THE IMPROVEMENT OF READING

GATES

H. E. Smith

Caldwell

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THE IMPROVEMENT OF READING

A PROGRAM OF DIAGNOSTIC AND REMEDIAL METHODS

BY

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To
E. L. T.

PREFACE

THIS book presents a detailed account of a system of measuring achievement, diagnosing difficulties, and conducting instruction in reading. The plan of diagnosis and all but one of the tests have been developed by the author during more than eight years of research. Probably the most important contribution of the volume is the demonstration of the utility of a new method of teaching reading. The value of this system has been evident not only in experimental studies of normal children but also when it has been subjected to the most rigid tests by using it as a means of teaching pupils who, because of deafness, dullness, instability, or other types of native and acquired limitations, have been unable to learn to read or have learned but little by other methods. The book describes the application of the new procedure (which the author has termed the "intrinsic method") to bright, average, and dull normal children, to pupils suffering many sorts of acquired reading difficulties, and to learners deficient in vision, hearing, motor control, speech, and in other capacities and mechanisms.

In order to explain and illustrate fully the new method of teaching reading, the desirable reading skills are described by presenting the performances of pupils who have achieved them and by giving the diagnoses of others who have failed to acquire them, together with the improvements brought about by remedial instruction of the new type. This method of exposition, it is hoped, will not only make the instructions for using the new methods concrete but give the reader added insight into the reading process and illustrate the application of the procedures to various types of individual learners.

In order to demonstrate the new system of diagnosis and follow-up instruction, the volume gives a detailed description of a series of new diagnostic tests and examinations and the methods of interpreting results in such a way as to indicate the remedial measures to be adopted for each case.

Throughout the book, major emphasis has been placed upon the diagnostic significance of all test results and every effort has been made to connect diagnosis with detailed directions for remedial measures. For the large amount of space devoted to illustration and explanation of remedial materials and methods, no apology need be offered.

This treatment of diagnosis and remedial methods in reading has been written for use by two groups of workers. In the first group are included teachers, principals, supervisors, and other members of the staff of instructors. The second class comprises psychologists, psychological examiners in schools and other institutions, and other experts in educational and psychological measurement and diagnosis.

School teachers and supervisors can readily master and put into effect all the directions and suggestions contained in Parts I, II, and III. These sections deal with the milder cases of difficulty in reading. The more elaborate types of examinations are described in Part IV. Although technical knowledge and skill is required to use the instruments adequately and to conduct the examinations described in the last section, teachers should nevertheless become familiar with this section, in order that they may learn how the more detailed diagnoses are made, what the underlying theories are, and what the purposes and types of the remedial work are likely to be. Able teachers can understand everything in this section without actually learning to conduct the tests. Such an understanding will greatly facilitate putting into effect the remedial measures which may be suggested by the technical examiner.

The psychological or educational diagnostician should read the whole book, even though the simpler examinations and remedial procedures are to be left in the hands of teachers. To understand fully the principles underlying Part IV, it will be necessary to study the earlier sections.

During the several years of research, which have made this volume possible, the writer has been ably and faithfully assisted by many persons. To Miss Dorothy Van Alstyne, who cooperated in the work for four years, to Miss Jessie La Salle and Dr. Helen Thompson, who helped during two years each, to Mrs. Eloise Boeker Cason, Mrs. Esther Hempke Chase, Mr.

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PART I

THE NEED AND GENERAL CHARACTERISTICS OF THE PROGRAM FOR DIAGNOSIS AND REMEDIAL INSTRUCTION

THE IMPROVEMENT OF READING

CHAPTER I

THE GENERAL NATURE AND JUSTIFICATION OF THE PROGRAM FOR DIAGNOSIS AND REMEDIAL INSTRUCTION

Reading is both the most important and the most troublesome subject in the elementary school curriculum. It is most important since it is a tool, mastery of which is essential to the learning of nearly every other school subject; most troublesome since pupils fail in reading far more frequently than in any other elementary skill.

The Importance of Good Reading

The importance of reading is indicated in many ways. That teachers and school officers recognize its significance is indicated by the relatively large time allotment and the wealth of teaching devices originated for this subject in the elementary school. That those engaged in research realize the importance of reading is apparent in the relatively large number of investigations in this subject that have been made during the last three

decades. Both school experience and scientific research have added new evidence of the prime importance of good reading in school work. That spelling is partly dependent upon effective reading, that good methods of study in geography, history, and other subjects are largely due to types of reading techniques, that difficulties in working arithmetic problems frequently result from faulty reading habits; these facts are examples of an increasing number of findings that emphasize the value of establishing good reading habits. For these reasons parents and principals alike expect the teacher to develop with promptness and efficiency the reading skills desirable at each stage of advancement.

Frequency of Failure in Reading

Despite the quantity of experimental data, the wealth of ingenious teaching devices, the range of interesting children's reading material, and the large amount of school time available for teaching reading, a surprisingly large number of pupils still experience extreme difficulty in acquiring satisfactory reading skills. In the latest study of this type,[1] it was found that "reading is the most frequent cause of school failure." Failures in the primary grades are almost wholly due to deficiencies in reading. In Grade I, 99.15 per cent of the pupils failing of promotion were marked as "failures in reading"; in Grade II, the percentage was

[1] Percival, Walter P. *A Study of the Causes and Subjects of School Failure*, a doctor's dissertation to be published by the Bureau of Publications, Teachers College.

approximately 90; in Grade III, approximately 70. It is commonly agreed that pupils should not be promoted from the primary grades until they can read intelligently and it is repeatedly found that pupils of good, or even of superior, intelligence, as well as the duller ones, do not always attain satisfactory skill despite every advantage and incentive. No other subject presents nearly as serious difficulties to the primary teacher.

It is now understood that while the training in the primary grades is of supreme importance, instruction in reading does not cease with the primary grades and difficulties in teaching are not confined to the lower levels. It is now widely recognized that a pupil does not in Grades I or II learn to read in a final form and for all purposes. On the contrary, there are numerous reading skills to be mastered at different grade levels. When the lower level techniques have been inadequately or imperfectly mastered, the acquisition of the higher level abilities becomes increasingly difficult. But pupils who have made normal progress through the primary grades are not proof against difficulty in mastering the more subtle skills for the more complex reading demands of the higher grades. That reading is a subject never fully mastered at any one point and that it affords plenty of difficulties above the second grade is indicated by the results of the study referred to above. Of the pupils failing of promotion in the several grades, the percentages failing in reading were approximately as follows: Grade III, 68; Grade IV, 56; Grade V, 40; Grade VI, 33; and Grades VII and VIII, 25. These

figures do not include the many pupils who, we have reason to believe, failed in geography, history, arithmetic, and other subjects primarily because of deficiencies in reading skill.

Causes of Failure or Difficulty in Reading

Why — we are driven to ask — are defects and deficiencies in reading so numerous? Why should a subject so important and so much studied be so difficult to teach and learn? Why do we find so many pupils, some of superior intelligence in the very best schools and under exceptionally able teachers, failing to learn to read satisfactorily?

Aside from the many causes of difficulty to be found in occasional individual cases — such causes as low mentality, defective vision, scholastic immaturity, etc. — there is one significant fact which makes intelligible the difficulty in teaching and learning to read. This is the fact that reading comprises highly complex abilities that are not easily detected and observed.

In the proficient reader, the skill seems utterly simple; the darting eye takes in the words with such facility and with so little obvious effort that one unfamiliar with the processes involved would be inclined to think that reading was a far more simple activity than typewriting, sewing, or dancing. This, however, is certainly not the case. The fluency and ease of proficient reading is evidence not of its simplicity and ease of acquisition but of the great skill acquired by dint of practice. Words seem literally to pour from the lips of an expert reader as movement sweeps the wheels of

an automobile. The result is dependent in a similar way upon the coöperative action of a number of very complex mechanisms. Indeed, the machinery upon which efficient reading depends is doubtless far more complex and the coördinations vastly more subtle than those found in the most elaborate car. And just as in the automobile various defects in one mechanism or function, various types of improper adjustment, various deviations in coördination may singly disturb the operation of the whole machine or stop it altogether, so, in reading, various single defects and deficiencies may produce an inadequate performance or inhibit the function entirely. If an automobile fails to work or operates badly, we at once investigate its parts and adjustments. Difficulties in reading should be attacked in a similar way. In reading, however, the diagnosis is often more difficult not only because of the greater complexity but also because of the greater obscurity of the machinery involved. It is more difficult to isolate the several organs and functions, less easy to observe them in operation, impossible to dissemble them, and often difficult or impossible to correct or replace them. Since reading skills cannot be invariably developed and maintained any more than cars can be built and operated perfectly enough to prevent the appearance of difficulties in performance, the teacher must be prepared with tools that will enable her to detect defects as they arise and to remedy them before they occasion serious disturbance. Until the day is reached, if ever, when methods of teaching reading are perfect, diagnostic and remedial techniques

will be essential. The day of perfection has not yet arrived as the facts concerning failures in reading amply attest. Diagnostic and remedial methods, indeed, are now sorely needed.

The Need of Diagnosis and Remedial Treatment

The diagnostic instruments and techniques to be reported in this book were designed to appraise habits, skills, or acquired functions on the one hand and fundamental capacities or machinery on the other. So far as they are to be utilized by the classroom teacher, the former are more useful and important. Whereas the teacher is not responsible for the organic deficiencies of her pupils and can do little to better them (except to understand them and take them intelligibly into account) she is in large measure responsible for the skills and techniques and may do a great deal to improve them. It is fortunate that the difficulties in reading are mainly due to deficiencies in habit formation, since they may often be remedied. The book will, therefore, give primary emphasis to the diagnosis and follow-up treatment of difficulties that may be overcome by instruction.

Plan of Presenting the Program for Diagnosis and Remedial Instruction in This Book

Since teachers are highly practical persons with little time to spare from the regular duties of teaching and with many things to do and learn in this time, a program for diagnosis in reading must be so organized

as to yield definite diagnostic pictures with a minimum of time and waste effort. The series of tests and examinations later to be described have, therefore, been developed and arranged to conserve time, to avoid unnecessary work, and to yield as objective diagnoses as possible.

In the first place, all the instruments proposed are designed to *measure* and to *diagnose* ability at the same time. The results are scored by objective means and interpreted primarily by use of scales of average achievements (usually called " norms ") in such a way that a pupil's attainment and his special needs for remedial work, if any, are disclosed by one and the same operation. The entire program for any class, moreover, is so arranged as to make it unnecessary to apply to any child few, if any, tests or examinations which are superfluous. The first tests given are those which all should take. The results of these measurements indicate which pupils should take still further tests, and so on.

