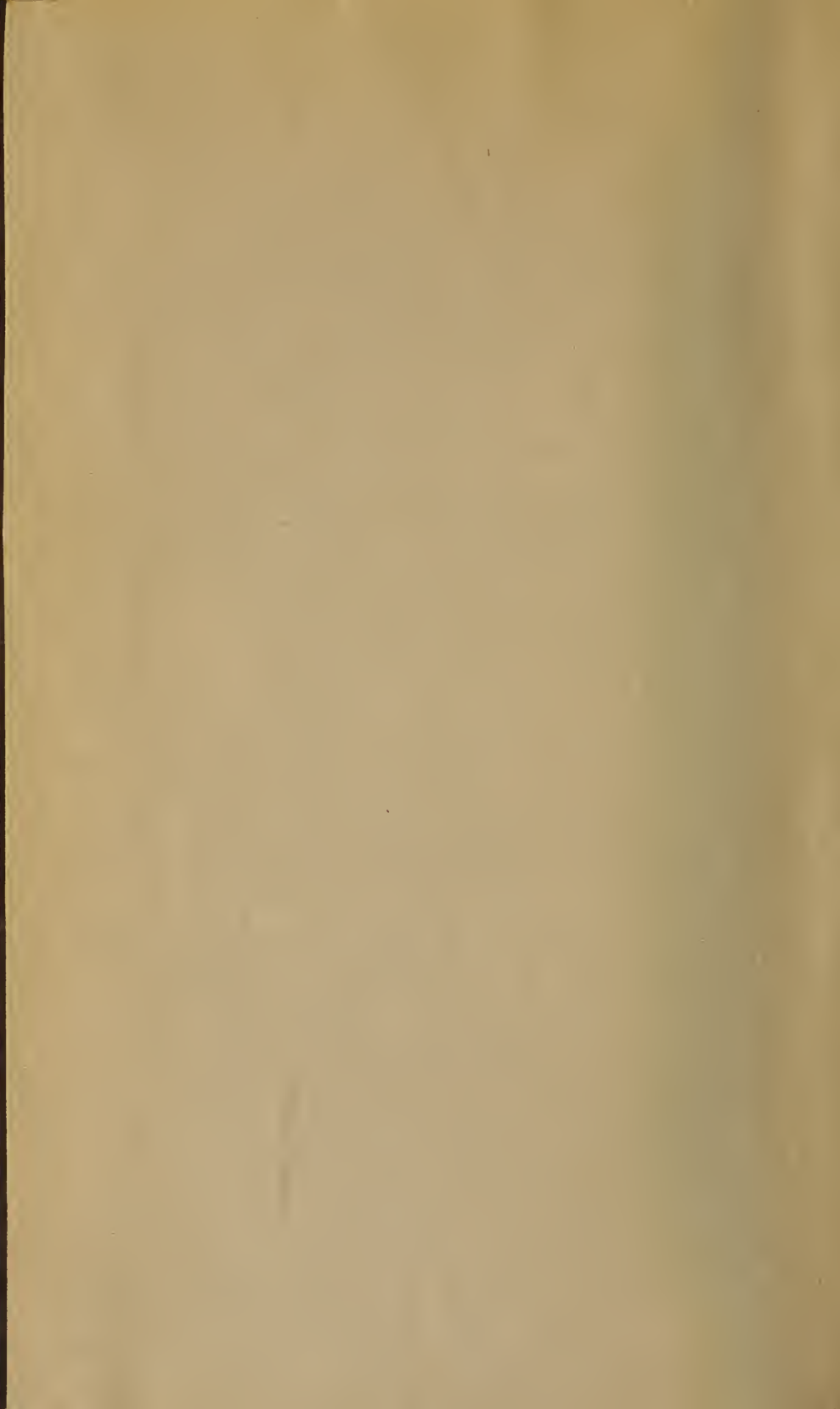








THE FIRST YEARBOOK
OF THE
Department of Elementary
School Principals

The Technique of Supervision by
The Elementary School Principal

THE PROGRAM AT THE BOSTON MEETINGS
OF THE DEPARTMENT, JULY 3, 5, AND 6, 1922,
WILL BE BASED UPON THIS YEARBOOK

PUBLISHED BY THE
DEPARTMENT OF ELEMENTARY SCHOOL PRINCIPALS
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Foreword

At the Des Moines Meeting, in July, 1921, it was unanimously voted that the Department should publish a Yearbook. It was further decided that the first number should be issued in 1922 and should be devoted to the Technique of Supervision by the Elementary School Principal. In the early part of August I received word that the duty of collecting and editing the material for the first issue had been assigned to me.

There were two elements in the situation that made this responsibility a tremendous one. First of all, it was vitally essential that the initial number of the Yearbook should be of such character as would make it of real service to the principals of the country. In the second place, while nobody doubted the capacity of elementary-school principals to make valuable contributions to the discussion of the technique of supervision, there still remained the difficulty of discovering the identity of individuals and of securing within the relatively brief period that was available their coöperation in a very material way.

There was need to reach large numbers of principals and reach them quickly. Lack of information as to where organizations of principals existed eliminated such agencies as a possible source for material. It is to be hoped in this connection that a directory of principals' associations may be available for the benefit of future Yearbook editors.

Accordingly, it was decided to call upon city superintendents throughout the country. About one hundred letters were mailed to them stating the plan of the Department for the publication of a Yearbook, inclosing a tentative outline of topics and requesting them to indicate the names of principals who were in a position to make contributions of value upon each topic. The response of the superintendents was cordial and in the majority of cases very prompt, indicating a high degree of interest in our undertaking. About one hundred fifty names were secured through their coöperation.

Each principal whose name was received in time was immediately requested to say whether he would be able to contribute or not and in the former event to give a brief statement as to what his study and experiences along the line of the given topic had been. With this information in hand, it was possible to select material that would measurably conform to the general plan of the Yearbook. Quite naturally, many principals who were nominated found it impossible to contribute. It is confidently believed, however, that each of the studies here presented constitutes a valuable addition to the literature of the principalship and as such is highly creditable to the profession.

This book is not submitted as the last word upon the Technique of Supervision in any sense; rather it is hoped that it may be the means of arousing discussion among principals upon this most vital of the principal's functions. It is extensive rather than intensive. We are working a field

whose surface has scarcely yet been scratched. It is easily conceivable that any one of the topics discussed, such as, for instance, the relation of intelligence testing to the measurement of teaching efficiency, might be profitably made the subject of a thorough investigation.

The future will afford opportunity for other Yearbooks dealing more intensively with various phases of the principal's work in the improvement of instruction.

Those who are more fitted by training and experience, who have at once the vision and the practical experience—the principals themselves—should rightfully take the leading part in the solution of the problems of supervision.

This Yearbook has been printed under the general direction of the Editorial Department of the National Education Association. It is being sent free to all members of the Department of Elementary School Principals. A limited number of additional copies have been printed and may be had at the price indicated on the cover by applying to the National Education Association, 1201 Sixteenth Street Northwest, Washington, D. C.

WORTH MCCLURE,

*Chairman of the Yearbook Committee of the Department
of Elementary School Principals, Seattle, Washington.*

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CHAPTER I

THE ART OF VISITATION

VISITATION AS A MEANS OF DIAGNOSIS

GEORGE RUGG, PRINCIPAL OF QUINSIGAMOND SCHOOL, WORCESTER,
MASSACHUSETTS

The elementary-school principal cannot hope for long to guide successfully the activities of his school unless he keeps in constant and close touch with his plant and personnel. And this implies that he is not primarily an office man, but rather an alert, observing, frequent visitor in all parts of his special field. He must see things at first hand in order to judge competently of motives, results, or needs.

Perhaps his first and greatest concern is with his teachers. Their strength and weakness will not be properly revealed to him unless he meets them often in the midst of their classroom work under varying conditions. Furthermore, his presence in a room at any time of the day should seem to the teacher as part of the natural order of things, reassuring rather than disquieting. A certain successful principal of a large New England grammar school once remarked to me: "When I approach a classroom, I always give an extra stamp of the foot to announce my coming. I am not a spy." By just such an open, free, disarming attitude, and without any sacrifice of dignity, a principal can best diagnose a teacher's capacity for service, and thus be in an assured position to advise and help whenever need arises.

Take the matter of the teacher's personality, that sum total of the qualities which give her power over children. Has she vitality that remains unquenched through the day? Has she poise, confidence, a ready smile, a bright, steady eye, a clear, modulated voice that carries easily to all parts of the room? Is she accurate of statement? Does she give evidence of some familiarity with current literature and the general progress of thought? Does she know her subject-matter? Has she imagination? Does she love childhood in general and children in particular? Does she control her school largely through force of character?

Where will a principal secure adequate knowledge of such aspects of a teacher's personal fitness save by direct observation in the schoolroom?

And how about the quality of instruction in various basic subjects of the curriculum? Take, for instance, the matter of reading. Fortunately, our primary children nowadays are usually very well taught in phonics and the mechanical pronunciation of words and short phrases. The subject-matter in primary readers is often delightfully simple, appealing, and well-arranged. The children's minds are pliable, interest is fresh, story-telling and dramatization abound. A certain glibness in oral reading is perhaps secured and all seems well. But somewhere in the third grade, let us say, the situation hardens. Children are losing some of their spontaneity. But

the acquisition of thought from the printed page, always a fundamental thing, now becomes imperative. Meanwhile other subjects of study are "crowding in" upon the reading time. The young pupil, it is evident, must be taught from this time on how to read by himself in silence and with gathering comprehension. More and more must sentence and paragraph, whether printed or in script, convey correct messages to his mind. And when he does read aloud to his fellows he must be taught how to stress the right words, a veritable task. Our principal, then, is looking all through the grades for teachers who discuss reading content with their classes, who exemplify correct and convincing expression by reading aloud in their best manner, and who, in short, act as interpreters of thought. Of what avail is it for a class to drone aloud in concert a Memory Gem, if stresses are continually laid on wrong words and the general content and fine finish of the poem are either misconceived or not conceived at all? Verily such efforts are as sounding brass or a tinkling cymbal. This whole reading problem touches closely every academic subject of the elementary course, and a principal may well take time to "sit in" with all his reading classes, to determine wherein his teachers fail to train children to uncover thought and pass it on.

And this leads us to consider the matter of instruction in the proper use of the mother tongue. For one thing, the principal will aim to discover and check such solecisms on a teacher's part as "He don't know." "Everybody take their pencils." His classroom visits will tell him whether the children, young or older, are given ample opportunity for original expression on topics within their ken. He will want to know how, for instance, a sixth-grade teacher accepts the challenge of a written paragraph like this:

Birds of a feather floc together.

In trees the birds have rests all the time the young ones follow there mother wherever she because the little do not like to stay home alone.

A long chapter could be written on the type errors in this broken, futile effort of the child. Note the lack of sentence sense, the absence of punctuation, the omissions and transfers of letters and connecting words.

And what a revelation for a principal who finds an eighth-grade boy writing on the "topic sentence" as follows:

There rain fell in torents last night. As I was coming home from a nickel show when a man said its a going to pour and I said to myself "that fellow thinks he is a wether profit, it would rain tonight for any money.

Could any evidence be more complete of inconclusive, drifting, confused thought, lack of word visualization, and so on? No textbook in grammar, however up-to-date or handsomely typed, will cure this condition. The call is for straight thinking and straight teaching. What an opportunity, then, for teachers all along the line to reconstruct, preferably at the blackboard, the maimed words and the sentences that run up blind alleys; to call equally close attention to successful attempts in language expression by their pupils, and to strive unceasingly to inculcate "sentence sense," the

"follow through" of a thought. Will the principal see to it that they do these things?

And then there is the cultural side of English training, a vital thing indeed. Appreciation, judgment, the choice of the better way, are qualities to be cultivated, as well as accuracy. Such things are a part of life in the living.

What of the simple appeal and uplift of that dainty little poem, "Daisies"?

At evening when I go to bed,
I see the stars shine overhead;
They are the little daisies white
That dot the meadows of the night.

What of the charm of Tennyson's "Brook"?

I chatter, chatter, as I flow
To join the brimming river.

And what of the summons to courage in Sill's splendid poem, "Opportunity," wherein the King's son, wounded, weaponless, and sore bestead, seized the craven's broken sword

And saved a great cause that heroic day.

Can teachers tune their intelligence and imagination to such a pitch that through their interpretations some of the rhythm, grace, and elan of classic phrase will lead their pupil's minds to higher things? Happy the principal who finds such a quality of mind and heart prevalent in his teaching staff!

Coming to the subject of arithmetic or number, what difficulties will a principal encounter in his rounds of the classrooms? Here is one: The work on essential number combinations, the adding of columns of figures, the manipulation of the multiplication table—in short, the whole attack on those fundamental concepts of abstract number, which only constant drill will perfect, is usually not speeded up sufficiently as the child works through the grades. For, be it remembered, that up to a certain point speed and accuracy go hand in hand. The principal has a right to expect that a drill test, which takes a fourth-grade pupil ten minutes to finish, will be handled in half the time by the eighth-grade child and with even greater accuracy.

Another point of perplexity, and oftentimes of partial failure, is the arithmetic problem. The difficulty lies chiefly in the inability or unwillingness of pupils to unravel thought, to consider two, three, or four conditions in one connection, to see the goal from the beginning. Unless the teacher can rise to something better than unit analysis and can train her children, in fair measure, to sort the given material of a clearly-stated problem, and then run through the needed steps to the final requirement, she has missed her opportunity to help fit for life in one of its most practical aspects. A principal will hardly let such a condition remain static, even if he has occasionally to teach a class himself.

We come now to the two so-called *fact subjects*, geography and history. These are especially adapted to pupil participation, or what is commonly known as the socialized or "stunt" recitation. This desirable form of training by no means excludes the teacher from her preëminent place as instructor and leader, but it does presuppose a higher and finer type of teaching. When a pupil will go to a wall-map, and, pointer in hand, will give a five-minute, carefully prepared talk on Brazil; or another pupil devotes an equal time to a discussion of the Monroe Doctrine, the substantial basis of our foreign policy—either child is sure of rapt attention from his fellows. Comment and criticism from these same classmates will just as surely follow the conclusion of such an effort, and the end of that lesson is better than the beginning.

To particularize, then: a principal has a right to expect in his geography classes much inspection of maps, and a growing power to associate the big natural features of a country, such as mountain, river, bay, or climate, with the development of life and human society. By the same token, he will look to find in history classes a zest for research in the story of the past, a habit of willing participation in the thought of the hour, and an increasing recognition of those great issues which, like the negro problem, run their course through a nation's life structure, like the warp threads of a fabric.

If unhappily he does not find these characteristics prevalent in some schoolroom, he will know all too well that the teacher is not studious, not professional, is a teacher of one book, and that her chief interests are elsewhere. A dead teacher, of course, means a dead school.

The recent and insistent demand for strong teaching in the upper grammar grades in elementary civics and economics is a good sign indeed, and a principal will surely not neglect to strengthen this work by every means at his command. Thus he will no doubt emphasize some adequate consideration of our Constitution and Declaration of Independence, a memorizing of the Gettysburg Address and the American's Creed, and a clear conception of certain essential political and civil rights of the citizen.

I was pleased the other day to find in the note-book of an eighth-grade child this paragraph: "Some of the principal duties of a citizen are (1) to obey the law; (2) to earn an honest living; (3) to defend my country; (4) to study public questions; (5) to take part in the Government."

With such principles of action inscribed in millions of school note-books, the coming generation of Americans may safely be trusted to "carry on." The elementary teaching process must serve from time to time to plant certain fundamentals beyond forgetting in the child's mind. No course of study is such a tyrant that it may not be curtailed in a measure to gain the higher purpose. The things that the child brings with conscious assurance into manhood's "fling at Fate" are the high lights and positive successes of schoolroom days. To be master of a few things is to gain a chance to be ruler over many.

Here is a most interesting professional problem for the supervising principal—how to check the all too-prevalent habit of guessing at answers, of

approximating, of remaining mediocre through lack of concentration. We all know the child who habitually spells correctly only seven or eight words out of ten, or four out of five; and the one who gives memoriter a paragraph from the history page, but fails completely to grasp its essential thought. Fortunate that school where teachers and principal combine their skill and will to minimize these failures; to train children to rationalize, to compare, to make rapid, sure decisions between right and left, right and wrong, fair and fine.

And happy that principal who encounters on his visits a generous measure of good-will. This is something which cannot be bought for a price. It is based upon a general recognition by the children of superiority, reliability, kindness with decision, and a certain high-minded sense of justice in the characters of their teachers and principal. When confidence abounds, then order, regularity, neatness, enthusiasm, all such desirable ends, may in the large be secured and held. The watchful principal will guard this condition as the apple of his eye. He will search out the occasional recalcitrant or restless child and give of his best to cure. The faithful pupil he will commend, and the brilliant one will likewise meet his word of praise. For, after all, he is not more a diagnostician than a director and friend.

HOW TO MAKE VISITS PROFITABLE TO TEACHERS

LEONARD POWER, PRINCIPAL OF THE FRANKLIN SCHOOL,
PORT ARTHUR, TEXAS

The chief function of the principal is to improve instruction. This assumes that he knows present methods in his school. This assumes that he visits the classrooms.

He must have definite standards well in mind else he cannot distinguish differences in degree of efficiency. This assumes that his visits are carefully planned. He may wish to visit the work by grades or by subjects; he may wish to see the work of a certain subject in just one or two grades, but his plan will prevent him from aimless drifting from room to room. Before making his visits he carefully reviews books on special methods, if he be studying the work in a given subject; he carefully reviews the course of study if he be studying the work in a given grade. In either case I have found it best to tell the teachers just what I wanted to study. Then, when visiting arithmetic classes, I was confident of seeing a high quality of teaching. Then, when visiting the fourth-grade teachers, I was pretty sure they were doing a little better planning than if they did not know my plan.

The carefully planned visits encourage the teachers to do their best and are in themselves an expression of confidence in the teacher's plans and purposes. I always have a waiting list of invitations to visit classes in grades or subjects that are not upon my schedule. It does not unbalance my plan, therefore, when Miss A tells me in the morning that she would prefer

I defer my visit a day or so. She has been ill, or perhaps, has had worries unknown to me and feels that my visit at that time would be unfair to her. I have had teachers tell me that they were in the midst of a plan which was proving to be of doubtful value, and on that account have deferred my visit. I have had teachers request me to come a day or so before my scheduled visit to see the beginning of a fresh project or the successful completion of an old one. In all of my planning I make allowance for the human factor. These teachers are the choicest of this city's womanhood and manhood. They need sympathy and they need constructive criticism. We all need both. To operate on any other basis is unthinkable to me. The tyrannical principal cannot fail to develop tyrannical teachers. Teachers will have faith in themselves in the same degree that the principal has faith in them.

I always assume that each teacher is fully conscious, that I believe she is doing her work as best she can, that I think her work in the school is very important, that I expect her to find herself in her work, and that I am here only to be of assistance. She knows my visits cannot be very frequent and she has no fear of "surprises."

I have said it is good to visit by subjects. The technique now needs to be explained. First, I make a schedule showing the exact time that a subject is taught to each class with the teacher's name and the number of the room in which the subject is taught. This is my Building-subject Schedule. In the two highest grades the work is departmentalized and each subject has one teacher for each grade. Second, I plan to visit each teacher twice on a given subject before calling the conference of teachers. This usually means a two weeks' schedule for me if I follow a subject through two or three grades. Third, I pay careful attention to what the teacher does while I am in the room but, as a rule, make no written notes. Fourth, I go from the teacher's room to my office where I dictate her a letter which is written while I am visiting the next teacher. I formerly wrote these letters myself and that necessitated my mastery of the typewriter, because I wanted two or three copies of each letter. Fifth, I generally confer with the teacher about the suggestions offered—this is usually after school hours. Sixth, I always stay throughout the entire period to hear the assignment and to get the opening of the next lesson. Seventh, I always consult the teacher's plan book. A carefully planned lesson is always assumed.

As noted already, my plan includes a carefully prepared report of each visit which is forwarded to the teacher in the form of a letter. When possible I offer helpful suggestions. When I cannot offer any helpful suggestions I report on the method only. I find that every time I visit the teachers during their arithmetic class time certain errors in method recur often enough to become typical. In any subject that is true. The best means for showing this is to reproduce here some letters covering typical errors. The following three letters on arithmetic show an attempt to correct the same teaching error. It was finally necessary to call all of the teachers of this subject together to witness a demonstration lesson in which

the element of measuring the accomplishments of the individuals was controlled.

Arithmetic 1.—Method: The children were learning how to multiply and divide small fractions. They were using cancellation. They did not write the figure (1) as a quotient when cancelling.

The class was divided into two parts and about half of the class was sent to the board at a time. The first half of the class worked ten problems and the last half worked three problems.

Suggestions: Why give all children the same example? If each child were given a different example or different examples, there would be no chance for copying, you could help the slow child while the bright child works ahead, and you could measure the progress of each member of the class. The children at their seats could also be working. Why not write the quotient (1) just as other quotients are written when cancelling?

I suggest that you write a row of fractions across the front board, thus:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$1/8$	$2/3$	$3/8$	$4/5$	$1/2$	$3/5$	$5/6$	$5/8$	$2/5$	$4/9$

Then, on a little card you could have brief instructions, as:

Card 1. Multiply each of these fractions by $2/5$.

Card 2. Multiply each of the first three fractions by all that follow.

Card 3. Multiply 1 by 3, then multiply 2 by 4, and continue until you have completed multiplying by every other one.

The directions could increase the difficulty of the task and you could give most difficult tasks to brightest children. It may be worth while to give the plan a try out. If you use it call me in some day to see it work.

Arithmetic 2.—Method: Eight children lined up at front of room for oral drill in fractions. Questions were as follows: "What is $1/4$ of 12?" "What is $3/4$ of 12?"

After a few minutes of this oral drill eight other children passed to the boards where they had a drill in column addition. They were taught to prove their sums by a method new to me. They added the digits in each number. If the sum of these digits equaled the sum of the digits in the sum of the numbers the work was proved.

235	10	1 plus 0 equals 1
148	13	1 plus 3 equals 4
267	15	1 plus 5 equals 6
134	8	0 plus 8 equals 8
784	46	19

7 plus 8 plus 4 equals 19; therefore, the problem is correct.

Suggestions: Not more than half of the class did any work during the entire period. Provision of supplemental assignment for those at their

seats should be made unless the lesson is a development lesson. While your plan of proving the addition is correct I think the method of casting out the nines is simpler. I am of the opinion that these children would better prove by simply adding from top to bottom and then from bottom to top. They may even write partial sums or column sums as follows.

235 I also suggest that you have many problems prepared for the
148 children to add. If these are on cards and the cards handed
267 to the children, each will be forced to do his own work. You
134 could have a key card with correct sums and could rapidly
— check all work. Then you could give your time to the slow
24 children and you would also have a means of knowing how
16 many problems each child can work in a given time. This will
6 help prepare for the Curtis Test No. 1.

— I liked the rapid oral drill in fractions but think the same
784 drill could have been given to all and all asked to write the
results. Any plan that will keep all of the class thinking will
be appreciated by me.

Arithmetic 3.—Method: Problems in long division were used. The teacher gave a problem to the entire class after 15 children had been sent to the board. After waiting some time, the teacher asked all of those who had the quotient to hold up their hands. Then another problem was given to the entire class and the same question. This method continued to the close of the period.

Suggestions: This is a very old method. In drill of this kind we need to make provision for putting every child on his own responsibility. Then we can tell how much an individual is doing and how much the class is doing in exact terms.

I suggest that you prepare about 300 examples in long division. Group these examples by tens. Put these problems on a card and give each child a card. Have the quotients on a key card that you can quickly use to check the work of a child.

Then you can give your time to those who need it most. The cards can be graded in degree of difficulty. Your present method loses time for the bright child and encourages the dull child to steal from his neighbor.

I am inviting all arithmetic teachers of fourth and fifth grades to a demonstration lesson on January 20, during period IX in room 206. Please permit me to use your children at that time.

Every principal knows these are common teaching types. Just one thing is lacking—a plan which measures the results and keeps every child on his own work.

The letters marked "History I" and "History II" show the regular textbook type of history lesson. No discrimination was used. Topic by topic the lesson was recited. All was a dull monotonous grind for the children, but I did not say so in so many words.

History I—Method: The teacher called upon individuals to read a paragraph at a time. There was no discussion and no audience situation.

Suggestions: I suggest that at least a part of the class be made into an audience in any oral reading lesson. This is done by having them close their books and get the meaning out of what is read. This will cause the reader to feel that he needs to read well. If all of the children have books the reader has no motive for reading other than to get to sit down again.

I also suggest that as this is rich material there be some discussion of those parts that are within the comprehension of the children.

I notice that you had every paragraph read. Some of the topics were discussed in the text in a manner that is beyond the children. It is not necessary to follow a book down to the paragraph or to the page. It is better to choose a few topics in history and develop them carefully than to cover so many at one recitation.

I should like to talk to you about your plans for this class and I realize the disadvantage at which you are placed by the class being held in the auditorium.

The discipline of the class was very good throughout.

One of the purposes of history, and I think it is a vital one, is to fill the hearts of these Texans with a patriotism that comes by relieving the conditions presented in the book. That is why I should insist on more discussion.

History II—Method: The topics which had been studied in the textbook were discussed by the class with very little supplemental suggestions from the teacher and no special reports from any of the children. This was a very good textbook lesson.

Suggestions: When was this lesson studied? I wish you would undertake a type study with one of your classes or one of your grades. I have in my office a type study of "The Development of the Constitution," and if you have not already read it I shall be glad to lend you a copy.

As a history teacher you have a splendid opportunity to work out something which will have the stamp of originality and of your own mind. If the work of some one half year was carefully planned for a period of, say two weeks, you can in a few years, find that your plans are much more helpful than the old textbook type of lesson. I commend your lesson of today.

I am including two letters on Reading to show how the principal may refer to mimeographed bulletins he has issued and to books on method which he has recently read. The plan includes careful preparation on his part before visiting the classrooms.

In reading we find need for creating an audience situation. One typical error in method is the one which calls the children to the front of the room to read something already familiar to all.

Copies of all of these letters are sent to the teachers at the close of the day. I frequently have stencils made of these letters in order that discussion may be intelligently directed at the teachers' meeting which follows each study of a subject.

Here follow the letters on reading and also two letters each on English and spelling.

Reading No. I—Method: The teacher called upon the children in irregular order and each child came to the front and read two or three paragraphs. When the child encountered a difficult word, the teacher prompted the child. No comment was made by the class or by the teacher on the contents of the lesson.

Suggestions: I suggest that you read my bulletin on the teaching of reading; also bulletin on the motivation of reading.

The children in the class were quiet while the reading was going on. Different individuals were reading further over in their book, but there was no motive for a clear distinct reading except to you. I shall be glad to talk about creating an audience, and I believe that for at least a part of each reading lesson there should be an audience or that at least a part of the class should be an audience in every reading lesson.

Reading No. II—Method: The children came to the front and read. Each child read two or three short paragraphs or one long paragraph. During the time of the class each child read twice. The selection was from the story of "Pandora's Box."

Suggestions: Here again we are confronted with the question of how to adapt the reading lesson to the child who reads. This lesson was well within the reading ability of the average child of your class, but there were some children who read haltingly because the vocabulary of the story was beyond them. I think that we should provide different material for these children or we should work this material over with them to such an extent that they can read it fluently. The former plan seems to me to be wiser.

I wish to commend your plan of having the children come to the front to read and your plan of selecting the children who you wish to do the reading. There was absolutely no confusion at any time, and each child knew when his turn had come. I have just completed reading Mr. Klapper's book called, *Teaching Children to Read*, and I find in chapter 9 some splendid suggestions, particularly on pages 129, 130, 131, 132, 133, 134, and 135. On page 141 I find some splendid suggestions under topic headed, *Suggestions for Procedure in Oral Reading*, and on pages 143-5, *How to Judge Oral Reading*. The whole chapter, in fact, is fine and if you have not read it recently, a review of this chapter would help you. I wish to commend the very good order of your class during the recitation.

English No. I—Method: The class period was taken up with hearing the letters read. The children had as their subject, *My First Day in School*. After reading the letter, the teacher would inquire if they thought

that was a good letter and would get criticism from the class on the contents of the letter.

Suggestions: I suggest that during your English period you have your class write some real letters and send them to their friends. The children may have the privilege of not letting others read the letters, but may come to you for corrections before putting the letters in the postoffice and those who do not care to come to you may send their letters without corrections. Many of the children would not care to have their letters read except by the one the letter was intended for. Your criticism of the letters was based on what you heard and so were the criticisms of the class, but most of the errors were probably in the form or the punctuation. How do you find out what they are?

English No. II—Method: After a development lesson of adverbs the teacher was having the children pick out the adverbs from selected passages that were printed in the text. The teacher called on volunteers and each time the correct answer was given she had the child state why the word was an adverb.

Suggestions: These sentences are too complicated for the children to handle at present. Your method of calling on the volunteers who know is all right when 90 per cent of the class are volunteers. When a child who volunteers gives the wrong answer, take time to have him learn why his answer is incorrect.

Spelling I—Method: The method used was similar to one outlined by me at any demonstration lesson. The method provides for testing the ability of each child to spell a word before he studies the word. The close of the period was used to work the words into sentences.

Suggestions: I am of the opinion that where we have a spelling book for all of the children we may give out the words for the lesson and then instead of writing them on the blackboard we may tell the children to look in the spelling book, mark the words that they have missed, and then study from the spelling book. This would leave the teacher free to help some of the weaker children while they are studying. I think that a little oral work in sentence building should precede the written work in sentence building.

I commend your spelling period in that it is a period during which the children spend their time studying words. So frequently the spelling period is a period for just silent, indirected study.

Spelling II—Method: Two rows of children sent to the blackboard to write words as dictated by the teacher; children seated; teacher passed on each child's work and with the help of the children who had remained seated made all corrections. The remainder of the children were sent to the board to write while the children who had first gone to the board studied the words they had missed.

Assignment for the next day made by pronouncing words in unison and using them in a sentence.

Suggestions: Is the blackboard work a part of your daily exercise? I suggest that the children who are at their seats be writing at the same time the children at the board are writing.

I suggest that when a correction is made of a child's work at the board, he make that correction at once on paper.

Do you keep a record of the work of the individual and the class? I suggest that the ability of each to spell be less openly presented to the other children. This would mean an elimination of the blackboard work. I should like to discuss this with you.

It is possible by tactful direction to influence teachers to study their problems. I am of the opinion that the teacher should do her additional professional reading, because she sees her need for it. The second and third years that my teachers work with me find fewer suggestions coming from me and more questions coming from them. They ask me where to go for help. The group meetings lead to questions of content, subject-matter, and the course of study, as well as to questions of method. The meetings are organized and the chairman usually makes special assignments for further report. Last year this led to the complete revision of the course of study for the elementary work. In all of these studies I lead because I expect the teachers to *lead* their children. Neither children nor teachers are cattle to be *driven*. This leadership costs much. It means many weary hours of reading and careful preparation, but it pays. The teachers who fear projects are lacking in knowledge and afraid to face the hours of special effort necessary to acquire it.

In conclusion I wish to state that the carefully planned visits to classrooms where entire recitations are studied will be most helpful if, while in the room, the principal: (1) Expresses confidence in the teacher's plans and purposes; (2) gives constructive suggestions; (3) leaves written summaries with teachers; (4) suggests experiments or general changes in method; and (5) suggests devices for saving time and effort.

As follow-up devices after the visit the principal may: (1) Hold detailed conferences with individual teachers; (2) hold group conferences by subjects or grades; (3) write bulletins of suggestions to teachers; (4) suggest special references in books and periodicals; (5) provide bibliographies on special problems; (6) teach demonstration lessons; (7) send the teacher to visit other classrooms; and (8) reclassify pupils and reorganize classes when necessary.

THE RATING OF TEMPORARY TEACHERS AFTER A SINGLE SUPERVISORY VISIT

ROSE A. CARRIGAN, PRINCIPAL OF SHURTLEFF SCHOOL DISTRICT,
BOSTON, MASSACHUSETTS

A statement of the problem—In a certain large city of over seven hundred thousand inhabitants there are employed in the public-school system more than three thousand five hundred permanently appointed teachers. Changes in conditions of the school population and the teacher service bring about the annual appointment of at least from fifty to eighty new teachers. A large majority of these appointees are drawn from an eligible list of teachers who, before permanent appointment, are employed by the city temporarily as substitute teachers or teachers of overflow classes. It is obvious that the judicious selection for permanent appointment of the ablest among these is a matter of grave importance as it is a major factor in determining the growing efficiency of the entire corps. An annual re-rating of all who are on the eligible list determines absolutely the order of permanent appointments during the ensuing year. It will readily be seen that the factors which determine what credits a candidate shall receive for position on the merit list warrant the most careful consideration. The credits for service are derived from two sources—namely, marks assigned by principals of schools in which the candidates teach and marks given by the visiting supervisors. The principal of the school records monthly ratings, and monthly ratings are also given by the supervisors who are Assistant Directors in the Department of Practice and Training. These last are usually five in number.

The Assistant Directors visit in turn all the candidates in whatever grade from the first to the twelfth they may happen to be. Most of the candidates are graduates of the City Normal School; all the men and a few of the women are graduates of a college as well. Each Director remains with the teacher from three quarters of an hour to an hour and is required to pass judgment upon any lesson which is on the daily program at the time of the visit. The final estimate is always made known to the candidate though this is often delayed until after a conference which is arranged by appointment whenever constructive help seems desirable and welcome. Teachers who wish to grow educationally always welcome this constructive criticism as also do those who are merely ambitious for a high place on the merit list. Four candidates are visited daily by each supervisor whenever the distances make this number of supervisory visits possible. The substitute teacher is rated at every visit except when unusual conditions prevail. These ratings are all factors in the annual re-rating mentioned above.

The present study suggested itself to one of the former Assistant Directors as a means of obtaining a consensus of opinion from judicious sources regarding the qualities which should receive credits and the proper apportionment of these credits to the respective qualities chosen on the basis of a total of 1000 points. The resultant score card is offered as suggestive

for a common basis for marking which may be used by principals and other members of the supervisory staff who wish to estimate observed teaching.

Method of investigation—An explanatory sheet and a score card on which estimates of the qualities thereon mentioned were omitted (see below, facsimile including the estimates determined by the present study) were submitted to a class in supervision at Teachers College, Columbia University, at the summer session of 1919. The class, taught by Dr. James Fleming Hosis, was composed chiefly of supervisors and principals of schools who came from various sections of the country. The merits of the items named on the card in its first draft were open to discussion by this group. Suggestions for omissions or additions were encouraged. A few recommendations for minor changes, almost negligible in their character and number, were made. These were introduced in a recast of the score card which is shown below and was again submitted to the same class for evaluation of the separate qualities. It was also submitted to five other classes in supervision in the same college. The personnel of these classes was made up of principals, supervisors, and teachers who recorded in the final sheet, home addresses scattered throughout the United States in city, town, and rural districts from the Atlantic to the Pacific and from the Canadian line to the Gulf of Mexico. Each person was given the sheets to carry away in order that the rating might be the result of careful and deliberate thought. Many of the blanks were retained three weeks before they were returned. Presumably, the values entered against each quality were the result of more or less mature deliberation. The following is a copy of the explanatory sheet which was sent out with the score card:

A special problem in supervising—*Problem*: In a large city system, to rate at a single visit the work of a temporary teacher who is a candidate for permanent appointment from an eligible list which is newly graded each year, and from which appointments are made in exact order of the occurrence of the names thereon printed.

Conditions: 1. These candidates for permanent appointment are visited, while in temporary positions, by five general supervisors whose ratings, with monthly estimates from the principal of the school, are the sole factors in an annual re-rating. It is probable that the supervisors' ratings are weighted in the cumulative final estimate.

2. Candidates are visited by each of the five supervisors about twice in the school year.

3. The period of a supervisor's visit varies in length from three quarters of an hour to an hour.

4. Some of the candidates are responsible for a year's work in one class; others have successive short-term assignments in several different sections of the city. The grades in which the teaching is done vary from I through VIII, although a few assignments are made above grade VIII.

5. The supervisor visits in a day four candidates who are often located at considerable distances from each other, an immediate conference being for this reason impossible.

6. Individual conferences with the supervisor are conducted at the central office by appointment after the close of the afternoon session.

7. No supervisor compares judgment with any other supervisor who rates the candidates, as it seems just and desirable to take precautions against influences which might cause a duplication of the same judgment.

8. Each supervisor tries to give an unbiased estimate of work actually seen, and so discourages discussion of the candidate with the principal of the school or teachers who are in the same building.

9. The candidates here under consideration are substitutes, or special assistants who have graduated from the City Normal School and have been certificated to teach in the city but who are not yet permanently appointed there. A few who have secured permanent appointments in neighboring cities or towns, but who wish to maintain their positions on the merit list of their own city, upon request, receive supervisory visits, on the same basis as the others.

10. Candidates are required to keep on the desk at all times, for the inspection of supervisors or principal, a daily plan of work, written in sufficient detail to indicate unmistakably the main topics they intend to treat in each lesson. A complete plan for the entire day must be written before the opening of the morning session if full credit is desired.

The score card follows. The estimates given below are the median judgments of the supervisors who participated in the study. Slight adjustments were made to keep the final total at 1000 points.

SCORE CARD

	No. of points.
I. The back-ground or workshop.....	250
A. Was the atmosphere of the room conducive to learning.	110
1. Were the hygienic conditions, so far as they were within the control of the teacher, at their best, <i>e. g.</i> , ventilation, seating of pupils, cleanliness of pupils, etc.?.....	30
2. Was the room neat and orderly?.....	20
3. Were there attempts to beautify it in any simple inexpensive way?.....	15
4. Were there visible evidences of proper incentives to study, such as display of best work, graphs of achievement, appropriate rewards for effort, material to supply voluntary work to quick pupils, etc.?.....	25
5. Were the necessary mechanical tools in good condition and ready at hand for quick distribution?..	20
B. Were there evidences present of sufficient preparation on the part of the teacher?.....	140
1. Had she put in writing a clear-cut definite plan for a day's work?.....	25

2. Did her written plan for the day indicate in proper proportion work which aimed at automatic reaction to a stimulus and work which aimed at the development of reflective thinking?.....	25	
3. Did her accumulated written plans evidence in any degree mastery of subject matter and wisdom in handling it?.....	25	
4. Did her book of plans indicate reasonable class progress?	25	
5. Had she provided or caused the children to provide such material for the day's work as would be likely to arouse enthusiasm in the learning?..	40	
II. The work		375
A. Was the subject matter, so far as it was under the control of the teacher, worthwhile?.....	50	
B. Was the specific aim apparent, definite, and of sufficient worth?	50	
C. Was the organization good?.....	50	
D. Was all the time profitably employed, thus indicating that the teacher had a proper sense of values?.....	40	
E. Did the proportion of individual response in the class prove that the teaching was successful?.....	50	
F. Was the work wholly coöperative or merely a guessing game in which the children tried to find out what answers the teacher wanted?.....	45	
G. Was there a checking up of results?.....	40	
H. Was there suggested any vital connection with a future activity?	50	
III. The child		375
A. Did the child have a conscious objective in mind at the beginning of the lesson?.....	95	
B. Was the task set within the power of the individuals provided they made effort?.....	90	
C. Was there a satisfactory proportion of individual children who, throughout the <i>entire period</i> , were absorbingly interested in the work and making effort?..	100	
D. Did each child experience the satisfaction of a measure of success, through effort expended.....	90	
Total number of points.....		1000

The following table indicates on the basis of 1000 points, the range of points which ought to be equivalent to the descriptive estimates given at the left, in the judgment of those making the returns.

Descriptive Estimates

Superior	950 to 1000
Excellent	900 to 950
Very good.....	850 to 900
Good	750 to 850
Fairly good.....	700 to 750
Possible	650 to 700
Poor	600 to 650
Unsatisfactory	500 to 600

A defense of the score card in answer to some objections—Agreement with the following theses will, the writer believes, iron out many of the objections which might be raised.

1. No quality can be given credit which is not revealed to a visitor at a single visit. This dismisses as impossible of observation such qualities as health conditions of the teacher, personal characteristics of disposition, co-operativeness in the school, moral efficiency, moral influence on the children, and all other qualities which remain invisible to the visiting supervisor.

2. The habit of faithful preparation for each day's work is essential for a teacher, especially at the beginning of her career. Experience has shown that there is need of a driving force within to ensure this *habitual* preparation of the day's work from the start. A requirement of visible evidence of such preparation is a safeguard which protects both teacher and children. The form of the written lesson plan need not be dictated. While it should be in sufficient detail to indicate class progress from week to week, its form will depend on the type of teaching. Teaching through projects will bring about a form of plan book widely different from the book which records plans for the traditional type of teaching.

3. It sometimes happens that a teacher is working along *towards* effectiveness in teaching, but has not yet arrived, that is, the pupil reaction may not yet be so superlatively good as is indicated by qualities mentioned in the score card under III. Undoubtedly, such a teacher should have credit for efforts rightly directed. An experienced supervisor can readily detect such efforts in the qualities indicated on the score card under II. Overlapping of qualities II and III, suggested by some of the participants of this study, need not be present if the points of view are properly differentiated by the supervisor.

