and Germaine. Silent Reading. Row, Peterson and Co. (Remedial work discussed in this book.)

CHAPTER VII

The Teaching of Language

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CHAPTER VII

Teaching Language under the Individual Method

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THE FIRST YEARBOOK of the Department of Elementary School Principals was devoted to the technique of supervision and in that book, under the title "The Problem of the Individual," was an article on the fundamental facts of the method of Individual Education as worked out by Dr. A. H. Sutherland, head of the Psychology and Research Department of the Los Angeles Public Schools. This article gave the procedure of examining and placing the individual pupils, that of giving tests in the four types of reading—for accuracy, speed, comprehension, and reading number—and in the fundamentals of arithmetic. Classes have been in operation under this method for a year and a half at the Sixty-first Street School, the results being highly satisfactory to pupils, teachers, and principal. It has not been found necessary to use group intelligence tests as the materials in use soon cause the pupils to group themselves, the slower ones taking a little longer and requiring more teacher-time while those with higher I. Q.'s are able to do the work in much less than the prescribed time and require very little assistance. One super-bright girl completed the work of two years in less than one, finishing the sixth grade before she was ten years old. She is now doing very creditable work in the junior high school. She is well prepared because she covered every step of the work, omitting nothing. Others, because of absence or low I. Q.'s, will complete but twelve or fifteen weeks' work in twenty, but they are able to continue at their own rate of speed. As the former article dealt with the general outline of the work this paper will be concerned with the detailed plan of handling one study. Language study has been chosen as an example of this work.

Two distinct plans—There are two distinct plans for the language work, one being for Written Expression, the other for Oral Expression.

Definite goals—In the Written Expression an attempt is made to set up definite goals and to build ideals. Penmanship is studied not only at the time allotted to it on the program but also in all written exercises. In these exercises the penmanship is graded so that the pupil may build an ideal of legibility and neatness. Spelling is em-

phasized in order that the pupil may build an idea of word sense. In learning the thought-carrying power of the sentence he builds an idea of sentence sense. A certain amount of grammar and syntax is given, but only the minimum required for effective writing in these grades.

Testing and placing the pupil—Each child is carefully tested and placed where he will be able to work effectively and at the same time build on the foundation which he has. The individual results are very interesting. One boy, ten years of age, was doing fifth-grade work when he entered the class. When he was tested it was found that, on account of the carelessness and general illegibility of his work, he was unable to satisfy the requirements for the second grade. By beginning with very simple work, following the forms given to him, grading his own penmanship with the aid of a penmanship chart, criticizing his own papers and having them passed upon by a fellow pupil, and finally his passing the timed tests all built up an ideal in his mind of legibility, neatness, word sense, and paragraph construction. By the time he had followed this plan through the sixth grade he was able to prepare a creditable paper. Our foreign children have made quite rapid progress under this method.

Essential facts of the practice cards—There are four steps in each topic of the Written Expression. These exercises are printed on cards from which the child works. Card No. 1 has a model of the particular topic, a letter for example. He is required to copy this model correctly before he is given a test card on which is another model which must be copied correctly in the required time. The next card tests his ability to correct exercises that he recognizes as incorrect, developing the imagination. After this preliminary work he writes spontaneously, using the abilities which he has developed. In other words, the aim is to develop the abilities of the pupil rather than to convey information. These abilities include the preparation of a neat, legible paper with words properly spelled, the correct use of a sentence, and the clear expression of ideas in sequence. The pupil's progress means his increasing ability to express his ideas in correct words through good sentence forms which are legible to others.

Testing progress—Each child has a self-criticism card with simple directions for clear expression and directions for grading the work done. His tools are penmanship, spelling, capitals, punctuation marks and these as well as form, margins and neatness are carefully scored. The points of the composition are scored under these questions: (1) Does every sentence belong to my story? (2) Do my sentences follow each other? (3) Does my story have a climax?

After he is able to make a satisfactory score on the exercises he is allowed to take a timed test under the supervision of the teacher. If she passes on his product he checks the proper place on his progress card, confident that he is prepared to do the advanced work.

Individual method—The individual method is in force here as in other subjects. The pupil is tested and placed according to the results of his test with no reference whatever to his placing in other subjects. He competes with himself only and he thus has an opportunity to form his own mental habits and attitudes toward his work without being influenced by other pupils. In this subject as in others the pupils scatter, each progressing according to his own abilities. At the opening of the term the majority of the class may be working on the same level but, in a short time, they will all be working with different cards. As each child is tested individually and keeps his own score the teacher has little difficulty in keeping in touch with the work. She also keeps a record of his progress by recording the dates of his successful tests.

Criticisms—A criticism which is often made of this method is that supervision of such work by the teacher and principal is almost impossible. With the progress cards, however, it takes but a glance to see whether the pupil is passing successive tests in a reasonable amount of time. This progress can be noted in all subjects. There is no guess work about it. The pupil either passes his test, or he does not pass it: his card shows a record of progress or is blank. This method of supervision is much more feasible than the method commonly used—that is, the method in which no definite goals are fixed and no definite records of progress are kept. If a principal visits an ordinary schoolroom he can tell whether, to him, the manner in which a teacher presents a topic is satisfactory and the teacher and principal can indicate with a fair degree of accuracy those pupils who have a working knowledge of the subject. But there is no way of knowing how many pupils were giving their undivided attention to the matter presented. With a class of forty children no one can expect every one to give his attention all of the time, but who can say which child was paying attention at a given moment? If a child's mind wanders while he is working with the individual materials the work waits until his attention returns. If he has forgotten the directions they are still in front of him so that there is no guess work about his understanding what he is required to do. In a regular class there is always a question as to whether the teacher really taught what she tried to teach. For this reason children dread a test, having no assurance that they possess the knowledge on which it will be based. In the individual work the

pupil is not tested until he is sure of himself. He is the judge. He is not tested until he places his name on a list provided for that purpose and the tests decide the question finally.

A second question which is often asked deals with the amount of clerical work required from the teacher. This work requires more clerical work than that necessary in other classrooms. There is, however, less time required for preparation of material and no time is required for the preparation of examinations, so that the time required by the two systems is rather nicely balanced. The satisfaction of knowing just what one's pupils are doing would, however, offset extra work if such were required.

Progress rating—The rating of progress in Written Expression is not done blindly for each pupil. It is not progress in memorizing rules of grammar or in securing other grammatical information but it is progress in the ability to develop ideas and to express them simply and clearly.

Plan for the oral expression—The work of Oral Expression is quite distinct from the plan followed in the written work. Since the actual placing cannot be done as accurately and since the testing and records cannot be as definite, the work is done as a purely socialized subject. The plan is carried on in the third grade as well as in the fourth, fifth, and sixth. The pupil chooses the topic which he wishes to prepare from a given list. In the upper grades the topics are taken from the courses of study in history and geography. He may use the materials found in the classroom, he may bring materials to class, or he may make all of his preparation outside of school. When he has found all of the material which is available and is ready to give his report he consults his teacher and a period is allotted to him. When he gives his report he brings pictures, models, and perhaps other items which will make his topic more interesting. He also prepares questions for the class, making it a socialized recitation. When the report is finished the class scores the work according to certain standardized questions.

Goals in the oral expression—In the preparation of these reports the child learns how to find materials relating to a given subject, how to organize this material and how to present it to a class in a clear and logical manner. He forms the library habit, learning how to use catalogs and reference books. All of this leads to the formation of ideals of independence of study, ideals of a satisfactory report, ability to receive criticism in an impersonal manner and to evaluate the report of another in the same way.

The goal of the expression work is to develop the individual pupil to the best of his ability in the art of expressing himself simply, in well-chosen words, and in a manner acceptable to others.

After-test Value of Language Error Tests

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A RECENT study made under the writer's direction shows that while the language errors of all school children in a large city are very numerous, the errors made by any one pupil are usually comparatively few. In a sixth grade of thirty-eight pupils, the number of oral errors per pupil ranged from none to five, the number of written errors from one to ten, and the number of oral and written errors combined from one to fourteen. In a seventh grade of thirty-six pupils, the number of oral errors per pupil ranged from one to eight, the number of written errors from three to fourteen, the number of oral and written errors combined from four to seventeen. In an eighth grade of forty-five pupils the number of oral errors per pupil ranged from zero to ten, the number of written errors from four to thirteen, and the number of oral and written errors combined from four to nineteen. These data were secured by carefully noting the oral and written errors of each pupil for a period of two weeks, the usual time for such studies.

The above paragraph helps to explain why language error tests can be used effectively in diagnosing room and pupil difficulties, although the number of errors used in each test is relatively small. It may be further noted in this connection that in the original Connersville study of oral errors, the ten most common errors accounted for 51 per cent of all errors; in the Cincinnati study of oral errors, the ten most common errors accounted for 56.2 per cent of all errors; and in all such studies, the frequent occurrence of a few errors has been outstanding.

It is claimed for the Language Error Tests (and the evidence will follow) that they can be used to:

1. Locate the parts of the city or the buildings in which particular attention is needed, or not needed, upon simple language forms as typified by the common language errors.

2. Locate the rooms or grades that are low (or high) in ability to use language correctly—that is, without errors.

3. Locate the pupils needing help on language, or for any pupil, the specific errors on which he needs to work.

The following are the characteristics of the tests that make these results possible:

1. They make use of actual (real) language-using situations. They are not on an alternate or guessing basis.

2. They are based chiefly on the language errors that are most common, as shown by several scientific studies (summarized by Wilson in the *Elementary School Journal* for December, 1920).

3. They are scaled for difficulty. Standards of age and grade performance are available, although, except for comparative purposes, these are not so important as the distribution within a room, school, or system.

Test B of a preliminary series is given herewith as a sample of the Language Error Tests.

Test B—Correcting Language Errors

Name ..... Grade ..... Age .....

Town ..... School ..... Date .....

Directions for the game: (To be read by the teacher, the pupils following.) This is a little *game* in which the pupil plays teacher, and corrects a composition written by a pupil. Correct by drawing a single line through words or expressions used incorrectly, and placing the correct words above them. For example, if you had the following sentence to correct: "He has went home." You would correct it by drawing a single line through *went* and writing *gone* above it. Make all changes necessary to secure correctness. Work at your usual rate. You will be given reasonable time in which to complete your work. When you have finished, turn the sheet right side down and leave it on your desk. All will be permitted to finish the work unless too slow.

The composition which you are to correct follows herewith:

A FISHING TRIP

John he is awful good to me. He ask me once't to go fishing and said that he could learn me to be a good fisherman on no time. He had saw some men git a great many fish out of a deep hole about a mile up the river. He said he watched them until they got tired fishing. He seen them leave with a big sack full. I agreed to go with him. "We hain't got no bamboo poles," he said, "the folks haven't none left over from last year. Good poles is difficult to find." John give me the lunch to carry. We et our lunch before we done any fishing. I sit the table while John cut two poles and fastened the lines to them. He baited my hook hisself and told me to throw it in. I felt a bite at once and jerked the line. It was a big catfish. I was afraid the line would break. John said the line was made good and had held to many big fish to break easily. I landed it but we didn't catch any more. We wanted to git another one so that each of us would have a fish to take home. We started and went home early. John said you can't never tell about beginners luck. John and I is good friends. As I neared home, I seen my little brother coming down the street. He had came to meet us. "I have got a big one," said I, as I showed him the fish. The fish was the main part of are supper that evening.

There are twenty-nine errors in this test. Table 1 shows the results of giving the test to seven third grades in Duluth, Minnesota. There is a possible score of 29. The table shows the number of pupils at each score and the medians. The third grade at the Franklin School did decidedly better than any other third grade. But more marked than the grade differences were individual differences within the grades. Some third-grade pupils came near to a perfect score, while others came near to a zero score. It is evident that teachers should at once turn attention to individuals.

Table 1—Test B in Third Grades, Duluth, Minnesota.

Number of Errors	Ely	Endion	Franklin	Jefferson	Lincoln	Salter	Washburn	Total
1	.....	.....	.....	.....	.....	.....	.....	0
2	.....	.....	.....	.....	.....	.....	2	2
3	.....	1	.....	.....	.....	.....	.....	1
4	.....	.....	.....	.....	.....	.....	.....	0
5	.....	.....	.....	.....	1	.....	.....	1
6	.....	.....	.....	1	.....	.....	.....	1
7	.....	1	.....	1	1	2	1	6
8	.....	1	.....	2	1	1	1	6
9	1	1	.....	4	4	1	2	13
10	1	1	.....	1	.....	1	2	6
11	3	2	.....	2	5	.....	1	13
12	.....	.....	1	2	1	1	1	6
13	1	.....	2	3	10	.....	2	18
14	1	2	.....	2	4	1	2	12
15	1	.....	2	3	4	2	3	15
16	3	.....	.....	.....	5	1	.....	9
17	1	2	1	2	6	1	2	15
18	1	1	1	.....	5	.....	2	10
19	1	.....	2	.....	2	.....	1	6
20	.....	.....	3	3	1	1	4	12
21	.....	.....	3	.....	1	.....	1	5
22	.....	3	4	2	.....	.....	1	10
23	.....	.....	2	1	.....	.....	2	5
24	1	.....	1	1	1	.....	.....	4
25	.....	.....	.....	.....	1	.....	3	4
26	.....	.....	.....	.....	.....	.....	1	1
27	.....	.....	.....	.....	.....	.....	.....	0
28	.....	.....	.....	.....	.....	.....	.....	0
29	.....	.....	.....	.....	.....	.....	.....	0
Number of pupils.	15	15	22	30	53	12	34	181
Medians	15	14	20	13	14	13	16	15

Table 2, table 3, and table 4 show similar data for fourth grades, seventh grades, and the high school, respectively. These are selected as typical of the value of the tests in pointing out grade differences. Note the tremendous differences between the fourth grades at Lakeside and Lincoln Schools. The fourth grade at the Lakeside School is superior to most seventh grades. The Lincoln School is low among seventh grades. Evidently there is a language problem at the Lincoln School, although there are many individuals there who do well. These tests show the individuals who need the help.

TABLE 2.—Test B in Fourth Grades, Duluth, Minnesota.

Number of Errors	Cobb	Endion	Jefferson	Lakeside	Lincoln	Salter	Total
1	.....	.....	.....	.....	1	.....	1
2	.....	.....	.....	.....	.....	.....	0
3	.....	.....	.....	.....	1	.....	1
4	.....	.....	.....	.....	1	.....	1
5	.....	.....	.....	.....	1	1	2
6	.....	.....	2	.....	.....	1	3
7	.....	1	1	.....	2	1	5
8	.....	.....	1	.....	3	.....	4
9	.....	1	.....	.....	2	1	4
10	1	2	3	.....	2	.....	8
11	.....	.....	2	.....	8	2	12
12	1	1	2	.....	.....	1	5
13	.....	2	3	.....	4	.....	9
14	.....	1	6	.....	2	3	12
15	.....	.....	2	.....	1	1	4
16	.....	.....	3	.....	3	3	9
17	.....	1	3	.....	1	4	9
18	.....	1	4	.....	.....	2	7
19	.....	.....	6	.....	2	2	10
20	1	1	3	1	.....	2	8
21	3	3	2	2	.....	1	11
22	.....	1	3	1	.....	1	6
23	.....	.....	5	3	1	.....	9
24	1	1	2	7	.....	2	13
25	2	.....	1	3	.....	.....	6
26	1	.....	1	4	.....	.....	6
27	.....	.....	5	6	.....	.....	11
28	.....	.....	.....	.....	.....	.....	.....
29	.....	.....	.....	.....	.....	.....	.....
Number of pupils.....	10	16	60	27	35	28	176
Medians.....	21	15.5	18	24	11	16.5	17

TABLE 3—Test B in Seventh Grades of Duluth, Minnesota.

Number of Errors	Jefferson	Lakeside	Lincoln	Salter	Washburn	Total
1	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....
7	.....	.....	1	.....	.....	1
8	.....	.....	3	.....	.....	3
9	.....	.....	2	.....	.....	2
10	.....	.....	1	.....	.....	1
11	.....	.....	2	.....	.....	2
12	.....	.....	4	.....	.....	4
13	.....	.....	5	.....	.....	5
14	.....	.....	1	.....	.....	1
15	.....	.....	6	.....	.....	6
16	.....	.....	8	.....	.....	8
17	1	1	12	.....	.....	14
18	3	.....	9	2	1	15
19	.....	1	10	1	.....	12
20	2	.....	11	.....	2	15
21	1	2	9	1	1	14
22	2	2	9	1	1	15
23	2	4	6	3	4	19
24	1	4	17	1	2	25
25	3	1	8	3	4	19
26	.....	3	2	1	2	8
27	.....	10	4	.....	4	18
28	.....	2	1	.....	.....	3
29	.....	1	.....	.....	.....	1
Number of pupils...	15	31	131	13	21	211
Medians...	22	26	20	23	24	22

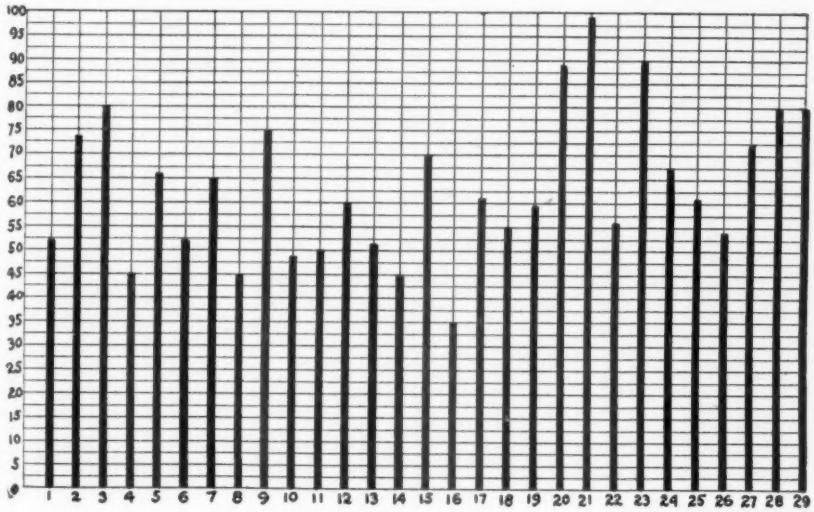
The uses of the Language Error Tests in discovering the need of attention upon particular errors, and the particular individuals needing help, can be better illustrated by a class study in the Gilbert Consolidated School, near the Iowa State College. A class in educational measurement were making a study of the school. Table 5, figures 1 and 2, and Table 6, show part of the language testing results. Table 5 shows for grades three to eight the number of pupils in each grade and the number in each grade missing each error of Test B.

TABLE 4—Test B in Duluth Central High School.

Number of Errors	9th Grade	10th Grade	11th Grade	12th Grade	Total
1	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....
17	.....	.....	1	.....	1
18	1	1	.....	.....	2
19	2	.....	.....	1	3
20	2	1	.....	2	5
21	3	2	3	3	11
22	4	5	3	2	14
23	3	10	3	7	23
24	12	19	7	7	45
25	18	16	8	16	58
26	7	23	14	15	59
27	13	26	23	10	72
28	5	8	21	22	56
29	2	4	6	4	16
Number of pupils	72	115	89	89	365
Medians.....	25	26	27	26	26

Figure 1 shows for grades three to eight of the Gilbert, Iowa, Consolidated School, the per cent of pupils missing each error of Test B. Ninety-five per cent of the pupils fail to correct Error No. 21, the use of *to* for *too*. Thirty-five per cent failed to correct Error No. 16, the use of *et* for *ate*.

Figure 2 is really more significant as it shows the language problem of a particular grade, the seventh grade. The errors are in the same order as in the test. No seventh grade pupil fails to correct Error No. 25, the use of *is* for *are*, while ninety-one per cent missed Errors No. 21 and No. 23.



1. John he
2. awful good
3. ask for asked
4. once't
5. learn for teach
6. on for in
7. had saw
8. git for get
9. got for were
10. seen for saw
11. hain't got
12. no for any
13. haven't none
14. is for are
15. give for gave
16. et for ate
17. done for did
18. sit for set
19. hisself
20. good for well
21. to for too
22. git for get
23. and went for to go
24. can't never
25. is for are
26. seen for saw
27. had came
28. have got
29. are for our

FIG. 1.—*Per cent of pupils in grades three to eight that missed each error of Test B*—Gilbert, Iowa, 1921-22

Table 6 is a table which especially appeals to children. It shows, for each child in the seventh grade, the particular errors which were missed. The aim is to make a clear record. The table makes the problem specific for each child, and thus gives him a motive for work. However, the pupil understands that a clear record on one test does not fully solve his language problem, for there are other tests containing different, although equally common, errors. The pupil becomes interested, therefore, in making a complete list of his language errors, in order if possible to anticipate the next test and make a clear record on it when it comes. There are three tests in the series. The most common language errors are fairly well covered. By the time the third test has been given, if the teacher has proceeded wisely, every child in her room has become interested in his language ability, and determined to eliminate his language errors.

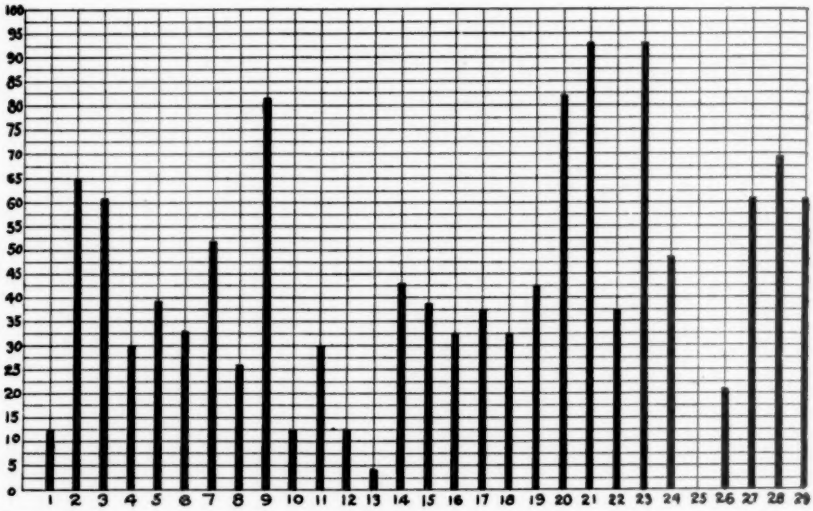


FIG. 2.—*Per cent of pupils in seventh grade that missed each error of Test B*

TABLE 5—Number of Pupils in Grades 3 to 8, and the Number of Pupils Missing Each Error in the Wilson Language Error Test B. Gilbert, Iowa, 1921–22.

Grade	3	4	5	6	7	8	
Number in Class	21	18	13	18	23	11	Total
1. John he	21	13	4	9	3	2	52
2. awful good	17	16	8	13	15	5	74
3. he ask-ed	20	18	9	14	14	5	80
4. once't	19	7	5	6	7	1	45
5. learn—teach	16	16	12	10	9	3	66
6. on—in	17	13	5	9	6	2	52
7. had saw	20	15	6	10	12	2	65
8. git—get	14	10	4	11	6	0	45
9. got—were	14	9	4	18	19	11	75
10. seen—saw	13	6	4	12	3	0	38
11. hain't got	14	18	3	6	7	2	50
12. no—any	20	17	6	11	3	3	60
13. haven't none	20	10	9	10	1	1	51
14. is—are	20	10	4	12	10	4	60
15. give—gave	19	17	5	15	9	5	70
16. et—ate	12	10	4	2	7	0	35
17. done—did	18	17	6	11	8	1	61
18. sit—set	18	11	7	11	7	1	55
19. hisself	19	11	8	14	10	0	62
20. good—well	21	16	6	18	20	7	88
21. to—too	21	18	12	18	21	9	99
22. git—get	18	12	6	11	8	1	56
23. and went for to go	21	16	10	15	21	7	90
24. can't never	20	16	9	11	11	0	67
25. is—are	19	14	4	8	0	0	45
26. seen—saw	18	10	2	13	5	1	49
27. had came	21	14	10	13	14	1	73
28. have got	20	18	12	13	14	3	80
29. are—our	20	16	12	14	16	2	80

TABLE 6.—Giving the Names of the Pupils of the Seventh Grade, Gilbert, Iowa, 1921–22, and Showing the Particular Errors Missed by Each Pupil, or Conversely the Pupils Missing Each Error, Test B, Wilson Language Error Tests, Preliminary Form.

Error	Name of Pupil																						
	F. Anderson	E. Dodds	E. Eness	O. Fossel	L. Gildersleeve	M. Holstead	M. Jacobson	I. Johnson	L. Johnson	S. Johnson	M. Lake	A. Mathison	G. Mesha	R. Miller	L. Olson	N. Perry	E. Peterson	L. Peterson	C. Ruth	R. Reece	L. Templeton	B. Tressler	Number missing each error.
1. John he												x	x		x								3
2. awful good	x	x	x	x		x		x		x	x	x	x	x			x	x	x	x	x	x	17
3. ask for asked			x	x		x		x			x	x	x	x		x	x	x	x	x	x	x	15
4. once't			x										x	x	x	x			x		x		7
5. learn for teach....	x		x					x			x		x	x		x	x	x					9
6. on for in			x	x													x	x					4
7. had saw			x	x				x		x	x		x		x	x		x				x	10
8. git for get			x	x				x						x				x			x		6
9. got for were	x	x	x	x	x		x	x		x	x	x	x		x	x	x	x	x		x	x	18
10. seen for saw	x		x										x					x					4
11. hain't got	x		x	x	x									x				x					6
12. no for any			x							x	x			x				x					5
13. haven't none			x															x					2
14. is for are....			x	x				x			x	x	x	x		x	x	x					10
15. give for gave			x	x								x		x		x	x	x	x		x	x	10
16. et for ate			x															x					2
17. done for did				x						x			x	x	x	x	x	x	x				9
18. sit for set			x										x	x		x		x			x	x	7
19. hisself	x			x						x		x		x	x	x	x	x			x	x	11
20. good for well	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x		x	x	20
21. to for too	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	21
22. git for get		x	x	x				x						x		x		x					7
23. and went for to go	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	20
24. can't never	x	x	x			x		x		x	x		x	x		x		x					11
25. is for are																							0
26. seen for saw	x			x									x					x				x	5
27. had came			x	x	x	x		x		x	x		x	x		x	x	x	x		x	x	15
28. have got	x	x	x	x	x			x		x	x		x	x				x	x			x	13
29. are for our	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x	x			x		17
Pupils' Score of Rights.	16	21	5	10	21	21	26	14	27	16	15	18	10	9	19	12	15	3	18	26	16	16	

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The Evaluation of Language Errors

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THROUGH the means of testing the language errors of children afforded by the informal diagnostic language error tests (see Informal Diagnostic Language Error Tests, Chicago Schools Journal, April, 1923) built up on the principle of the Wilson Standardized Language Error Tests, the teachers of the Corkery School are attempting to do for language errors what Jones, Ayres, and Buckingham have done for spelling, that is to arrange them in rank of difficulty and in grade lists.

The Connersville and Kansas City studies of language errors listed them in order of frequencies of occurrence. Professor Wilson, taking the total number of language errors included in the several studies selected the twenty-eight most common language errors, which number he has included in his standardized tests.

The scheme of the standardized tests rests upon the assumption that inability to recognize an error in a natural setting in a child's story indicates the probable use of that error in the pupil's ordinary speech. This assumption we have accepted as valid but it will be quite possible to test it empirically after we have the reaction of the pupils to the tests and have learned the particular disabilities of each child. We can then check up on the errors in oral work of the class and compare such data with the results of the written tests.

The twenty-eight common language errors have been included in each of three stories, thus affording alternate forms of the tests. The directions to the children ask them to play a game in which they are to cross out errors found in the story and to write in the correct

form. The teachers of the Corkery School have improvised additional stories, shorter and including only the language errors of the grade, which are thus more specifically adapted to the pupils of the particular grade.

In order to establish grade lists of language errors we have endeavored through the tests to evaluate the twenty-eight most common language errors in rank of difficulty, just as Ayres took the 1000 most commonly used words and arranged them in order of difficulty and in grade lists. When language errors are arranged in stories and given in tests to many children we are justified in ranking as "hardest," or most difficult, those errors which are missed the most times.

Our test results were tabulated from diagnostic charts imitated from Woody's diagnostic chart in his arithmetic study.

The entire list of the twenty-eight errors of the Wilson Standardized Tests was included in short stories of simple vocabulary and natural situations which were given to each grade. In the first grade it was necessary to get the reaction of each child as the teacher could best manage with individual examinations but in other grades the group test was used. The results indicated in the tabulations of the diagnostic charts furnished a statistical basis for the arrangement of the language errors in grade lists according to their rank in difficulty. Where "seen" was missed eight times and "done" was missed sixteen times we were justified in considering "done" as twice as difficult as "seen," at least for the pupils of that particular grade.

Where an error is not missed by at least 20 per cent of the class it obviously does not constitute a sufficiently general disability of that grade to justify its inclusion in a grade list and its status is changed from that of a class problem to that of individual attack. Thus economy is afforded by subordinating errors to the status of individual attack and not regarding them as problems for attack by all of the class. The economy is afforded as in spelling, through the pupil being required to attack only his own disabilities and an error which does not have a high rank of difficulty for the grade may properly be considered an individual rather than a class problem.

This means that the language errors may be arranged in grade lists which assign for class attack those errors ranking high in difficulty and leave for individual attack, only, those which are missed by but a small per cent of the grade.

The best classification and most thoroughly organized attack on language errors which we have at present is perhaps that of Sheridan and of Mahoney. There has, however, not been any basis afforded

heretofore for the assignment of errors in grade lists because the rank in difficulty of errors has not been available. We have had only frequency of occurrence not rank in difficulty as a guide. Frequency of occurrence is not a reliable guide because the most common language error is not the one most missed. Sheridan and Mahoney therefore assign "seen," for instance, to every grade from first through eighth and according to their lists this error is not eliminated in the course of all the grades.

Our study of language errors through our tests afforded data which when arranged in diagnostic charts revealed not only the status of each pupil with respect to his individual disabilities but gave us the relative difficulty of the several errors.

The evaluation of language errors thus afforded enabled us to assign to the various grades the language errors arranged in grade lists for class attack, and the teacher, using this grade list as a basis, includes these errors in a story for a grade list.

The following tests were given to twelve hundred pupils in the Corkery School:

LANGUAGE ERROR TEST

Name ..... Grade ..... Room .....

Correct by drawing a single line through words or expressions used incorrectly and placing the correct words above them.

PLAYING MARBLES

Marbles is a good game. I seen some boys playing the game yesterday. I went home to look for my supply of marbles. I couldn't find none, so I saw my father. I said to him: "Father, I aint got no marbles. Will you give me a dime. He done it willingly. Me and father is very good friends.

I started down the street. I had not went very far, when I met John Taylor. John he is a good friend of mine. He seen me leave my home, and had came to meet me. I owed him a dime, but he did not ask me to pay up. I guess he wanted me to have some marbles so as I could play with him. He had some marbles hisself.

I ask him to go to the store with me. "No," he replied, "I have got an errand to run. Can I play with you when I have did the errand?" We aggreed and spent the entire afternoon together. We had lots of fun.

INFORMAL TEST

Me and John run all the way to school this morning. My mother she said I shouldn't never be late. I done all my work before I come and that delayed me. I lost that new pencil my mother give me yesterday. Where did you git your pencil? It ain't sharp.

INFORMAL TEST

John is awful good to me. After we had came home from school yesterday he ask me to go to the store with him and I did. We had lots of fun on the way back and John give me a sack full of pop-corn. He bought a sack full for hisself to. It sure tasted good.

The results of the above tests, are shown in the following table:

Language Error Percentages by Grades

Number Errors	I	II	III	IV	V	VI	VII	VIII
1. I seen	34	11	8	0	0	0	2	0
2. He done	21.4	26.9	42.2	11.3	21.1	1.9	1.2	0
3. She run	5.2	20.8	20.1	7.3	1.9	0	0	0
4. He come	8.4	17.1	31.1	13.2	15.2	1.4	4.5	0
5. She give it	7.2	28.8	28.4	6.5	7.2	1.4	1.8	0
6. If I git it	6.3	7.4	26.6	10.5	7.9	2.1	2.7	0
7. ain't	1.2	2.8	55	11.3	3.9	7.1	0	0
8. Me and John	28.5	20.2	59.6	13.8	28.4	6.4	11	0
9. My mother she	3.9	26.7	62.3	11.3	4.6	3.5	0	0
10. shouldn't never	22.5	36.1	67.8	34.9	40	28.9	11.7	4.9
11. are for our	.....	40.9	33.3	25.4	21.9	6	8.1	0
12. hisself	.....	51.6	38.5	31.4	11.4	2.4	0	0
theirselves								
13. learned-taught	.....	50	83.3	67.6	50	16.1	19.8	3
14. their there	.....	46.7	76.3	58.4	48.6	33.8	26	6
15. is are	.....	29.5	42.1	29.6	28	12.9	6.3	6
16. Can may	.....	42.6	76.3	88.1	48.6	30.9	32.4	10
17. have got—have	.....	14.1	42.6	40.8	18.1	29.1	11.7	12
18. to, too, two	.....	68.3	82	52.5	44.3	39.3	30.6	22
19. guess, think	.....	63.3	88.6	66.6	89.9	43.8	14.4	24
20. them books	.....	64.1	80.8	52.5	25	19.7	17.1	7
21. If I was	.....	30.7	30.4	45.8	30.4	25.9	23.4	16
22. awful good	.....	76.2	46.8	28.3	32.6	21.5	24.3	14
23. had came	.....	40.4	53.1	29.1	31.4	14.3	10.8	8
had went								
had saw								
24. ask, asked	.....	74.6	53.1	46.6	32	15.8	7.2	4.8
25. lots of fun	.....	86.6	63.9	70.8	31.3	67.6	80.1	28.8
26. sack full—sackful	.....	55.2	59	62.4	64.8	67.6	76.5	34.8
27. sure—surely	.....	65.7	61	68.7	71.3	19.4	23.4	25.8
28. pay up—pay	.....	80	89	60.2	29.8	20	18.2	26

A study of the percentages will show that the first nine errors logically belong in the first three grades since they were missed by more than 20 per cent of the pupils of those grades. A peculiar condition may be observed with reference to the verb seen. Although this is popularly considered an error belonging to all grades of the Elementary School, our investigation shows an elimination of this error in the fourth grade with no recurrence in higher grades.