Just as a mere measurement — one which merely indicates that a pupil is above, below, or equal to a " norm " — is inadequate without a diagnostic significance, without indicating clearly what abilities are represented, so is a quantitative diagnosis incomplete without a remedial significance, without portraying the type of instruction, if any, that is especially needed. The present series of tests were designed primarily to lead to the application of the most needed type of follow-up instruction. Each test diagnoses an essential reading skill; each measure suggests whether, and if

so how seriously, a pupil is deficient in this skill. Special attention is given, in the discussions of the results, to the methods of developing the techniques in which deficiencies are disclosed, so that measurement, diagnosis, and remedial methods become three intimately related topics. The first two are really preparatory and subordinate to the third, the follow-up instruction.

Since the tests and examinations to be employed, the difficulties found, and the types of remedial exercises to be used differ according to the age, grade, and general reading ability of the individual pupils, the treatment of these subjects is organized for different levels. Much is to be gained, however, by becoming familiar with the desirable achievements expected and the types of difficulties found at higher and lower levels than the teacher's own class, partly because in any one grade a wide range of abilities and variety of difficulties are to be found and partly because the best teaching will take into account the experiences of a pupil's past and the demands of his future.

In each division, the directions follow the order of the steps recommended in conducting a survey; the most widely applicable, necessary, and least technical diagnoses coming first while those designed primarily for the most exceptional and complex "disabilities" which require especially detailed diagnoses are given last. How far the teacher will find it possible or profitable to pursue the study of her most obstinate reading difficulties will vary with circumstances. Some of the more technical methods are offered in order that the teacher, although unable to carry out such extensive

studies, may at least secure some understanding of the nature of the methods.

The Number of Pupils Studied

The critical reader, especially one with scientific training, will be interested in knowing the variety and number of pupils studied in the preparation of the present program of diagnosis and remedial instruction. Since it is desirable to avoid all impediments to a straightforward exposition of methods of diagnosis and remedial work in the following chapters, a brief summary of the quantitative data on which this program is founded will be given here.

	Number of Pupils
I. Pupils serving as subjects in experimental studies requiring daily practice periods for various periods of time.	
1. Daily practice periods for a full academic year; separate groups of very bright, average, dull, deaf-mutes, unselected, and other types included in this total	292
2. Daily practice period of 5 weeks or more	712
3. Daily practice periods from 1 to 5 weeks	260
Total subjects in practice experiments	1264
II. Pupils tested by batteries of three or more achievement tests in work related to construction of present series.	
1. First study, 11 different tests given to each	155
2. Second study, 4–8 tests given to each	186
3. Third study, 1–12 experimental test types	980
4. Preliminary forms of Primary Reading, 3–8 tests	2600
5. Preliminary forms Advanced Series, 6–15 tests	3200
6. Each tested with preliminary and final forms of Gates Pronunciation Test	2100
7. Tested with both Pronunciation and Oral Passages	255
Total pupils tested with batteries of achievement tests	9476

III. Pupils tested and examined with a series of Diagnostic Tests.	Number of Pupils
1. With series of 3 to 6 different diagnostic tests (both good and deficient readers)	580
2. With series of 9 diagnostic tests (all deficient in reading)	256
3. With series of 14 (both good and deficient readers)	810
4. With series of 46 (both good and deficient readers)	150
5. With series of 14–42 tests, as needed, to secure diagnosis (all deficient readers)	79
6. With the complete present series as outlined in this book (both good and deficient readers)	465
Total number given series of diagnostic tests	2340
Total number pupils studied	13,080

Thirteen thousand pupils have been tested or examined in some definite manner. For over ten thousand of these, the author has in his files diagnostic data secured from 3 to 46 tests; for over nine thousand, from 6 tests or more; for over four thousand, from 9 tests or more. The entire series of tests, requiring from 3 to 7 hours' time of mainly individual testing, has been given to six hundred seventy-eight pupils.

Studies Which Justify the Program

The present program for diagnosis and treatment of difficulties in reading is amply justified by the existing need. But it requires also another type of justification not satisfied by the number of cases, however impressive, that have been studied. The recommendations should be validated by means of appropriate experimental and statistical analysis. The tests and remedial materials here offered are the results of studies begun by the writer in 1918 and continued up to the

present time. The data from these investigations have been appearing in the literature at intervals since 1921. For the critical reader who may wish to study the original data, a list of these studies to date, including three now in preparation from which materials have been drawn in writing this volume, is given below, with brief annotations, in chronological order. The list includes only those studies made either by the writer or by students working under his supervision. Needless to say, the writer has also taken advantage of the results of other studies ably summarized by W. S. Gray in his *Summaries of Investigations Relating to Reading,* published by the Department of Education of the University of Chicago in 1925.

1. GATES, A. I., "An Experimental and Statistical Study of Reading and Reading Tests," *Journal of Educational Psychology,* September, October, November, 1921, pp. 303–14, 378–91, 445–64.
   A study of the validity, reliability, and significance of different types of reading tests and test elements; of the merits of different kinds of devices for measuring comprehension; of the degree to which tests of one reading skill indicate ability in others.

2. GATES, A. I., "The Correlation of Achievement in School Subjects with Intelligence Tests and Other Variables," *Journal of Educational Psychology,* March, April, May, 1922, pp. 129–39, 223–35, 277–85.
   A study of reading and its relation to intelligence and other abilities and of the development of reading skill.

3. GATES, A. I., *The Psychology of Reading and Spelling with Special Reference to Disability.* New York: Teachers College, Bureau of Publications, 1922, pp. viii, 108.
   A study based on the results of a series of tests for intelligence, reading and other school attainments, visual acuity, visual perception, hearing, learning to spell, spelling and pronouncing familiar and unfamiliar words, etc., together with diagnostic analyses of methods of perceiving and learning words, etc.,

and experimental studies of remedial instruction. One hundred fifty pupils, of which twenty-five were seriously retarded in reading and spelling or both, were studied intensively. This study summarizes the author's work on diagnosis and remedial instruction done prior to 1922.

4. GATES, A. I., "Study of Depth and Rate of Comprehension in Reading by Means of a Practice Experiment," *Journal of Educational Research*, January, 1923, pp. 37–50.
   A study of the characteristics of different types of comprehension and the influence of practice upon them.

5. GATES, A. I., "The Relative Predictive Values of Certain Intelligence and Educational Tests, Etc.," *Journal of Educational Psychology*, December, 1923, pp. 517–40.
   A study of the development of reading ability and its relation to other functions based on consecutive measurements over a period of two years.

6. GATES, A. I., and BOEKER, ELOISE, "A Study of Initial Stages in Reading by Pre-School Children," *Teachers College Record*, November, 1923, pp. 469–90.
   A study of the methods of word perception and analysis, etc., utilized by the beginning reader, including experiments on the influence of the length, types of configurations, and other word characters upon difficulty in learning. This problem, which was subsequently studied more extensively and by other methods, is discussed in the following monograph.

7. MEEK, LOUIS., *A Study of Learning and Retention in Young Children*. New York: Teachers College, Bureau of Publications, Contributions to Education No. 164, 1925, pp. ix, 96.

8. GATES, A. I., and VAN ALSTYNE, DOROTHY, "The General and Specific Effects of Training in Reading with Observations on the Experimental Techniques," *Teachers College Record*, March, 1924, pp. 98–123.
   A study of the interrelations of different kinds of reading ability and the degree to which training in one increases skill in others. The results of this study justify the fundamental point of view adopted in this book concerning methods of testing and teaching reading. This study was carried further in Dr. Carroll's book.

9. CARROLL, R. P., *An Experimental Study of Comprehension in Reading*. New York: Teachers College, Bureau of Publications. In press.

10. GATES, A. I., "A Test of Ability in the Pronunciation of Words," *Teachers College Record*, November, 1924, pp. 205–20.
    Description of one of the diagnostic tests and analysis of results obtained from giving it individually to 1600 pupils.

11. GATES, A. I., "Problems in Beginning Reading," *Teachers College Record*, February, 1925, pp. 572–91.
Results of a study of different teaching methods and devices, vocabularies, etc., used in the first year of reading.

12. GATES, A. I., "The Supplementary Device versus the Intrinsic Method of Teaching Reading," *Elementary School Journal*, June, 1925, pp. 775–86.
A discussion of two fundamental methods of teaching reading.

13. GATES, A. I., "Experimental Investigations of Learning in the Case of Young Children," *Journal of Educational Research*, June, 1925, pp. 41–49.
A discussion and summary of methods of studying the early stages in reading development.

14. GATES, A. I., "Functions of Flash-Card Exercises in Reading: an Experimental Study," *Teachers College Record*, December, 1925, pp. 311–27.
A report of various studies made to determine the merits and limitations of the use of flash cards.

15. GATES, A. I., and TAYLOR, GRACE, "An Experimental Study of the Nature of Improvement Resulting from Practice in a Mental Function," *Journal of Educational Research*, December, 1925, pp. 583–93.
Results of an experiment made to determine whether the memory span, a deficiency in which is the alleged cause of occasional inability to learn to read, can be permanently improved by means of intensive training.

16. GATES, A. I., "The Construction of a Reading Vocabulary for the Primary Grades," *Teachers College Record*, March, 1926, pp. 625–43.
A description of methods used in selecting and appraising words and the arrangement and use of a vocabulary of 1500 words. These words are used in the tests and remedial materials described later for the primary grades.

17. GATES, A. I., *A Reading Vocabulary for the Primary Grades*. New York: Teachers College Bureau of Publications, 1926, p. 23.
The list of 1500 words arranged for use.

18. GATES, A. I., BATCHELDER, MILDRED I., and BETZNER, JEAN. "A Modern Systematic versus an Opportunistic Method of Teaching: an Experimental Study," *Teachers College Record*, April, 1926, pp. 679–701.
An experimental study of two methods of teaching reading during the first year.

19. GATES, A. I., "Methods and Theories of Teaching Reading Tested by Studies of the Deaf," *Journal of Educational Research*, June, 1926, pp. 21–33.

20. GATES, A. I., "An Experimental Study of Teaching the Deaf to Read," *Volta Review*, June, 1926, pp. 295–98.
Two brief statements of the theories underlying a method tried experimentally with deaf-mute subjects as a severe test of the intrinsic merits of the procedure and the possibilities of teaching reading without articulation or phonetic instruction. A full report concerning subjects, methods, materials, and results are given in the following:

21. THOMPSON, HELEN, *An Experimental Study of the Beginning Reading of Deaf-mutes*, a Doctor's dissertation to be published in 1927 by the Teachers College Bureau of Publications.

22. GATES, A. I., "Measurement and Diagnosis in Reading and Spelling," *Schoolmen's Week Proceedings*, University of Pennsylvania School of Education, March, 1926, pp. 376–83.
A brief statement of theories underlying the methods treated in this volume.

23. GATES, A. I., "A Study of the Rôle of Visual Perception, Intelligence and Certain Associative Processes in Reading and Spelling," *Journal of Educational Psychology*, October, 1926, pp. 433–45.
A study of the significance of certain conceptions and diagnostic tests utilized in this volume.

24. GATES, A. I., "The Gates Primary Reading Tests," *Teachers College Record*, October, 1926, pp. 146–78.
A description and discussion of the uses of a team of tests; results of applying the tests to 1600 pupils.