4. Discipline may be omitted from the score card since it becomes a negligible quantity when the child is absorbingly interested in his work. This matter of *absorbing interest* appears in III C.

5. It is probable that the initiative of the child need not be mentioned on a score card which contains a place for absorbing interest; initiative is likely to be an outgrowth of such interest.

Recommendations—It is the belief of the writer that the score card resulting from this study must be tested out before it can merit the confidence of the profession. To prove its value it should be used in many places in connection with the work of teachers of known ability. If, when tried on the work of an eminently successful teacher, it scores her low, undoubtedly it is lacking in some essential characteristics and should be revised through a wholly new study. Modifications brought about by renewed study of the investigation type will, in all probability, be necessary before a fairly satisfactory score card can be evolved. This work should begin at once.

If the present study has accomplished no more than to point emphatically to the need for principals and supervisors to unite on some standards by which teaching can be judged in definite situations, it will not have been attempted in vain.

Editor's Note: Complete data, showing frequencies of judgments in the returns, quantity ranges, and the like, were submitted by Miss Carrigan. Considerations of space, however, made it necessary to eliminate all figures save the summaries as expressed by the median values indicated on the score card itself.

CHAPTER II

THE MEASUREMENT OF EFFICIENCY

THE MEASUREMENT OF TEACHING EFFICIENCY BY MEANS OF STANDARDIZED TESTS

ALBION U. JENKINS, PRINCIPAL OF SCHOOL NO. 2, PATERSON, NEW JERSEY

Since by efficiency we mean the power to achieve, to accomplish, to do, then efficiency in management and instruction will imply the getting of results in keeping with the expenditure of time, money, and energy. Before we can know whether every part of the school machinery in any particular school or school system is giving an educational account of itself, it will be necessary that certain definite accepted standards of achievement be set up, so that we can compare our own achievements with those that have been accepted as satisfactory. A measure of efficiency will indicate the degree to which results have approached or exceeded these established standards of achievement.

From this point of view the measurement of teaching efficiency will be possible to the extent that units of measure and standards of achievement for the various school activities have been established. The teacher cannot be certain of the soundness of her methods of work, unless there is some measure of the results of her instruction, which will indicate whether sufficient progress has been made from month to month, term to term, and grade to grade.

There have always been attempts to measure the formal results of teaching. Among those used, the chief means have been opinion and the old-fashioned written examination. Standardized tests are rapidly superseding or at least supplementing these inaccurate, unreliable measures of efficiency. Such tests are now available in citizenship, drawing, language, composition, spelling, handwriting, foreign languages, history, home economics, journalism, intelligence, mathematics, music, physical training, reading, science, and vocational subjects.

Achievement tests inadequate as a measure of teaching efficiency—Standard achievement tests and scales have been used a number of years in the public schools with great success. It has been estimated that more than two millions of these tests were given to pupils during the year in reading, writing, arithmetic, spelling, history, and geography. Their usefulness in improving the efficiency of teaching is now generally accepted in leading school systems throughout the country, and progressive teachers and supervisors are everywhere using them to supplement the regular school procedure. The time has come when the efficiency of teaching and the progress of children in school subjects can be more clearly stated in terms of standardized tests than in any other way. They offer standards of attainment in school subjects for the several grades, based upon the performance of

a large number of children to whom the tests have been given, with which the relative performance of any pupil or grade can be compared.

Table I shows the improvement in efficiency that may come as the result of standardized testing. The Monroe Standardized Silent Reading Tests, Revised, Forms 1 and 2, were used.

TABLE I—Median scores in rate and comprehension showing improvement in silent reading from November 14, 1921 to January 17, 1922, in third, fourth, and fifth grades

Grade	Standard Scores		November 14, 1921		January 17, 1922	
	Rate	Comp.	Rate	Comp.	Rate	Comp.
5A.....	142	9.8	107	6.1	135	9
5B.....	142	9.8	85	3.8	98	6
4A.....	122	7.7	90	3.3	118	8
4A.....	122	7.7	78	2.6	105	7
4B.....	122	7.7	63	1.6	99	5.5
3A ¹	82	3.8	..	..	82	3.5
3B ¹	82	3.8	..	..	73	3.5
3B ¹	82	3.8	..	..	68	3

¹ Not tested November 14.

The results of November 14 show that the average 5A grade pupil reads silently with less than fourth-grade ability, while the 5B grade and the fourth grades compare none too favorably with the standards for the third grade.

These scores proved very unsatisfactory and led the principal and the teachers of this school, a school with an Italian population in the most congested part of the city, to put forth considerable effort to correct these conditions. Upon analysis it was found that the problem in these classes was one of increasing both rate and comprehension in reading. Special effort was then put forward to correct the defects that had become apparent. The limits of this paper will not permit full presentation of the work done in this direction. Suffice it to say that the work in silent reading was more carefully motivated, daily drills for increasing rate were given, and emphasis was placed upon thought-getting. The causes of slow rate such as over-emphasis on oral reading, belief that slow reading is good reading, and the failure of teachers to recognize the fact that rate of reading is important, were carefully discussed by teachers and principal.

It is interesting to note that the test destroyed the smug complacency of the teachers based upon opinion only that the silent reading in this school was very good. After four years of careful work in silent reading, it was discovered that plans, discussion, and time spent, had after all failed to produce satisfactory results. But once the fact became known that results were not what they should be, and standards of achievement became available, teachers rapidly increased their efficiency, as is shown by the splendid record of January 17, 1922, two months later. What effect un-

familiarity with the plan and the failure of pupils to understand directions may have had in the first test is of course unknown.

A careful study of the scores will show that Grade 5B failed to make as much progress as the other grades. Most of the grades made excellent relative progress, and there was no reason apparently why the 5B grade should not have done as well. The teacher is a strong, energetic, intelligent young woman, capable of doing high-grade work, yet she failed to make any startling improvement with this particular class. This is a condition that frequently faces principals and teachers. In accounting for the failure of this class to make adequate progress, the principal and teacher and other interested teachers, after a careful examination of the cumulative record cards, came to the conclusion that this class was below the average mentally. This however was only an opinion and counted for but little in scientific education.

It is at this point that the weakness of the standardized achievement tests as a measure of teaching efficiency becomes apparent. One cannot account definitely for poor results, and it becomes necessary to guess at the causes. To judge the teacher of this class on the basis of achievement alone would have been an injustice. The results indicate how much the individual pupils accomplished in this test, but they do not indicate how much each child should have accomplished. The standard of achievement is a grade standard, representing the achievement of the average pupil of thousands of children in the same grade. No one knows how much each child should have accomplished, and it is evident that this capacity cannot be measured by the achievement test.

A more complete study of this 5B grade will be presented in Part III of this paper.

Intelligence tests fundamental in any scheme of measurement—While intelligence tests have not been used so widely and as group tests have not been in use so long as the achievement tests, their importance as a measure of the capacities of pupils for learning is rapidly gaining ground. The scores of an achievement test may show that one class is inferior to another class, but it is no longer good practice to assume that the instruction has been inferior. An intelligence test may show that the children in such a class are low in capacity to learn and consequently should not be expected to make so much progress as the pupils of the superior class. It is now generally conceded that a pupil may succeed in school work because of either high intelligence or superior teaching; or that he may fail because of either low intelligence or inferior teaching. Strict accountability for the success or failure of the work in a class or a school is possible only when the capacities of pupils for school subjects are known.

A teacher of any class may be regarded as efficient only when provision has been made for all the pupils in her class to work up to the maximum of their capacity. Supervisors are apt to underrate the difficulties involved in putting this principle into practice. The teacher has been trying to vary the assignments so as to meet the needs of children of different capacities to learn, but the realization of what it means for a teacher to assign all the

lessons in all the subjects with this aim in mind probably never occurs to the supervisor unfamiliar with the results of an intelligence test.

Before the teacher can be expected to maintain her work at the highest possible efficiency, it remains for the administrator to classify her pupils more carefully. What has been done in this direction has been largely of an arbitrary nature, based mainly on achievement scores or age. The sins that have been committed by classifying pupils on such a basis will never be known. A superintendent in a large city discovered recently that a number of schools were promoting to high-schools classes whose average mental age was but twelve years. In the same classes were pupils whose mental age was as low as eight years, six months. Assuming that fourteen years or fourteen years and six months is an average age of pupils for promotion to high school, it may be seen how little chance hundreds of these pupils had of succeeding in their high-school studies and also what a problem the teachers had in trying to teach algebra and foreign languages to pupils not able mentally to do the work of the early grammar grades. Mental measurements, wherever made, are revealing similar conditions. The classification of pupils can be carried out intelligently only when the mental ages and capacities of pupils for the various school subjects are known.

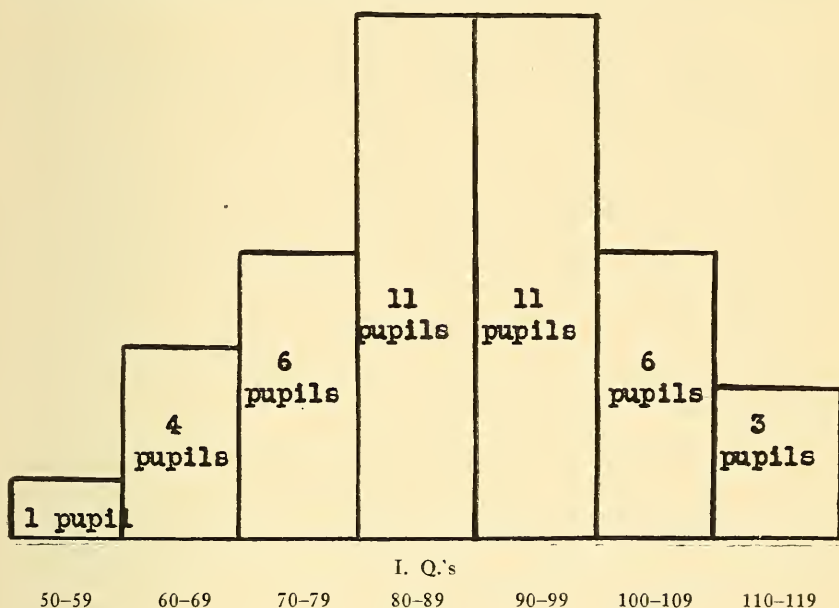
Something has been done, particularly in the cities, to reduce the teacher's burden by eliminating the incapable from the regular classes and placing them in special classes under teachers with special training for the work. But even from this standpoint, the surface of the problem has been barely scratched. Dr. Corson reports that in Newark, New Jersey, there are 477 pupils enrolled in the Binet centers and special classes, but that there are 500 mentally deficient boys and girls still in regular classes who are candidates for these classes. In addition to these there are 516 congenital illiterates, pupils who are repeaters in the primary grades and absolute failures in the grammar grades. These are children who seem unable to cope successfully with academic subjects and finally drop out with practically nothing to show for their years of school attendance. Commenting on these pupils, Dr. Corson says: "Many of these are pupils in grades below the fourth, who cannot be taught to read and spell, and others have so little power that they are seriously handicapped. They must be taught each day what they were taught the day before."

Here is but one instance of the conditions which exist in school systems the country over. With classes clogged by a large number of pupils who are deficient, backward, or slow because of poor inheritance, illness, irregular attendance, and the like, how can we expect maximum efficiency from the classroom teacher?

Dr. Bliss, of Montclair, New Jersey, has supplied a graph, Figure 1, showing the teaching load in a certain class before provision has been made for the exceptionally bright children and the abnormally slow. The pupils in this class were measured by the Pressey group test. Doubtful cases were checked by use of Binet and Stanford Revision individual tests. The results show that there are five, if not eleven pupils, who belong in special

classes, children with I. Q.'s below 80 being rated as very inferior. In addition there are three superior pupils with I. Q.'s of 110 to 119 who ought to be given an opportunity for rapid advancement.

FIGURE I—*The teaching load in a class of 42 pupils before provision was made for the exceptionally bright and the abnormally slow.*



Testing 132 kindergarten pupils with the Stanford Revision intelligence test, Dr. Bliss found them divided into groups as shown in Table II. Figures such as these present a strong argument for the measurement of intelligence and the careful grouping of pupils based on the results of the tests.

TABLE II—*132 kindergarten pupils grouped on the basis of their intelligence quotients*

Number of pupils	I. Q.	Rating	Per cent
14	Below 80	Very inferior	10.6
23	80- 89	Inferior	17.4
59	90-109	Average	44.6
22	110-119	Superior	16.6
14	120-140	Very superior	10.6

In measuring the intelligence of large numbers of children the group tests, such as Haggerty, National, or Otis, should be given first. Those pupils who are classified by the group test as very bright or very slow, and those for whom the classification is at variance with the teacher's estimate, should be checked with an individual test, such as Binet or the Ter-

man Stanford Revision of Binet. Dr. Bliss finds that the teacher will agree with the test in about fifty per cent of all cases.

In Montclair, intelligence tests have been used very widely. Of 482 pupils tested recently, 40 were promoted to a higher grade, 17 were demoted, 17 were assigned to special classes, and for 13 pupils schedules were adapted to their needs. A few comments, taken from one of Dr. Bliss' reports, will be interesting.

"Twenty pupils of high intelligence quotients were assigned to a special class in English. This class will try to accomplish the seventh and eighth grade English this year."

"Six pupils were allowed to drop geography and take eighth-grade English."

"A boy in the seventh grade was failing in all his work. Physical age, 11 years 10 months. Mental age, 13 years 5 months. I. Q., 113. It was found that his home conditions had been completely changed. His father was dead and he had been separated from his mother and placed in a home."

"A girl in the sixth grade, aged 11 years 2 months, tested 13 years 6 months, I. Q., 128. She was sent to the Junior High School and was getting high marks at the second report."

"A boy in the sixth grade was estimated inferior by the teacher and mother. Physical age, 11 years 1 month; mental age, 12 years 9 months; I. Q., 115. He was not interested in school; called it 'grindy.' The teacher remarked, 'If he has that intelligence, it's my business to make him use it.' In a month she reported that she had given him a responsible task in a special day's program and he had made good. She had won his interest. The mother is yet to be convinced."

As we study these results carefully we cannot help but conclude that a measurement of teaching efficiency will involve not only the use of achievement tests to test knowledge and skill but also intelligence tests to arrive at some idea of the child's ability to do the work of the school as now organized. At present achievement standards are for the grade only; there are no standards for pupils younger or older than the grade average. A very bright pupil can make the grade average without exerting himself, while a slow pupil, who has worked diligently, may be regarded as a failure because he has failed to reach the grade standard. It is evident that this is unfair to both pupils.

To accept the results of any intelligence test as a final measure of intelligence would be a dangerous practice and would not give children an opportunity to grow and advance. Many tests of intelligence should be given; seldom, if ever, should we rely on the results of a single test. Our man-made measures may be at fault after all. Results found through the use of tests should be carefully checked in practice the following term or year; it is worse than folly to go ahead and do things and not know whether we are right or wrong.

The joint use of intelligence and achievement tests as a measure of teaching efficiency—Until quite recently there has been but little definite rela-

tion between the intelligence and achievement tests and scales. The school product of cities and States has been surveyed through the use of achievement tests alone, and within the last year or two the intelligence of the pupils of whole cities has been measured without any consideration of the achievements of the pupils tested. The results of intelligence testing have been used mainly for the purpose of classifying the pupils into groups—slow, average, bright, and the like, thus indicating the rate at which pupils might be expected to progress through school. The results of achievement tests have been used to evaluate the school product in terms of definite standards, thus determining somewhat roughly the efficiency of pupils and teachers.

The absence of any relation between the two types of tests has been recognized and efforts are now being made by scientific workers in education to interpret achievement scores in terms of mental age, thereby getting another result which has been called the achievement age. The achievement ages are found by giving any achievement test to a group of pupils sufficiently large whose mental ages are known. The median score of say the twelve-year-olds is the achievement age of pupils with a mental age of twelve years. The value of the achievement age is shown in the following illustration. A pupil $13\frac{1}{2}$ years old in the fifth grade in a silent reading test may read at a rate of 148 words per minute, which would ordinarily be considered satisfactory, the median being 148. But in connection with a test in which the achievement ages are given, we find that 148 is the achievement score of a pupil 11 years old. A $13\frac{1}{2}$ -year-old pupil should read at a rate of 174 words per minute. This pupil has therefore apparently not worked up to his capacity. An intelligence test however shows that this pupil's mental age is only 11 years, I. Q. 82. He is therefore achieving as much as he should.

When we have measured a pupil in respect to his achievement in a school subject and his capacity for that subject, the quotient of achievement divided by capacity is an important measure of accomplishment. This achievement quotient is an index of his efficiency. If a pupil with a capacity of 80 makes a score of 80 in arithmetic, the result is very different from a score of 80 by a capacity of 110. In the first place the achievement quotient is 100, in the second it is only 73. The first pupil is working at full capacity, the second at but 73 per cent of his normal ability. If the standard median in such a test is 80, it is apparent that there is no standard of achievement for a pupil with a capacity of 110. The pupil of capacity 110 should be required to do enough more than the average to bring his score up to 110, so that his A. Q. (achievement quotient) would also be at least 100. On this basis when pupils' capacities for different subjects are known, every pupil will be required to maintain his A. Q.'s at or near 100. Unfortunately it is not a simple matter to arrive at achievement ages and achievement quotients; we must therefore depend upon the tables that have been prepared by those who have tried to correlate the two kinds of tests.

It is possible to use to advantage the results of any intelligence test and

any well-standardized achievement test. By arranging the standard mental ages and the standard achievement scores according to grades a graph may be drawn showing roughly the achievement ages of any pupil. For example, Angelina Delvecchio is a normal girl in fifth grade, 11 years of age, mental age 11 years, I. Q. 100, who entered public school in 1B grade, left in 2B, attended a parochial school where Italian and religion are emphasized, returned in 4A, and is now a member of a very slow class, whose median mental age is 8 years, 8 months, or 2 years below standard. Her work in reading, writing, spelling, and composition is decidedly superior, reaching 8th grade ability in comprehension and spelling. Her general ability in arithmetic is normal as shown by Monroe's General Survey in Arithmetic, yet her work is of only third and fourth-grade ability as is shown by the Curtis Tests in Fundamentals. This is partly accounted for by the fact that the more difficult work in fundamentals was not emphasized because of the low mentality of the class. Secondly, the course of study no longer requires emphasis in the fifth grade on examples as difficult as those which make up the Curtis tests. The low scores in States and cities may be accounted for in the same way. The girl is temperamentally a good student.

Such a record card for every pupil in the school would be of great value. At a glance the pupil's standing in all subjects may be known. By comparison with the year of the pupil's mental age, one can see whether the pupil is working at full capacity. Furthermore, one can state roughly the pupil's achievement age in any subject. In reading it is about 13 years 6 months; in writing, 13 years 6 months; in spelling, 14 years; and so on. With special instruction in arithmetic for a few weeks, this girl could probably skip a year. Her I. Q., however, if correct, would indicate that she is in about the right grade for her age. Several mental tests, particularly an individual test, might show a much higher I. Q. By arranging the achievement ages for each pupil horizontally a summary record sheet for a whole class may be easily prepared.

One of the best tests now available in which the intelligence and achievement scores of pupils have been closely correlated is the Illinois Examination. This Examination, Form II, was used to discover the difficulties involved in teaching the 5B grade mentioned in Part I. The examination was given to 41 pupils on the 26th of January, 1922, with results as shown in Table III.

TABLE III—*Class record of 5B grade showing mental ages and intelligence quotients; also achievement ages and achievement quotients in arithmetic and silent reading*

	Mental Age		Arith. A. A.		Silent Reading A. A.			I. Q.	Arith.	Silent Reading. A. Q.		
	Yrs.	Mo.	Yrs.	Mos.	Ave.	Comp.	Rate		A. Q.	Aver.	Comp.	Rate
Median . .	8	8	9	6	7-9	8-0	7-6	74	117	94	100	89
Standard.	10	8	10	11	11-2	11-6	10-10	99	102	105	108	102

Table III is to be interpreted as follows: The average mental age of the class is 8 years, 8 months, as compared with the standard age for a fifth grade class of 10 years, 8 months. The average arithmetic achievement age of the class is 9 years, 6 months, as compared with the standard of 10 years, 11 months. The average I. Q. of the class is 74, while the standard is 99. The median A. Q. of the class in arithmetic is 117 as compared with the standard A. Q. of 102. The median achievement quotient in comprehension is 100 as compared with the standard A. Q. of 108. All other figures are to be compared in similar manner.

The range in physical age for this class is 9 to 14 years, with a median age of 11 years, 6 months. When this median physical age is compared with the median mental age of 8 years, 8 months, it shows under what difficulties the teacher has been struggling. The median intelligence quotient of 74 also shows the inferior mentality of this class. Yet the achievement quotients of 117, 94, 100, and 89 compare favorably with the standards of 102, 105, 108, and 102.

Grouping these pupils according to their mental ages the composition of the class is as follows:

	No. Pupils	I. Q.
Feeble-minded	7	Below 60
Borderline	14	60-74
Dull	10	75-84
Normal	10	85-114

In order to reduce the teaching load, the class has now been reclassified and 13 with the lowest ratings have been assigned to an opportunity class where they will be given every advantage to gain the next grade. This however is probably impossible, as the mental ages of most of these pupils are the ages of pupils of a strong third-grade class. A number of them will later be placed in special classes which are maintained for those mentally deficient. Those rated as feeble-minded have been given the individual Stanford Revision test without any change in classification.

Achievement quotients are valuable measures of teaching efficiency. A quotient of less than 100 indicates less than average efficiency. A quotient greater than 100 indicates superior efficiency. In the distribution shown in Table IV the median score in reading indicates average teaching efficiency; in arithmetic, superior teaching efficiency.

TABLE IV—Distribution of 5B pupils on basis of achievement quotients

Quality of pupil achievement	Number of pupils	
	Reading	Arithmetic
Very superior, 165 and above.....	—	2
135-164.....	—	4
Superior, 117-134.....	5	15
Average, 83-116.....	28	20
Poor, 71- 82.....	8	—
Failure, 55- 70.....	—	—
Below 55.....	—	—

A study of this class has been presented to show the necessity for making use of mental ages in interpreting measures of achievement. A rating of a teacher on the basis of the achievement scores given in Table I would be unjust. It is only through the joint use of intelligence and achievement tests that the true success of the teacher can be estimated. A reliable measure of teaching efficiency in any school system means a similar study of the work of every teacher.

Summary—1. A measure of efficiency is a measure of results achieved.

2. Achievement results alone are not a safe measure of the efficiency of a teacher, a school, or a pupil.

3. The mental ages of pupils are valuable for purposes of classification.

4. Mental ages are of further value in estimating the efficiency of teaching by indicating the capacities of pupils to do the work of the school.

5. If pupils are to be kept working at the maximum of their capacity to learn, provision must be made for the conversion of achievement scores into achievement ages.

6. Achievement quotients, or A. Q.'s are indices of teaching efficiency. A. Q.'s above 100 indicate superior efficiency, those below 100, less than average efficiency.

7. Scientific education requires that A. Q.'s be recorded year by year for each pupil in all subjects.

ACCOMPLISHMENT QUOTIENTS AS AN AID IN DIAGNOSIS

RENA C. STEBBINS, CITY NORMAL SCHOOL, ROCHESTER, NEW YORK

In connection with the City Normal School, we have an elementary school of about nine hundred children. These pupils are taught by skilful "critic" teachers, aided by normal school students who obtain their practice in teaching in our grade school. The inexperience of the student teachers is, we believe, more than offset by the superior ability of the "critic" teachers and by the close supervision of all student teaching by the "theory" instructors. So the children in our school are probably better taught than is the average child.

Need of educational tests—On the other hand, the pressure for time, the prominence given to special subjects, the importance attached to the "development" of subjects, the large number of visitors, all tend to increase the amount of informational and inspirational teaching, and to decrease the amount of drill in fundamental skills of education. There is a danger that the teacher in the City Normal Elementary School is giving her pupils an education that is extensive, but not intensive.

Any teaching that neglects training in fundamental skills of education is weak. To be sure that our pupils are making normal progress in acquiring these skills, we have made constant use of educational tests. Only by com-

paring the attainments of our children in reading, writing, arithmetic, and spelling, with some concrete standard or norm, can we be sure that we are giving them the necessary tools for acquiring more knowledge. Moreover, to measure the teacher's efficiency in securing results in these skill subjects, educational tests to us are indispensable.

Unfairness of educational tests—When the examiner has finished giving a battery of educational tests, he has two groups of data to offer to the principal—first, a record of our grade norms in comparison with standard norms, showing what grades have central tendencies above, equal to, or below standard; second, individual scores for each pupil. And as the examiner gives this record to the principal, he is struck with the unfairness of it all—its unfairness to the teacher, because the records show only how her grade compares in measurable educational abilities with other grades in the country, without taking into account the pupil; material with which she worked; its unfairness to the pupil, because it gives to those above the norm a high rank and praise, and to those below the norm a sense of failure and blame, without taking into account the native capacity or intelligence of these children.

Those interested in educational testing have long realized that the valuable and fair testing program will be one in which the results of educational tests are compared not alone with the norm, but with the results of mental tests of these same children, in which we measure both teacher and pupil not merely what the child has learned, but by what he has learned in relation to what he is capable of learning. In April, 1921, the City Normal School began its study to find some method of combining intelligence and educational test results so as to measure fairly both its teachers and its pupils. This need for a fair combination has long been felt. The method has been the chief difficulty. Several different lines of approach to the problem have been taken in various parts of the country. In Rochester we have chosen the method which follows because of its simplicity, its fairness, and its possibilities for interpretation.

The field of our experiment—Because of other testing projects in the first three grades, we limited our work to grades four through seven. Each year of work in our school is divided in two, and promotions are half yearly. The first half year in each grade is designated by B, the second half by A. Not only are there B and A grades for each year, but in every grade there are two parallel classes, one composed of brighter children, one of slower children, classified on the basis of teachers' judgments. Thus there are in the fourth grade:

- 4B₁—First half of Fourth Grade, brighter pupils
- 4B₂—First half of Fourth Grade, slower pupils
- 4A₁—Second half of Fourth Grade, brighter pupils
- 4A₂—Second half of Fourth Grade, slower pupils

In the four grades studied, there were in all sixteen classes, taught by fourteen well-trained teachers.

Selection and administration of tests—Since the purpose of our study was to find a wider and fairer use of educational test results, rather than to find valuable new tests, we chose only well-known, widely-used tests, whose value had already been clearly demonstrated. We also chose tests only in fundamental skill subjects, since in our school the danger of under-teaching lies here. The tests chosen were:

Mental

National Intelligence Test, Scales A and B, Form 1

Educational

Reading—Thorndike-McCall

Woody Addition Scale A

Arithmetic Processes—Woody Subtraction Scale B

Woody Multiplication Scale A

Woody Division Scale A

Problems—Buckingham Problem Scale

Spelling—Ayres (in lists)

Monroe Timed-Sentence Spelling Test

The group mental tests were given by Miss Leila Martin, Director of the Child Study Bureau of Rochester, under uniform and excellent conditions. The educational tests were all given by one trained examiner under uniform testing conditions, and all corrections, tabulations, and statistical work were done either by this examiner or under her personal supervision. Because of this great care in the administration of the tests, we feel that mechanical error has been reduced to a minimum, and that conditions warrant a close comparison between grades.

The scores—When the tests were given, we had scores in two groups of intelligence tests and in seven educational tests for each child. The typical record for each child follows:

A. J.—Age 10 years 3 months

	Score
National Intelligence Test—Scale A	94
National Intelligence Test—Scale B	98
Thorndike-McCall Reading Test	46
Woody Addition Scale A	28
Woody Subtraction Scale A	23
Woody Multiplication Scale A	27
Woody Division Scale A	24
Buckingham Problem Scale	6.46
Ayres Spelling Scale	77
Monroe Time-Sentence Spelling Test	42

One glance at this record makes the difficulty apparent. When these scores are given to the teacher, they are valuable only in so far as she may compare them with scores of other children in her grade. This comparison

she had already made, however, long before we gave the tests. A more concrete comparison she cannot make. If these scores should ever be given to a parent, he would get almost no information from them, except the judgment that he, who used to be "good in reading," has a child who "stands 46." Even the examiner himself cannot interpret or compare results based upon such varying criteria without further work. Clearly, before we can study the relation of the child's educational achievement to his mental capacity, we must reduce these unrelated scores to some comparable unit.

The method of composite scores and the method of composite ranks seem to yield results less capable of interpretation to the average teacher and parent than the method of the educational age.

Mental and educational ages—In the field of intelligence tests, all efforts to substitute scores, percentiles, intelligence indices, and the like, for Binet's and Terman's contributions of the mental age (M. A.) and the intelligence quotient (I. Q.) have failed. The layman understands M. A. and he wishes the results of the intelligence test stated in terms which he can comprehend. In the field of educational measures, if we could give both the teacher and parent in the case of the child mentioned above, instead of a group of scores, a statement like this, "The child reads as well as the average child of 11 years 6 months; in addition he does as well as the average child of 11 years 10 months; in subtraction, 11 years 6 months; in multiplication, 12 years; in division, 11 years 10 months; in problems, 12 years; in list spelling, 12 years 4 months," we would make test results immeasurably more valuable to teacher, pupil, and parent. This is what we have attempted to do with the scores obtained in our study.

The transforming of National intelligence scores into mental ages was simple. Using the age norms given by the National Research Council, we interpolated for months, forming an age-score table as follows:

TABLE I.—*Provisional Age Standards, National Intelligence Test—Scale A—Form I.*

Yrs.	Mos.	Score	Yrs.	Mos.	Score	Yrs.	Mos.	Score	Yrs.	Mos.	Score
8	0	65	9	0	78	10	0	91	11	0	103
8	1	66.1	9	1	79.1	10	1	92	11	1	103.8
8	2	67.2	9	2	80.2	10	2	93	11	2	104.6
8	3	68.3	9	3	81.3	10	3	94	11	3	105.5

From these tables we read the mental ages which correspond to the scores on Scales A and B, and averaged them to find the child's mental age. While no one experienced in the inaccuracies of group testing at its best would care to state that this is the child's true mental age, at least it is the mental age which corresponds to his scores obtained on group tests given under the best possible conditions.

Our next task was to transform educational scores into what we have called an educational age. If we say that a child has a mental age of twelve

years when he does as well on a mental test as the average child of that age, then we may say that a child has an "educational age" of twelve years when he does as well on educational tests as the average child of that age. It is clear that, in order to transpose scores into educational ages, the same method of standardization is necessary that is used in finding age norms for mental tests. Large unselected groups of children at each age, taken regardless of the grade in which they are located, should be given the test, and age standards found from the median or mean performance of these children. This has been done in the case of the Thorndike-McCall Reading Scales. In a clear discussion of scale construction Dr. McCall¹ points out how he procured the educational age norms for his ten reading scales. The examiner, by using the table of reading age standard sent with the manual of directions, can find directly and accurately the "reading age" for each child. This has been done with all our reading scores.

Method of deriving educational ages—For the other tests in our study, only grade norms were furnished by the test originators. Our problem was to find some method by which we could use these grade norms given with the tests to find educational ages. We realize that the method we have used has its defects, that it is at best only a makeshift, that it is as accurate as it could now be made, and until test constructors furnish us with age norms, it is the best method for interpreting scores that we have yet found.

Let us take for an example the Buckingham Problem Scale. Dr. Buckingham has found the following grade medians for the end of the term, based on large numbers of pupils tested:

End of	Score
3B	3.66
3A	3.84
4B	4.36
4A	4.74

It is generally accepted by educators, and the 1918 school census reports support the facts, that the standard median ages for the above grades are:

End of	Age
3B	9 years
3A	9 years 6 months
4B	10 years
4A	10 years 6 months

We have said, since the median performance in the problem scale for 3B grade is 3.66, and since the median age for 3B grade is 9 years, we shall

¹ McCall, William A., *Uniform Method of Scale Construction*, Teachers College Record XXII (January, 1921), p. 31-51.

let 9 years be the "problem age" for all children making a score of 3.66 on the scale. Hence we derive the following table:

TABLE II.—*Age Standards for Buckingham Problem Scale*

Score	Age		Score	Age		Score	Age	
	Yrs.	Mos.		Yrs.	Mos.		Yrs.	Mos.
3.66	9	..	5.86	11	..	7.89	13	..
3.84	9	6	6.13	11	6	8.15	13	6
4.36	10	..	6.46	12	..	8.27	14	..
4.74	10	6	6.61	12	6	8.56	14	6

By interpolating for months, we found the complete table, and from this table we read our scores in terms of problem ages. This same method was used in finding age tables for each scale used. With the spelling scales, we were limited by the fact that the scales do not run continuously through the grades. In the Ayres' list it was necessary to make a separate table for each column, using Ayres' standard per cents for each grade. In Monroe's timed-sentence test, we made a separate table for the test for grades 3 and 4, for grades 5 and 6, and for grades 7 and 8.

When we had secured an educational age for each child in each subject tested, we wished to find the arithmetic mean of these ages to procure an average educational age. There were, however, four tests in arithmetic processes and two in spelling, as against one test in reading and one in problems. We wished our mean to give equal value to skills in each subject. It was necessary, therefore, to weight the reading age by four as a multiplier, the Woody ages by one, the problem age by four, and the spelling ages by two each, in order to equalize their value. This was done in every case except in the two spelling ages. Although we considered spelling ability as important as the other abilities, we felt that our spelling ages were not reliable enough to warrant equal weighting with the others, and we decided to weight each spelling age by one only, thus giving only half value to spelling.

TABLE III.—*Chronological, Mental, and Educational Ages of Six 7A Pupils Selected for Showing Interpretative Value for the Child of the Several Measures Presented*

Pupil	C.A.	M.A.	Read.	Add.	Sub.	Mul.	Div.	Prob.	S.Sp.	L.Sp.	Mean	I.Q.	E.Q.	A.Q.
D. M. . . .	13-8	11-2	10-10	12-4	13-3	13-2	13-11	12-10	10-10	10-3	12-0	82	88	108
F. Z. . . .	12-8	16-8	13-11	11-8	12-7	11-5	11-10	14-11	13-9	12-6	13-6	132	107	80
E. D. . . .	13-9	13-11	12-8	15-1	12-10	13-5	13-5	13-9	14-10	14-2	13-6	101	99	97
G. M. . . .	16-9	9-6	11-3	11-0	11-9	11-7	12-0	12-11	10-10	9-9	11-8	57	70	123
S. R. . . .	13-4	15-7	14-4	14-5	14-0	14-6	14-8	13-9	14-8	13-5	14-2	117	106	91
S. F. . . .	10-4	16-0	15-6	15-5	14-4	14-6	14-4	15-6	15-2	16-0	15-3	155	148	95

Table 2 illustrates the record of the chronological, mental, and educational ages which was made for each of the sixteen grades. A similar tabulation was made for the teacher of each grade for reference during promotion week, as summing up for her in an intelligible manner the results of the educational tests given to her pupils. Compared with the usual method of representing test results, we feel that this summary is far more valuable for diagnosis of individual differences than the usual "scores in order" method.

With our material now in terms of comparable units, we were able to combine the mental ages and educational ages in one measure, the Accomplishment Quotient. The A. Q. is the ratio of a child's educational age to his mental age; it is the summary of what a child accomplishes educationally compared with what he is capable of accomplishing. In the case of a ten-year-old child who is twelve years mentally, but who does as well as the average eleven-year child in his work, his I. Q. is 12/10, or 120; his E. Q. is 11/10, or 110; but his A. Q. is 11/12, or 92. His I. Q. of 120 shows him to be of superior intelligence. His E. Q. of 110 shows that he is doing better work than the average for his age, but it does not show that he is doing as well as he is capable of doing. His A. Q. tells the whole truth—he is accomplishing only 92 per cent as much as he would normally be expected to accomplish, considering his intelligence. We believe that his Accomplishment Quotient is the fairest and most valuable measure now known of the efficiency both of the pupil and of the teacher.

The Accomplishment Quotient and the teacher—From the point of view of the teacher, the A. Q. is the only quotient which takes into account the material with which she is working: (1) For the teacher of slow pupils, the A. Q. interprets fairly the results of her work in relation to the capacities of the children. Her low educational scores may appear high when we compare attainment with native capacity.

(2) For the teacher of bright pupils, the A. Q. interprets the educational results fairly. Her high scores may not be as high as they should be, when compared with the native ability of the children whom she teaches.

(3) For every teacher and every supervisor who is supplied with the A. Q.'s at the beginning of the term, this measure is a protection against injustice. If the class has not been properly taught for two or three years, the A. Q. reveals to the teacher and to the supervisors the handicap under which the new teacher is working. If the class has been unusually well taught for two or three years, the A. Q. reveals the fact and prevents the new teacher from resting too complacently upon the past laurels of the class.

TABLE IV.—Median results of eight tests in the 6A2 grade expressed as per cent of room and results of the same tests expressed in terms of median accomplishment quotients

City Normal School, Rochester, New York, Grade 6A-2

	Read.	Add.	Sub.	Mul.	Div.	Prob.	S.Sp.	L.Sp.	Mean
Per cent of norm.	84.4	97.7	94.8	91.0	97.3	88.4	82.0	73.0	88.4
Median A. Q.	108.0	115.0	115.0	117.0	116.0	117.0	103.0	100.0	111.0

TABLE V.—Results of eight educational tests in sixteen grades in the City Normal School, expressed first in terms of mean per cent of standard; secondly in terms of mean accomplishment quotients for each grade

Grade	7A ₁	7A ₂	7B ₁	7B ₂	6A ₁	6A ₂	6B ₁	6B ₂	5A ₁	5A ₂	5B ₁	5B ₂	4A ₁	4A ₂	4B ₁	4B ₂
Mean per cent of norm.	100	95	103	90	104	88	106	89	103	88	99	85	107	79	116	92
Mean A. Q.	100	108	100	109	109	111	107	102	108	107	114	127	122	121	113	126

An illustration from one grade (6A₂) will illustrate the unfairness of the "score" method of showing results and the fairness of our proposed Quotient method. If we represent the grade medians in each test as per cents of standard scores (see Table 4), the teacher of this grade faces discouraging results. In every test her grade is below the norm. In only three tests is her grade above 95 per cent of the norm. The teacher and the principal realize that the 6A₂ grade is a slow grade, but the record does

FIG. I.—Results of eight educational tests given to a 6A-2 grade in the City Normal School, Rochester, N. Y., expressed first in terms of mean per cent of test norms; secondly in terms of median Accomplishment Quotients.

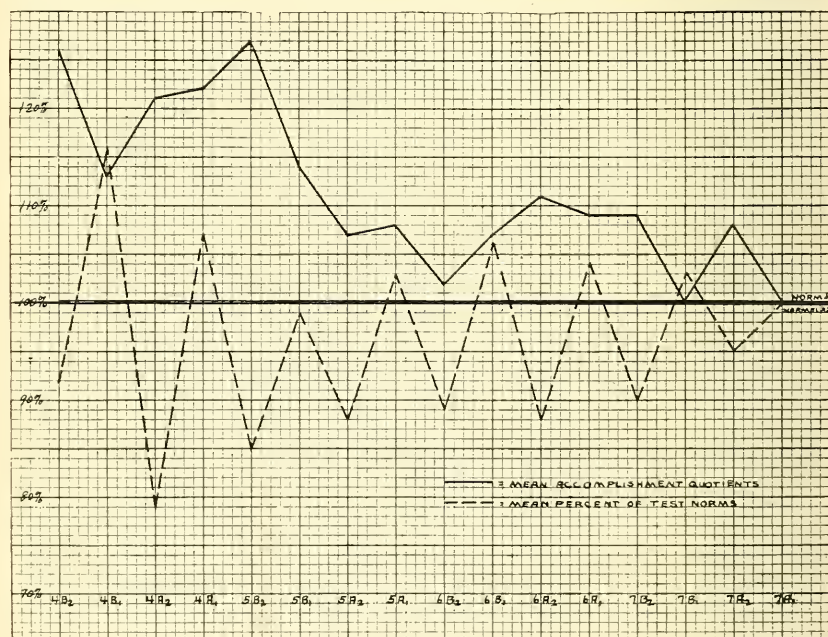


not acknowledge that fact. If, however, we represent these results not as per cents of norms, but in terms of median accomplishment quotients in each test (i. e., the median of the educational ages in each test divided by the median mental age), notice how this grade shifts (see Figure 1). In

every test this grade is doing as well as or better than might be expected from its mentality. This teacher should not be discouraged but encouraged by the excellent progress her children are making in skill subjects in the light of their mentality.

The facts of a grade are consistent for the entire school. Table V shows the average results of the eight educational tests in each grade, expressed first in terms of mean per cent of grade norms; secondly, in terms of the mean accomplishment quotients. Figure 2 shows these results graphically. In every case the duller section of the grade presents a discouraging showing as to educational test results alone. All but one of the brighter sections is above standard in the tests. But when we take into consideration the mentality of these grades, and represent the results in terms of average accomplishment quotients, as shown by the upper line in Figure 2, we find that the teachers who seemingly are doing the best work are those in charge of the slower groups. Two dull sections are achieving over 125 per cent of what might be expected from them. The 4A₂ and the 5B₂ grades, the two grades whose medians were lowest in the school, are accomplishing 121

FIG. II.—Results of eight educational tests given to 359 pupils in sixteen grades in the City Normal School, Rochester, N. Y., expressed first in terms of mean per cent of test norms; secondly in terms of mean Accomplishment Quotients.



per cent and 127 per cent, which is more than might be expected from their mental ability. This is the true measure of a grade's achievement—not how much can it score, but how much can it achieve in relation to its ability?