The first three grades, therefore, have been given language error lists consisting of the first nine errors. Lists for the other grades have been compiled with reference to the difficulty of the errors as shown by the frequency of occurrence, and overlapping is provided for by inclusion of the more difficult ones in order that these may be thoroughly learned.

The Corkery School grade lists of language errors are appended.

PRACTICE FOR FIRST, SECOND, AND THIRD GRADES

1. I seen
2. He done
3. She run
4. He come
5. She give it
6. If I git it
7. ain't
8. Me and John
9. My mother she

FOURTH GRADE

1. shouldn't never
2. ain't got none
3. are for our
4. hisself
5. theirselves
6. learned for taught
7. You was
8. Is there enough pencils?
9. Can for may
10. have got for have

FIFTH GRADE

1. there, their
2. Can for may
3. have got for have
4. *Was* there many boys in the yard?
5. to, two, too
6. guess for think
7. them books
8. My brother he
9. learned for taught
10. ask for asked

SIXTH GRADE

1. Can for may
2. If I was you
3. had came
4. had went
5. awful good
6. had saw
7. guess for think
8. to, too, two
9. have got
10. lots of fun

SEVENTH GRADE

1. Can for may
2. their, there
3. If I was you
4. Lots of fun
5. to, too, two
6. awful good
7. sack-full sackful
8. sure—surely
9. pay up—pay
10. have got—have

EIGHTH GRADE

1. guess—think
2. to, too, two
3. lots of fun
4. sure—surely
5. pay up—pay
6. sack full—sackful
7. cup full
8. If I was you
9. Can—may

Chart of Language Aims with Suggestions and Activities for Realizing Them[1]

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THE PRESENT statement of language aims with suggestions and activities for realizing them, eventually to be printed in a chart of convenient size, is an outgrowth of the work in the author's classes at the University of Michigan in the "Psychology of the Common School Branches." From time to time various committees from these classes have been assigned the task of constructively criticising present-day language teaching as outlined in existing courses of study or as observed in every-day classroom teaching. These tasks often revealed courses of study with no statements of aims, or else statements so indefinite that they were useless as teaching guides. Even if a fair statement of aims were given at times the apparent relationship between the stated aims and the actual activities assigned for the different grades was so indefinite that it is safe to say that aims and activities were not on "speaking terms." Consequently, as the outgrowth of these criticisms, the task was set of formulating an acceptable statement of aims and of listing suitable concrete suggestions and activities for realizing each of the given aims in each of the grades. In order to make the relationship between aims and activities more apparent and to set forth a bird's-eye view of the whole language situation, the chart idea used so successfully in the public schools of Rochester, New York, was imitated.

In the construction of the so-called chart, it is needless to say that ideas from books on language teaching, experiments on different

[1] The author is indebted to the following individuals for aid in the preparation of this chart: C. K. Searles, Constance Hopkins, Luther Purdom, Edith Bader, and Alice M. Woody.

phases of language teaching, books embodying modern theories of education, and from courses of study were freely mixed—possibly I had better say "scrambled"—with ideas gained from practical experience. Since so little of a scientific nature has been done in the field of language teaching, the resulting mixture—the omelet—cannot be said to be highly scientific. However it does represent an attempt to apply scientific knowledge wherever it is available and to make at all times scientific implications. Whether these implications are good or bad must be determined by experimentation or by the refining influence of critical discussion.

The chart in its present unfinished form—for it was intended not only to include the first four grades, but also the upper grades—is submitted for two reasons: (1) Members of the various classes and different teachers who have seen it have urged that it be made available. (2) The author invites constructive criticism from those, who may be interested in language teaching, in the hope that the present chart may be modified, enlarged, and transformed into a more valuable instrument of instruction.

LANGUAGE AIMS, WITH SUGGESTIONS AND ACTIVITIES FOR THEIR REALIZATION

(Grades I-IV, inclusive)

AIM 1. TO TEACH THE CHILD TO COMMUNICATE FREELY, EFFECTIVELY, AND CORRECTLY IN SPEECH OR IN WRITING IN THOSE LIFE SITUATIONS WHICH DEMAND COMMUNICATION

Grade I

1. Create situations which stimulate communication.
   a. Encourage telling of experiences outside of school life.
   b. Utilize conversations and questions on family and home life, pets, toys, etc.
   c. Encourage reciting of rhymes, poems, and stories learned out of school.
2. Enlarge experiences as basis for communication.
   a. Nature study, picture study, visits to parks, museums, etc., stories of children of other lands.
3. Utilize dramatization and story reproduction.
4. Have children write coöperative invitations to parents and other grades. (Use visiting day, parties, etc., as motives.)

Grade II

1. Continue work outlined for Grade I.
2. Work for discrimination in choice of experiences to be related.
   a. Inculcate ideals of "being interesting," "having a point," "giving information," "giving pleasure," etc.
3. Encourage children to give several sentences at a time about a particular point, as in nature study or picture study.
4. Have children tell how to play games, how to do things, or how to make them.
5. Send children to other grades to deliver messages or make reports.
6. Have children write coöperative invitations to parents or other grades. (Have real motives.)
7. Have children write coöperative letter, a single paragraph in length, to absent members of class.
8. Have children keep class diaries of nature-study work.

Grade III

1. Use nature study, picture study, geography, science lessons as material for language work.
2. Encourage children to elaborate upon phases of above topics appealing to them.
3. Have children reproduce stories read.
4. Have children tell original stories.
5. Have children write coöperative reports of trips, meetings, committees.
6. Have children write class notes to be published in school paper.
7. Have children keep class diaries of nature-study work.
8. Have children write letters to absent classmates, to children in other cities (single paragraphs).
9. Have children write letters ordering seed catalogues.
10. Have children write letters ordering seeds for school garden.
11. Have children write rules for playing games.

Grade IV

1. Have children take turns reporting interesting experiences to class.
2. Have children take turns telling to class stories read outside of school.
3. Have children tell about things they are making at home in workshop, etc.
4. Have children conduct visitors over building and explain points of interest.
5. Have children go to other rooms with messages and reports.
6. Have children tell original stories.
7. Have children dramatize stories for presentation to other grades.
8. Have children write reports of committee meetings.
9. Have children write reports of visits to industrial plants and museums.
10. Have children write letters to children in other cities.
11. Have children write class notes for school paper.
12. Have children write original stories and poems for school paper.

(Compositions indicated under points 8, 9, 10, 11, 12 should be individual work except when class work seems necessary for purposes of illustration.)

AIM 2. TO ENLARGE THE CHILD'S VOCABULARY AND TO STIMULATE EFFECTIVE CHOICE OF WORDS

Grade I

1. Read to children stories chosen partly for beauty of language.
2. Encourage inquiring attitude toward new words.
3. Encourage imitation of language of stories, commend use of new words.
4. Suggest synonyms for overworked adjectives and adverbs.
5. Play games describing objects for guessing—"I am thinking of something big and red and round." Guess what?
6. Read poems to children.
7. Have children commit parts of poems.
8. Play rhyming games—"I am thinking of a word that rhymes with tall." Is it ball? etc.

Grade II

1. Read to children—stories of biography, history, travel, folklore.
2. Stimulate an inquiring attitude toward new words.
3. Call attention to appropriateness of certain language in stories.
4. In conversations and reports suggested under Aim 1, give names of objects, parts of objects, give synonyms for descriptive words.
5. Play games, as—
   a. Send one child from room. Others choose object to be guessed. Child returns to room and receives suggestions. "It is large." "It is beautiful."
   b. Rhyming games as suggested in Grade I.

6. Read poems to class.
7. Have children commit and recite a number of short poems.

Grade III

1. Continue dramatization. Choose some stories in which class must compose conversation rather than repeat what is printed.
2. Continue reading to children—biography, travel, hero stories, poetry.
3. Stimulate inquiring attitude toward new words. Commend use of effective words heard in stories.
4. Stimulate appreciation of appropriateness of language of stories read.
5. Have children memorize eight or ten poems chosen from those of Stevenson, Field, Sherman, etc.
6. Devise games, as—
   a. Leader says—"I am thinking of a word which rhymes with lamp." Guesser says—"Is it a place where one spends a vacation?" Leader—"No, it is not a camp." Guesser—"Is it something to put on a letter?" Leader—"No, it is not a stamp."
   b. Leader says—"I am thinking of a bird." Guesser—"Does it have a red head, white back, black wings?" Leader—No, it is not a woodpecker."
   c. Leader says—"I am thinking of an object that is rectangular in shape." Guesser—"Is it a book?" etc.

Grade IV

1. Continue reading to children from history, biography, travel, science, classic literature, poetry.
2. Have class memorize poems.
3. Encourage inquiring attitude toward new words.
4. Encourage incorporation of new words into vocabulary.
5. Expect contributions of more than a single sentence in recitations in history, geography, science, and in oral reports on trips to manufacturing plants and places of interest.
6. To enlarge list of synonyms play games as—
   a. Minister's Cat—"One child says minister's cat was an active cat. Every child takes turn describing cat with word beginning with "a." The next time round descriptive words begin with "b," etc. This game may have numerous variations.
   b. My Ship Comes Sailing—Child says, "My ship comes sailing." Next child asks, "With what is it loaded?" Answer may begin with any initial agreed upon. (Teacher may make game very profitable by encouraging choice of appropriate adjectives.)
   c. Association game—Leader says a word, as "ocean." Next child says any word which "ocean" suggests to him, as "shark," "ship," "waves," etc. (Teacher may make this profitable by encouraging unusual answers.)

AIM 3. TO TEACH CHILD TO COLLECT, ORGANIZE, AND PRESENT MATERIALS FOR ORAL AND WRITTEN DISCUSSION

Grade I

1. Use materials and opportunities suggested under Aim 1.
2. Emphasize order of occurrence of events in giving reports of field trips and visits to museums, etc.
3. Eliminate irrelevant matter in relating experiences.
4. Have children pick out important parts of stories to be dramatized or reproduced.
5. Have children tell "where," "when," "what doing" about pets or incidents, as, I saw sheep grazing in the field this morning.

Grade II

1. Use materials suggested under Aim 1.
2. Work for paragraph idea in conversation lessons.
3. Teach discrimination in choice of points to be made in reports of visits, trips, etc. (Have these reports made to other grades as motive for good organization.)
4. Encourage children to say all they can about a topic. (Allow children to choose topics part of the time.)
5. Have children tell how to play games.
6. Have children write as class compositions—
   - *a.* Report of trip to museum.
   - *b.* Report of a nature lesson.
   - *c.* Description of game to be played.
   - *d.* Conversation for story dramatization.
   - *e.* Riddles for other grades to guess, as—

     I am a liquid.
     I am silver in color.
     I can roll in balls.
     I expand when I am heated.
     I am useful.
     What am I?
     (Mercury.)

Grade III

1. Have children prepare reports of trips, etc., to be given before other grades.
   - *a.* Emphasize order in which statements best give information.
   - *b.* Eliminate irrelevant statements.
   - *c.* Emphasize paragraph idea.
2. Have children prepare talks on "pictures" to be given before grade assembly.
3. Have children prepare "dramatization" to be given before grade assembly.
   - *a.* Let children determine scenes to be included.
   - *b.* Let children determine facts to be in each scene.
4. Have children give summaries of recitations made by group.
5. Have children write paragraphs on class activities, for school papers.

Grade IV

1. Use suggestions given for Grade III.
2. Have children prepare bulletins and slogans for "health week," "good English week," "safety week."
3. Have children keep diaries of simple experiments in science, etc.
4. Have children undertake project of writing and presenting performance of marionettes.
   - *a.* Keep reports of committee meetings.
   - *b.* Keep records of all phases of project.
   - *c.* Write dramatization of story to be used.
   - *d.* Write original story to be used.
5. Have children prepare for school paper paragraphs on class activities.
6. Have children compare well-organized paragraphs with loose ones.
   - *a.* Have class analyze to see why one is better.
   - *b.* Mimeograph samples of children's compositions for purposes of comparison.

AIM 4. TO MAKE AUTOMATIC CERTAIN HABITS FOR EFFECTIVE ORAL AND WRITTEN SPEECH

Grade I

1. Make inventory of errors in speech and concentrate on most common ones, *i. e.*—seen for saw; come for came; haven't for haven't got; knew for knowed; you were for you was.
   - *a.* Play games as,—Leader—"I am thinking of an animal that lives in the woods." Child—"Is it a bear?" Leader—"No, it isn't a bear," etc.

2. Make inventory of mispronunciations and practice on corrections—"git, ketch, gimme, goin'," etc.
3. Teach child to write his name and address properly.
4. Have children copy by means of word cards, sentences from book, or board, in order to learn how to begin and end sentences.

Grade II

1. Make inventory of errors of speech and drill to eliminate as many as possible.
2. Work especially on proper use of wrote and written, threw and thrown, says and said, doesn't and don't.
   a. Act out verb forms, as—
      One child writes a word on board. He then says, "What have I written?" or "What did I write?" "What did I do?" Child answers, "You have written," "You wrote."
   b. Have children make statements of comparison, as "I ride in an automobile, the Eskimo boy doesn't." "The Eskimo kills seals, the Chinese doesn't."
3. Have children copy sentences from book or board. They should learn that
   a. Sentences begin with capital letters.
   b. A statement ends with a period.
   c. Names of people and places begin with capital letters.
   d. A question is followed by interrogation point.
   e. Commas take the place of "and" in a series of words.

Grade III

1. Keep individual lists of errors and stimulate correction of them.
2. Drill for correction of errors listed under Grades I and II.
3. Devise games for drill upon correct use of nominative and objective forms for pronouns as "It was *he*." "It was *they*." "For *him* and *me*." "To *her* and *me*."
4. Continue correcting mispronunciations, as, "across*t*," "could *of* gone," "use to," "didja."
5. Emphasize punctuation and correct written form as suggested for Grade II.
6. Teach correct form and punctuation for letter heading, salutation, closing, and address on envelope.

Grade IV

1. Continue lists of individual errors.
2. Stress the correction of errors that still persist from other grades. Incorrect use of personal pronouns in nominative and objective forms will be among the persistent errors.
3. Instead of games use mimeographed practice sheets with exercises having blanks to be filled, as
   "The book was given to (*him*) and (*me*)."
   "It was (*they*)."
   These exercises may be both oral and written.
4. Emphasize correct use of punctuation and form suggested for written work of Grade III.
5. Teach use of capital letters in titles.
6. Teach use of quotation marks.

AIM 5. TO DEVELOP TASTE FOR GOOD LANGUAGE AND FOSTER IDEALS OF PROPER SPEECH AND STYLE

Grade I

(Creating the desire to use good English is important in the early grades.)

1. Strive for a spirit of coöperation in drill periods. Force and drudgery should be avoided.

2. Use language which is appropriate to situations, avoiding "talking down" to children and refraining from conspicuous language.
3. Build up habits of noticing language.
   a. By repeating phrases in reading to children, remarking, "I enjoy this," etc.
   b. By saying to child who has expressed a thought well, "How well you said that."
4. Create attitude of group approval—
   a. By allowing children to comment freely upon each other's language.
      (1) These comments should be spontaneous and should not become stilted, or formal, or petty.
   b. By having children choose those using especially good English to carry messages to other grades, etc.
   c. By having children in the second or third grade who use good English relate incidents to the children of the first grade. Call attention to the quality of the diction used after the various incidents have been related.

Grade II

1. Build up spirit of coöperation as suggested for Grade I.
2. Encourage children to comment spontaneously upon language of stories read to them.
   a. Teacher's example cited under suggestions for Grade I.
3. Encourage children to comment upon language of their classmates and themselves.
   a. Avoid perfunctory complimenting and petty criticizing.
4. Occasionally have third and fourth-grade children who use good English tell stories to second grade.
   a. Comments on diction should be made after story.
5. Children who show ability in style should be selected by class to tell interesting incidents to higher grades.
   a. Children who show improvement in language should be chosen sometimes for sake of encouragement.
6. In coöperative written work suggested under Aim 3, encourage free commenting and discussion in choosing sentences to be incorporated.

Grade III

1. Build up spirit of coöperation as suggested for Grades I and II.
2. In written and oral composition encourage:
   a. Recognition of good style and language.
   b. Imitation of good style and language.
      (1) Analyze some compositions chosen by class to see what makes them good.
      (2) Analyze one literary paragraph to see what makes it good.

Grade IV

1. Build up attitude of interest and spirit of coöperation as suggested for previous grades.
2. Analyze with class one short literary selection appropriate to grade, for sake of calling attention to appropriateness of language and style.
3. Analyze compositions written by members of class to find what makes them good compositions.
4. Have children imitate style and language of good compositions written by members of class, good compositions written by members of fifth grade, and occasionally paragraphs chosen from literary selections.
5. Have children imitate poems and write original poems.

AIM 6. TO TEACH THE CHILD TO PASS CRITICAL JUDGMENT ON HIS OWN SPEECH AND WRITING

Grade I

(Encouraging a critical attitude and establishing right habits of speech are all that can be expected in the primary grades. Principles underlying the correction of speech cannot be comprehended.)

1. **Make children conscious that there is a correct form of speech.**
   a. **See suggestions under Aim 3.**
2. **Teach children to compare their speech with correct forms to see whether they speak correctly.**
   a. **See suggestions under Aim 5.**
3. **Teach children to compare their written work with correct forms.**
   a. **See written work suggested under Aim 3.**

Grade II

1. **Follow suggestions for Grade I.**
2. **Inculcate in the children the habit of comparing copied work with the original to see that copy is accurate.**
3. **Teach the rules governing correct written form in order that children have basis for criticizing their work.**
   a. **See rules suggested under Aim 3.**
4. **Inculcate into the children the habit of examining their work to see that they have observed rules of form and punctuation.**

Grade III

1. **Follow suggestions given for previous grades.**
2. **Class and teacher coöperate to form set of standards for judging oral and written composition.**
3. **Have children form habit of comparing their oral and written work with these standards.**
4. **Have children form habit of criticizing their written work from standpoint of form. (Items of form and punctuation are given under Aim 3.)**

Grade IV

1. **Follow suggestions given for Grade III.**
2. **According to set of standards worked out by teacher and class, arrange ten of the children's compositions in a scale to be used as basis for criticism.**
3. **Have children form habit of evaluating their composition by means of the scale.**
4. **Have class formulate rules governing punctuation and form to be emphasized in written work of this grade. (Punctuation and form suggested under Aim 3.)**
5. **Have class form habit of criticizing their written work according to these rules.**

CHAPTER VIII

Remedial Work in Arithmetic

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CHAPTER VIII

Remedial Work in Arithmetic

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THE STUDY here recorded was made in an attempt to improve the arithmetic situation in the Waukesha, Wisconsin elementary grades. We had felt for some time that the results of the arithmetic teaching in our schools were far from satisfactory, and found our opinions verified when Form I of the Buckingham Reasoning Scale given in January of last year, and a survey[1] of the work in mechanics, made at about the same time, showed many grades taking the test below the required standard. This serious condition led to an intensive diagnosis of the causes of failure. This article is a summary of the suggestions given to teachers during the drive that brought the grades up to a satisfactory standard in mechanics and greatly improved the conditions in problem solving as shown by the results of Form II of the Buckingham Reasoning Scale, which was administered the following May.

THE ELIMINATION OF MECHANICAL DIFFICULTIES

Elda L. Merton

Mechanical difficulties were the first to be attacked, since we realized that without their elimination accuracy in problem solving would be impossible. A diagnosis of the abilities required for each of the fundamental operations brought to light many previously unrecognized causes of failure and aided teachers in locating them in the work of their pupils.

The abilities required for addition, substraction, multiplication, and short division are listed below, followed by some of the most effective remedial measures used. Because of limited space any remedial measures which are self-evident, such as a multiplicity of examples requiring concentrated drill involving the ability which the pupil lacks, are omitted.

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[1] Waukesha was one of four Wisconsin cities included in a survey of fundamental operations in arithmetic, made by University of Wisconsin students under the supervision of Dr. Frank L. Clapp.

A. Abilities Required in the Fundamental Operations

I. Knowledge Required for Addition

1. The 100 addition combinations.
2. Ability to apply the combinations to higher decades:

$$\begin{array}{r} 2 \\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 52 \\ 4 \\ \hline \end{array}$$

3. The meaning of the addition sign.
4. The meaning of the following terms: Addition, Sum, Add, Addend, and Carrying.
5. That in writing the example units must be placed under units, tens under tens, etc.
6. That one must begin at the right and work to the left.
7. That unit figures should be added to unit figures in a column, tens to tens, etc. This also includes the ability to keep one's place in a column.
8. Ability to add a seen to a thought-of number.

$$\begin{array}{r} 47 \\ 56 \\ 93 \\ \hline \end{array}$$

After a child has added 3 and 6, he no longer sees both of the numbers he is required to add. Now 7 is a seen number, but 9 is only a thought-of number. This also includes the ability to keep in mind the result of each addition until the next number is added to it.

9. How to regard zeros in a column.
10. How to regard empty spaces in a column.
11. How to place the answer in the sum when a column has been added and the total sum of these figures is less than 10.
12. How to proceed with the next column when meeting the condition in (11).
13. How to place the answer in the sum when a column has been added and the total sum of these figures is 10 or more than 10.
14. How to proceed with the next column when meeting the condition in (13). (Carrying.)
15. Ability to remember the number carried.
16. How to proceed when the need for carrying and no carrying is met alternately in an example.
17. How to place all the numbers in the sum.
18. How to check for correct answers.

II. Knowledge Required for Subtraction (Subtraction Method)

1. The 100 subtraction combinations.
2. Three ideas in one's subtraction concept:
   Taking away idea: 15—7, 7 from 15.
   Adding idea: What number added to 7 equals 15?
   Difference idea: 15 is how many more than 7?
3. The meaning of the following terms: Minus, less, subtrahend, minuend, "borrowing," difference, remainder.
4. The meaning of the subtraction sign.
5. That the complete minuend must always be larger than the complete subtrahend.
6. That in writing the example units must be placed under units, tens under tens, etc.
7. That one must begin at the right and work to the left.
8. That the order of units in the subtrahend must be subtracted from the same order in the minuend.
9. How to proceed when the first number to be subtracted in the minuend is larger than the corresponding number in the subtrahend.

10. That one must not "borrow" unless the number in the subtrahend is larger than the corresponding number in the minuend.
11. How to proceed when a number of the subtrahend is larger than the corresponding number of the minuend. "Borrowing."
12. What it means to place a "1" in front of a number when necessary.

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 423
—219
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1 adds in terms of 10.

13. What it does to the next number in the minuend when "1" has been placed before the following number.
14. Must be able to remember the new number made through "borrowing."

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 628
—239
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After subtracting 9 from 18, the child is dealing with 11, not 12.

15. How to proceed when the need for "borrowing" and no "borrowing" are met alternately in the example.
16. How to "borrow" when two or more successive digits in the subtrahend are larger than the corresponding digits in the minuend.
17. How to proceed when there are fewer figures in the subtrahend than in the minuend.
18. How to proceed when the last subtraction takes place with the subtrahend and minuend the same.

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 649
—623
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(The zero must not be placed in the remainder.)

19. Ability to handle a zero or a succession of zeros in the subtrahend.
20. Ability to handle a zero or a succession of zeros in the minuend.
21. How to check for correct answers.

IV. Knowledge Required for Multiplication

1. The multiplication tables through 9 x 9 including zeros.
2. How to add.
3. The meaning of the multiplication sign.
4. The meaning of the following terms: Multiplication, product, multiplier, carrying, multiplicand, sum
5. That in writing the example, units must be placed under units, tens under tens, etc.
6. That the multiplier is always a number of times.
7. That the number in the multiplicand is to be multiplied by the numbers in the multiplier.
8. That one must begin at the right and work to the left.
9. How to place the product after the first multiplication when the product is less than 10.
10. Ability to proceed with the multiplication of the next digit when meeting the condition in (9).
11. How to place the answer in the product when the product is 10 or more than 10.
12. How to proceed with the multiplication of the next digit when meeting the condition in (11). (Carrying.)
13. Ability to "multiply and add" quickly.
14. Ability to remember the number carried.
15. Ability to handle zero or succession of zeros in the multiplicand.
16. How to proceed when the need for carrying and no carrying are met alternately in the example.
17. How to proceed after the multiplication by the units figure of the multiplier is completed when there is more than one figure in the multiplier.
    (*a*) Which number to multiply with next.
    (*b*) Where to place the first product.

18. Ability to handle a zero or a succession of zeros in the multiplier.
19. That these products must be added and how this is done. This involves any or all of the 18 points on addition.
20. How to check for correct answers.

V. Knowledge Required for Short Division

1. The multiplication tables through 9 x 9 including zeros.
2. The 100 subtraction combinations.
3. The division tables through the 9's including zeros.
4. The meaning of the form $\overline{}$)
5. The meaning and use of each of the following terms: Division, product, dividend, carrying, divisor, quotient, remainder.
6. How to proceed when the first number of the dividend is the same as, or greater than, the divisor.
7. Where to place the first number of the quotient when meeting the condition in (6).
8. Must know how to proceed when the first number of the dividend is smaller than the divisor as:

   $4\,\overline{)\,104}$

9. Where to place the first number in the quotient when meeting the condition in (8).
10. Each step:
    Divide
    Place quotient figure
    Multiply
    Subtract
    Carry.
11. How to handle the remainder after subtracting. $2\,\overline{)\,9^{1}5\,4}$
12. Ability to remember the number carried.
13. That no number equal to or larger than the divisor can be carried.
14. Ability to find the correct quotient figure with a minimum of trial—(rapid recognition of the two factors, one being given).
15. How to continue dividing after some number in the quotient brings no remainder.

    $$\begin{array}{r} 18 \\ 2\,\overline{)\,364} \end{array}$$

16. Ability to handle the zero in the quotient and make the proper operation in the dividend.

    $$\begin{array}{r} 150 \\ 4\,\overline{)\,6012} \end{array}$$

17. Ability to handle the zero in the dividend when alone or used with a number carried.
18. How to handle a zero or a number of zeros at the end of the dividend.
19. How to place correctly all quotient figures.
20. How to handle the remainder at the end of a problem that does not come out even.
21. How to check for correct answers.

B. Remedial Measures Based on the Preceding Diagnosis

I. What Was Done for Pupils Having Difficulty with Addition

1. A common mistake made by teachers in primary grades has been the idea that only 45 combinations in addition need to be taught. It has been found by testing that pupils knowing $\begin{array}{r} 7 \\ \underline{2} \end{array}$ do not necessarily know $\begin{array}{r} 2 \\ \underline{7} \end{array}$. It was also taken for granted that pupils would

know how to handle zeros without being taught. This has resulted in many needless errors on the part of pupils. The hundred addition combinations are:

2	1	1	3	1	0	2	1	4	6
2	5	1	2	4	0	1	6	2	0
3	4	1	0	2	1	1	2	0	1
1	4	2	2	5	7	3	4	7	9
5	1	5	2	6	4	0	3	8	2
2	8	1	0	2	1	6	4	1	6
9	0	7	6	3	5	8	2	2	6
1	5	2	1	3	3	0	8	3	6
0	7	7	3	7	2	5	0	4	2
4	3	1	6	7	9	5	1	3	7
3	8	3	4	8	7	9	4	0	3
5	2	7	5	8	0	3	6	9	8
6	7	8	6	9	8	4	6	3	4
3	5	3	4	2	4	0	5	9	8
6	0	5	8	7	5	8	4	9	9
7	8	6	6	4	4	5	7	0	5
8	1	9	7	9	0	5	7	4	6
7	0	9	6	4	3	7	8	9	8
3	9	5	9	5	6	5	8	9	7
0	8	9	7	0	9	8	9	6	9

Experience shows that these 100 combinations must be substituted for the 45 combinations formerly taught. There is much discussion as to the most economical and effective method of teaching combinations to secure automatic responses. The following experiment carried on in the second grades of the city has answered this question definitely and satisfactorily for the teachers of Waukesha.

PRESENTATION OF COMBINATIONS

(Method Used by Miss Georgia Ausse, Grade II)

The combination to be learned is 6
2.

The child selects any objects he desires to "play the stories" of the combination. A second child steps to the board to write the

combinations as they are discovered. Let us suppose that the first child has selected some small colored blocks. He places six of the blocks in one hand and two in the other. He stands before the class and shows first, the hand containing the six blocks, then the hand with the two blocks. Holding both hands open before him he says "6 and 2 equals 8." Then, showing the hand with the two blocks first, he says "2 and 6 equals 8." Now, holding both hands before him he says "8" and, withdrawing the hand containing the six blocks, leaving the hand containing the two blocks before him, he continues "8 minus 6 equals 2." Then holding out both hands he says, while he places the hand containing the two blocks behind him, "8 minus 2 equals 6." He has now played the stories of $\begin{array}{r}6\\2\\\hline\end{array}$ and while he has been talking his partner has written the combinations on the board and the class has learned how to associate the concrete with the abstract form of the combination. Even the slowest pupils have learned combinations in a surprisingly short time with this method.

For seat work the children needing special help make little 4-page books in which they show the combinations by pasting therein colored stars.

AUTOMATIZING COMBINATIONS

In spite of the fact that primary teachers have drilled endlessly upon combinations, using every game and device coming to their attention, results have, as a rule, been discouraging; and upper-grade teachers have found it necessary to spend much time reteaching combinations. The experiment described below grew out of the feeling that the sight of $\begin{array}{r}4\\2\\\hline\end{array}$ alone is not enough to automatize $\begin{array}{r}4\\2.\\\hline 6\end{array}$ Some teachers, feeling this inadequacy, experimented with flash cards bearing $\begin{array}{r}4\\2\\\hline\end{array}$ on one side and the answer "6" on the back. But they found that the sight of $\begin{array}{r}4\\2\\\hline\end{array}$ alone or of "6" alone did not insure the knowledge of $\begin{array}{r}4\\2.\\\hline 6\end{array}$ A child must see the whole in order to know automatically the part which is missing.

To carry out the experiment, four of the seven second-grade teachers of the city supplied each of their pupils with a small set of flash cards (made by the pupils in the drawing period), each card containing a combination on one side, and the combination and answer on the back.

During periods of independent study each child took his pack of cards and tested himself in the following manner: Looking at the card $\begin{array}{r} 4 \\ \underline{3} \end{array}$ he said to himself "7"; then, turning the card over he saw $\begin{array}{r} 4 \\ \underline{3.} \\ 7 \end{array}$ This card he placed in one pile called his "Know Pile." One after another he tested himself on the cards in the entire pack, coming occasionally to some which he found to be incorrect upon turning the cards over. These were placed in a second pile called his "Don't Know Pile." After separating the cards in this way, he put away the "Know Pile" and proceeded to study the "Don't Know Pile," by means of the side containing the combination and answer. In this way he taught himself the combinations that he did not know. He then retested himself on the "Don't Know Pile," gradually eliminating those he did not know. Occasionally pupils chose partners and tested each other, the object of the test being to finish without a "Don't Know Pile." After pupils were sure that all answers were learned and could be given rapidly as well as accurately, they came to the teacher to be tested by her. This method placed the responsibility of learning the combinations not upon the teacher, but upon the pupils, where it properly belongs.

The remaining three second-grade teachers continued drilling upon combinations in the usual manner, using games and devices of every sort and depending upon repetition of answer-calling for the automatizing of the combinations.

At the close of the semester each of the second grades was given a timed test on the combinations. These tests were prepared on mimeographed sheets. The 2B grades were required to write the answers to 72 addition combinations and 72 subtraction combinations, the maximum time limit for each being five minutes. The 2A grades were given a maximum time limit of six minutes for the 100 addition combinations and six minutes for the 100 subtraction combinations.

The following table will show the comparative efficiency of the two methods as revealed by this experiment. The letters A, B, C, and D represent the grades supplied with the flash cards described above, E, F, and G the grades taught by the old method.

Grade	IIB Grades				Grade	IIA Grades			
	Addition		Subtraction			Addition		Subtraction	
	Median number tried	Median number correct	Median number tried	Median number correct		Median number tried	Median number correct	Median number tried	Median number correct
A	72	72	72	71	A	100	99	100	100
B	72	71	72	71	B	100	99	100	94
C	72	70	71	68	C	100	100	100	98
D	72	71	71	56	D	100	99	100	98
E	70	58	52	24	E	100	97	68	52
F	56	54	22	15	F	100	92	76	66
G	53	50	26	17	G	76	68	35	32

In no case were the results of the three grades using the old method as good as those secured by the four teachers using the combination and answer method.

2. The ability to apply combinations to higher decades is one which comes with practice. Unless their attention is called to it, pupils fail to see that if they know $\underline{\overset{4}{5}}$ they also know $\underline{\overset{74}{5}}$.

Practically the whole of the drill given in primary grades is upon the combinations. Still, in column addition nearly all of the sums required are secured, not by adding the simple combinations, but by applying them to higher decades. The following drill was found to correct the errors made by pupils unable to make this application:

38	
33	1
34	2
30	3
39 and	4
31	5
37	6
35	7
32	8
36	9

After a child has added each single number in the right column to the entire column of higher decade numbers, the teacher erases the tens figures of the left hand column and changes them to 5's,

9's, 2's, or any number she wishes. This device provides for much drill in applying combinations to higher decades.

3. In an attempt to find out why pupils who are able to give sums accurately when numbers are placed before them as $\begin{array}{r} 47 \\ 6 \\ \hline \end{array}$ are unable to do this same thing when adding numbers in a column, it was decided that the trouble was due to the fact that drill given in the form just illustrated did not prepare pupils to add a *seen* to a *thought-of* number, an ability which is required in every case of column addition. To meet this need the following drill was used with most satisfactory results:

The teacher tells the pupils to keep in mind some number such as 65, 92, 37, or 81. She then writes upon the board some digit, such as 5. The child must add the 5 (the seen number) and 65 (the thought-of number). Changing the digits rapidly and occasionally changing the thought-of number gives the much-needed practice for the overcoming of this difficulty.