25. GATES, A. I., *Manual of Directions for the Gates Primary Reading Tests*. New York: Teachers College Bureau of Publications, 1926, p. 36.

26. GATES, A. I., "A Series of Tests for the Measurement and Diagnosis of Reading in Grades III–VIII," *Teachers College Record*, September, 1926, pp. 1–23.
General description and explanation of uses of tests.

27. GATES, A. I., "The Gates Silent Reading Tests: Methods of Selecting, Constructing and Validating the Tests." To be published in a forthcoming issue of the *Teachers College Record*.

28. GATES, A. I., *Manual of Directions for the Gates Silent Reading Tests, Grades III–VIII*. New York: Teachers College Bureau of Publications, 1926, p. 27.

29. GATES, A. I., *New Methods in Primary Reading*. New York: Teachers College Bureau of Publications. 1928.
This volume will give an appraisal of current phonetic methods and of the new intrinsic methods advocated in the present book from the point of view of theory, previous experimentation, opinions of experts, and results of use in schools. Two extensive experimental studies are presented together with detailed

directions and illustrations of materials for using the intrinsic method.

30. GATES, A. I., *An Analysis of the Abilities and Capacities Related to Reading Ability and Disability.*

A monograph in preparation giving all technical data concerning the diagnostic tests treated in Parts IV and the Appendix in this volume.

31. GATES, A. I., *Diagnosis of Over Four Hundred Cases of Serious Backwardness in Reading.*

A study of over 400 cases tested with all or most of the writer's complete series of diagnostic tests.

CHAPTER II

CHARACTERISTICS OF REMEDIAL INSTRUCTION

Since testing and diagnosis are to be conducted primarily as a means of discovering suitable remedial measures, it will be advisable at the outset to consider the characteristics of remedial instruction. In this chapter it will not be our purpose to discuss particular remedial exercises or devices but to consider the features which characterize all types of good remedial teaching.

Remedial instruction as the phrase implies is designed to improve abilities in which diagnosis has revealed deficiencies. Such teaching is designed to strengthen demonstrated weakness or to remove inappropriate habits. It emphasizes administering to individual needs. A type of instruction seriously needed by one pupil may be disadvantageous to another. Certain skills, such as those involved in a detailed visual or phonetic analysis of words, may be incompletely developed by one, properly mastered by another, and so strongly emphasized by a third as to interfere with fluency in reading. The first pupil may need further training in ability to disentangle word forms, whereas the second may need none, and the third may need a type of experience which will in proper degree counteract the effects of overemphasis of a skill that is wholesome in moderation. Remedial instruction, then, is

first and primarily individual prescription for individual needs.

Remedial instruction, often conceived as an emergency measure, is frequently a form of teaching radically different in type and intent from ordinary measures. For this reason, in part, such follow-up methods are frequently of distinctive character. They are often novel "supplementary" devices partaking of the nature of "stunts." Indeed, some of the worst devices and most inadequate teaching methods are to be found in remedial instruction for pupils who, precisely because they have had difficulties with a subject, are most in need of the best possible teaching.

The fact is that remedial teaching should follow the same general principles of learning that are, or should be, observed in any other type of instruction — with certain occasional departures to meet particular types of need. These variations represent not contradictions of the main principles but special applications of them which require unusual skill and understanding. Such a comprehension is to be reached by a clear grasp of the main principles themselves.

Learning Explained as Reacting

The most general as well as the most important principle is that learning consists in the acquisition of reactions. Learning is never a passive process of absorption: We learn by means of reacting; we learn the reactions we exercise. This is a bald statement of the general fact, which should be illustrated and clarified.

If a child or adult is presented with a typewriter and

certain general directions concerning ways of handling the machine, we may see fairly clearly — far more clearly than in learning to read — the process of learning. The learner begins by attempting to strike the proper keys in order. At first these "reactions" are made with difficulty and are imperfect, producing errors. Gradually certain combinations of strokes, through repeated efforts, are practiced until a degree of uniformity is achieved. A complex motor reaction is thus built up. It is established by repeatedly making reactions, more or less close approximations to an effective one, until, various little imperfections eliminated, a fairly good reaction is "stamped in." The child learns only by making reactions and, obviously, what he acquires are the reactions. It is usual for each learner, having at length attained a reaction which is for his purposes fairly satisfactory, to repeat the act until it becomes rather stable, fixed, smooth-running, "habituated."

Now, it is important to observe that children or adults left largely to their own devices in learning to typewrite will habituate very different types of reactions. One may depend upon his eyes primarily in finding the keys, another may depend upon his fingers; others may use both vision and touch in different degrees. One uses two fingers on the right hand and one on the left; another uses three on each; another rarely uses his thumbs; another uses all his digits, and so on. Each learner eventually habituates one type of reaction. Fortunately in typewriting these different types of reaction may be readily seen and the merits

of most of them are known. Observation of learners under such conditions shows that appropriate and inappropriate reactions are acquired in the same way; that unless the learner knows exactly how he should react, he is very likely to acquire undesirable types; that any type of response, once persisted in for a time, is likely to become habituated, and that it is very difficult to tell in advance what learners will hit upon inappropriate methods at any time.

The Characteristics of Learning to Read

Although the development of reading skills is difficult to perceive, the characteristics of learning to read are the same as those of learning to typewrite. One investigator, Dr. Meek,[1] attempted to arrange an experimental situation that would make it possible to observe differences among young children in their first reading reactions. She selected a group of children of average or superior intelligence who had not learned to read a word. Then she provided a prescribed learning situation in which each pupil was given the same first lesson. She arranged five boxes with one of the following words — *ball, bolt, bell, fall, roll* — on the top of each. She showed the pupil the real ball in the box whose cover bore that word and explained that if the pupil picked out this word-picture three times in succession he could keep the ball. Without exception the pupils entered this game with enthusiasm. Some succeeded at once and gained increasing skill rapidly in similar games

[1] Meek, Lois. *A Study of Learning and Retention of Young Children*, Teachers College Contributions to Education, No. 164, 1925.

with other words. Some learned quickly but apparently did not acquire a method of reacting to the word that assisted them much with later lessons. Some learned each word by noting a characteristic but minute detail such as the monkey's tail on the *y* in *monkey* or the hole in *hot;* some observed mainly the first letters, others the last or middle, others reacted chiefly to the general configuration of the word. There were many types of reaction and many degrees of success. Indeed, there were a number who could not master the task although they kept at it until, after more than a hundred trials, they were quite discouraged. Tests of intelligence and of ability to learn in other situations made it quite certain that these failures were not due to general dullness, inability to learn, inattentiveness, or initial lack of interest or effort. They were almost certainly due to hitting upon ineffective modes of reaction and to inability to discover by themselves effective types of response. That such was the case was indicated by the fact that certain types of guidance by the investigator given after a period of failure enabled the pupils to adopt a better type of reaction and thereby to learn the words.

The Relation of Difficulty and Interest in Reading

The behavior of these children, especially of those who failed or learned slowly, affords considerable insight into the origin and causes of difficulties in reading.

The pupils, whose difficulties were due to ineffective types of reaction to the words, were at the beginning

as highly interested in the game as the others. But, as repeated failures met their efforts to learn, their interest began to wane. Soon certain pupils showed every evidence of distaste for the task. One hid behind the piano when the investigator appeared; another refused to try when the task was set; another told her in no uncertain terms what she thought of " that old game." In such cases distaste and half-hearted effort were added disadvantageous modes of learning, each magnifying the other. Had such conditions been permitted to continue, the result would doubtless have been, in time, a serious " disability " in, and hatred of reading. Doubtless many " disabilities " in reading arise in just this way; perhaps some of them originate in the very first lesson.

It should be noted that, in this study, interest usually depended upon achievement. If the pupil's efforts were successful his interest persisted or increased; if his efforts led to failure, his interest died or turned to distaste. There was no evidence that interest was the cause of the pupil's attainments; on the contrary, it appears that the degree of interest was the result of achievement. Similarly, we may expect to find at later stages a correlation between ability and interest in reading. In the main, the good readers will like the activity, the poor ones may often dislike it. In most cases, therefore, we should not say that the pupils failed because they were not interested in reading but that they probably had no interest because they failed. And quite as Dr. Meek found in her study that she could arouse little interest by indirect means, whereas it blos-

somed overnight when the pupil was assisted in such a way as to enable him to succeed; so, in general, in dealing with difficulties in reading we must attack the difficulty in learning as a means of reviving interest rather than attempt primarily to cultivate interest as a means of removing the difficulties. Such, at any rate, is the general rule, although there are occasional cases, to be treated later, in which the difficulty is due to the fact that the pupil has become more distinguished, more of a success, in general, by being a failure than by being a success in reading.

The suggestions contained in Dr. Meek's study are as follows: In the early stages of reading, different pupils will develop very different types of reaction to the same learning situation. These methods of attack will vary from excellent to very inadequate ones. High intelligence, keen interest, extreme effort do not guarantee adequate reactions in a task so complex and difficult to guide as reading is, and when the pupils' efforts are unsuccessful, interest and effort are both likely to wane. Until our methods of initial teaching of reading become far more effective than they now are, difficulties may be expected and, consequently, remedial treatment will be needed.

Such a study as the one reviewed reveals the need of a definite, refined, fool-proof guidance of the young learner in such complex and subtle skills as reading. Indeed, as commonly understood, remedial treatment is the extreme form of rigidly controlled practice. Ordinary teaching no less than remedial instruction should be a type of activity directed exactly to achieve

a definite result. The main principles to be observed in the one are, consequently, the same as in the other type of training. What these principles are, and how they should be applied, merits further discussion.

Method of the Supplementary Device in Reading

The most common method of teaching reading in American schools may be described as "direct learning coupled with supplementary devices." [1]

The learning is direct in the sense that the pupil is encouraged to "read meaningful material" from the first; he does not learn the alphabet, series of phonograms, or some type of "phonoscript" [2] before he reads words, phrases, or sentences to get their thought. On the contrary, he begins at once to read whole words or even sentences or paragraphs. That the exclusive use of such a direct attack may often result in defects in what are usually called the "mechanics" of reading is widely recognized, however. To avoid inappropriate and establish appropriate ways of "seeing" words, of recognizing specific word parts, of grasping large "eyefuls" of words at once, of seeing ahead of the words being articulated and to establish other fundamental

[1] See Gates, A. I., "Problems in Beginning Reading," *Teachers College Record*, March, 1925, pp. 572–91 and "The Supplementary Device versus the Intrinsic Method of Teaching Reading," *Elementary School Journal*, June, 1925, pp. 775–86.

[2] As, apparently, is done in England, see Winch, W. H., *Teaching Beginners to Read in England:* Bloomington: Public School Publishing Company, 1925.

habits of reading, it is customary to provide a number of supplementary drills for each of these skills. The program then consists of a period for real reading and other periods for brisk drills with flash cards, phonetic exercises, word games, phrasing practices, and the like. The direct reading of senseful material is thus coupled with special supplementary drills.