Interesting facts revealed by Figure 2 are that the lower grades in our school seem to be more efficiently taught in these skill subjects than the upper grades, and that all grades in the school are accomplishing as much or more than might normally be expected from their mental abilities.

TABLE VI.—*Median I. Q., E. Q., and A. Q. for All Grades in Rank Order*

Rank	I.Q.	E.Q.	A.Q.
1	7B ₁ -103	4B ₁ -107	5B ₁ -127
2	7A ₁ -101	6A ₁ -105	4B ₂ -126
3	6A ₁ - 98	7B ₁ -103	4A ₁ -122
4	5B ₁ - 97	5B ₁ -102	4A ₂ -121
5	4B ₁ - 96	4A ₁ -102	5B ₁ -114
6	6B ₁ - 94	7A ₁ -101	4B ₁ -113
7	5A ₁ - 94	5A ₁ -101	6A ₂ -111
8	6B ₂ - 93	6B ₁ -100	7B ₂ -109
9	5A ₂ - 90	5A ₂ - 95	6A ₁ -109
10	4A ₁ - 85	6B ₂ - 94	7A ₂ -108
11	7A ₂ - 84	5B ₂ - 92	5A ₁ -108
12	7B ₂ - 84	7A ₂ - 90	6B ₁ -107
13	6A ₂ - 81	7B ₂ - 89	5A ₂ -107
14	4A ₂ - 74	6A ₂ - 89	6B ₂ -102
15	4B ₂ - 72	4A ₂ - 89	7A ₁ -100
16	5B ₂ - 69	4B ₂ - 89	7B ₁ -100

Table 6 represents a summary of the median I. Q.'s, E. Q.'s of the sixteen grades in order of their rank. The brightest grades tend to have the highest educational age, but they tend, after all, to be the laggards, for it is the duller grades that have relatively superior performance. It is this information yielded by the accomplishment quotients that makes the standard testing in our school this past year a real and fair measure of the teachers' work in these subjects tested. For the first time teachers and pupils in dull grades have received the credit due to them. For the first time the actual efficiency of the brighter grades can be compared with that of the slower grades. Principals, supervisors, and teachers find satisfaction in such results.

While this year our Accomplishment Quotients are not an entirely just measure of the teacher's efficiency in these eight phases, since they do not take into account with what quotients the grade came to her, they are valuable in revealing the results of one year under her teaching, and in another year, we feel, a similar record will show very fairly the teaching efficiency of every teacher in these skill subjects.

We have confined this paper to a discussion of accomplishment quotients in their relation to the teacher. It does not lie within the scope of this article to discuss the equally valuable use made of our data—namely, the individual diagnosis of pupil efficiency on the basis of A. Q.'s, and the reclassification of our pupils on the basis of our combination of educational and mental tests. Here, we feel, the A. Q. has been equally valuable and fair.

In conclusion, then, may we state our faith? We believe (1) that standard test results alone are not a fair measure of a teacher's efficiency in the subjects tested; (2) that a fair measure must consider the results of her teaching in relation to the mentality of the pupils; and (3) that the Accomplishment Quotient is the fairest measure of the teacher's and pupil's efficiency in the subjects tested, because it exacts from every pupil and every teacher results in proportion to the native capacity of the pupils.

CHAPTER III

FOLLOWING UP THE INTELLIGENCE TEST

INTELLIGENCE TESTS AS A BASIS FOR CLASSIFICATION

CORA CAMPBELL, PRINCIPAL OF THE BANCROFT SCHOOL,
KANSAS CITY, MISSOURI

A few years ago all of the elementary schools of Kansas City were organized along traditional lines. Classes were promoted as wholes from grade to grade, little or no effort being made to secure homogeneous groups. On the contrary, each teacher was given her share of "undesirable" pupils. No teacher was willing to have a room full of slow pupils, because each teacher felt that she was expected to bring her class up to standard in every respect. "Besides," she said, using the old arguments, "the bright children are an inspiration to the dull ones; slow children gain great benefit from association with children who can think more quickly, and talk more interestingly than themselves." The teacher looked upon her brighter pupils as the pace-setters for the class, and labored long and faithfully to speed up her slow ones, and brighten up her dull ones, so that her class might rank as high as the class of her fellow teacher.

The exceptionally bright child's right to special attention received no recognition. He would get along very well anyway, he would always make a creditable showing, why should the teacher worry about his progress? Occasionally, indeed, the teacher found a child of such active mind and body that she could not keep him busy; such a child she "specially promoted" to a higher class. This, however, frequently proved to be an unsatisfactory method of acceleration, because in the promotion, topics were "skipped" which were necessary parts of the foundation for higher grade work. These special promotions, therefore, were not regarded with great favor and were not nearly so frequent as demotions.

Gradually, the feeling grew in Kansas City, as elsewhere, that neither the very bright child nor the very slow child was being given a square deal. The bright child's time was being wasted, he was bored or in mischief while waiting for slower children to comprehend points that he had grasped at once. Drill, repeated for the laggards, was deadly dull for him. Never did he have enough work to call forth his best effort, and bad habits of thinking and of working naturally resulted.

The slow child, on the other hand, was hurried along, half comprehending, until the work became too difficult for him even to attempt, then he became a failure and a repeater, or left school altogether.

Attempts to remedy these evils resulted in reorganization of classes into more homogeneous groups. I shall describe the beginning made in one elementary school in Kansas City, the Bancroft.

It was not the desire of the faculty of this school suddenly to overturn the established organization of the school. Violent revolutions in school policy are apt to arouse so much suspicion and opposition that only disaster can result. It seemed wiser to proceed slowly and to be sure of each step than to attempt so much at one time that mistakes were inevitable and failure almost sure. Our readjustment, therefore, began at the bottom with the beginning pupils.

Classification—On the first day of school in September, 1920, the first-grade children were divided into two groups. Group I consisted of children who had had a full year of kindergarten experience and who were considered by the kindergarten teacher to be strong pupils. Group II was made up of all average or poor pupils who had attended kindergarten for a full year, and of all first-grade pupils entering Bancroft school for the first time.

During the first two days of school, the kindergarten and first grade classes became so crowded that it was decided to form a third first grade group composed of (a) pupils who had attended kindergarten for half a year but were not yet six years old, and (b) the least mature children of Group II. No children are admitted to first grade under six unless a mental test shows their mental age to be six or more years.

We had then in first grade these three groups: (1) A strong group of six-year-old children; (2) an average group of six-year-old children; and (3) a mixed group, most of whom were under six.

During the first ten days, all of the children of Group III were individually tested by the Terman revision of the Binet test. The testing was done by a kindergarten teacher who had made special preparation for the work, by study with Dr. Schwegler, of Kansas University, and with Dr. Dickson, of Berkeley, California. After the test, thirteen of the five-year-olds were returned to kindergarten for another half year. The other eleven, who were chronologically under six years, were considered mature enough to remain in first grade.

Individual testing was continued with the other groups, and adjustments made as rapidly as wrong classifications were observed. By October, we had three fairly homogeneous groups of first-grade pupils:

	Average Chron. Age		Average Mental Age		Average I. Q.
	Yrs.	Mos.	Yrs.	Mos.	
Group I—43 pupils.....	6	4½	7	3	114
Group II—36 pupils.....	6	4	6	7	104
Group III					
(a. 11 pupils.....)	5	9	6	7	114+
(b. 11 pupils.....)	6	3	6	2	95

The distribution of I. Q. in these three groups was as follows:

TABLE I—*Distribution of groups by percentages according to intelligence quotients*

Group	Below 100	100 to 110	111 to 120	Above 120
I.	2.3 ¹	28.0	58.0	11.7
II.	19.4	80.6	0.0	0.0
III(a.)	0.0	44.4	55.6	0.0
(b.)	91.0	9.0	0.0	0.0

¹ One pupil chronologically eight years old.

With few exceptions, this grouping was kept during the first half of the school year, new pupils being tested as they entered, and placed in the classes where they seemed best to fit. The teacher of Group III was able to give individual help not only to her own slowest pupils, but to a number of backward children in Group II.

Progress of the groups—It was not expected that the three groups would accomplish the same amount of work. No definite changes had been made in the content of the course of study for any group; but adjustments to the needs of the children were left largely to the three first-grade teachers. These teachers were fortunately alive to the situation, deeply interested, and anxious to coöperate with each other, with the principal, and with the primary supervisor.

From the first, it was thought that Group I would do more work than either of the other groups, because they were mentally mature for first grade, and all had a background of kindergarten experience. No pupil of this group failed during the year. All except those transferred to other schools were promoted in June, 1921, to second grade—a strong, self-reliant, enthusiastic class, a class that had, all year, kept the teacher busy keeping them busy. These pupils did more reading, both oral and silent, more writing, more drawing, more dramatizing, more hand-work than either of the other groups. They wrote letters to absent classmates; they followed written directions for study and hand-work, they made booklets of free cut-outs and stories which they wrote about their pictures. The quality of all this work was above the average for first grade. Their health was good; there was very little absence. Parents were constant visitors, interested and eager to coöperate.

Group II was a more irregular group. Some of the children had attended kindergarten in Kansas City or in other cities; but many of them were entering school for the first time, without kindergarten experience. All were six years of age or older. They were slightly inferior to Group I in mental ability; they were quite inferior in attitude toward school.

This indifferent attitude was found also in the parents of these children; probably the parents' lack of interest accounted for the children's lack of response. Many of the children were frail, physically, and the attendance

was not as good as in Group I. Six pupils failed during the first half year. The teacher gave the following reasons for failure:

- One pupil, I. Q. 99, irregular attendance
- One pupil, I. Q. 100, irregular attendance
- One pupil, I. Q. 96, poor health: Adenoids and bad tonsils
- One pupil, I. Q. 108, absence caused by illness
- One pupil, I. Q. 102, no English at home
- One pupil, I. Q. 101, lack of response, indifference

All of these six repeated the first half-year's work during the second semester, the remainder of the group completed first-grade work and were promoted in June to second grade.

Group III contained two divisions: (a) Eleven children who had attended kindergarten only half a year and whose chronological ages ranged from 5 years 8 months to 5 years 11 months, but whose mental ages ranged from 6 years to 7 years 4 months, and (b) a slow group, all of whom needed special help and special care. The plan with Group III was to allow them to do all the work that they could do easily, but not to crowd them. Section (a) however, was so alert and eager that every one did a full year's work with no apparent strain, and all were promoted in June to second grade. Of the slow section (b), five completed first grade, three left the city, two were absent much and hence completed only half a year's work, one, who was chronologically 6 years 1 month old in September, but only 5 years 6 months mentally, failed all year.

Thus, of the 102 tested in September, nine failed to do a full year's work. Eight of these nine, however, did complete a half year's work and were in June promoted to A class of first grade. Only one pupil failed both half-years; a child whose I. Q. is 90 and whose M. A. in September, 1920, was 5 years 6 months, and who came from a very poor home. It must be admitted that this per cent of failure is very low for first grade.

Attitude of teachers and parents—The teachers of these groups were and still continue to be enthusiastically in favor of grouping according to ability. The teacher in charge of the very slowest group exclaims, "Why, see the way Rose developed! I never could have interested her if she had been with the children of Group I." Rose's I. Q. is 84.

The children are happier in such classes, because the work is suited to their ability; the slow ones do not experience failure every day, their work is not compared with that of children who far excel them. The bright ones are happy, because they are busy, which they cannot be in a class of "average" or slow pupils.

Parents, we find, are satisfied if their children are happy and interested. Not one complaint was heard from parents in regard to this first-grade classification.

The further progress of these groups during the first half of their second year, which is just completed, fully justified our classification.

Group I is still a happy, eager class, growing in civic spirit and in unselfishness as they grow in knowledge. They are very busy and always interested, they read and reason as well as ordinary third-grade classes do.

The youngest children, those of Group III (a) are mastering second-grade work with as much zeal as they showed last year.

The slowest children are plodding along at their own pace and forming habits of steady work, even if it is slow work.

We intend, therefore, to continue such classification, by individual tests given during the kindergarten year and the first part of the first grade, and by group tests given from time to time as the children progress through the grades. These test results, combined with other factors, such as health, attendance, school attitude, and the like, should furnish us data for the classification of each child, so that he may work with the group with which he can work best.

USING THE RESULTS OF TESTING

JESSICA MARSHALL, PRINCIPAL OF THE NEWTON SCHOOL, TOLEDO, OHIO

The combined use of intelligence and educational tests is of twofold benefit to principals:

1. It has awakened us to the fact that the greatest problem in our work today is that of individual differences among the children of any school group.

2. It provides us with a scientific means, from which the old hazard of opinion has been eliminated, for measuring the degree of success with which we are solving this problem by giving to every child the type of education best suited to his needs.

Tests Applied to the Problem of Individual Differences

In October, 1920, Newton School, Toledo, was selected by Dr. Goddard, of the Ohio State Bureau of Juvenile Research, as one of the schools to be used in making a survey of public education in this State.

The examiner sent by the Bureau gave the pupils four tests, a non-language intelligence test with a corresponding educational test, each arranged by Dr. Rudolph Pintner, of the Psychological Department of the Ohio State University, an Army Alpha, and a literacy test. The two tests prepared by Dr. Pintner were those upon which the success or failure of our work was to be estimated, the others being used as a basis of comparison. These tests were given to about six hundred children in the second to eighth grades, inclusive.

The intelligence and educational tests are designed to show (1) the relation between each pupil's intelligence, or his capacity to learn, and (2) his knowledge or what has actually been learned. The tests also show the great overlapping of abilities and attainments in each group. There has been no effort to measure such qualities as perseverance, honesty, or desire

to coöperate, which are also important factors in learning; "but it is probable that the ability to form these desirable traits of character is itself largely dependent upon the degree of intelligence and capacity to change with which a child is endowed." On the other hand, educational tests when used alone merely establish a comparison with other pupils of the class, or with the grade norms. There is really no other fair way to measure the work of a child than that of estimating his achievement in terms of his capacity to learn.

According to the score on the intelligence test each child is classified as very bright, normal, backward, or dull, while according to the score on the educational test he is rated as very good, good, average, poor, or very poor. The comparison of the two scores then shows whether the pupil is doing as much, more, or less than is to be expected of a child of his mentality.

The findings in the Newton survey showed that in the case of 53 per cent of the pupils the mentality and attainment were very closely correlated, while 14 per cent were doing less and 33 per cent more than the average child of the same mental level.

The most reassuring fact brought to light was that most of the failures were in the lower grades, the number constantly decreasing up to the eighth, where there was but one whose educational rank was below that of his intelligence. On the whole, the report was very satisfactory, but the present study of individual differences is establishing new standards of success, and our aim now is to study the abilities and characteristics of each pupil and adapt the work to his particular needs.

Fortunately, teachers are no longer forced to be solely responsible for an estimate of what each child's particular needs may be, for a large number of standardized tests can be brought to their aid in determining this question.

The tests used at Newton School showed that our greatest need was for regrouping. The regular division of classes showed a scattering of abilities ranging over eight years of school work if expressed in terms of grade norms, and over ten years in mentality if expressed in terms of mental age. Pupils of the same mental age were likewise found to be in widely scattered groups; for example, pupils testing nine years mentally being found in every grade beginning with the second up through the eighth. The chronological age of the mental nine-year-olds also varied from seven to fifteen.

It was then seen that the results on the intelligence tests alone could not be used as a basis for regrouping, especially as one test will not always place them in the same class that another might.

Regrouping in the upper grades—To get more light on the subject of regrouping, standardized tests in various subjects were next given. In this way we were able to diagnose more accurately the particular points of divergence. The tests given included those of Gray, Monroe, Ayres, Courtis, Von Wagenen, and Woody-McCall. These tests in specific subjects, like the intelligence tests, showed a very great scattering in ability among the

pupils of the same grade. In addition they proved that it was very rare for any pupil to be altogether good or altogether poor in scholarship. Nearly every child had at least one subject in which he excelled and one in which he encountered difficulty.

It was therefore determined that the groups should vary according to the subject and that the division should not be hard and fast, but so arranged that a pupil might at any time be changed from one class to another if his work showed sufficient improvement. This adjustment is virtually an experiment in remedial work, and is made possible by a modified use of the platoon system.

A follow-up system is now being worked out to meet the needs of the new groups along the lines given below: (a) Development of special types of remedial work; (b) study of minimum essentials; (c) consideration of methods of measuring progress; and (d) study of the means of making more complete use of special talents.

Types of remedial work—The goal of the remedial work is reached when the attainment of the child is brought up to a point commensurate with his ability. His present rating is given by the tests.

A series of close case studies was started in order to make a better estimate of the improvement that might result if the instruction were more exactly fitted to the individual, and also to determine, if possible, the rate of advance that might be expected from a child of normal ability as compared to one whose rating was less than average. In working along this line it has been our good fortune to come under the direction of Dr. William S. Gray, of Chicago University, who has selected a few pupils from Newton School as subjects for special training in reading.

Each pupil's ability to read is measured by a series of tests until the cause of every difficulty has been disclosed. The outstanding defects are then classified and the corrective work directed along the most needed lines.

One of the greatest contributions to scientific remedial work is the series of graded tests prepared by Dr. Gray, which can be given frequently, and the effectiveness of the instruction thus determined.

All the methods that accomplish their purpose in the laboratory of case studies have been found to produce equally good results in the classroom. Our reading in general has been greatly improved by the use of Dr. Gray's system of closer analysis of difficulties and subsequent concentration on points to be improved.

In the case studies a marked correlation has been shown between grade of intelligence and rate of improvement, but there has been no uniformity in types of weakness among pupils of the same mentality, nor have we found any particular point beyond which it seems hopeless to try to advance with the pupils on the lower mental level.

The findings have brought us to the conclusion that individual limitations, though largely matters of heredity, may be overcome to a great extent by improved methods of education so long as "the potentialities of development are found to be so much greater than the actualities."

Another type of remedial work is being prepared for the pupil who is doing excellent work in his grade but is falling short of the work to be expected from a child of his mentality. Case studies have shown that there are possibilities of great increases in attainment, particularly in the upper ranges. However, placing a young child with an older group destroys the social adjustment to such an extent that there is grave doubt as to the wisdom of such an arrangement. An alternative when working with a bright group is to have mental development as an objective rather than the acquisition of facts. Assignments are given that provide "stretching exercises" in the power to select, evaluate, and organize, while many school projects are chosen because of the opportunity afforded for the development of the much-desired qualities of initiative and leadership.

Minimum essentials—After the pupils have been regrouped in accordance with some specific need, the courses of study must be altered to meet the new requirements. The greatest difficulty arises from a lack of courage to cast out things that are not indispensable. As a basis for elimination an effort has been made to take out the various phases of the work which studies in relative difficulty have shown would require an undue amount of time on the program. Development of a good method of attack has often been found to take the place of much detailed work now in the course of study. Drill on only the simplest form of any type work required has also been a help in bringing retarded pupils up to grade without seriously weakening the foundation.

A close study of many varieties of standardized tests gives an insight into the things considered essential in the learning process, and these essentials furnish in turn a scientific basis for the estimate of the value of subjects taught.

One thing is obvious: it is useless to make a diagnostic study of individual needs and then make no differentiation in the curriculum.

Methods of measuring progress—Both teachers and pupils are anxious to have some scientific method of measuring progress, for the age of opinion in education is past.

Of course, the most satisfactory method is by giving those standardized tests which come in a series. Such tests have already been prepared for measuring spelling, reading, and fundamental processes in arithmetic, but their use for frequent testing by the average principal is out of the question because of the cost.

As a substitute for the tests many teachers have prepared specific drills upon which the pupils can easily measure gain, such as that provided by the mastery of "books" of new words added to a child's vocabulary, as suggested by Dr. Gray. These "books" are merely a series of cards upon each of which has been printed a new word with which some child in the class has difficulty. The cards are then flashed before the pupil, and when he is able to recognize every word the book is put away to be used later in review.

Similar drills can be prepared in each subject. Any type of lessons can also be made into a series, provided that they are so arranged as to be graded on points that can be easily recognized by the children.

Giving these lessons at a stated time—as every Friday, every two weeks, or even once each month—makes them still more valuable as incentives. It is desirable that whenever possible standardized tests in specific subjects be given at the beginning and close of each school year. The joint intelligence and educational tests can be given profitably every two years.

Progress on drills and tests can be represented objectively, and individual record and classroom charts have both been found very effective in stimulating the pupils to increased effort.

Making use of the special talents—The constant overcrowding in the school curriculum has resulted in the overlooking of special aptitudes for much the same reason that the dull child has received more consideration than the bright child. That is, the attention has been fixed upon grade standards and not upon individual possibilities. In the rush of work the talents, even when discovered, have often been left to take care of themselves. A study of the economic situation shows the inadvisability of this method, for success in life has been found to depend largely upon the peculiar fitness of a man for his calling.

The use of tests has shown that nearly every child has genuine ability along some line, or, at the worst, finds some line less difficult than the others. Our problem, then, is to provide the environment in which talents will grow. The flexible system of grouping furnishes one means of meeting this need, for a child can be placed in a class which will require the stressing of the talent in order to hold his own. This arrangement is usually of particular benefit to the retarded child, for he is apt to be placed, for a part of the day at least, with pupils of his social age. One of the first responses obtained is that of an increase in happiness, which is essential to growth. The child also learns faster, because he is going at a rate suited to his ability, and this fact encourages him to greater effort.

The bright child who can do things quickly can also be given tasks requiring all his energy, and habits of industry will be developed because he is allowed to work at his maximum speed.

When regrouping is not possible, other means may be found to make use of the talents. Some responsibility for helping a slow student in the class helps in a child's own development, and special assignments often serve to keep the bright child busy and interested.

On the whole, new methods of discovery and encouragement of superior ability are much needed, for when sufficient stimulus is provided the upper limit in attainment is greatly extended even among pupils of elementary-school age, and nothing that gives promise of achievement should be neglected.

Grouping in the first grade—The wide scattering in ability and attainment in the higher classes which was revealed by the tests raised the question as to whether it would be possible, by using improved methods of grouping when children first entered school, to avoid much of the confusion and overlapping that are found in our upper grades today. This need for re-classification is not a local one. Hoke, of Richmond, Virginia, in exam-

ining 743 children from a typical school, found that almost one half of all those tested were above or below normal mental age for the grade; while Garver, in a study made at the University of Pennsylvania, found that in any of the upper grades examined there existed a range in ability to do work according to the grade norm of six or seven grades.

An experimental classification was made in the first grade, based on the standings on an intelligence test prepared for young children who cannot read or write. The test here used was the Pintner-Cunningham test, brought out under the auspices of Columbia University.

The first result hoped for was to establish a rate of progress, each group being allowed to work at maximum speed. At the end of the first semester the best group had completed the first-grade course and was ready to start on the second year's work at the beginning of February. The slowest group had taken eleven rhymes, but was doing nothing in writing or spelling and very little in number work. The intermediate divisions were at different points in the course, but both supervisors and teachers agreed that all except the slowest division were ahead of the mixed classes in the city.

However, the most noticeable improvement was not in the greater ground covered, but that above the very slowest division every pupil was sure of every step of the work. The scattering in educational attainments in the upper grades ought, then, to be materially reduced if a satisfactory plan of grouping in the lower grades results in developing pupils who "know what they know."

This experiment seems to indicate that group intelligence tests can be relied upon for the trustworthy placing of individual pupils at the beginning of the school course, and when followed by diagnostically directed teaching may do much toward lessening the variations now found within all school groups.

Tests Used in the Measurement of Teaching Efficiency

The joint use of intelligence and educational tests furnishes the only standard of measuring efficiency in teaching which takes into account the individual differences among children. It places the emphasis on the progress of the child being commensurate with his ability, not demanding a fixed standing for all the pupils of a grade. It also provides an application of the statistical method in measuring teaching success.

An analysis of comparative scores indicates that these tests may be relied upon to show the success of the teaching from the standpoint of the individual taught, and they can also be used to measure accurately the effectiveness of the educational system as a whole. But they cannot be used to measure justly the efficiency of an individual teacher, as the weaknesses brought to light are usually in the line of administrative procedure, or limitations of curricula and time schedules over which the teachers, and sometimes the principals, have no control.

The results of the tests are more valuable when considered as diagnostic rather than as furnishing a means of measuring teaching success. They

also make a trustworthy basis for experimental investigation of the improvement in the effectiveness of teaching due to controlled causes.

One of the most practical uses of the joint tests, from the point of view of the head of an elementary school, is the help given in bringing his specific educational problems clearly before the superintendent and supervisors. This is possible because the findings on the tests can be represented objectively and the standards used easily defined. The wide range in abilities can also be seen at a glance, and the differences may then be provided for by wider range in curricula, smaller classes, more individualization of instruction, or any other readjustment which the superintendent may deem advisable.

Summary—1. The joint use of intelligence and educational tests shows the range in ability and attainment of the various pupils and helps in determining their individual needs.

2. The tests are an aid in solving the administrative problems of classification and grouping.

3. They show the significance of individual differences upon which remedial work and curriculum changes can be based.

4. They furnish the best standard of measuring the success with which the educational system is providing for the fullest development of each individual.

INTELLIGENCE TESTS AS A BASIS FOR RECLASSIFICATION

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After being assigned as Supervisor of the William T. Harris School on West Seventeenth Street, New York City, I felt the need of giving attention to the "educational misfits." This led to a study of the entire problem of grading and classification. In fact, even before the larger problem was considered, studies of individual cases of "misfits" were made.

A psychiatric worker, interested in the boys of our school, undertook this work in order to discover, if possible, the causes of backwardness and conduct, irregularity in the school, and to help in suggesting ways of overcoming these difficulties. It consisted necessarily in as thorough a study as possible of "misfits" and the various elements in their separate problems. The work was begun by interviewing the boys referred to us and getting facts as to their home conditions and their own ideas as to the cause of the difficulty. It was interesting to find how frank they were and how quickly they responded to straight talk, combined with friendliness and concentration, on their problems. One colored boy who had been troublesome in school and on the street gave a clear account of gang organization and the reason why gangs existed. He became a member of the Terman Opportunity Class and did splendidly.

Neighborhood conditions—A further survey of the neighborhood of the school showed the following: an environment that was poor in facilities for proper living or playing; small shops and cheap tenement houses inhabited by longshoremen and other unskilled laborers; several centers for the rendezvous of those who had little regard for law and order and much less for coöperation with such institutions as cared for the proper development of the boys of the neighborhood; parents who understood very little what the school was attempting for the welfare of their boys and who made life for their youngsters not always a bright one; a barren condition so far as socially helpful agencies was concerned.

The school building is about eighty years old, with no school playground—only a basement and the most minute of yards—only one inadequate shop, no assembly-room, and no gymnasium.

Mental survey of school—Traditional methods of reclassifying the boys from kindergarten to 8B grade in order to make for better teaching and healthier adjustments of the individual boy were discarded as having not proved successful in Public School No. 11. Accordingly, it was decided to make a mental survey of the entire school, so as to determine the native capacity of each boy.

The Department of Psychology at Teachers College, Columbia University, was invited to survey the school. The Department of Ungraded Classes of New York City's Department of Education also coöperated in this work, with the thirteen graduate students of psychology working under the immediate supervision of their instructor, Dr. Leta S. Hollingworth. It should be mentioned in passing that each person had had technical instruction in the task which he or she was set to perform, the reliability of the results being thus assured.

The original plan for the survey included the following:

1. Group tests in each grade as indicated in Pintner's Mental Survey because it gives norms of performance, and Public School No. 11 not being a typical school, we would see the abnormality;
2. Individual tests of a large alphabetical sampling of 8B's to determine how much good high-school material there may be in 8B;
3. Individual tests of a large number of problem cases;
4. Measurement of the product of instruction: Reading for the understanding of sentences—Thorndyke; Spelling—Ayres; Arithmetic—Woody-McCall—Mixed Fundamentals; Trabue—Language; and Thorndyke—Penmanship.
5. Study of special disabilities as revealed by discrepancies between mental and educational tests;
6. Sensory examination of a random selection;
7. Motor tests.

The following tasks were, however, accomplished:

1. Group intelligence tests were made of all boys between grades 3A and 8B inclusive by means of Pintner's tests.

2. Group intelligence tests were made in grades 1A to 2B inclusive by means of devices original with one of the graduate students assisting in the survey.

3. Tests of spelling, arithmetic, language, and reading were made.

4. Individual intelligence examinations were given to all boys in grades 8B, with a view to determining the frequency of median high-school intelligence in the graduating class.

5. Individual mental examinations were given to boys between the fourth and sixth grades who ranked at the top in group tests, for the purpose of selecting a Terman Class for the gifted children of the school.

6. Individual mental examinations were given to boys falling lowest in the group tests, and selections were made for membership in the Ungraded Class.

7. Partial case studies were made of some of the problem cases reported by teachers.

Study of results of mental survey—A study of some of the results submitted by Dr. Leta S. Hollingworth indicated the following:

1. The distribution of I. Q.'s in our school gives a curve tending strongly towards subnormality. The school has not its normal share of the gifted children of the city, while it has less than average capacity for learning. The school has a great many boys who need vocational training and who can profit relatively little from following the present prescribed curriculum for eight years of their lives. The modal intelligence of the school lies between 85 and 95 I. Q., whereas in the juvenile population chosen at random the modal intelligence lies between 95 and 108 I. Q.

2. In each class a wide range of intellectual ability was found. In many of the classes the brightest boys were five or six years above the dullest in mental age. This was true despite the fact that the writer had already made a systematic effort to grade the school according to ability as well as can be done by separating the over-age pupils from those who are average or young for the grade.

3. In the graduating or 8B classes a relatively small proportion of the boys gave promise in mental tests of being able to pursue high-school work successfully.

4. Between grades 4A and 6A were found thirteen boys with I. Q.'s of 120 or more. These were selected for a Terman class and several boys between 110 and 120 I. Q. were added to complete the register as required. The most intelligent of these boys stood as high as 146 I. Q.

5. Several children who fell below 70 I. Q. were placed in the Ungraded Class by the Department of Ungraded Classes acting upon the evidence adduced. In a group of 743 boys it was found that only 143 were normal—i. e., their mental age corresponded with their chronological age. Of the remainder, 428 were below normal and 172 were above normal.

Reorganization of the school—Utilizing the findings of the Mental Survey, the school was reorganized to give every boy in Public School No. 11 the opportunity to develop in harmony with his powers and capacities and

with the realization of the localized difficulties and diagnosed capabilities of the boys.

The boys (3A-6B) of chronological ages ranging from 13 to 15 whose mental ages ranged from 8 to 15 were organized into five "opportunity" classes as follows:

	Chronological age	Mental age	I. Q.
Class A.....	14-12	8-9.5	65-85
Class B.....	14-12	8-10	65-85
Class C.....	14-12	9-11	65-85
Class D.....	15-13	10-11.7	70-85
Class E.....	9-11	11-15	112-146

Other special classes organized as a result of the observations and conclusions drawn from the mental survey were: (1) Class for anæmic boys; (2) class for foreigners; and (3) classes for normal boys more homogeneously classified.

Every boy found himself in a class where he seemed to be able to do much better work, and the teacher seemed to have a class which she better understood and led in school activities. Bright, normal, and low mental type, all knew that work was expected of them; work that was rather hard, yet valuable and pleasant—a rather new experience for the smartest boys of the school as well as for the boy of low mentality.

The organization of our classes showed gradual improvement in homogeneity.

	1918—I. Q. Range	1921—I. Q. Range	1922—I. Q. Range
8B-1	115-60	147-85	145-107
8B-2	115-85	111-71	118-91
8B-3 .....	....	....	92-72
8A-1	133-78	145-80	142-98
8A-2	108-67	108-66	110-97
8A-3 .....	....	....	93-71
7B-1	128-64	110-77	139-100
7B-2	120-64	119-74	106-93
7B-3 .....	....	....	90-77

Not only were intelligence-test results employed in the grouping of boys, but their physical and nervous condition as well as the chronological age were considered. The school was fortunate in having a psychiatrist. A certain amount of home visiting was done, and boys were referred to clinics (mental and medical) as well as to various welfare agencies. At no time did parents hinder us. In fact, they were enthusiastic coöperators, knowing, as they soon learned, that we were closely linking school with the life of the boy and developing his capacity for leadership.

CHAPTER IV

THE PROBLEM OF THE INDIVIDUAL CASE

THE INDIVIDUAL CASE—AN ADMINISTRATION PROBLEM

CHARLES C. KRAUSKOPF, PRINCIPAL OF THE VICTOR F. LAWSON SCHOOL,
CHICAGO, ILLINOIS

In inspecting, examining, or administering a graded school, one of the first things to attract attention is the presence, in any group or grade, of pupils who do not fit, who are unable to take part fully in the work of the group. In the past these unfortunates were often slighted or ignored until increasingly rigid compulsory education laws revealed the large number of them who were leaving school with no adequate preparation for life's struggle. Of late years, however, these atypical pupils have been receiving much attention from investigators both in the schools and in the laboratories of schools of education. These investigators have treated these pupils as "individual cases" and have attempted to diagnose and prescribe for them as individuals. In all this work, little or no attempt has been made to solve the difficulties of administration arising from the presence of these children in classes of normal pupils.

It might be interesting to approach this problem from the side of school administration, to outline some of the difficulties encountered by the principal in handling these pupils and to make a few practical suggestions.

In spite of foolish criticism from within and without the profession, the graded school has been a marked success. Further, there always will be certain backward, slow, erratic, unstable, atypical, peculiar, unfortunate children who will not easily fit into any scheme for group work. Teaching a "graded" room is a group proposition. The teacher as leader secures the best results from the reaction of each individual on the group and the group on each individual. If at any time the teacher of such a room is compelled to stop the group work to give special assistance to one or more individuals, she ceases to teach, and the group either pauses in its work or proceeds without a leader while the teacher tutors or coaches the individual case.

Enter, then, the "individual case" as an administrative problem.

This problem, in its statement one of the simplest, is, in its complete solution, one of the most difficult of any with which the administrator has to deal. To the principal of a graded school it is, first, a matter of relieving the graded divisions of individuals who are misfits, and who, as such, interfere with and delay the regular group work of the classes; or, in other words, the task of the partial, temporary, or permanent exclusion from the regular rooms of the "individual cases"; second, a matter of arranging instruction for these excluded pupils which will be more thorough and adequate than that which, on account of their handicap, they can get in the

regular group or grade. It is easy to imagine the beneficent effects on the graded room of the removal of these individual cases, but any plan is a failure that does not give the excluded pupils at least as much as they can secure in the regular room, and no plan is a complete success that cannot show that these special cases receive greater benefit than they did before.

It might be well at this point to consider how this important problem has been received. The actual amount of progress made in its solution has been pitifully small. The interest displayed by the superintendents of school systems in the United States is almost negligible. At the last meeting of the Superintendents' section of the National Education Association only one paper, that of Susan M. Dorsey, of Los Angeles, mentioned the subject, and that address made no analysis and suggested no solution. These superintendents, who are supposed to outline the policies of our school systems, are constantly crying for better trained teachers and better teaching. The attempts made to relieve and help the grade teacher have frequently taken the form of appointing: (*a*) Supervisors of special subjects, who are too often enthusiastic specialists, over-emphasizing subject matter without helping instruction; or (*b*) supervisors of grades, too many of whom are mere peddlers of methods and devices that tend to destroy the initiative and freedom of the teacher and thus deaden the work. But no matter how skilful these supervisors may be, they never can do more than increase the teacher's knowledge and improve her skill as a teacher. In a consideration of "individual cases" it is like trying to overcome friction due to sand in the bearings, by an increase of motive power. The engineer should remove the sand. The administrator is still confronted with the problem of making some additional classification which will relieve the regular classes of the "individual cases" (who hamper group work), and which will also provide special accommodations and special teachers to care for these excluded pupils.

In a way this neglect simplifies the first administrative steps necessary to approach the situation, *i. e.*, the selection of those pupils who are to be excluded from the regular classes. We are at the beginning of the work and the first attack will naturally be with the most obvious cases. These are easily selected. Like "mavericks" in a well-kept herd, they are easily detected even by the uninitiated. To the earnest teacher, busy with her group problems, they bear the same relation to the rest of the class that a sore thumb has to a busy hand, and frequently their presence produces much the same condition as the offending digit. The normal order of the class work is thrown into confusion, and delay and irritation result. Ignoring the irritation, it is easy with these obvious cases to set an arbitrary mark where the delay and confusion due to their presence is great enough to warrant exclusion from the regular classes.

At first thought this might seem a point where the intelligence tests, which have been produced in such quantities by our universities, might be invaluable. There is no wish or intention to flee at the efforts of our co-workers of the schools of education. However, the first care of the

principal, the administrator, the head of a school, is to keep both feet squarely and solidly on the ground. He must see the school as a whole. He must make workable decisions.

The exclusion of these pupils from the regular classes is a *class* problem. Therefore, whatever use may be made of such tests and however illuminating the results may seem in regard to any individual pupil, the best guide in the selection of these obvious cases will be the judgment of the grade teachers who have been, day after day, witnesses of the failure of their struggles to do group work.

The study of the excluded pupil is an *individual* matter and should include every available test, examination, investigation, and observation that can be made and, at least, should include: (1) A thorough physical and medical overhauling; (2) a careful estimate of any difference between intellectual and chronological age; (3) an exact determination of scholastic standing in school studies; (4) an estimate of judgment and ability in every-day matters; and (5) the securing of all available information in regard to home life, heredity, family history, and the like. The more complete the information secured, the more "individual" each case will appear, and the more hopeless will the problem seem. This fact prompts another word of caution. While no item of this information should be ignored, the practical decisions of the principal may, and often will, set aside for a time, apparently sound conclusions of the theorists and experimenters. His task is to produce a workable plan for the handling of these pupils.

In attempting the construction of such a plan for the more obvious cases the following rough groupings may be found useful:

(1) The pupil well advanced in one or more school studies and very poor in others.

(2) He who, apparently competent in every-day matters, finds it difficult to interest himself in intellectual work or school studies.

(3) The delayed pupil, the unfortunate, who, finding himself placed with much younger pupils, resents working with a group less mature than himself.

(4) The backward pupil who acquires knowledge slowly and who loses out in group work on account of lack of mental agility.

(5) Those distinctly below par mentally, a large and varied group often termed subnormal.

(6) The mentally unstable, the erratic, the weak-willed.

(7) The physically handicapped—crippled, deaf, blind, or epileptic.

Other groups or sub-groups may be made as the work progresses.

Where the school is large enough or where a number of schools contribute to a "center," divisions may be formed on the basis of some such practical classification and some little group work may be possible, but for the most part the problem remains one of personal, individual instruction, and this factor governs the size of such divisions. Where, for any reasons, the members of such divisions are markedly disparate in age, normal-grade, mental condition, ten will be none too few for good work, while, under the

most favorable conditions, twenty pupils per teacher is a dead line which is dangerous to approach.

The selection of the teacher for this work is of prime importance. Tact, sympathy, directness, alertness, ingenuity, resourcefulness are only a few of the definite qualities to be hoped for, to which must be added a real interest in, and desire to attempt, such work; nor is superior ability in the group work of the regular grades a certain proof of ability to succeed in this comparatively new field. May the gods be kind to the principal in his search for the next-to-impossible. Having found the teacher, let nothing interfere with the work; let nothing come between teacher and pupil. Supervisors of grade work or special subjects should be absolutely barred. Superintendents, district superintendents, inspectors, might be allowed to visit and observe but had much better be attending to other business. The principal, whose decisions created the division, may well keep his mouth shut and tread softly. It should ever be kept in mind that these pupils are just what the term implies—individual cases—and the instruction is often, nay usually, a pedagogical wrestling match, catch as catch can, no holds barred.

The broad test of the success of such instruction will always remain this: Are these pupils happier, more intellectually alive, progressing more rapidly toward worthwhile citizenship in school and after life, than they could be in the regular grades? The constant application of this test will disclose a vertical cleavage through any strata of classification made for purposes of instruction, and there will be at least three classes of pupils—those partially, those temporarily, and those permanently excluded from normal class work.

An attempt at the handling of the more serious cases of the atypical and unfortunate children may be seen in the special divisions of the Chicago schools. Of the groups listed in the rough classification given above Chicago has partially provided for:

(1) The physically unfit: Rooms for anemic and tubercular, deaf, blind, crippled, and epileptic have been provided. Of the deaf and blind a few have attempted to enter and follow the work of the upper grades and high schools after a course of special instruction, but the vast majority pass to the special state or private schools, or are cared for privately.

(2) The epileptic: This work is still in the experimental stage.

(3) The crippled, anemic, and tubercular: These are cared for in special divisions in quarters especially fitted for their treatment. They are patently surgical and medical cases where instruction either waits on successful medical, hygienic, or surgical treatment, or is modified and specialized to assist the child in overcoming his physical handicap and become self-supporting in spite of misfortune. The mortality is naturally high. A few of the crippled and a large number of the anemic and tubercular recover sufficiently to return to the regular divisions.