II. What Was Done for Pupils Having Difficulty with Subtraction

1. Flash cards with combination and answer similar to those just described were supplied the pupils. The 100 combinations drilled upon were those which correspond to the 100 addition combinations listed in a former table.

2. The following table was used for rapid oral or written drill on these 100 combinations:

0	4	1	7	0	9	3	6	5	8	2
1	5	2	1	7	4	10	8	3	6	9
2	7	3	9	2	5	8	11	4	10	6
3	9	12	3	4	8	10	6	11	5	7
4	13	5	11	9	7	12	4	8	6	10
5	8	11	14	6	9	13	5	7	10	12
6	6	10	8	15	11	7	14	9	12	13
7	10	7	16	9	11	8	15	12	14	13
8	15	11	8	10	17	12	14	9	13	16
9	12	18	14	17	13	15	9	16	10	11

A child was required to give orally the remainders, subtracting 0 from each number in the first row, 1 from each number in the second

row, 2 from each number in the third row, etc. When writing remainders, a whole group wrote remainders only, to rows designated by the teacher. The value in this lay in the fact that all pupils in the group were not only working, but working independently.

3. In applying these facts to higher decades an adaptation of the drill described for such work in addition was found to be most effective. (See Addition, Drill 2.)

III. What Was Done for Pupils Having Difficulty with Multiplication

1. Flash cards with combination and answer similar to those described for addition were supplied the slower pupils. The same 100 combinations given for addition are needed for multiplication drills. Special drill was given upon the multiplication of a number by 0. A study of the most difficult combinations made of all grades of the city by University of Wisconsin students under the supervision of Dr. Frank L. Clapp, showed the following to be true of the multiplication combinations:

Multiplication Test, Waukesha Public Schools, Grades 4–8, Inclusive. 729 Pupils.
The 25 Most Difficult Combinations

Combination	Errors	
	Number	Per Cent
8 x 0	207	28.4
7 x 0	192	26.3
0 x 5	182	25.0
0 x 7	176	24.1
9 x 0	172	23.6
0 x 2	172	23.6
4 x 0	168	23.0
2 x 0	166	22.8
0 x 6	166	22.8
0 x 4	164	22.5
0 x 1	164	22.5
6 x 0	162	22.2
0 x 9	158	21.7
0 x 3	149	20.4
8 x 0	147	20.2
3 x 0	146	20.0
1 x 0	135	18.5
9 x 7	130	17.8
5 x 0	127	17.4
7 x 8	106	14.5
6 x 9	103	14.1
9 x 6	102	14.0
8 x 7	100	13.7
7 x 9	100	13.7
6 x 8	97	13.3

From this report it was evident that much of the difficulty could be attributed to insufficient drill upon zeros. A sixth-grade teacher who had tried every corrective measure she could think of and had become greatly discouraged when she could not reduce the errors in multiplication in her room, found when this survey was made that 90 per cent of her pupils did not know how to multiply by zero. Some pupils confessed to uncertainty as to the answers and called one combination 0, and another such as 7x0, 7, so as not to get them all wrong. This accounts for the irregularity in the number of errors in the above table. It was also discovered that many pupils thought that 8x0 equals 0, but that 0x8 equals 8. A study of old papers of this sixth-grade group showed that in nearly every case errors in multiplication had been made in examples containing one or more zeros. The fact that these pupils had passed through the first six grades without this cause of error being discovered is one of the many unfortunate examples of unscientific attacks on school problems.

2. The knowledge of the multiplication tables is not enough to insure accuracy in an example like $\begin{array}{r} 538 \\ \underline{\text{x}7} \end{array}$. To work the example the child must think:

7 x 8 equals 56
7 x 3 equals 21 plus 5 equals 26
7 x 5 equals 35 plus 2 equals 37.

Efficient work requires the ability to multiply and add quickly. To cultivate this ability the following device was used:

	7		
	2		1
	8		2
4x	0	and	3
	9		4
	3		5
	1		6
	4		7
	5		8
	6		

The child begins with 4x7 and 1, 4x2 and 1, 4x8 and 1, etc., until he has finished the column. He then begins again with 4x7 and 2, 4x2 and 2, 4x8 and 2, etc. Any digit may be used in the multiplier. There is one matter which must be guarded, however: No number added should be greater than the multiplier less one, since this situation is never met in an actual example. For instance, in multiplying by 4, 3 is the largest number ever carried and to require a pupil to add a number such as 8 would be wasteful drill.

IV. What Was Done for Pupils Having Difficulty with Short Division

1. The division facts drilled upon before the survey previously mentioned in this report was made were those which seemed to the teacher to be most difficult. The survey revealed a startling fact, and one which is clearly shown in the following table:

Division Test, Waukesha Public Schools, Grades 4-8, Inclusive. 727 Pupils. The 25 Most Difficult Combinations.

Combination	Errors	
	Number	Percent
2 div. 2	237	32.6
9 div. 9	206	28.3
3 div. 3	191	26.3
1 div. 1	191	26.3
6 div. 6	189	26.0
5 div. 5	184	25.3
8 div. 8	182	25.0
7 div. 7	177	24.3
4 div. 4	172	23.7
28 div. 4	156	21.5
36 div. 4	151	20.8
0 div. 2	138	19.0
0 div. 7	133	18.3
54 div. 6	132	18.2
0 div. 8	131	18.0
63 div. 9	130	17.9
0 div. 9	127	17.5
0 div. 3	125	17.2
42 div. 7	124	17.1
0 div. 5	122	16.8
48 div. 8	118	16.2
0 div. 4	115	15.8
2 div. 1	111	15.3
0 div. 6	109	15.0
54 div. 9	108	14.9

The very combinations which teachers have always taken it for granted needed no teaching were the combinations which the pupils did not know. This difficulty was overcome by means of intensive drill upon combinations such as 2 div. 2, and 0 div. 7. The complete list of 90 division combinations was thoroughly covered in drills.

2. Drill upon the division tables alone will not insure rapidity and accuracy in short division. It was found that pupils knowing that there are 7 sixes in 42 were unable to state the number of sixes in 45. It is just as important that pupils be drilled upon the giving

of quotients and remainders as upon the division tables. The chart printed below was used almost daily by teachers in the fourth, fifth and sixth grades in overcoming slow and inaccurate work in naming quotients and quotients and remainders.

	14	23	31	40	56	69	72	85
1	18	27	35	47	52	63	77	81
2	13	20	32	45	58	67	71	89
3	11	24	38	41	51	60	79	83
4	12	29	30	49	50	65	73	87
5	17	26	37	48	59	68	76	80
6	15	21	33	42	54	66	70	86
7	19	25	39	44	57	61	74	82
8	10	22	34	46	53	64	78	84
9	16	28	36	43	55	62	75	88

In oral work a pupil began with 1 in the first left-hand column and divided the numbers in this column by 1; he then began with 2 in the first left hand column and divided all succeeding numbers in the first two columns by 2, thus: 1; 1, remainder 1; 2; 2, remainder 1; 3; 3, remainder 1; 4; 4, remainder 1; 7; 9; 6, remainder 1, etc. Beginning with 3 in the first left-hand column he divided each number in the first three rows by 3. This chart is so planned that every division fact about 3 is contained in the first three rows, about 4 in the first four rows, etc.

In written work a whole group wrote quotients and quotients and remainders using divisors designated by the teacher, or those of their own choosing.

V. Most Economical and Effective Devices and Games

During the time this remedial work was carried on, teachers tested out the efficiency of various devices and games which might add to

the interest of the work in Arithmetic as well as aid in automatizing number facts. The following were found to be most effective in securing results with slow pupils.

1. *Game of silence*—This game proves most fascinating to children. After the game begins no one speaks until the exercise is over. Each pupil is handed as many combination cards as the teacher desires. The teacher steps to the board and writes some number. In case the number is 14, all pupils having combinations of 14 come quietly to the front of the room. Pupils examine the line closely for "intruders" who do not belong in the line. If no errors have been made the class nods to the teacher who places a new number on the board and the game proceeds. If an error is made the child who discovers it steps to the board and places the wrong combination on the board with its answer.

2. *A guessing game*—Any number of children may take their places at the blackboard, each with chalk and eraser. The leader selects a flash card, and without showing it to the class, gives the answer only, as 12. Each child then puts upon the board some combination of 12, as

$$\begin{array}{r} 8 \\ 4 \\ \hline 12 \end{array} \quad \begin{array}{r} 4 \\ 8 \\ \hline 12 \end{array} \quad \text{or} \quad \begin{array}{r} 6 \\ 6 \\ \hline 12 \end{array}$$

When everyone has finished, the leader holds up the card, and those who have guessed correctly add a point to their score.

3. *Blackboard contest*—Send three pupils to the board; dictate an example: let the pupil who first gets the correct result take his seat; another pupil takes his place and the game is repeated. As no pupil takes his seat until he has won over two other pupils, this game gives additional drill to those who need it, and at the same time takes nothing from the "glory" of the better pupil whose aim it is to be seated as soon as possible. When the pupils gain a little confidence in their ability, four or five may be sent to the board at once.

4. *Speed game*—This game is an excellent one for stirring up sleepy children. Place upon the board some number, such as 12. This means that any number placed upon the board is to be subtracted from 12. Then write 8 and erase the 8 immediately, pointing to some child in the group, who says 4. Then write 7 and erase immediately. The child pointed to answers 5. Speed is what is needed to make a game of this device. It can be used for any of the operations taught. Any teacher using this device will find almost immediate improvement in her group. Its value lies in that all of the group are held for every example given.

5. *Speed game*—The following drill discourages inaccuracy and gives quick and accurate workers full credit. Sides should be chosen; the pupils remaining seated. To facilitate the tallying on each side have each pupil write his captain's name at the top of the paper. When all are ready put from five to ten examples on the board. Let the pupils give you their papers as soon as they finish and place them in order, the first one on the bottom and the last one on top. In correcting allow 1 for the top paper, 2 for the second, 3 for the third, etc. Subtract 5 from the captain's total score for every paper containing errors.

6. *Making a border*—This exercise prepares pupils for column addition. Each child is given a card bearing a number from 0 to 9. He steps into line and marches by the blackboard ledge. Number one lays his card along the ledge and says 8 if his card contains that number; number two puts his next and tries to add it; number three continues the "border" by adding his number to the sum of the others and the game proceeds until all cards have been placed.

7. *Combination puzzles*—Rows of examples similar to the following are given the pupils.

$$\begin{array}{rrrrrrr} 4 & 9 & 6 & 8 & 2 & 9 & 7 \\ \hline 7 & 2 & 3 & 14 & 10 & 3 & 0 \end{array}$$

Pupils must not only determine the answer but also the process. These puzzles when used in races by rows or groups encourage speed on the part of the slowest pupils. (Suggested by Miss Ida Klausch, Waukesha Public Schools).

8. *Guessing games*—

(*a*) I am thinking of a number between 40 and 50.

Is it 9 x 5?

It is not 45.

Is it 7 x 6?

It is not 42.

Is it 4 x 11?

Yes, it is 44.

(*b*) If I multiply my number by 8, I shall have 40. Of what number am I thinking?

If I add 6 to my number, I shall have 14. Of what number am I thinking?

If I subtract 6 from my number, I shall have 3. Of what number am I thinking?

If I divide my number by 9, I shall have 7. Of what number am I thinking?

9. *Self proving example*—Choose a number. Multiply it by 2. Multiply this product by 3, the next by 4, and so on through 9. Divide the last product by 2, this quotient by 3, the next by 4, and so on through 9. If the work is correct the result will be the number started with. This self-proving feature, besides developing accuracy, gives the device the interest of a game. A different example given to each child for individual or seat work helps to strengthen weak spots and develop self-reliance. Use small numbers until the pupils understand the process. Later, if allowed to choose they often take large numbers of their own accord.

10. *Post-office game*—This game was invented by pupils who had visited a post office and had watched the speed with which the men tossed letters into their proper boxes. As preparation for the game the children draw 19 squares arranged and numbered in the following way:

0	1	2	3	4
5	6	7	8	9
10	11	12	13	14
15	16	17	18	

The teacher gives a combination such as $\frac{9}{-4}$, and the child must decide what the answer is, find the box labeled five and write the combination in this box before the teacher gives the next combination. His "5 box" will then look like this:

5 9 -4

To check work, the teacher reads all the combinations which should be found in each box. The value of the corrected sheet lies in that each child has a permanent record of the errors he has made and which he will need to study more thoroughly. This game is intended for rapid reviews of addition and subtraction facts. (Suggested by Miss Georgia Ausse, Waukesha Public Schools.)

11. *Box race*—When this device was first tried out in one of the fourth grades of the city, each child prepared his own paper before class, but the results obtained from its use were so startling that it was deemed profitable to mimeograph the form and supply each teacher with as many copies as she cared to use. The cost of the thousands of copies requested has been slight compared with the benefit derived from their use.

6					3				
2					8				
0					4				
8					1				
3					6				
1					2				
7					5				
4					9				
9					0				
5					7				

A form is passed out to each child and the pupils are told whether they are to add or multiply. The teacher says, "Ready,—7, go!" If they are to add, the pupils place a 7 above the first vertical column of squares and immediately proceed to add 7 to each of the numbers in the column, placing the answer only in the square. As each child finishes, he stands and a record is kept of the order in which the rows complete the column. Papers are exchanged, the teacher reads the answers rapidly, errors are checked, papers returned, and the first row up with no errors against it receives a point. A new number is then given to be added, and the game proceeds as before. The value of this device lies in that pupils waste no time copying examples, devoting the full

time to writing answers, and that the corrected sheet is a permanent record of combinations which the pupils do not know and which need further study. (Suggested by Mrs. Frances Federer, Waukesha Public Schools.)

THE ELIMINATION OF DIFFICULTIES IN REASONING

G. O. Banting

During the past few years many serious and profitable studies have been made of the subject of reading, the results of which have been given to the public. We have careful analyses of failure and valuable remedial suggestions therefor. The results have been gratifying. The reading situation is at present, if not satisfactory, at least hopeful.

When, however, a study is made of the causes of failure in problem work in arithmetic one is surprised at the meager literature upon the subject. What has been published is largely general in character and scientific in language. Little has been added to the principles of reflective thinking found in any recent text in psychology. Those in direct contact with the problem know of what little value this is to those actually teaching the children. At least ninety per cent of the teachers in our schools are unable to profit by general scientific discussion. What they need and appreciate is definite concrete material. They have not the time nor are they generally equipped to do much original investigation or to translate psychological principles into suggestions of practical helpfulness.

The study in the Waukesha Schools was made without any thought of doing more than investigating the local condition and giving to the teachers the help they needed. There was no idea of contributing anything to the psychology of the subject; the aim was mutual coöperation in the solution of a practical problem. The following analysis of the causes of failure to solve problems in arithmetic is the result of a coöperative study for one year in the grades below the junior high school. It is not complete nor are the remedial suggestions either thoroughly scientific or adequate. They have, however, proved of some practical use. We all realize that it will require many such studies before sufficient material is available for reference and for a foundation for further investigation.

This study was begun in February, 1922. Not only were the results of Buckingham's and Monroe's tests carefully weighed, but the daily work of the pupils was scrutinized, and the boys and girls questioned as to their difficulties. Thorndike's Psychology of Arithmetic which was received shortly after the study was begun was freely consulted and proved very useful to those guiding the investigation.

A. Causes of Failure. The following causes of failure to solve simple problems like those of Buckingham's Standard Tests have been observed:

I. Failure to comprehend the problem in whole or in part. This may be due to any one of the following:

a. Lack of general ability in silent reading.

b. Lack of knowledge of the technical terms used, *i. e.,* inability to read the language of arithmetic.

c. Carelessness in reading. The child may know how to read the problem but yet fail to comprehend it because of lack of care and attention. This often results in a partial solution of the problem.

d. Lack of the necessary experience to reproduce mentally the concrete situation of the problem.

II. Lack of the ability to perform accurately and readily the fundamental operations.

III. Lack of the knowledge of facts essential to the solution of a problem. For example, lack of knowledge of the tables of weights and measures, etc.

IV. Lack of the ability to identify the proper process or processes with the situations indicated in the problem. One may understand the processes very well and yet not know which to choose to solve a particular concrete problem. The lack of this ability, not to know whether to add, subtract, multiply, or divide in a concrete case is characteristic of so-called dull pupils in arithmetic, and is the chief cause of the painful stabbing, the mere juggling with figures that is the despair of the teacher in the middle and upper grades.

V. Lack of sufficient interest in the problem to inspire the required mental effort.

VI. Failure to form the habit of verifying the results. Pupils who are able to read the problem and to identify the proper process often make snap judgments, which are easily apparent if an attempt is made to verify the partial and the total results.

VII. The habit of focusing the attention upon the numbers and being guided by them instead of by the conditions of the problem. For example, in a problem in which the essential fact was that a man received $18 for 24 hours' work, a number of children divided 24 by 18 to find the hourly wage, because 18 is a smaller number than 24. It will be noted that the correct process was identified.

Another example is the fact that many children feel that they must use every number stated in a problem in its solution.

VIII. Akin to the foregoing, pupils are sometimes completely nonplused by large numbers. Though they can read the problem and

identify the process when smaller numbers are used, they are perplexed by numbers larger than those of everyday experience.

IX. The habit of being guided by some verbal sign instead of making an analysis of the problem. For example, in the problem from Buckingham's test, "A boy had 210 marbles, and lost one third of them. How many had he left?" A bright boy whose answer was 70, explained his mistake as follows: "Miss ———— (his teacher) told us that if we saw 'of' after a fraction in a problem we were to multiply."

Other examples are rules given based not on an analysis but upon some verbal expression. For example, in the problem, "What part of 36 is 9?" teachers frequently tell pupils that the number after "of" is always the base and we must divide the other number by it.

X. Lack of ability or care to properly arrange the written work in orderly, logical form. In longer problems this is a fruitful source of error.

XI. The failure to recognize the mathematical similarity to type problems which the pupils understand, because of some unusual situation in the problem in question. For example, the pupil who readily solved problems dealing with the purchase and sale of familiar things, failed when given a problem dealing with the purchase and sale of a farm.

XII. Lack of ability to understand quantitative relations such as:

(1) Cost, loss or gain, selling price.
(2) Income, expenditures, amount saved.
(3) Interest, rate, time, principal, amount.
(4) Time, distance, rate.

In order to solve problems containing such quantities one must know not only their meaning but the relations existing between them.

XIII. The pupil may fail because the problem requires exertion beyond his span of attention.

XIV. The pupil may fail because of absolute inability to do reflective thinking.

B. General Suggestions

I. Much more effective problem work must be done in the second and third grades.

II. While in mechanical work in arithmetic pupils should be inspired to quick incisive response, in problem solving pupils must be given time to think.

III. In no subject is the manifest impatience of the teacher or the interference of other pupils a greater impediment to successful effort.

IV. Skill in the solution of problems will not come by merely giving a multiplicity of problems.

V. Modern education demands of the teacher not only the knowledge that the pupil is failing, but also why he is failing.

VI. The teacher must establish such relations in the school and with the individual pupils that they will tell her frankly of their difficulties.

VII. The teacher must know how to help the pupil in any particular difficulty and be able to give him the experience or the drill he especially needs.

VIII. Informal parallel tests should be given frequently to check improvement.

C. Special Remedial Suggestions

The following more specific remedial suggestions apply to the various causes of failure listed in the foregoing. The numbers of the suggestions here given correspond to the numbers in the list of causes of failure:

I. *a.* 1. Give special drill in silent reading to the pupils in any grade who show lack of general ability to comprehend problems.

2. Introduce the written or printed problem to the child in the first grade not as an exercise in numbers, but as an exercise in silent reading. Example: A first-grade exercise in silent reading for seat work.

Picture I

Draw a tree.
Put five little birds in the tree.

Picture II

Draw the tree again.
Two of the little birds are flying away.
Draw them.
How many little birds are left in the tree?
Draw them.

Such exercises are invaluable for seat work and hundreds of them should be given to children in the first and second grades. The language used should gradually approach the ordinary form of the arithmetic problem.

Problems of this kind are also excellent for dramatization and for graphic illustration. In one of the second grades of the city, pupils have produced dozens of original devices in paper cutting, drawing, and dramatizations to illustrate problems in which they have become interested.

The important thing to consider is that the skill required to read a problem should be developed not in the arithmetic class, but in the silent reading lessons. As Thorndike well says, "The pupil should not be given elaborate drill in reading during the time devoted to the treatment of quantitative facts and relations." It is the business of the reading class to prepare the pupil to read the problem in Arithmetic.

I. *b*. 1. In teaching the fundamentals, acquaint pupils with the proper arithmetical terms at the outset. Give drills upon the vocabulary of arithmetic used in the stating of problems. Such terms and phrases as: total amount, how many are left? how much remains? gained, lost, sold, bought, etc., should be thoroughly understood by the child and be to him a cue to the process required for solution.

2. Give drill upon the common abbreviations used in arithmetic.

3. Avoid needless verbal difficulties. Select only such problems as are expressed in words which ought to be familiar to the pupils.

4. Pupils confined to one text become accustomed to the language and form used by one writer in the stating of problems and are unable to solve the same problems when stated somewhat differently in another text. For this reason teachers should be supplied with copies of a number of arithmetic texts so that they may select problems from various sources and give their pupils a richer experience in problem solving.

I. *c*. "Carelessness" in reading problems is a phase of lack of ability in silent reading and should be corrected in the reading class.

Exercises like those listed under IV and VI are, however, very valuable and insure against carelessness.

1. From the outset put a premium upon accuracy in reading and in copying the figures of a problem.

2. Let every problem contain such a challenge to effort that the pupil is alert and attentive.

I. *d*. 1. In the first, second, and third grades pupils should be given a wealth of experience in situations which involve number relations, number games of many kinds, playing post office, store, etc. Every opportunity should be embraced which introduces an element that helps to form a foundation of experience for problem work.

2. If the pupil has not had the experience that enables him to reproduce mentally the concrete experience necessary to the solution of some particular problem, there are two things which the teacher may do.

Produce in the schoolroom the conditions of the problem, or similar conditions, in order to give the pupil the required experi-

ence. If a pupil fails in a problem give another problem dealing with familiar situations involving the use of the same process or processes in the same order. If the child solves II and fails to solve I he needs further practice.

II. 1. For remedial suggestions in fundamental operations see Part I of this article.

2. It must be remembered that accuracy does not come by repetition alone. Pupils should be impressed with the one hundred per cent accuracy standards demanded by the business world.

3. Pupils (in the fifth and sixth grades) should be given practical methods of checking and of proving the work. The modern adaptation of the old method of casting out nines is valuable for multiplication and long division.

III. 1. Pupils should not be given problems which require for solution facts which they do not know and cannot secure. However, problems which do not state all the facts necessary for their solution are especially valuable. For example, problems which require reference to price lists, market prices, etc.

2. Pupils should be taught to analyze a problem and be able to state what they need to know in order to solve it. The following principles given to slow pupils and memorized by them proved very helpful in determining a process:

(*a*) When we know the price of a number of miscellaneous articles of different prices, we find their total cost by adding.

(*b*) When we know that one thing has greater value than another we find how much greater one is than the other by subtracting.

(*c*) When we know the value of one thing we find the value of many similar things by multiplying.

(*d*) When we know the value of many similar things we find the cost of one of these things by dividing.

3. If the pupil finds the need of a piece of knowledge in order to solve a problem and knows where to get it, he is acquiring information under the best conditions and is very liable to retain it.

IV. This is the most important consideration of the whole subject. The success of the pupil in problem solving depends very largely upon the strength and permanency of the bonds formed in the mind of the child between a specific concrete situation and the proper arithmethical process to apply. The forming of these bonds is the all-important work of the lower grades. If the pupil does not acquire this ability there, he is a helpless failure in upper-grade arithmetic and frequently in algebra as well.

The child must first comprehend the concrete situation of the problem. That he may do so and yet not know the proper process to

apply is shown by the following attempts at the solution of one of Buckingham's problems by 3B pupils who had not yet been taught to divide by 9. "If an electric car runs 9 miles an hour, how many hours will it take to travel from one city to another, a distance of 117 miles away?"

Solution by Harold S.	Solution by Frank B.	Solution by Ray K.
9	9 108	12 13
9	x12 9	12 13 13
9	— —	12 13 x 9
9	108 117	12 13 —
9 Answer 13 hrs.	Answer 13 hrs.	12 13 117
9		12 13
9		12 13 Answer 13 hrs.
9		12 13
9		12 13
9		— —
9		108 117
9		
9		
—		
117		

The pupil is ready for the process when he understands the situation.

As a means of aiding pupils in problem solving the following suggestions will be found helpful:

1. Teach no isolated fact in arithmetic but every fact in connection with some practical situation.

2. Have the pupils make up one step problems giving them specific directions as:

Make up a problem in which you add.

Make up a problem in which you multiply, etc.

3. Give the pupils one-step problems and have them indicate the process by writing the word or giving the sign of the operation. Later have them specify the numbers to be added or multiplied, subtracted, or divided.

4. Give the pupils a number of problems and have them make up problems from their own experience different in condition but similar in solution.

5. From lists of review problems in textbooks, have pupils select problems in which the same process must be applied. In checking a page in the text a list of one-step problems may be divided into four classes in some such form as the following:

Process	Number of Problem
Add	1, 8, 7, 3
Multiply	2, 4, 6
Subtract	5, 9
Divide	10

A bright child should be given a number of arithmetics from which to select problems for assignments of this nature.

6. There are fifteen kinds of two-step problems which should be studied intensively:

Add and subtract
Add and multiply
Add and divide
Subtract and subtract
Subtract and add
Subtract and multiply
Subtract and divide
Multiply and add
Multiply and subtract
Multiply and multiply
Multiply and divide
Divide and add
Divide and subtract
Divide and multiply
Divide and divide

Collect problems which cover all of these and see that pupils are able to meet any of these situations by solving any such problem. They should be asked to make up problems in which these steps are required for solution as, "Make up a problem in which you add and multiply; in which you subtract and divide, etc."

7. Give problems without numbers for which the pupils will give the processes, for example: "If I know all the items of a bill and the amount I give in payment is greater than the amount of the bill, how do I find what change I am to receive?"

8. Teachers should avoid assigning lists of problems in any particular process as review work. Such work has little or no value as a reasoning exercise. Unless problems require a variety of response so that the child must think in every case, they are valuable merely as an exercise in mechanics.

9. When giving a problem similar in process to the one which has preceded it, teachers should not tell pupils, "this is another problem just like it." Pupils must be required to discover for themselves the similarity of the situations involved.

V. 1. The cause of lack of interest is mainly lack of motivation. Discard the bookish problem. Give to the pupil the practical problem of daily life.

2. Let every problem be a challenge to the pupils to do something that is worth while.

3. Have pupils bring actual problems from the home.

4. Correlate with situations in geography, history, or reading which involve situations requiring the use of numbers.

5. Appeal to the interests of pupils. Boys are interested in batting averages, basket-ball scores, the laying out and measurement of a baseball diamond, etc. On pages 9 to 23 of his Psychology of Arithmetic, Thorndike gives an excellent discussion on this subject, which every teacher should read.

VI. Lead the pupil to form the habit of doing the following: After reading the problem, as aids to the solution: (1) Label your answer. (Will the answer be in dollars, yards, days, etc.?) (2) Estimate the answer in numbers—Will it be larger or smaller than some number in the problem, and why? (3) After solving the problem check all your work, and if possible prove your answer; and (4) If it is impossible to prove the answer, its reasonableness should be tested.

VII. Secure a careful analysis of the problem by such devices as the following:

1. Have the pupils specify what each number in the problem represents.

2. Give the pupils a similar problem but with the numbers of such character that they will not lead to error, for example: A man received $24 for 6 hours' work.

3. Give a similar problem without numbers and have pupils tell the solution in general terms. For example, in problem under discussion, divide the total amount received by the number of hours the man worked.

VIII. 1. Have the pupils make up a problem just like the one given, but with smaller numbers. After he has solved it let him again try the original problem.

2. In teaching a new principle use only simple numbers.

IX. 1. In this case the teacher is generally responsible for the failure. There is a constant tendency to give the pupils some rule or guide (like the examples given in the list of Causes of Failure under IX) by which they can arrive at a solution without reflective thought. This is, of course, the very reverse of what ought to be done.

2. It is true, however, that some dull pupils who can never be led to reason effectively can be taught to solve problems of some degree

of difficulty by giving them rules and cues to solution; but care must be taken to select only cues which have no exceptions which will at some later time lead a pupil into error.

3. Require oral analyses of pupils who are failing to do satisfactory work in reasoning. This will enable the teacher to find the exact spot where a pupil is erring in his reasoning.

X. 1. Pupils must be impressed with the importance of neatness, care, and logical order in all written work in arithmetic.

2. Partial results should always be labeled.

3. A premium should be put upon good written solutions to problems by displaying them upon the bulletin board.

4. Pupils should keep arithmetic note-books in which, from time to time, are inserted neat, orderly, solutions of type problems and of such others as have proved difficult to them.

XI. Training in the solution of problems by means of type problems is of value. Suggestions already given, listed below, will be found helpful. See IV, 2, 3, 4, 5, and 6; X, 4. When an important and difficult type problem is taught, an effective method will consist of omitting the mechanical operations and merely discussing the solution.

XII. Special care should be taken in a study of the relations between various quantities like those cited. The algebraic form may be used. For example:

Amount = Principal + Interest
Distance = Rate × Time
Cost + Gain = Selling Price
Area = Length × Width

XIII. 1. Pupils should not be given problems beyond their powers of comprehension and span of attention. Two-step problems should not be given until the pupils have displayed a complete mastery of one-step problems; three- or more-step problems until there is mastery of the two-step problem.

2. Care must be taken that the situation described in the problem be not unnecessarily complicated or the statement too wordy.

XIV. Teachers should have the intelligence quotients of all their pupils and must realize that it will be impossible to train those whose rank is below that of the dull normal to do much reflective thinking in arithmetic. Such pupils may often be proficient in mechanical work to which the attention in such cases should be largely confined.

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A Diagnosis Sheet in Arithmetic

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IN THE FALL of 1922, the Courtis Supervisory Arithmetic Test A, Form 1, was given to grades 4B through 8A in the Longfellow School. It was found that the school was practically at standard. However, an analysis of the scores for the various pupils revealed some interesting results. According to the test tabulation sheet, pupils are divided into five groups as follows:

Group 1—Pupils of standard ability.

Group 2—Pupils for whom the regular class work will suffice.

Group 3—Pupils in need of thorough drill.

Group 4—Pupils in need of special drill and extra attention.

Group 5—Pupils so far below standard that special adjustments of class work and drill must be made.

Pupils in groups 1 and 2 are not problems for the classroom teacher. Pupils in groups 3 and 4 can be provided for by being given special drill, which is suited to their individual needs. Such devices as the Courtis Standard Practice Tests, or the Studebaker set are sufficient to bring these pupils up to standard.

Pupils in group 5 are problem cases. Pupils of this type often have peculiar, individual difficulties that remain undetected when regular class work is the only procedure used to provide drill. Their difficulties must be diagnosed in much the same manner that is used by the physician, namely, by a careful study of the individual case.

The need of suitable materials to assist in the study of this problem resulted in the development of series of diagnostic tests of the simpler basic processes of addition, subtraction, multiplication, and

Diagnostic Tests in Four Fundamentals

Addition	Subtraction	Multiplication	Division
I 3 4	I 7 −2	I 6 3	I 2) 6
II 44 23	II 19 −3	II 5 9	II 4) 16
III 28 4	III 12 −7	III 9 7	III 3) 27
IV 32 72	IV 27 −4	IV 41 3	IV 7) 56
V 1 23 6 14 1 38	V 25 −6	V 19 6	V 2) 26 3) 29
VI 4 43 8 26 3 35 1 15	VI 29 −15	VI 214 2	VI 7) 357
VII 3 47 3 25 5 64 8 34 7 13	VII 38 −14	VII 351 5	VII 3) 72
	VIII 31 −19		VIII 8) 720
	IX 48 43 −26 −18		IX 6) 428
	X Summary		X Summary

division. Each test consists of a number of problems of a single type, by means of which it is possible to discover the particular type of problem upon which the pupil fails. These problems are on small cards, and the tests are given in succession by the examiner until the type problem is reached upon which the pupil fails. The problems on any test require ability to work the problems of the preceding tests. On the preceding page are samples of the problems found on the tests.

A diagnosis sheet for each pupil in group 5 is made out at the time he is examined. Pupils are examined individually. This is necessary in order to be able to get the individual pupil's responses. The procedure is somewhat as follows:

1. Repeat the initial Courtis Supervisory test as a check upon the first test.

2. If the pupil's score still is low begin with the test cards in the process in which the pupil has apparently the greatest difficulty.

3. When the pupil fails upon a type of problem, ask him to repeat orally what he does, giving all steps of the process involved in securing the answer he gives. At this point the tact and skill of the examiner is an important factor. It is often difficult to get the pupil to give aloud the process he uses, for it is generally round about, involved, or awkward. However, with patience, this can generally be accomplished.

The diagnosis sheet used by the examiner makes it possible to condense the facts found out about the child and to present them to the teacher in a more or less organized form. It is possible to tell at a glance upon what tests the pupil failed, the difficulties that were noted, and illustrations of the types of responses made.

If the examining is done by a person other than the teacher, as much of the information asked for at the top of the sheet should be filled in before the examiner tests, as is available. This includes the teachers' estimate of the pupil's scholarship, intelligence, industry, and general attitude. A place is provided at the top of the sheet for the examiner to check the general difficulties discovered. The lower part of the sheet gives the details.