Grave difficulties attend this method of depending on supplementary training to develop various desirable habits in reading. The source of these difficulties may be understood by recalling our most trusty general principle of learning, namely, the dictum that learning consists of the establishment of particular reactions to particular learning situations. By practice in the recognition of words in large print exposed very briefly on a flash card, the pupil learns better to react to the particular big-word-on-big-card-quickly-exposed-at-a-distance situation. But small words on a near-by page of other words, not divided into convenient groups which are presented to view and quickly removed by another person, is another situation. We cannot always be sure that skill in the flash card situation will reappear in large degree in the reading situation. Not only are the two settings different in several respects but the skills required in the two cases are also different in some degree. The difficulty with supplementary training of this type is that the abilities so developed to be fruitful must transfer to other situations. Careful studies of the transfer of training in such cases show often a disappointing carry over. In one study, it was found that many of the important skills developed by flash card

drill did not reappear appreciably in regular reading.[1] In other studies, similar limitations have been found for certain types of phonetic drill, for exercises for improving memory, for special drills on phases of basket-ball throwing, in judging the lengths of lines, and so on. Similar difficulties with the method of supplementary drills, in other words, have been found in many different types of learning.

Method of the Intrinsic Device in Reading

Psychology does not recommend either a complete abolition of everything which smacks of the nature of the supplementary device or a return to an exclusive use of a direct trial-and-error attack upon reading in a strictly "natural" way. The limitations of the natural method, that is, of unguided learning, are too great to be neglected, and the supplementary device has a certain emergency function which will be explained presently.

For establishing the several important special skills not properly developed in ordinary natural learning, psychology has revealed greatest promise in what may be called the *intrinsic device.*

An intrinsic device is one which is not separate or supplementary but an integral part of the natural process of reading. It consists of a type of organization of a reading situation which guides or impels the pupil to react in a desired way while his efforts are directed to accurate interpretation and normal enjoyment of the

[1] Gates, A. I. "Functions of Flash-Card Exercises in Reading: an Experimental Study," *Teachers College Record.* December, 1925.

content. To illustrate, suppose that our technical purpose is to lead pupils to observe closely certain characteristic parts of words and gradually to become aware of certain elements common to many different word-forms. Phonetic drill in analyzing and blending word parts as a special exercise would illustrate the method of the supplementary device. Such exercises as the following would constitute an intrinsic device.

1. The pupil reads a series of directions which tell how to color an outline drawing, *e.g.*

Color the cat blue.
Color the hat black.
Color the coat brown.

2. After reading a short story the pupils solve such comprehension problems as the following:

Who got most of the milk?	The rat.
	The cat.
	The bat.
How did the little girl feel?	She felt sad.
	She was mad.
	She was glad.

3. Solve such puzzles as the following:

I am made of iron.
I can make a sweet sound.
I live in every school.
I call the children to church.
What am I?
A cell?
A bell?
A doll?

These exercises are not separated from useful reading work since they constitute a very helpful means of in-

creasing comprehension. They also add to the enjoyment of reading and stimulate a desirable attitude toward it. It is merely the arrangement of the task that forces the child to distinguish carefully between similar words and throws into relief the common elements. The teaching of word perception is intrinsic.

Intrinsic devices of this sort have many advantages over the separate supplementary drill. They save time since no time is taken from genuine reading activities. They introduce the particular skill desired into the actual reading process. They greatly reduce the risk of loss through failure of transfer. They usually make possible an easy and accurate check on errors. They introduce no obviously unnatural drills, as do many supplementary exercises. They are typically more interesting than the isolated formal practices. That they do bring about more fruitful returns, as theory indicates they should, has been demonstrated in several crucial tests which will be described in detail later.

Supplementary and Intrinsic Devices in Remedial Instruction

In remedial instruction as well as in regular teaching, the intrinsic device is superior to the supplementary. For this reason, the remedial measures recommended in this book are as far as possible of the intrinsic type. There is really only one justification for adopting a supplementary method, namely, inability to contrive an intrinsic procedure that will take care of the special defect to be removed or deficient ability to be improved.

A supplementary device may then be necessary until some one has ingenuity enough to create a better intrinsic method. If we recognize the limitations of the supplementary drill, and conceive it as a last resort rather than the really ideal type of remedial device, we shall make fewer errors and avoid much waste. We may also be led to apply our ingenuity in the right direction in building new practice materials for special cases.

It may be said that so far as the organization of the learning situation is concerned the same principles should be observed in both regular and remedial instruction. Indeed, in remedial teaching we should exercise even greater care to fuse the special training with the normal task since pupils who need remedial treatment are usually those for whom ordinary methods have been ineffective.

Motivating Remedial Instruction

The need for remedial work indicates an emergency situation. Often the pupil is characterized not only by a deficiency but also by loss of zeal, by distaste, by disinclination to exert himself in the task, and by indifference concerning the outcome of training. In such cases more is needed than mere arrangement of new materials and a new learning situation. What is needed is greater incentive, keener application, and interest. How are these requirements to be satisfied?

Developing interest. — As stated in an earlier section, interest in an activity is not an independent force which develops spontaneously and disappears without cause. On the contrary, it is a symptom or result of

very definite causes. Where interest is not manifest, then, the procedure is not merely to hope or wait for it or even to try to talk it up by building a verbal picture of pleasures and practical uses to be enjoyed by those who master the subject, but rather to ascertain and remedy the conditions which tend to produce distaste and to provide those which tend to generate zeal. Some of the conditions of learning which influence interest are susceptible to management and it is especially important to take them into account in remedial instruction.

Make improvement possible. — The first suggestion is derived from the fact that successful efforts are a most potent source of interest. In Dr. Meek's study the rebirth of zeal when the failing child, under a new type of tuition, began to master the lessons was almost amazing. Out of deep despair or chagrin at failure, a new interest sometimes appeared almost immediately with the occurrence of success.

Adjust material to pupil's ability. — In addition to setting up a helpful learning situation and pointing out methods of attack, a means of insuring success consists in selecting a proper level of work. The pupil who encounters difficulty in reading may be carried by the sweep of the school program to reading tasks and materials that are beyond his ability. The diagnosis of all such pupils should reveal the level of difficulty at which the pupil has a reasonable chance for success. The tests later described are designed in many cases to make such a diagnosis possible. It must be recognized, however, that the material used may be too easy as

well as too difficult. Material that is too obvious dulls interest quite as fully as content that is too intricate. The pupil is most fully attracted by a level on which he may be largely successful but which also provides difficulties to be overcome. The difficulties should, however, be within the limits of mastery when the pupil is at his best. He enjoys not so much encountering difficulties or overcoming easy obstacles as successfully overcoming real difficulties. How the test results may be utilized to determine the proper level for remedial work will be discussed in detail later.

Select attractive content and exercises. — In addition to the level of the material the character of material may be selected to incite greater interest. In remedial work especially it is important to provide the encouragement to learning which a taste of attractive materials may provide. Since individual interests differ greatly, the teacher would select materials of maximum interest for each case. This is not always possible but the types of content and practice exercises found to be generally highly attractive may be adopted with some confidence. Many of the types to be described later have proved to be almost invariably high in interest value.

Measure and display improvement. — In remedial instruction it is highly important not only to make the pupil's progress possible, but also to make clear to the learner the improvement he has achieved. Far better than the teacher's assurance that he is getting on is objective evidence of improvement. Better than vague assurance is a definite, intelligible expression of the amount of advancement. For these reasons one should

use in remedial work some device for measuring a pupil's achievement each day and thereby make possible a quantitative statement of progress. The daily achievements should be recorded in graphic or other form so as to indicate the curve of improvement. "Nothing succeeds like success" must be changed to "nothing succeeds like observed success."

Enlist the competitive impulse. — A graph or display of improvement incites eagerness for further progress not only by making obvious the fact that the pupil is really achieving success but also by giving play to the competitive impulse. The pupil, as he becomes confident of mastering further difficulties, develops an interest in surpassing his own previous rate of improvement. Competition with the improvement made by other pupils of similar ability may also be encouraged by comparison of records. The impulse that adds so much zest to typical games of both children and adults may thus be enlisted to enliven the process of learning.

Detect the pupil's particular errors and successes. — The devices for measuring achievement and progress should be sufficiently definite, furthermore, to reveal the particular successes and errors made in daily work. Such records the teacher may utilize as means of further diagnosis, of discovering in what particulars the pupil errs and requires further experience. The pupils themselves may be taught to check their own errors and to seek for their causes. The obscurity which surrounds the efforts of young learners is not infrequently one cause of loss of interest in improving. To have their successes and errors become apparent is often a

means of arousing interest and effort to understand and correct them. Such an attitude is rich with promise for advancement.

Choose time and method of beginning remedial work. — With such requirements as have been mentioned properly satisfied, the teacher's task consists in initiating the remedial work vigorously. Intense effort is to be sought by any legitimate means. It is especially important that the remedial work be begun with a vigorous attack in order that success, if possible, be immediately achieved and appreciated.

To this end, the teacher should seize the right opportunity for a beginning. The pupil should be fresh. To penalize the remedial work, as is too often done, by introducing it at an after-school hour is to rob it of its appeal from the first. The pupil's mental attitude should be favorable; he should be caught in a cheerful and coöperative mood. To substitute the remedial work for a play period or for a subject especially attractive is to encourage the pupil's antagonism. Remedial work should not be administered as a reproach or punishment. The teacher should, on the contrary, take special pains to establish a happy relation with the learner and to arouse in him an optimistic attitude.

Be optimistic and encouraging. — Encouragement and cheerful assistance may be frequently needed. Children in need of remedial treatment are notably susceptible to " off days " and to periods of stagnation in interest and aptitude. At such times they should realize that the most skilled baseball players, golfers, composers, artists, and others are frequently subject

to the very same difficulties and that even to the seasoned expert such periods are often exceedingly depressing. Indeed, it is not at all improbable that disabilities and distaste for many activities among children originate in the throes of such " plateaus " in the curve of learning. It is, therefore, important that the teacher detect such crises and that she deal with the victim at these times with greatest skill and tact.

Distribute practice so as to avoid fatigue and boredom. — Care should be exercised not to permit the remedial lessons to continue to the point of fatigue or boredom. Intensity is more important than length of application. Several short periods of vigorous work are superior to an equal total time devoted to continuous study. Although the optimum length of the remedial lesson varies so greatly with the age, interest, strength, freshness, and stability of the pupil and with the character of the practice that no single guiding rule can be offered, the teacher may, by observing the signs of waning zeal, acquire good judgment in deciding when a lesson has run its fruitful course.