(4) The mentally low grade pupils: On account of lack of room only the younger and more serious cases can be cared for. Very few of these become able to carry the grade work, and when replaced in the grades on

account of lack of room, drag along and are later withdrawn from school to enter custodial institutions, or are cared for at home and become a menace to the community as they grow older. For the large number of border-line cases, the ones who might receive the most benefit from special instruction, no provision has been made.

For all the other thousands of individuals who (while not receiving proper attention themselves) are hampering to a greater or less extent the regular work, a few divisions of pre-vocational classes are provided. These classes are so few that only a limited number of the oldest and most backward can be received and attendance is voluntary. The large majority of these children reach these classes too late to derive much benefit from the careful attention and the liberal courses (including much manual work) which they receive. The vast majority leave school and drift into poorly paid, blind-alley jobs, often a prey to the unscrupulous employer and a dupe to the criminal and vicious. Compared to most school systems, Chicago's pitiful attempts to approach this problem stand out as a shining light. The results of these experiments, while woefully meager, give almost certain indication of success if adequate facilities could be provided.

In conclusion, it might be said that theoretically and emotionally the United States has had, during and since the Great War, a wonderful enlightenment on the subject of education. Practically this awakening has resulted mainly in vastly increased demands on the public schools: business demands better trained employees; society demands special and specific instruction, mental, moral, and physical, on every subject under the sun.

Legislatures pass mandatory laws providing for special instruction, special schools, higher grade and age limits, and then, at the behest of those same business groups, refuse appropriations to carry the added burden.

The day has passed when the public looks with indifference upon the withdrawal from school of a child inadequately equipped for life. It objects to the individual case, the misfit, dropping out of school to become a misfit in society.

In other words, the public has developed an abiding faith that the public schools can solve any problem put up to them. Some day it may awake to the necessity of furnishing adequate sinews of war. Meanwhile it is the principals and teachers in daily contact with the work who most clearly see the need for more careful classification of pupils to meet the complications arising from these new demands, and on them will ultimately fall the burden of this new work. In any attempt to make a closer or more accurate classification the problem of the "individual case" looms large.

Conclusion—(A) The greater demands now made on the schools must be met by more careful and closer organization and classification of pupils.

(B) This organization and classification is the work of the principal of the school.

(C) The "individual" forms one of the most serious problems in this better classification.

FINDING THE INDIVIDUAL

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LOS ANGELES, CALIFORNIA

Educators everywhere are searching for a method of instruction that will more adequately and successfully train our youth for effective citizenship—for a method that will permit the pupils to develop the full range of abilities possible to each individual. In October, 1921, a method was installed in part of our school which solves many of the problems which prevented this desired training under the present public-school method.

Dr. Arthur Sutherland, Director of Psychology and Educational Research, of the Los Angeles City Schools, is the author of the basic principles of this method, and his able assistants, under his direct supervision, have worked out the material which makes it in fact as well as in theory, an individual method of instruction. The plan was first tried in adjustment rooms, where the retarded child was permitted to work on the subjects in which he was weak to the exclusion of all others until he had strengthened these subjects sufficiently to return to his regular grade. But in the present experiment the material is being used in regular grades under normal conditions—in classes containing slow, average, and bright pupils.

The most important of the basic principles are: first, that the child be properly placed in each subject; then, that he be trained to think quantitatively; to read with comprehension; to organize his ideas for self-expression through the use of definite guides within his comprehension; that the subjects of the curriculum should be used as tools in obtaining real educational objectives; that there should be a distinction made between training [habit and attitude formation] and appreciation [a broadening, deepening, and extending of the intelligent and emotional comprehension and organization]. That these principles may be realized, each step in the material was worked out with a definite goal or purpose in mind.

The material is prepared in twelve levels, each level corresponding to a class of the first six grades of the elementary schools. The content of the *Reading Exercise Books* is based on the *Horace Mann* and the *Riverside Primers* in the second grade, on *Tree Dwellers* and *Robinson Crusoe* in the third and fourth, and on the regular geography and history work of the fifth and sixth grades. Each level has twelve goals or purposes, each representing a definite mental attitude; and so that the child may study more intelligently, each goal is printed at the head of each exercise. Steps are worked out so progressively that the child may measure his own growth by his ability to work the problems as they are presented in each successive level. Four of these reading goals deal with number problems. These are placed in separate booklets for convenience in the classroom. Formal number exercises, the processes of association and memory, are presented by cards of the Studebaker type. In the written *Expression Exercises* emphasis is placed on the ideas to be expressed and definite guides within the comprehension of the pupils are given before any free expression is

attempted. There are three types of exercises: copying, reconstruction, and completion of a structure; or imitation, organization, and constructive imagination. The language content follows the city curriculum and is a group of minimum essentials. A student self-analyzing card directs the self-criticism of the written work. This criticism includes penmanship, spelling, language, and form—rhetorical and literary.

A very adequate system of project tests has been prepared whereby a careful check may be kept of each pupil's progress. There is a series of tests for each level, a test for each goal, each representing a particular mental attitude—comprehension, analysis, reason, speed and accuracy, together with imagery and memory; they are given scientifically and are in effect intelligence tests, the use of which soon discloses the level of each individual mentality.

In order that the conditions in the present experiment might be as normal as possible, the first twenty-three odd numbered children on the registers were chosen from each class from the B2 to A5 inclusive, giving one hundred and eighty-four children in all. They are under the direction of six teachers, thus averaging thirty-one to each teacher. The day is divided into four periods: two are devoted to individual work while two are spent in group work. The child is a social being and must learn the importance of the social group. In the individual-education room there are two teachers, each responsible for twenty-three pupils or one class each period. In the recitation-group room there is but one teacher who has forty-six pupils or two classes each period. In this room the penmanship, music, drawing, nature study, oral language, history, and geography are studied in groups. During the first period in the morning the second grade works in the group room while the third grade is in the individual-education room; they exchange rooms for the second period, then the second grade returns to the group room for the third period and to the individual-education room for the fourth; the third grade being in the opposite room at the same time. The fourth and fifth grades alternate in the same way. All subjects are given the full State schedule allotment of time.

After the children were chosen they were very carefully tested individually by specially trained teachers, to determine the weaknesses and powers of their "performance abilities." In reading the Starch Test was given for speed; the Gray for accuracy; the Monroe for comprehension; the Sutherland Reading Number Problem Test for comprehension of problems; the Curtis for the four fundamentals in Arithmetic; the Arleigh Fraction Test; and the Spelling from the Ayres' list. The results were carefully tabulated on cards showing the grades as well as the levels reached by each of the individual pupils. The results were startling. Many cards showed a variation from A2 to A6—in fact not one of the one hundred eighty-four pupils registered the same grade in all of the reading tests. Many of the 4th and 5th grade pupils made a second-grade score in addition and subtraction while making a 4th, 5th or even 6th-grade score in multiplication and division; while some made satisfactory scores in the fundamentals but

fell low in the problem scores. The speed and accuracy in reading was usually above grade and the comprehension was generally one or two classes below. Whenever there was a question the pupil was placed lower rather than higher, the examiners feeling that the child needed the review in any subject in which there was any doubt as to his performance ability.

PRELIMINARY PLACEMENT CARD

READING		LEVEL	
Accuracy—Gray		VII	
Speed—Starch		IX	
Comprehension—Monroe Test—Score		VIIj	
Reading Number—(Problem Comprehension)		IIIj2	

NUMBER		SCORE	
Integers—Prim. Add. }	Courtis Add. _____	V	
Sub. }	Test _____ Sub. _____	X b	
Mult. }	Mult. <u>above</u>	XII d	
Div. }	Test _____ Div. _____	ALL	

Fractions—Common:

Add. and Sub.	Test 1	X
Mult. and Div.	Test 2	X
Mixed Num.	Test 3	

Decimal:

Add. and Sub.	Test 4	
Mult. and Div.	Test 5	

A1	B2	A2	B3	A3	B4	A4	B5	A5	B6	A6
					X			X		
							X	X		
					X			X		
X								X		

B2	A2	B3	A3	B4	A4	B5	A5	B6	A6
		X							X
							X		X
									X
									X

Date 11-7-21NAME Katherine KGrade A5

Age _____

After the scoring was finished the pupil was given a program showing just which level he was to work with in each subject [he was not told his grade score] and was taught to use the material. Then he became his own teacher, analyzing his own weaknesses and judging of his own needs. He is privileged to ask help of any neighbor, or he may go to the teacher for assistance at any time. In the 4th and 5th grades were found the greatest variations of levels; and in almost every case, without any suggestions, the child worked on the lowest levels until they were brought up to the levels of the other subjects. Sometimes a little time is given to the higher level, but the larger share is given to the lower ones. When one level is extremely low in comparison, it is because of one or two weaknesses which are soon overcome and the child finds, maybe for the first time, that the subject that he has always considered difficult is easy after all; his confidence is strengthened and he enjoys conquering the subject and is anxious to take the test to prove his power. Many children who had been having difficulty in doing the long division work discovered that the difficulties lay in the addition and subtraction and not in the long division at all. The same was discovered in relation to fractions.

The pupil works from an exercise book and the required text, writing his results in a notebook. When he has finished a certain task, he passes to a rack on which hang other exercise books like the one he is using but

in which the answers have been written. He takes the two books to a large table, where he corrects his work. Pencils are left at the seats and the corrections are noted with colored crayons. If the answer in his note book differs from that in the answer book he does not check his answer as wrong, but makes a note of it, returns to his seat and tries to obtain the correct result from his own work. If he is unsuccessful, he questions the correctness of the book and takes it to the teacher for final judgment. There is no promotion given on this exercise work, so there is no incentive to be dishonest. The few who tried to get through the exercise book, by copying a good part of the answers, found that they were unable to pass the test. The same time and energy spent in good honest effort brought results, while copying only brought disappointment and the need of spending more time on the same work.

As soon as the pupil feels that he has gained the ability that he has been working for by using a given exercise, he writes his name on a paper provided for that purpose, signifying his readiness for a test, which is given at the teacher's earliest convenience. A child rarely fails in a test because he is sure of himself before putting up his name, he knows that the test has been worked out similar to the material he has been working with, and that if he has conscientiously worked the exercises he will find the test easier than the text. These project tests are given at the teacher's desk; no variations as to time or procedure, no questions, interruptions, nor suggestions being permitted. In giving these individual tests the teacher has an opportunity to judge the powers and abilities, to analyze difficulties, and to advise wisely as to the best methods for further study.

The results of the tests are recorded on progress cards, on which squares are laid off; vertical columns representing the levels and the horizontal columns representing the goals. When a test has been successfully completed the pupil blocks in the proper square, while the teacher writes in the date on her duplicate card. The completed tests are put in large envelopes made for that purpose. If a pupil passes his test with exceptional ability, on a goal of speed in reading for instance, he may be excused from a test on the same goal in the next level. In that case the square is crossed out.

This child's card varied from the B2 in problem work to B5 in speed in reading. She is now doing straight B6 work in reading, while she has finished the required work in the fundamentals of arithmetic.

The following represents typical portions of the Adjustment Progress Card:

ADJUSTMENT PROGRESS CARD

School—61st Street	Class_____	Card No. 21
Pupil—Katherine K.	Teacher _____	
Date of Birth_____	Age _____	
Date of Entrance_____	From Grade A5_____	
Date of Ltr._____	To Grade_____	
Time in Room_____	Weeks Prog._____	

PRELIMINARY PLACEMENT

Reading	Level	Arithmetic	Level
Accuracy	XII	Addition	V
Speed	IX	Subtraction	X
Comprehension	VII	Multiplication	XII
No. Placement	III	Division	XII

FINAL PLACEMENT

Reading VII

No. III

W. E. IV

To Teachers: Cards should be numbered in order of entrance, and one card sent to the Department of Psychology and Educational Research on the first of each calendar month. When pupil leaves, this card is sent in for permanent record.

To Pupil: You should have two of these Progress Cards. Keep one at your teacher's desk and one at your desk. When you complete a project, block it in on your card. Copy your record on the other card as your teacher directs.

When pupils are placed low in subjects the review soon discovers the difficulties. These are rapidly overcome and the progress is very marked. Some children have done the work of six terms or three years in the twelve weeks that the experiment has been in operation. Some have made even more progress in one or two subjects especially those who were placed low in the fundamentals in arithmetic. One little girl who was a normal A4 is now doing straight B6 work; one boy who was an A5 is now doing straight A6th. The aim is not to shorten the time in the elementary grades but to build a firm foundation for the work of the intermediate and high schools. Supplementary material is being prepared that the children with the quicker minds may have a broader and richer experience along the lines of the elementary grade subjects.

The one great fault in the present plan is the fact that the children have two teachers during the day. A new room has just been opened with twenty-five sixth-grade children at work all day under one teacher. She will have charge of the individual work, using the Sutherland material; and also the group work, which will be based on citizenship. Objections will be raised because of the numbers. Many consider that it is expensive to have small classes; but when it is understood that there will be no failures—no repeaters—as every child will find his own rate of speed and travel accordingly—that there will be no marking time for the brighter pupils—no dragging along for five months of the slow ones, who then probably drag over the same work for five months more without finding where their difficulties are—considering all these things it is not expensive to guide successfully twenty-five pupils into correct mental habits, attitudes, and appreciation.

Under this method the pupil is placed at the beginning of his difficulty in each subject; he spends his time in studying and making definite, business-like reports; he is allowed free rein for developing self-reliance by independent and honest industry. He develops abilities at a rapid rate and forms habits and attitudes of intensive and intelligent control by working towards a definite goal. The independence and responsibility developed is evident in the general character of the child; discipline as such is reduced to a minimum. The individual is learning the true foundation of citizenship—to compare, to evaluate, and to choose or to determine intelligently and independently.

CHAPTER V

PROVISIONS FOR THE GIFTED CHILD

AN EXPERIMENT IN THE EDUCATION OF GIFTED CHILDREN IN THE FIRST GRADE

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During the past few years the writer has had the opportunity of directing a number of experiments in the education of gifted children in various grades of the Emerson School, Berkeley. This public school is admirably adapted to administration of this nature. It is located in a residence district adjacent to the campus of the University of California. The fathers of the pupils are highly trained, successful men; professional men, engineers, financiers, and other equally well-trained and successful men constitute the greatest number of male adults. There are a few skilled mechanics and practically no unskilled laborers. Almost all of the mothers are free from other duties except the care of their households. Accordingly, the school draws its pupils where high levels of intelligence prevail.

This desirable condition makes possible experimentation in the education of gifted children. Intelligence tests, given throughout the school, indicated that the rate of progress or development of this upper group needed more attention than the others. One of the readjustments made possible the application of mental tests as one of the means of reorganizing the first grades. The adjustments of classes over a period of six months resulted in the reduction of the new high first grade to nineteen pupils. The entering class enrolment exceeded forty-five. It was decided to reorganize the two classes so as to secure two groups as nearly homogeneous in ability as possible. Therefore, a study of each child was made with respect to his possibilities.

About one half of the new receiving class had previously attended kindergarten, and from their former teacher information was obtained regarding their general intelligence, attitude toward school-work, industry, and health. She was also able to supply data indicating parent coöperation. Similar information was collected about the rest of the class through such sources as parents, older brothers or sisters. The high first-grade teacher made a similar study of her small class. The entire receiving class was kept intact for two weeks to give one teacher an opportunity to study the group with the above points in mind while the enrolment was being completed. This made possible a tentative rating by her, which, with that of the kindergarten teacher, served as an index of progress possibilities.

Meanwhile, each child was tested by means of the Stanford Revision of the Binet-Simon Scale. On the basis of the results and all other information accumulated, we selected a group of fifteen children to be moved from the large low first to the small high first grade. Each one of these selected

children seemed capable of completing the first year's work in much shorter time if given the opportunity. The two groups were placed under the one teacher, in one room. The first group consisted of the entire class of high first-grade pupils who had completed more or less successfully a half year of school work. The second group included only the fifteen carefully selected pupils. Because the former group was the entire high first grade, it constituted a control. The latter, with one exception, as indicated further on, was composed of gifted children.

TABLE I—*Teacher Judgment and Recorded Information with Respect to Individual Pupils in the Two Groups*

Group	Number	Sex	Teacher Gen. Int.	Judgment Sch. Work	Health	Kinder- garten Training	Occupation of Father
Gifted Group	1	G	2	3	1	Yes	Merchant
	2	B	1	1	1	Yes	Sales Mgr.
	3	G	3	4	1	Yes	Broker
	4	B	1	1	1	No	Exp. Engineer
	5	G	1	1	1	Yes	High-Sch. Teacher
	6	B	2	1	1	No	Agriculturist
	7	B	1	1	1	Yes	Mgr. Wholesale
	8	G	1	1	1	Yes	Univ. Professor
	9	G	1	1	1	No	Mgr. Wholesale
	10	G	1	1	1	Yes	Phys. & Surg.
	11	B	1	1	1	No	Accountant
	12	B	1	1	1	Yes	Merchant
	13	G	2	2	3	Yes	Insurance Agent
	14	B	2	1	2	Yes	Bank Representative
	15	B	1	1	1	Yes	Civil Engineer
Lower Q.			2	1	1		
Median			1	1	1		
Upper Q.			1	1	1		
High.... First....	1	G	3	3	1	Yes	Com'l Artist
	2	G	5	5	1	Yes	Marine Survey
	3	B	3	3	1	No	(deceased)
	4	B	3	4	2	Yes	Lithographer
	5	G	1	3	1	Yes	Attorney
	6	G	3	1	1	No	Mining Engineer
	7	G	3	4	1	No	Mining Engineer
	8	G	2	2	1	No	Farmer (Jap.)
	9	B	5	5	5	Yes	Phys. & Surg.
	10	G	2	2	2	Yes	Accountant
	11	B	3	3	1	No	(deceased)
	12	B	5	4	1	Yes	Farmer
	13	G	3	4	1	Yes	R. R. Brakeman
	14	G	1	4	1	Yes	Musician
	15	G	4	4	2	Yes	Mgr. Wholesale
	16	B	2	3	1	Yes	Auditor
	17	B	2	5	5	Yes	Adjuster
	18	B	1	2	1	No	H. S. Vice-Principal
	19	B	2	2	1	No	Asst. Mgr. Mfg.
Lower Q.			3	4	2		
Median			3	4	1		
Upper Q.			2	2	1		

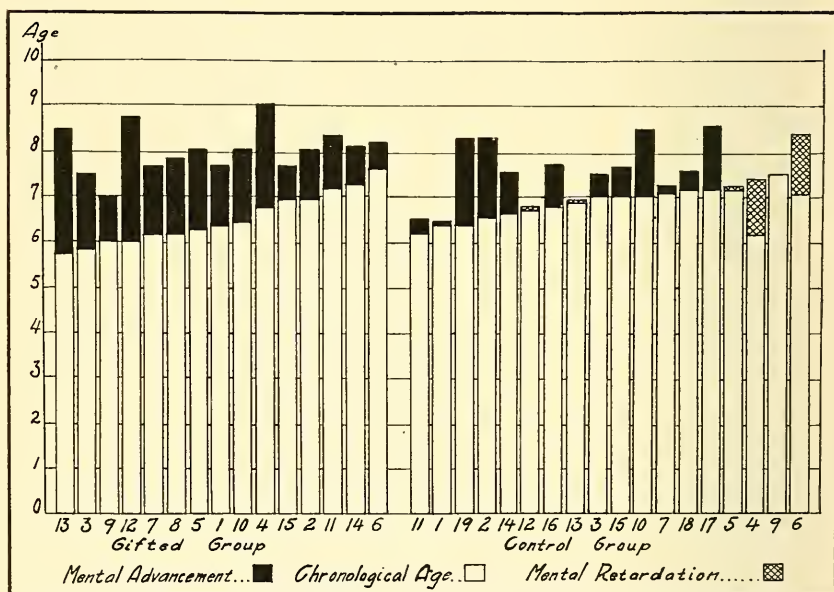
Table I gives the data obtained from teacher judgment and enrolment cards. The ratings by the teachers were based upon the following seven-point scale: "Very superior" was marked "1"; "superior," "2"; "above average," "3"; "average," "4"; "below average," "5"; "inferior," "6"; and "very inferior," "7." In making the division, we had given no thought to distribution according to sex, but upon checking up this item found that each group was divided about equally with respect to the number of boys and girls. The table also shows that a very large majority of each group had received training in the kindergarten. Both groups seemed to be healthy, with the gifted group having a slight advantage. This was partly due to the fact that health was considered in selecting the members.

TABLE II—*Teachers' Judgment of Intelligence, the Age and Mentality of the Individual Pupils in the Two Groups*

Group	Number	Teacher Judg't of General Intelligence	Chron. Age		Mental Age		Intelligence Quotient
			Yrs.	Mo.	Yrs.	Mo.	
Gifted Group	1	2	6	4	7	8	121
	2	1	6	11	8	—	116
	3	3	5	10	7	6	128
	4	1	6	9	9	—	133
	5	1	6	3	8	—	128
	6	2	7	7	8	2	107
	7	1	6	2	7	8	125
	8	1	6	—	7	—	117
	9	1	6	2	7	10	127
	10	1	6	5	8	—	125
	11	1	7	2	8	4	116
	12	1	6	—	8	9	146
	13	2	5	9	8	6	148
	14	2	7	3	8	1	111
	15	1	6	11	7	8	111
Lower Q..		2	6	—	7	8	116
Median...		1	6	4	8	—	125
Upper Q..		1	6	11	8	4	128
High First	1	3	6	4	6	5	101
	2	5	6	6	8	3	126
	3	3	7	—	7	6	107
	4	3	7	5	6	2	83
	5	1	7	3	7	2	98
	6	3	8	5	7	1	84
	7	3	7	1	7	3	102
	8	2	6	6	No test; lang. hdcp.		
	9	5	7	6	7	6	100
	10	2	7	—	8	6	121
	11	3	6	2	6	6	105
	12	5	6	9	6	8	98
	13	3	6	11	6	10	98
	14	1	6	7	7	6	113
	15	4	7	—	7	8	109
	16	2	6	9	7	8	113
	17	2	7	2	8	7	120
	18	1	7	2	7	7	106
	19	2	6	4	8	3	130
Lower Q..		3	6	6	6	8	98
Median...		3	7	—	7	6	102
Upper Q..		2	7	2	7	8	113

The data on the intelligence of the individuals in the experiment are contained in Table II. The teachers' judgment with respect to the general intelligence of the pupils has been included again, so that immediate comparison may be made with the intelligence records obtained in the tests. The intelligence quotient in the table is the ratio of mental age to chronological age. The mental age and intelligence quotient could not be accurately determined for Pupil Number 8 in the control group because of her language handicap and experience. She was a little Japanese girl with a limited command of English, living in an oriental home. Her rapid grasp of school work and successful efforts led the teacher to rate her a "superior" child. It seems safe to consider her at least an average child.

Diagram Showing the Chronological and Mental Ages of the Two Groups, etc.



An analysis of the chronological ages of the pupils discloses that the control group consists of children older than those in the gifted one. The youngest pupil in the former, though only six years and two months old, is nearly a half year older than the youngest in the latter. The oldest in the high first grade, eight years and five months, is ten months older than the oldest in the corresponding pupil in the special first group. The median ages differ by eight months. The gifted group of the low first grade is at least one half year younger than the high first grade. The age range shows more homogeneity in the special division than in the other.

Probably the most significant fact that we find in analyzing the mental ages of the pupils is that the gifted group, though younger chronologically, is older mentally than the control group. The youngest, median, and old-

est mental ages of the former when compared to the corresponding ages of the latter show the gifted children to be about a half year older mentally than those of the high first grade. The child with the youngest mental age in the selected group, seven years, is older in this respect than five of these in the control group. Two of the former group are older mentally than the mentally oldest in the latter. The median mental age of the special section is older than the mental ages of fifteen out of the nineteen pupils in the regular high first grade. The upper quartile of this control group is the same as the lower quartile of the other.

The diagram constructed from Table II clearly shows the mental superiority of the gifted group. The pupils have been arranged in the two groups according to chronological age, from the youngest to the oldest. The solid black extension indicates the mental advancement of each child beyond his actual age. Mental retardation has been presented by a shaded section superposed upon the chronological age bar. The graph of the gifted section shows mental advancement of all its members. The graph of the high first section indicates a more normal distribution of cases from almost as high mental advancement to marked retardation. Tables III and IV have been compiled from the previous ones for the purpose of presenting the distribution of intelligence of the groups. The classification of intelligence in the fourth table is that used by Professor Terman.¹ Hence we have two fairly comparable tables of ratings on seven-point scales. The distribution based on the intelligence tests is more accurate than the one based on teacher judgment. However, the corresponding distributions are strikingly similar. By teacher judgment we have all of our gifted group rated "above average" or higher. According to actual test, one of the pupils is normal. In Table II, we find the one case to be Pupil Number 6, a boy much older than the rest of the group and mentally able to achieve what eight-year-old children are capable of doing. Therefore, there seemed to be no justification for eliminating him from the gifted group. The girl, Number 3, rated by the teacher as only "above average," was next to the youngest pupil in the group, but by test was shown to be a very superior child. According to teacher judgment and intelligence tests, the control group presented a nearly normal distribution from "below average" and "dull" to "very superior."

The occupations of fathers of the children have been listed in Table I. Although in general most children in the two divisions come from homes where success in life is no stranger, the gifted group show to advantage in this respect. The farmers are men who are able to maintain very good homes in the university city in order that their children may have the best of educational opportunities. Pupils number 6 and 7 in the control group are daughters of the one mining engineer. In the gifted group all fathers except one are highly successful professional or business men, while in the control group there are one parent classified as an unskilled laborer, one skilled mechanic, and three others slightly more successful.

¹ Terman: *The Measurement of Intelligence*.

Other points of contrast between the two groups can be made from the various tables. The most important have been noted and indicate definitely the difference between them. The one, a special group of gifted children, young, healthy, capable of doing exceptional work; the other a nearly normal group of children ranging from dull to superior mentality, older in actual years, younger in mental age, healthy with a few exceptions, and capable of varying degrees of success and even retarded progress. Of the latter group, pupils number 3, 4, 11, and 17 had spent at least one year in the receiving class. All members of the high first grade were considered

TABLE III—*Distribution of the Two Groups on the Basis of Teacher Judgment of Intelligence*

Score	Definition of rating	Gifted number	Group per cent	High number	First per cent
1.....	Very superior	10	66.7	3	15.8
2.....	Superior	4	26.6	5	26.3
3.....	Above average	1	6.7	7	36.8
4.....	Average	....	....	1	5.3
5.....	Below average	....	....	3	15.8
6.....	Inferior	....	....	....	....
7.....	Very inferior	....	....	....	....
Total.....		15	100.00	19	100.0

TABLE IV—*Distribution of the Two Groups Based on Intelligence*

Intelligence Quotient	Classification	Gifted number	Group per cent	High number	First per cent
Above 140....	Near genius or genius	2	13.3	—	—
120-140....	Very superior	7	46.7	3	16.7
110-120....	Superior	5	33.3	3	16.7
90-110....	Normal or average	1	6.7	10	55.6
80- 90....	Dullness	....	....	2	11.1
70- 80....	Borderline deficiency	....	....	....	....
Below 70....	Definite feeble-mindedness	....	....	....	....
Total.....		15	100.0	18	100.1

ready to begin the second term's work; a few were somewhat advanced. Only one pupil of the gifted group was able to read a few simple sentences and none could write.

To insure to both groups more individual attention and to prevent any possibility of handicapping the high first-grade class, or the special group, the daily program was organized, so that each group attended school approximately four hours of the day, while the teacher's program consisted of a five-hour teaching day. This type of program required each group to be in the room at nine o'clock and one o'clock. But one group was dismissed at eleven in the morning and the other at noon. The latter group

was dismissed at two o'clock, while the former remained until three o'clock in the afternoon. Thus, during the third hour in the morning, the teacher could give her undivided attention to one group and during the last hour in the afternoon to the other group. During the term the programs of the groups were interchanged, so that for a part of the term the special group attended school two hours in the forenoon and two in the afternoon, and the rest of the term three hours in the morning and one in the afternoon.

Another reorganization was made at this time. The teaching procedure was modified in the interest of motivated methods. For example, language

TABLE V—*Achievement of the Two Groups in Reading at the Close of the First Half Year Together; Haggerty Sigma I Test.*

Pupil	Scores in Haggerty Sigma I			
	Gifted Group		Control Group	
	Test 1	Test 2	Test 1	Test 2
1	10	—	11	1
2	15	7	4	—
3	Left; tr.	—	—	—
4	12	1	6	5
5	10	2	10	4
6	1	2	8	2
7	14	5	18	8
8	21	12	1	—
9	9	2	4	2
10	12	6	18	7
11	Left; tr.	—	8	3
12	17	4	11	3
13	Absent;sick	—	11	5
14	8	3	4	4
15	6	2	Left; tr.	—
16	....	....	4	—
17	....	....	11	—
18	....	....	19	16
19	....	....	Absent;sick	—

and numbers were developed and reading taught through projects. A hat store was built and furnished and hat sales were conducted. A doll house was built, furniture and decorations were made, and various home activities portrayed. With these projects as motives, the children made their own primers, developing their own stories of their activities.

Three months after classwork began the teacher requested that plans for a new distribution be made. In her judgment, a very small number of the selected, gifted children were able to do work as good, if not better, than that of the average pupil in the control group. She felt certain that a few of the latter were achieving results poorer than most of the pupils in the former. There was available no standard scale of scientific nature simple enough to determine accurately the need of redistributing the pupils on the basis of achievement in the work of the grade. In our efforts to regroup into two new comparable divisions, we found that the one pupil of the

special class, who had entered school able to read a little, and two pupils in the regular group seemed to be ready for advancement beyond their class. By trying them in the low second grade on a "visitor basis" under a second teacher, one from each group was found capable of doing satisfactory work in that advanced grade. If there were any doubt with respect to the two pupils' preparation, it applied to the one from the control rather than the pupil from the gifted group. Before the close of the term the second pupil of the regular division had adjusted himself sufficiently to join the two previously advanced. These three, Pupil Number 8 of the selected group

TABLE VI—*Distribution of Scores of the Two Groups in the Haggerty Test in Reading Achievement*

Score	Test 1		Test 2	
	Gifted Group	Control Group	Gifted Group	Control Group
Over 15...	2	3	..	1
15.....	1	..	..	..
14.....	1	..	..	..
13.....	..	..	..	..
12.....	2	..	1	..
11.....	..	4	..	..
10.....	2	1	..	..
9.....	1	..	..	..
8.....	1	2	..	1
7.....	..	..	1	1
6.....	1	1	1	..
5.....	..	..	1	2
4.....	..	4	1	2
3.....	..	..	1	2
2.....	..	..	4	2
1.....	1	1	1	1
0.....	..	1	1	5
Total.	12	17	12	17
Lower Q..	9	4.63	2.25	.85
Median...	11	8.75	3	3.25
Upper Q...	15	11.7	6	5.38

and Numbers 10 and 18 of the other, were promoted to the high second grade at the end of the term. Pupil Number 12 of the gifted children was advanced also early in the new term.

When the half year ended, the pupils were tested in reading achievement by means of the Haggerty tests.¹ Table V contains these data. In Table VI this has been arranged according to the distribution of scores in the two tests. Of the pupils marked "transfer" in Table V, Number 3 in the gifted section was in the school only a short time. There is, therefore, no way of

¹ M. E. Haggerty: Achievement Examination in Reading, Sigma I.

estimating what she would have achieved. Pupil Number 11 in the group would have scored very high, undoubtedly, because he was placed in the high first grade of the school to which he was transferred, and was reported as doing satisfactory work. While still in the Emerson School, he had been selected as one of those pupils to be placed in the most advanced division when the first readjustment was made. Pupil Number 13 would have scored low, because of several prolonged illnesses during the half year, which necessitated remaining at home without studying. Pupil 15 in the control class was in the weakest section of the readjusted groups when she moved away. Her score would have been low. On the other hand, the absent boy of this section was exceptionally good and would have done better than the average. Hence, the transferred and absent pupils would probably have affected to only a very small degree the median and the quartile scores.

We found Test 1 of the Haggerty examination of a more effective measure of reading ability and comprehension with respect to little children than Test 2, because of its longer period of twenty minutes of reading. This was borne out by the data obtained in this test as well as the standard scores for each one. The scores of the individuals, as well as median and quartiles, indicated how much greater was the achievement of the gifted children than that of the control first grade. In spite of the fact that the schooling of the gifted children covered one half year, as compared with not less than a year for all pupils in the regular high first grade, at least seventy-five per cent of them had become better readers than fifty per cent of the control first grade. About one half of the special group were better than three fourths of the pupils in the other division. That the medians were about the same in Test 2 was due, very probably, to the advantage of drill during a longer period of time experienced by the regular high first class. In spite of this factor, five absolutely failed in Test 2, as compared with only one in the special class. An inspection of Table V shows that in Test 1 this latter pupil had scored very much higher than four of the five in the control group failing in Test 2.

TABLE VII—*Standard Scores and Medians of the Two Groups in the Haggerty Reading Examination*

	Test 1	Test 2
Control Group Medians	8.75	3.25
Gifted Group Medians	11.00	3.00
Standards for Grade I	4.00	2.00
Standards for Grade II	12.00	8.00

That no child had been handicapped by the experiment is indicated in Table VII. The medians of the control and special divisions were higher than the standards established for both tests. In Test 2 the achievement for both groups was at least one half year beyond first-grade standard. In Test 1 the selected group was within one point of finishing second-grade standard.

Two administrative sources of data disclosed how markedly successful the experiment had proved. The promotion records at midyear were as follows:

Of the eighteen pupils with complete term records, two were regularly promoted to the high second, fifteen to the low second grade, and one was given a trial promotion. The same type of information was available for fourteen members of the gifted group. At the completion of the half-year period, two pupils were regularly promoted to the high second grade, eleven to the low second, and one to the high first. The last case was that of the pupil previously mentioned as having been compelled to remain home much of the term on account of illness. During the broken periods of attendance she seemed to respond but slowly to special attention. Whether this would have been true if she had been in school regularly we were not able to determine.

The division of the pupils after eight weeks of the second term indicated that those of the gifted group were doing better work than those of the control. In the new low second, ten of the eleven pupils of the special group were in the upper division. The exceptional case was the one pupil, Number 6, with an intelligence quotient less than 110. Evidently, he was able to maintain the rate of the gifted section only as long as his chronological age, and mental age as well, was far beyond that of the normal age for his grade. With the eleven gifted children in the upper division there were only seven of the pupils of the larger original high first.

Some of the most important advantages are summarized in conclusion:

1. Special groups of gifted children make possible rapid progress of the individuals.
2. The rapid rate of progress is in reality the normal rate of the gifted children.
3. Rapid progress is achieved with and through enriched curricula and motivation of school work.
4. Individual pupils within selected groups move at different rates even when more highly selected than ordinarily.
5. Drill is greatly lessened, explanation required on the part of the teacher is minimized, and yet gifted children achieve better results in shorter time than do normal ones.
6. The natural poise and social normality of bright children is not warped by the knowledge that they are able to accomplish more than other children. No incident occurred which would indicate that they felt themselves better than others.
7. Careful selection of such a group will eliminate possible failures. Health, age, mentality, teacher judgment of ability to do school work, and home conditions are important factors to consider.
8. Normal children are not handicapped by experiments permitting more rapid progress of their brighter classmates. They do their best under the incentive of promotion whenever ready.
9. The use of tests gives the administrator a feeling of confidence in carrying on such experiments.

TAKING CARE OF THE GIFTED CHILD

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To assist the child of supernormal ability to get more than the ordinary normal child is a problem that interests every teacher. Such children exist in every school. Their native ability enables them to accomplish more than the normal children. Usually much valuable time for them is wasted and often their energies are perverted into activities of positive harm to themselves and to their associates.

They either should be accelerated till they reach the point in the course corresponding to their mental age, or they should be given a broader and richer curriculum all along the line, retaining them the full period in the grades and in the high school. To require them to spend eight years in the grades and four years in the high school before graduating does not seem fair to them. That they would be stronger and better at the time of graduating by doing so is certain. But if they wish to do so they could enrich their knowledge by taking graduate work and be better prepared then to choose their own courses.

I think the ideal scheme would be to have a sufficient number of supernormal pupils to constitute a class by themselves and then to give them a broader and richer course and also take them over it more rapidly. This can be done in a very large school or in groups of schools aggregating 3000 or 4000 pupils. Three thousand pupils ought to furnish sufficient exceptionally bright children to make a good-sized class in each grade. These ought to be segregated, beginning about the third grade and kept in a separate class throughout the grades and the high school. We are doing this for the subnormal type; why not for the superior?

These superior children, when they have completed creditably the high-school course, should be admitted into the Freshman class at college regardless of their chronological age. Our school being small, only about 1000 average enrolment, we could not follow the plan of permanent segregation. We are following this plan for the subnormal type, but we draw for those classes from the surrounding schools.

As the most feasible scheme possible within our limitations we hit upon the following plan:

Children selected for acceleration are taken from their regular room and placed in the room devoted to this work. These pupils continue the work as in the regular room, though more rapidly, till they have caught up in all the main subjects with the class ahead. They are then placed in the room with the advanced class, thereby having gained a special promotion.

Usually another class for the special room is then selected from the class to which the special promotion is made to prevent overcrowding; and in this manner the work is kept up through the school year. Two classes, or grades, aggregating from twenty to twenty-five pupils, are kept in the room at the same time.

The time allowed each class to accomplish the work of catching up with the half grade just ahead is nine and one half weeks, or half of the semester. Thus four sets of pupils, aggregating about one hundred, have an opportunity in the room each school year.

Selecting the pupils—Two kinds of children are eligible: those with superior native mental ability and those who have, for some reason, become retarded and are capable of restoration to their proper grade.

The following factors are considered in the selection: (a) Class standing; (b) mental ability, as determined by the Stanford Revision of the Simon-Binet Intelligence Test; (c) effort; (d) physical condition.

Of these, the two most important are the class standing and the mental age. Experience in this room has proved that a child is capable of acceleration until he has reached the grade corresponding to his mental age. Thus a child of nine with a mental age of eleven, if he has the proper opportunity, can be accelerated at this age till he reaches the sixth grade. He ought not to be pushed beyond. On the contrary, a child of eleven with a mental age of nine ought not to be beyond the beginning fourth; but, if he has not yet reached the fourth he is capable of acceleration up to that point. In other words, a subnormal child retarded below his mental age is capable of acceleration to the grade corresponding to his mental age.

In some instances, when we were unable to find a sufficient number of bright pupils of the grade selected to fill up the class, the slower pupils of the grade just above were permitted in the class, thus giving them an opportunity to strengthen themselves in the work just gone over, and at the end of the period to be restored to their regular class. It was found that these pupils were always inferior to the bright pupils in the lower class. It did some good, but would hardly pay for the expense of an extra teacher.

Pupils who cannot, under proper conditions and incentives, be made to do the regular work of the class, are usually found to be subnormal and should be segregated from the rest of the pupils and given a course suited to their mental ability.

The plan is simple, inexpensive, and easily operated, one teacher being able to care fairly well for the bright pupils in a school of from 1000 to 1500. The reason it is so little used, I think, is the ignorance of the principals and teachers of the actual number of superior children they really possess. These children exist everywhere, just as do the subnormals. Both ought to be sought out and cared for. Many a time in the last twelve years have I sat in my office and wondered where my next class was to come from, but on investigation the class every time was found, and very rarely have we pushed a child beyond its mental capacity. Since the intelligence tests have come into use, there is no necessity for this to happen at all. Before we used the tests we had to consider the chronological age largely as a factor, which is not reliable. Even here we were doing what many are still doing—accelerating the subnormals and retarding the gifted.

We have in this room at present (February, 1922) a 4B class of thirteen children working for 4A and a 5A class of twelve children working for 6B.

The 4B children were selected from a class of 57; 19 were given the intelligence tests, 14 were selected, some doubtful cases being taken, in order to reduce the number of those remaining so one teacher could handle them where two had been employed before. Within a week, two were found unable to do the work in arithmetic and were returned to the regular room. Tables I and II show the ratings of the groups who were served during the third quarter of 1922.