Recommendations as to remedial work are given at the bottom of the sheet and on the back of it when more space is necessary. These usually are statements of specific drills the pupil needs to overcome his difficulties.

A careful record has been made of the types of errors found under each of the fundamental processes. To make clear the nature of the difficulties discovered and the work that must be done with each

MINNEAPOLIS PUBLIC SCHOOLS

Diagnosis Sheet in Arithmetic

Name Dorothy **Grade** 6B **Room** 2

Age 12 **Intelligence Quotient** 95 **Score on Test** 18–12

Teacher's Estimate Scholarship C **Intell.** B **Effort** B

General Attitude	General Difficulties			
Coöperative	Vocalization-lip movements	x	Accuracy	
	Counting	x	Speed	x
	Guessing		Short memory span	
	Faulty Procedure	x	Lack of thoroughness	x

Tests	R	A	Addition Difficulties	Tests	R	A	Subtraction Difficulties
1a	+	+	1. Starts backwards✓	1s	–	+	1. Upper from lower members
2a	–	–	2. Inspection to find starting point✓	2s	–	+	2. Faulty statements✓
3a	–	–		3s	–	–	3. Zero difficulties✓
4a	–	–	3. Skips around	4s	–	–	4. Borrowing✓
5a	–	–	4. Breaks up combinations✓	5s	–	–	5. Roundabout methods✓
6a	–	–	5. Adds by tens	6s			6. Adding to secure results
7a	–	–	6. Carrying				7. Weakness in fundamentals✓
			7. Trouble with 2d addition✓	7s			
				8s			
			8. Large numbers first✓	9s			
			9. Bridging tens✓	10s			
			10. Roundabout methods✓				

For illustrations see other side of paper.
(See case history)

Tests	R	A	Multiplication Difficulties	Tests	R	A	Division Difficulties
1m	+	+	1. Multiplier not always multiplier✓	1d	+	+	1. Roundabout methods✓
	+	+		2d	+	+	
2m	+	–	2. Zero difficulties✓	3d	+	+	2. Uneven division
3m	+	–	3. Carrying difficulties✓	4d	+	+	3. Zero difficulties
4m	–	–	4. Placing of product✓	5d	+	—	4. Inability to subtract ✓
5m	–	–	5. Weakness in fundamentals✓	6d	–	+	5. Forgets what to carry✓
				7d	–		
6m	–	–	6. Very erratic	8d		–	6. Repeats tables for results
				9d		–	
7m				10d		–	7. Difficulty with trial division

child, the case of Dorothy ———— is presented in detail. The examination was by Miss Amy Souba.

February 6, 1923

Dorothy Grade 6B

Addition

Starts backwards. Counts with head and fingers. Taps out results to herself with her tongue. Movements barely perceptible. Cadet teacher had never observed this before but child claims she always counts in this way. She is unable to tell how she keeps track of these taps. She skips around, sometimes beginning at the top and sometimes at the bottom of the column. She has round about methods of adding.

```
47  7 and 7=14        87  5 and 5=10
 9     +  2=16         5 —  +  2=12
 —                     —
56  4 and 1= 5        92  8 and 1= 9
```

She points to the figures in adding saying:

```
7  5 and 5=10          7     2 and 6=8
4     +  1=11          7     7 and 7 and 7=21
5     +  4=15          2           and     1
6     +  7=22 tapped it out 6
—                      —                   —
22                     22                  22
```

She always taps out the larger numbers or separates them as 8 = 6 and 2 and 9 = 6 and 3. She is able to keep track of about 5 taps in her mind and then she says and 1 or 2, or whatever the number may be. When it comes to two-column addition it is hard for her to remember what she has to carry.

Subtraction

Subtraction took the most time. Began backwards. All her problems were correct but one. Of the 29 problems she failed in only four when allowed to take her own time (6 minutes). While she was accurate there was evidently some obstruction to ease in working. This explanation I think helps to explain why it takes her so long to do even a simple subtraction problem.

```
 7  3 and 3=6      7  4 and 4=8
—3        1=7     —4  4 less 1=3
——                ——
    3 —  7=4
```

She thinks 4 less 1 = 3

```
16  Counts 5 dots (10-11-12-13-14) and 2=7
—9          2
——          —
 7          7
```

This procedure seems to be ingrained in her system. Every problem is worked this way. In view of this it is not surprising that it takes her so long to work the problems.

Multiplication and Division

Multiplication and division were very easy for Dorothy but even here she has faulty methods of procedure.

43	$3 \times 2 = 6$	52	$3 \times 2 = -6$
$\times 2$	$4 \times 2 = 8$	$\times 3$	$5 \times 3 = 15$

She evidently pays no attention as to which number is the multiplier. It depends on which combination is the easiest for her.

```
 19   Cannot get the correct results if she does not tap out the answer with
×6      her tongue.
----
104

 32      7 × 2 = 14   Is apt to turn her numbers around.
×7       7 × 3 = 21
----
124

                3)27     7 × 4 = 28
                  ----
                  7½     7 × 3 = 21

How much is left over from 21?
6 is left over.
7 and 6 = ½
    ---
     3
```

Dorothy needs to be taught right habits. It seems too bad that she has been allowed to formulate such round-about ways. I feel sure that she will do all in her power to help herself. She told me she thought she was doing better now because she had been drilling herself at home. She had even made cards for herself. A little individual attention every day showing her the quickest way to obtain results will be beneficial. In addition she should be taught to begin at the foot of the column, not to skip around, not to separate her numbers. She is now absolutely dependent upon her ingenious scheme of counting out her answers in all her processes. She is accurate and seldom makes a mistake when she uses her own methods. It really is remarkable how she is able to tap out the correct results.

Below are given illustrations of the different types of difficulties found on the diagnosis sheet in subtraction as found in the experimental work of Miss Souba at the Longfellow School. (Illustrations

of type difficulties in other forms are omitted on account of limited space.)

Subtraction

1. Upper from lower numbers:

```
 43
-18
----
 35
```

Some children take the minuend from the subtrahend if the former is smaller than the latter.

2. Faulty statements:

```
 12
 -7
----
 15
```

One boy persisted in obtaining results similar to this. He was reminded that he was to subtract, but he insisted he was making the correct response when he said $7 - 12 = 5$ and bring down the one makes 15

```
 161
-68
----
 73
```

Another boy in explaining his problem stated it as follows:
8 goes into 11, 3 times.
$2 \times 6 = 12$
$12 + 4 = 16$
16 goes into 16, 16 times.

3. Zero difficulties:

```
 90
-36
----
 60
```

This type of problem causes quite a great deal of trouble to some children.

```
 403
-286
----
 27
```

In a problem of this type the pupil thinks of zero as nothing and borrows from the four twice, once to make 13 and the second time to make 10.

4. Borrowing; adding ten to results:

```
 22    18
 -8    -9
----  ----
 24    19
```

Many children seem to have difficulty when it comes to borrowing problems. They forget that they have borrowed and so their answers are ten too large.

5. Roundabout methods:

(*a*)
```
 7   3 + 3 = 6
-3     + 1 = 7
----  3 from 7 = 4
 4
```

(*b*)
```
 7   4 + 4 = 8
-4   4 less 1 = 3
----
 3
```

(*c*) 16 counts 5 dots (10-11-12-13-14) + 2 = 7

```
-9      + 2
---     ---
 7       7
```

(*d*)
```
 18   7   8   9   10   11   12   13
 -5   5   5   5    5    5    5    5
 --   --  --  --   --   --   --   --
 13   12  13  14   15   16   17   18
```

(*e*)	25 —6 ——— 31	25 — 5 = 20 1 from 20 = 19
(*f*)	37 —15 ——— 22	15 goes into 30 twice Add the other 2 (obtained by taking 5 from 7) 2 goes into 4 (3 and) twice
(*g*)	12 —8 ——— 4	8 from 10 = 2 2 + 2 = 4
(*h*)	57 —29 ——— 26	9 from 17 = 8 2 from 5 = 3 1 from 3 = 2
(*i*)	21 —4 ———	20 is 1 19 is 2 18 is 3 17 is 4
(*j*)	22 —8 ———	20 is 1 18 is 2 16 is 3 14 is 4
(*k*)	23 —9 ——— 25	9 + 5 = 13 9 from 13 = 5 and 2 = 25

Here some pupil knew four 2's were needed.

Subtraction seemed to be the hardest of all the fundamental processes. Pupils are not able to give the results promptly from inspection, and so they resort to all kinds of roundabout methods as shown above.

7. Some pupils have difficulty with some particular combinations. One child, I remember, always failed wherever she came across the 8 plus 5 = 13 combination. When she came to subtract she never gave the correct result if the problem involved any of those particular figures.

```
 53
—8
———
 44
```

Came across a child in the fifth grade who was not able to work the simplest problems in subtraction.

7	9	8	6
—2	—3	—5	—1
———	———	———	———
1	2	5	3

It should be evident that pupils who have difficulties of the type described here are problem cases and must be given special help.

Continued drill makes the difficulties even harder to overcome. On the other hand, a short period of careful individual instruction will usually help a pupil to acquire the correct methods of work. With these pupils the additional effort required is amply repaid by the rapid increase in ability. With many of them work must be begun with the most elementary number facts.

This diagnosis sheet enables the principals and teachers to make a careful study of individual needs of the pupils and to check carefully the methods of the teacher in establishing the basic skills. The sheet also makes it clear that arithmetic is not a general ability but rather a complex of abilities, each of which must be developed to the standard necessary to carry out properly the tasks of the classroom.

CHAPTER IX

An Evaluation of After-Testing Work

G. A. Yoakam

CHAPTER IX

An Evaluation of After-testing Work, with Bibliography

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IT IS NOT surprising, in view of the recent development of the testing movement, that the methods, devices, and techniques of after-testing should not have been more fully worked out. The necessity of following up the testing work with changes in organization, classification, and instruction has been sufficiently urged by a number of prominent writers, but investigators have been busily engaged in the making of tests and learning how to administer them and have not devoted their attention to follow-up procedure. However, as the number of good tests grows the necessity for using them for other than mere comparative purposes becomes greater. The critics of testing are clamoring for results as measured by improvement in teaching. Elementary school principals, in particular, want to know what to do after tests have been given, and actual concrete data on after-testing procedure are all too few.

Haggerty (25)[1] reported five years ago that tests were being used by school superintendents for six different purposes: (1) Changes in classification of pupils, (2) changes in organization, (3) changes in course of study, (4) changes in methods of instruction, (5) changes in time devoted to subjects, (6) changes in methods of supervision.

These six types of change were reported by sixty-two school superintendents. Haggerty at that time urged the necessity of following up the giving of tests by definite remedial work.

Buckingham (17), writing three years ago, commented upon the small amount of literature available, which gave anything beyond a mere expression of the desirability that changes in school procedure should come about as the result of testing. The writer has reviewed such material as was available in a library well equipped with books, reports, and magazines and finds relatively few references giving concrete data on measures actually taken after tests have been given. Letters to directors of educational measurement in some twenty-three of the leading American cities failed also to elicit definite procedures which will guide in any satisfying degree the one who desires to develop after-testing work. So far as the writer knows, there is

[1] References cited in this article are to numbers in accompanying bibliography.

no book that gives the actual results of after-testing work. Several books discuss the desirability of it and give general principles; at the same time the magazines are full of testing, and of the giving and making of tests, there is no end. More attention should undoubtedly be given to the methods, devices, and techniques to be used in follow-up work after a testing program.

It is not suggested, however, that testing is getting nowhere. There is much use of tests in the classification and promotion of pupils, if we are to judge from the number of available reports on this phase of the after-testing work. The recent development of group mental tests is responsible for this movement. Within the last year or two there has also been a strong movement to employ achievement tests, together with mental tests, in such classification or reclassification. Success in properly classifying children by means of tests has been reported from various quarters (36-50), or the uses of tests for such purposes has been implied. The proper classification of children is being perfected through the use of scientific measuring instruments. There is also a tendency, plainly marked, to be more cautious in making radical changes as a result of testing alone (17, 5). The previous scholastic records of children, teachers' judgments, and other data are combined with mental and achievement tests to arrive at decisions in making changes in classification. Measurement must be freed of the charge of cold-blooded scientific procedure without regard to humanitarian impulses and without due attention to the needs of the individual child. This is a healthy tendency which was strongly urged by the earlier proponents of the testing movement, but which was sometimes disregarded by over-enthusiastic testers, with the resulting cry for democracy in our schools and a large measure of charity for those who are apparently shown to be mentally and pedagogically unfit by mental and achievement tests.

A movement contrary to any such cold-blooded proposal as that above, if indeed it ever was proposed by those well-founded in the theory of educational measurements is seen in the reports of those who have turned their attention through tests, upon the individual child. (29, 51, 53, 54, 62, 63, 69, 73, 74.) Contrary to the opinion of the opponents of the testing movement, the result, in a large number of cases, has not been to emphasize the group, but rather to focus attention upon the individual child and his difficulties and to attempt to repair such weaknesses as exist, due to previous training or lack of training. Gray's reports of work with individual children in reading (53, 54) are especially rich in suggestion for elementary

teachers and show where such measurement and diagnosis may lead us. The work of Courtis in arithmetic, and more especially his excellent practice tests with their provisions for individual drill, also promises great things for the future in elementary instruction. Testing to find weaknesses, teaching to correct them, and testing to estimate the effectiveness of teaching is coming to be a well-recognized means of securing efficiency in reading, spelling, handwriting, composition, and language, if not in geography, history, and other content subjects. The writer is of the opinion that such work is one of the most significant happenings in elementary education during the last century and perhaps during the entire history of elementary education. More reports of such activities as those mentioned above are needed. Some one ought to collect, evaluate them, and put them out in book form.

Perhaps a part of the movement mentioned in the preceding paragraph are the changes brought about in methods of instruction by testing. Reports by Anderson and Merton (51), Uhl (60), and Zirbes (62) show what may be done in improving instruction in reading. That by Anderson (63) points out the use of diagnostic and remedial work in arithmetic. Experimental work by others blazes the way for further remedial work following the diagnosis of weaknesses through tests (64, 65, 66, 67, 68, 69, 70). These reports, together with others that might be cited, offer suggestions for a body of new method in arithmetic, reading, and spelling, which may be used to improve class instruction after tests have been given and weaknesses discovered. It is only to be regretted that more reports are not being published on the success which follows such exercises in reading as those employed by O'Brien[1] in his report of an experiment in increasing speed in silent reading in the Twentieth Yearbook. The use of such exercises after testing would seem to promise greatly improved results in methods of instruction. Such devices as are already available may be used, with or without tests, to bring about great changes in silent reading. Other reports in this yearbook also suggest what may follow the giving of tests.

Reports of changes in the course of study as a result of testing are less frequent than other changes although they are implied, if not definitely described, in the division of classes into groups as in 36, 37, 38, 39, 40, and others. Callihan (39) states definitely that courses of study were adapted to classes of different grades of ability.

[1] O'Brien, John A. Development of Speed in Silent Reading. Twentieth Year Book, 1921, Pt. 2, National Society for the Study of Education, I, 39-76.

The report of O'Hern (58) shows what is happening, either as a result of experimental work in reading, or the result of testing, or of both. The writer knows of many changes in courses of study in certain school systems which are brought about through testing. Nevertheless, clear-cut reports seem to be few. A survey of the courses of study of American cities will show, however, that such changes are taking place. The introduction of more silent reading, decreased number of words in spelling, practice materials in arithmetic, and the like, are witnesses to the fact that the inefficiency in certain fundamentals as shown by surveys, is having an after-testing effect in eliminating useless subject matter and in a focalization of effort upon remedying weaknesses so revealed.

Changes in methods of supervision are implied in the reports of the use of tests in reclassification of pupils, in diagnosis and remedial measures, and in general articles on the use of tests in supervision such as are listed in references 15 to 35, although they are not specifically stated. Supervisors are using the results of testing to aid them in judging of the needs for supervision in particular quarters and to enable them to distribute their time where needed. Instead of relying solely upon personal visits and content examinations, supervisors are now giving tests to find out where their schools are weak and following up such work with conferences on remedial treatment. Examples of this type of change in methods of supervision are found in the reports of Brooks (71), Pittman (8), Ballou (19), Richardson (34), and others. This, in general, means that elementary school principals and superintendents are becoming more scientific in their methods and relying to a greater extent upon objective evidence than upon subjective judgment. The extent to which this is being done may be roughly estimated by the number of reports of testing and after-testing which are found in the accompanying bibliography. Moreover, the movement is probably much wider spread than the magazine literature would indicate. There is much unorganized material that has never been put into printed form. As one superintendent puts it, "We are so busy trying to get things done right on the job that it is quite hard to have all of our data assembled in a form suitable for distribution."[1] It is to be noted also that many school systems have only recently installed a director of tests and measurements. The work therefore has hardly had time to get under way.

On the whole, however, the growing amount of material appearing, much of it during the past two or three years, in books, maga-

[1] From a letter written by J. W. Studebaker, superintendent of schools, Des Moines, Iowa.

zines, superintendents' reports, and surveys, suggesting or reporting after-testing procedures, is encouraging and positive proof of the fact that tests and measurements are exerting a powerful influence upon elementary education. The articles on the making and administering of tests are still in the majority but after-testing work is growing in richness and amount. There are still many fields in which no tests of any significance are available; much work still needs to be done to perfect existing tests. Moreover, teachers are still largely untrained in the giving of tests and the checking of results, but as training institutions give teachers better instruction in the use of tests, supervisors will be freed more and more from the necessity of training their teachers in the rudiments of testing and more time will be available for follow-up work. That such work is already under way, the accompanying bibliography amply proves.

After all is said and done, as writers have pointed out since the beginning of the movement, while testing for purposes of comparison is justifiable and necessary, the follow-up work must come if the time and money spent in giving tests is to be justified. It is to be hoped that reports will be more and more frequent of detailed procedures after testing and that diagnostic and remedial measures will characterize these reports to a greater extent as such methods are learned from scientific experiment and from practical experience. The elementary principal need not fear, however, that he is joining himself to a dying cause when he espouses tests and testing, because it is very clear that out of the scientific movement in education is growing a body of more workable knowledge and more exact and effective supervisory method and technique than could have been evolved in centuries of time by the empirical methods of our progenitors in the art and science of supervision.

BIBLIOGRAPHY OF AFTER-TESTING WORK

The following is not a complete bibliography of standard tests but rather a selected, annotated bibliography of books, articles, and reports which include explanatory material of measures which should be taken, or have been taken, after tests had been given. It seemed advisable to include articles which emphasized the importance of the work in general and set forth the principles, as well as reports of what had actually been done. The writer lays no claim to having exhausted the subject.[1]

I. Books

1. Burton, W. H. Supervision and Improvement of Teaching. D. Appleton. 1922. Chap. XIII. Gives general statements as to use of tests in diag-

[1] The writer is indebted to his advanced students in school supervision for reading and reporting on articles included in this bibliography.

nostic and remedial work. Valuable bibliography at end of chapter. (1922.)

2. Courtis, S. A. Manual for Standard Practice Tests. World Book Co. 1919. Gives detail suggestions for diagnosing shortcomings of pupils in arithmetic.

3. Gray, C. T. Deficiencies in Reading Ability. D. C. Heath & Co. 1922. Part II is devoted to remedial and diagnostic work in reading. Very valuable. Bibliography.

4. Judd, C. H. Reading: Its Nature and Development. University of Chicago Press. One of the earliest treatments of testing, diagnosing, and remedying defects in reading.

5. McCall, W. A. How to Measure in Education. Macmillan Co. 1922. Contains three chapters setting forth principles for use of tests in classifying pupils, diagnosing difficulties, and improving teaching.

6. Monroe, W. S. Measuring the Results of Teaching. Houghton Mifflin Co. 1918. Contains valuable material on reading, arithmetic, spelling, and handwriting. Suggests corrective measures and gives some results.

7. Nineteenth Year Book, Part II. National Society for the Study of Education. 1920. "Classroom Problems in Education of Gifted Children." Shows what may be done when children are reclassified for instruction.

8. Pittman, M. S. The Value of School Supervision. Warwick & York. 1921. Shows how tests were used in rural schools to measure the effects of supervision and what was done by the supervisor in the schools following the original testing.

9. Proctor, W. M. Psychological Tests and Guidance of High School Pupils. Public School Publishing Co. 1921. Report showing success in educational guidance. Significant for elementary school principals.

10. Stone, C. W. Standardized reasoning tests in arithmetic and how to use them. Teachers College, Columbia University, Contribution No. 83. 1916. Tells how changes were brought about in arithmetic after testing and diagnosis.

11. Twenty-first Year Book, Parts I and II. National Society for the Study of Education. 1922. Gives a summary of intelligence testing and the uses of intelligence tests in elementary, junior, and senior high schools.

12. Terman, L. M. Intelligence of School Children. Houghton Mifflin & Co. 1919. The most authoritative book on intelligence tests and their uses. Gives results in classification of children by intelligence tests.

13. Trabue, M. R., and Stockbridge, F. P. Measure Your Mind. Doubleday Page & Co. 1920. Contains a chapter on the use of intelligence tests in schools.

14. Wilson, G. M., and Hoke, K. J. How to Measure. Macmillan. 1920. Very simple discussion of tests and their uses.

II. Magazine Articles and Reports

General

15. Ann Arbor, Michigan. Sixty-fourth Report, Board of Education. 1920-1921. Contains after-testing data according to Buckingham.

16. Bliss, D. C. Application of Standard Measurements to School Administration. Fifteenth Year Book, National Society for the Study of Education, Part 1. 1916; 69-78. No concrete results of after-testing. Largely expository.

17. Buckingham, B. R. Suggestions for procedure following a testing program. J. Educ. Re. 2: 787-801. Gives detailed discussion of use of achievement and educational tests in reclassification of children. Excellent after-testing bibliography.

18. Capps, A. G. Function of tests and scales as found in recent educational literature. J. Educ. Re. 6: 204-208, 1922. Review of the purposes for which tests were used as summarized from fifty magazine articles. Follows outline of Haggerty's report in Seventeenth Year Book.

19. Ballou, F. W. Improvement of instruction through educational measurements. N. E. A., 1916: 1086-93. Also Educ. Adm. 2: 354-367. Gives an account of testing work in Boston and measures taken for improvement of instruction.

20. Dearborn, W. F. Misuse of standard tests in education. Sch. & Soc. 3: 493-495, 1916. Points out harmful practices after testing due to misinterpretation of the tests.

21. Courtis, S. A. Objective standards as a means of controlling instruction and economizing time. Sch. & Soc. 1: 433-436, 1915.

22. Duluth, Minnesota, Report, Board of Education, 1918-19. Contains after-testing data according to Buckingham.

23. Gray, W. S. The use of tests in improving instruction. El. Sch. J. XIX: 121-141, 1918. Good discussion of diagnostic use of tests.

24. Gray, W. S. Methods of improving the technique of teaching. El. Sch. J. XX: 263-275, 1919. Brief general discussion of the use of tests.

25. Haggerty, M. E. Specific uses of measurement in the solution of school problems. Seventeenth Year Book of the National Society for the Study of Education, Part II, 25-40, 1918. Outlines the results of a questionnaire to 200 school superintendents showing what has been done following the giving of tests. Valuable article.

26. Haggerty, M. E. Measurement and diagnosis as aids in supervision. Sch. & Soc. 6: 271-85, 1917. Discussion of uses of tests in supervision. Composition scale in scientific supervision.

27. Henmon, V. A. C. Improvement in school subjects throughout the school year. J. Educ. Re. 1: 81-95. Report showing improving through mere giving of tests with no follow-up.

28. Hines, H. C. What Los Angeles is doing with the results of testing. J. Educ. Re. 5: 45-57, 1922. Emphasizes use of achievement tests in diagnosis.

29. Kallom, A. E. The importance of diagnosis in educational measurement. J. Educ. Psych. 10: 1-12, 1919. Concrete procedure in diagnosis.

30. Louisville, Kentucky. Eighth Report, 1919. Contains after-testing data according to Buckingham.

31. Madsen, I. N. Procedures following a testing program. Sch. & Soc. 14: 606-605, 1921. An account of an investigation of twenty-one schools of Idaho to ascertain what was being done as follow-up work. Good list of after-testing procedures.

32. Monroe, W. S. Improvement of instruction through the use of tests. J. Educ. Re. 1: 96-102, 1920. General discussion. Not concrete.

33. Morrison, J. C. Supervisors' use of standard tests of efficiency. El. Sch. J. 17: 335-54, 1917. Account of how tests were used in school of 400 pupils for eight months. Tells of benefits gained through after-testing procedure.

34. Richardson, J. W. The campaign method in elementary education. J. Educ. Re. 2: 481-92, 1919. Shows what was accomplished by laying emphasis upon intensive effort between tests.

35. Woody, Clifford. Tests and measurement in the schoolroom and their value to teachers. Sch. & Soc. 6: 61-66, 1917.

Use of Tests in Classification of Pupils

36. Alexander, J. M. Binet-Simon tests in practical use in public schools of Hindsdale, Illinois. El. Sch. J. 21: 146-148, 1920. Use of tests in grouping children.

37. Brooks, S. S. Some uses for intelligence tests. J. Educ. Re. 5: 217-239. Gives concrete data on measures taken after intelligence tests were given.

38. Brooks, S. S. Using standardized tests in rural schools for grading purposes. J. Educ. Re. 2: 729-735. Suggestive detailed account of use of standardized tests in New Hampshire rural schools.

39. Callihan, T. W. Experiment in the use of intelligence tests as the basis for proper grouping and promotion in the eighth grade. El. Sch. J. 21: 465-69, 1921. Procedure after giving Illinois intelligence examinations. Changes in course of study.

40. Davis, Helen. Use of intelligence tests in classification of pupils in public schools of Jackson, Michigan. Twenty-first Year Book, National Soc. for Study of Educ., chap. III, 131-142. Largely descriptive of classes and test.

41. Dickson, V. E. What first-grade children can do as related to what is shown by mental tests. J. Educ. Re. 2: 475-480, 1919. Concrete data as to whether tests can predict what a child will do.

42. Dickson, V. E., and Norton, J. K. Otis group intelligence tests applied to elementary school graduating classes of Oakland, Calif. J. Educ. Re. 3: 106-115, 1921.

43. Glass, J. M. Classification of children in ability groups. Sch. Rev. 28: 495-508, 1920. This article gives valuable data on supervised study, study coach, ability grouping, remedial and preventative measures in correction of retardation.

44. Kentner, Sarah P. Grouping by standardized tests for instructional purposes. J. Educ. Re. 2: 620-625. Successful use of achievement tests for instruction.

45. Layton, W. K. The group intelligence program of the Detroit Public Schools. Twenty-first Year Book, National Society for Study of Educ., Chap. I, pp. 117-130, 1922. Description of group intelligence tests used in Detroit. Mentions use of tests in changing course of study and reclassification. Not much detail.

46. Pintner, R. The significance of intelligence testing in the elementary school. Twenty-first Year Book, National Soc. for the Study of Education, Part II (1922), 153-167. Points out what intelligence tests may be used for.

47. Pintner, R., and Noble. Classification of school children according to mental age. J. Educ. Re. 2: 713-738, 1920. Gives use of standardized intelligence tests in gradation and promotion. Concrete.

48. Saam, T. Intelligence testing as an aid to supervision. El. Sch. J. 20: 76-32, 1919. Account of the use of Simon-Binet tests in Council Bluffs, Iowa, for classifying and promoting children.

49. Rogers, Agnes L. Measurement of the abilities and achievements of children in the lower primary grades. Twenty-first Year Book, National Society for the Study of Educ., 143-152, 1922. Chiefly expository. Mentions the need of using the results of testing.

50. Zornow, T. A., and Peckstein, L. A. An experiment in the classification of first-grade children by the use of mental tests. El. Sch. J. 23: 136-147. Gives results of classification in Rochester, N. Y.

Use of Tests in Improving Instruction

A. Remedial and Diagnostic Work in Reading

51. Anderson, C. J., and Merton, Elda. Remedial work in reading. El. Sch. J. 20: 685-701, 1920. Excellent account of testing followed by remedial work in reading.

52. Gates, A. J. Study of reading and spelling, with special reference to disability. J. Educ. Re. 6: 12-24, 1922. Experimental study of disabilities in reading, significant for after-testing work.

53. Gray, W. S. Individual difficulties in silent reading in fourth, fifth, and sixth grades. Twentieth Year Book, National Society for the Study of Educ., Part II, Chap. III (1920). Careful diagnostic and remedial work with individual children. Very significant.

54. Gray, W. S. A diagnostic study of an individual case in reading. El. Sch. J. 21: 577-594. Detailed study of an individual case.

55. Hawley, W. E. The effect of clear objectives on the teaching of reading. J. Educ. Re. 3: 254-260, 1921. Results of tests followed out and remedial measures provided.

56. Llewellyn, E. J. Reading in Mt. Vernon, Indiana, city schools. El. Sch. J. —: 123-127, 1916. Tells of certain types of training which were found effective.

57. McBroom, Maude. How a test may be used to improve instruction in reading. N. E. A. Proceedings, 1921: 446-8. Test in itself may be considered a method of improving reading.

58. O'Hern, J. P. The development of a chart for attainment in reading. J. Educ. Re. 3: 180-194. Suggests what might follow a testing program in reading.

59. Sutherland, A. H. Correcting school disabilities in reading. El. Sch. J. 23: 37-43. Suggestive data for remedial work.

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Abbreviations Used

Sch. & Soc.: School and Society
Sch. Rev.: School Review
J. Educ. Re.: Journal of Educational Research
Ed. Adm.: Educational Administration and Supervision
El. Sch. J.: Elementary School Journal
N. E. A.: National Education Association
J. Educ. Psych.: Journal of Educational Psychology

CHAPTER X

The Platoon School

Arthur S. Gist, R. D. Chadwick, W. P. Burris

Articles dealing with the platoon organization and work of the elementary school are included in this volume because it is probable that many of the matters urged in previous chapters may be most easily worked out in this type of school.

Dr. W. P. Burris, to whose courtesy the publication of the rating scale for principals and assistant principals is due, was largely influential in the establishment of the Department of Elementary School Principals.

CHAPTER X

Education in a Platoon School

ARTHUR S. GIST
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THIS article attempts to show what pupils are receiving in scholastic and socialized training in a platoon school which can hardly be offered in an elementary school organized along more traditional lines. The plan of organization has already appeared in educational periodicals.[1]

Segregation of sexes—In the sixth, seventh, and eighth grades the pupils are segregated by sexes in all academic subjects. This segregation permits a selection and a treatment of material which is best suited to the needs of the members of the classes. It also results in more freedom of discussion than can be possible where the girls are timid and the boys self-conscious in each other's presence.

Academic subjects—Although this plan of organization lessens the amount of time spent upon the academic subjects there seems to be no lessening in the accomplishments. This is based upon the results of standardized tests and the achievement of pupils promoted to the high school.

There is an opportunity for supervised study with the platoon plan which is seldom afforded in other types of organization. Supervised study permits teachers to discover deficiencies and poor habits of study which may more easily be corrected and results in fewer home assignments.

The platoon plan affords an excellent opportunity for making special programs for pupils deficient to the degree that warrants work in a lower grade. Following is the schedule of a boy who has just returned to school after four years of illness:

9:00– 9:40	7B History
9:40–10:20	6A Arithmetic
10:30–11:50	6B Arithmetic
12:50– 1:30	6B Language
1:30– 2:05	5A Arithmetic
2:15– 2:55	6A Language
2:55– 3:30	7B Arithmetic

This is an extreme case, yet many pupils take arithmetic or language in a lower grade than their own, omitting for the time being some special study, such as music or art.

[1] Koos, L. A. The Plan of Organization of the Green Lake Elementary School. *Elementary School Journal*, 20: 435-448, February, 1920.

Reading—This subject is specialized in the sixth, seventh, and eighth grades where many phases of reading can be more advantageously taught than where the subject is taught by the teacher who is responsible for some ten or twelve other subjects at the same time.

Interpretative and content reading is carried on with the use of standard achievement tests and all the enthusiasm which a lover of good literature can bring to such teaching adds greatly to the accomplishments.

Dramatization is carried on both by the use of material at hand and original material written by the teacher or the pupils. Original plays have been written on Becoming an American Citizen, Liberty and Union, An Evening at Home, The Court of Good Reading—a clear speech project; The Court of Public Safety, and a hygiene play.

Good oral reading is secured by emphasizing the need of articulate speech, using enunciation drills, whispering and deep breathing exercises, and continued attention to clear speech.

Music—The specializing of music means a specially equipped music room and arouses an enthusiasm which is often lacking otherwise. Latent talent is discovered and developed and a worthwhile avocation is here begun. Pupils develop an appreciation for good music which carries over into the home. It is a common occurrence to have the pupils volunteer the information that such and such a selection was heard outside. An orchestra can be successfully operated in such a school. Requests often come from the homes for suggestions as to a special teacher of music, musical instruments, selection of pieces for outside lessons and assistance in the arrangement of an outside program of music.

Art—In specializing Art, we again have the opportunity of concentrating all of the school's expense in this direction and specially equipping a classroom which has an atmosphere of refinement and artistic taste. Here again latent ability may be discovered and such knowledge on the part of the special teacher may carry over for the several years that she has this pupil for instruction in art. Pupils with special talent often spend all of their spare time in the art department. This department does considerable poster work and generally assists the school in all matters pertaining to art.

Penmanship—Here again is a classroom specially equipped for its work. This special equipment includes adequate display space and at the pupils' level. Arousing an interest in this subject by a well-qualified teacher has produced remarkable results in the general writing in other departments of the school. In other words, the enthusiasm and skill acquired in the writing period have carried over to all periods of the day.