Provide a variety of materials and exercises. — Fatigue and loss of zeal in remedial work may be increased by prolonged use of the same type of material and device and, contrariwise, interest and application may be preserved by variety. Since in remedial instruction the pupils are engaged in mastering skills that have proved troublesome, they are more likely to tire quickly than in most types of work. The need for a variety of content, activities and problems, exercises, and checks is therefore especially great. Proj-

ects which require much accurate reading, such as reading coupled with comprehension checks which take the form of selecting, drawing, or coloring illustrations, the use of puzzle paragraphs to be solved, or individual and group competitive games in which the reading is realistic and abundant are types of activities that may often be enlisted to increase interest with little or no other loss of productivity. Indeed, it would be desirable to have for each specific purpose a sufficient variety of remedial devices to make it possible to provide the pupil with a choice.

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PART II

DIAGNOSIS AND REMEDIAL INSTRUCTION IN GRADES I AND II

CHAPTER III

DIAGNOSIS IN THE PRIMARY GRADES BY MEANS OF A TEAM OF GROUP TESTS

In this chapter will be described a team of three group tests that have been constructed to measure important abilities and to reveal significant weaknesses in reading during the first two grades. Pupils in Grades III and above who are such poor readers that they achieve little success in the tests designed for the upper grades (described in Chapter VIII) should be given the primary tests and remedial treatment similar in kind to those suggested for the beginning pupils.

Three types of tests are included in the team for the primary grades.

Type 1. Word Recognition; time 15 minutes
Type 2. Phrase and Sentence Reading; time 15 minutes
Type 3. Paragraph Comprehension: Reading of Paragraphs of Directions; time 20 minutes.

In order to make clear the abilities measured by the three instruments, the materials from which the tests were constructed will be described.

Construction of the Tests

Vocabulary of the tests. — The greatest difficulty encountered in providing standard instruments for the measurement of reading in the primary grades, especially in Grade I, is the fact that each child has only a limited reading vocabulary and these vocabularies vary greatly from class to class. Several studies [1] have shown the large number of words found in one reading system which do not appear at all in others. First grade pupils are largely limited in word recognition to those words taught in the particular system used. Their reading, in other words, is largely specific; they can read what they have learned to read but are likely to be unable to read other material which is, for pupils at large, equally easy.

The first prerequisite to the construction of suitable tests for general use was the analysis of word lists of different sorts and the construction of a more satisfactory reading vocabulary for the primary grades. Such a word list has been completed and is described elsewhere.[2] Words were individually appraised on each of the following ten criteria:

1. Utility: words which enable children to learn to read important words, phrases, signs, etc., in their environment.

2. Utility: words which enable children to read connected sentences of a simple sort.

[1] A study giving representative facts is reported by E. Selke and G. A. Selke in the *Elementary School Journal*, June, 1922.

[2] "The Construction of a Reading Vocabulary for the Primary Grades," *Teachers College Record*, March, 1926.

3. Utility: words which enable children to read representative school readers.

4. Utility: words which enable children to read the best and most interesting stories and other "primary literature."

5. Utility: words which help children to develop the vocabulary for reading more advanced representative materials.

6. Interest: words connected with facts, activities, situations of interest at the primary levels.

7. Interest: words interesting in reading because they are commonly used in speech by children.

8. Interest: words used in the most interesting primary reading material.

9. Difficulty: on assumption that words commonly used in speech will be easier to learn to read than those less commonly used. The easier the word, other things equal, the higher its position in the list.

10. Difficulty: as determined by length and configuration of words.

The ratings of the words on these items were combined to give a composite score. The words were then carefully studied by three different persons who (already familiar with the factors known to contribute to difficulty in learning) sought for possible instances of poor allocations from the viewpoint of difficulty. Very few such instances were found, however; the other criteria had apparently taken care of this one.

In the final arrangement[1] the words are ranked con-

[1] *Reading Vocabulary for the Primary Grades*, Bureau of Publications, Teachers College, Columbia University.

secutively from 1 to 1,500. The higher the rank — 1 being the highest rank — the greater the word's composite claim to be taught first. To appear in the first few hundred, a word must have a high standing in several respects; it must, in other words, be a word that satisfies the significant demands for primary reading.

All the words in the tests here offered are taken from this primary list; indeed, practically all from the easier two-thirds of the list. Since these words are those used in speech by young children, are found in primary readers and select primary literature, are related to interesting and important features of children's lives, and satisfy best the other demands of early usage, they are highly suitable for standard tests.

Even if the teacher is using materials in which the vocabulary departs considerably from that here offered, she will be interested to know how great a mastery of the words basal to children's speech, representative school readers, choice primary literature, etc., her pupils have achieved. Tests of ability to recognize and pronounce words singly, and especially of ability to read with understanding various types of passages based entirely on words from different levels of the list, would indicate the range of the basal vocabulary and the degree of independent reading ability a pupil has achieved, and, consequently, the security with which he may be trusted, without danger of practicing errors, to read miscellaneous children's material. The words were originally selected in such a manner as to make such tests possible.

Description of the Three Types of Tests

The three tests are designed for use as a team. Each measures a particular phase of reading ability.

Type 1. Word Recognition. — This test is designed to sample the pupils' ability to read words representative of the primary vocabulary. A sample page from the test is reproduced on page 45. The directions for giving this test are as follows:

To the examiner. 1. Place drawings of pictures and words (appearing on this first page) on blackboard before (or while) papers are passed out. 2. See that each child has a pencil. 3. Distribute papers. 4. Have children fill in blanks at top of this page (with your help). 5. This front page should be up when signal to begin is given. 6. These samples are to be very fully shown and explained to pupils. Instructions to children: "I want you to look at the first picture. Next to it there are some words. One of the words goes with the picture. You are to draw a ring around that one word that tells about the picture. Put your finger on the word that belongs with the picture. Now watch what I am going to do. [Examiner, chalk in hand, points to words on blackboard which are in the first block in any order.] Shall I draw a ring around this one? This one? [until correct one is reached and ring is drawn around this correct word.] That is right. The four words are 'did,' 'egg,' 'dog,' and 'two.' We have drawn a ring about the word 'dog' because the picture is of a dog. This word tells us the most about the picture. Now you look at your own paper, look at the picture, find the right word, and with your pencil draw a ring around it. Do it. [Correct errors.] [Pause.] [Same procedure for other three pictures and words on front practice page.] Do not open your books until I tell you to. Now I am going to show what we are to do next. On the inside of the book are some more pictures and words. [Examiner holds up copy of the test showing the inner pages.] You are to do the first one, then the next one below it, etc. [Examiner points down first column, then second, etc., and also demonstrates order on all three pages.] As soon as you have drawn a ring around the one word for one picture, go right ahead and do the next one.

Now remember, first you are to look at the picture, then at the words next to the picture, then find the one word that goes best with the picture and make a ring around that one word. Make a ring around one word only for each picture. Do you understand? All right. Open your books and BEGIN. Go ahead." 7. Inspect the work of each child; see that each works from top to bottom of columns and that each follows the pages in order. Urge children individually to try the examples in order but *do not tell them the answers.* Discourage dawdling over difficult problems; tell them to try the next. Watch for children who make rings indiscriminately and tell them to make only one ring for each picture. 8. The signal STOP is given at the end of 15 minutes. Collect papers immediately. 9. The score is the number of exercises marked correctly minus one-third the number incorrect. If more than one word in an exercise is marked, that exercise is scored as incorrect. For further details see the Manual of Directions.

In case it is not possible or convenient to draw the rough sketch, suggested in Step I of the directions, a copy of page 1 of the test may be used instead to illustrate the procedure. If the test blank alone is used, great care should be exercised to see that all pupils have an opportunity to observe the procedure as it is demonstrated. Repeat before smaller groups if necessary.

It cannot be too strongly urged that care should be exercised to make sure that every child understands what he is to do, to survey the work of individual pupils as soon and as often as possible after the test has begun, and to see that every child does not dawdle but continues to work vigorously until he has done all he can do. Pupils in the primary grades require much fuller explanation and demonstration, and much more supervision during tests, than do older pupils. Pupils making gross errors or losing considerable time should be retested under more careful supervision.

Each test consists of 48 exercises of the same type. The first exercises are composed of the easy and most

fix	lie
lip	tie

frog	flag
floor	clap

more	stick
story	store

farmer	falling
father	warmer

rats	rain
ran	again

clock	chalk
block	clean

grow	blow
bow	slow

liking	walking
wanting	talked

hear	said
hair	pair

find	stand
sand	stair

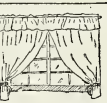
goat	boat
gold	road

ride	hide
hill	made

crow	drop
cow	across

hour	soup
south	soap

pies	rock
pick	pink



winds	window
finding	throw

Page 2 of the Gates Primary Reading Test, Type 1, Word Recognition (greatly reduced in size).

commonly used words — those of relatively high rank in the primary list — grouped with three other words similar in some detail or in general shape. Gradually the words become less easy and common — of higher rank in the primary list — and are presented with words more similar in detail and general configuration. Thus at the beginning are such groups as *can*, put, run, red and such groups as: *comb*, camp, come, lamb; cherry, geese, *cheese*, change. The identical elements are carefully determined and arranged so as to increase gradually from the beginning to the end of the test. This arrangement is based on the assumption that as the child's vocabulary and reading experience widens, he will encounter more frequent " confusing words " and, furthermore, that as he nears the point of venturing to read various materials by himself he should be able to identify words more precisely, and to avoid more completely misrecognitions due to similarities of elements and general configurations of words.

This test, then, measures the degree to which a pupil can identify with reasonable accuracy representative primary words. The fewer he can recognize without error, the less ready he is to do independent reading on the primary level.