TABLE I—4B for 4A, entering January 30, 1922

Pupil	Sex	Chron. age		Mental age		I.Q.	Teacher's estimate of intelligence	Class standing	Effort
		Yrs.	Mos.	Yrs.	Mos.				
1...	G	9	6	10	3	108	Av.	A-B	A
2...	G	8	7	9	5	110	Av.	B	A
3...	B	8	9	11	5	130	Av.	A-B	AA
4...	B	11	5	10	7	93	Av.	B	AA
5...	B	12	10	10	1	79	Av.	B	AA
6...	G	12	1	9		75	.....	B	B
7...	B	10	6	8	6	81	Slow Av.	A-B	A
8...	G	8	2	10	3	125	Av.	A	A
9...	B	9	8	10	4	107	Below Av.	B	B
10...	B	8	11	9	9	109	Av.	B	B
11...	B	9	9	10		103	Av.	B	B
12...	G	10	6	(Foreign—I.Q. not obtainable)				A	A

TABLE II—5A for 6B, entering January 30, 1922

Pupil	Sex	Chron. age		Mental age		I.Q.	Teacher's estimate of intelligence	Class standing	Effort
		Yrs.	Mos.	Yrs.	Mos.				
1...	B	11	2	13	10	124	Ex.	AA	A
2...	B	11	1	11	2	100.7	Fair	A-B	A
3...	G	10	3	11		108	Above Av.	A-B	A
4...	B	12	1	13	11	115	Av.	A-B	B
5...	B	10	2	10	9	106	Av.	A-B	A
6...	B	11	5	11	1	97	Av.	A-B	A
7...	G	10	2	10	6	103	Av.	A-B	A
8...	B	10	7	11	6	109	Av.	A-B	A
9...	B	10	9	10	1	94	Above Av.	A-B	A
10...	G	10	4	11	3	109	Above Av.	B-A	A
11...	G	11	1	13	2	111.2	Good	A-B	A

The following table shows the rating of ten upper-grade pupils during the second quarter, 1922.

TABLE III—*Standing of 7B class entering November 14, 1921, and becoming 8B on January 27, 1921*

Pupil	Sex	Chron. age		Mental age		I.Q.	Teacher's estimate of intelligence	Class standing	Effort	Standing in special room
		Yrs.	Mos.	Yrs.	Mos.					
1...	B	11	5	13	9	120	Av. plus	B	B	B
2...	B	11	11	13	7	123	Superior	B-A	B-A	B
3...	B	13	3	15	4	116	Av.	B	A	B-C
4...	G	11	9	15	3	130	Very Super.	AA	AA	A
5...	G	11	2	14	..	125	Very Super.	AA	AA	A
6...	G	11	9	12	..	102	Av.	A-B	A	A-B
7...	G	12	..	16	8	140	Very Super.	A	AA	A
8...	G	13	7	12	4	91	Av.	B-C	A	B-C
9...	G	11	1	14	9	130	Very Good	A	A	A
10...	B	10	11	17	1	155	Very Super.	A-B	B	B-A

From the very best of this class and from other 8B classes in surrounding schools we expect to select a good class for our last quarter and prepare them for 9B in June.

To illustrate the exact manner in which the plan is carried out, we give the formation of the four different groups of children in the room for 1918-9:

(1) First quarter, beginning September 3, 1918: 10 pupils in 4B working for 4A; 3 pupils reviewing in 4A working for 4A; and 14 pupils in 6B working for 6A.

(2) Second quarter: 8 pupils in 4A working for 5B, becoming 5A at end of semester; 5 pupils reviewing in 5B working for 5B, becoming 5A at end of semester; and 10 pupils in 6A working for 7B, becoming 7A at end of semester.

(3) Third quarter: 11 pupils in 5A working for 6B; and 9 pupils in 7A working for 8B.

(4) Fourth quarter: 11 pupils in 6B working for 6A, becoming 7B in June; 9 pupils in 8B working for 8A, becoming 9B in June; and 1 pupil in 8A working for 8A, becoming 9B in June.

An analysis of these figures shows that had any pupil beginning with either class in September continued with the class till the end of the year in June, he would have made three full years' work in one. This would be phenomenal and would likely be too great a tax upon even a very superior child; but by giving only one promotion at a time, or at most two in succession, the four special promotions have frequently been accomplished before leaving the eighth grade. These specially gifted children generally receive one or more special promotions before leaving the primary grades.

If a child is capable of making more than one special promotion, he is retained in the room with the new class entering, or he may be returned to the regular school and be selected again when the opportunity comes. Some

children have made as many as four special promotions before leaving the eighth grade. Our aim is to advance the pupil to a point where he will find opportunity for the exercise of his superior intelligence. It is based on the theory that when a child has once reached the grade corresponding to his intelligence quotient he will then be required to put forth a normal effort to keep up with his class.

In the spring of 1919, the Pressey Group Intelligence Scale was used in testing two hundred and fifty-four Whittier School pupils of the fifth, sixth, seventh, and eighth grades for the purpose of determining the correlation between the school rating and the intelligence score of the pupils selected for the classes for accelerates and retardates. The authors of this scale believe that children who score above the 90 percentile show superior endowment and that below the 10 percentile we may look for cases of mental deficiency.

The tests were given to three groups, and the results are stated in detail in a previous discussion.¹ They showed the correlation to be high for the accelerated group.

The following table indicates the general character of the achievements of the pupils for four years.

TABLE IV—*A summary of the teacher's record for four years*

	1916-7	1917-8	1918-9	1920-21
Total number of pupils in room during year.	107	105	92	92
Number receiving special promotion.....	82	77	82	84
Number pupils saved from demotion.....	20	18	7	0
Number unable to do the work and returned to regular room.....	4	3	2	5
Number withdrawn before promotion.....	1	7	1	3
<i>Advancement beyond chronological age on receiving special promotion:</i>				
Number advanced 6 months to 1 year.....	24	15	12	26
Number advanced 1 year to 1½ years.....	10	11	5	11
Number advanced 1½ years to 2 years.....	4	0	5	4
Number advanced 2 years or more.....	1	2	0	1
Number of normal age.....	17	19	28	32
<i>Still retarded on receiving special promotion:</i>				
Number retarded 6 months to 1 year.....	8	6	12	7
Number retarded 1 year to 1½ years.....	9	12	9	2
Number retarded 1½ years to 2 years.....	3	8	5	0
Number retarded 2 years or more.....	6	4	6	1

Careful record is kept and observation made of the gifted children after special promotion and it is found that as a rule the large majority of them continue to be among the best in the class. Rarely does one fail and lose what he has gained.

¹Zirkle, H. W., Character and Results of Special Rooms as Conducted in the Whittier School, *Elementary School Journal*, XXI (November, 1920), 180-197.

History of an individual case—R. C.—Boy, 12 years 5 months, who had made three special promotions; tested June 14, 1919.

Pressey Score 168. Certified June 27, 1919, to 9B Grade.

Pressey Score 167 is ninety percentile for 15 years, Grade 10.

Entered Special Room January 22, 1917, in 5B Grade, 10 years old.

Promoted March 27, 1917, to 5A, Regular Class.

Promoted June, 1917, to 6B, Regular Class.

Promoted January 21, 1918, to 6A.

Entered Special Room January 21, 1918, as 6A pupil.

Promoted March 22, 1918, to 7B.

Promoted June, 1918, to 7A.

Promoted January, 1919, to 8B.

Entered Special Room May 12, 1919, as 8B.

Promoted June 27, 1919, to 9B, age 12 years 5 months.

Language, A; Penmanship, C; Manual Training, B; Reading, AA; Spelling, A; Effort, B; Deportment, B—.

January, 1917, to June, 1919, completed grades 5, 6, 7, and 8.

This room has been run on this plan continuously for the past twelve years and has demonstrated its usefulness in the lives of nearly 1000 different children, by putting them creditably through the grades from a half to two years earlier than they otherwise would have been. Many of these children have gone on through high school and college, never missing a single promotion throughout their school career. Measured in dollars and cents, reckoned on the number of promotions made by each regular teacher, it has been a saving to the district of the salary of one teacher each year throughout the whole period, which in Denver means nearly \$15,000.

In addition to our room for acceleration we have six rooms for subnormals, aggregating about 120 average enrolment. These represent all the grades and are given a modified course in academic subjects suited to their mental abilities. Much manual work is given, which relieves the mental strain of the academic subjects, and makes life much more pleasant for these unfortunates. In the normal classes, wherever it is possible to do so, the classes of the same half grade are divided into higher and lower according to the mental ability of the pupils. The brighter ones are expected to do more than the others, each according to his ability to acquire. Thus we endeavor to arrange the classes and the work in order to keep each child working to his full capacity and none beyond.

CHAPTER VI

DIAGNOSIS BY MEANS OF THE INFORMAL OR UNSTANDARDIZED TEST

INFORMAL TESTS AS A MEANS FOR THE IMPROVEMENT OF INSTRUCTION

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Characteristics of the informal test—Informal tests as used in this discussion might well be termed unstandardized tests. They are, in many instances at least, patterned after the standardized tests, but lack the tempering obtained through the long process of standardization. They might be termed standardized tests in the making, although many of them will never be completely standardized. The informal tests are similar to the standardized tests in that they are as nearly objective as possible, that is, they are so constructed that the method of administering, scoring, and tabulating is identical with that provided for the standardized tests. They are usually constructed by teachers or supervisors for securing accurate measures of the achievements of pupils in a particular room, grade, building, or city. No definite attempt is made to evaluate each element of the test other than possible comparison with similar existing standardized tests or utilization of the judgments of other interested people, and no attempt is made, for the time being at least, to develop standards of achievement through giving them to a vast number of children in various places. The informal tests are usually constructed in response to local situations and limited in their use to the situations concerned. Obviously, they do not possess all the virtues of the standardized tests and are limited in their application, but it is the thesis of this article that they can be used effectively by teachers and supervisors as a means for the improvement of instruction.

Types of informal tests—The following exercises from the sample examination on the physical features of the United States described by McCall¹ illustrates one of the popular informal tests, the true-false test.

Sample I—Some of the following twenty statements are true, and some are false. When the statement is true, draw a line under TRUE; when it is false, draw a line under FALSE. Be sure to make a mark for every statement. If you do not know, guess.

1. In general the mountain ranges run east and west__ TRUE FALSE
2. Most of the rivers flow north_____ TRUE FALSE
6. The Cascade Mountains are nearer the Pacific
Ocean than the Rocky Mountains_____ TRUE FALSE

¹ McCall, W. A. A New Kind of School Examination. *Journal of Educational Research*, Vol. I, 1920.

13. The Mississippi flows into the Great Lakes----- TRUE FALSE
 20. The central portion of the United States is on the
 whole more level than the eastern or western part----- TRUE FALSE

Pupil's score = (number right) — (number wrong). Answers not marked are disregarded. In case both answers to the statement are marked, the answer is called wrong.

A slight variation of the true-false test is the test in which all the questions are answered by "yes" and "no." Since the yes-no test is so similar to the true-false test no illustration of it will be given.

The three illustrations below are extracts from informal tests patterned after the Thorndike-McCall Paragraph Reading Test, although one of the extracts pertains to the subject matter of history and one, to the subject matter of arithmetic.

Sample II—Read this paragraph, and then answer the questions about it. Read it again if you need to.

Four years ago a garden-club boy in Massachusetts faced what would have seemed even to an adult a hard problem. Born in Italy, but thoroughly inoculated with the American idea of the necessity of an education, Tito, while in the eighth grade, was told by his father that he could no longer be kept in school. His future path was to lie toward the neighboring factory.¹

1. Where was Tito born? -----
2. What did Tito think he needed? -----
3. What did Tito's father wish him to do? -----
4. What problem did Tito have to face? -----
5. To what club did Tito belong? -----

Sample III—Read this problem and then write the answers to questions 1, 2, 3, 4, and 5. All questions must be answered from what the problem says. Reread the problem if you need to, but do not work it.

A plumber and his helper leave the shop at 8:20 A.M. to repair a pipe. They return at 11:15 A.M. Make out the bill for the job, counting 60 cents an hour for the time the plumber is out from the shop, half as much for the helper, and 85 cents for the material used. Make the date today. Use any name you choose.²

1. Whose names are to be used in making out the bill? -----
2. How many items are to be included in the bill? -----
3. Between what hours was the plumber away from the shop? -----
4. How much per hour was the plumber to receive? -----
5. What does this problem ask you to do? -----

Sample IV—Read this paragraph, and then answer the questions about it. Read it again if you need to.

¹ Lewis and Rowland. *The Silent Readers*. Seventh Grade, page 96.

² The Thorndike Arithmetics, Book III, page 71.

The colonists reached the coast of Virginia in the spring of 1607. They landed on a small island. They began building a town there which they named Jamestown, in honor of James the First, who was then king of England. They built huts, made of branches of trees, to live in. But things did not go well with them. They were not used to such hot weather as they had in Virginia, and by September many of them had fallen sick and died.

1. In what year did the Virginians land? -----
2. In what season did they land? -----
3. What did they name their settlement? -----
4. Whom did they wish to honor by giving their colony this name? ----

These three illustrations are sufficient to show the possibility of constructing informal tests after the Thorndike-McCall reading test. Other illustrations could have been given from geography, physiology, nature study, or any of the subjects taught. The crude score on any of these tests is the number of questions correctly answered. The number of paragraphs included in the informal test depends upon the time available for testing, although no time limit is placed on the test itself.

Many informal tests are patterned after the information test of the Army Alpha, but only two illustrations will be given.

Sample V—In each of the following sentences underline the word, or group of words which make the sentence most nearly correct.

1. The Capital of the United States is Chicago, New York, Philadelphia, Washington.

2. The germ of malaria is carried by the house-fly, wood-tick, mosquito, bad air.

3. To kill poison from poison ivy bathe afflicted parts with milk, soothing syrup, solution of sugar of lead, kerosene.

4. The mild climate of Seattle is caused by abundance of rain, nearness to the equator, Japan Current, mountains.

Sample VI—Draw a line under the word in parentheses which is the best definition of the word in capitals.

1. IMPEACH (to accuse, to convict, to deplore, to insist).
2. REGULATE (to commute, to govern, to appoint, to abolish).
3. VETERAN (foreigner, soldier, minister, professor).
4. FEDERAL (national, ancient, municipal, judicial).

The score to tests like Samples 5 and 6 is the number of correct answers. The number of questions in such tests varies from 20 to 100, depending on the purpose for which the tests are given and the time available. The difficulty of tests similar to Samples 5 and 6 depends upon the difficulty of the first part of the exercise involved and the range and similarity of the elements in the second part. Such tests may be given either with or without time limits.

The sample below is an imitation of the so-called "judgment" test used in so many of the intelligence tests. This form of test is used when there

is a desire to test the more involved mental processes. The score is the number of exercises correctly marked.

Sample VII—Read the paragraph and then check the one of the five statements below that best expresses the central thought of the paragraph.

One day Abraham Lincoln was riding with a friend. They came to two little birds lying in the road. The wind had blown them from their nest. One man rode on, but that man was not Abraham Lincoln. He stopped and put the birds back into their nest. Then with a happy heart, he rode after his friend.

1. ---- Abraham Lincoln once found some birds lying in the road.
2. ---- Abraham Lincoln was a very tender-hearted man.
3. ---- Abraham Lincoln went riding with his friend.
4. ---- Abraham Lincoln put the birds back into the nest.
5. ---- Abraham Lincoln stopped when he saw the birds lying in the road.

The principle of the "mixed relations" or "analogies" test employed in the construction of the informal tests is exhibited in extracts from the grammar and history tests which follow.

Sample VIII—Write in column D a word that bears the same relation to the word in column C as the word in column B bears to the word in column A.

A	B	C	D
do not-----	don't	cannot -----	-----
he-----	his	she -----	-----
boy-----	boys	box -----	-----
ran-----	run	shot -----	-----
Wednesday-----	Wed.	Friday -----	-----
sweeter-----	sweet	longer -----	-----
cat-----	cats	wife -----	-----
go-----	gone	see -----	-----

Sample IX—Write in column D a word or group of words that bear the same relation to the word or group of words in Column C as the word or group of words in column B bears to the word or group of words in column A.

A	B	C	D
Jefferson-----	Declaration of Independence	Madison -----	-----
Howe-----	Sewing Machine	McCormick -----	-----
Garfield-----	Republican	Clay -----	-----
Pennsylvania-----	Quakers	Maryland -----	-----
New York-----	Royal Colony	Pennsylvania -----	-----
South-----	County Unit of Government	New England-----	-----
Webster-----	Unionist	Calhoun -----	-----

The score on tests like Samples 8 and 9 is the number that are correct. The use of tests similar to these is somewhat more limited than some of the other tests, but they present interesting possibilities.

The final type of informal test presented is of the "matching" variety. Tests of this kind can be devised in almost any field, and they prove to be the most useful instruments of measurement.

Sample X—Write in the answer column the particular number of the civic term given in column 1 which corresponds to the descriptive phrase given in column 2.

Civic term	Descriptive term	Answer
1. Direct Primary	The movement of foreigners to America	No.---
2. Initiative	Method of removing public officers by vote -----	No.---
3. Tariff	Power given voters to get new laws-----	No.---
4. Short Ballot	"Victory," appointments, and removals	No.---
5. Conservation	The method of secret voting-----	No.---
6. Recall	Power given voters to pass laws-----	No.---
7. Immigration	The plan of filling a few important offices at one time-----	No.---
8. Australian Ballot	Method of nomination of officers by popular vote -----	No.---
9. Referendum	Tax levied on imports-----	No.---
10. Spoils System	Wise use of natural resources-----	No.---

The above samples of informal tests are sufficient to show the unlimited possibilities which a classroom teacher or supervisor can utilize in test construction. Had space permitted, illustrations of informal tests could have been given for each and every standardized test now constructed. The possible use of informal tests is in reality much wider than the use of the standardized tests, for informal tests can be applied in many instances where no standardized tests are yet available.

At this point it seems fitting to describe briefly the type of informal test advocated by Gray.¹ He urges having the teachers test the pupils on selections from the subject matter of their own books. He suggests that when a suitable selection is chosen and when the child is situated in a suitable environment, the following formula of directions be given. "I want you to read page — aloud for me. Begin with the first word at the top of the page when I say *Begin!* Read until I tell you to stop. If you find some hard words, read them as best you can without help and continue reading." The teacher should record the exact time required for reading the selection and calculate the number of words read per minute. If desired, while the pupil is reading, she may keep a record of the errors made, following about the same system of recording the errors as used in Gray's Oral Reading Test. She may test the pupil for comprehension by

¹ Gray, William S. Value of Informal Tests of Reading Accomplishment. *Journal of Educational Research*, February, 1920.

having him reproduce what was read or by having him answer a list of given questions. When she has tested the whole class in such manner, she should have a very good measure of the reading ability of the different pupils. Furthermore, if she has been careful in carrying out the test she may repeat it at a later time to show how much improvement has resulted from a definite amount of training. This procedure can be followed with many selections, and it is safe to say that it furnishes a very effective device for diagnosing the reading situation.

Principles underlying the construction of informal tests—The guiding principles in the construction of informal tests are the same as the principles underlying the construction of the standardized tests, and therefore only two of them will be rehearsed here.

1. *The test must attempt to measure desirable outcomes of the teaching of the subject under consideration.* Only those bits of subject matter should be included which can be justified by the current philosophy of education. Unimportant details have no more place in an informal test than in any other test. The subject matter of the test should be taken from the course of study under consideration and should be varied enough to emphasize all of the desirable outcomes to be derived from the teaching of the subject. It may be possible to include all of the different varieties of subject matter within one test, but it is usually better to make different tests for the different objectives.

2. *The test should be objective.* It should be of such a nature that there is perfect agreement in its scoring. The exercises should be terse, clearly expressed, and so chosen that there is only one correct answer to each. This accurate scoring of the informal tests constitutes one of their great advantages over the traditional examinations. The objectivity of the informal tests implies definite methods of administering, scoring, and tabulating. These methods are usually borrowed from appropriate standardized tests, and if properly carried out make possible the repetition of the tests and provision of comparable data. Those constructing informal tests must give heed to these two fundamental principles if informal testing is to go unchallenged.

The use of informal tests—1. Informal tests are a valuable supplement to the standardized tests. Many of the standardized tests have but a single edition and this edition may soon lose its value if extensively used within a school system. This single edition may be sufficient for reliably measuring achievement of a group, but insufficient for reliably measuring the achievement of an individual. Informal tests patterned after the standardized test or after a particular part of it furnish the means for passing judgment of the reliability of the measurement with a standardized test. With the Woody Arithmetic Test, when the emphasis is placed on the measurement of an individual, it is recommended that the individual be given any list of problems similar to the ones in the standard test in order to get a reliable measure of achievement. The same is true with many other standard tests.

2. Informal tests can be used when no standardized tests are available. As yet no suitable standardized tests have been constructed in such studies as nature study, physiology, hygiene, civics, or drawing. Furthermore, in many fields where there are standardized tests they are not applicable to all grades in the elementary school. Very few tests have been worked out for the primary grades. Many of the standardized tests, too, emphasize only certain phases of a particular subject and many times the phase of the subject emphasized is the mechanical aspect. Informal tests will overcome both of these deficiencies. To illustrate, there is no suitable vocabulary test for reading in the primary grades, but a very usable informal test can be constructed from the word lists of Thorndike,¹ Jones,² Packer,³ or Houser.⁴ Again since most of the standardized tests in arithmetic emphasize the mechanical aspects of the subject, the use of an informal test such as Sample 3, which attempts to measure the reading aspect in the solution of problems in arithmetic, will call attention to a most important but often neglected phase of the subject.

3. *Informal tests may be used as a substitute for standardized tests.* While no one would advocate the complete substitution of informal tests, in these times of financial stringency the cost of providing the regular standardized tests makes their use prohibitive. In such cases the informal test, if properly constructed and mimeographed on suitable paper, is an excellent substitute and the cost will be nominal. While there will be no well-established standards of comparison for the informal tests, it must not be forgotten that the most significant standards of comparison for any city are developed within the city itself.

4. *Informal tests can be used as a means of training for the effective use of standardized tests.* The effective use of standardized tests depends upon a thorough understanding of the significance of following specifically the directions for giving, scoring, and tabulating sent out with the tests. This understanding comes mainly through practice with test material. Too often testing programs are launched without having given preliminary practice in the technique of testing, and gross errors, which could have been easily prevented, destroys the validity of the testing. In some school systems the first attempt at measurement is often almost worthless. Preliminary practice with informal tests will prevent this and will save the school the price of the standard tests and in all probability will create a real demand for the use of them. Furthermore, the use of informal tests emphasizing various aspects of a single subject and including measures of the high aspects, such as thinking, character, judgment, or appreciation, will prove an excellent antidote to the idea that achievement in a subject has been completely measured when a single test has been given. This fact will certainly make for the more effective use of the standardized tests.

¹ Thorndike, E. L. *Teachers' Word List*.

² Jones, R. G. *Standard Vocabulary*. Fourteenth Yearbook, National Society for the Study of Education. Part I, p. 37.

³ Packer, Paul C. *The Vocabulary of Ten First Readers*. Twentieth Yearbook, National Society for the Study of Education. Part II, p. 127.

⁴ Houser, E. T. *Analysis of the Contents of Ten Second Readers*. Seventeenth Yearbook of the National Society for the Study of Education. Part I, p. 40.

5. *Informal tests are useful as means of diagnosis.* In this particular, informal tests are almost as valuable as the standardized tests. Informal tests in arithmetic patterned after the Woody tests will reveal the types of errors made just about as well as the original tests. Likewise informal reading tests patterned after the Thorndike-McCall tests or the Gray oral or silent reading tests will portray in a very satisfactory manner the strengths and weaknesses of the reading situation concerned. Of course, accurate standards of comparison for these informal tests will be lacking, but standards of comparison are not needed to tell whether a child has a habit of adding 8 and 9 and getting 15 or a habit of mispronouncing words or misconstruing the meaning of them when reading. Thus remedial instruction and practice exercises can be based about as well on the results of informal tests as on those of standardized tests. The informal tests can be used from the standpoint of supervisory diagnosis as well as from the standpoint of pedagogical diagnosis just mentioned. The supervisor by use of properly constructed tests can measure how successfully and to what extent various aspects of the different subjects are being emphasized. In this way instruction can be directed and motivated.

6. *Informal tests are useful instruments for evaluating the results of educational experiments.* Standardized tests are very useful in experimentation, but they are not adaptable to many of the classroom experiments and dependence must be placed upon the informal tests. In many of the experiments from which most valuable contributions have come to educational procedure the informal tests have been the instruments by which the different practices have been evaluated. Often these experiments have been conducted by the classroom teacher, and it is safe to predict that in the future much more experimentation will be carried on than in the past. Out of it is certain to come much improvement of instruction and a real interest in the professional and scientific aspects of teaching.

THE VALUE OF INFORMAL TESTS IN SUPERVISION

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If we must have standings, they should be determined in large measure from the results of frequent well-chosen tests, so that they may represent as closely as possible the relative ability of the pupils. I know of no better way to test the quality of teaching or the achievement of the class than by the informal test. The preparation of such tests by the teachers is of great value to them, since it demands that they give considerable thought to the outstanding points of the subject under consideration. Many times the difference between a brilliant man and a mediocre one is the ability to give attention to really essential points and let petty details go.

I have heard of pupils of great natural capacity who were so excitable that they went to pieces at the time of tests and failed utterly, but in

twenty-two years of experience in day and evening classes, I have yet to meet the pupil who was not able to demonstrate his ability in frequent informal tests.

I have never been able to understand why a pupil should not be expected to answer questions upon the important facts of a subject which he is studying. I have always used tests to a considerable extent in ranking my pupils, since much of the work has been done at home, and I must be absolutely certain that the papers represent the work of the pupils without help from any kind friends. Of course, if the teacher begins to talk examination day as if it were a day of judgment before a judge who knew no such words as sympathy or pity, the case is entirely different.

The pupils are told that promotion does not depend primarily upon the results of tests and an effort is made to have the tests given in such a way that there will be no fatigue, either to the pupil or to the teacher.

We notify students who are not doing satisfactory work at least five weeks before the end of the term, so that they may try to improve sufficiently to pass. Pupils who are doing satisfactory work are told of their good standing and are excused from the tests near the end of the term, unless they wish to take them in the hopes of achieving higher rank.

SAMPLES OF INFORMAL TESTS THAT HAVE BEEN FOUND HELPFUL IN DIAGNOSIS

AMERICAN HISTORY¹

Mark correct statements +

Mark incorrect statements —

Mark statements you do not know about 0

1. Columbus discovered America in 1492.
2. De Soto was a French explorer.
3. John Cabot was sent by Portugal.
4. Eli Whitney invented the cotton gin.
5. De Soto discovered the Mississippi River.
6. Samuel Adams was a President of the United States.
7. The Battle of Gettysburg was fought July 3, 1875.
8. The Battle of Bunker Hill was fought April 19, 1775.
9. The Constitution was adopted in 1787.
10. The French and Indian War was fought before Washington was born.
11. Washington was inaugurated in 1789.
12. Thomas Jefferson believed in the right of all men to vote.
13. The War of 1812 was caused by English trying to tax the colonies.
14. The Stamp Act was passed to help the colonies.
15. Dred Scott was a famous explorer.
16. Magellan was the first to circumnavigate the globe.
17. The Mexican War was caused by a dispute over slavery.
18. Samuel F. B. Morse invented the telephone.
19. Andrew Jackson was the American Commander at the Battle of New Orleans.
20. Benedict Arnold fought bravely at Saratoga.

¹ Submitted by William F. Butler, Principal Belmont Street School, Worcester, Mass.

AMERICAN HISTORY TEST I—ANALOGIES¹

Name..... Boy or Girl.....
 Age last birthday..... Next birthday will be.....
 Grade..... Class:..... School.....
 Teacher.....

General Directions

This sheet contains a test in American history. Read the directions carefully, and when the signal to begin is given, turn the page, and do the test as rapidly as you can, but remember that it is more important to get it right.

Do not turn the page until you are told to do so.

Samples

	Attempted.....
	Right.....
1. Battle of Bunker Hill—Revolutionary War	Battle of Santiago.....
2. Robert Fulton—Steamboat	Eli Whitney.....
3. 1513—Balboa discovered the Pacific Ocean	1492.....

Note example one. Revolutionary War tells you in what war the Battle of Bunker Hill was fought. Now ask yourself in what war the battle of Santiago was fought. It was fought in the Spanish-American War. So you write Spanish-American War after Battle of Santiago.

Now look at example two. Following the name Robert Fulton, you see the word Steamboat. This word should recall to you what Fulton did. He invented the steamboat. Now you must ask yourself what Eli Whitney invented. Of course you know it was the cotton gin. So you write Cotton Gin after Eli Whitney.

Now turn to the third example. 1513 was the year when Balboa discovered the Pacific Ocean. Now ask yourself who discovered something in 1492 and what he discovered. You know the answer. Columbus discovered America in 1492. Write Columbus discovered America.

After you have filled in the blank spaces with your answers your paper will be like the examples below:

1. Battle of Bunker Hill—Revolutionary War	Battle of Santiago—Spanish American War
2. Robert Fulton—Steamboat	Eli Whitney—Cotton gin
3. 1513—Balboa discovered the Pacific Ocean	1492—Columbus discovered America

Now go through the list on reverse side and write your answers in the blank spaces. They should be brief, and similar in character to those given above in explanation. If you come to one you cannot answer omit it and try the next.

1. Jefferson—Declaration of Independence	Madison
2. Howe—Sewing Machine	McCormick
3. Northwest Territory—Michigan, Indiana, etc.	Oregon Territory.....
4. 1825—Erie Canal completed	1913
5. Supreme Court—Interpretation of the Laws	Congress

¹ Prepared by Virgil Smith, Principal of the Highland Park School, Seattle, Washington.

- | | | | |
|--|---|--|---|
| 6. Civil War—Battle of Gettysburg | Revolutionary War..... | | |
| 7. Revolutionary War—Washington | Civil War..... | | |
| 8. Battle of Lake Erie—Perry | Battle of Manila..... | | |
| 9. War of 1812—Impressment of American seamen | Civil War..... | | |
| 10. Revolutionary War—(German) Steuben | Revolutionary War (French)..... | | |
| 11. New York colony—Royal colony | Pennsylvania colony..... | | |
| 12. Alaska—Acquired by purchase | Hawaii | | |
| 13. Northwest Territory—George Rogers Clark and Daniel Boone | Oregon territory..... | | |
| 14. New York—Settled by the Dutch | Florida | | |
| 15. Jefferson—Purchased Louisiana | Wilson | | |
| 16. New England colonies | <table border="0"> <tr> <td> <div> <div>fishing</div> <div>wheat raising</div> <div>cotton growing</div> <div>mining</div> <div>shipbuilding</div> <div>tobacco growing</div> </div> </td> <td> <div>Southern colonies</div> <div> <div>mining</div> <div>fishing</div> <div>wheat raising</div> <div>cotton growing</div> <div>shipbuilding</div> <div>tobacco growing</div> </div> </td> </tr> </table> | <div> <div>fishing</div> <div>wheat raising</div> <div>cotton growing</div> <div>mining</div> <div>shipbuilding</div> <div>tobacco growing</div> </div> | <div>Southern colonies</div> <div> <div>mining</div> <div>fishing</div> <div>wheat raising</div> <div>cotton growing</div> <div>shipbuilding</div> <div>tobacco growing</div> </div> |
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| 17. Samuel F. Smith—Wrote "America" | Francis Scott Key..... | | |
| 18. Pennsylvania—Quakers | Maryland | | |
| 19. Massachusetts—James Otis | Virginia | | |
| 20. Cyrus W. Field—Atlantic cable | Samuel F. B. Morse..... | | |
| 21. Henry Hudson—Discovered Hudson River | De Soto | | |
| 22. Washington—Proclamation of Neutrality | Lincoln | | |
| 23. Webster—Unionist | Calhoun | | |
| 24. Jamestown Exposition — Celebrated settlement at Jamestown | Louisiana Purchase Exposition..... | | |
| 25. Cause of Dorr's rebellion—Property qualification for voting | Whiskey rebellion..... | | |
| 26. South—County unit of government | New England..... | | |
| 27. Susan B. Anthony—Suffrage | Clara Barton | | |
| 28. Spanish-American War — Acquired Philippines and Porto Rico | Mexican War..... | | |
| 29. Raleigh—Aided by Queen Elizabeth of England | Columbus | | |
| 30. Balboa—Spanish explorer | John Cabot..... | | |
| 31. 1848—Close of the Mexican War | 1865 | | |
| 32. 1732—Settlement of Georgia | 1620 | | |
| 33. Pennsylvania—William Penn | Rhode Island..... | | |
| 34. 1565—St. Augustine | 1607 | | |
| 35. John Winthrop—Governor of Massachusetts colony | John Smith..... | | |
| 36. Alaska | <table border="0"> <tr> <td> <div> <div>mining</div> <div>cotton raising</div> <div>sugar cane industry</div> <div>cattle raising</div> <div>hemp growing</div> <div>fur hunting</div> </div> </td> <td> <div>Philippines</div> <div> <div>mining</div> <div>cotton raising</div> <div>sugar cane industry</div> <div>fur hunting</div> <div>cattle raising</div> <div>hemp growing</div> </div> </td> </tr> </table> | <div> <div>mining</div> <div>cotton raising</div> <div>sugar cane industry</div> <div>cattle raising</div> <div>hemp growing</div> <div>fur hunting</div> </div> | <div>Philippines</div> <div> <div>mining</div> <div>cotton raising</div> <div>sugar cane industry</div> <div>fur hunting</div> <div>cattle raising</div> <div>hemp growing</div> </div> |
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HISTORY QUIZ—7B¹

This exercise is used to test the pupils' memory of certain historical facts. The teachers read the statements to the pupils and they write the word "true," or "false."

True or False

1. Dale's first great reform was to establish individual ownership of land and goods.
2. Self-government was established in Virginia in 1619.
3. The most notable provision of the Virginia charter was that the colonists as citizens in America should have the same rights and privileges as belonged to citizens of England.
4. The first negro slaves were brought to Virginia in 1619.
5. Tobacco established village life in Virginia.
6. The Navigation Laws and the tyranny of Berkeley led to Bacon's Rebellion.
7. The Puritans wished to stay in the church and reform it.
8. The Pilgrims made their first settlement at Plymouth, Mass., in 1620.
9. The Pilgrims at Plymouth believed that the people should rule; they planted democracy in their church and state.
10. The Pilgrims received a very liberal charter from the king.
11. The Puritans allowed none but church members to vote.
12. The Connecticut Constitution was the first written Constitution in all history upon which a government was built up.
13. Thomas Hooker, the minister at Cambridge, was the leader of a movement in favor of a more democratic form of government.
14. The Connecticut Charter was so liberal and satisfied the people so well that it afterwards became the State constitution and remained in force till 1818.
15. Roger Williams was governor of the Massachusetts Bay Colony.
16. The first union of the colonies was the New England Confederacy in 1643.
17. Massachusetts lost her charter in 1684.
18. The Connecticut Charter was hidden in an oak tree.
19. The people of New England lived mostly in towns.
20. Andros was a good governor and liked by all the people.

¹ A. S. Gist, Principal of the B. F. Day School, Seattle, Washington.

U. S. HISTORY TEST—ANALOGIES—7B¹

1. New York colony—Royal colony	Pennsylvania colony.....
2. New York—Settled by the Dutch	Florida
3. New England colonies	Southern colonies
<u>fishing</u>	mining
wheat raising	fishing
cotton growing	wheat raising
mining	cotton growing
shipbuilding	shipbuilding
tobacco growing	tobacco growing
4. Pennsylvania—Quakers	Maryland
5. Henry Hudson—Discovered Hudson River	De Soto.....
6. Raleigh—Aided by Queen Elizabeth of England	Columbus
7. Balboa—Spanish Explorer	John Cabot.....
8. 1732—Settlement of Georgia	1620
9. Pennsylvania—William Penn	Rhode Island.....
10. 1565—St. Augustine	1607
11. John Winthrop—Governor of Massachusetts colony	John Smith.....

¹ Submitted by A. S. Gist, Principal of the B. F. Day School, Seattle, Washington.

U. S. HISTORY TEST—ANALOGIES—7A¹

1. Jefferson—Declaration of Independence	Madison
2. Howe—Invented Sewing Machine	McCormick
3. Northwest Territory—Michigan, Indiana, etc.	Oregon Territory
4. Supreme Court—interprets law	Congress
5. Civil War—Battle of Gettysburg	Revolution
6. Northwest Territory—Geo. Rogers Clark	Oregon Territory
7. Samuel F. Smith—wrote <i>America</i>	Francis Scott Key
8. Massachusetts—James Otis	Virginia
9. Webster—Unionist	Calhoun
10. Cause of Dorr's Rebellion—Property qualification for voting	Whiskey Rebellion
11. Field—Atlantic Cable	Samuel F. B. Morse

¹ A. S. Gist, Principal of the B. F. Day School, Seattle, Washington.

U. S. HISTORY TEST—ANALOGIES—8B¹

1. War of 1812—Treaty of Ghent	Spanish American.....
2. Grover Cleveland—Democrat	Abraham Lincoln.....
3. Woodrow Wilson—served two terms	U. S. Grant.....
4. George Washington—Virginia	Warren Harding.....
5. War of 1812—Impressment of American seamen	Spanish American.....
6. 1893—Columbian Exposition	1904
7. 1907-1909 — Atlantic fleet sailed around the world	1519-1521
8. Manila—Dewey	Santiago
9. De Witt Clinton—Erie Canal	Ferdinand de Lesseps.....
10. Horace Greeley—New York Tribune	Benjamin Franklin.....
11. Harriet Beecher Stowe—Uncle Tom's Cabin	Edward Everett Hale.....
12. Horace Mann—Public schools	Clara Barton
13. Commodore Perry—Lake Erie victory	Admiral Dewey.....
14. George Washington—Father of his country	John Stevens.....
15. Texas—acquired by annexation	Florida

¹ A. S. Gist, Principal of the B. F. Day School, Seattle, Washington.

ARITHMETIC¹ $+$ = ADD $-$ = SUBTRACT $\times$ = MULTIPLY $\div$ = DIVIDE

WHAT PROCESS SHOULD BE EMPLOYED IN EACH OF THE FOLLOWING EXAMPLES?

1. Multiplicand and product given, to find the multiplier.
2. Sum and one number given, to find the other number.
3. Subtrahend and remainder given, to find the minuend.
4. Base and rate given, to find percentage.
5. Area of rectangle and length given, to find width.
6. Selling-price and gain given, to find cost.
7. Quotient and divisor given, to find dividend.
8. Minuend and remainder given, to find subtrahend.
9. Tax paid and rate of tax given, to find assessed valuation.
10. Cost and discount given, to find the marked price.

¹ Submitted by William F. Butler, Principal of the Belmont Street School, Worcester, Mass.

CIVICS: FACTS ABOUT WORCESTER¹

Fill in the blanks.

1. The Public Library is on Street.
2. The Art Museum is on Street.
3. Worcester is the city in size in Massachusetts.
4. The largest mill in the world owned by an individual is in Worcester.
5. Worcester is often called "The".
6. A building in Worcester owned by the United States Government is the
7. The municipal golf links are off Street.
8. The Worcester Polytechnical Institute is on Street.
9. Clark College is on Street.
10. Worcester Academy is on Street.
11. Holy Cross College is on Street.
12. The Mayor of Worcester is
13. The Chief of Police is
14. The United States Envelope Company is on Street.
15. The industry which gives work to the greatest number of men in Worcester, is the
16. Street cars are built by the
17. Chains for trucks are made by the.....
18. An institution which belongs to the State is the on Street.
19. A building which belongs to Worcester County is the..... on Street.
20. The member of the United States Congress whose home is in Worcester is

¹ Submitted by William F. Butler, Principal of the Belmont Street School, Worcester, 14 ss.

DIAGNOSTIC TEST—ORAL ARITHMETIC, GRADES 4 TO 8¹

Use the pencil to write the number of the problem and the result only.

1. Cost of 7 yds. of baby ribbon at 4c. a yard?
2. How many inches in half a foot?
3. How many days in 6 weeks?
4. At 50 cents a dozen what should you pay for 6 apples?
5. Rachel had a quarter. She spent 10 cents for ice cream; amount left.
6. The divisor is 4 and the dividend 12; what is the quotient?
7. How many half pint bottles could you fill from a quart bottle?
8. At 3 for 5c. how many marbles could you buy for a dime?
9. A blackboard pointer is $2\frac{1}{2}$ ft. long; how many inches is that?
10. At 2 for 5c. what will half a dozen oranges cost?
11. A yard stick is cut into 4 equal parts; how long is each part?
12. A boy's shoes cost \$5.50; what change should he receive from \$10.
13. At 40c. per yard what should you pay for $2\frac{1}{2}$ yards of gingham?
14. Your school room is 24 ft. wide; how many yards is that?
15. At 40c. per lb. what would 8 oz. of steak cost?
16. When milk sells at 2 cans for 25c. what should 6 cans cost?
17. When grape fruit are 3 for 25c. what should you get for \$1.00?
18. How many 6 in. badges could you cut from 5 yds. of ribbon?
19. Which is cheaper, 2 lbs. for 15c. or 3 lbs. for 25c.?
20. At 20c. a pound, how many pounds of chops should you get for 50c.?
21. Gloves that cost \$72 per doz. sold for \$9 per pair. Gain per pr.?
22. Apples that cost \$2.25 per box of 84 apples sold at 50c. per doz. What was gained on a box?
23. Your schoolroom is 24 ft. x 24 ft. At \$3.00 per yard, what would it cost to cover the floor with linoleum?
24. What is the gain per cent when hats that cost \$60 per dozen sell at \$7.50 each?
25. What is the distance around a 7 in. stove pipe?
26. Find the cost of a load of coal weighing 4000 lbs. at \$12.50 per ton.
27. At 50 lbs. per cu. ft. what is the weight of a block of ice 12 in. x 18" x 24"?
28. Potatoes costing \$30 per ton sell at \$200 per cwt.; what is the gain per cent?
29. At a 25% discount sale what should I pay for a suit of clothes marked \$60?
30. A piece of paper 8" x 12" is cut into squares to cover a 4 in. cube. How much paper remained?