Physical education—Specializing this subject has meant a gymnasium which we would not otherwise have. The four aspects of this work are calisthenics, physical measurement work, hygiene teaching and supervision of organized athletic contests. Probably fewer classroom teachers are competent to teach calisthenics than any of the special subjects, hence greater efficiency in specialization. The measurements of the pupils can be taken more accurately and corrective measures more thoroughly remedied. Hygiene teaching can be more definitely correlated with the corrective measures as the special teacher gives all her time and attention to the physical welfare of the pupils. Last year nutrition classes were organized for certain underweight pupils whose physical condition could be improved. These classes were handled by the special teacher of physical education in conjunction with the teacher of Home Economics. The results were satisfactory as considerable interest was aroused and definite results were noted in the home. In this special teacher the principal has a competent assistant in the management of interschool athletic contests.

Elementary manual arts—The quality of work done in this branch of instruction is also enhanced by being specialized. Here again the necessary equipment is concentrated in one room and such equipment renders the work more easily conducted as the room is equipped in a manner that is impossible in the ordinary classroom. This equipment includes benches, cabinets, and adequate drying facilities for all painted articles.

Administrative advantages—In the selection of teachers the administration of the platoon type of school is often simplified as it is less difficult to select a competent teacher for one of the specialized subjects or for four academic subjects than it is for all the twelve or fourteen subjects of the elementary school curriculum. A city system secures many of its new teachers from other city school systems. More and more systems are providing some type of departmentalization, thus making it impossible for such teachers to receive any experience in teaching many of the subjects.

Teachers in training are also concentrating on few subjects and doing little or nothing in other subjects. Concentration means more efficiency. Teachers who formerly taught all subjects and who were rated mediocre are now being rated good or excellent. Any type of organization which will improve the quality of work done by the teacher in service is worthy of consideration.

Socializing opportunities—It is surely broadening to pupils to come under the influence of different teachers, to become acquainted

with different personalities, and to learn the viewpoints of different individuals.

Movement of classes to different parts of the building cannot but produce socializing effects upon the pupil. He feels more a part of a large community, contributing his bit toward the general welfare, than would be the case where he is confined to one room and one teacher.

Unsupervised passing to all parts of the building increases the pupil's feeling of self-confidence, self-respect, and determination to be trusted. This prepares him for situations which will confront him later in high school.

Furthermore, this passing produces a feeling of physical and mental relaxation which has noticeable benefits upon him when he takes up his next task.

Teachers' viewpoints—That the teachers see marked benefits in this platoon type of organization is evidenced by the following statements regarding the departmental plan as used by the B. F. Day School:

1. The pupils have an advantage in not being disturbed during their recitation or study period by the pupils of the other class.
2. A second great advantage over the old system is the fact that pupils, especially the ones who need special help or are unable to get class instructions, are able to have individual instruction from the teacher, which is not possible under the old system unless they stay after school.
3. The supervised study period, to a large extent, does away with so much "Home Work," which has its disadvantages to all concerned—pupil, parent, and teacher.
4. There is not one who would not be able to see the advantages in the superior instruction that the pupils receive from having teachers who have specialized in special subjects.
5. The children develop an independence or mental poise by recognizing their responsibility to various teachers.
6. One who believes in the segregation of boys and girls finds here the best of an opportunity to put it into operation.
7. The pupils claim they have an advantage in the different personalities of teachers, as well as their various viewpoints.
8. The advantages for teachers are too varied and too numerous to enumerate. However, one cannot refrain from mentioning less preparation, less discipline, less confusion, fewer pupils, fewer subjects to prepare, teaching the subjects you are prepared to teach well, coöperation with other teachers, and a poise or balance that comes from having a relief every day from the "incorrigible."

1. Teacher knows her pupils better.
2. She is able to give help at the right time when pupils are having difficulty. By doing a thing wrong the pupils fix the wrong habit. If the teacher has to wait to look over papers before she discovers the errors, it is much harder to correct in the pupils' mind.
3. Pupils acquire the habit of asking about things when they are not certain. As in language, "Should I have a comma here?" Pupils give reasons; if it is not satisfactory they can be shown. They are less apt to make the mistake a second time.
4. Spelling is corrected as they write it.

5. Nothing interferes with academic subjects. This is the first year I have easily covered the ground in geography.
6. Added interest.
7. Pupils do not get so tired because of changes.
8. Lessens the nerve strain on teacher, as she is not teaching one subject while she has to keep the other class at work on another subject.
9. One of the excellent points I find in the plan is that it gives me time to correct Arithmetic and Language papers right with the children and then they can correct their own papers.

1. There are fewer interruptions.
2. Discipline is easier—black sheep have fewer leisure moments to foment trouble.
3. Easier for pupils to concentrate—interest is undivided.
4. Opportunities for supervised study.
5. Children like school better.
6. Pupils come under influence of different personalities.
7. Change in classes is refreshing and inspiring to pupils.
8. Changing classes relieves the tension of continuous sitting and application in one room.
9. Long play period promotes health and reduces restlessness.
10. Special subjects taught better by teachers specializing in their subjects.
11. Teachers relieved of much anxiety and strain because of fewer subjects and fewer pupils under their care at one time.
12. Better work can be done in academic rooms because one class is freer to talk and act naturally without fear of disturbing the neighboring class. Freedom can be given to one class that to both would often cause disaster.
13. One class may use the whole room and its facilities; two would divide those facilities between them.
14. Several teachers may confer regarding the problems of certain pupils.
15. A pupil finds the same fault criticised by all or several teachers. He is thereby impressed with the fact that he really has that fault and is not merely the victim of one teacher's prejudice.
16. Stimulates greater interest in one division preparing some exhibition work for the other—gives incentive for thorough work, well done.
17. Changing classes, transfer of books and materials, offers opportunity for development of responsibility, self-control, coöperation (under wise direction).

I. The Smaller Group
   a. Can be dealt with less formally and thus initiative and originality are promoted.
   b. Lends encouragement to the reticent and timid who are more or less backward in a large group.
   c. Makes instruction seem more personal and direct, and misconceptions more easily discovered and corrected.
II. Segregation of Boys and Girls Possible
   a. Different methods of discipline for boys and girls.
   b. A different interest in subject-matter, especially in reading and geography lessons; in manual arts, physical training and play.
   c. Lessens the difficulties of the boy and girl interest in each other.
III. Supervised Study Periods
   a. Pupils form better habits of study.
   b. Study period not interrupted by another class reciting.
   c. The pupil receives more individual help.
   d. The teacher can better understand the pupil and his needs.
IV. Greater Influence for Good
   a. The pupil is influenced and helped by contact with the personality of not only one teacher, but of several.
V. Teachers' Preparation
   a. Having fewer subjects to teach, the teacher can concentrate her efforts and do more efficient planning and work.

1. It gives opportunity for supervised study, which is especially important in fourth and fifth grades where content reading begins in History and Geography.
2. All subjects so much better taught than is possible where one teacher has all branches.
3. Better concentration on part of pupils with only one class in the room.
4. Written lessons can be corrected with the pupils which is impossible under the old plan.
5. Far less nervous strain on the teacher, therefore better work.

I. For the Pupil
- *a.* Gives opportunity for supervised study.
- *b.* Increases interest by providing variety.
- *c.* Gives better instruction.
- *d.* Gives better chance for concentration.

II. For the Teacher
- *a.* Makes fewer preparations necessary and thus allows for better preparation.
- *b.* Allows her to give undivided attention to work at hand.
- *c.* Relief from worry over pressure of work.
- *d.* Gives closer contact with pupils.
- *e.* Easier discipline.

1. Provides a supervised study period for the academic studies. This supervision of study causes a saving of time to pupils.
2. It gives the teacher an opportunity to correct poor study habits. Often just a suggestion from the teacher saves the entire period for the pupil.
3. It lessens the number of subjects for which a teacher is responsible, giving her ample time to better plan and prepare the lessons.
4. Her undivided attention is given to the one class.
5. It practically eliminates the problem of discipline.
6. It fosters a closer fellowship between teacher and pupil.

The departmental system has many advantages over the old system:

I. Advantages to Pupils
- *a.* The distraction of another class doing a different kind of work is removed.
- *b.* Weaker pupils can receive special help when necessary.
- *c.* Higher standards of work can be kept before pupils.
- *d.* Passing of classes gives relaxation to pupils.
- *e.* More freedom can be given pupils in the classroom when only the one division is present.
- *f.* Supervised study periods can be conducted which are a great benefit to pupils.
- *g.* Contact with many teachers will have a broadening influence on pupils' lives.

II. Advantage to Teachers
- *a.* Fewer lessons to prepare, hence more time and thought can be devoted to preparation.
- *b.* Special teachers only can do justice to special work.
- *c.* Discipline is easier.
- *d.* Teachers become better acquainted with pupils' needs and can be of greater assistance to them.
- *e.* I can say many things in favor of it and nothing against it.

1. Children are much better able to concentrate.
2. The teacher can give her undivided attention to the recitation.
3. Recitations can be socialized much more than under the old system.
4. This tends toward giving the children more freedom in expressing themselves.
5. Gives more time for supervised study, which is very badly needed in the intermediate grades.

6. Course of study can be covered much more easily—probably the result of more supervised study.
7. The children are made more independent, especially from a disciplinary standpoint.
8. It is of value to both the parent and teacher to have several teachers' opinion of a child.
9. The teacher is able to be much better prepared where her time is divided among four subjects rather than ten or twelve.
10. The children get the benefit of better instruction in the special subjects.
11. They work under the most favorable conditions in rooms especially fitted for the work, i. e., drawing and manual arts.
12. Forty minutes of physical training and supervised play cannot fail to make the children healthier. It is especially beneficial to those children who are not in the habit of joining with the others in their sports.
13. The system is very well liked by both parents and children.
14. There is time for much more individual instruction in subjects on which a child may need extra help.
15. One of the problems of the fifth grade is concentration. This problem is reduced to a minimum in departmental work.

I. Pupils receive greater knowledge.
   a. Preparation of teacher.
      1. Subject-matter.
      2. Presentation.
   b. Enthusiasm of the teacher.
   c. Special environment for subject—room, furnishings, and teacher.
II. Pupils are better prepared for high school.
   a. Subject-matter.
   b. Discipline.
   c. Adjustment to many teachers.
III. Better training for citizenship.
   a. Subject to higher law, law of school instead of law of a room.
   b. Sooner convinced of the need of self-correction.
   c. Freedom trains for self-reliance and leadership.
   d. Adjustment of self to personality of teachers.
   e. Childish adoration of personality broadened into appreciation of principle.

The above quotations are taken from the comments of the academic teachers and are given in full to show that these teachers heartily approve the platoon plan and are able to see that it offers more to the pupils than can be done under the more traditional type of organization.

Auditorium Studies

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INTRODUCTION—The auditorium assembly has been an integral part of the school program for six years, in fact, since the school was organized. When the decision was made to make the auditorium an educational factor in the school, one of two courses of

procedure had to be decided upon. The first was to have special auditorium teachers direct the work, and have the classroom teachers in absentia. The second was to have the classroom teachers go to the auditorium with the pupils and direct the staging of activities which had been developed in the classrooms. The latter procedure was adopted.

The relative values and economies of the two methods of procedure will not be discussed here. The sole purpose in making the assembly an integral part of the program was its educational possibilities. At that time we had the experience of the Francis Parker School of Chicago and the public schools of Gary, Indiana, to serve somewhat as guides.

The purpose of this paper is to present a record (1) of the sources of the contributions to the auditorium programs (2) to give a record of the number of pupils who participated in the auditorium programs and (3) to give some evidence as to the range of grades that may be profitably assembled in an auditorium group.

The unit of measurement—In the year 1917-1918 we decided to call each unit of auditorium work a *project*. The word was the best descriptive term that we could find, and since that time we have considered ourselves fortunate in the selection. Each unit of auditorium work we have henceforth called a project. A project may be any of the following: a talk by a pupil, an address by the superintendent of schools, a solo, a song by the glee club, community singing, a reading, a dramatization, a motion picture, a spelling match, a speed contest in algebra, a style show, and so on.

We designed a card for recording the following data: (1) Subject of study, (2) title of project, (3) grade or class, (4) number taking part, (5) teacher, (6) date, (7) how the problem was developed in the classroom, (8) method of presentation in the auditorium, (9) attention of audience, (10) number in audience, and (11) remarks.

This may look formidable, but it has not proved so in practice during six years. The card is only 3½ x 5 inches in size. This card permits of clear tabulation of data concerning the sources of projects—teacher, subject, and grade. It enables us to tabulate the number who participate either actively or as members of the audience. The data collected in number seven gives an interesting analysis. The relation between 8, 9, and 10 tells an interesting story, even though number nine is a human estimate. The consideration of the data collected in 7, 8, 9, and 10 will not be attempted in this paper. We will consider the data tabulated from 1, 4, and 5.

The sources of projects in 1920-21 and in 1921-22—The *subject sources* for two school years 1920-1921 and 1921-1922 are tabulated

in Table 1. In the first of these years the school had a kindergarten and eleven grades; the following year the twelfth grade was added. The school was organized as an elementary school of kindergarten and six grades, and a junior-senior high school of six grades. During this time the junior-senior high school pupils and teachers came to the auditorium three forty-five-minute periods each week, and constituted the "high school assembly." Grades 4, 5, and 6 met the same number of periods each week, and constituted the "elementary assembly." On Friday the three lower grades and kindergarten came to the elementary assembly and presented a program which was usually supplemented by one reel of educational movies. The enrolment of the school was approximately 600, with 250 in the junior-senior high school, and 350 in the elementary school.

The data tabulated in Table I refer to two normal years, following three years of practice and experimentation in auditorium work. During these years we found that three periods a week in the auditorium were all that we could profitably use. In 1921-1922, the latter of the two years, we used two forty-five-minute periods each week for the extra-curricular activities, such as club and class meetings, one on Monday, the other on Tuesday. Thus one period each day was used for either high-school assembly, or the extra-curricular activities.

Table 1 shows that in the auditorium work of a "twelve" school 25 per cent of the projects come from English. English, music, and educational films contribute approximately 50 per cent of the projects. Adding to these physical education, history, reading, addresses, and geography, we have the sources of 75 per cent of the projects. The remaining 25 per cent of the projects come from twenty-five sources.

Current events make such a low showing because many projects that might have been credited to this source were credited to English and some to history. It may also be observed that projects credited to geography in 1921-1922, were credited to industrial arts in the earlier year. Art and industrial arts are also border-line cases, and the same teachers teach them. Practically all of the school subjects have contributed one or more projects. Those that did not were shorthand and geometry.

When you stop to think it is not remarkable that English produces nearly 25 per cent of all the projects, for in the English classes all of the subjects studied furnish themes for oral and written work.

TABLE 1—Subject Sources of Auditorium Projects During the Two School Years of 1920–1921 and 1921–1922, Elementary and Junior-Senior High School Combined

Rank	Subject	1921–22	1920–21	Total	Percent
1	English	105	111	216	24.2
2	Music	73	57	130	14.7
3	Educational Films	58	64	122	13.7
4	Physical Education	35	14	49	5.5
5	History	28	17	45	5.0
6	Reading	16	27	43	4.8
7	Addresses	15	25	40	4.5
8	Geography	25	11	36	4.0
9	Home Training	13	17	30	3.3
10	Industrial Arts	6	20	26	2.8
11	Art	12	7	19	2.0
12	Spelling	6	12	18	1.9
13	Arithmetic	6	11	17	1.8
14	Civics	10	6	16	1.6
15	Extra-Curricular	8	5	13	1.3
16	General Science	3	7	10	1.0
17	Nature Study	2	5	7	
	French	5	2	7	
18	Physiography	1	5	6	
19	Chemistry	4	0	4	
20	Latin	3	0	3	
	Physiology	2	1	3	
	Electricity	1	2	3	
.21	Current Events	2	0	2	
	Wood-working	0	2	2	
22	Algebra	1	0	1	
	Auto Repair	1	0	1	
	Foundry Practice	0	1	1	
	Mech. Drawing	0	1	1	
	Physics	0	1	1	
	Typewriting	0	1	1	
	Hygiene	0	1	1	
	Phonics	0	1	1	4.9
	Total: (33)	443	444	887	100.0

In Table 2 following, you will see that in the elementary school for 1920-1921 English stands first with 26.4 per cent of the projects to its credit. As principal of the school I am glad that music makes such a good showing. It stands second in rank and produces 14.7 per cent of the projects. In a school with definite emphasis on such practical studies as shop-work, commercial training, and home training, I think we should bring as much culture as possible to the pupils in all grades, and this comes from listening to orchestra, soli, choruses, music appreciation periods, and community singing. As principal, I am also gratified to have educational films stand third in rank. We finance our own film service, and average at least one reel each week. The value of films to bring clear ideas of industries, geography, nature study, and the applications of science can be over-

emphasized, but as a rule we under-emphasize it. I agree with Dr. Bobbitt when he says: "We find here the justification for the ever-increasing use of motion pictures for greatly extending one's visual observation of concrete processes and conditions." (The Curriculum, p. 106.)

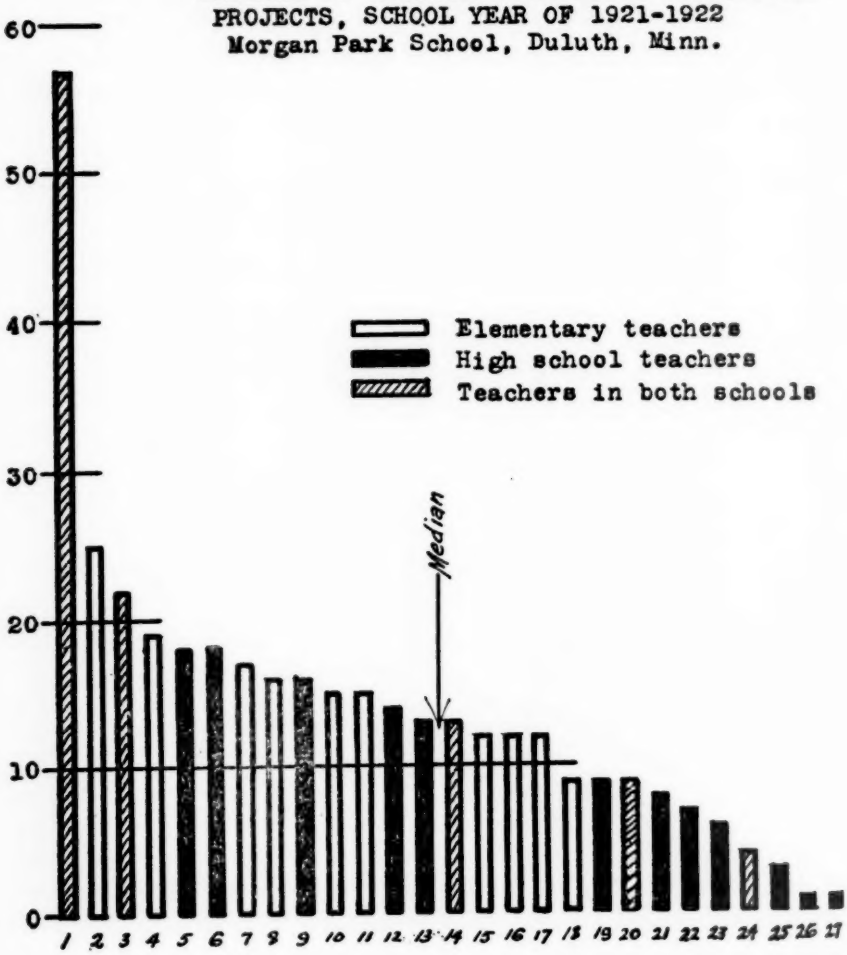
TABLE 2—Subject Sources of Auditorium Projects in the Six-Grade Elementary School, 1920–21.

Rank	Subject	1920–21	Per cent
1	English	69	26.4
2	Music	35	13.6
3	Educational Films	32	12.2
4	Reading	27	10.3
5	Industrial Arts	26	10.0
6	Physical Education	14	5.4
7	History	12	4.6
8	Geography	11	4.2
	Arithmetic	11	4.2
9	Spelling	10	3.8
10	Addresses	8	3.0
11	Nature Study	5	1.9
12	Hygiene	1	
	Phonics	1	
	Total (14)	262	100.0

Table 2 gives the tabulation of subject sources for the elementary auditorium assembly for the single year of 1920-1921. In this we see that English, music, and educational motion pictures contribute over 50 per cent of the projects. If reading, industrial arts, and physical education are added we have the sources of over 75 per cent of the projects. The remaining eight sources contribute less than 25 per cent. There is a striking correlation of geography with industrial arts in this school, and no doubt some of the industrial arts projects could have been called geography projects. This was done the following year unconsciously by the teachers.

The teacher sources of auditorium projects—Diagram I shows the *teacher sources* of auditorium projects during the single year of 1921-1922. Each white bar shows the number of projects an elementary teacher has produced. Each black bar gives the same record for each junior-senior high-school teacher. The hatched bars represent teachers who have given projects in both assemblies. The median number of projects produced by the teachers is thirteen, taking the school as a whole. The median for the exclusively elementary teachers is fifteen. The median for the high-school teachers is nine.

DIAGRAM I. TEACHER SOURCES OF AUDITORIUM PROJECTS, SCHOOL YEAR OF 1921-1922
Morgan Park School, Duluth, Minn.



One reason for the higher median in the elementary school is undoubtedly due to the fact that projects of the smaller children are on the average shorter than the projects of the older children. Project teaching is more prevalent in the elementary grades. I would say also that the younger pupils are on the whole more delighted with the prospect of appearing before their fellows than their elders.

In further explanation of Diagram I the grade and subjects taught will be given in the following:

Elementary teachers (white bars): No. 2, fourth grade academic subjects; No. 4, fifth grade academic subjects; No. 7, music grades one to six; No. 8, third grade; No. 10, second grade; No. 11, fifth

and sixth grade academic subjects; No. 15, kindergarten; No. 16, first grade; No. 17, fifth and sixth grade academic subjects; No. 18, beginning first grade. (The last named, No. 18, is leading the elementary teachers this year.)

High-school teachers (black bars): No. 5, history; No. 6, English and Latin; No. 9, seventh grade academic subjects; No. 12, English and French; No. 13, eighth grade academic subjects; No. 19, mathematics and science; No. 21, sewing; No. 22, the principal; No. 23, cooking and household science; No. 25, mechanical drawing, and other shop subjects; No. 26, shorthand and typing; No. 27, woodwork and machine shop.

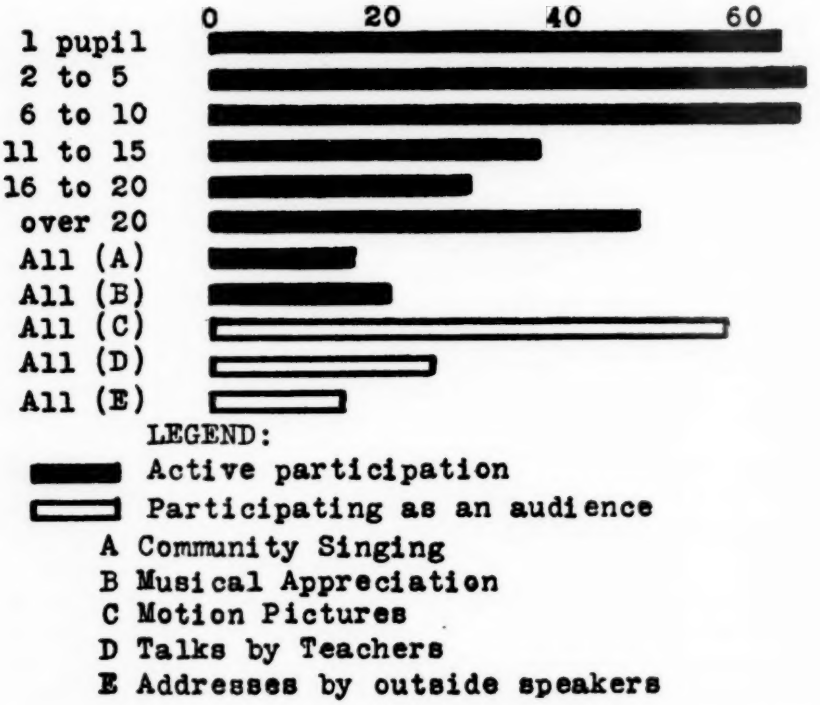
Teachers in both schools (hatched bars): No. 1, music and head of auditorium work; No. 3, art and industrial arts in grades 4, 5, 8; No. 14, director of physical training for girls; No. 20, director of physical training for boys and coach of boys' athletics; No. 24, art and industrial arts in grades 6, 7, and high school.

Undoubtedly some subjects more naturally and easily produce auditorium projects than others. However, our study of the matter has led us to conclude that the teacher is the decisive factor in the situation. Some teachers will make contributions to the auditorium in whatever subject they teach. Note that No. 3 and No. 24 are teachers in the same department. The former is an experienced teacher with alertness, initiative, originality, and a purposeful worker; the latter is younger, has less experience, and has less of the other qualities. One is known all over the city for her excellent work, and the other is an average teacher, much less than average as far as the auditorium work is concerned.

Teachers of academic subjects who are slaves to their text-books rarely reach the average in auditorium work. The auditorium directs the teacher to vital methods, it leads the teacher to use the word "project" in her daily vocabulary and to think of subject-matter in terms of projects. Not always, but very frequently, the number of projects a teacher is developing is an index to the vitality of the classwork, the psychology of her methods, and the willingness to prepare for the day's work.

The discussion of the sources of auditorium projects in the faculty meetings has been very profitable. These discussions are usually prefaced by the distribution, a day or so in advance, of mimeographed tabulations, graphs, questions, suggestions, etc. Most teachers desire to improve their own records and to compare favorably with their fellows.

DIAGRAM II. PUPIL PARTICIPATION IN AUDITORIUM PROJECTS, 1921-1922



It has been extremely valuable to the principal to know whence come the auditorium projects. Only by knowing where the weak points are can improvement be made in an intelligent manner.

The extent of pupil participation—Diagram II is submitted in an attempt to answer a question that is sometimes asked concerning auditorium work—namely, To what extent do the pupils actually participate in auditorium work? One answer to this is, Every child is participating who is giving attention; as a member of the audience he is a participant. This does not quite satisfy any one who has thought enough about the subject to ask the question. In addition to this the questioner desires to know how many children appear upon the programs. It has occurred to me that we also want to know how often "team-work" is called for—coöperation to make the project a success.

Diagram II is a bar-gram which distinguishes between participating as an actor and participating as a member of the audience. The black bars should be read as follows: In 64 projects one pupil

was the actor; in 67 projects from 2 to 5 pupils were actors, and so on. The white bars should be read: All the pupils viewed motion pictures as members of the audience, and so on. According to this distribution the pupils were the actors in 73.6 per cent of the projects. Subtracting the 14.4 per cent of the projects in which one pupil was the actor, we have remaining 59.2 per cent of the projects. In these the pupils were compelled to coöperate with each other. In 26.4 per cent of the projects the pupils participated only as members of the audience.

However, it must always be remembered, that each and every member of the audience is participating when attention is fixed on the project being produced on the stage. This type of participation demands team-work and coöperation, too. A noisy, whispering, or otherwise disturbing youngster is a citizen of the school who is failing in the necessary function of coöperation. Team-work and coöperation is an attitude and a skill that needs to be instilled during school life; a skill and an attitude once definitely acquired will carry over into later life.

Some pupils are actors more often than others. This is to be expected. School life would not even approach life if this were not true. However, we attempt to have those who make indifferent actors appear on the stage as often as possible for the training that comes to them. These poorer actors test the coöperation of the audience and in this very thing they are valuable to the audience. The poor speaker may not appear in a one-pupil project, but he gets his chance in connection with others. This shows up in the tabulation: there were forty-eight projects (10.8 per cent) in which over 20 were actors, twenty-nine (6.3 per cent) in which 16 to 20 participated, thirty-seven (8.5 per cent) in which 11 to 15 were on the stage. In other words, over 25 per cent of the projects afforded large groups of children, frequently an entire class of forty pupils, an opportunity for training.

My own knowledge of the evidence that I have tried to present through Diagram II, leads me to say with confidence that the auditorium as organized in this school *gives training to the many,* and not alone to the few. No more than in the classroom does the strong pupil monopolize the training to the exclusion of his less endowed brother. As in the classroom the weaker pupil is given especial attention because of his weakness.

We often gain a knowledge of the way to do something by observing others dexterously and successfully do it. This is true of children of all ages in the auditorium assemblies. A child in the ele-

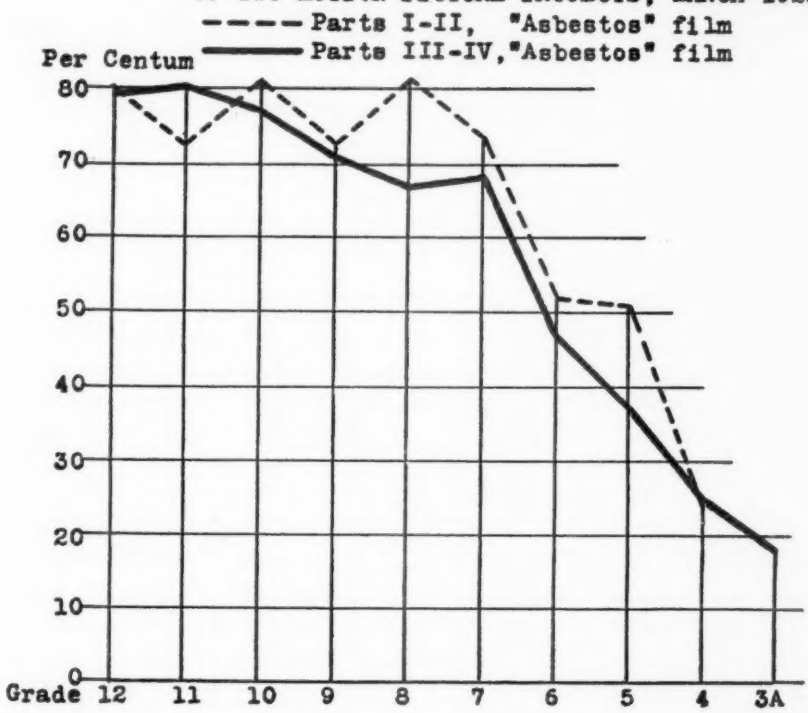
mentary school or a youngster in the high school will often surprise his teachers by his poise, enunciation, and complete all-round success on the stage. What is the source of his unsuspected ability? I am convinced that the pupil has learned from close attention to the elements of success in the efforts of his fellows.

The range of grades in an auditorium group—An occasional test of an auditorium program has led us to believe that, (1) the auditorium work may be satisfactorily tested, (2) the active attention of the pupils is greatly improved, and (3) the number of grades that can be profitably combined as an auditorium group may be determined.

By using mimeographed True-False tests the programs may be economically and efficiently tested. A test of twenty or twenty-five questions is usually given in about fifteen minutes, counting the time of giving instructions, distributing papers, five minutes for writing the examination, and in the high school the correcting of the papers by the pupils themselves. The tests are enjoyed by the pupils of all grades, and do not add a burden to the teachers, for if the teacher marks the papers herself it takes but a few minutes to make corrections and enter the scores on a form. The tests are also satisfactory in testing the comprehension and attention of the pupils. It is clearly evident to us that pupils become better coöperators and give more concentrated attention as a result of tests, in other words, their participation as members of the audience is improved and made active. There is a wholesome rivalry between classes, and many pupils evince the greatest interest in self-improvement. The auditorium audiences always greet the announcement of test results with close attention and manifestations of great interest. Applause always follows the announcement of the leaders. Graphs and tabulations placed on the bulletin boards are the subjects of interest for days. Parents tell me that they are also subjects of conversation at home.

Diagram III shows the percentile standings derived from two tests on a four-part film picturing asbestos mining and the manufacturing of asbestos products. Parts I and II were concerned largely with the mining operations, and proved to be more easily comprehended than Parts III and IV which showed the processes of manufacture. The broken line gives the results of the test on Parts I and II, it consisted of a True-False test of twenty statements. The percentages were secured by dividing the median of each grade by the number of statements in the test. It was given to the high-school pupils immediately after the films were shown, and to the elementary

DIAGRAM III. TESTS OF PUPILS' COMPREHENSION OF TWO MOTION PICTURE PROJECTS, MARCH 1923



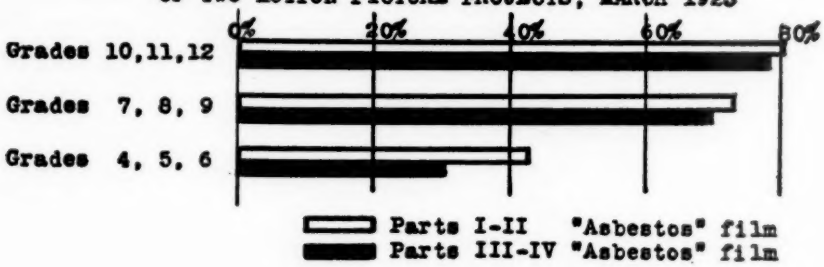
pupils from two to three hours after the film was shown, in both cases without any warning that a test was to be given.

The test of Parts III and IV consisted of twenty-five statements. The pupils were told that a test would be given before the film was shown. In all other ways the procedure was identical with the first test.

In the first test the eighth and tenth grades stood first, with the twelfth a close second. We have found that such results frequently occur. In consequence, we have decided that grades seven to twelve may be satisfactorily combined as an auditorium group. The improved position of the eleventh grade in the second test is clearly a case of determination to improve the standing made in the first test.

The sharp decline of the curves between the seventh and sixth grades is undoubtedly due to the fact that the tests were not given to the sixth grade and the other elementary grades until two or three hours after the films were shown. I would estimate that if the tests had been given immediately after the showing of the films the elementary medians would have been from ten to twenty per cent higher.

DIAGRAM IV. TESTS OF PUPILS' COMPREHENSION OF TWO MOTION PICTURE PROJECTS, MARCH 1923



The second test (heavy continuous line) shows the usual results in grades 4, 5, and 6. There seems to be a rapid improvement in ability to give active attention to auditorium work in these grades. This conforms to the results from standard tests in school subjects. We combine these three grades for auditorium work, but we do so realizing that there is more difference between grades four and six than between grades seven and twelve.