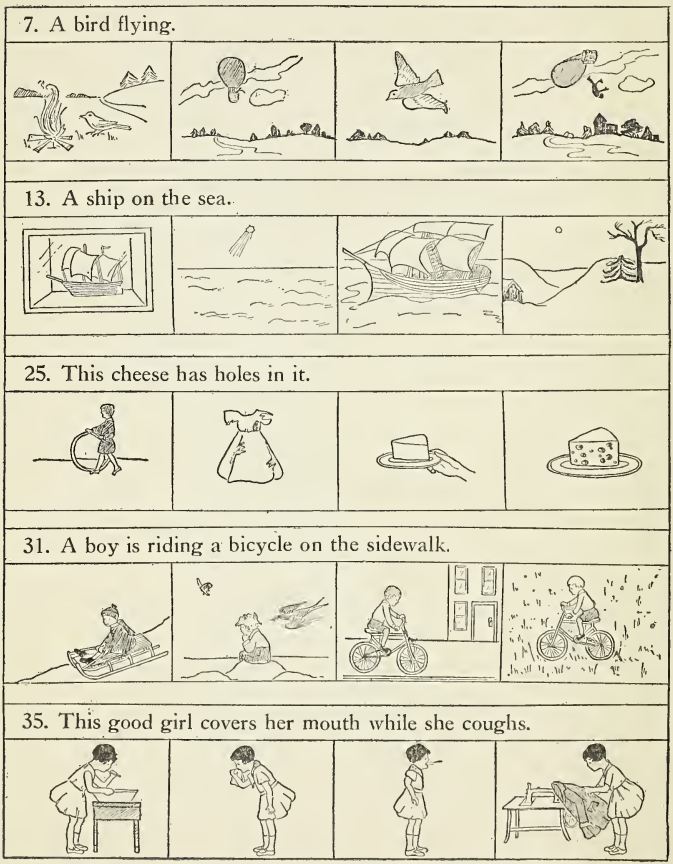
Type 2. Phrase and Sentence Reading. — This test measures ability to read verbal units of increasing complexity and difficulty. The nature of the test units is shown on page 48. The directions for giving this test are as follows:

To the Examiner. 1. Place drawings of words and pictures (appearing on this first page) on blackboard before (or while) papers

are passed out. 2. See that each child has a pencil. 3. Distribute papers. 4. Have children fill in blanks at top of this page (with your help). 5. This front page should be up when signal to begin is given. 6. These samples are to be very fully shown and explained to pupils. Instructions to children: "I want you to look at the words or story above the first row of pictures. Read what it says. Now find the picture below that tells about the words or story and put your finger on it. Now watch me. I am going to draw a ring around the picture which goes best with the story. [Examiner, chalk in hand, points in any order to pictures in first row.] Shall I draw a ring around this one? This one? [Until correct one is reached and ring is drawn around this correct one.] That is right. The words say, 'A bed,' so I have drawn a ring around the picture of a bed. The picture of a bed tells us the most about the words or story above. Now you look at your own paper, read the words or story, find the right picture, and with your pencil draw a ring around it. Do it. [Correct errors.] [Pause.] [Same procedure for No. 2 on this front practice page.] Do not open your books until I tell you to. Now I am going to show what we are to do next. On the inside of the book are some more stories and pictures. [Examiner holds up copy of the test showing the inner pages.] You are to do the first one, then the next one below it. . . . [Examiner points down first column, then second, etc., and also demonstrates order on all seven pages.] As soon as you have drawn a ring around the one picture for one story, go right ahead and do the next one. Now remember, first you are to read the story, then you are to look at the pictures and find the one picture that goes best with the story and draw a ring around this one picture. Make a ring around one picture only for each story. Do you understand? All right. Open your books and BEGIN. Go ahead." 7. Inspect the work of each child; see that each works from top to bottom of columns and that each follows the pages in order. Urge children individually to try the examples in order but *do not tell them the answers*. Discourage dawdling over difficult problems; tell them to try the next. Watch for children who make rings indiscriminately and tell them to make only one ring for each story. 8. The signal STOP is given at the end of 15 minutes. Collect papers immediately. 10. The score is the number of exercises marked correctly minus one-third the number incorrect. If more than one picture is marked for any story,

that exercise is scored incorrect. For further details see the Manual of Directions.

In case it is not possible or convenient to draw the rough sketch,



Reproductions of several exercises from the Gates Primary Reading Test, Type 2, Phrase and Sentence Reading (greatly reduced in size).

suggested in Step I of the directions, a copy of page 1 of the test may be used instead to illustrate the procedure. If the test blank alone is used, great care should be exercised to see that all pupils have an opportunity to observe the procedure as it is demonstrated. Repeat before smaller groups if necessary.

This test consists of 36 units. It is so designed that the pupil cannot succeed unless he grasps the unit as a whole. Note that the pictures are so made as to prevent guessing the right answer by reading correctly any single letter, word, or phrase. In the first exercise, for example, the names for all the objects pictured — ball, boy, boat, book — begin with *b* so that the pupil fails unless he reads "ball" fully. In the last exercise, "This good girl covers her mouth when she coughs," merely to read "girl" would be insufficient since there is a girl in every picture; merely to read "covers her mouth," would likewise be insufficient since in two pictures the hand is at the mouth. Similarly, two pictures illustrate "cough" and in one "coat" is put in to be similar to "covers" and "cough."

This test measures ability to get the thought from conventional statements, mainly phrases and sentences (only the first five exercises are single words), composed of representative words from the most common primary reading vocabulary. The test is so designed that a careless, incomplete, or erroneous reading will result in error; only complete understanding of the whole statement will enable the pupil to avoid mistakes. The test gives a good idea of a pupil's ability to read phrases and sentences typical in vocabulary and

form to those found in representative children's reading. Frequent mistakes or lack of power in this test suggests similar defects and limitations in independent reading.

Type 3. Reading of Paragraphs of Directions. — The third test requires the reading and comprehension of complete paragraphs except for the first few introductory exercises which are single sentences. Parts of the test are reproduced on page 52. The directions for giving this test are as follows:

To the Examiner. 1. Place drawing of pictures (appearing on this first page) on blackboard before (or while) papers are passed out. 2. See that each child has a pencil. 3. Distribute papers. 4. Have children fill in blanks at top of this page (with your help). 5. This front page should be up when signal to begin is given. 6. These samples are to be very fully shown and explained to pupils. Instructions to children: "We are going to see how well you can read. Do you see the pictures, and the stories below the pictures on the front page of your little book? (*) Everyone look at the first story and picture. Read the story to yourself. [Examiner points with finger to story on his own copy.] [Pause.] What does it say to do? [Have child read the story aloud to the class.] That is right. Now read the story to yourself while I read it aloud. [Examiner reads *slowly* and clearly while children watch their own papers.] Now watch what I am going to do. [Examiner makes mark called for on board with chalk.] Read to yourself again what it says under the first picture. Then take your pencil and make the mark on your paper as I did on the board. Do it. [Examiner or teacher should go among children and help them correct errors made on this practice page.] Everyone look at the second story and picture. [Refer to (*) above, using same procedure for remainder of samples on practice page. Be sure to read in correct order: 1, 2, 3, etc.] **Do not open your books until I tell you to.** Now I am going to show you what we are to do next. On the inside of the book are some more pictures and stories. [Examiner holds up a copy of the test showing the inner pages.] You are to do No. 1 [Examiner points to it on his

own copy], then go on and do No. 2, then do the next one, and the next one, etc. [Examiner points down first column, then second, etc., and also demonstrates order on all three pages.] As soon as you have finished one story, you must go right ahead and do the next one right below it. Now remember, first, you are to read the story below the picture; then you are to take your pencil and do *exactly* what the story tells you to do. Do you understand? All right. Open your books and BEGIN. Go ahead." 7. Inspect the work of each child; see that each works from top to bottom of columns and that each follows the pages in order. Urge the children individually to try the examples in order but *do not tell them the answers.* Discourage dawdling over difficult problems; tell them to try the next. 8. The signal STOP is given at the end of 20 minutes. Collect papers immediately. 9. The score is the number of directions followed correctly. The mark made *must be* that specified in "the story" to be correct. For further details see the Manual of Directions.

In case it is not possible or convenient to draw the rough sketch, suggested in Step I of the directions, a copy of page 1 of the test may be used instead to illustrate the procedure. If the test blank is used, great care should be exercised to see that all pupils have an opportunity to observe the procedure as it is demonstrated. Repeat before smaller groups if necessary.

This test measures ability to read thought units with full and exact understanding. To get only a word or a phrase here and there, or to get a whole sentence or two, is insufficient. The pupil must understand the whole passage as a unit. To comprehend the whole passage in a loose, unorganized, less than fully integrated and less than completely clear form will also be insufficient. The pupil must grasp clearly and exactly the total thought to execute the directions successfully. Test 3, then, measures, within the limits of a carefully selected vocabulary, the pupil's ability to do independent reading of a rigorous sort. It measures what will be called " paragraph comprehension."

This test measures the same general type of reading ability as the Gates Reading to Understand Precise

11. Put an X on the farmer who is walking by the side of his horse.

15. Draw a line from the robin to its nest. You will find the nest in the tree on the left side of the picture.

12. The baby likes milk to drink. Draw a line from the baby to the milk.

16. The rabbit and the hen live on the land. The fish lives in the water. Draw a line under the one that lives in the water.

13. One of these dolls has lost her leg. Look for the leg, and make an X on it.

17. A train goes faster than a horse, and a horse goes faster than a man. Make an X on the train. It goes the fastest.

14. The school is on High Street between First Street and Green Street. Put an X where the school is.

18. "Always wash your hands before eating," said Mother. Draw a line under the boy who is doing what Mother told him to do.

Page 2 of the Gates Primary Reading Test Type 3, Reading of Paragraphs (greatly reduced in size).

Directions Test which is Type C of the team of tests designed for Grades III to VIII. The primary test measures various levels of complexity, the highest of which is just below the level of Type C. If a child reads correctly the hardest passages in the primary test, the advanced instruments should be used to measure his abilities fully and, conversely, if a pupil fails on the harder test, he should be given the primary type.

The Use of Age and Grade Scores in Diagnosis

The three tests are designed for use as a team. Each measures distinctive aspects of reading ability and the follow-up instruction should take different forms according to the pattern of achievement revealed.

In order to make apparent the relative achievements in the different tests some standard of comparison is needed. Experience has shown that the opinions of experienced teachers differ greatly concerning what pupils should do at the end of Grade I, or at any other time, in such tests as these. Some criterion for judging, some intelligible standard of comparison, is needed.

The ideal standard of comparison would be a table of norms indicating for different stages of advancement the optimum achievement for a pupil of given intellectual capacity. Until very elaborate investigations requiring years of time have been performed, such a series of norms cannot be offered. Meanwhile two standards of comparison have been prepared: (1) a scale showing for the different ages and grades the average achievements of classes of average intelligence in a number of typical New York City schools and

(2) a scale showing the highest achievements of the classes of average mentality among those tested. The first "norms" are scales of average attainments of average classes; the second are scales of maximum achievements of the average classes tested.

The scale of averages is, of course, more reliable since it is based on many more pupils. It is the type of scale or "norm" most commonly accompanying published tests. It is very serviceable provided the person using it understands and remembers exactly what it is. It is a picture not of an ideal achievement but of average or mediocre performance. It is not an educational objective which teachers should seek merely to equal. It is a score excelled by nearly half of the pupils in average classes; to equal such records should for half of the pupils in other schools be the occasion not for gratification but for dismay. Nevertheless these scores are useful as a basis of comparison. They are offered for no other purpose.

The scales of best or maximum achievements approximate more nearly a series of goals of achievement. They represent the highest attainments of classes of average pupils — mainly of I.Q. between 90 and 110 — in New York City public schools. They may be expected to be lower than those which could be obtained by optimum instruction and certainly lower than should be expected from classes with higher average intelligence. They represent, however, reasonable and attainable goals for average pupils.

The relative difficulties of the tests for the several grades, and a comparison of average with best scores

from average classes are shown in the accompanying table.

At the End of Grade	Type 1		Type 2		Type 3	
	Average Score	Best Score	Average Score	Best Score	Average Score	Best Score
IA	8	16	5.0	11	4	10
IB	18	33	12.0	24	10	15
IIA	32	43	22.0	33	16	23
IIB	39	45	26.0	34	20	24
IIIA	43	47	30.0	34	22	25
Highest possible score	48	48	35	35	26	26

In the lower grades, the "best" classes surpass the average classes by very wide margins. It will be noted that the best classes can, on the average, nearly complete all of the tests by the end of IIA. At this point the best classes are about equal to the average classes a year later. In other words, some classes of average pupils do as much in two years as the typical class of similar mental capacity does in three years.