Instructions to teachers—Fourth-grade pupils should solve a minimum of 10 problems, fifth-grade pupils, 15, sixth-grade pupils, 20 and seventh-grade pupils, 25 problems. Eighth-grade pupils should solve all of the problems. Tabulate carefully the number of pupils missing each problem, so as to bring out points of weakness.

The maximum time, allowance should be 10 minutes for the fourth grade, 13 for the fifth, 15 for the sixth, 17 for the seventh, and 20 minutes for the eighth grade. All pupils who finish in 5 minutes less than the time allotted should be given 100 per cent in speed.

¹ Submitted by George A. Stanton, Principal of the Washington School, Seattle, Washington.

DIAGNOSTIC TEST—WRITTEN ARITHMETIC, GRADES 4 TO 8¹

Solve the following on this sheet without copying the problems:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\begin{array}{r} 17 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ +7 \\ \hline \end{array}$	$84-12=$	$\begin{array}{r} 7 \\ 8 \\ 5 \\ 9 \\ \hline \end{array}$	$5 \overline{)3685}$	$\begin{array}{r} 2846 \\ \times 8 \\ \hline \end{array}$

(8)	(9)	(10)	(11)	(12)
$6+5+7+9=$	$\begin{array}{r} 87543 \\ -79652 \\ \hline \end{array}$	$\begin{array}{r} 24632 \\ \times 36 \\ \hline \end{array}$	$29 \overline{)86496}$	$\begin{array}{r} 365 \\ 284 \\ 576 \\ 734 \\ 842 \\ \hline \end{array}$

(13)	(14)	(15)	(16)
$\begin{array}{r} 5\frac{1}{4} \\ 8\frac{3}{8} \\ +7\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 24\frac{1}{8} \\ -17\frac{3}{4} \\ \hline \end{array}$	$\begin{array}{r} 36 \\ \times 8\frac{1}{4} \\ \hline \end{array}$	$\begin{array}{r} 3 \quad 8 \\ - \times - = \\ 4 \quad 15 \end{array}$

(17)

$$\begin{array}{r} 3 \quad 9 \\ - \div - = \\ 5 \quad 20 \end{array}$$

(18)

$$\begin{array}{r} 4 \quad 2 \\ 2- \times + = \\ 5 \quad 7 \end{array}$$

(19)

$$\begin{array}{r} 3 \text{ gal. } 2 \text{ qt. } 0 \text{ pt.} \\ -1 \text{ gal. } 0 \text{ qt. } 1 \text{ pt.} \\ \hline \end{array}$$

(20)

$$\begin{array}{r} 3 \text{ yd. } 1 \text{ ft. } 6 \text{ in.} \\ \times 5 \\ \hline \end{array}$$

To the teacher: Tabulate carefully the number of pupils missing each example, so as to bring out points of weakness.

¹ Submitted by George A. Stanton, Principal of the Washington School, Seattle, Washington.

DICTIONARY TEST¹

This test is diagnostic in purpose. It was devised in September, 1921, as an aid in the discovery of difficulties that children in the 5th, 6th, 7th, and 8th grades have in finding words readily in the dictionary. It has been used in only three schools thus far, so there are no tentative standards of achievement.

Preliminary to taking this test, the pupils of the Salmon Bay School in the grades mentioned above, were required to find a listed group of ten words in the dictionary. As each word was found, its page number and column number were recorded opposite the word. Records for the different classes, showing the medians for number attempted and number correctly found, within a certain time limit, were made.

The dictionary test was then given. During the year, dictionary drills have been conducted which should bring about a marked improvement in this kind of work.

The dictionary test seems to lead to these conclusions: (1) That many pupils, especially in the intermediate grades, cannot write the letters of the alphabet in correct order; (2) that extensive drills on letter groups, like those found in part 2 of the test, should be given; and (3) part 4 of the test is too difficult for pupils below the 7th grade. However, pupils of the 7th and 8th grades enjoy this part of the test.

NOTE—This test serves, to a considerable extent, as an intelligence test.

¹ Submitted by W. A. King, Principal of the Salmon Bay School, Seattle, Washington.

DICTIONARY TEST

Name..... Grade..... Room..... Date.....

I. Writing letters in alphabetic order:

1. From d to n:.....
2. From m to z:.....
3. From s to x:.....
4. From b to k:.....

II. Rearranging groups in alphabetic order:

1. at ans ax amn ap:.....
2. cond cas comm centi cont:.....
3. stu sti sup spi smo:.....
4. fri pre dro per mon:.....

III. Writing words in alphabetic order:

1. Mary Marie Martha Marion Marian:.....
2. Montana Kentucky Indiana Nebraska Illinois
3. gone get grind game group:
4. hundred hinder hence hour hand

IV. Writing words in alphabetic order:

1. Five words that begin with "s." The first word is *sand*. Think of four others and write them in alphabetic order:

a. sand b..... c..... d..... e.....

2. Five words that begin with "d." The first word is *day*.

a. day b..... c..... d..... e.....

3. Five words that begin with "ca." The first word is *cab*.

a. cab b..... c..... d..... e.....

4. Five words that begin with "cr." The first word is *crab*.

a. crab b..... c..... d..... e.....

Score:	I	II	III	IV	Total
Right					
Wrong					

Note: "Right" means entirely right.

ENGLISH—CORRECT USE OF WORDS

Cross out the incorrect words in the following sentences:

1. John ^{lay}
laid the book on the table.
2. Please ^{bring}
take these apples to the kitchen.
3. There is no reason for a quarrel between you and ^I
me
4. If I had known your wish in the matter, I should have ^{done}
did as you suggested.
5. Everyone in the school must be very careful of ^{his}
their books.
6. As Mary did not feel well, she ^{lay}
laid down for an hour.
7. I have never ^{drank}
drunk any water which tasted ^{so}
as sweet as this.
8. I do not like ^{this}
these kind of apples.
9. When you have the table at the end and serve.
(Use correct form of sit or set)
10. ^{May}
Can I recite a poem to the class, if I ^{can}
may learn it before Friday.

ENGLISH—TEST FOR PARTS OF SPEECH ¹

N. = Noun	Adv. = Adverb
V. = Verb	Conj. = Conjunction
Pro. = Pronoun	Inter. = Interjective
Prep. = Preposition	0 = Do not know
Adj. = Adjective	

Write the abbreviation above each word.

"Whilst the camel was speaking, there arose a cloud of dust which opened and showed a short, thin old man, with a basket of carpenter's tools on his shoulders and a branch of a tree and eight planks on his head. When I saw him, O my sister, I fell down for excess of affright."

¹ Submitted by William F. Butler, Principal of the Belmont Street School, Worcester, Mass.

CORRECT USAGE ¹

Write the following exercises on your paper choosing the correct words needed to complete the sentences.

1. Do you think that it was (he him) ?
2. (Who whom) did you wish to see?
3. Was that Mary? I am sure that it was (her, she).
4. I (saw, seen) her on the car last Wednesday.
5. Where (was, were) you last evening?
6. (Can, may) I speak to you at recess?
7. Who was speaking? It was (I, me.)
8. She (done, did) her work very well.
9. John (don't, doesn't) recite so well as he did last week.
10. Will you please (set, sit) down, Julia?
11. Laura and (her, she) are invited.
12. He sent an invitation for you and (she, her) to go.
13. The dog (lay, laid) on the rug by the fire.
14. He has (laid, lain) there a long time.
15. The game (begun, began) before I arrived.
16. There (was, were) several people on the car.
17. Only Rose and (her, she) were present.
18. They were (sitting, setting) on the grass.
19. The rain has (lain, laid) the dust.
20. Was that your father and mother? Yes it was (them, they).

Instructions to teacher—Tabulate results by questions, so as to determine which points the class needs to have better fixed by drills.

¹ Submitted by George A. Stanton, Principal of the Washington School, Seattle, Washington.

GEOGRAPHY¹

Mark correct statements +

Mark incorrect statements —

Mark statements not known 0

1. The capital of New York is Albany.
2. Chicago is in Indiana.
3. Seattle is in Idaho.
4. The Mississippi is the longest river in the United States.
5. The deepest part of New York Harbor is 183 feet.
6. Boston is south of Providence.
7. Worcester is the second city in New England in population.
8. Richmond is the capital of Virginia.
9. There are more than 500,000 people in Boston.
10. Worcester has a population of 210,000.
11. Boston exports more shoes than any city in the world.
12. The largest carpet mill owned by an individual is in Worcester.
13. Louisiana is mostly east of the Mississippi.
14. The capital of Maine is Bangor.
15. New York is east of Rhode Island.
16. In 1920 the population of Boston was 132,726.
17. Maine exports great quantities of potatoes.
18. North Carolina is north of the city of Washington.
19. Philadelphia is the capital of Pennsylvania.
20. Providence is not a seaport.

¹ Submitted by William F. Butler, Principal of the Belmont Street School, Worcester, Mass.

GEOGRAPHY—COMPARISON AND CONTRASTS¹

1. Maine is (larger, smaller) than Washington.
2. Seattle is (larger, smaller) than Chicago.
3. Saint Paul has (less, greater) extremes of climate than Seattle.
4. New York is further (north, south) than London.
5. Louisiana raises (more, less) sugar than Cuba.
6. The foreign commerce of Seattle is (greater, less) than that of San Francisco.
7. The distance from Seattle to New York is (less, greater) than from New York to Liverpool.
8. The climate of Florida is (more, less) moist than that of southern California.
9. The area of Washington is (less, greater) than that of England.
10. The elevation of Seattle is (greater, less) than that of Minneapolis.

¹ Submitted by George A. Stanton, Principal of the Washington School, Seattle, Washington.

REVIEW OF PLACE GEOGRAPHY—GRADES 4 TO 8¹

On an outline map of North America locate the following, placing the numbers only on the map. In locating a city place a dot at the exact position with the number close beside it. In locating a region, a river, or a mountain system, place the number near the center or middle of the feature located. Draw lines when needed as for number 6.

- | | |
|-------------------------------------|------------------------------|
| 1. Pacific Ocean | 21. Puget [*] Sound |
| 2. Gulf of Mexico | 22. Long Island |
| 3. Alaska | 23. Florida |
| 4. Mexico | 24. Ohio River |
| 5. Mississippi River | 25. Wisconsin |
| 6. The Cotton Region | 26. Parallel 49° N. |
| 7. Chicago | 27. Sugar Cane region |
| 8. The Rocky Mountains | 28. Greatest Commercial Port |
| 9. The Columbia River | 29. Where oranges are grown |
| 10. The Wheat Region | 30. Meridian 90 W. |
| 11. The Tropic of Cancer | 31. Greatest iron mines |
| 12. Appalachian Mountains | 32. Greatest Pacific Port |
| 13. Lake Superior | 33. Greatest forests |
| 14. St. Lawrence River | 34. Greatest corn fields |
| 15. Cuba | 35. A great petroleum region |
| 16. A region of very heavy rainfall | 36. Galveston |
| 17. Florida | 37. Great fisheries |
| 18. A region having hot dry summers | 38. Denver |
| 19. Pittsburgh | 39. Lake Erie |
| 20. A great manufacturing region | 40. Panama Canal |

Fifth grades answer twenty; sixth grades, thirty; and seventh and eighth grades, all forty.

Time: ten minutes for all grades.

¹ Submitted by George A. Stanton, Principal of the Washington School, Seattle, Washington.

READING TESTS

The following tests are selected from a number of similar tests made by a study club composed of seven women principals of the Seattle public schools, Belle Dirimple, Chairman. These tests, similar in form to various standard tests, were prepared for the purpose of determining children's comprehension of the Geography, History, Arithmetic, and Reading material used in the Seattle schools.

The twenty-five sentences in the second-grade test contain words common to second-grade reading material; the words to be crossed out are found in the minimal list of required spelling words for the second grade.

The words and phrases given in the test for grade 5 are those which most frequently occur in the geography text used in that grade.

The material used in the third-grade test was selected from four readers provided for that grade.

Second Grade

READING TEST—K-1

School..... Grade..... Date..... Name.....

Read each sentence rapidly.

Make a circle around *one* word which does not belong there.

To be done with the teacher (1—4)

1. The bear ran of home.
2. The wolf was angry get.
3. I will play in had the garden.
4. We will buy some had meat.

Now do the same with the following sentences:

1. The lark sang his sweet make song.
2. See he these pretty flowers.
3. I am looking for a boy do.
4. He started to with run.
5. The duck can every swim.
6. They walked any a long way.
7. The bee brings home take honey.
8. The boy up was seven years old.
9. There are many flowers in Holland man.
10. They ride on the horse come.
11. I saw the such elephant.
12. I have a horn each, Ned.
13. Our May baskets are me done.
14. I can great climb a tree.
15. The wigwam was time done.
16. Mother be made bread.
17. The sun shines this.
18. The man built a was house.
19. He got up at little four o'clock.
20. Little Red Riding Hood put the basket no on the table.
21. The farmer how had a cat.
22. Where are my go sheep?
23. The pine tree lived in the woods out.
24. The bird had a nest can in the tree.
25. The bear likes climb honey.

Third Grade

School..... Name..... Grade.....

Read each exercise. Then answer the question or questions by drawing a line under the right word.

1. George lives on a farm. He rides his little gray pony to school. George helped his father on the farm. When George was ten years old, his father gave him the gray pony.

Where did George live?

city, country, farm.

What color was his pony?

black, gray, brown.

Who gave the pony to George?

father, uncle, mother.

2. Don and Rose made a big snowman. On the snowman's head they put father's tall hat. In his arms they placed mother's old broom. Then they used large, round pieces of coal for buttons.

What was tall?

snowman, broom, hat.

What shape were the buttons?

square, narrow, round.

3. But this poor boy was very happy. The great forest was his playground. The birds, squirrels and pretty flowers were his friends. He was kind to them all. He never threw stones at the birds or squirrels and never crushed the beautiful flowers.

What kind of boy was he?

selfish, kind, cruel?

Where was his playground?

street, forest, school.

4. Crusoe's stay on the desert island had come to an end. When he left the island he carried on board the sailing vessel his goatskin cap and umbrella, also the parrot.

How many things did Crusoe carry on board with him?

seven, one, three.

5. And now at last the sun

Is going down behind the wood

And I am very happy

For I know that I've been good.

What time of day was it?

noon, evening, morning.

6. The Dutch people are always washing and scrubbing and dusting. They give their boats a coat of fresh paint every year. The floors of their homes are scrubbed until you can almost see yourself in them. Every morning the doorsteps are washed and the streets swept.

Which word best describes the Dutch people?

wise, saving, clean, healthy.

7. The air is warm in our Eskimo house although there is no stove to be seen. In place of a stove there is a big bowl made of stone, in which seal oil is burning. This makes a lamp which is used for cooking and for warming the house.

What do the Eskimos burn?

coal, oil, gas, wood.

8. Now look at those huge ivory tusks on the ground over there. They came from an elephant. The man who killed the great beast has brought the tusks to sell to a white trader.

For what do men hunt the elephant?

skin, ivory, flesh.

9. The Desert of Sahara in northern Africa is almost as large as the whole United States.

Which is larger?

United States, Sahara Desert.

10. There are many rivers in the world. The source of a river is the place where it begins. Its mouth is the place where it ends in some larger body of water.

The place where the river begins is called what?

mouth, bed, source, banks.

GRADE FIVE

DIRECTIONS FOR TEST I—PART I.

Time: This is not a time test, but it would be interesting to note the time of pupil who finishes first and also the last to finish. Do not consider any pupil who is unusually dull or clever.

Place the list of words upon the board concealed from view, or give individual copies if possible.

Pupils place papers on desks face down.

I am going to show you some words and phrases. There will be two or three words or phrases on each line like this:

_____ good—bad (Write on board)
 _____ fair weather—pleasant weather

If the words or phrases on a line seem to mean the same thing, write *Yes* at the beginning of that line; if they do not mean the same, write *No* at the beginning of the line. Do *good—bad* mean the same? Then what shall we write? *No*. Do *fair weather* and *pleasant weather* mean the same? Then what shall we write? *Yes*.

There are some phrases like these on the paper before you. When I say "Begin," you are to turn your paper over and start with the top line; read each line through; write *yes* at the beginning of the line if you think they mean the same; write *no* at the beginning of the line if you think they do not mean the same. Be sure to read each line.

Ready—begin.

TEST I—PART I

_____ area—size
 _____ inhabitants—people—population
 _____ principal occupation—leading occupation—chief occupation
 _____ barren soil—productive soil
 _____ well suited to farming—adapted to farming
 _____ commerce—trade
 _____ dense population—scattered population
 _____ located—situated
 _____ raw products—finished products
 _____ tributaries of the Mississippi—branches of the Mississippi
 _____ collected—distributed
 _____ prairie—forest
 _____ region—district—section
 _____ natural highways—artificial highways
 _____ densely populated—thinly settled
 _____ vapor—moisture
 _____ arid—dry
 _____ tropical climate—cool climate
 _____ cold belt—torrid zone
 _____ straight—irregular
 _____ prominent city—important city
 _____ industry—business

TEST I—PART II

From the list of words or phrases below, select the ones you think right for the spaces in the sentences:

mineral products	navigable
abundant water power	extensive trade
transportation	valuable deposits
metropolis	republic
irrigation	

1. has changed much of California from a desert to a paradise of flowers.
2. Seattle has an with Alaska.
3. The United States is a
4. Oil and natural gas are important
5. Railroads run in all directions, so there is good.....
6. The Mississippi River is
7. The New England States have for manufacturing.
8. New York City is the for manufacturing.
9. of gold have been found in Alaska.

Possible score—9.

Score for each correct answer—1.

UNSTANDARDIZED READING TESTS¹

The following are samples of unstandardized reading tests such as are used in upper² auxiliary classes.

Stories judged to be of interest to children of twelve and fourteen years were simply rewritten, using a vocabulary that a third-grade child would be able to read.

A graph, showing the individual record of each pupil in the class is placed in a conspicuous part of the room, and the children have shown considerable interest in watching their progress as compared with that of the class.

¹ Submitted by Helen Davis, Department of Measurements and Special Education, Jackson, Michigan.

² Editor's Note.—The term "auxiliary classes" is here used to designate specially selected groups of dull overage pupils.

TEST—THE BURNING OF THE RICE FIELDS¹

Instructions to teachers—Allow 15 minutes for the test. Explain the following words: Japan, precious, brand, solemnly, hearth, honored, torch, tidal, ablaze, Yone.

The questions are in form of a completion test. Illustrate on the blackboard with such sentences as:

Detroit is a

Apples grow on and grapes grow on

All the blanks in each sentence must be filled in correctly in order for it to count. The words used do not necessarily have to be those suggested in the key, but they must be reasonable and have direct reference to the story.

Key to the questions—

- | | |
|----------------------------------|--|
| 1. Grandfather | Japan |
| 2. mountain | the sea, or village, or people of the town |
| 3. rice | food |
| 4. village, or sea | some fire, or a brand, or a torch |
| 5. brand, fire, or torch | rice, or grain |
| 6. ran, or hurried | save |
| 7. angry, bitter, or cross | set fire to, or burned |
| 8. water | village, field, houses, or town |
| 9. honored, loved, praised, etc. | lives. |
| 10. tidal wave. | |

The Burning of the Rice Fields

Once there was a good old man who lived up on a mountain, far away in Japan. All 'round his little house the mountain was flat, and the ground was rich; and there were the rice fields of all the people who lived in the village at the mountain's foot. Mornings and evenings, the old man and his little grandson, who lived with him, used to look far down on the people at work in the village and watch the blue sea which lay all 'round the land, so close that there was no room for fields below, only for houses. The little boy loved the rice fields, dearly, for he knew that all the good food for all the people came from them: and he often helped his grandfather watch over them.

One day, the grandfather was standing alone, before his house, looking far down at the people, and out at the sea, when, suddenly, he saw something very strange far off where the sea and sky meet. Something like a great cloud was rising there, as if the sea were lifting itself high into the sky. The old man put his hands to his eyes and looked again. Then he turned and ran to the house. "Yone, Yone!" he cried, "bring a brand from the hearth!"

The little grandson could not imagine what his grandfather wanted of the fire, but he always obeyed, so he ran quickly and brought the brand. The old man already had one and was running for the rice fields. Yone ran after. But what was his horror to see his grandfather thrust his burning brand into the ripe dry rice, where it stood.

"Oh, Grandfather, Grandfather!" screamed the little boy, "what are you doing?"

"Quick, set fire! Thrust your brand in!" said the grandfather.

Yone thought his dear grandfather had lost his mind, and he began to sob; but a little Japanese boy always obeys, so though he sobbed, he thrust his torch in, and the sharp flame ran up the dry stalks, red and yellow. In an instant, the field was ablaze, and thick black smoke began to pour up, on the mountain-side. It rose like a cloud black and fierce, and in no time the people below saw

¹ Submitted by Helen Davis, Department of Measurements and Special Education, Jackson, Michigan.

that their precious rice fields were on fire. Ah, how they ran! Men, women, and children climbed the mountain, running as fast as they could to save the rice; not one soul stayed behind.

And when they came to the mountain top, and saw the beautiful rice-crop all in flames, beyond help, they cried bitterly, "Who has done this thing? How did it happen?"

"I set fire," said the old man, very solemnly; and the little grandson sobbed, "Grandfather set fire."

But when they came fiercely 'round the old man, with "Why? Why?" he only turned and pointed to the sea. "Look," he said.

They all turned and looked. And there, where the blue sea had lain, so calm, a mighty wall of water, reaching from earth to sky, was rolling in. No one could scream, so terrible was the sight. The wall of water rolled in on the land, passed quite over the place where the village had been, and broke with an awful sound on the mountain-side. One wave more, and still one more, came; and then all was water as far as they could see below; the village where they had been was under the sea.

But the people were all safe. And when they saw what the old man had done, they honored him above all men for the quick wit which had saved them all from the tidal wave.

Yone

(Fill in the blank spaces so that the sentences will be true).

1. Yone lived with his far away in
2. They lived upon a and down below they could see the
3. They took care of the fields which furnished most of the for the people.
4. One day as the grandfather was looking toward the he cried to Yone to bring him a
5. He took the and thrust it into the fields of ripe
6. When the people in the village saw the fields on fire they as fast as they could to the rice.
7. At first the people were very because they thought that the old man had the rice without any good reason.
8. When the people looked below they saw nothing but where a few minutes before the had been.
9. When they understood what the old man had done for them they him because he had saved their
10. What the old man had seen was a

THE BLOW-GUN¹

Instructions for teachers—Allow ten minutes for the reading of this paragraph. If the fourth grade appears to need more time, allow them fifteen minutes.

Words for study: Weapon, remarkably, bamboo, Carolina, cane, shaft, bandage, thistle-down, rifle.

A picture of a native using a blow-gun is given on page 336 of the National Geographic for October, 1921. I am sending you a copy of this magazine. Before starting on the test, hold the picture up before the class so that the pupils can get a general idea of the weapon they are to read about, and explain that after they have finished answering the questions they may examine the picture more closely.

Key to the questions:

1. Pea shooter or bean gun.
2. Bamboo or cane.
3. Balls of clay and arrows (both must be mentioned for credit).
4. No.
5. Thistle-down; weeds like cotton; down from a burr; wad of soft stuff.
(Any one acceptable)
6. No.
7. Eight or nine feet.
8. No.
9. One hundred yards.
10. Poison.

The Blow-Gun

Every boy and girl has seen the pea shooter or bean gun. This toy is really a small copy of the blow-gun, a large weapon used by some Indian tribes. The blow-gun is a long, straight, hollow piece of bamboo or cane. The pea shooter is about twelve inches long, but the blow-gun is twelve feet or more. The Indian shoots from his blow-gun little balls of clay that have been baked hard in the sun, or light arrows. These little arrows have sharp points at one end and are bound at the other with a wad or plug of some soft stuff, like cotton or thistle-down. This plug is of such size as to fit neatly and with a little pressure inside the tube. The sharp point very commonly is dipped in poison. The arrow is placed at one end of the tube, which is then raised to the lips and pointed at the game; a sharp, quick, but not remarkably strong puff of breath sends it on its noiseless flight.

Indians that once lived in North and South Carolina used this kind of gun. They used for a tube a piece of cane eight or nine feet long, which they cleaned out carefully and made smooth inside. Their arrows were about sixteen inches in length, made of hard wood and cut to a point at the upper end. The plug at the lower square-cut end of the shaft was made of down from a burr much like a species of thistle; this plug was big enough to fit the tube and was perhaps three inches long. With these guns the Indians could send an arrow clear through the body of a rabbit at a distance of one hundred yards.

¹ Submitted by Helen Davis, Department of Measurements and Special Education, Jackson, Michigan.

The Indian in the picture that has a bandage around his leg has his blow-gun held to his mouth ready to blow an arrow from it. The man in front of him is holding a rifle. Notice that the blow-gun is almost twice as long.

1. What toy is like a blow-gun?
2. What are blow-guns made of?
3. What two things do they shoot from a blow-gun?
4. Does it take much breath to shoot the gun?
5. What do they use to make a tight-fitting plug at the base of the arrow?
6. Would the blow-gun work if the inside of the tube were rough?
7. How long was the blow-gun that the Carolina Indians used?
8. Could you hear an Indian shoot with a blow-gun?
9. From how far away could the Carolina Indians send an arrow through a rabbit's body?
10. What was sometimes put on the sharp point of the blow-gun arrow?

CHAPTER VII

THE FOLLOW-UP WORK OF THE PRINCIPAL

THE IMPROVEMENT OF INSTRUCTION AND CREATING PROFESSIONAL ATTITUDE

REINHARD H. RUHNKE, PRINCIPAL OF THE MINERAL STREET SCHOOL,
MILWAUKEE, WISCONSIN

The vital fundamental function of the principal of a school is the improvement of the methods of instruction of the teachers in his charge. Only through the exercise of this function can the product which passes through his school be improved.

One of the factors which is most essential in improving instruction and stimulating professional attitude is the observation and analysis lesson. This is more important and effective in improving classroom efficiency than any other agency. It has never been worked out to its fullest value. At the present time some of the most expert teaching power of our best teachers is going to waste as far as imparting the essence of this power to others is concerned. These best teachers should be used as ideals in creating classroom efficiency for the others in the school. The principal can easily arrange matters so that the teachers of his school can attend a demonstration lesson by an expert. After the lesson the most valuable and important work in the matter of growth is to be done. The work should be discussed and analyzed, not from the standpoint of destructive criticism, but from the standpoint of reaching a higher plane of teaching through analysis. Such work as this should go on in the school at frequent intervals. The teachers during each semester should be able to observe the work of an expert in every subject at least once, more than once, if possible to so arrange. If properly handled, especially the analysis factor after the lesson, resulting in wholesome constructive, mass-discussion on the part of the teachers, it will spur everyone with an extreme, wholesome, self-desire to improve.

It is true that most school systems now provide for visiting days but these individual, isolated visits do not create mass discussion and hence do not create mass desire to improve.

No principal can improve the condition of the product which passes through his school unless he consistently improves the methods of teaching of the executives who directly handle this product.

STIMULATING PROFESSIONAL STUDY AMONG TEACHERS

ARTHUR S. GIST, PRINCIPAL OF THE B. F. DAY SCHOOL,
SEATTLE, WASHINGTON

Among the many responsibilities of the principals, none is more important than that of stimulating professional study, growth, and interest among his teachers. This is especially essential in cities where the length of service is long and the tenure fairly secure. Often the teacher's work is sufficiently well done to warrant her retention year after year, yet she is not working or developing up to her limit of capacity. With this teacher of experience and training, the elementary-school principal in the large city has a real problem, as most of his new teachers come to him with enthusiasm, well-trained, and with the modern viewpoint. The writer has tried four means of arousing interest in professional study.

Scientific study of pupils and standard tests—An interest in this phase of work has been attempted from two standpoints; from that of the pupils and from that of the tests. Every class has its problems, which means study for both the teacher and the pupil. In some cases it may be the individual cases, but in large schools, where the pupils are carefully classified, an entire class may present a real problem. It has often been possible to arouse an interest in a scientific study of individuals and of classes as the problems present themselves. When standardized intelligence or achievement tests are given, the principal has a real problem in interpreting and arousing an enthusiasm for standard tests.

Professional reading—To be of service to teachers in recommending professional reading, it is necessary for the principal to be familiar with current school literature. Professional reading can often be suggested to the teacher when problems arise. Sometimes quoting the contents of an article arouses sufficient interest. An article which does not meet with the teacher's approval will often cause critical study and discussion. Ten professional magazines are taken by our school. The writing of schoolroom practices by teachers in the school always arouses interest in professional study and reading.

Extension work—We are fortunate in having our State University with a willing and efficient College of Education close at hand. Some fifteen to thirty per cent of the writer's corps take work at the State University. The courses and professors in charge are generally discussed with the principal before registering, as well as many times during the course. Material of a practical nature is made available to them and the papers written for these courses are often read and discussed with the writer.

Professional meetings—For several years we have met as a building group and discussed some professional topic at each meeting. These discussions have been short but specific. For three years we have held one professional meeting each month, when the afternoon program is shortened and school is dismissed thirty minutes early. At these meetings, the

teachers often take the lead in the discussions; the topics having been selected in advance. Attendance and discussions at these meetings are always optional with the teachers, but never less than twenty of our thirty teachers have attended. Because our school is departmentalized, the topics are often general in character, that special teachers may not become too narrow in their outlook. Following is a list of such topics discussed: The Junior High School; Practical teaching of democracy to elementary-school pupils; How to plan and give drill; The interpretation of standardized tests; Correlation of subjects; Advantages and disadvantages of the semi-departmental elementary school; The teacher as a student; Special study; Study of texts, their contents and arrangement of material; Classroom repetition wise or otherwise; Reports by teachers of vocational trips; The value of home assignments, and home assistance; The securing of home coöperation by sending home papers; and The vacation school and its purpose.

THE DUNDEE SCHOOL IMPROVEMENT CLUB

ALICE PETERSON, PRINCIPAL OF THE DUNDEE SCHOOL, OMAHA, NEBRASKA

What led to the organization—The usual spring complaints concerning children's running over lawns, breaking down hedges, and disregarding others' property rights, came to my office during the spring of 1920. I began at that time to plan a campaign for the following year, that we might be ready in time to prevent some of the trouble. At a teachers' meeting early in the spring, I suggested to the teachers a campaign, including painting signs, making speeches, writing poems and songs, and asked that they think about it and be ready to offer suggestions that would really be effective in handling the problem.

Aims

- I. To enlist the interest of the children in improving the village, and thus create a spirit against destruction of flowers, grass hedges through carelessness.
- II. To improve and beautify the schoolhouse and yard.
- III. To learn to do these things in a businesslike way by means of committees and by use of parliamentary procedure.
- IV. To train children to take responsibility as they are really needed to do it.

Outline of Organization

I. Membership

- A. Grades 5 to 8, inclusive.

II. Officers

President, Vice-President, Secretary, and Treasurer. Board of Directors, consisting of one member from each room. There is no court and at present no plan for one.

III. Committees

School Yard, Signs, Mottoes, Songs and Poems, Speeches, Publicity, Badges, Education, Dundee North, Dundee South, Dundee East, Dundee West, Good Citizenship, Program, Election, Auxiliary Clubs. In the lower grades: Policy of Club, Interior of School, Courtesy, Hall Duty.

Results

I. The Pledge

"I pledge myself to try to help in the organization and prove its helpfulness to Dundee; to get the spirit, and to keep the rules; to coöperate in carrying out its plans."

II. Work of Committees

a. The following was presented by the Committee on Policy of the D. S. I. C. at the last meeting:

1. The making of better citizens
2. Public safety
3. To develop more and better pupil leaders
4. To promote independence of pupils
5. More coöperative discipline
6. Better conduct in public meetings
7. To be courteous
8. To be reliable and responsible
9. To make Dundee more beautiful and desirable to live in
10. To improve the school yard and building
11. To have a few laws, enforce them, and thereby make it unnecessary to make more laws or to provide punishment for violating them

The same committee suggested the following topics for consideration in making a D. S. I. C. Constitution:

1. Qualification of officers
2. Manner of electing officers
3. Duties and powers of these officers
4. Term of office
5. Qualifications of voters
6. Qualifications of members
7. Fiscal year of Club
8. Amount and manner of collecting dues
9. Manner of holding meetings
10. Appointment of subordinate officers
11. Traffic and school rules
12. Ratifications and amendments

b. The Publicity Committee planned for representatives from the school to address the Woman's Club at a meeting. Speeches were written in the English class and the best one selected.

The same committee prepared a program for the intermediate grades, calling on various grades for songs, mottoes, and speeches. The chairman of the committee presided at this meeting and announced the program.

In the writing class the Eighth Grade wrote notes, saying, "Fix your lawns; we are behind you," signed, D. S. I. C. These were placed in mail boxes of residents.

One-minute speeches were given in all rooms of the building when the occasion demanded, urging respect for property rights, explaining club regulations for traffic, including roller skates and bicycle riders.

c. Committee reports were called for and included the following:

1. A committee 'phoned the three newspapers to tell them that the newsboys were very careless in scattering paper at 49th and Doge Streets each Sunday. They received favorable answers and appointed a committee to see if there was any improvement the following Sunday.

2. Thirty signs were painted in school colors (yellow background with blue letters) and placed in parkings and lawns where most needed.

3. A committee made a chart showing which corners needed officers. Then they selected suitable officers to patrol these corners to control traffic for the purpose of safety to children and preservation of property.

4. Plans for beautifying the school yard were submitted.

III. Slogans

"Remember, you are a member of the Dundee School Improvement Club."

"Use the sidewalk."

"Each boy can help to pick up the papers in the street."

"Bicycle riders—stay in the street."

"Before going across the street and street-car tracks, stop, look, and listen; it only takes a minute to be safe."

"Girls, do not walk in groups."

"Do your best to keep off the grass."

"Our watchword: *Coöperation*."

IV. Patrons take greater interest in school

The patrons of the school became greatly interested in our campaign. One boy reported that his father would donate trees for the parking and play-ground, about fifty trees in all; ivy vines to plant along the fence and around the building were also donated. One mother presented the school with a bird bath in memory of her two sons who had died during the summer.

A live Christmas tree was presented and planted in the yard the week before Christmas. A large elm is to be the birthday gift of a little girl in the kindergarten.

REDUCING THE PERCENTAGE OF FAILURES IN THE DETROIT ELEMENTARY SCHOOLS WITHOUT LOWERING STANDARDS

JOHN MERRILL, DISTRICT PRINCIPAL OF THE LINGEMANN SCHOOL,
DETROIT, MICHIGAN

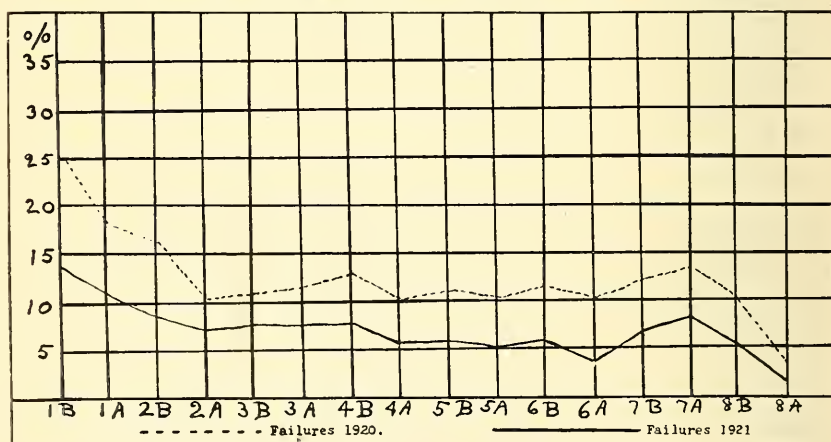
For the purpose of ascertaining the number of failures in the elementary grades of the Detroit Public Schools, the promotion rolls for January, 1920, were tabulated. Following an extended period of carefully planned, well-sustained effort, two more tabulations were made and a comparison of the figures showed that somewhat striking reductions had been made in the "flunkage." The following table and diagram tell the story of what was accomplished in one year.

TABLE 1.—Comparison of failures in January, 1920, with those for January, 1921

Grade	Per cent failed 1920	Per cent failed 1921	Grade	Per cent failed 1920	Per cent failed 1921
B1	27	14.3	B5	10.4	6.6
A1	19	10.3	A5	10.4	5.5
B2	16	9.2	B6	12.7	6.4
A2	11.3	7.2	A6	10.5	4.9
B3	12.6	7.3	B7	12.6	7.2
A3	12.8	7.1	A7	13.4	7.9
B4	10.8	7.6	B8	10.4	6.6
A4	10.8	6.3	A8	3.1	2.6

Total failures on January, 1920..... 14.7 per cent
Total failures on January, 1921..... 8.4 per cent

DIAGRAM 1.—Comparison of failures for January, 1920 with those for January, 1921



When the promotion rol's for January, 1921, were tabulated it was found that out of a total of 85,804 pupils in the eight grades of the elementary schools, 7214, or 8.4 per cent as indicated by the table, had failed. This amounts to a reduction of 42.8 per cent from the amount of failure at the end of the first term of the previous year. On the basis of the enrolment of the semester ending January, 1921, it meant that 5405 more pupils were saved from failure.

For the semester ending June, 1921, "flunkage" was reduced to 6.7 per cent. Credit for this low percentage is due to the teachers and principals who early in the term began remedial work.

It was made clear that the object was not to lower the standard so as to pass pupils, but rather to center attention and assistance upon their difficulties and needs, thus enabling them to raise the quality of their work in the subjects found difficult. The final scores¹ in the Courtis Standard Tests indicate that the quality of work did not suffer but was slightly strengthened by the plan.

The initial standard tests of September, 1921, were compared with those of September, 1920. The results likewise indicate that the grade standards were maintained in spite of the reduction of failures from 14.7 per cent to 6.7 per cent during this time.

The failing pupils in ten elementary schools for 1921 made scores as good or better than did those who failed in 1920. This was shown by a comparison of test results for arithmetic and spelling, whereby it was discovered that the pupils failing in 1921 had scored slightly higher in those subjects than did those who failed the preceding year. This also serves to show that the reduction in "flunkage" was not obtained by lowering standards.

The procedure followed in obtaining the results that have been stated was carefully worked out. By a series of detailed investigations of the various districts, by tables and graphs worked out by the district principals and presented to the principals of the various groups, the condition of the city, of each district, and of each school in relation to the failure problem, was shown. The principals were urged to study with their teachers the problems as found in their particular schools. This material was presented in December, 1920.

It was suggested to the principals that they make lists of the pupils who would probably fail at the end of the semester, showing the cause of each failure, and that attention be centered upon the weak subjects and every available assistance be given to the pupils in overcoming weaknesses during the time that intervened before the date of promotion.

Briefly stated, the following are some of the means that were found effective in raising the quality of the work of the weak pupils:

1. Attention was centered upon the needs and difficulties of each individual.

¹ Editor's Note—Detailed figures, which considerations of space make it necessary to omit, were submitted by Mr. Merrill to cover this statement.

2. Principal or teacher interviewed privately each pupil, and the situation was frankly discussed in the effort to arrive at the cause and find a remedy.
3. Parents were visited, called into consultation, or otherwise informed of the impending failure and their coöperation was requested.
4. Pupils were allowed to devote more time to the subjects in which they were weak.
5. Special help was given by the regular coaching teacher, or by brighter pupils during study periods or after school.
6. Weak pupils were required to make special reports to the office at stated intervals, daily or weekly, upon their scholastic progress.
7. Outside help and study were encouraged.

STIMULI IN READING FOR THOUGHT¹

General Suggestions

1. Three kinds of reading important: (*a*) Cursory, careful reading, (*c*) consultative reading.
2. Aim of the lesson, the first important consideration. May be instructive, ethical, or esthetic.
3. Teacher's preparation indispensable.
4. Story should be divided into logical parts.
5. Timeliness of a selection is important to secure interest.
6. Dramatization as an individual or class project is helpful.
7. Correlation with other subjects highly desirable.
8. Illustrations in books should be made use of frequently.
9. Introduction to lesson (first formal step) should be carefully thought out. Emotional and intellectual preparation.
10. Outline-making is of great assistance.
11. Visualization is to be fostered by every possible means.
12. Criticism of reproduction should follow, rather than interrupt.

DEVICES—1ST, 2D, AND 3D YEARS

1. Anticipation of the narrative provoked by questions, prospective as well as retrospective questions.
2. Action words and phrases actually performed by pupils.
3. Teacher questions; pupil reads answer from text.
4. Pupils find selection illustrated in picture.
5. Pupil-postman with whistle leaves letter (card with sentence) at each desk. Receivers answer or perform.
6. Pupils place finger under word answering teacher's question.
7. "How does the character feel?" Who said this? as aids to expression.
8. Pupil to find page and place when told title.
9. Labelling all objects in classroom a great help.
10. Orders to class placed on board. Pupils read silently and perform.

¹ Report of Committee appointed by District Superintendent William A. Boylan, the Bronx, New York City.