In Diagram IV we have combined the test results in senior high, junior high, and elementary groups. This seems to indicate that we have a satisfactory grouping of the grades for auditorium work when we combine grades 7 to 12, and 4 to 6. As the school grows it will be increasingly satisfactory to group the grades as follows: (1) 10 to 12, (2) 7 to 9, (3) 5 and 6, and (4) 3 and 4.

Conclusion—In this paper an attempt has been made to give quantitative answers to the following propositions: (1) The sources of auditorium projects; (2) the degree of participation by pupils, and (3) the range of grades that may be profitably combined in auditorium groups.

Proposed Scale for Rating School Principals and Assistant Principals

W. P. BURRIS

University of Cincinnati, Cincinnati, Ohio

Note.—No one will be given a professional rating whose personal, social, or general educational qualifications are not satisfactory as indicated below:

I. *Personal Qualifications* (check)—Satisfactory.
Not satisfactory.

Indicate by + or — the strong or weak points insofar as there is clear evidence of either. Do not give either mark for any item unless there is an outstanding characteristic which can be recorded in this way—that is, do not mark any given quality unless its presence or absence is so striking as to arrest your attention. The assumption is that the one marked has all of these qualities, in ordinary measure, except insofar as the pluses or minuses indicate the respects in which he is strong or weak. Ordinarily not more than one third of the qualities will receive a mark on this basis in any given case. There should be more "strong" than "weak" points before a mark of "satisfactory" can be given.

Naturalness	Sincerity	Balance
Good Taste	Ambition	Patience
Pleasant Voice	Enthusiasm	Courage
Cheerfulness	Perseverance	Energy
Appearance	Independence	Force
Physique	Originality	Self-control

II. *Social Qualifications* (check)—Satisfactory.
Not satisfactory.

Indicate as under I. A minus after more than one quality will disqualify.

Courteous	Sympathetic	Tactful
Kind	Democratic	Impartial

III. *Educational Qualifications* (check)—Satisfactory.
Not satisfactory.

Equivalent to a standard college curriculum and 30 credits in educational courses as a part of or in addition to such curriculum. Courses in psychology, philosophy, and social science may be counted as education to the extent of six credits each.

IV. *Professional Qualifications.*

Estimate the candidate's qualifications as "Very Superior," or "Superior," etc., and then substitute the numerical equivalents, the sum of which will give the candidate's standing

In rating Assistant Principals for Principalships, weight these items, checking the appropriate value		In rating teachers for Assistant Principalships, weight these items, checking the appropriate value
1. For Supervision of Teaching	Very Superior..... 40 Superior ..... 32 Average ..... 24 Inferior ..... 16 Very Inferior..... 8	1. Quality of Teaching

2. For School Management	Very Superior.....	25	2. Ability in Class Management
	Superior	20	
	Average	15	
	Inferior	10	
	Very Inferior.....	5	
3. For Community Leadership	Very Superior.....	15	3. Coöperation in school, community, and professional activities
	Superior	12	
	Average	9	
	Inferior	6	
	Very Inferior.....	3	
4. For Promotion of Professional study and growth	Very Superior.....	10	4. Skill in the analysis and solution of school problems
	Superior	8	
	Average	6	
	Inferior	4	
	Very Inferior.....	2	
5. For Clerical Work	Very Superior.....	10	5. Efficiency in clerical work
	Superior	8	
	Average	6	
	Inferior	4	
	Very Inferior.....	2	

ORGANIZATIONS OF ELEMENTARY SCHOOL PRINCIPALS

Chicago Principals Club, Chicago, Illinois: Rose A. Pesta, president; Daniel J. Beeby, first vice-president; Walter J. Harrower, treasurer; Robert G. Jeffrey, secretary.

Conference Group, Elementary School Principals, Elgin, Illinois: Mrs. Matie H. Walls, president; Aimee E. Lyford, secretary; Lillian M. Larsen, program committee; Hattie M. Griffin, member superintendent's cabinet.

Principals' Exchange Club, Grand Rapids, Michigan: Margaret Strahan, president; Mrs. Jeannette Brown, vice-president; Edna M. York, secretary-treasurer.

Duluth Principals' Club, Duluth, Minn.: John L. Bracken, president; Mrs. Ethel Kunerth, secretary.

Department of Elementary School Principals, Missouri State Teachers Association: W. T. Longshore, Kansas City, chairman; L. M. Dougan, St. Louis, vice-chairman; Ida L. Barley, Kansas City, secretary-treasurer.

Elementary School Principals' Association, St. Joseph, Missouri: Emma O. Mumm, president; Mabel White, vice-president; Cecil Crawford, secretary; Clarence Carpenter, treasurer.

Principals' Club of Cleveland, Cleveland, Ohio: Maude Burroughs, president; M. Emma Brookes, vice-president; Alice Christianar, treasurer; Mattie Stewart, secretary. Executive Board: Florence McEachren, Mary Strachan, Julia Mulrooney.

Elementary Principals' and Supervisors' Section, Texas State Teachers' Association: J. E. Park, Wichita Falls, president; Mrs. Pearl Robertson, Tyler, secretary.

The Spokane Association of Elementary School Principals, Spokane, Washington: M. O. Roark, president; Frances Weisman, secretary-treasurer.

Superior Principals' Club, Superior, Wisconsin: A. T. Conrad, president; John Andrews, secretary.

LIST OF MEMBERS

THE DEPARTMENT OF ELEMENTARY SCHOOL PRINCIPALS

For the year 1922-1923, corrected to April 28, 1923

Unless otherwise indicated those listed are elementary school principals.

Aarvig, Bertha O., Apartment 3, K. C. Bldg., Fort Dodge, Iowa.

Adams, A. Virginia, East Ave. School, East Landis Ave., Vineland, N. J.

Adams, G. L., Ward School, 463 St. Louis Ave., Fort Worth, Texas.

Adams, Norma A., Gansevoort Primary School, 215 W. Bloomfield St., Rome, N. Y.

Adel, Edna P., Fieser School, 530 So. Ohio Ave., Columbus, Ohio.

Adlington, Maude, 6 Raymond St., Lexington, Mass.

Afflerbach, Calvin E., Supervising Principal, Felton, Del.

Agnew, Thomas, Horace Mann School, 835 Avenue A, Bayonne, N. J.

Albert, Mrs. Jessie S., Froebel School, 48 Thomas St., Muskegon, Mich.

Alderman, Mrs. Gertrude, Todd Ave. School, Warren, Ohio.

Alexander, Hattie, Elizabeth School, 201 N. Caldwell St., Charlotte, N. C.

Alexander, Thomas, Prof. of Elementary Education, Peabody College, Nashville, Tenn.

Allen, Lillie E., A. D. Bache School, 1750 No. 15 St., Philadelphia, Pa.

Allen, Lora, 99 W. Kansas, Pittsburg, Kans.

Allen, Nell B., Emerson School, Box 35, Hoquiam, Wash.

Altamer, M. H., College Hill School, Cincinnati, Ohio.

Alter, Harvey E., Thomas Street School, Rome, N. Y.

Amacker, J. C., Supt. of Schools, Pace, Miss.

Amoss, W. H., Supt. of Schools, Mena, Ark.

Andersen, W. N., Supt. of Schools, Anita, Iowa.

Anderson, Mrs. Cora S., 106 So. 25th St., Omaha, Nebr.

Anderson, Ellen R., 5 Greenview Ave., Princeton, N. J.

Anderson, John O., Longfellow School, Duluth, Minn.

Anderson, Lillian, 128 Chapen St., South Bend, Ind.

Anderson, William, Dunbar School No. 101, 1513 Druid Hill Ave., Baltimore, Md.

Andrews, Alice L., Dickey Ave. School, 40 Rose Lawn Ave., Warren, Ohio.

Andrews, J., Box 225, Eastland, Texas.

Angland, Helen, 347 Von Houten St., Paterson, N. J.

Anthony, John W., 225 Hampden St., Pittsburgh, Pa.

Arlett, Elizabeth, Alexander Hamilton Junior High School, 24 Linda Ave., Oakland, Calif.

Armstrong, Cora, Clarenden School, Canton, Ohio.

Armstrong, Mrs. Mary F., Congress School, Grand Rapids, Mich.

Arnold, M. A., Horace Mann School, 29 Walnut St., Everett, Mass.

Arrington, Mrs. Stella P., Sanford, Fla.

Askin, Bessie D., Madison School, Pittsburgh, Pa.

Atkinson, F. H., Henry Ford School, Detroit, Mich.

Atwood, Clinton H., 104 Center St., Solvay, N. Y.

Augsburger, F. D., Supt. of Schools, Butler, Kansas.

Austin, Mary N., Bancroft School, Omaha, Nebr.

Bacon, Meda, Stocking School, Grand Rapids, Mich.
Badanes, Saul, P. S. 173, Pennsylvania Ave., Brooklyn, N. Y.
Baer, Alice H., 10414 So. State St., Chicago, Ill.
Baisden, Leo B., Jefferson School, Alaska St. and California Ave., Seattle, Wash.
Baker, Bertha, Geo. B. Longan School, 39th and Warwick, Kansas City, Mo.
Baker, Della F., North School, 245 E. Palace Row, Geneseo, Ill.
Baker, Eliz. S., 159 Paxton St., Harrisburg, Pa.
Baker, Ethel, Washington School, 628 Wallis Ave., Farrell, Pa.
Baker, N. A., 343 E. 46th St., Portland, Oreg.
Baldwin, Agnes M., School No. 46, 122 College St., Buffalo, N. Y.
Bancroft, Harriet E., 1441 Fair Ave., Columbus, Ohio.
Bankhardt, Lena M., Warren School, Cleveland, Ohio.
Banning, Eva L., Warren School, Cleveland, Ohio.
Barber, E. Olive, Spring Street School, Gloversville, N. Y.
Barker, Mary C., Ivy Street School, 123 Myrtle St., Atlanta, Ga.
Barley, Ida L., Ashland School, 1539 Admiral Boulevard, Kansas City, Mo.
Barnes, Abbie C., Ernst School, St. Joseph, Mo.
Barnes, Percival S., Supt. of Public Schools, East Hartford, Conn.
Barnhart, Mrs. Agnes, St. Mary's School, Lueama, N. C.
Barnetson, Amy B., Columbia School, So. Orange, N. J.
Barnicle, John F., Saxonville School, Framingham, Mass.
Barns, B. A., Angell School, Detroit, Mich.
Barns, Harold, Girard College, Philadelphia, Pa.
Barr, H. M., 629 E. 59 N., Portland, Ore.
Bartely, Mary E., Nolan School, 9 Third St., Fitchburg, Mass.
Bartine, Helen W., William Cramp School, Howard and Ontario Sts., Philadelphia, Pa.
Bates, Elizabeth, 66th Street School, 1158 Fifth Ave., Los Angeles, Calif.
Batman, Anna C., Longfellow School, Lincoln, Nebr.
Bauer, S. G., Guilford School, Fourth and Ludlow Streets, Cincinnati, Ohio.
Baugh, Lila, Allen School, Houston, Texas.
Beam, Paul A., 601 West Main, North Manchester, Ind.
Beaudry, Wilfred, George E. Tracy School, 4 State St., Milford, Mass.
Beck, E. W., Horace Mann School, Iowa City, Iowa.
Beck, Julia F., School No. 67, Old Frederick and McCurley St., Baltimore, Md.
Beck, J. O., Westwood School, 3044 Lischer Ave., Cincinnati, Ohio.
Bednar, Christine, Sherwood School, 132 W. Marquette Rd., Chicago, Ill.
Beek, Charles H., Harvey Wheeler School, Concord Junction, Mass.
Beers, George A., Clarke School, 3925 W. Van Buren St., Chicago, Ill.
Bell, Nellie, Second District School, 623 Vine St., Chattanooga, Tenn.
Benedict, Myrtle L., Kentucky School, Cleveland, Ohio.
Benfer, Mabel C., Washington School, 621 Keeler, Bartlesville, Okla.
Bennett, V. B., Moorhead School, Pittsburgh, Pa.
Benson, Bertha, William Penn School, 321 N. Lockwood Ave., Chicago, Ill.
Benson, J. R., Eliot School, St. Louis, Mo.
Bergan, K. W., Simms, Mont.
Berkaw, Geo. R., Russell School, Detroit, Mich.
Bennett, Arthur, Daniel Webster School, 322 McKinley Ave., Avalon, Pa.
Berry, W. T., 221 Wood St., Maysville, Ky.
Beseman, Ella, Lee School, 233 Prospect Ave., Peoria, Ill.
Bickler, Peter, Grant Street School, Milwaukee, Wis.
Bingham, H. Beth, South Side School, Mishawaka, Ind.
Bettes, Lucy M., Madison School, Grand Rapids, Mich.
Bibens, Burnham, A., 11 Union St., Springfield, Vt.
Billings, Neal, 312 N. Courtland St., East Stroudsburg, Pa.
Birkenhauer, Louise, Longfellow School, 3304 Wabash Ave., Kansas City, Mo.
Birnie, Jeannette, 523 W. 9th St., Grand Island, Nebr.
Bittner, Emma, School Street School, 153 Wilbraham Rd., Springfield, Mass.
Black, May I., Liberty School, 200 S. Rebecca St., Pittsburgh, Pa.
Blackburn, Lulu, Benj. Harrison School, 421 Huntington Rd., Kansas City, Mo.
Blackmore, Ida, Monmouth Park, Omaha, Nebr.
Blake, Katherine D., P. S. No. 6, Manhattan 101 W. 85th St., New York.
Blanchard, Mrs. Cora B., Supt. of Schools, La Barge, Wyo.
Blankenship, Mrs. Essie, 300 N. Brevard St., Charlotte, N. C.
Blessing, Louise, Roosevelt School, 4837 Lytle St., Pittsburgh, Pa.
Bliss, Carrie W., Acushnet Avenue School 233 Arnold St., New Bedford, Mass.
Bloodworth, Mrs., Hill Street School, 70 W. 5th St., Atlanta, Ga.
Blough, H. B., 272 Broadway, Portland, Ore.
Boecker, Alexander, Public School 100, Coney Island, Brooklyn, N. Y.
Boggs, Judge, Riddick School, 4136 Evans Ave., St. Louis, Miss.
Bolen, Elizabeth, South Park School, 1717 Jule St., St. Joseph, Mo.
Bolenbaugh, Geo., Fairview School, Cincinnati, Ohio.
Bolten, Belle, Hicks School, Cleveland, Ohio.
Bond, Elizabeth, Washington School, Salt Lake City, Utah.
Bonfield, Q. Louise, St. Clair School, Cleveland, Ohio.
Bonfield, Susan, Douglas School, 3211 Giles Ave., Chicago, Ill.
Boon, Sally Knox, Rollins School, 4059 Central St., Kansas City, Mo.
Bortle, Helen, Beck Street School, 254 S. Monroe Ave., Apt. 7, Columbus, Ohio.
Boughan, Mary J. W., Sabin School, 2216 Hirsch St., Chicago, Ill.
Bovee, Earl E., Whittier School, 2113 So. Royce St., Sioux City, Iowa.
Bowman, C. P., Minor School, Birmingham, Ala.
Bowen, Wayne F., 403 So. Tamarind, Compton, Calif.
Boyce, Thomas W., Cass Street School, 840 Marshall St., Milwaukee, Wis.
Boyer, Martha E., Hayne School, 11th and Huntington Sts., Philadelphia, Pa.
Boyle, Miss M. E., School No. 22, Paterson, N. J.

Bracken, J. L., U. S. Grant and R. S. Munger Schools, Duluth, Minn.
Brainerd, Charles E., Supervising Principal, 82 Munroe St., Somerville, Mass.
Branson, Mrs. Lilla T., 34 Union Street, Mount Holly, N. J.
Brehm, J. J., Junior High School, 6th and Woodbine, Harrisburg, Pa.
Brennan, Fannie, Webster School, 1015 Henry St., St. Joseph, Mo.
Bridgland, L. A., Whittier School, 2020 So. 5th East, Salt Lake City, Utah.
Brinser, Ira S., Supt. of Schools, Lewes, Dela.
Broadwell, Carrie E., Halle School, Cleveland, Ohio.
Brogen, Mrs. K. E., Columbia School, Florida and 26th Sts., San Francisco, Calif.
Brookes, Emma, Chesterfield School, Cleveland, Ohio.
Brooks, C. J., Madisonville School, Cincinnati, Ohio.
Brooks, Robert P., School 3, 347 E. 37th St., Paterson, N. J.
Brown, Edythe J., 434 W. La Salle Ave., So. Bend, Ind.
Brown, Elmer, 759 E. 27th N., Portland, Ore.
Brown, Mrs. Jeanette, Michigan School, Grand Rapids, Mich.
Brown, W. Q., Kennedy-Silverton School, Cincinnati, Ohio.
Brown, Zadie, Lynbrook School, Lynbrook, N. Y.
Brun, Elizabeth, Kensington School, Kansas City, Mo.
Bruce, G. L. (Miss), N. Doan School, Cleveland, Ohio.
Buchanan, B. M., 495 Greenwood Ave., Portland, Ore.
Buchanan, Wm. D., Dozier School, 5749 Maple Ave., St. Louis, Mo.
Buchsieb, Carrie J., Third Street School, Columbus, Ohio.
Buckley, Charles, Supervising Principal, Harrity, 56 and Christian Sts., Philadelphia, Pa.
Burdick, Annie P., Arthur Avenue School, Providence, R. I.
Bureau of Educational Research, Ohio State University, Columbus, Ohio.
Burke, Hanna J., School 29, 222 So. Park Ave., Buffalo, N. Y.
Burke, L. C., Riverside School, 176 Wisconsin, Memphis, Tenn.
Burris, Frances A., Jackson and Noyes Schools, St. Joseph, Mo.
Burroughs, Maude, Supervisor School Hdqtrs., Cleveland, Ohio.
Bush, Fred S., Bloomfield, N. J.
Byers, Ruby M., 385 So. 15th St., Cedar Rapids, Iowa.
Byers, W. A., Alliance, Ohio.
Byrne, Clara R., Everett School, St. Joseph, Mo.
Byrnes, Lillian O., E. Rome and Columbus Schools, 111 W. Linden St., Rome, N. Y.

Caldwell, Maud, 130 Rice St., Alliance, Ohio.
Calverly, Belle, Jefferson School, Duluth, Minn.
Cameron, James B., 135 E. Liberty St., Girard, Ohio.
Camp, Elizabeth, Leggett School, Akron, Ohio.
Camp, Frederick S., Supervisor Elementary Education, Board of Education, Hartford, Conn.
Campbell, Miss Cora, Bancroft School, Kansas City, Mo.
Campbell, Elwyn G., Clarence A. Cook School, 84 Laurel St., Fairhaven, Mass.
Campbell, Florilla, Grant School, 825 N. Baker St., Stockton, Calif.
Campbell, Isabelle, M., East View School, Shaker Heights School, 2249 E. 83rd St., Cleveland, Ohio.
Campbell, Oliver H., Supt. of Schools, Victor, Mont.
Candlin, Albert, Chestnut St., Jr. High School, Springfield, Mass.
Carls, Rufina A., P. S. 42, Manhattan, Hester and Essex Sts., New York City, N. Y.
Caradine, Jane, Crockett School, 1810 Bingham Street, Houston, Texas.
Carback, Clarence H., Kenderton School, 4613 Morris St., Germantown, Philadelphia, Pa.
Carnine, Jennie M., Hawthorne School, 385 8th Ave., S., Fargo, N. D.
Carothers, Alice, Union School, Cleveland, Ohio.
Carpenter, Clarence, 3821 Lafayette St., St. Joseph, Mo.
Carpenter, Harriet, Box 18, Aberdeen, S. D.
Carrington, C. L., New Underwood, S. D.
Carroll, Miss A. W., 239 Palmer Ave., E., Detroit, Mich.
Carroll, Katherine F., New South School, 64 Pleasant St., Ware, Mass.
Carter, Charlotte, School No. 72, Indianapolis, Ind.
Casebere, L. A., 345 E. 54th Street, Portland, Ore.
Casey, Thos. J., Gladstone School, 5559 W. Adams St., Chicago, Ill.
Cassidy, H. A., Alki, Seattle, Wash.
Cavanah, Lucretia, 5009 Franklin Ave., Cleveland, Ohio.
Caverno, Cora, 1550 E. 65th Place, Chicago, Ill.
Chadwick, R. D., Morgan Park School, Duluth, Minn.
Chambre, Marguerite, 22 Mountain Ave., Dover, N. J.
Chandler, Maud, Chestnut Street School, Chattanooga, Tenn.
Chaney, Florence A., 49 Boston St., Somerville, Mass.
Chapman, Grace, Jefferson School, Spokane, Wash.
Charters, Daisy I., John Burroughs School, The Lenox, Columbus, Ohio.
Chase, Marie S., M. Washington School, Supervising Principal, 44th and Aspen Sts., Philadelphia, Pa.
Christianar, Alice, Willson Cripple School, Cleveland, Ohio.
Clagg, J. Henry, Hamilton and Mt. Washington School, Nichols St., Everett, Mass.
Clampitt, Xenia C., 6805 North 11th St., Oak Lane, Philadelphia, Pa.
Clark, B. F., Supt. of Schools, Gilbert, Iowa.
Clark, Charles S., Supt. of Schools, Somerville, Mass.
Clark, Jeanette A., Sherman School, 29 E. Grand St., Rahway, N. J.
Clark, Kenley J., Glasgow Street School, 223 Webster Ave., Portsmouth, Va.
Cleavenger, W. C., Thaddeus Stevens School, 1028 Steuben St., Pittsburgh, Pa.
Cleland, Lillian A., Fairfax School, Cleveland Heights, Ohio.
Clemens, Paul B., Hanover Street School, Milwaukee, Wis.
Clement, W. W., Bryant School, 57 and Wornall Rd., Kansas City, Mo.
Clemson, Mary W., Open Air School, 1224 Madison Ave., Columbus, Ohio.
Clephane, U. D., Evanston School, Cincinnati, Ohio.

Clish, Herbert C., Center Grammar School, Litchfield, Conn.
Cobb, Chas. C., Carpenter School, 1830 Chase Ave., Chicago, Ill.
Cober, E. W., Holmes School, 1419 Elm St., Wilkinsburg, Pa.
Cogshall, Charles H., Hall School, Grand Rapids, Mich.
Colburn, Jessie B., Junior High School 96, Manhattan, 8 West 103 Street, New York.
Coleman, L. A., R. F. D. No. 2, Springfield, Mass.
Collins, Bessie Eleanor, 4910 Larchwood Ave., Philadelphia, Pa.
Collins, C. B., Wendall Phillips School, Boston, Mass., North Station.
Combs, R. W., Ravenna Memorial School, Palenville, N. Y.
Comstock, W. H., Shakespeare School, 2031 E. 72d Place, Chicago, Ill.
Conland, Lulu N., West Side Grammar School, Central Falls, R. I.
Conlon, Mary A., Walton Junior High School, P. S. 30, Bronx, 141st and Brook Ave., New York City, N. Y.
Connelly, Augusta M., Market Street School, 302 Reed St., Clearfield, Pa.
Connolly, Edna, Rickoff School, Cleveland, Ohio.
Conrad, Fannie M., McKinley School, Revere, Mass.
Converse, L. R., Gorman School, St. Paul, Minn.
Conway, Mary, P. S. 15, Borough of Richmond, Tompkinsville, Staten Island, N. Y.
Cook, Louis D., John B. de Valles School, No. 2 Morgan Terrace, New Bedford, Mass.
Cook, Selda, Outhwaite School, 5810 Clinton Ave., Cleveland, Ohio.
Cooper, C. P., 106a State St., Windsor, Vt.
Copeland, Eunice D., 1107 E. Denny Way, Seattle, Wash.
Corbett, Clara Bess, Baily Block, Eveleth, Minn.
Corbett, Delia A., James M. Aldrich School, 3 Hambly St., Fall River, Mass.
Corcoran, Teresa M., McKinley School, Dayton, Ohio.
Corish, Gertrude L., Cedar Street School, New Bedford, Mass.
Cornish, Lydia R., Evans School, W. 11th Ave. and Acoma St., Denver, Colo.
Corrington, Alice T., 13 Eighth St., New Bedford, Mass.
Cort, Ambrose, P. S. No. 73, Brooklyn, N. Y.
Cortledge, Franklin F., Sharswood School, 2d and Wolf Sts., Philadelphia, Pa.
Coughlin, John L., Columbus School, 1115 Erown's Ave., Erie, Pa.
Cowan, Ora U., Leinkaub School, 56 Dexter Ave., Mobile, Ala.
Cox, Helena, Laird Avenue School, 5 March Building, Warren, Ohio.
Cox, Mrs. Winona, S., Moultrie, Ga.
Coyte, Florence E., Linden Avenue School, Glen Ridge, N. Y.
Craig, Christine, Yorkville School, 14 Elm St., Whitesboro, N. Y.
Crane, H. L., Oakley School, 5636 Bramble Ave., Cincinnati, Ohio.
Craven, Ina E., Box 112, Ogden, Utah.
Creedon, Clara W., Haven School, 308 N. Waller Ave., Chicago, Ill.
Cronan, Frances J., P. S. 222, Murray St., Flushing, New York City, N. Y.
Crowell, Myra D., 37 Main St., Fairhaven, Mass.
Crumrene, M. Ella, 917 Chislett St., Pittsburgh, Pa.
Curfman, Bessie, Harris School, Akron, Ohio.
Cushing, Lena, 27 Fellows St., Danvers, Mass.
Cutler, G. V., Supt. of Schools, Lovell, Wyo.
Cutler, J. Katherine, Shepard School, 2839 Fillmore St., Chicago, Ill.

Dale, Ralph B., Taggart School, 4th and Porter Sts., Philadelphia, Pa.
Daly, Margaret, 25th District School, Cincinnati, Ohio.
Darling, Mrs. Emily D., Samuel Stroug School, Elkhart, Ind.
Davis, Adelaide, Matthew G. Emery School, Washington, D. C.
Davis, Alice A., Wheeler School, 43 Beech St., Winchendon, Mass.
Davis, Courtland V., J. E. B. Stuart School, Norfolk, Va.
Davis, Hettie J., Miles School, Miles Ave. and 119th, Cleveland, Ohio.
Davis, Lena L., Lowman School, 1812 Huntoon, Topeka, Kans.
Davis, Mrs. W. P., Grant Park School, 72 Park Ave., Atlanta, Ga.
Dawley, Sara J., West End School, 10 Pleasant St., Whitinsville, Mass.
Day, C. E., Supt. of Schools, Aurelia, Iowa.
Dean, W. A., Tulsa, Okla.
Dearness, F. W., Sands School, 452 Riddle Road, Cincinnati, Ohio.
Deevers, Roland G., Washington School, 705 Ivy St., Pittsburgh, Pa.
Delamere, Lulu, 491 Judd St., Woodstock, Ill.
Delany, G. Edmund, Roosevelt School, 82 Beaumont Pl., Newark, N. J.
Dennison, Lillian M., 50 Elmira St., Brighton, Mass.
Derby, Mary M., 1030 Cleveland, Kansas City, Mo.
Devereux, Helena T., Devereux School, Berwyn, Pa.
De Voss, Gertrude, Krug School, No. 1 Summit Place, St. Joseph, Mo.
Dickinson, Amy, Junior High School, Sterling, Colo.
Dickson, J. C., Warren Avenue School, Seattle, Wash.
Dickson, W. A., 272 Broadway, Portland, Ore.
Dietz, Charles E., 65 Boyle Ave., Paterson, N. J.
Dimmick, Fenton H., School No. 1, 349 Crescent Ave., Buffalo, N. Y.
Dingley, Vivian A., Homer School, 26 Irving St., Cambridge, Mass.
Dix, W. L., Centennial School, Trenton, N. J.
Dobbin, Clara S., Guilford School, Baltimore, Md.
Dodge, Florence E., Currier School, 19 Central St., Methuen, Mass.
Dolan, Edith A., Bond Hill School, Cincinnati, Ohio.
Dolton, Isabella, 333 Lincoln Ave., Dolton, Ill.
Donald, Helen M., Central School, 68 Pleasant St., Orange, Mass.
Donaldson, Teresa M., Principal of Schools, Northfield, Wis.
Doniat, Thecla, 4129 Kenmore Ave., Chicago, Ill.
Donoghue, Mary M., A. J. Lowrie School, 406 Griswold St., Elgin, Ill.
Donovan, John I., Bruce School, Lawrence, Mass.
Dooley, L. W., Junior High School, Hibbing, Minn.
Doolittle, Laura M., Frances E. Willard School, 11 Grant St., Warren, Ohio.
Doran, Nora, Dore School, 9150 Harper Ave., Chicago, Ill.

Dorgan, Anna L., 5 Telton St., New Bedford, Mass.
Dorsey, Julius, Reagan School, 3608 Swiss Ave., Dallas, Texas.
Down, E. F., Willard School, 71 Waverly Ave., Highland Park, Mich.
Downes, Harold M., Supervising Principal, Barnegat, N. J.
Doyle, Florence A., Supervising Principal James Wilson School, 12th and Wharton Sts., Philadelphia, Pa.
Doyle, Julia H., P. S. 11, 314 W. 17th St., New York City, N. Y.
Dresser, Minnie, 7 Oak School, Kansas City, Mo.
Drew, Elizabeth L., 4640 Drexel Boulevard, Chicago, Ill.
Driver, Emma McC., Washington School, Beverly, Mass.
Duggan, Elizabeth A., P. S. No. 57, Manhattan, 176 E. 115 St., New York.
Dungee, J. Riley, 711 Johnson Ave., Norfolk, Va.
Dunn, Mrs. E. R., Hamline School, 4747 So. Bishop St., Chicago, Ill.
Dunne, Marie A., Nobel School, 4127 Hirsch St., Chicago, Ill.
Durbin, Lorene, Brier Hill School, 332 Lincoln Ave., Youngstown, Ohio.
Durham, M. E., Leschi School, Seattle, Wash.
Dutcher, Edward H., Eastern School, East Orange, N. J.
Du Valle, Lucie N., Phyllis Wheatley School, 1923 W. Chest St., Louisville, Ky.

Eagleton, W. H., Villa Park School, 2275 Elm St., Denver, Colo.
Eastman, Mrs. Helen B., Emmet School, 711 Wellington Ave., Chicago, Ill.
Ebaugh, Geo. W., Junior High School No. 40, Baltimore, Md.
Eddy, Clara D., Harvard, Mass.
Edgerton, Ida M., Scranton School, Cleveland, Ohio.
Edwards, C. R., 1121 West 2d Ave., El Dorado, Kans.
Edwards, J. C., Clinton School, 1109 Grattan St., St. Louis, Mo.
Egan, Nora L., Hely School, 2672 West Gd. Blvd., Detroit, Mich.
Eissler, Louise, Birney School, 4613 Wayne Ave., Philadelphia, Pa.
Elder, Miss M. E., Edw. Everett Hale School, Everett, Mass.
Elgar, Frances, Lester Park School, Duluth, Minn.
Ellings, Abigail C., 2628 Lake View Ave., Chicago, Ill.
Elliott, Dorothy M., School Street School, 57 High St., Springfield, Mass.
Ellis, Esther E., 1432 Florencedale, Youngstown, Ohio.
Emerson, Harriet C., 16 Buckingham St., Springfield, Mass.
Emery, Alvah H., Campbell School, West Philadelphia, Pa.
Emig, G. C., McKinley School, Cincinnati, Ohio.
Emrey, Miles L., Baray School, 59th and Race Sts., Philadelphia, Pa.
Engell, Annie G., Baldwin School, Philadelphia, Pa.
Estabrook, E. M. (Miss), Theodore Roosevelt School, Gary, Ind.
Evans, Abel J., John Hay School, Philadelphia, Pa.
Evans, Elizabeth, Harding School, 656 Elm St., Youngstown, Ohio.
Evans, Herbert H., Ogdensburg, N. J.

Fagon, Chas., Cascade School, Seattle, Wash.
Fallon, M. E., 6234 Rhodes Ave., Chicago, Ill.
Farrar, Frank, Washington Irving School, Seattle, Wash.
Fassig, Elizabeth, 8th Avenue School, 297 E. Lane Ave., Columbus, Ohio.
Fellows, Mary E., Newberry School, 1922 Patterson Ave., Chicago, Ill.
Felt, Edna, Roosevelt School, Euclid, Ohio.
Fennimore, Roland, Willow Street School, Fair Haven, N. J.
Ferris, Olive, 47 Buckingham Apts., Salt Lake City, Utah.
Finch, Adelaide V., 39 Howard Street, Lewiston, Me.
Fink, Mrs. Jessie, Palmer School, Grand Rapids, Mich.
Fink, Jessie Alice, North Ward School, Greeley, Colo.
Fischer, Emilie, Myles Standish School, Cleveland, Ohio.
Fish, Mrs. Elizabeth E., Schneider School, 4258 N. Winchester Ave., Chicago, Ill.
Fitch, Mrs. Margaret S., Prescott School, 4341 N. Keeler Ave., Chicago, Ill.
Flagg, Sadie E., 60 Temple St., Springfield, Mass.
Flessa, H. L., Sherman School, Cincinnati, Ohio.
Floyd, Adelia B., 5590 Pocussett St., Pittsburgh, Pa.
Floyd, James R., 714 Richmond St., Plainfield, N. J.
Flynn, Mary C., Michel Torena St. Elementary School, Los Angeles, Calif.
Follmer, Katherine, Normal Nebraska School, Normal, Nebr.
Fonts, Jno. M., Lagow School, 123 N. Rosemont, Dallas, Texas.
Footman, Carrie E., Sarah D. Ottiwell School, 18 7th St., New Bedford, Mass.
Force, Anna Laura, Lincoln School, 216 Sherman St., Denver, Colo.
Forkin, May A., Audubon School, 3929 Ellis Ave., Chicago, Ill.
Forman, W. O., Jefferson School, Tulsa, Okla.
Forsyth, Fannie, Central School, Omaha, Nebr.
Fort, Fred W., Wilson Avenue School, Newark, N. J.
Fox, John H., 3d Class High School, Worcester, Pa.
Frank, Mary W., Petworth School, Washington, D. C.
Frankenfield, Ira M., Calypso and Fairview School, 638 Fourth Ave., Bethlehem, Pa.
Franz, G. F., Highlands School, 2344 Clifton Ave., Cincinnati, Ohio.
Fraser, Isabelle J., 533 Hanover St., Fall River, Mass.
Freeborn, Della E., Rozelle School, East Cleveland, Ohio.
Freed, H. E., 1209 Herbert St., Philadelphia, Pa.
French, H. P., Elmont School, Elmont, L. I., N. Y.
Fries, A. C., Philo, Ohio.
Frost, Grace E., Longfellow School, Salt Lake City, Utah.
Frigate, Edwin L., Jr., Whittier School, 329 Hansberry St., Germantown, Philadelphia, Pa.
Fuller, Ada, Walker School, Grand Rapids, Mich.
Fulton, Mrs. T. N., 205 Oak St., Decatur, Ga.