It may be noted in the table above that the relations among the scores in the three tests are about the same in the average records as they were in the best records. In the typical and in the best cases, in other words, ability to recognize individual words, *i.e.* reading vocabulary, ability to grasp phrases and sentences, and ability to comprehend whole paragraphs tend to develop together at a rate indicated by the three scores. Studies that have been made of individual cases indicate, moreover, that these rates, as shown in detail in Tables II,

III, and IV, in the Appendix, are approximately the most desirable. Pupils, whose development in the three abilities differs widely from these, are nearly always subject to certain deficiencies. Our diagnosis, then, will take into account not only deviations from the average in all three tests but deviations of ability in one test from achievement shown in the others. Our diagnosis, in other words, will be based upon the pattern or profile of abilities revealed by the three tests.

Methods of Portraying the Patterns of Ability

Before illustrating and discussing the several patterns of ability which the three tests may reveal, we must consider different ways of portraying these profiles.

When the tests have been scored according to directions given in the Appendix, the resulting figure is a "raw score." For this figure we may substitute either the reading age score or the reading grade score by the use of the tables of averages of age or grade achievement. Choice is to be based upon convenience and the nature of other available data.

If the teacher or examiner does not have at hand good measures of intelligence, in particular a good measure of mental age determined by use of the Binet or other reliable intelligence test, or if she is uncertain concerning the pupil's chronological age, she should use the reading grade scores. She should enter, first, the child's grade position, calling it 1.0 at the beginning of Grade I; 1.1 after one-tenth of the grade is completed; 1.5 when half completed, and so on. According to our procedure, a pupil measured at approximately the end

of Grade I should be entered as at Grade 1.9 and as 2.0 when he begins Grade II. Adjacent to the grade status score, enter the "reading grades" earned on each test, thus:

Name	Actual Grade	Test 1	Test 2	Test 3
		Reading Grade	Reading Grade	Reading Grade
John Doe	1.5	1.5	1.5	1.5

This record indicates that John Doe obtained exactly the average score in all three tests for his grade position.

In this record there is one great deficiency; John Doe's mental ability is not taken into account. If John is a very bright boy, he should have better than average reading scores for his grade (or age); if he is dull, average scores should not be expected. Although we do not yet know exactly how much higher or lower the reading score should be, the best approximation is that the reading score should be about as much above or below the average as the pupil's intelligence is above or below the average for his grade or age. It is expected, in other words, that the "reading grade" should about equal the "mental grade" and that the "reading age" should about equal the "mental age." When the results of mental tests are available, then, we should enter along with the actual grade or age, the mental grade or age.

The mental age is a familiar concept and is usually

derived from tables accompanying the test. For the mental grade, scores are not always available. In the Appendix is given a table (Table I) which makes it possible to transmute the mental age into a mental grade that may be used for comparison with our reading grades.

The important data may now be assembled either in terms of grade or age scores, *e.g.*[1]

Name	Actual Grade	Mental Grade	Test 1	Test 2	Test 3
			Reading Grade	Reading Grade	Reading Grade
J. B. C.	1.5	1.6	1.5	1.5	1.5
A. R. P.	1.6	1.8	1.7	1.5	1.9

Name	Actual Age	Mental Age	Test 1	Test 2	Test 3
			Reading Age	Reading Age	Reading Age
J. B. C.	7.0	7.1	7.0	7.0	7.0
A. R. P.	7.1	7.3	7.2	7.0	7.4

The mental age or grade indicates the proficiency in the tests that an individual should theoretically be able to achieve under average circumstances — average teaching, time, health, application, etc. But, just as some pupils of average mental ability under favorable conditions do better than others of the same mentality, so may those of higher or lower mentality earn reading

[1] In years and tenths.

scores better than their mental age or grade. One should not assume, in other words, that no child should ever earn a reading age (or grade) higher than his mental age (or grade). One should assume, however, that a pupil should secure a reading score that is at least as high as his mental score — except, perhaps, in the case of bright pupils during the first part of the first grade before they have had time to exercise their mentality sufficiently. For appraising a pupil's general reading achievement, then, the mental level should be taken into account. But for diagnosing a pupil's particular reading deficiencies the profile is of main significance, as will be explained in the next section.

Diagnostic types revealed by the tests. — When the results of the three tests are arranged, together with the actual grade or age and the mental grade or age, the several types of deficiency may be determined by inspection. Four types of deficiencies are indicated, as follows:

1. Relatively low score in Test 3, Reading of Paragraphs, combined with average or higher scores in Test 1, Word Recognition, and Test 2, Phrase and Sentence Reading.
2. Relatively low scores in Test 3, Paragraphs, and Test 2, Phrase and Sentence Reading combined with average or higher scores in Test 1, Word Recognition.
3. Low scores in all three tests.
4. Low scores in Test 1, Word Recognition, combined with average or higher scores in Test 2 or Test 3 or both.

TYPE I. RELATIVELY LOW SCORE IN TEST 3, READING OF PARAGRAPHS COMBINED WITH AVERAGE OR HIGHER SCORES IN TEST 2, PHRASE AND SENTENCE READING IN TEST 1, WORD RECOGNITION

All of these pupils are up to or above their actual grade positions (though in some cases below their mental grades) in Test 1, Word Recognition. This indicates that they have as large a reading vocabulary and as effective a type of word recognition as the average pupil of the same grade status. All of the pupils

PUPIL	ACTUAL GRADE	MENTAL GRADE	TEST 1	TEST 2	TEST 3
			READING GRADE	READING GRADE	READING GRADE
A	1.5	1.6	1.8	1.5	0 (failure)
B	1.8	2.0	2.2	2.0	1.2
C	2.4	2.7	2.6	2.5	1.4
D	2.8	3.0	2.7	2.9	1.6
E	3.4	3.9	3.5	3.3	2.0

are approximately equal to their grade positions in Test 2, Reading of Phrases and Sentences, but, on the whole, are not quite as good as in Test 1. This indicates that they have learned not only to read words but also to get the thought from simple language units. All of the pupils are low in Test 3, Paragraph Comprehension, however; some of them more than a full grade behind the average pupil whom they equaled or excelled in the other two tests.

This deficiency in Test 3, coupled with average or higher abilities in Tests 1 and 2, indicates in general a deficiency in precise comprehension of the thought contained in bigger and more complex thought units. These pupils have not advanced sufficiently far through

the several " hierarchies " or levels of analysis and comprehension in reading. They are word or phrase, or single sentence readers or, at best, they are able to read but very simple paragraphs. Their comprehension is insufficiently broad, precise, and sustained to grasp with clarity and fullness the paragraphs which an average pupil can interpret at this stage. Although they can recognize the words and grasp the phrases as well as the average pupil or better, they have failed to acquire the several techniques of accurate paragraph comprehension.

Such pupils as these need primarily not more instruction and practice in reading and word study in general but, rather, special types of experience to develop the specific weaknesses revealed. They need to be encouraged and assisted to acquire the subtle skills essential to reading and understanding units of greater size and complexity.

In the next chapter, the proper remedial work for such pupils will be described.

TYPE II. RELATIVELY LOW SCORE IN TEST 3 (PARAGRAPH READING) AND TEST 2 (PHRASE AND SENTENCE READING) COMBINED WITH AVERAGE OR HIGHER ABILITY IN TEST 1 (WORD RECOGNITION)

The second common type of case shows low scores in both Tests 2 and 3 and average or better scores in Test 1. Representative scores follow:

PUPIL	ACTUAL GRADE	MENTAL GRADE	TEST 1	TEST 2	TEST 3
			READING GRADE	READING GRADE	READING GRADE
F	1.5	1.8	1.7	1.2	0 (failure)
G	1.9	2.1	2.0	1.4	1.3
H	2.4	2.5	2.7	1.6	1.8
I	3.4	3.6	3.3	1.9	2.1

In these cases, word recognition is average or better but reading of phrases, sentences, and paragraphs is poor. This is a picture of more serious backwardness than that of Type 1. The pupils have, on the whole, failed to develop the more complex reading habits. They remain in the narrow stage of word reading. They have a fair reading vocabulary of single words but little skill in grasping larger thought units. Since they can recognize individual words, the difficulty with the larger units, in most cases, is due to inappropriate or undeveloped methods of reaction to the larger complexes. The remedy, then, lies in instruction designed to break up the inappropriate habits and substitute adequate ones. Detailed suggestions for remedial treatment will be given in Chapter V.

Type III. Deficiencies in All Three Tests

The following data illustrate cases showing weakness in all three phases of reading ability.

Pupil	Actual Grade	Mental Grade	Test 1	Test 2	Test 3
			Reading Grade	Reading Grade	Reading Grade
J	2.4	2.5	2.3	2.4	2.4
K	2.4	2.9	1.7	1.4	1.3
L	2.9	2.7	2.0	1.7	1.4
M	2.9	2.8	1.5	1.7	1.5
N	2.5	3.2	2.0	2.2	2.4

Case J, strictly speaking, is not below the norms but quite uniformly of average ability. It must be remem-

bered, however, that the "norms," which are merely average achievements, represent only mediocre ability. Classes of average mentality have achieved much greater reading ability in all three types (see the table of "best" attainments above). What one teacher has accomplished, others may. It may therefore be insisted that any teacher whose pupils are average or better, or any pupil whose mental age is equal to or above the average for his grade should be expected not merely to equal but to exceed the average scores.

Case K is below the average in all three tests; by 0.7 of a grade in word recognition, by a full grade in reading phrases and sentences, and by a trifle more than a grade in reading paragraphs. In all phases of reading this pupil needs help despite the fact that his mental ability is relatively high. Cases L and M are likewise below the average. Case L is very similar to K. M is as badly retarded in word recognition as in reading the larger units. Case N is not so far below his grade status but is considerably below the grade equivalent of his intelligence score.

Pupils showing deficiencies in all three tests obviously need instruction in all phases of primary reading. Since they can scarcely be expected to read phrases, sentences, and paragraphs without being able to recognize the words of which the larger units are composed, they should give attention first to the development of a better reading vocabulary. Methods for accomplishing this purpose will be discussed in Chapters VI and VII.

TYPE IV. RELATIVELY LOW SCORES IN TEST 1, WORD RECOGNITION, AND AVERAGE OR HIGHER SCORES IN TEST 2 OR TEST 3 OR BOTH

Pupils very poor in Test 1 but good in either Test 2 or 3 or both are not so frequently found as the other three types and it is even more unusual to find pupils poor in Test 1 and 3 but good in 2, or poor in 1 and 2 but good in 3. This is due to the fact that children usually cannot read phrases, sentences, or paragraphs unless they can recognize individual words. But such combinations of abilities will sometimes appear.