11. Guessing game. Riddle written on board. Silent reading followed by attempts to guess.
12. Statement written on blackboard by teacher, pupils manipulate objects to make the statement true. "John's hat is on Mary's desk."
13. Perception cards placed on blackboard ledge. Teacher touches one card while one pupil is out of room. On his return this pupil asks is it "On the hill?" Class replies "No, it isn't." Thus furnishing drill in correct English.
14. Preception cards flashed. Pupils perform act.
15. Sentence on board with missing word or phrase. Pupils read silently, then aloud, supplying missing word.

DEVICES—4TH, 5TH, AND 6TH YEARS

16. Missing word devices. Same as No. 15 applied to paragraph.
17. Reproduction of story in parts by a relay team.
18. Reproduction by means of column of key words on board.
19. Incomplete outline written on board by teacher. Pupils supply omission.
20. Drawing of picture or map by pupils to illustrate.
21. Selecting by pupils of the most lovable character, most beautiful line, most humorous incident, and the like.
22. Changing narrative to dialogue. Teacher writes best sentence on board.
23. Pupils read selection and underline words that they think should be emphasized.
24. Anticipatory story device. Teacher invents another story using new, difficult words which will later appear in regular lesson.
25. Pupils make up caption for a paragraph.
26. Pupils, with teacher's aid, plan dramatization. Time, place, things, people.
27. Pupils read part of selection containing certain words selected by teacher.
28. Pupils make gestures or actions called for by the selection.

DEVICES—7TH, 8TH, AND 9TH YEARS

29. Pupils read selections giving synonyms for underlined words.
30. Pupils reproduce from point of new or different character.
31. Pupils in these grades should learn use of braces, letters, Roman and Arabic numerals in writing outlines.
32. Pupils should be required to formulate good questions and answering by pupils.
33. Pupils find topic sentence.
34. Debate on ethical principles involved in text.
35. Examinations should frequently be given with textbooks open. Questions formed by teachers to test ability to use book.

36. Pupils read to find answers to questions on board.
37. Questions are assigned to certain groups or committees.
38. Dramatization—developed by class and written on board as a class project.
39. Pupils write “Who’s Who” of the characters in the story.

Members of committee:

ROBERT S. STANTIAL, P. S. No. 56, *Chairman*.
 HERMA E. HARRIS.
 CATHERINE J. ENGLISH.
 ELIZABETH V. MCGIVNEY.
 KATHERINE FRIEDRICH.

KEEPING TEACHERS NOTIFIED OF MEETINGS, COMMITTEE ASSIGNMENTS, AND THE LIKE¹

A daily calendar pad on the table in the teachers' room is an especially useful and almost automatic device for keeping teachers informed from day to day of supervisor's meetings, committee work, etc.

The clerk, or the principal in the absence of a clerk, enters all notices of meetings on the calendar pad as soon as the information is available. With all meetings thus scheduled in advance and with the pad in plain sight on the table, the matter of referring to the pad each morning takes only a second and easily becomes a matter of daily routine.

The following is a typical page from the pad now in use:

Monday, February 27

Charge of Halls..... Miss Becker
 Charge of Grounds..... Room 2
 Charge of Lunchroom..... Miss Day
 Grades 7-8—Penmanship Meeting—Central School, Room 10; 3:45
 Grade 4—Fine and Industrial Arts Meeting—Central School, Room 3; 3:45
 Book Improvement Day (Once a month).
 Begin Physical Training Work on the March outline.

SYSTEMATIC PROFESSIONAL STUDY²

This year each teacher has reported to the group on the work for her grade in each subject in the new course of study; thus everyone got an idea of the whole course.

Last year, for one semester, we took up the reviews of new books on the “Curriculum,” each teacher reporting on a certain number of chapters at each meeting. For the other semester, two teachers each month gave a resumé of two excellent articles in educational journals.

¹ Leo B. Baisden, Principal of Jefferson School, Seattle, Washington.

² Belle Dirimple, Principal of South Seattle School, Seattle, Washington.

EXAMINATION OF PUPILS' REPORTS¹

I always examine all report cards just before they are sent out. This is done at the teacher's desk while the room is in session. We then count up the number of unsatisfactory marks and record the number somewhere to see if we cannot reduce the number the following quarter.

A general letter is sent to the parents calling attention to the report cards which are about to be issued.

AN EXECUTIVE COUNCIL²

Title and composition—An Executive Council of the Daniel Bagley School shall be elected consisting of twenty-four (24) members—twelve (12) boys and twelve (12) girls. Three (3) boys and three (3) girls being chosen from each of the four upper rooms—not grades, of the Bagley School.

Purpose—The purpose of the establishment of this council is to arouse a keener sense of the responsibility of each grammar-grade pupil as a citizen of his room and of the school in general.

Eligibility—The members of this council shall be chosen by each room acting as a committee of the whole—any pupil, or teacher may make nominations. The basis for such nominations should be high citizenship in the classroom, in the halls and basement of the building, about the grounds, and in the community in general. It is especially desired that scholarship not be the main quality in the selection of the members of this council, though the attitude of the boy or girl toward the assignment of school tasks should be the chief factor perhaps in the selection of the members. In other words, a student who is doing "C" work should be eligible to election to this council if this "C" work represents the best of his ability and if his citizenship is of a high order.

Certification—Each of the teachers of the four upper rooms shall certify to the principal the first of each calendar month the six pupils who have been selected from her room for the previous month. These names shall be made a part of the permanent record of the Bagley School and certification will be made of such selections when the boy, or girl, passes on to high school. The list becomes then, in a way, an honor roll not conditioned on scholarship alone.

Meetings—Each Executive Council shall hold one formal meeting and then adjourn, *sine die*. The business which will be brought before the Council will be business pertaining to the general good of Bagley, though the business to be transacted will always be of importance secondary to the election of this honor group of the list. We propose to put before the first meeting of the executive Council, the matter of restoring a fence between the Bagley School and an adjoining orchard, which was destroyed some years ago by former pupils of this school. The principle of bringing this item of business before the council is to emphasize the responsibility of each group of citizens not only to a succeeding group, but to those who have gone before them. Our plan is that refreshments will be served at every meeting and everything possible done to make their one meeting a happy occasion for all the members. The advisers of the Boys' and Girls' Clubs and the principal of the school will be *ex-officio* members of the Council. Guests may be invited by these *ex-officio* members of the Council.

¹ William A. Blair, Principal of T. T. Minor School, Seattle, Washington.

² J. W. Graham, Principal of the Daniel Bagley School, Seattle, Washington.

CHAPTER VIII

MEMBERS OF THE DEPARTMENT

MEMBERS OF THE DEPARTMENT OF ELEMENTARY SCHOOL PRINCIPALS OF THE NATIONAL EDUCATION ASSOCIATION, 1921-1922

- THOMAS AGNEW, JR., *Principal of the Horace Mann School*, Bayonne, N. J.
- JESSIE ALBERT, 48 Thomas Street, Muskegon, Mich.
- EFFIE ALBRIGHT, *Principal of the Greenwood Avenue School*, Atlanta, Ga.
- THOMAS ALEXANDER, *Principal of the Peabody Institute*, Nashville, Tenn.
- LILLIE E. ALLEN, 3d and Catherine Streets, Philadelphia, Pa.
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- W. H. ALTAMER, *Principal of the College Hill School*, Cincinnati, Ohio.
- LILLIAN V. ALTER, *Principal of the Knox School*, Pittsburgh, Pa.
- W. H. AMOSS, *Principal of the Oden High School*, Oden, Ark.
- CORA S. ANDERSON, 106 South 25th Street, Omaha, Nebr.
- HELEN ANDERSON, 12 Grimaell Street, Greenfield, Mass.
- MARY J. ANDERSON, 5758 Howe Street, Pittsburgh, Pa.
- ALICE L. ANDREWS, 12 Monroe Street, Warren, Ohio.
- HELEN W. ANSTICE, *Principal of Sandenberger School*, Philadelphia, Pa.
- MARY F. ARMSTRONG, *Principal of the Congress School*, Grand Rapids, Mich.
- BESSIE B. ATKIN, *Principal of the Madison School*, Pittsburgh, Pa.
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- JANE S. ATWATER, 6824 Harper Avenue, Chicago, Ill.
- MARY M. AUSTIN, *Principal of the Columbian School* Omaha, Nebr.
- MEDA BACON, *Principal of the Stocking School*, Grand Rapids, Mich.
- CAROLINE BAIRD, *Principal of the Soho School*, Pittsburgh, Pa.
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- ELIZABETH S. BAKER, 159 Paxston Street, Harrisburg, Pa.
- AGNES M. BALDWIN, 122 College Street, Buffalo, N. Y.
- BALTIMORE PRINCIPALS' ASSOCIATION, *Public School No. 40*, Orleans and Asquith Streets, Baltimore, Md.
- MRS. CHARLES T. BANGS, *Principal of the Green River School*, Greenfield, Mass.
- LENA M. BANKHARDT, *Principal of the Warren School*, Cleveland, Ohio.
- MARY C. BARKER, 123 Myrtle Street, Atlanta, Ga.
- IDA L. BARLEY, 24th and Elmwood Streets, Kansas City, Mo.
- HAROLD BARNES, *Girard College*, Philadelphia, Pa.
- ALMA BARTELS, *Principal of the Larimer School*, Pittsburgh, Pa.
- HELEN W. BARTINE, Howard and Ontario Streets, Philadelphia, Pa.
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- ELLA BESSEMAN, 233 Prospect Avenue, Peoria, Ill.
- LUCY M. BETTES, *Principal of the Madison School*, Grand Rapids, Mich.
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- MAY I. BLACK, 200 South Rebecca Street, Pittsburgh, Pa.
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- MARY CONVERY BOOZ, *Principal of the Columbus School*, Trenton, N. J.
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- PHILIP A. BOYER, Sellers and Griscom Streets, Philadelphia, Pa.
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- C. J. BROOKS, *Principal of the Madisonville School*, Cincinnati, Ohio.
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- FLORENCE HOLBROOK, *Principal of the Forestville School*, Chicago, Ill.
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VOL. II, NO. 4

JULY, 1923

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

PUBLISHED QUARTERLY BY THE
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Foreword

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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

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

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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
Detroit, Michigan*

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 for 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 children'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. Re-discovery 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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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

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 MEASUREMENT¹

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:

¹Haggerty, 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 attempts¹ 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 Indices² 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

$$\text{Transmuted score} = 100 + \left(\frac{X - M_x}{\sigma_x} \right) 20$$

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—189.12
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—158.83	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	.....

di-ke-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— 98.53	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 error¹ 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

88.13
Index as, $\frac{117.28}{88.13}$ and we get .75 as our Accomplishment Ratio in the

118.32
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 needs¹ 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-

¹It 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 cent¹ 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

MARY C. FLYNN

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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 140-500-5.2.22

PUPIL'S CREDIT CARD

Name Holt, Russell

GROUP	READING	FORMAL ENGLISH	ARITHMETIC	SPELLING	GEOGRAPHY	HISTORY	MUSIC	DRAWING	SHOY	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.D. 4/9/20	G.E.P. 6/22/20	B.M.B. 1/21/21	Q.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. 6/30/22	G.E.P. 6/17/21	M.M. 6/17/21	Cr. 6/30/22	G.E.P. 6/17/21	I.M.B. 6/17/21	Q.M.B. 6/17/21		Z.L.M. 6/17/21
B	O.P.P. 6/30/22	O.P.P.Cr. 6/30/22	Opportunity 6/30/22	I.M.B. 6/30/22	Opportunity 6/30/22	O.P.P. 6/30/22	O.P.P.Cr. 6/30/22	I.M.B. 6/30/22	Q.M.B. 6/30/22		Z.L.M. 6/30/22
A	"	"	6/30/22	6/30/22	"	"	"	6/30/22	6/30/22		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

G. A5 Rm. 9

Fred J.

1st mo.

	61	61	62	63	66	68	69	71	75	76	76	77	78	79	Tests					
Page.....	61	61	62	63	66	68	69	71	75	76	76	77	78	79						
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							
		1	2	3	4		1	2	3	4		1	2	3	4					
Page.....	61	61	62	63	66	68	69	71	75	76	77	78	79							
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

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		Age in Months
				Scale A	Scale B	
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

$$AA + 2 RA + SA.$$

formula was then: $\frac{\quad}{4}$

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.

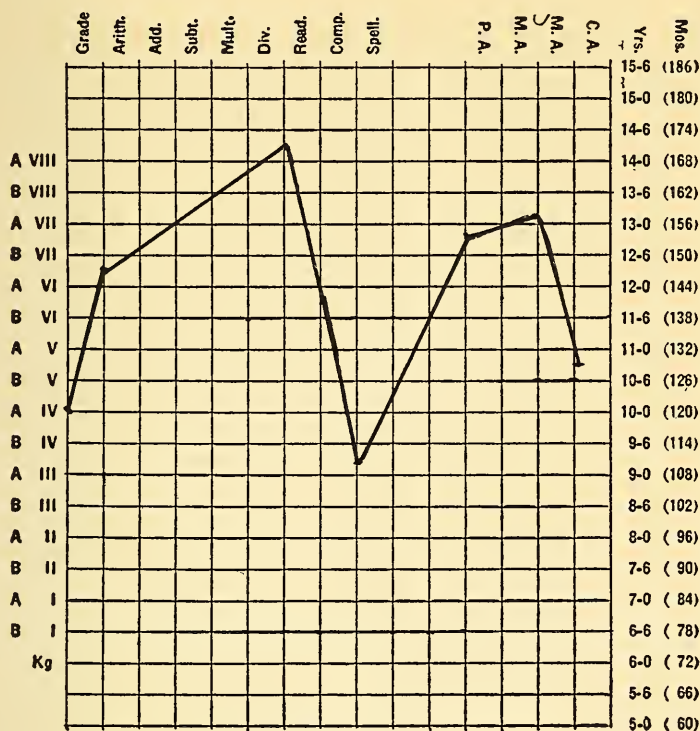
The promotion age was computed by giving the mental, the educational, and the pedagogical age equal weight. Lists were made of each class. The child was ranked under these several heads. See Classification Record Sheet, Fig. 4, page 198.

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
Mental Test Results:							E. Q. 117
Date	Test	C. A.	Raw Score	M. A.	I. Q.		
12-7-23	Nat.	10.8	107.4	13	123		

STATISTICAL RECORD CARD—Form I

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.

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.

	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
				1	1	1							3
		1			1	4	3	5	9	4	3		30
				4	11	19	27	43	24	19	10		157
A. Q.	1	1	3	18	20	30	40	29	15	6	4	1	168
			8	13	29	16	21	4	4	1			96
			1	8	3	6	2	2					22
			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.

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 Reorganization

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-

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

HELEN DAVIS

*Director of Measurements and Special Education
Jackson, Michigan*

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 TESTS¹

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. Achievement 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.

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	Minute	Recess						
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
						Noon	Inter	mission							
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	S.H.	8	5	6	2	13			3, 4, 9, 12

zonally 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	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	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	Med- ian
11 yrs.....												1	1	2	2	4	2	4	2					4	3.9	120
12 yrs.....				1				1	2	1	1	3	2	6	4	3	1	1	1			1		32	31.4	124.6
13 yrs.....				1			1	1		2	8	3	4	6	4	3	3	1	1	1	1		1	40	39.2	125
14 yrs.....				1				1	1	3	3	1	4	2										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	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	1					37	36.6	114
14 yrs.					1			5	3	4	2	1		1	1	1	2							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	1	4	2	3	3				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		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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MCALL 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.....	47 $\frac{1}{2}$	86	146	62	83	16
Margaret....	46 $\frac{1}{2}$	138	180	57	72	0
Leroy.....	42 $\frac{1}{2}$	93	193	0	41	5
Vernet.....	48 $\frac{3}{4}$	94	156	63	52	0
Lillian.....	50	93	100	0	58	6
Eunice.....	50	87	140	38	96	9
Lois.....	46 $\frac{1}{2}$	113	193	53	75	12
Harold.....	48 $\frac{3}{4}$	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.....	36 $\frac{1}{4}$	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.....	48 $\frac{3}{4}$	67	186	65	46	13
Eleanor.....	45	47	117	92	96	0
Norman.....	43 $\frac{3}{4}$	79	167	10	66	9
Mildred.....	40	64	117	58	52	12
Esther.....	47 $\frac{1}{2}$	66	107	64	86	2
Flora.....	43 $\frac{3}{4}$	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 $38\frac{3}{4}$ 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 tests¹ 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

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

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

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

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.

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

Low VII

Rank Int. Test	Monroe Comprehension		Monroe Rate		Sigma 3 Haggerty		Thorndike- McCall	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
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:	<i>complex</i>	.....
4 Grammatical predicate of independent clause:	<i>deserved</i>	.....
4 Grammatical subject of dependent clause:	<i>who</i>	.....
4 Direct object of deserved:	<i>praise</i>	.....
4 One prepositional phrase:	<i>in France</i>	.....
(Any one of three given here)	<i>for their great courage</i>	
	<i>under the enemy's fire</i>	

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 score and write the total in the left-hand margin of your paper.

Question III

	Wrong
5 James is older than <i>he</i> . (He or him)	.....
5 Have you and <i>he</i> (he or him) exchanged papers?	.....
5 Was it <i>he</i> (him or he) whom you called?	.....
5 He never <i>did</i> (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
<hr/> 2014 | 4. Subtract
48321
9211 Wrong
<hr/> 39110 | 8. Add
1/3 of 90 = 30
1/6 of 78 = 13 Wrong
<hr/> 43 |
| 2. Add
493
547
387
493
184 Wrong
<hr/> 2104 | 5. Multiply
497
x 6 Wrong
<hr/> 2982 | 9. Add
7 1/4 = 7 3/12
5 1/3 = 5 4/12 Wrong
<hr/> 12 7/12 |
| 3. Subtract
48321
29623 Wrong
<hr/> 18698 | 6. Divide
6)2988 Wrong
<hr/> 498 | 10. Subtract
8 2/3 = 8 8/12
6 3/4 = 6 9/12 Wrong
<hr/> 1 11/12 |
| | 7. Add
1/2 of 80 = 40
1/4 of 36 = 9 Wrong
<hr/> 49 | |

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 $14 \frac{2}{5}$; $27 \frac{3}{4}$; $8 \frac{5}{8}$.
7. From $32 \frac{2}{3}$ take $17 \frac{7}{8}$.
8. Multiply $26 \frac{3}{7}$ by $5 \frac{2}{7}$.
9. Divide $5 \frac{2}{3}$ by $5 \frac{5}{6}$.
10. Divide $10 \frac{4}{9}$ by $6 \frac{3}{4}$.

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 School¹ that we needed the help of educational and mental tests in

¹The 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.

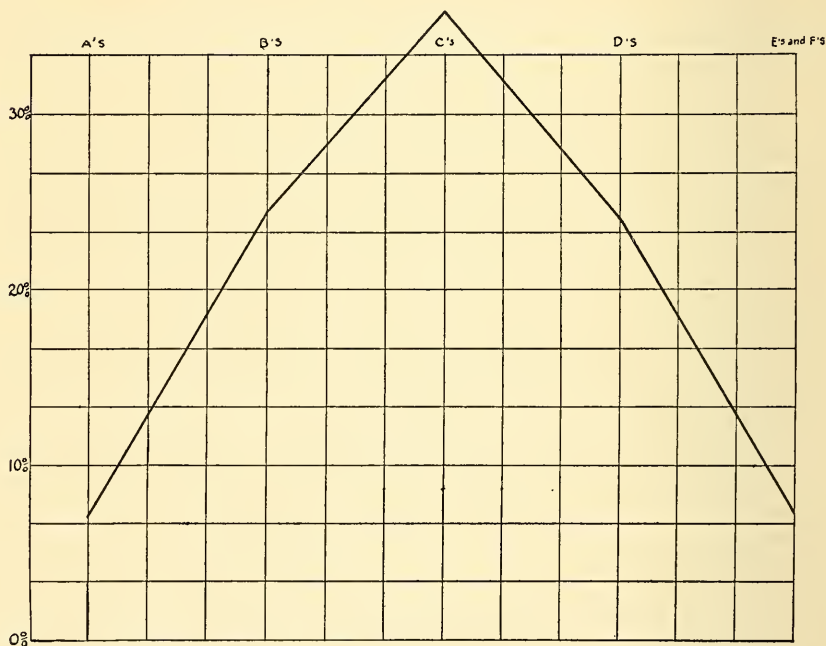


FIG. 1. *Composite Graph of Six Teachers' Marks for Grades 4, 5, and 6 Through the First Three Marking Periods*

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

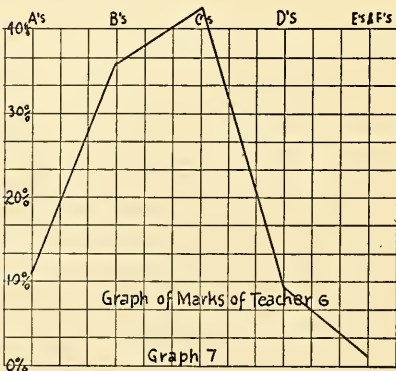
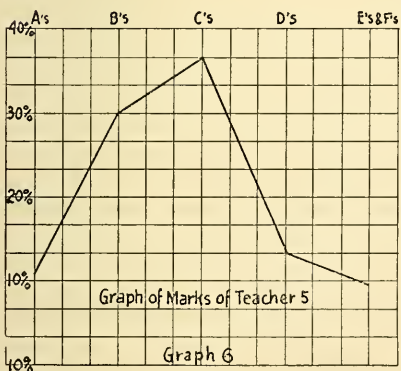
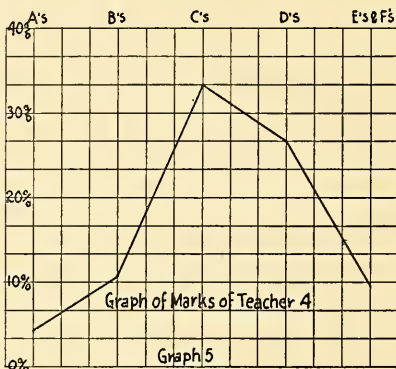
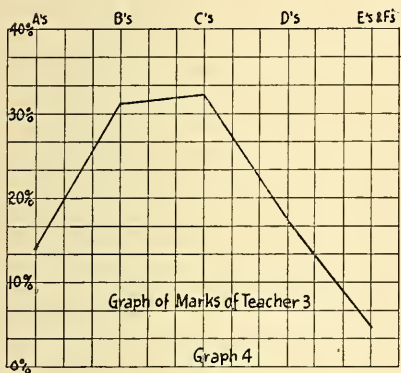
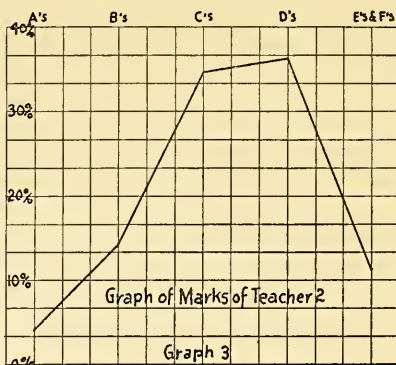
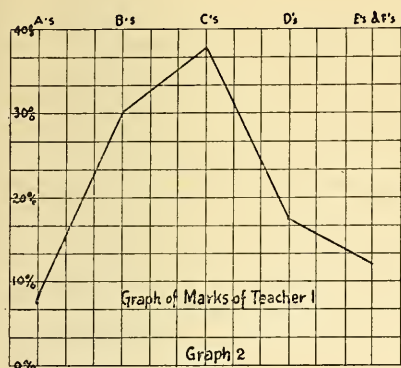


FIG. 2. Marks of Six Teachers

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.

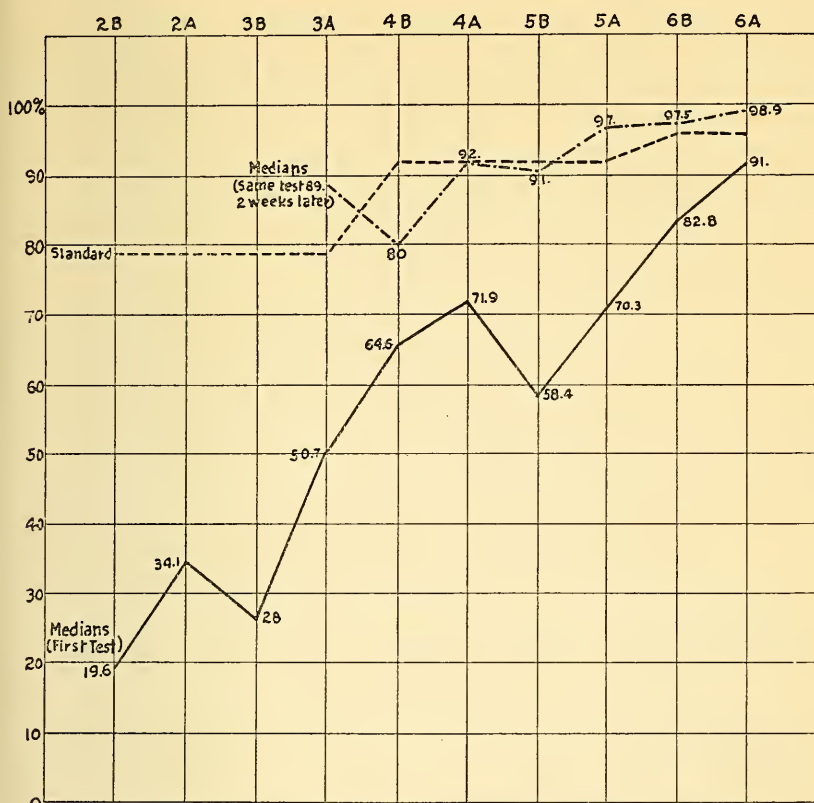


FIG. 3. *Effect of Two Weeks' Practice with Ayres' Spelling Lists*

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

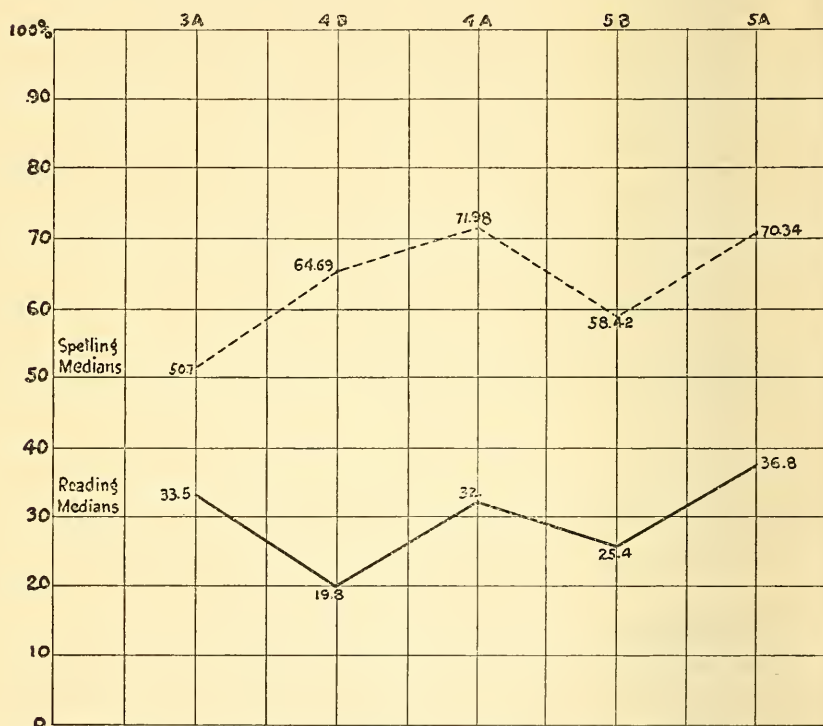


FIG. 4. Correlation between Spelling and Reading. Ayres' Spelling Scale and Silent Reading Scale

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 gauge *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

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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

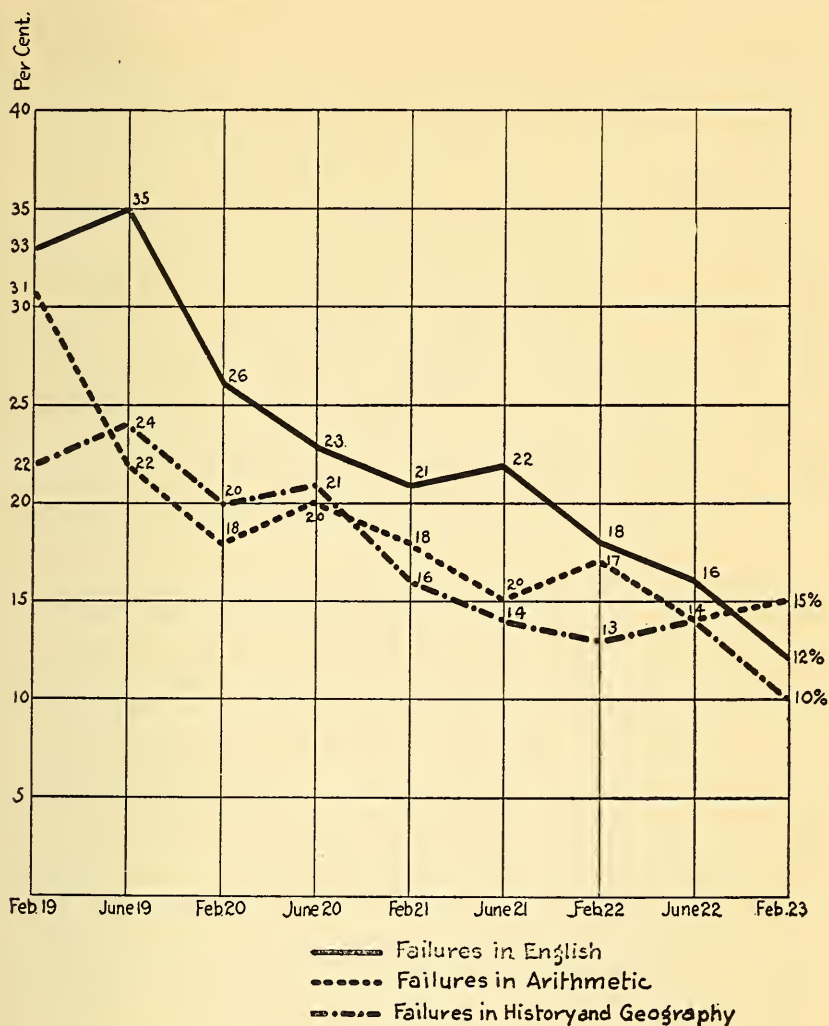


FIG. 1.—Per Cent of Failures at the Close of Each Semester, February 1, 1919, to February 1, 1923

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: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, 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 $30^\circ - 60^\circ$ 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, salesman ship, 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.

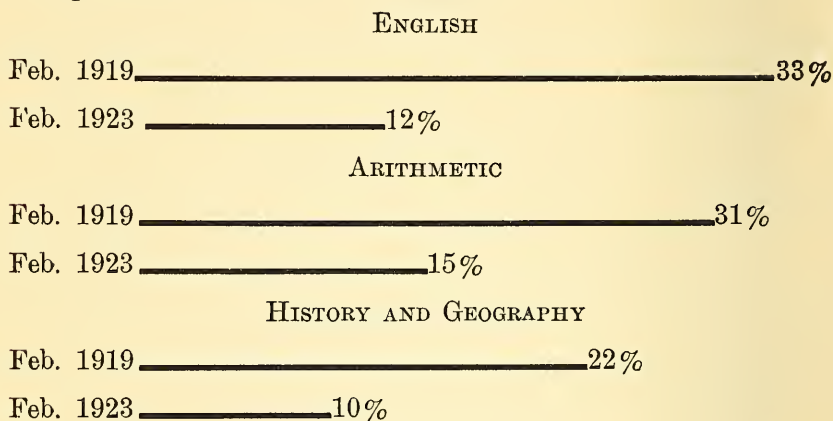


FIG. 2—Comparative Failures Stated in Per Cents, of Terms Closing February, 1919, and February, 1923, of 1100 Pupils Enrolled in Washington Junior High School.

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

CHAPTER V

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

ERNEST HORN

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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 physician 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

vo ume; 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	<i>anyone</i>	chin
<i>she's</i>	<i>anywhere</i>	core
awoke	<i>couldn't</i>	pretended
rap (rapped)	<i>doesn't</i>	queer
threw	<i>isn't</i>	shelf
<i>anybody</i>	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.....2	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

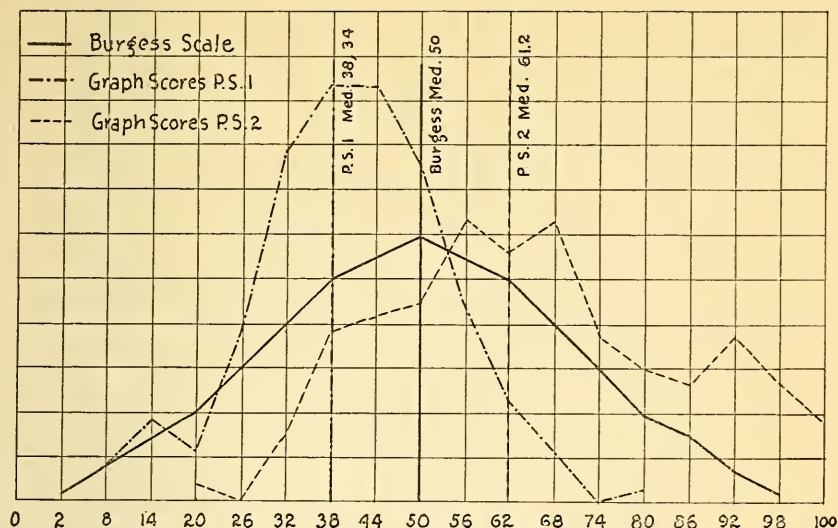


FIG. 1.—Comparison of Scores Made in Two Tests with Burgess Scale

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 pronunciation 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—47 .....	.....
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 Marceus 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*, Aire-dale
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 white Cobra?

Ankus that he took from the
 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 frances 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.

Analysis:

Goal 1....4 times.
 Goal 2....1 time.
 Goal 3....1 time.
 Goal 4....6 times.
 Goal 5....2 times.
 Goal 6....2 times.
 Goal 7....1 time.
 Goal 8....2 times.

Goal 9....1 time.
 Goal 10....1 time.
 Goal 11....1 time.
 Goal 12....1 time.
 Goal 13....1 time.
 Goal 14....1 time.
 Goal 15....1 time.
 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



CHAPTER VI

Remedial Work for Non-readers¹

HELEN BASS KELLER and GRACE M. FERNALD

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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

¹This 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

Case M.

April, 1922

Jan. 31, 1922

an x

x

me c

do c

and c

ma x

o x

go c

at c

ot x

an x

a c

gt c

is x

on c

a c

it c

is c

she c

can c

see c

run c

the c

can c

see c

run c

the c

in c

so c

no x

ug x

sg x

no x

m

n

man c

ten c

mam x

in x

Bad x

tad x

bed c

top c

FIG. 1.—Result of Spelling Tests on January 31, 1922, and April, 1922

I see a cat
 I ma a boy to
 I o to Ro. R
 I can run
 I can see a

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.

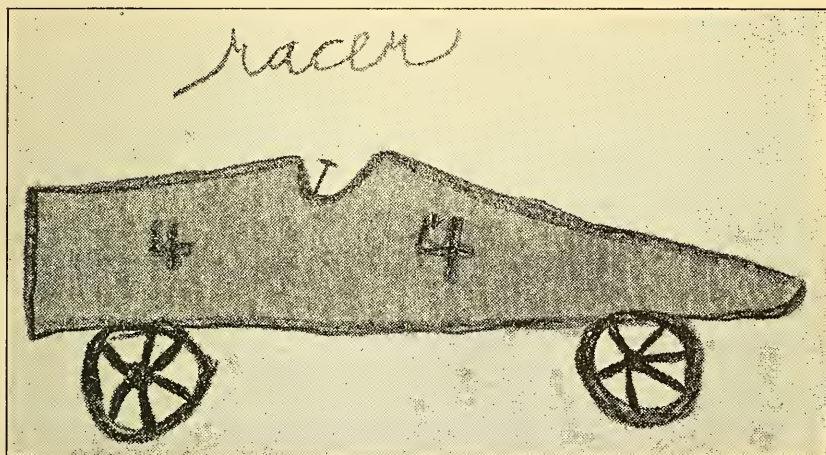


FIG. 3.—*M's Drawing, February, 1922*

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.)

<i>a</i>		couch.....	3	five.....	1
accident.....	2	caught.....	4	fine.....	1*
almost.....	6	cream.....	2	flew.....	2
along.....	1	crash.....	3	fur.....	2
afraid.....	6	catch.....	1	friend.....	7
ask.....	2	couldn't.....	3	fell.....	1
after.....	1	care.....	3	fun.....	1
across.....	5	came.....	1*	fetched.....	1
again.....	1	covered.....	2	farm.....	4
another.....	4	carried.....	4	from.....	3
also.....	1	cover.....	2	few.....	1
around.....	1	careful.....	2	first.....	1
age.....	2	conductor.....	4		
arms.....	2	cents.....	1	<i>g</i>	
away.....	9	costs.....	3*	going.....	1
asked.....	3	carry.....	2	gather.....	2
<i>b</i>		close.....	1	gate.....	1
baker.....	5	captain.....	2	give.....	4
blackberries.....	3	chickens.....	2	grew.....	4
beans.....	1	chimney.....	1	gave.....	1
birds.....	3	cherry.....	2	gray.....	2
buttons.....	3	could.....	1	games.....	1
breakfast.....	3	changed.....	3	gentle.....	3
broke.....	5	chased.....	2	great.....	2
bowl.....	2	crept.....	3	growing.....	1
brown.....	3	cheese.....	1	glad.....	1
baking.....	1	chance.....	1	ground.....	8
back.....	1	curls.....	1	gnaw.....	3*
blossom.....	2	<i>d</i>		gay.....	2
bright.....	5	down.....	9	giving.....	1
before.....	2	days.....	1	<i>h</i>	
bow.....	2	danced.....	2	heard.....	3
buttoned.....	2	ducks.....	2	hide.....	2
blew.....	1	drive.....	1	here.....	1
bought.....	1*	drink.....	1	hollow.....	2
bite.....	1	dresses.....	2	home.....	1
broken.....	1	dinner.....	1	head.....	1
butterflies.....	3	dearly.....	1	him.....	2
black.....	2	dare.....	2	horse.....	1
boat.....	1	dooryard.....	1	high.....	4
best.....	1	deal.....	1	hills.....	1
behind.....	1	<i>e</i>		hopping.....	1
busy.....	2	eyes.....	1	hour.....	1
boiling.....	1*	each.....	1	honeysuckle.....	5
both.....	1	easy.....	2	haste.....	1*
breast.....	1	eight.....	1	heart.....	3*
bonbons.....	1	ever.....	1	hard.....	1
better.....	1	else.....	2	holds.....	2
believe.....	3*	<i>f</i>		harm.....	4
bark.....	2	feel.....	1	<i>i</i>	
brought.....	3	fern.....	1	I'm.....	1
<i>c</i>		floor.....	1	<i>j</i>	
cotton.....	4	fast.....	1	jacket.....	6
cabbages.....	4	face.....	1	just.....	2
cried.....	2	front.....	2	jungle.....	1
carrying.....	4	filled.....	4		
children.....	4				

<i>k</i>		<i>o</i>		squirming1	
kind	2	onions	1	stile	1*
kitty	2	one	1	shan't	1
kitchen	2	out	1	sister	1
kennel	2	oven	2	sure	1
<i>l</i>		over	2	side	2
large	7	off	1	shed	1
lamp	1	o'clock	2	story	3
lay	1	other	2	since	1
leave	3	once	2	stay	1
left	5	outdoors	1	sure	1
lying	2	opened	2	shoulder	2
legs	1	<i>p</i>		suffer	2
lost	1	pie	4	sheet	1
leaf	1	parsley	3*	sound	1
ladder	1	planting	2	sung	2
lawn	1	pulled	6	shower	2
loft	5	pillow	1	strong	1
locked	1	pole	1	spread	1
looked	1	play	2	sly	2
laughed	3	picnic	2*	slung	1
lined	3	pile	1	stole	1
lamp	1	pretty	2	snug	1
<i>m</i>		perhaps	2	squeezed	3
morning	3	pleasant	3	sick	2
may	2	pigeons	2	shoes	2
much	2	picture	3	some	3
month	4	porch	2	sang	5
Monday	2	peas	1	shed	3
many	3	pet	3	scratch	6
must	3	papa	1	slipped	3
mooley	1*	pattering	1	Saturday	2
merry	2	people	1	Sunday	2
more	2	pocket	1	stay	5
motorman	2	piece	1	skip	2
motor	1	proud	1	sitting	2
March	1	<i>q</i>		speak	5
market	1	quench	2	swim	1
moonlight	2	<i>r</i>		snap	4
mower	1	radishes	2	softly	2
mama	3*	rest	1	sweet	2
meadow	2	rug	3	songs	1
minute	1	rapped	3	spring	1
mean	1	rolled	1	sunshine	2
<i>n</i>		red	1	shone	2
naughty	4	roared	2	stands	3
never	5	robin	1	strong	1
net	1	rock	2	same	1
night	1	replied	1	shook	2
near	2	<i>s</i>		<i>t</i>	
nose	2	sewing	3	tail	2
nodded	4	soon	4	there	3
next	1	something	2	thief	3
not	1	spy	2	tried	3
nutting	1			these	2
noise	1			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	<i>v</i>	water.....2
time.....2	very.....2	waves.....1
tap.....1	voice.....4	windmills.....1
turn.....2	violets.....2	wet.....1
tugged.....1	velvet.....2	warmer.....1
tightly.....4	vegetables.....2	wear.....1
thin.....1		wakened.....3
tall.....1	<i>w</i>	won't.....2
through.....3	with.....4	wonder.....2
trotting.....3	went.....4	whole.....1
trouble.....1	white.....3	
tracks.....2	window.....1	<i>y</i>
they.....1	Wednesday.....2	yellow.....3
that.....2	were.....2*	
threw.....1	which.....5	<i>z</i>
tiny.....2	what.....5	
	while.....1	
<i>u</i>	wise.....2	
under.....5	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
	Feb. 23	Feb. 24	Mar. 1	Mar. 14	May 18	
Page 114						
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 school-room 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 overcoming 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).