Gaffney, James T., Farren School, 1222 Leland Ave., Chicago, Ill.

Gage, Clara C. M., 365 Pleasant St., New Bedford, Mass.
Gale, Lulu, Nash School, Parkersburg, W. Va.
Gallup, Jackson, School 18, Rochester, N. Y.
Gard, Clara F., Fairview School, 1126 Josephine, Denver, Colo.
Gardner, Mrs. Jessie C., West Avenue School, Lockport, N. Y.
Gartenback, Margaret, 3156 So. Morgan Ford Rd., St. Louis, Mo.
Garthe, Martha, 702 North Carey St., Baltimore, Md.
Gary, T. J., 615 E. Pine St., Portland, Ore.
Gedney, Miss A., Madison School, Lakewood, Ohio.
Gee, Etta Q., Plaza Hotel, Chicago, Ill.
Gentry, Blanche M., 1801 Eye St. N. W., Washington, D. C.
Gibbons, Mabel F., 408 Broad St., Charleston, W. Va.
Gideon, S. E., 1906 Bennett Ave., Dallas, Texas.
Gifford, Annie L., Longfellow School, Seattle, Wash.
Gilbert, O. G., 517 Dakota St., Milwaukee, Wis.
Gilday, Abigail, Buena Vista School, Miami, Fla.
Gill, Margaret L., Fitler School, Knox and Seymour Sts., Philadelphia, Pa.
Gillespie, Nehemiah, 81 Worcester St., Boston, Mass.
Gilnock, Clara S., Nishuane School, 299 Orange Road, Montclair, N. J.
Ginty, Clara W., Lopham School, P. O. Box 303, Madison, Wis.
Gist, Arthur S., B. F. Day School, Seattle, Wash.
Given, Margaret E., Lewis School, Everett, Mass.
Goddard, Miss Io, Washington School, Aberdeen, S. D.
Goetz, G. Herman, 213 So. Front Street, Harrisburg, Pa.
Goforth, Preston C., Mt. Pleasant Academy, Mt. Pleasant, S. C.
Goggin, Anna C., 810 Edgecomb Pl., Chicago, Ill.
Golden, Mrs. Emma, Supt. of Schools, Zeeland, N. D.
Good, S. V., Garvanza School, 300 W. Ave., 62, Los Angeles, Calif.
Goodspeed, David H., Wollasten and Mass. Fields School, Quincy, Mass.
Goodwin, A. J., Hiawatha School, Hiawatha, Utah.
Gorbutt, Miss Catherine, Aoy School, El Paso, Texas.
Gorham, Mary E., Teachers' Training School, 523 Brandywine Ave., Schenectady, N. Y.
Goss, Mrs. Josephine, Sigsbee School, Grand Rapids, Mich.
Graham, Elizabeth, 32 Spring St., Fairhaven, Mass.
Grassmuck, Erna, State Dept. of Public Instruction, Harrisburg, Pa.
Graves, Mary E., 107 7th St. S. E., Washington, D. C.
Greely, Esther M., William Whiting School, Holyoke, Mass.
Green, A. S., Garfield School, Wabash and Omie, Kansas City, Mo.
Green, Emily A., El Mara 12 School, Elizabeth, N. J.
Green, G. H., Lowell School, 6189 Kingsbury Blvd., St. Louis, Mo.
Green, Miss Loa, 5 Washington Apts., Mt. Clemens, Mich.
Greenburg, Benjamin B., P. S. 11 Manhattan, 314 W. 17th St., New York City, N. Y.
Greening, Florence, Burroughs School, 320 Islington St., Toledo, Ohio.
Greenlaw, Evelyn A., Cove and Prospect School, Beverly, Mass.
Greer, Loula, Penn. Avenue School, Beaumont, Texas.
Gregory, Katherine T., Adams School, Lexington, Mass.
Gridley, H. N., Lowell School, Seattle, Wash.
Griffin, John J., P. S. No. 4, 1008 Willow Ave., Hoboken, N. J.
Grise, J. W., Belle Grove School, Fort Smith, Ark.
Groff, Maude F., Spring Street School, Columbus, Ohio.
Grossnickle, Mrs. Foster E., Yontacow School, Nutley, N. J.
Grout, D. A., 1625 E. Main St., Portland, Ore.
Grunder, Anne, J. B. Atkinson School, Louisville, Ky.
Gullette, Albert, 2522 Filmore St. N. E., Minneapolis, Minn.
Gross, Frances, Saratoga School, Omaha, Nebr.

Hack, Hazel M., Pierce Street School, 234 Federal St., Greenfield, Mass.
Haddow, Mary A., Caldwell School, Youngstown, Ohio.
Hadley, E. J., 792½ E. Salmon, Portland, Ore.
Hager, E. R., Asa Messer School, 123 Elmwood Ave., Providence, R. I.
Hague, Rebecca A., Harriet Beecher Stowe School, Crown and Beech St., Scranton, Pa.
Hahn, Mrs. Alta M., Washington School, South Bend, Ind.
Hall, J. O., 1436 E. Glisan, Portland, Ore.
Hall, Rita K., 299 Center St., Newton, Mass.
Halpin, Mabel L., 543 Union St., New Bedford, Mass.
Hamilton, A. J., Washington School, 2515 Piedmont Ave., Berkeley, Calif.
Hamilton, Margaret, Central Park School, 519 North 40th St., Omaha, Nebr.
Hanlon, Marcella R., 5421 S. Carpenter St., Chicago, Ill.
Hansen, Herbert C., Talcott School, 1045 N. Lockwood Ave., Chicago, Ill.
Hanson, F. H., Barnet School, Newark, N. J.
Hanson, Theodore, 320 Walsh St., Grand Forks, N. D.
Harding, Ernest A., Peapack-Gladstone School, Gladstone, N. J.
Harris, John F., Public School 44, 454 7th St., Brooklyn, N. Y.
Harris, Luella C., School No. 13, 90 Westfield Ave., Elizabeth, N. J.
Harrison, Ford O., Wells School, Canton, Ohio.
Harrison, Lucretia, South School, 813 So. 6th St., Lyons, Iowa.
Harrower, W. J., 413 E. 60th St., Chicago, Ill.
Hart, Harry T., Hart and Stevens Schools, 26 W. Henry St., Stamford, Conn.
Hart, Helen A., Chase School, Toledo, Ohio.
Hart, John C., 538 Carey Ave., Wilkes-Barre, Pa.
Hartman, Harry C., Summit School, Seattle, Wash.
Hartwell, Mildred M., 45 Maple St., Greenfield, Mass.
Harvey, Mrs. Cora, Alexander School, Grand Rapids, Mich.
Hatfield, Walter R., 6030 Kenwood Ave., Chicago, Ill.
Hauch, Jacob H., Lloyd School, 2103 N. Lamon Ave., Chicago, Ill.

Hauer, J. S., Sixth District School, Cincinnati, Ohio.
Haulbrook, Hallie, First Ward School, 502 N. Main St., Moultrie, Ga.
Hayden, Rena, 400 Jackson St., Warrensburg, Mo.
Hayden, Mrs. Rena C., School No. 22, Floral Park, L. I., N. Y.
Hazelton, Mrs. M. V. P., 3130 Coleman Road, Kansas City, Mo.
Hazen, Mary C., Public School 18, Yonkers, N. Y.
Hearne, Clara, Roanoke Rapids, N. C.
Hefflan, Mrs. Bertha S., Highland School, 51 Myrtle Terrace, Winchester, Mass.
Heidenis, Henry J., Public School 82, 1311 1st Ave., New York.
Heidler, Samuel H., 933 So. 5th St., Springfield, Ill.
Hein, Henry E., Public School 40, Bronx, 1385 Prospect Ave., New York, N. Y.
Heiser, Bess M., Hawthorne School, 614 Grafton Ave., Dayton, Ohio.
Henderson, Grace H., Caryl School, Dover, Mass.
Henderson, Mrs. Margaret B., San Jacinto School, Dallas, Tex.
Hendryx, Luella T., Barr School, 524 So. 7th St., Escanaba, Mich.
Herendeen, Harriet, Custer Street School, Box 46, Sheridan, Wyo.
Herrick, Hattie L., John Nelson School, 720 Second Ave., Rockford, Ill.
Hesselbaum, Caroline, Illinois Ave. School, Aurora, Ill.
Heuermann, Minna S., Schley School, Chicago, Ill.
Hicken, Blanche E., Brown and Runnion School, West Salmon St., Manchester, N. H.
Hickey, Margaret, South Broad Street School, 35 Goodwill Ave., Meriden, Conn.
Hicks, Edith M., Lewis School, 479 Chestnut St., Lynn, Mass.
Higbee, R. C., Webster School, St. Paul, Minn.
Higgins, Gertrude, Highland Park School, 1015 N. Florence St., El Paso, Tex.
Higgins, T. J., Canterbury Street School, 29 Stoneland Road, Worcester, Mass.
Hill, Edith, Horace Mann School, 21 The Roanoke, Clifton, Cincinnati, Ohio.
Hill, Ella, Caledonia School, E. Cleveland, Ohio.
Hill, Laura E., Box 345, Willis, Tex.
Hill, Thomas Crawford, Christian Fenger High and Curtis Elementary Schools, State and 115th St., Chicago, Ill.
Hinckley, C. G., Newaygo, Mich.
Hinden, Charlotte D., Liberty School, Canton, Ohio.
Hirsdansky, Simon, Public School No. 4, Bronx, Fulton Ave. and 173d St., New York, N. Y.
Hodgkins, Geo. W., 1821 Kalorama Road, Washington, D. C.
Holbrook, Florence, 4429 Greenwood Ave., Chicago, Ill.
Holmes, C. M., Supt. of Schools, Fayette, Iowa.
Holmes, Lindsley R., 1604 Iowa St., Cedar Falls, Iowa.
Holmes, Mary E., School No. 55, Chestnut Ave., and 37 St., Baltimore, Md.
Holway, Nellie E., Weston Avenue School, Rowell St., Madison, Me.
Hood, W. F., Lincoln School, 234 Howland Ave., Racine, Wis.
Hopkins, Amelia M., 561 Chrisler Ave., Schenectady, N. Y.
Hopkins, C. G., 139 North Acacia Ave., Eagle Rock, Calif.
Horn, Ernest, State University of Iowa, Iowa City, Iowa.
Hornbaker, E. P. (Mrs.), 1710 W. 104th St., Chicago, Ill.
Hornbaker, Wm. R., 1710 W. 104th St., Chicago, Ill.
Horne, Elizabeth B., Columbia Street School, 322 Franklin Ave., Salem, Ohio.
Howlett, Mary E., Tod School, 12752 Cedar Road, Cleveland, Ohio.
House, Martha R., Sackett School, Cleveland, Ohio.
Huebner, Elsa, Clemens Vonnegut School, 2406 N. Pennsylvania, Indianapolis, Ind.
Huff, Wm., F., Luther Burbank School, Long Beach, Calif.
Hull, Annie E., Fifth Avenue School, Columbus, Ohio.
Hull, Bruce H., East Hill School, 1415 Pine St., The Dalles, Ore.
Hunt, Abigail M., 5425 Dorchester Ave., Chicago, Ill.
Huston, Alice L., Lawrence School, Pittsburgh, Pa.
Hutchings, Raymond B., Franklin School, 1211 Mora Villa Ave., Santa Barbara, Calif.
Hutchins, Eva, Gladstone School, Cleveland, Ohio.

Irvin, Miss M. Hunter, Lindsay Street School, Greensboro, N. C.
Irwin, Kathryn, Box 161, Antioch, Calif.

Jack, Mary, Coventry School, Cleveland Heights, Ohio.
Jackson, Jennie, 601 Gandy, Denison, Tex.
Jackson, Jessie, Roosevelt School, 529 Mahoning Ave., Warren, Ohio.
Jacobs, Emilie V., Alexander K. McClure School, 6th and Hunting Park Ave., Philadelphia, Pa.
Jacobs, R. C. T., Roberts School, 716 Waverly Ave., Dallas, Tex.
Jamieson, C. M., 5010 N. Winchester Ave., Chicago, Ill.
Jamieson, Minnie M., Budlong School, 5010 N. Winchester Ave., Chicago, Ill.
Jansen, William, Public School 9, Bronx, 481 E. 138 St., New York City, N. Y.
Jeffords, Alice L., Plymouth Normal, Plymouth, N. H.
Jeffry, Robt. G., Sawyer Avenue School, 6921 S. Sangamon Ave., Chicago, Ill.
Jenkins, Albion U., School No. 2, Paterson, N. J.
Jennings, Egbert, Supt. of Schools, Box 726, Kennett, Mo.
Jenny, Chas. A., Lincoln School, Brockton, Mass.
Jensen, Randolph, Duchesne, Utah.
John, Anna M., Gibbs School, Canton, Ohio.
Jewett, Grace M., 59 Vine St., Leominster, Mass.
Johnson, Jennie U., 1676 Van Buren St., St. Paul, Minn.
Johnson, John A., 1352 East 48th St., Chicago, Ill.
Johnson, Lula, Fraser School, 38 Peachtree Circle, Atlanta, Ga.
Johnson, W. H., Manchester School, 15th and Winchester St., Kansas City, Mo.
Johnston, Ida Estelle, Mills Street School, 40 Mills St., Morristown, N. J.
Johnston, J. B., Oyler School, Cincinnati, Ohio.
Johnston, Kathryn, Hawthorne School, Helena, Mont.
Johnston, Laura A., Waring School, Cleveland, Ohio.

Johnston, Sara W., Maple Ave., Niagara Falls, N. Y.
Jones, Clarence H., Julia Ward Howe School, Dale St., Rox, Mass.
Jones, Etta, Finney School, Grand Rapids, Mich.
Jones, Harry L., Vocational School, Somerville, Mass.
Jones, Olive, Public School No. 120, Manhattan, New York City, N. Y.
Jordan, Adelaide E., McPherson School, 4606 N. Racine Ave., Chicago, Ill.
Jorgenson, E., Werner Consolidated School, Werner, N. D.
Judd, Mrs. Anne D., Medary Avenue School, Columbus, Ohio.
Judd, Harriet A., West Broad Street School, Columbus, Ohio.
Judson, Hazel D., School Street School, 226 Pearl St., Springfield, Mass.

Kahl, Henry, Madison Street School, Cor. 5th Ave., Milwaukee, Wis.
Kahlert, Florence, George W. Morris School, 311 East Walnut, Louisville, Ky.
Kalb, John A., School 23, Romaine Avenue, Jersey City, N. J.
Kammerer, Charles C., Corydon Township School, Corydon, Pa.
Kansas State Normal School, Kellogg Library, Emporia, Kans.
Kaross, Ella B., Fratney Street School, Milwaukee, Wis.
Kelley, Margaret, 820 W. 9th St., Wilmington, Del.
Kellum, M. Effie, Allen School, 814 W. Washtenaw, Lansing, Mich.
Kennedy, Anna F., McDonogh School No. 16, New Orleans, La.
Kennedy, Ella F., 741 Hague Ave., St. Paul, Minn.
Kenney, Thomas, Garfield Avenue School, 806 Burleigh St., Milwaukee, Wis.
Kensinger, Floy, Nettleton School, Duluth, Minn.
Kernan, Katherine, Morningside School, 5545 Jackson St., Pittsburgh, Pa.
Kerns, Morey V., McKean-Cary School, 82 and Tinicum Ave., Philadelphia, Pa.
Kerns, Nancy M., Perry Home School, 4246 Agnes Ave., Kansas City, Mo.
Ketner, Sarah P., Myrtle Hill School, Cleveland, Ohio.
King, Helen M., Supervising Principal, 8 Walker St., Portland, Me.
King, Katherine L., 19 Copley St., Roxbury, Mass.
King, Keo (Miss), 912 Court Merrill, Mitchell, S. D.
Kling, M. J., Supervising Principal, 1512 Jacob St., Troy, N. Y.
Kluckhohn, Harvey N., Supt. of Schools, West Union, Iowa.
Knight, N. D., Huck School, Cleveland, Ohio.
Kniseley, J. N., Green Lake School, Seattle, Wash.
Knoch, E. H., Hazelwood School, 2825 Espy Ave., Dormont, Pittsburgh, Pa.
Knooihnizen, Marguerite, Coit School, Grand Rapids, Mich.
Knuth, Mamie E., South Case School, Cleveland, Ohio.
Knutson, K. J., Mercer School, Seattle, Wash.
Kober, Marie, Garfield School, Mason City, Iowa.
Kolbe, Miss Bertha M., Miles Park School, Cleveland, Ohio.
Kornmann, Elsie W., Public School 157, 327 St. Nicholas Ave., New York, N. Y.
Kotinger, E. W., Durant School, 1526 Webster St., Oakland, Calif.
Krall, Helen, 418 N. Third St., Steelton, Pa.
Kramer, Grace M., No. 1 Grammar and Junior High Schools, 317 E. Atlantic Ave., Audubon, N. J.
Kroening, Frank, Scott Street School, Milwaukee, Wis.
Kuehn, Nita E., 2708 Clark Ave., Cleveland, Ohio.
Kuhns, Isabel, 12 Colbert Ave., Oil City, Pa.
Kunerth, Mrs. Ethel M., Fairmount and Riverside Schools, Duluth, Minn.
Kurtz, Elizabeth H., R. D. Wood School, 120 Mulberry St., Millville, N. J.

Lafferty, Annie L., Sunnyside School, McCandless Ave. and 56th St., Pittsburgh, Pa.
Lake, J., Carstens School, 2592 Coplin, Detroit, Mich.
Lamb, Emma J., Bainbridge Junior High School, So. Richmond, Va.
Lamberet, W. G., College Hill School, Beaver Falls, Pa.
Landsman, Chas. M., Public School 139, Cortelyon Rd. and E. 13th St., Brooklyn, N. Y.
Lang, Katherine, Denison School, Cleveland, Ohio.
Lantrip, Dora B., 4309 Wilmer St., Houston, Tex.
Lathrop, Antoinette, Diamond School, Grand Rapids, Mich.
Latmer, Anna E., Memorial School, Cleveland, Ohio.
Laughlin, Hugh C., Public School No. 57, Bronx, New York, N. Y.
La Vance, Laura F., School No. 8, Delawanna, N. J.
Lawlor, Edward A., John R. Rollins School, 24 Winthrop Ave., Lawrence, Mass.
Leach, G. S., 5 Iona Place, Glen Rock, N. J.
Lee, Ruby, School No. 36, 1516 N. Pennsylvania St., Indianapolis, Ind.
Leech, N. Della, 242 No. 8th St., Coshocton, Ohio.
Leidy, Mrs. Emma B., Warren School, 7 Scottwood Apts., Toledo, Ohio.
Leland, Abby Porter, 60 West Tenth St., New York, N. Y.
Lendis, Mrs. Frances, Merrill School, Memphis Principal's Association, Memphis, Tenn.
Lettinger, Katherine M., Hartrauft School, Philadelphia, Pa.
Levangie, Pearle, Job C. Trebb School, Fairhaven, Mass.
Lewis, H. P., Supt. of Schools, Conrad, Mont.
Lewis, John L., Raymond School, 3633 Wabash Ave., Chicago, Ill.
Lightbody, W., 1689 Atkinson, Detroit, Mich.
Lincoln, Arthur A., Washington Allston School, Boston, Mass.
Linerode, A. A., Supt. of Schools, Creston, Ohio.
Lipscomb, Roy S., Stevens School, 18th Ave. N. and Galer St., Seattle, Wash.
Littlefield, Lucy H., Lowell School, Boston, Mass.
Lockhart, Lenore, Livingston School, Columbus, Ohio.
Lockwood, Cora M., 147 Oregon Ave., Dundee, Ill.
Lodor, Chas. F., Public Schools 4 and 11, Passaic, N. J.
Loeper, Helen, 1508 N. Alabama St., Indianapolis, Ind.

Loewinthan, Albert, Public School No. 30, 230 E. 88th St., New York, N. Y.
Logan, Jack M., Supt., High School Bldg., Eagle Grove, Iowa.
Logan, S. T., Mt. Auburn School, Cincinnati, Ohio.
Lokes, Frank C., Robert Morris School, Philadelphia, Pa.
Loney, Maria C., School No. 20, Wilmington, Del.
Long, Edward L., Schuylerville, N. Y.
Long, J. B., East School, 633 Washington Ave., Greenville, Ohio.
Luke, Sadie E., 2386 Delhi St., Dubuque, Iowa.
Longshore, W. T., Greenwood School, 27th and Cleveland, Kansas City, Mo.
Loos, Lloyd F., Paradise, Mont.
Loucks, Mabel R., Linne School, 3933 N. Tripp Ave., Chicago, Ill.
Loughridge, Bessie, Consolidated School, Burnside, Miss.
Louis, Hilda, School No. 21, 1724 Eutaw Place, Baltimore, Md.
Lowe, Henry F., Lenox School, Washington, D. C.
Lower, M. B., Bemiss School, Bridgeport and Stone St., Spokane, Wash.
Lustnauer, Chas. F., Maryland Training Schools for Boys, Loch Haven, Md.
Lutes, O. S., Supt. of Schools, Medford, Minn.
Lyford, Aimee E., 320 Spring St., Elgin, Ill.
Lynch, John E., Woodland St., Worcester, Mass.
Lyon, H. W., McKinley Junior High School, Kenosha, Wis.

McBain, Mrs. L. M., 310 W. Van Buren St., Battle Creek, Mich.
McCall, L. C., Garfield School, Bartlesville, Okla.
McCarthy, Stella L., 233 Middle St., New Bedford, Mass.
McCarty, Fannie, Century School, 494 W. Hill St., Wabash, Ind.
McClory, Mary C., School No. 8, Paterson, N. J.
McClure, Adela, Central School, Denver, Colo.
McClure, Eliza, Montooth School, 1139 Piermont Ave., Dormont, Pittsburgh, Pa.
McClure, Worth, Gatewood School, 7329 Wright Ave., Seattle, Wash.
McCoart, Rose L., Wooldridge School, 1710 E. 21st St., Cleveland, Ohio.
McConnell, Clara E., 670 Pingree St., Detroit, Mich.
McCord, Jesse, 1570 E. Belmont St., Portland, Ore.
McCormick, Elizabeth R., Franklin Junior High School, Superior, Wis.
McCracken, Mary, Fulton School, 11 Brushton Ave., Pittsburgh, Pa.
McCreary, C. J., Davenport School, Fall River, Mass.
McCuen, B. J., Ann Visger School, River Rouge, Mich.
McCullough, Mary, Bryant School, 1115 N. Central, Oklahoma City, Okla.
McDade, James E., 8108 So. Green St., Chicago, Ill.
McEachren, Florence E., Fullerton School, Cleveland, Ohio.
McElray, Flora L., 1284 Ramona Ave., Lakewood, Ohio.
McElvain, Margaret, 216 So. Ohio Ave., Columbus, Ohio.
McEntee, Bertha C., Garfield School, Pittsburgh, Pa.
McFarlin, Clara H., 1363 East 47th Place, Chicago, Ill.
McGrath, William J., Public School No. 32, Bronx, 183 St. Beaumont Ave., New York, N. Y.
McGuire, Gertrude H., Noble Road School, Cleveland Heights, Ohio.
McIlravy, Frank, Georgetown School, Seattle, Wash.
McKean, Annie, Penn School, 305 W. 5th St., Erie, Pa.
McKenzie, Clara E., Fauntleroy School, California Ave. at W. Barton St., Seattle, Wash.
McKenzie, Mary Belle, School No. 7, San Antonio, Tex.
McKinney, Anna J., William McKinley School, Lawrence St. and Susquehanna Ave., Philadelphia, Pa.
McLatchy, Gertrude, Elyton School, Birmingham, Ala.
McLatchy, Lillian, Cleveland School, Youngstown, Ohio.
McLaughlin, S. Welty, R. D. No. 1, Appollo, Pa.
McLaughlin, Roy L., Thayer Street School, Providence, R. I.
McLean, Wm., Mt. Hebron Junior High School, Upper Montclair, N. J.
McMichael, Mrs. Madge S., Broad and West End School, Butler, Pa.
McMichael, Mattie B., Junior High School, 329 Quincy St., Rapid City, S. D.
McNeil, Flora, 725 Ogden St., San Antonio, Tex.
McPherson, R. A., McKinley School, 1809 17th St., Parkersburg, W. Va.
McQuirk, Mary E., Public School No. 43, Brooklyn, N. Y.
McSkimmon, Mary, Pierce School, Brookline, Mass.
McSwiggen, Alice, Jefferson School, Monastery Ave., Pittsburgh, Pa.
MacDougall, J. A., Bakersville School, Manchester, N. H.
MacMahon, S. Ida, B. C. Gregory School, 1111 Greenwood Ave., Trenton, N. J.
MacMillan, Emma, 120 Cramer Ave., Montgomery, Ala.

Madden, Margaret, Doolittle School, 6600 Newgaard Ave., Chicago, Ill.
Magee, Martha L., School No. 11, Wilmington, Del.
Magers, Ida R., 1801 Poplar Grove St., Baltimore, Md.
Magnusson, A. L., Supt. of Schools, Coleharbor, N. D.
Maher, Miss A., Howe School, 10430 Charlevoix, Detroit, Mich.
Mann, Blanche, N. Division School, Grand Rapids, Mich.
Mansfield, Mrs. Katherine, Cedar School, Canton, Ohio.
March, Grace E., Lincoln School, New Brunswick, N. J.
Manion, Minnie E., 24 Amory St., Fond du Lac, Wis.
Marsh, Lettie, W. Leonard School, Grand Rapids, Mich.
Marshall, Eleanor E., 160 Pollock St., New Bern, N. C.
Marshall, H. C., Hubbard Junior High School, Columbus, Ohio.
Marshall, Miss Jessica, Newton School, Toledo, Ohio.
Marshall, Mary E., Magnolia Borough School, Nicholson Road, Audubon, N. J.
Marston, C. E., Woodland School, 516 Maple Blvd., Kansas City, Mo.
Martin, Jane B., Bane School, 733 Aiken St., Pittsburgh, Pa.

Martin, Sarah A., Whittier School, The Dalles, Ore.
Martin, Wm. H., Scranton Street School, 104 Hawthorne Ave., New Haven, Conn.
Marvin, Adeline R., Draper School, 419 Sterling Place, Madison, Wis.
Mason, Eva T., Geo. Rogers Clark School, Louisville, Ky.
Mason, Kate, Emerson School, 302 Linwood Ave., Indianapolis, Ind.
Mathews, Mrs. Lulu B., Saunders School, Omaha, Nebr.
Matthews, Laura P., 5115 Grand Ave., Des Moines, Iowa.
Maule, Mrs. E. O., Garden City School, Garden City, L. I.
Matzenger, Lena, Oakdale School, Mobile, Ala.
Maxson, Wm. S., Cort Street School, White Plains, N. Y.
Maynard, A. Y., Robert E. Lee School, Norfolk, Va.
Maynard, G. E., Gabe Meyer School, Pine Bluff, Ark.
Mazurowska, Martha M., Public School No. 13, 668 Northampton St., Buffalo, N. Y.
Matthews, Nora, Sheldon School, Grand Rapids, Mich.
Mead, Georgia E., Harrison School, 610 A St., Lorain, Ohio.
Macker, H. H., Patrick Henry School, 4946 Devonshire Ave., St. Louis, Mo.
Meigs, Sarah I., Lincoln School, New Brittan, Conn.
Meinhardt, Anna, Saltere School, 1531 E. 4th St., Duluth, Minn.
Melvin, Belle, Longfellow School, Everett, Wash.
Memhard, Lillie, Colfox School, So. Bend, Ind.
Mendenhall, Clara, School No. 9, Wilmington, Del.
Mercer, Elizabeth, Miller School, Akron, Ohio.
Merrill, John, Lingemann School, 1526 Garland Ave., Detroit, Mich.
Messenger, Elizabeth, Harvard School, Cleveland, Ohio.
Metcalf, Mira E., Robbins School, Waltham, Mass.
Metras, L. H., 108 E St., S. E., Auburn, Wash.
Metz, MacD., Glenwood School, 478 Cherry St., Marion, Ohio.
Meyer, Florence L., Hutton School, 24th Ave., Spokane, Wash.
Miles, Etta F., Elementary School No. 22, 292 Second St., Albany, N. Y.
Miller, A. R., Glen Elder, Kans.
Miller, Emma L., 544 W. 7th St., Erie, Pa.
Miller, Harry F., 418 Pontiac St., Rochester, Ind.
Miller, Mamie E., Box 180, Greer, S. C.
Miller, Persis K., 722 Wyndhurst, Baltimore, Md.
Miller, W. E., Cedar Point, Ill.
Miller, W. M., 442 E. 44 N., Portland, Ore.
Milliet, Harold J., Liberty Street School, Adams, Mass.
Milliken, Elizabeth B., Locke School, 509 Main St., Saco, Me.
Mills, Jeannette, Kirkwood and Given School, 1415 24th St., Des Moines, Iowa.
Mills, Olive, High School, Grafton, N. D.
Mitchell, Mrs. Louise K., Turner School, Grand Rapids, Mich.
Mitchell, Mary W., Main Street School, 341 Hanover St., Manchester, N. H.
Moffett, Adaline S., Hawthorne School, Clinton, Iowa.
Moffett, L. B., Summit School, Seattle, Wash.
Money, Ella B., Landon School, Cleveland, Ohio.
Montanye, Edwin G., Ferguson School, Philadelphia, Pa.
Montgomery, Alice, 106 East Genessee St., Auburn, N. Y.
Montgomery, Eva, Garfield School, 1015 Faran St., St. Joseph, Mo.
Montgomery, Lydia D., Summit School, 1701 E. 16th St., Sedalia, Mo.
Moore, Chas. W., Public School No. 14, the Bronx, 3041 Eastern Blvd., New York, N. Y.
Moore, Harold I., Bliss Corner School, South Dartmouth, Mass.
Moore, Ida, 234 Morgan St., Phoenixville, Pa.
Moore, J. F., Brookline School, 2146 Beaufort St., Pittsburgh, Pa.
Moore, Lulu M., Lincoln School, Toledo, Ohio.
Moore, Mabel I., 605 Main St., Burnside, Conn.
Moore, Mary, Young School, 2809 Sacramento St., St. Joseph, Mo.
Morey, Anna A., School No. 14, 573 First St., Troy, N. Y.
Morgan, Anna, Wyamn School, 742 Magnolia Ave., Excelsior Springs, Mo.
Morgan, Paul, Barwise School, Wichita Falls, Tex.
Morrison, R. H., 1034 No. Stevenson, Flint, Mich.
Morstatter, Catherine, Wooster School, New Haven, Conn.
Mortimer, Agnes O., Bryant School, 1412 E. St., Lincoln, Nebr.
Morton, F. E., Brooks High School, 412 W. College St., Griffin, Ga.
Moyers, A. E., Supt. of Schools, Sidney, Iowa.
Mulrooney, Julia A., Murray Hill School, Cleveland, Ohio.
Mumford, E. H. E., Ferris School, Highland Park, Mich.
Mumm, Emma C., Hosea School, 3133 Penn St., St. Joseph, Mo.
Murkland, Charlotte M., Bartlett Training School, 179 Pine St., Lowell, Mass.
Murphy, Gertrude, 2714 High St., Des Moines, Iowa.
Murray, Albert S., La Fayette School, 1242 W. Minnehaha, St. Paul, Minn.
Murry, N. Belle, 5715 Elmer St., Pittsburgh, Pa.

Nants, J. S., Bates School, St. Louis, Mo.
Nash, Mrs. C. T., Seales Chapel School, Dist. 33, Karnes Co., Nixon, Tex.
Nash, Della, Floyd School, 1015 Faroon, St. Joseph, Mo.
Neereamer, Cora, Heyl Avenue School, Columbus, Ohio.
Neil, Jane, Spalding School, 550 Surf St., Chicago, Ill.
Nelson, Minnie, Hyde School, 1315 N. 10th St., St. Joseph, Mo.
Newell, Anna W., Gates Lane School, Worcester, Mass.
Newell, Bernice H., South St., Wrentham, Mass.
Newell, Lillian S., Mt. Pleasant School, E. 116th and Union St., Cleveland, Ohio.
Newell, Minnie B., North Main Street School, Spring Valley, N. Y.
Newman, Annie S., Mayfair School, 4527 N. Kilpatrick Ave., Chicago, Ill.
Newton, George E., Grand Lake Stream High School, Princeton, Me.
Nichols, Fred R., 6200 Kenwood Ave., Chicago, Ill.

Nickerson, Agnes, Cheyenne Wells, Colo.
Nicol, Lucille, Public School No. 61, Brooklyn, Fulton St. and New Jersey Ave., Richmond Hill, L. I., N. Y.
Nixson, Elizabeth, Amarillo, Tex.
Noble, Elizabeth S., Wade Park School, 1686 Hower Ave., Cleveland, Ohio.
Noble, Fred R., Center and Elm Street Schools, Stanford, Conn.
Norton, Charlotte L., Corlett School, 1392 East 110th St., Cleveland, Ohio.
Norton, Fannie May, Romer, Ala.
Nute, Arthur C., Snowden School, Memphis, Tenn.

O'Connor, Frances, Franklin School, Framingham, Mass.
O'Connor, Mary, Park School, 2049 So. 19th, Lincoln, Nebr.
O'Dea, Lillian, School No. 11, Paterson, N. J.
O'Keefe, Mrs. Mary W., 4117 Michigan Ave., Chicago, Ill.
Oliver, Adele Allen, Central School, Hoquiam, Wash.
Olson, Ove S., Junior-Senior High School, 400 First Ave., So. St. James, Minn.
O'Neill, Cordelia L., Gilbert School, Cleveland, Ohio.
O'Neill, Jennie M., Waterbury, Conn.
Orr, Estelle B., Lafayette School, Cleveland, Ohio.
Otis, Elizabeth, Center School, 178 Thomas St., Bloomfield, N. J.
Ovitz, Delia G., State Normal School, Milwaukee, Wis.
Owen, Lincoln, 130 Appleton St., Boston, Mass.
Owens, Alice, 191 Main St., North Adams, Mass.

Page, Miss J. E., Randall-Cardozo School, First and Eye Sts. S. W., Washington, D. C.
Palmer, U. G., Supervising Principal, Verona, Pa.
Pantall, Myrta, Public School, Franklin Building, 515 So. Third Ave., Sterling, Colo.
Park, J. E., Alamo School, Wichita Falls, Tex.
Parker, Eliza, New Hope Junior High School, Wilson No. 1, N. C.
Parkhurst, Marion C., 30 Elmwood Ave., Burlington, Vt.
Parks, Belle L., Superior School, East Cleveland, Ohio.
Parle, Alice V., Public School No. 56, Manhattan, 351 W. 18th St., New York, N. Y.
Pattee, Ida M., Bryant School, Spokane, Wash.
Patterson, M. J., 3220 Benton Blvd., Kansas City, Mo.
Patterson, M. Rose, 631 Euclid Ave., Baltimore, Md.
Patterson, Ollie T., Wichersham School, 234 N. Craig St., Pittsburgh, Pa.
Patterson, Wilhelmina, McKay School, Beverly, Mass.
Patton, Anna M., Public School 18, Troy, N. Y.
Patton, H. E., Oakwood School, Crafton, Pittsburgh, Pa.
Patton, O. M., Rothenberg School, Cincinnati, Ohio.
Paulsen, Gertrude M., Public School No. 105, Brooklyn, N. Y.
Payne, Mrs. Eunice R., Alta Vista School, El Paso, Tex.
Payne, John C., 654 L St. N. E., Washington, D. C.
Pearson, Lora, Ward Bldg., 704 S. Harrison St., Shelbyville, Ind.
Peed, Julia, 9 So. Elm St., Hutchinson, Kans.
Peixotto, Mrs. Bridget C., Public School, No. 96, Queens, So. Ozone Park, L. I., N. Y.
Pendlebury, Mrs. E. B., 4713 Penn St., Frankford, Philadelphia, Pa.
Perkins, Josie, Avenue A School, Hutchinson, Kans.
Perrott, Lillian, Ward School, 329 Ontario St., Storm Lake, Iowa.
Pesta, Rose A., West Pullman School, 1548 East 65th Place, Chicago.
Peters, Miss Edith C., Gordon School, 3910 W. 33d St., Cleveland, Ohio.
Peters, Thomas H., Center Ave. School, Needham, Mass.
Peterson, Alice C., Dundee School, 51st and Davenport, Omaha, Nebr.
Peterman, May B., Bliss School, 1112 So. 12th St., St. Joseph, Mo.
Peters, Miss Florentine, 1543 Aberdeen St., Chicago Heights, Ill.
Peterson, Frank W., Salmon Bay School, 20th Ave. N. W. and 63d Ave. W., Seattle, Wash.
Pettit, J. E., Mayfair School, 1867 Charles Road, East Cleveland, Ohio.
Pettys, W. A., 4007 64th St. S. E., Portland, Ore.
Pfeiffer, Anna, Fourth Street School, Columbus, Ohio.
Phelps, Grace C., Mt. Vernon School, 88 Linwood Avenue, Columbus, Ohio.
Phillips, Byron A., Blaine School, 30th and Norris Sts., Philadelphia, Pa.
Phillips, Mrs. Jane E., Eastwood Ave. School, 7 Auburn Ave., Columbus, Ohio.
Phillips, Mary F., Battell School, 921 Lincoln Way, E., Mishawaka, Ind.
Phipps, T. M., High School, Clintonville, Pa.
Pickett, Lillian, Kearsley St. School, 111 W. Baker St., Flint, Mich.
Pierce, Adelaide, Cary School, Chelsea, Mass.
Piland, Effie, Magnolia School, Cor. Poplar and Madison, Beaumont, Tex.
Pierce, Elmer S., Seneca Vocational School, Buffalo, N. Y.
Pinhard, Estella M., 3706 Library Ave., Cleveland, Ohio.
Plank, Carrie, Pine School, Grand Rapids, Mich.
Plank, Eva, Webster School, Red Oak, Iowa.
Plumb, Mae A., Columbine School, Longmont, Colo.
Poore, Margaret I., Townsend Apt., 11th and Oaks Sts., Oakland, Calif.
Porcher, Maria R., Bancroft School, 3549 Du Pont Ave. So., Minneapolis, Minn.
Porter, C. H., Washington School, Cincinnati, Ohio.
Porter, Eva, Jackson School, Duluth, Minn.
Porter, Fannie, 1010 Jackson St., Oregon City, Ore.
Postell, Miss Mary W., Lee Street School, Atlanta, Ga.
Potts, Frances, Avenue B School, Council Bluffs, Iowa.
Powell, L. R., A. B. Hill School, Memphis, Tenn.
Powell, Thos. E., 1134 24th St., Parkersburg, W. Va.
Power, Leonard, Franklin School, 312 De Queen Blvd., Port Arthur, Tex.
Powers, Glenn, Washington School, Ely, Minn.
Preston, Alice M., Beverly Farms School, 292 Dodge St., Beverly, Mass.

Probst, Ella, Longfellow School, Minneapolis, Minn.
Puffer, W. J., Dort School, Flint, Mich.
Purer, Mary I., Lafayette School, 543 Roscoe St., Chicago, Ill.
Purinton, Estelle, Holmes School, Spokane, Wash.

Quackenbush, C. H., Supt. of Schools, Midian, Kans.
Quirk, Margaret, Washington School, St. Joseph, Mo.

Rae, Margaret, Public School No. 1, Manhattan, Henry St., New York, N. Y.
Ragsdale, S. L., F. M. Guthrie School, 1429 Faxon Ave., Memphis, Tenn.
Rand, Herbert L., Pickering School, Salem, Mass.
Rape, Arthur O., 7100 Yale Ave., Chicago, Ill.
Rarey, Mrs. Margaret M., Ohio Avenue School, 379 So. Ohio Ave., Columbus, Ohio.
Rawlings, Julia M., The Marlborough, Washington, D. C.
Raymond, Ward, Hollis School, Braintree, Mass.
Reibert, Lydia, 1307 Highland Ave., Louisville, Ky.
Reichert, Harriet C., 8628 Wade Park Ave., Cleveland, Ohio.
Reigart, John F. 31 Euclid St., Yonkers, N. Y.
Reisse, Mary W., Simon Muhr School, 2010 N. 18th St., Philadelphia, Pa.
Reither, M. Louise, East Main Street School, 60 East Hudson St., Columbus, Ohio.
Remick, Nellie A., 320 No. Cascade Ave., Colorado Springs, Colo.
Remley, W. H., 28th District School, Cincinnati, Ohio.
Reppeto, Mary D., 2006 Warwood Ave., Wheeling, W. Va.
Reynolds, Maude, Lincoln School, 215 W. 5th St., Ottumwa, Iowa.
Rhodes, Sara, Public School No. 28, Brooklyn, N. Y.
Rhodes, Thaddeus H., Daniel Webster School, 20th and Missouri Sts., San Francisco, Calif.
Rich, Frank M., School No. 19, 133 Walnut St., Paterson, N. J.
Richards, Sophia E., Yeager School, 3930 Troost Ave., Kansas City, Mo.
Richardson, Dio, Horace Mann School, 24th Ave. and E. Cherry St., Seattle, Wash.
Richardson, Hattie E., Vassar School, Denver, Colo.
Richmond, H. C., Linwood School, Kansas City, Mo.
Richmond, J., Maplewood School, Maplewood, Mo.
Riddle, Marie, 1524 N. Sixth St., Waco, Tex.
Rieder, Frank W., 650 E. 91st St., Chicago, Ill.
Riegner, Rebecca, Ellwood School, 13th and Oak Lane, Philadelphia, Pa.
Rieman, Ella H., Muessel School, South Bend, Ind.
Rifenbark, H. H., Supt. of Schools, Arlington, S. D.
Riggs, Cora M., Straight School, Grand Rapids, Mich.
Riley, Mrs. E., 66 Adelaide, Detroit, Mich.
Riniker, Amelia, Garfield School, Canton, Ohio.
Ritchie, Frances, McKinley School, 1201 N. 2d, St. Joseph, Mo.
Ritter, B. T., Mt. Washington School, Independence and Arlington Ave., Mount Washington, Mo.
Ritterspaugh, Lina, Dueber School, Framingham, Mass.
Roach, Mary M., Roach School, Decatur, Ill.
Robenort, William, 2 Washington Terrace, New York, N. Y.
Roberts, L. D., Chapman School, 910 Bryce Ave., Portland, Ore.
Robertson, Martin B., 219 Church St., Hartford, Conn.
Robinson, Miss Annie J., Hazeldell School, Cleveland, Ohio.
Robinson, Florence L., 515 South Washington St., Winchester, Va.
Robinson, Ida E., Supervisor, Elementary Grades, Bloomfield, N. J.
Robinson, Roy H., Safford School, Tucson, Ariz.
Rockfort, R. A., Webster School, 4256 Maryland Ave., St. Louis, Mo.
Rogers, George Calvin, 190 Tradd St., Charleston, S. C.
Rogers, W. C., 4509 N. 17th St., Philadelphia, Pa.
Ronning, O. E., Frankfort, S. D.
Roosa, Annette, 717 Kelley Ave., Devils Lake, N. D.
Roseboom, J. Agnes, South Street School, Auburn, N. Y.
Ross, Miss M., St. Clair School, 3918 Montclair, Detroit, Mich.
Ross, Pete W., Washington School, San Diego, Calif.
Rourke, Constance, Mrs. Widdicomb School, Grand Rapids, Mich.
Rouse, E. L., Supt. of Schools, Scottsbluff, Nebr.
Ruddock, Miss L., 5670 Missouri Ave., Detroit, Mich.
Rueff, Katherine S., Healey School, 6726 Cornell Ave., Chicago, Ill.
Rugg, George, 35 Somerset St., Worcester, Mass.
Ruggles, Martha M., 858 N. La Salle St., Chicago, Ill.
Runkel, Lura E., 712 G Ave., East End, Superior, Wis.
Runyan, D. L., Hoffman School, Victory Blvd., Cincinnati, Ohio.
Russell, Zenobia C., Acting Prin., Douglas School, Alms Place and Chapel St., Cincinnati, Ohio.
Ryan, Estelle E., Box 809, Great Falls, Mont.
Ryan, Helen R., 534 Western Ave., Lake Forest, Ill.
Ryan, Mary G., Sterling School, 5407 Magnet Ave., Cleveland, Ohio.

Salter, Mrs. Annie E., Hough School, Cleveland, Ohio.
Sampson, Elizabeth H., Hedge School, Clifford Road, Plymouth, Mass.
Samworth, Ellen, Schools Nos. 13 and 27, 1508 Lancaster Ave., Wilmington, Del.
Sanders, Grace S., 152 Wilson St., Baltimore, Md.
Sanford, Helen M., Dewey School, Evanston, Ill.
Sargeant, Ide G., Public School No. 10, Paterson, N. J.
Sauers, Helen, South Division School, Grand Rapids, Mich.
Saunders, Willis G., Supervising Principal, Avon, N. Y.
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Scarlett, Andrew, Forest Street School, 485 Tillon Road, Orange, N. J.

Schaefer, Louise, McKinley School, Great Falls, Mont.
Schafer, J. J., Supt. of Schools, 510 McDonald St., Midland, Mich.
Schartung, J. A., 554 Dawson Ave., Bellevue, Pittsburgh, Pa.
Scheel, Elizabeth A., Comegys School, 2013 Diamond St., Philadelphia, Pa.
Scherer, Amelia, Public School 116, Manhattan, 211 E. 32d St., New York, N. Y.
Schjoldager, I. M., Peirce School, 1423 Bryn Mawr Ave., Chicago, Ill.
Schlegel, Matilde E., 278 Galic Ave., Brooklyn, N. Y.
Schlotman, R. C., 27th District School, Cincinnati, Ohio.
Schmitt, Elizabeth D., Broad Street School, 18 W. Wetmore St., Cuyahoga Falls, Ohio.
Schmitz, Alvinia, 1014 Felix St., St. Joseph, Mo.
Schultz, Frederick, Garfield School, 910 Walnut St., Erie, Pa.
Schwoll, Mary E., P. O. Box 274, So. Dartmouth, Mass.
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Scott, Bertha I., 19 East Broad St., Hopewell, N. J.
Scott, Lora B., Hackett School, 1709 N. 17th St., Philadelphia, Pa.
Scrivener, Emily, 3413 13th St. N. E., Washington, D. C.
Scrogie, Ellen R., Kinsman School, 4091 E. 91st St., Cleveland, Ohio.
Seager, Sarah E., School No. 85, Lakewood Ave. and Oliver St., Baltimore, Md.
Sears, Seth, Franklin School, Waltham St., Boston, Mass.
Secrist, Chester C., 71 Chestnut St., Mansfield, Ohio.
Seif, Louisa D., Springfield School, 214 Gross St., Pittsburgh, Pa.
Sellman, W. N., Edward Wyman School, 1547 So. Theresa Ave., St. Louis, Mo.
Serena, Joseph A., S. E. Mo. Teachers College, Cape Girardeau, Mo.
Severson, S. O., 5660 First Ave., So. Minneapolis, Minn.
Shackleford, B. G., Mullanphy School, 4221 Shaw Ave., St. Louis, Mo.
Shaffer, Chas. G., Eliot School, Newark, N. J.
Shaver, Ida A., 6814 East End Ave., Chicago, Ill.
Shaw, Sallie Reid, 812 W. 9th St., Wilmington, Del.
Shaw, Emily, 8210 Hough Ave., Suite 2, Cleveland, Ohio.
Shedd, Kendrick, High School, Naples, N. Y.
Sheffield, Mrs. F. L., 17 Garnett Ave., Mobile, Ala.
Shelton, Maude, Lincoln Junior High, 415 Cable St., Kenosha, Wis.
Shenefield, B. C., Studebaker School, South Bend, Ind.
Sheridan, Margaret L., Carr School, 1421 Carr St., St. Louis, Mo.
Sherwood, H. M., Stephens School, 7th and Stephens Sts., Portland, Ore.
Sherwood, Mrs. M. B., Wiley School, 214 E. Morgan, Raleigh, N. C.
Shield, Ruth, Longfellow School, 1120 N. Monroe St., Peoria, Ill.
Shurtz, Emily, 140 21st St., 4 The Linden, Toledo, Ohio.
Siehl, B. H., Hartwell School, Cincinnati, Ohio.
Sigler, Lou I., Buchanan School, Grand Rapids, Mich.
Sill, Ruth P., Trade School for Girls, 11th and Pine Sts., Philadelphia, Pa.
Simmernon, T. C., Pleasant Ridge School, 6315 Ridge Ave., Pleasant Ridge, Cincinnati, Ohio.
Simmons, Myrtle T., Elementary and Junior High School, 331 South 7th, Monmouth, Ill.
Simmons, William F., Grand Avenue School, Milwaukee, Wis.
Simpson, Francis M., School No. 19, Baltimore, Md.
Sipson, Maud M., 69 So. Transit St., Lockport, N. Y.
Siviter, A. B., 5500 Elmer St., Pittsburgh, Pa.
Skillen, Mildred, Yeadon, Pa.
Skinner, Clara, Jefferson School, Grand Rapids, Mich.
Sloan, Miss A. C., Columbia School, Columbia Ave., Cleveland, Ohio.
Sloan, Isabelle P., Cooper School, 1514 Rebecca St., Sioux City, Iowa.
Simpers, A. Adelaide, School No. 3, 507 W. 10th St., Wilmington, Del.
Smith, Abraham, Public School 70, Manhattan, 213 E. 75th St., New York, N. Y.
Smith, C. Florence, Fulton School, 23 Wyman St., Arlington, Mass.
Smith, Edith, Henry School, Grand Rapids, Mich.
Smith, Ella, Blodgett School, Grand Rapids, Mich.
Smith, Emma O., Fort Hawkins School No. 6, Nevarro Apts., Macon, Ga.
Smith, Fanny R., Gaudy School, Fullerton Plaza, Chicago, Ill.
Smith, Fred E., Chicago Parental School, 3600 Foster Ave., Chicago, Ill.
Smith, George A., Mather School, Boston, Mass.
Smith, Lena Martin, High School, Meade, Kans.
Smith, Margaret H., 61st Street School, Los Angeles, Calif.
Smith, W. Virgil, 2412 N. 43d St., Seattle, Wash.
Smoat, Lucy J., 4011 Baltimore Ave., Kansas City, Mo.
Smyth, Elizabeth A., Tench-Tilghman School No. 13, Patterson Park Ave. and McElderry St., Baltimore, Md.
Snow, Irving W., 930 Waverley St., Palo Alto, Calif.
Somerwill, Grace, First Street School, Warren, Ohio.
Sothower, H. W., High School, Mount Union, Pa.
Sparra, Annie, 517 Penelope St., Belton, Tex.
Speirs, T. E., 260 E. 53d St., Portland, Ore.
Spencer, Cornelia J., Kennedy School, Portland Hotel, Portland, Ore.
Sperow, Wilson P., Bunker Hill High School, 309 W. Burke St., Martinsburg, W. Va.
Spoffard, Mrs. Eva, Lone Pine School, Lone Pine, Calif.
Spooner, Mary E., Oliver School, State St., Bristol, R. I.
Sprague, Elizabeth, Rosedale School, Cleveland, Ohio.
Springer, Isidore, 787 Lafayette Ave., Brooklyn, N. Y.
Springmeyer, Chas. E., Public School No. 85, 635 Evergreen Ave., Brooklyn, N. Y.
Stafford, C. M., Sabin School, 1054 Killingsworth Ave., Portland, Ore.
Standley, James W., Theodore Roosevelt School, Gary, Ind.
Stanton, Lottie, 703 University Ave., Laramie, Wyo.
Stapleton, Mrs. Louise V., Dickinson School, Grand Rapids, Mich.

Starry, D. Ralph, Evergreen School, 1309 Denmark Road, Plainfield, N. J.
St. Clair, Robert, 1344 Laurel St., St. Louis, Mo.
Steele, Laura, School No. 5, 102 Lewis St., San Antonio, Tex.
Stehman, J. H., Avondale School, 2616 N. Spaulding Ave., Chicago, Ill.
Stephens, Ada, Chicago Avenue School, Columbus, Ohio.
Stephens, C. E., Emerson School, St. Louis, Mo.
Stephenson, Mrs. Ella, Coldbrook School, Grand Rapids, Mich.
Stevens, E. N., Hyde Park, Vt.
Stevens, Harry R., Sartell Road, Grafton, Mass.
Stevens, Plowdon, Jr., Public School No. 44, Bronx, 3332 Decatur Ave., New York, N. Y.
Stevenson, Mrs. C. A., Nelson School, 150 Lake, Muskegon, Mich.
Stevenson, Jessie, Sibley School, Grand Rapids, Mich.
Stewart, Anna, 2871 Humboldt Ave., So. Minneapolis, Minn.
Stewart, Clara, Brett Memorial School, Cleveland, Ohio.
Stewart, I. Daniel, 740 E. 3 South, Salt Lake City, Utah.
Stewart, L. P., Mary Dill School, Cincinnati, Ohio.
Stewart, Martha A., East Madison School, 8608 Carnegie Ave., Cleveland, Ohio.
Stiles, Gertrude, Burns School, 816 Poplar St., Erie, Pa.
Stitely, Marshall, 1532 Linden Ave., Baltimore, Md.
Stockley, Callie L., Edwin T. Merrick School, 2318 Cadiz St., New Orleans, La.
Stone, C. R., Gardenville School, 6651 Gravois Ave., St. Louis, Mo.
Stone, Grace, 1708 No. 11th St., Waco, Tex.
Storing, Julia H., Henry School, Akron, Ohio.
Stott, Maud, 33 Crescent St., Franklin, Mass.
Stough, Elizabeth, Henry S. Belden School, 2000 Cleveland Ave., N. W., Canton, Ohio.
Stout, I. M., Bluthe, Calif.
Strachan, Mary G., 4268 Warner Road, Cleveland, Ohio.
Strahan, Margaret, Lexington School, Grand Rapids, Mich.
Strauss, Bella, Public School No. 88, 300 Rivington St., New York, N. Y.
Strong, C. L., Route 2, Canby, Ore.
Strauss, Ernestine, Madison Avenue School, Atlantic, N. J.
Stuart, H. H., Supt. of Schools, Melrose, Mass.
Sullivan, Katharine C. V., Westall School, Maple St., Fall River, Mass.
Summers, Anna N., West End School, 512 King St., Alexandria, Va.
Sunderland, Henry, Consolidated Schools, Lancaster, Minn.
Swanson, Vivian C., McKinley School, Gloversville, N. Y.
Swasey, Marion H., 58 Maple St., New Bedford, Mass.
Sweeney, Ellen C., R. D. No. 4, New Bedford, Mass.
Sykes, Marion, 5647 Dorchester Ave., Chicago, Ill.

Taggart, Alice C., Chandler School, Manchester, N. H.
Taliaferro, Sallie C., 3314 Elgin Ave., Baltimore, Md.
Taylor, Emily F., Wm. Stix School, 5078 Cates Ave., St. Louis, Mo.
Taylor, Mary, La Salle School, 2546 Logan Blvd., Chicago, Ill.
Taylor, F. W., High School, St. Paul, Va.
Taylor, Nell, 1201 N. El Paso St., El Paso, Tex.
Teague, Grace L., Wallace School, Lewiston, Me.
Teilgaard, S., Revere School, Chicago, Ill.
Thies, Lillian C., Walnut Street School, Corner 23d, Milwaukee, Wis.
Thom, Bernard E., Box 900, Kempton, W. Va.
Thomas, Catherine E., Shamrock Apt., Paducah, Ky.
Thomas, L. D., 600 Maple, Portland, Ore.
Thompson, A. C., 1555 E. 118th St., Cleveland, Ohio.
Thompson, Anna, 484 E. 23, N., Portland, Ore.
Thompson, Anna E., Slater-Langston School, 1925 15th St. N. W., Washington, D. C.
Thompson, Cornelia B., Bond Street School, Asbury Park, N. J.
Thompson, C. T., 309 E. 28th N., Portland, Ore.
Thompson, Fred, School No. 12, Paterson, N. J.
Thompson, Eleanor, Endion School, Duluth, Minn.
Thompson, Harriet E., Second Avenue School, Columbus, Ohio.
Thompson, Lucy, Reeb Avenue School, 274 Piedmont Rd., Columbus, Ohio.
Thompson, Mary A., George Dewey School, St. Louis, Mo.
Thompson, M. D., Western Springs School, Western Springs, Ill.
Thorne, Leona L., Moseley School, 2348 Michigan Ave., Chicago, Ill.
Thornley, Mary, Harriet Beecher Stowe School, Seventieth St. and Woodland Ave., Philalelphia, Pa.
Thorpe, H. Wilson, Geo. Wythe School, Hampton, Va.
Thorter, B. A., 1062 Buehla Vista Terrace, Portland, Ore.
Tidrick, Neva, McGregor School, Canton, Ohio.
Tillman, Catherine I., Public School No. 142, Brooklyn, Henry and Rapelye St., Brooklyn, N. Y.
Tinkham, Marian L., George T. Baker School, West Barrington, R. I.
Tireman, L. S., Postville, Iowa.
Tompkinson, Samuel V., Sheridan School, Ontario and G Sts., Philadelphia, Pa.
Torrance, William A., 39½ Falconer St., Jamestown, N. Y.
Towne, Lillian M., Bowdoin School, Myrtle St., Boston, Mass.
Treanor, Gertrude E., Mastick School, 2201 San Antonia Ave., Alameda, Calif.
Treat, Mabel, Moulton School, Cleveland, Ohio.
Treel, A. O., 1042 Cleveland Ave., Portland, Ore.
Treffinger, Jane, Hall's Grove School, Pittsburgh, Pa.
Tregallas, Ida M., 3046 Logan Blvd., Chicago, Ill.
Trisler, Earl, Peaslee School, Cincinnati, Ohio.
Troeger, John W., Washington Irving School, 2140 Lexington St., Chicago, Ill.
Tupper, Inga B., 1635 Grande Ave., Cedar Rapids, Iowa.
Turk, Genevieve, Gladstone School, Kansas City, Mo.
Turnbull, Lillian, Woodland School, Canton, Ohio.

Turner, Mary M., School No. 28, Eighth and Adams St., Wilmington, Del.
Turpin, L. T., Washington High School, Cedar Rapids, Iowa.
Twichell, W. S., School No. 9, Paterson, N. J.
Twiggs, Templeton P., George School, Detroit, Mich.
Twito, Helmer, Supt. Noltimier Consolidated School, Valley City, N. D.
Tyndall, Sara E., State Street School, Hackensack, N. J.

Underhill, Frances A., 1458 State St., Schenectady, N. Y.
Underwood, C. P., Samuel Ullman School, Birmingham, Ala.
Underwood, Franklin M., Fanning School, St. Louis, Mo.

Van Auken, W. D., Public School No. 13, Paterson, N. J.
Van Buren, Frances, Lafayette School, Grand Rapids, Mich.
Vance, Rufus A., Public School No. 148, Brooklyn, 185 Ellery St., Brooklyn, N. Y.
Vandegriff, Celia, Clinton School, Columbus, Ohio.
Venderink, Eva, Barkwill School, 10706 Columbia Ave., Cleveland, Ohio.
Viertel, Samuel, 509 W. 129th St., New York, N. Y.
Villars, Mrs. Icy B., 116 South Star St., El Dorado, Kans.
Vincent, H. D., School No. 3, Troy, N. Y.

Walbran, Mary A., 429 Margaret St., Herkimer, N. Y.
Waldie, Conrad T., Darby School, Darby, Pa.
Walker, Hattie E., Ruhrer School, Cleveland, Ohio.
Walker, Mary I., Walton School, Cleveland, Ohio.
Walker, Sadie A., Central Grade Bldg., 328, de Lendrecie Block, Fargo, N. D.
Wallace, Lillian, McIntyre School, 30th and Gorden St., Philadelphia, Pa.
Walsh, Frances, Olentrange School, 148 Buttles Ave., Columbus, Ohio.
Walsh, Frances, 27th Street School, Milwaukee, Wis.
Walters, Marjorie, Harrison School, Cedar Rapids, Iowa.
Ward, Clara, Franklin School, Grand Rapids, Mich.
Ward, Evelyn, Fountain School, Grand Rapids, Mich.
Ward, W. H., Supt. of Schools, Greer, S. C.
Warren, Nellie G., Greenwood School, 37th St., So. of Grand Ave., Des Moines, Iowa.
Wash, John S., Box 377, Fresno, Calif.
Watson, A. E., 935 E. Ankeny, Portland, Ore.
Weatherly, Mrs. Louise, E. Leonard School, Grand Rapids, Mich.
Webster, Reginald, Sagamore School, Sagamore, Mass.
Weibel, Elise, Emerson School, Sylvia and Hickory Sts., Louisville, Ky.
Weidler, Sara A., 1804 Shunk St., Philadelphia, Pa.
Weisman, Frances, Webster Junior High School, Spokane, Wash.
Weisman, Sara E., Hawthorne School, Spokane, Wash.
Wells, Annie L., Wyatt School, 11th and Henry Sts., St. Joseph, Mo.
Wells, Mrs. Bessie F., Noble School, Cleveland, Ohio.
West, Nathanial G., Andrews School, No. 9, Rochester, N. Y.
Wetzel, Marie C., Walnut Hill School, 44th and Hamilton Sts., Omaha, Nebr.
Wheatley, Emily G., Woodland Hills School, Cleveland, Ohio.
Wheeler, Alice R., 13 Stevens St., Methuen, Mass.
Wheeler, Mrs. Elsie L., Colesville, Md.
Wheeler, Nina L., Kemble School, Rock Island, Ill.
Wheelock, Alice H., Garfield School, Moline, Ill.
Whelan, Grace, 304 Lincoln Blvd., Cleveland, Ohio.
Whelan, Mary, 2186 E. 78th St., Cleveland, Ohio.
Whipple, Frank L., Central Junior High School, Lynn, Mass.
Whitaker, Jennie E., 74 Euclid Ave., Springfield, Mass.
White, Mrs. Henry, 514 3d St., S. E., Little Falls, Minn.
White, Mabel, A. Sherwood School, St. Joseph, Mo.
White, Mrs. M. Elizabeth, Lincoln School, Box 428, Wenatchee, Wash.
Whitney, Elizabeth, Watterson School, Cleveland, Ohio.
Whitney, Lucy, McCoy School, 16th and White, Kansas City, Mo.
Whitty, Mary E., Hosmer School, Fitchburg, Mass.
Whitzel, Mary Effie, Ninth Avenue School, Columbus, Ohio.
Wickey, Rose, Whittier School, 3031 Paseo, Kansas City, Mo.
Wilbur, Frances M., The Union School, Canandaigua, N. Y.
Wilcox, Lucia C., Almira School, Cleveland, Ohio.
Wilcox, Walter E., Divoll School, 2918 Dayton St., St. Louis, Mo.
Wilcox, Walter H., Monroe School, 3701 So. Broadway, St. Louis, Mo.
Wildeman, Edward, Shields School, 4250 So. Rockwell St., Chicago, Ill.
Wiley, L. A., 1619 E. Stark, Portland, Ore.
Wilkinson, Anna A., Wistar School, 8th and Parrish St., Philadelphia, Pa.
Wilkinson, Jessie, 4th School, San Bernardino, Calif.
Willard, Frank E., Asst. Supt., in charge of Elementary Schools, 850 Central Bldg., Seattle, Wash.
Williams, Ben M., Lee Street School, Greensboro, N. C.
Williams, Fannie C., 2027 Seventh Ave., New Orleans, La.
Williams, J. D., Woodlawn School, Birmingham, Ala.
Williams, Mary, John Howland School, 53 Elton St., Providence, R. I.
Williams, M. E., Chambers School, 1353 E. 142d St. E. Cleveland, Ohio.
Williams, M. Iola, Firestone Park School, Akron, Ohio.
Williams, Winnie M., South and Edwards Schools, Beverly, Mass.
Williamson, Edith, Lemington School, 22 Arbor St., Pittsburgh, Pa.
Williamson, Lilias M., McClellan School, 6622 University Ave., Chicago, Ill.
Wilson, C. A., Avondale School, Cincinnati, Ohio.
Wilson, Irvin A., 1711 E. 72d St., Chicago, Ill.
Wilson, Jennie R., Stonard School, Cleveland, Ohio.
Wilson, Margaret, Public School No. 53, 176 Troutman, Brooklyn, N. Y.

Wilson, Martha M., Public School No. 127, Manhattan, 515 W. 37th St., New York, N. Y.
Windsor, W. B., Greensboro, N. C.
Winemann, Mrs. C., Scripps School, 2141 Belvidere, Detroit, Mich.
Wingebach, Joseph, Public School No. 66, Brooklyn, N. Y.
Winkworth, Jessie L., 220 Ninth Ave., Haddon Heights, N. J.
Winslow, Ethel M., 45 Maple St., Greenfield, Mass.
Witter, C. E., Witter School, 5182 Maple Ave., St. Louis, Mo.
Wolfe, Miss H. Alene, Merritt School, 517 N. 16th Ave., E. Duluth, Minn.
Wolfe, J. B., Grottoes, Va.
Wood, Blanche, Superior, Wis.
Woods, Mrs. Blanche, 501 W. 13th St., Oklahoma City, Okla.
Wood, Jennie D., King Street School, Meriden, Conn.
Woodard, J. A., High School, Bozeman, Mont.
Wright, F. McK., Henley School, Birmingham, Ala.
Wright, Owen B., Washington School, Rock Island, Ill.
Wright, W. H., Supt. of Schools, Otho, Iowa.
Wuthrich, Maude G., Lincoln School, Bartlesville, Okla.
Wyman, P. S., 226 E. 30th St., Portland, Ore.

Yaple, F. W., Jefferson Township High School, Richmond Dale, Ohio.
Yale University, Dept. of Education, Graduate School, New Haven, Conn.
Yeaton, Clyde E., 1932 Aldridge St., Minneapolis, Minn.
Yeomans, Rosa A., Paul Revere School, Revere, Mass.
Yerkes, Helen K., Walton School, 28th and Huntingdon, Philadelphia, Pa.
York, Edna M., Plainfield School, 1005 Madison Ave., S. E., Grand Rapids, Mich.

Young, Mrs. A. D., 7364 Church St., Detroit, Mich.
Young, F. C., So. Highland School, Birmingham, Ala.
Young, Mabel S., Lauman School, Burlington, Iowa.
Young, Nora B., 302 E. So. St., Lebanon, Ind.

Zook, C. Milwaukie, Ore.
Zirkle, H. W., Whittier School, 24th Ave. and Marion St., Denver, Colo.
Zollman, Mary J., Blaine School, 3800 Southport Ave., Chicago, Ill.

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