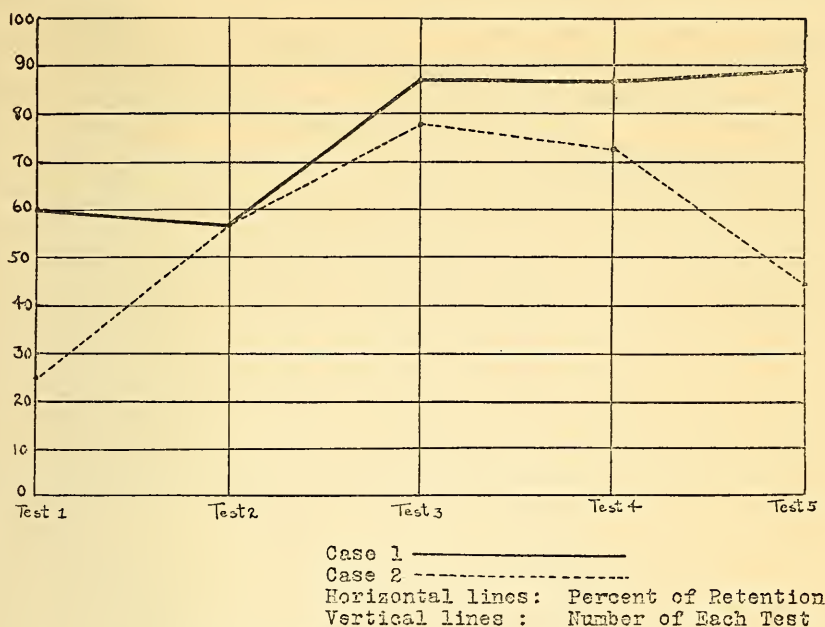


FIG. 1.—Per cent of retention of two 6B pupils

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:

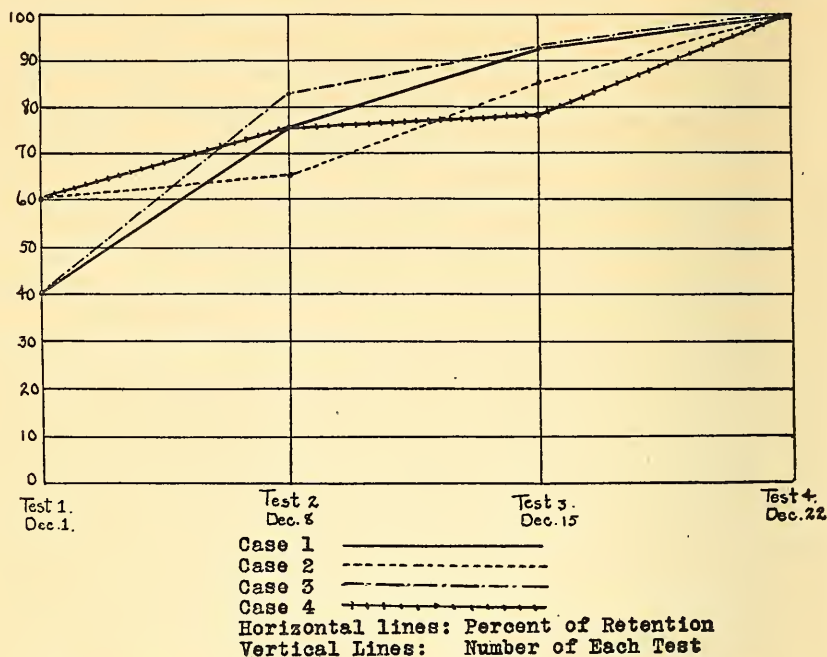


FIG. 2.—Per cent of retention of four 6A pupils on summary tests

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:

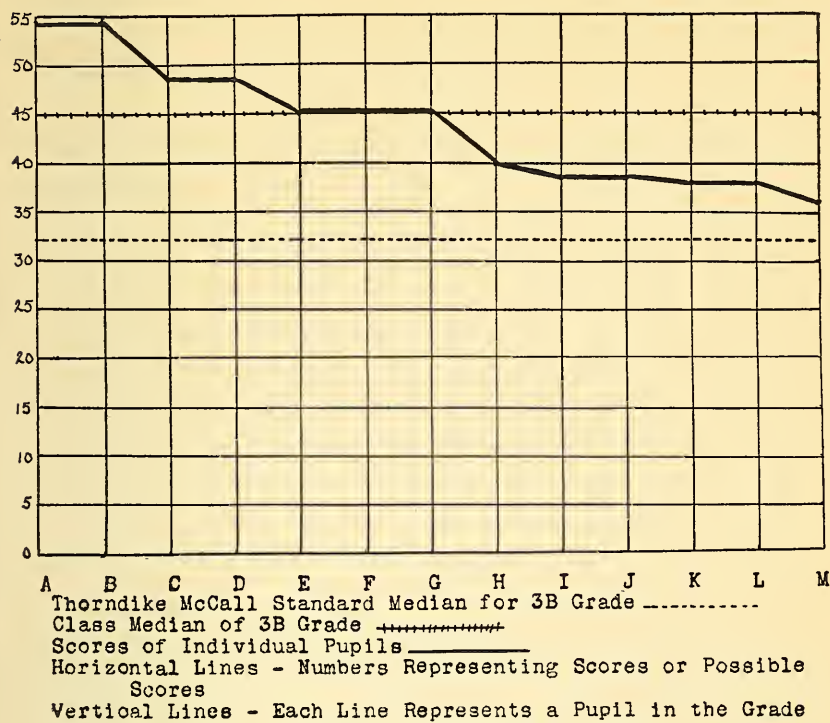


FIG. 3.—Record made on Thorndike-McCall reading test by 3B pupils

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

¹These 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 outline¹ 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, ascension.)
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.
- Gray, William S. Remedial Cases in Reading: Their Diagnosis and Treatment. Educational Monograph No. 22, University of Chicago Press.
- 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

MARGARET H. SMITH

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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	Lake-side	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.

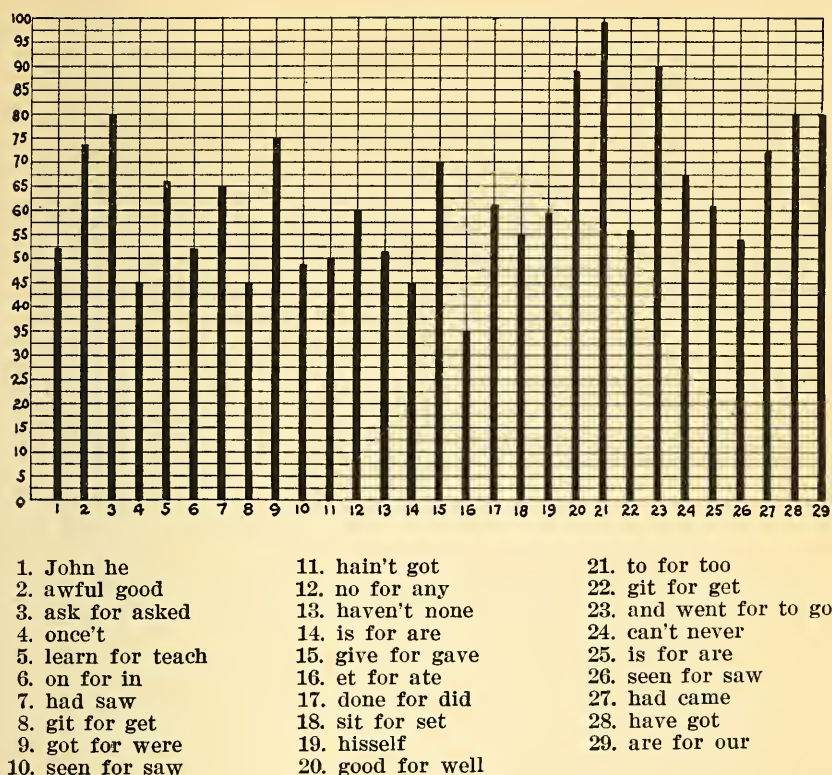


FIG. 1.—Per cent of pupils in grades three to eight that missed each error of Test B—Gilbert, Iowa, 1921-22

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.

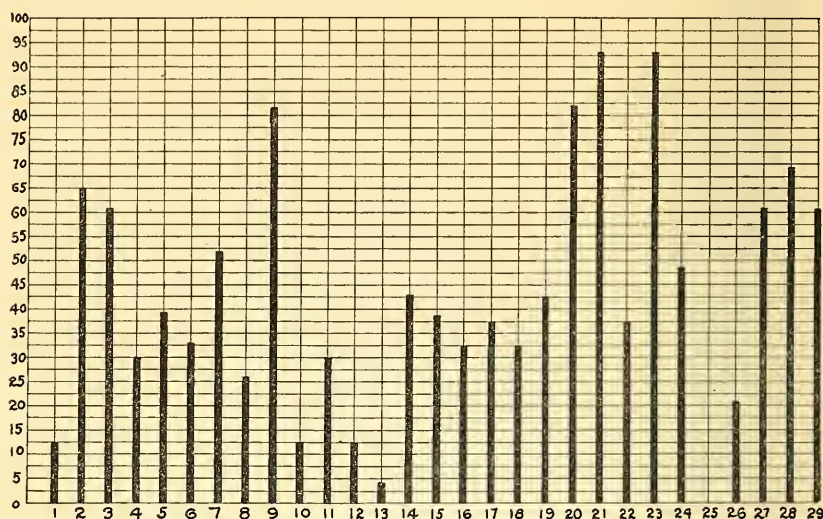


FIG. 2.—Per cent of pupils in seventh grade that missed each error of Test B

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																						Number missing each error.
	F. Anderson	E. Dodds	E. Eness	O. Fossil	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	
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	15
4. once't			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					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					10
15. give for gave			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	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	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	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	15
28. have got	x	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	31	8	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 Comersville 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 series, 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 agreed 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.....		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
themselves								
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 Them¹

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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

¹The 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 survey¹ 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, subtraction, 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.

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 use the combinations to higher decades:

2	52
4	4
—	—
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.

47
56
93
—

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.

$$\begin{array}{r} 423 \\ -219 \\ \hline \end{array}$$

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."

$$\begin{array}{r} 628 \\ -239 \\ \hline \end{array}$$

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.

$$\begin{array}{r} 649 \\ -623 \\ \hline \end{array}$$

(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 9×9 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 9×9 including zeros.
2. The 100 subtraction combinations.
3. The division tables through the 9's including zeros.
4. The meaning of the form $\overline{\hspace{1cm}}$
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:

$$\begin{array}{r} 4 \overline{) 104} \end{array}$$

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. $2 \overline{) 9^5 4}$
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

7

taught. It has been found by testing that pupils knowing 2 do not

2

necessarily know 7. 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 6

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 $\frac{4}{2}$ alone is not enough to automatize $\frac{4}{6}$.

Some teachers, feeling this inadequacy, experimented with flash cards bearing $\frac{4}{2}$ on one side and the answer "6" on the back. But they found that the sight of $\frac{4}{2}$ alone or of "6" alone did not insure the knowledge of $\frac{4}{6}$. 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

4
card 3 he said to himself "7"; then, turning the card over he saw

4
3. This card he placed in one pile called his "Know Pile." One
7

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 $\frac{4}{5}$ they also know $\frac{74}{5}$.

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
47
accurately when numbers are placed before them as 6 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 7×0 , 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 8×0 equals 0, but that 0×8 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 $\overset{538}{x7}$. To work the example the child must think:

7×8 equals 56
 7×3 equals 21 plus 5 equals 26
 7×5 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 4×7 and 1, 4×2 and 1, 4×8 and 1, etc., until he has finished the column. He then begins again with 4×7 and 2, 4×2 and 2, 4×8 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 8, 4, or 6. When everyone

$$\begin{array}{r} 4 \quad 8 \quad 6 \\ \hline 12 \quad 12 \quad 12 \end{array}$$

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.

$$\begin{array}{r} 4 \quad 9 \quad 6 \quad 8 \quad 2 \quad 9 \quad 7 \\ \hline 7 \quad 2 \quad 3 \quad 14 \quad 10 \quad 3 \quad 0 \end{array}$$

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 9×5 ?

It is not 45.

Is it 7×6 ?

It is not 42.

Is it 4×11 ?

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	

9

The teacher gives a combination such as -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:

$ \begin{array}{r} 5 \\ 9 \\ -4 \\ \hline \end{array} $
--

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 non-plused 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 arithmetical 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	<u> </u>	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		<u> </u>
9		108 117
9		
<u>117</u>		

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:

$$\text{Amount} = \text{Principal} + \text{Interest}$$

$$\text{Distance} = \text{Rate} \times \text{Time}$$

$$\text{Cost} + \text{Gain} = \text{Selling Price}$$

$$\text{Area} = \text{Length} \times \text{Width}$$

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 <u> </u>	I 7 -2 <u> </u>	I 6 3 <u> </u>	I 2) <u>6</u>
II 44 23 <u> </u>	II 19 -3 <u> </u>	II 5 9 <u> </u>	II 4) <u>16</u>
III 28 4 <u> </u>	III 12 -7 <u> </u>	III 9 7 <u> </u>	III 3) <u>27</u>
IV 32 72 <u> </u>	IV 27 -4 <u> </u>	IV 41 3 <u> </u>	IV 7) <u>56</u>
V 1 23 6 14 1 38 <u> </u> <u> </u>	V 25 -6 <u> </u>	V 19 6 <u> </u>	V 2) <u>26</u> 3) <u>29</u>
VI 4 43 8 26 3 35 1 15 <u> </u> <u> </u>	VI 29 -15 <u> </u>	VI 214 2 <u> </u>	VI 7) <u>357</u>
VII 3 47 3 25 5 64 8 34 7 13 <u> </u> <u> </u>	VII 38 -14 <u> </u>	VII 351 5 <u> </u>	VII 3) <u>72</u>
	VIII 31 -19 <u> </u>		VIII 8) <u>720</u>
	IX 48 43 -26 -18 <u> </u> <u> </u>		IX 6) <u>428</u>
	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			
Cooperative	Vocalization-lip movements	x	Accuracy	
	Counting	x	Speed	x
	Guessing		Short memory span	
	Faulty Procedure	x	Lack of thoroughness	x

Addition Difficulties			Subtraction Difficulties		
Tests			Tests		
	R	A		R	A
1a	+	+	1s	-	+
2a	-	-	2s	-	+
3a	-	-	3s	-	-
4a	-	-	4s	-	-
5a	-	-	5s	-	-
6a	-	-	6s		
7a	-	-	7s		
			8s		
			9s		
			10s		
		1. Starts backwards✓			1. Upper from lower members
		2. Inspection to find starting point✓			2. Faulty statements✓
		3. Skips around			3. Zero difficulties✓
		4. Breaks up combinations✓			4. Borrowing✓
		5. Adds by tens			5. Roundabout methods✓
		6. Carrying			6. Adding to secure results
		7. Trouble with 2d addition✓			7. Weakness in fundamentals✓
		8. Large numbers first✓			
		9. Bridging tens✓			
		10. Roundabout methods✓			

For illustrations see other side of paper.
(See case history)

Multiplication Difficulties			Division Difficulties		
Tests			Tests		
	R	A		R	A
1m	+	+	1d	+	+
	+	+	2d	+	+
2m	+	-	3d	+	+
3m	+	-	4d	+	+
4m	-	-	5d	+	-
5m	-	-	6d	-	+
			7d	-	
6m	-	-	8d	-	-
			9d	-	-
7m			10d		-
		1. Multiplier not always multiplier✓			1. Roundabout methods✓
		2. Zero difficulties✓			2. Uneven division
		3. Carrying difficulties✓			3. Zero difficulties
		4. Placing of product✓			4. Inability to subtract✓
		5. Weakness in fundamentals✓			5. Forgets what to carry✓
		6. Very erratic			6. Repeats tables for results
					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.

$$\begin{array}{rcl} 47 & 7 \text{ and } 7 = 14 & 87 & 5 \text{ and } 5 = 10 \\ 9 & + 2 = 16 & 5 & - + 2 = 12 \\ \hline 56 & 4 \text{ and } 1 = 5 & 92 & 8 \text{ and } 1 = 9 \end{array}$$

She points to the figures in adding saying:

$$\begin{array}{rcl} 7 & 5 \text{ and } 5 = 10 & 7 & 2 \text{ and } 6 = 8 \\ 4 & + 1 = 11 & 7 & 7 \text{ and } 7 \text{ and } 7 = 21 \\ 5 & + 4 = 15 & 2 & \text{and } 1 \\ 6 & + 7 = 22 \text{ tapped it out } 6 & & \\ \hline 22 & & 22 & 22 \end{array}$$

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.

$$\begin{array}{rcl} 7 & 3 \text{ and } 3 = 6 & 7 & 4 \text{ and } 4 = 8 \\ -3 & 1 = 7 & -4 & 4 \text{ less } 1 = 3 \\ \hline & 3 - 7 = 4 & & \end{array}$$

She thinks $4 \text{ less } 1 = 3$

$$\begin{array}{rcl} 16 & \text{Counts } 5 \text{ dots } (10-11-12-13-14) \text{ and } 2 = 7 & \\ -9 & 2 & \\ \hline 7 & 7 & \end{array}$$

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.

$$\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 3 \times 2 = 6 \\ 4 \times 2 = 8 \end{array} \quad \begin{array}{r} 52 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 3 \times 2 = -6 \\ 5 \times 3 = 15 \end{array}$$

She evidently pays no attention as to which number is the multiplier. It depends on which combination is the easiest for her.

$$\begin{array}{r} 19 \\ \times 6 \\ \hline 104 \end{array} \quad \begin{array}{l} \text{Cannot get the correct results if she does not tap out the answer with} \\ \text{her tongue.} \end{array}$$

$$\begin{array}{r} 32 \\ \times 7 \\ \hline 124 \end{array} \quad \begin{array}{r} 7 \times 2 = 14 \\ 7 \times 3 = 21 \end{array} \quad \begin{array}{l} \text{Is apt to turn her numbers around.} \end{array}$$

$$\begin{array}{r} 3 \overline{) 27} \\ \underline{7 \frac{1}{2}} \end{array} \quad \begin{array}{r} 7 \times 4 = 28 \\ 7 \times 3 = 21 \end{array}$$

How much is left over from 21?

6 is left over.

7 and 6 = $\frac{1}{2}$

$\frac{1}{2}$

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:

$$\begin{array}{r} 43 \\ -18 \\ \hline 35 \end{array}$$
 Some children take the minuend from the subtrahend if the former is smaller than the latter.

2. Faulty statements:

$$\begin{array}{r} 12 \\ -7 \\ \hline 15 \end{array}$$
 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

$$\begin{array}{r} 161 \\ -68 \\ \hline 73 \end{array}$$
 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:

$$\begin{array}{r} 90 \\ -36 \\ \hline 60 \end{array}$$
 This type of problem causes quite a great deal of trouble to some children.

$$\begin{array}{r} 403 \\ -286 \\ \hline 27 \end{array}$$
 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:

$$\begin{array}{r} 22 \\ -8 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 18 \\ -9 \\ \hline 19 \end{array}$$
 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)
$$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 3 + 3 = 6 \\ + 1 = 7 \\ 3 \text{ from } 7 = 4 \end{array}$$

(b)
$$\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 4 + 4 = 8 \\ 4 \text{ less } 1 = 3 \end{array}$$

(c) 16 counts 5 dots $(10-11-12-13-14) + 2 = 7$

$$\begin{array}{r} -9 \\ \hline 7 \end{array}$$

$$\begin{array}{r} +2 \\ \hline 7 \end{array}$$

(d)
$$\begin{array}{r} 18 \\ -5 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 7 \\ 5 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 8 \\ 5 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 9 \\ 5 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 10 \\ 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 11 \\ 5 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 12 \\ 5 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 13 \\ 5 \\ \hline 18 \end{array}$$

$$\begin{array}{r}
 (e) \quad 25 \\
 \quad -6 \\
 \hline
 \quad 31
 \end{array}
 \quad
 \begin{array}{l}
 25 - 5 = 20 \\
 1 \text{ from } 20 = 19
 \end{array}$$

$$\begin{array}{r}
 (f) \quad 37 \\
 \quad -15 \\
 \hline
 \quad 22
 \end{array}
 \quad
 15 \text{ goes into } 30 \text{ twice}$$

Add the other 2 (obtained by taking 5 from 7);
2 goes into 4 (3 and) twice

$$\begin{array}{r}
 (g) \quad 12 \\
 \quad -8 \\
 \hline
 \quad 4
 \end{array}
 \quad
 \begin{array}{l}
 8 \text{ from } 10 = 2 \\
 2 + 2 = 4
 \end{array}$$

$$\begin{array}{r}
 (h) \quad 57 \\
 \quad -29 \\
 \hline
 \quad 26
 \end{array}
 \quad
 \begin{array}{l}
 9 \text{ from } 17 = 8 \\
 2 \text{ from } 5 = 3 \\
 1 \text{ from } 3 = 2
 \end{array}$$

$$\begin{array}{r}
 (i) \quad 21 \\
 \quad -4 \\
 \hline
 \quad 17
 \end{array}
 \quad
 \begin{array}{l}
 20 \text{ is } 1 \\
 19 \text{ is } 2 \\
 18 \text{ is } 3 \\
 17 \text{ is } 4
 \end{array}$$

$$\begin{array}{r}
 (j) \quad 22 \\
 \quad -8 \\
 \hline
 \quad 14
 \end{array}
 \quad
 \begin{array}{l}
 20 \text{ is } 1 \\
 18 \text{ is } 2 \\
 16 \text{ is } 3 \\
 14 \text{ is } 4
 \end{array}
 \quad
 \text{Here some pupil knew four 2's were needed.}$$

$$\begin{array}{r}
 (k) \quad 23 \\
 \quad -9 \\
 \hline
 \quad 25
 \end{array}
 \quad
 \begin{array}{l}
 9 + 5 = 13 \\
 9 \text{ from } 13 = 5 \\
 \text{and } 2 = 25
 \end{array}$$

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.

$$\begin{array}{r}
 53 \\
 -8 \\
 \hline
 44
 \end{array}$$

Came across a child in the fifth grade who was not able to work the simplest problems in subtraction.

$$\begin{array}{r}
 7 \\
 -2 \\
 \hline
 1
 \end{array}
 \quad
 \begin{array}{r}
 9 \\
 -3 \\
 \hline
 2
 \end{array}
 \quad
 \begin{array}{r}
 8 \\
 -5 \\
 \hline
 5
 \end{array}
 \quad
 \begin{array}{r}
 6 \\
 -1 \\
 \hline
 3
 \end{array}$$

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

¹References 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'Brien¹ 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-

¹The 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 I*. 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.* 20:76-82, 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.
60. Uhl, W. L. Use of reading tests for planning remedial work. *El. Sch. J.* 17: 266-75, 1916. Account of testing, classification, and remedial work in reading.
61. Waldman B. Definite improvement of reading ability in a fourth-grade class. *El. Sch. J.* 21: 273-80, 1920. Very good account of methods used in improving reading after giving of tests.
62. Zirbes, L. Diagnostic measurement as a basis for procedure. *El. Sch. J.* 18: 505-522, 1918. An account of an experiment in one class in reading. Diagnosis and remedial treatment.

B. Remedial and diagnostic Work in Arithmetic

63. Anderson, C. J. Use of Woody scale for diagnostic purposes. *El. Sch. J.* 18: 770-781, 1918. Very thorough method of diagnosing division difficulties.
64. Gist, Arthur S. Errors in the fundamentals of arithmetic. *Sch. & Soc.* 6: 175-177 (1917). Analysis of errors made on 812 Courtis Series B. Arithmetic tests. Types of errors clearly shown.
65. Heckert, J. W. Cleveland survey tests in arithmetic in the Miama valley. *El. Sch. J.* 18: 447-57, 1918. Gives some suggestions as to what should follow these tests.
66. Kallom, A. W. Analysis of and testing in common fractions. *J. Educ. Re.* 1: 177-192. Concrete data on diagnosis in fractions.
67. Kelly, F. J. The results of three types of drill on the fundamentals of arithmetic. *J. Educ. Re.* 2: 693-700, 1920. Experimental study showing the effects of use of standard practice material in arithmetic. Suggestive for after-testing work.
68. Newcomb, R. S. Teaching pupils how to solve problems in arithmetic. *El. Sch. J.* 23: 183-189, 1923. Illustrates use of tests in experimental work adaptable to after-testing.
69. Smith, J. H. Individual variations in arithmetic. *El. Sch. J.* 17: 195-200. Suggestive for after-testing. Shows effectiveness of three types of drill. (1916-1917.)
70. Torgerson, T. L. Analytical study of the results of the Woody arithmetic test in West Allis, Wisconsin. *J. Educ. Re.* 6: 180-2, 1922. Shows types of errors found. Does not tell what was done to correct them.

C. Miscellaneous Uses of Tests

71. Brooks, S. S. Putting standardized tests to practical use in rural schools. *J. Educ. Re.* 1: 392-97; 2: 425-35; also Nov., 1920, Jan., 1921, Dec., 1921, of articles outlining possible uses of tests in rural schools. Illustrates change in method of supervision.
72. James, M. E. Using results of measurement in reading in training student-teachers. *El. Sch. J.* 23: 190-196. Shows how student-teachers were taught to remedy defects in reading through standardized tests.
73. Willing, M. H. The encouragement of individual instruction by means of standardized tests. *J. Educ. Re.* 1: 193-198. Emphasizes the importance of using tests to center the attention upon the individual child.
74. Washburne, C. W. Educational measurements as a key to individual instruction and promotions. *J. Educ. Re.* 5: 195-206. Good concrete data on use of tests in individual instruction.
75. Williams, L. A. Standard tests in ungraded classes. *Sch. & Soc.* 6: 568-70, 1917. Shows gains made in reading, spelling, etc.

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 $3\frac{1}{2} \times 5$ 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	Physiology.....	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.)

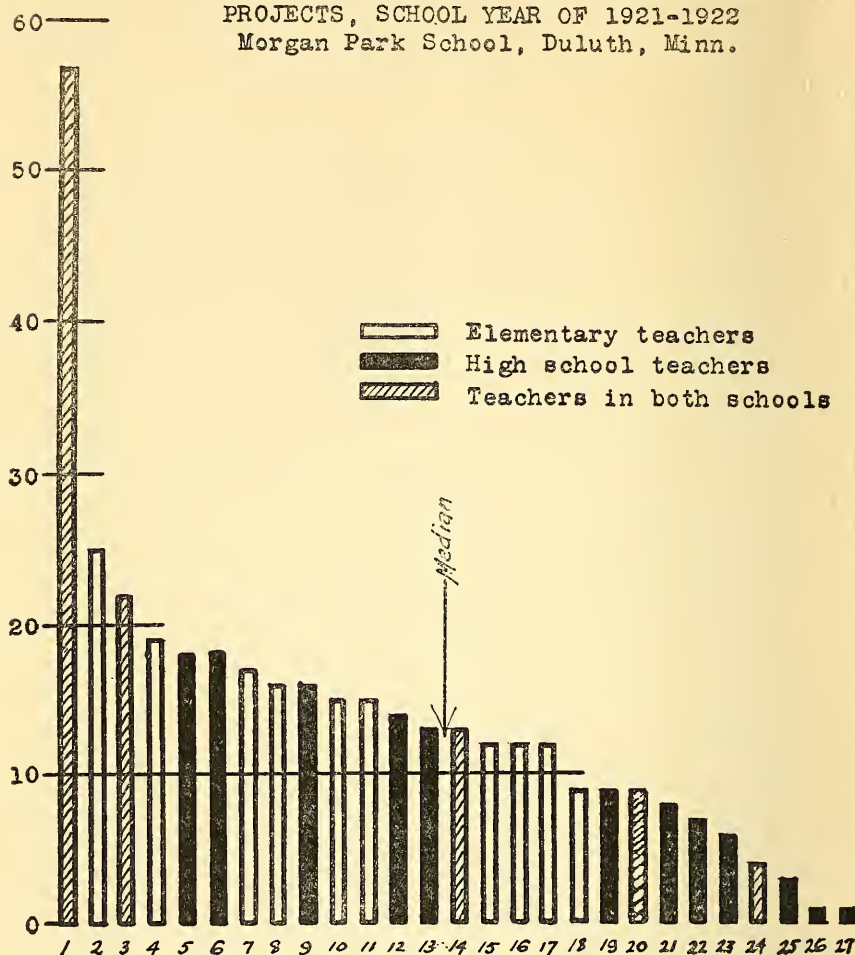
TABLE 2—Subject Sources of Auditorium Projects in the Six-Grade Elementary School, 1920-21.

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, wood-work and machine shop.

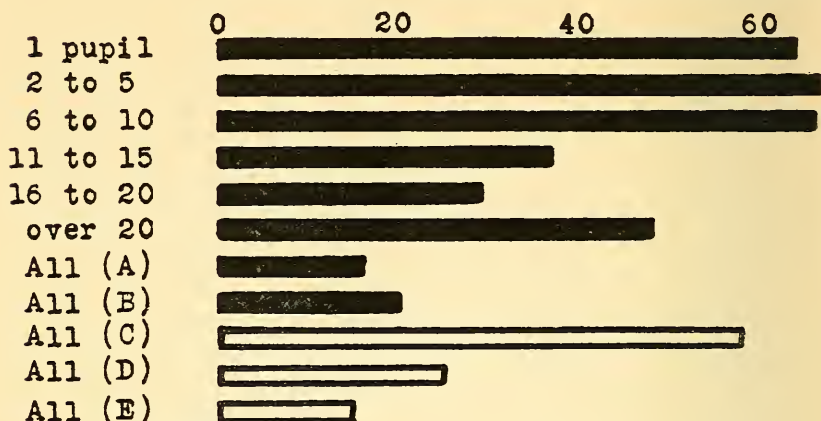
Teachers in both schools (hatched bars) : No. 1, music and head of auditorium work; No. 3, art and industrial arts in grades 4, 5, 8; No. 14, director of physical training for girls; No. 20, director of physical training for boys and coach of boys' athletics; No. 24, art and industrial arts in grades 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**



LEGEND:

- Active participation
- Participating as an audience
- A Community Singing
- B Musical Appreciation
- C Motion Pictures
- D Talks by Teachers
- E Addresses by outside speakers

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-

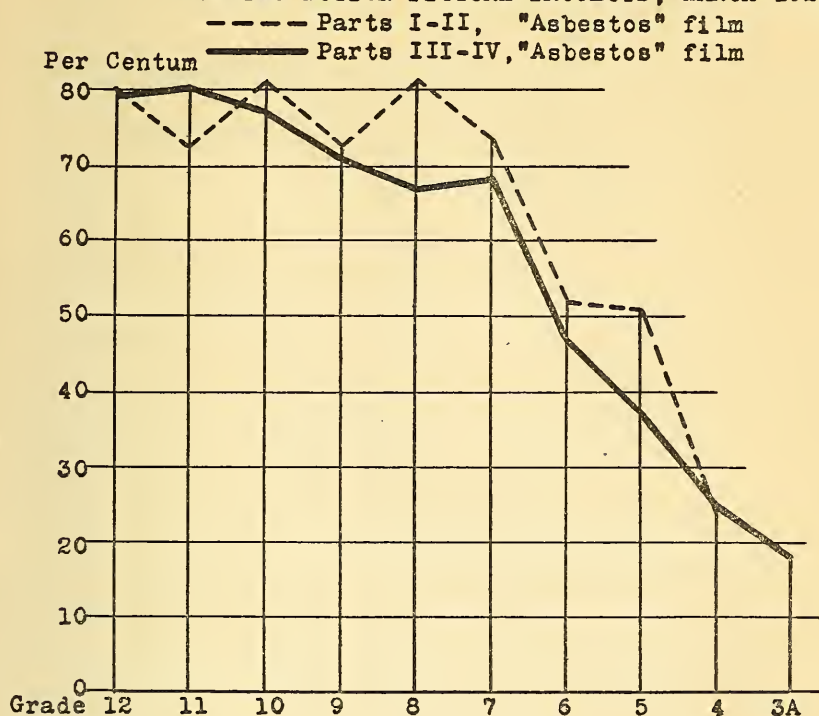
mentary school or a youngster in the high school will often surprise his teachers by his poise, enunciation, and complete all-round success on the stage. What is the source of his unsuspected ability? I am convinced that the pupil has learned from close attention to the elements of success in the efforts 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



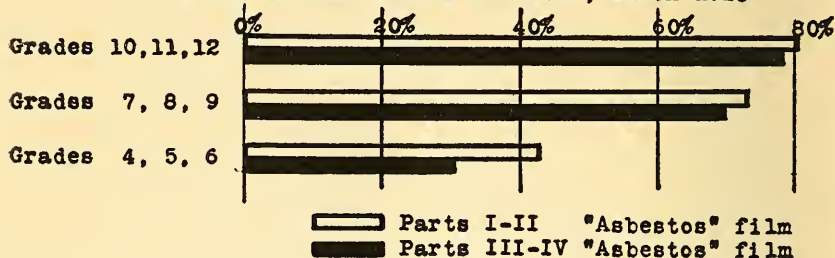
pupils from two to three hours after the film was shown, in both cases without any warning that a test was to be given.

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

1. For Supervision of Teaching	Very Superior.....	40
	Superior	32
	Average	24
	Inferior	16
	Very Inferior.....	8

In rating teachers for Assistant Principalships, weight these items, checking the appropriate value

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.

Afferbach, 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, Clarendon 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.
- Bartley, 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 Sts., Baltimore, Md.
- Beck, J. O., Westwood School, 3044 Lischer Ave., Cincinnati, Ohio.
- Bednar, Christine, Sherwood School, 132 W. Marquette Rd., Chicago, Ill.
- Beck, 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, Harry, 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 Brown'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.
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 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 Huntington, 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.
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- Driver, Emma McC., Washington School, Beverly, Mass.
- Duggan, Elizabeth A., P. S. No. 57, Manhattan, 176 E. 115 St., New York.
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- Dunn, Mrs. E. R., Hamline School, 4747 So. Bishop St., Chicago, Ill.
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- 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.
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- Edwards, J. C., Clinton School, 1109 Grattan St., St. Louis, Mo.
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- Eissler, Louise, Birney School, 4613 Wayne Ave., Philadelphia, Pa.
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- Elgar, Frances, Lester Park School, Duluth, Minn.
- Ellings, Abigail C., 2628 Lake View Ave., Chicago, Ill.
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- 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.
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- 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 Torenas 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.
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- 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 Lealand Ave., Chicago, Ill.

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- Gallup, Jackson, School 18, Rochester, N. Y.
- Gard, Clara F., Fairview School, 1126 Josephine, Denver, Colo.
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- Gee, Etta Q., Plaza Hotel, Chicago, Ill.
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- Gilbert, O. G., 517 Dakota St., Milwaukee, Wis.
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- Given, Margaret E., Lewis School, Everett, Mass.
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- Goodwin, A. J., Hiawatha School, Hiawatha, Utah.
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- Graham, Elizabeth, 32 Spring St., Fairhaven, Mass.
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- Green, A. S., Garfield School, Wabash and Omie, Kansas City, Mo.
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- Green, G. H., Lowell School, 6189 Kingsbury Blvd., St. Louis, Mo.
- Green, Miss Loa, 5 Washington Apts., Mt. Clemens, Mich.
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- 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. Lamont 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, 700 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.
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- Holmes, Mary E., School No. 55, Chestnut Ave. and 37 St., Baltimore, Md.
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- Hood, W. F., Lincoln School, 234 Howland Ave., Racine, Wis.
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- 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, Jeannie, 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.
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- 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.
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- 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.
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- 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 Tincum Ave., Philadelphia, Pa.
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- Knoolhizen, 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.
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- 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.
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- Latmer, Anna E., Memorial School, Cleveland, Ohio.
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- La Vance, Laura F., School No. 8, Delaware, N. J.
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- Levange, Pearl, Job C. Trebb School, Fairhaven, Mass.
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- Lewis, John L., Raymond School, 3633 Wabash Ave., Chicago, Ill.
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- Lincoln, Arthur A., Washington Allston School, Boston, Mass.
- Linerode, A. A., Supt. of Schools, Creston, Ohio.
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- Littlefield, Lucy H., Lowell School, Boston, Mass.
- Lockhart, Lenore, Livingston School, Columbus, Ohio.
- Lockwood, Cora M., 147 Oregon Ave., Dundee, Ill.
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- 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 Brush-ton 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, Apollo, 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, Cole-harbor, N. D.
- Maher, Miss A., Howe School, 10430 Charle-voix, 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.
- Metcalfe, 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., Scales 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. 16th and Union St., Cleveland, Ohio.
- Newell, Minnie E., 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.
 Nixon, 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., Wickersham 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.
 Rifenburg, 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.
 Ritterspach, 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.
 Sayers, Helen, South Division School, Grand Rapids, Mich.
 Saunders, Willis G., Supervising Principal, Avon, N. Y.
 Sawyer, E. M., Hyde Park School, 4715 Ward St., Cincinnati, Ohio.
 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.
- Schwoil, Mary E., P. O. Box 274, So. Dartmouth, Mass.
- Scott, Belle Torrey, 2522 Brentwood Road, Bexley, Columbus, Ohio.
- Scott, Bertha L., 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, Navarro 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 McEllderry 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.
- Stitley, Marshall, 1532 Linden Ave., Baltimore, Md.
- Stockley, Callie L., Edwin T. Merrick School, 2313 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.
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- 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.
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- 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.
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- 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., Philadelphia, 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.
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- 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.

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 Underwood, C. P., Samuel Ullman School, Birmingham, Ala.
 Underwood, Franklin M., Fanning School, St. Louis, Mo.

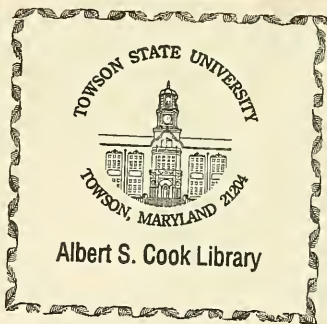
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 Waldie, Conrad T., Darby School, Darby, Pa.
 Walker, Hattie E., Ruhler School, Cleveland, Ohio.
 Walker, Mary I., Walton School, Cleveland, Ohio.
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 Walsh, Frances, 27th Street School, Milwaukee, Wis.
 Walters, Marjorie, Harrison School, Cedar Rapids, Iowa.
 Ward, Clara, Franklin School, Grand Rapids, Mich.
 Ward, Evelyn, Fountain School, Grand Rapids, Mich.
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 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.
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 Wells, Mrs. Bessie F., Noble School, Cleveland, Ohio.

West, Nathaniel 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.
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 Wheeler, Nina L., Kemble School, Rock Island, Ill.
 Wheelock, Alice H., Garfield School, Moline, Ill.
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 Whelan, Mary, 2186 E. 78th St., Cleveland, Ohio.
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 White, Matel, A. Sherwood School, St. Joseph, Mo.
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 Whitney, Lucy, McCoy School, 16th and White, Kansas City, Mo.
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 Wilcox, Walter E., Divoll School, 2918 Dayton St., St. Louis, Mo.
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 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, Beverly M., South and Edwards Schools, Weymouth, Mass.
 Williamson, Edith, Lemington School, 22 Arbor St., Pittsburgh, Pa.
 Williamson, Lillias 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., Had-don Heights, N. J.
- Winslow, Ethel M., 45 Maple St., Green-field, 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, Meri-den, Conn.
- Woodard, J. A., High School, Bozeman, Mont.
- Wright, F. McK., Henley School, Birming-ham, Ala.
- Wright, Owen B., Washington School, Rock Island, Ill.
- Wright, W. H., Supt. of Schools, Otho, Iowa.
- Wuthrich, Maude G., Lincoln School, Bar-tlesville, 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, Grad-uate School, New Haven, Conn.
- Yeaton, Clyde E., 1932 Aldridge St., Minne-apolis, Minn.
- Yeomans, Rosa A., Paul Revere School, Re-vere, 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., De-troit, Mich.
- Young, F. C., So. Highland School, Birm-ingham, Ala.
- Young, Mabel S., Lauman School, Burling-ton, 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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