The chief legitimate cause of markedly greater achievements in Tests 2 or 3 or both than in Test 1 is special skill in utilizing the context. Certain pupils tend to do better in the larger thought unit tests than in examinations on words, for the reason that they have acquired a special knack of appraising the thought from the few words they may happen to know in the sentence. To get some of the context is of great help to these children. In oral reading, they are often observed to omit, to transpose, or mispronounce words or phrases or to substitute others which mean about the same. Some of these pupils are experts in getting the thought from relatively few clues. They contrast sharply with the pupils at the other extreme who must understand every word before they can comprehend the phrase or sentence, and who will give up when an unknown word is encountered. Although below the average in the number of isolated words which they can recognize or work out by phonetic or other analytic methods, these pupils may excel their companions in getting the meaning from a phrase or sentence or paragraph.

Such skill is not undesirable, on the contrary it is highly useful except in so far as it tends to inhibit the efforts to master a sight vocabulary and to acquire skill in independent recognition of unfamiliar word forms. For such pupils the proper remedial work consists, first, in requiring more literal reading of sentences and paragraphs, though care should be exercised not to direct attention from the thought and not to let the pupil become too " word conscious " and, second, in developing skill in ready recognition of word forms by means of exercises to be suggested later. These pupils usually need also to acquire more effective means of enlarging their reading vocabulary. Methods for these purposes will be described in the next four chapters.

The main types of patterns of achievement which appear in the results of the three tests are those described. Other types should be viewed critically. Any factor which interferes with proper work by the pupil during the test, such as failure to understand the directions for one or two tests, loss of time due to broken pencils or improper application, etc., as well as errors in scoring, will, of course, produce a distorted picture of the pupils' abilities. Whenever any doubt arises concerning the reliability of a pupil's work, the test should be repeated. For this purpose an equivalent form of each test is available. The same norms may be used in interpreting the results of a second testing since the practice effects are nearly negligible. In cases where the pupil misunderstood the directions or, for other reasons, did not apply himself to the test properly, the same form may be used in a reëxamination.

Composite Scores for General Reading Ability

In school surveys and in appraising the fitness of individuals for promotion, a single score is often desired to represent reading ability in general. While the writer believes that for all such purposes the diagnostic, specific appraisals such as have been outlined above are superior to the composite score, the latter can be computed from these tests with a high degree of reliability precisely because the instruments measure different phases of reading ability. A composite of different important reading skills is better than a combination of scores from several tests of very similar abilities. To obtain the composite, convert the raw scores for each test into either reading ages or grades and compute the average of these derived scores.

If some of the individual tests to be described later for use in more detailed diagnostic work are also given to all the pupils, the age or grade averages thus obtained may be added to the composite.

REFERENCES

The tests, together with a Manual of Directions giving methods of administering and scoring, scoring keys, tables of age and grade norms, etc., are distributed by the Teachers College Bureau of Publications. In ordering it is important to specify the *Primary Tests* in order to avoid confusion with the *Gates Silent Reading Tests, Types A, B, C and D,* for use in Grades III to VIII. The latter tests serve for the upper grades the same general purposes which the present tests serve for the primary groups.

The more technical details concerning reliability, standardization, norms, intercorrelations, etc., are given in an article in the *Teachers College Record,* October, 1926.

CHAPTER IV

REMEDIAL INSTRUCTION FOR DEFICIENCIES IN PARAGRAPH COMPREHENSION

In this chapter will be considered primarily the remedial measures to be adopted for pupils of Remedial Type I whose scores in Test 3, Reading of Paragraphs, were low but whose scores in Test 1, Word Recognition, and in Test 2, Phrase and Sentence Reading, were average or better.

Causes of Difficulty in Paragraph Comprehension

The causes of deficiencies in paragraph comprehension are many. They may be grouped roughly as follows:

1. Certain general deficiencies which produce difficulty in all types of reading, such as: *A. Inferior intelligence.* — In so far as the reading difficulty is due to general mental inferiority, it may be expected to show itself in all phases of reading but somewhat more clearly in comprehending the more complex organizations of thought in paragraphs, other things being equal. For reading deficiency thus caused, special management in all phases may be needed. Attention will be given to this special problem, the teaching of reading to the duller pupils, in Chapter XII.

B. Lack of training or practice. — Since the tests are standardized on all levels of training, from the beginning of the first grade, the pupil who is simply untrained should secure substantially the same age or grade scores in all tests. If the pupil does especially poorly in the paragraph comprehension test, he may be suffering primarily from lack of training in this special phase of reading and should be taught along the lines indicated in this chapter.

C. Inadequate general experience. — Meagerness of general information, lack of general experience in life and in learning situations may be causally related to slow development in reading. If the pupil's intelligence is not subnormal and his ignorance the result of this deficiency, it is not advisable merely to wait for more experience or growth. For such children, reading provides an effective means of extending experience, broadening interest, and increasing information. Many of the teaching exercises described in this and the following chapters have been found to work with gratifying results with a group of children of this type, namely, a group of young congenital deaf-mutes from homes of poverty. For pupils seriously deficient in experience, information, familiarity with spoken English, and the like, the suggestions given in Chapter XII should be considered as well as those given in this chapter.

D. Lack of interest, application, etc. — Lack of interest and the like are not to be treated as primary data or final explanations. They are merely symptoms of other difficulties and, as pointed out in Chapter

II, they are often the results, but rarely if ever the real causes, of difficulty. If interest and application do not increase with improvement in the function, search should be made for defects of the physical organism such as defective vision, diseased tonsils, etc., or possibly for inappropriate character training. Some attention will be given to these matters in Chapter XI.

2. **Factors which influence reading vocabulary.** — A pupil can rarely read paragraphs well unless he has a large reading vocabulary and can recognize words promptly. All the causes which contribute to these deficiencies indirectly affect paragraph comprehension. For meager reading vocabulary and inappropriate methods of word recognition, there are many different causes. These causes and the remedial treatment for them will be taken up in Chapters VI and VII.

3. **Factors which influence comprehension of phrases and sentences.** — A third group of causes of difficulty in paragraph reading are those which produce, primarily, difficulty in comprehending readily phrase and sentence units. Unless the pupil can grasp these small units properly he can hardly be expected to comprehend paragraphs adequately. The main causes of difficulty in phrase and sentence comprehension — aside from those producing a limited vocabulary — and the specific remedial measures recommended are treated in Chapter V.

Aside from poor intelligence, lack of general training in reading, lack of worldly experience, poor application, and the many specific factors (to be explained in the next two chapters) which result in meager reading

vocabulary, poor recognition of words, and inadequate comprehension of phrases and sentences, the main cause of inadequate skill in paragraph comprehension is inappropriate or insufficient training specifically in interpretation of whole paragraphs. In order to learn adequately to comprehend whole paragraphs, certain special skills must be developed. These skills are over and above those needed to comprehend words, phrases, or even sentences. Thorndike, who was one of the first to call attention to the unique character of paragraph comprehension, wrote as follows:

> Understanding a paragraph is like solving a problem in arithmetic. It consists in selecting the right elements of the situation and putting them together in the right relations, and also with the right amount of weight or influence for each. The mind is assailed by every word in the paragraph. It must select, repress, soften, emphasize, correlate and organize, all under the influence of the right mental set or purpose or demand.

Effective interpretation of paragraph units, therefore, requires special and subtle techniques. To develop these skills, the pupil needs proper material to read, a certain appropriate "mental set" while reading, and abundant practice, adequately supervised and checked, in just this type of reading reaction.

Conduct of Remedial Work

In conducting remedial work to increase the ability to comprehend total units of thought contained in a paragraph, two requirements should be kept in mind. First, the material used should be suitable in difficulty to the pupil and, as his ability develops in the course of

remedial work, the material should be increased in complexity in order to provide opportunity for further growth. Second, comprehension should be constantly required, checked, and made apparent to the pupil to help him detect defects and to encourage him with the evidence of successful endeavor. Both of these points merit further consideration.

Reference to the pupil's achievements on Test 3 will show about how difficult a passage he can comprehend and how difficult the paragraphs are on which he begins to make errors. The proper difficulty for remedial work should be one slightly greater than the passages on which he is rather uniformly successful. An element of difficulty should be present in order to stimulate and provide for higher achievement, but the level should not be too high.

It is important that the pupil constantly test his comprehension of the paragraph as a whole. It is, consequently, necessary that paragraphs be selected which are really thought units. Many paragraphs used in children's reading are mere collections of sentences, mere strings of separate ideas and not unitary thoughts. It is furthermore necessary that the comprehension exercises be such as cannot be solved by reading a single sentence in a paragraph but only by understanding the passage as a whole. The pupil must discover the futility of mere search for the key word, phrase, or sentence, and the fruitfulness of appraising the passage as an entity. In this way *he* will acquire the proper mental " set " which is a means of furthering the development of the proper techniques of appraising the passage.

Suggestions for remedial work may be grouped in three classes: (1) Suggestions concerning types of reading content; (2) suggestions concerning types of devices for stimulating or demanding and measuring comprehension; (3) suggestions concerning the varieties of paragraph-comprehension to encourage.

Types of Materials

As a matter of fact, there is scarcely a limit to the types of content that may be utilized in suitable paragraph form. Any content adaptable to the ability or interest of the pupil may be organized in well-knit passages or episodes. For remedial work it is more important than usual to secure content that makes a real appeal to interest. Some of the materials adapted or made up for successful use are as follows:

1. *Stories, poems, etc., in readers of recognized merit.* These materials are utilized by supplying typed or mimeographed sheets or cards of comprehension exercises, such as those to be suggested presently. Such studies as those of Uhl and Washburne (references at the end of the chapter) will be helpful in determining the general level of difficulty and interest in many familiar selections.

2. *Especially attractive stories of greater length.* — This heading includes stories such as *Little Black Sambo* by Helen Bannerman; *Peter Rabbit* by Beatrix Potter, *Perez the Mouse,* adapted by Lady Moreton, some of the Gelett Burgess books, and the like. These may be accompanied by the appropriate type of guiding, comprehension exercises. There is often an increased zest

secured by using a real story book that has not become familiar schoolroom property. Children's books which are usually read aloud rather than volumes already associated with unsuccessful efforts in silent reading often elicit a more favorable attitude. The references at the end of the chapter indicate aids in selecting such books.

3. *Miscellaneous printed materials from children's pages in newspapers, magazines, child-knowledge books, etc.* — These materials may be clipped out or copied and attached to cards or sheets bearing the exercises. Some of the best and most effective remedial material the writer has seen was accumulated from such miscellaneous sources.

4. *Especially prepared material.* — The advantage of preparing material lies in the possibility of adjusting very adequately type, content, difficulty, and vocabulary to the particular needs of the pupil. The deficiencies of such material are usually to be found in the lower literary and interest value and in the physical deficiencies of mimeographed or typed copy. Some teachers, however, produce very satisfactory material, both original and from other compositions.

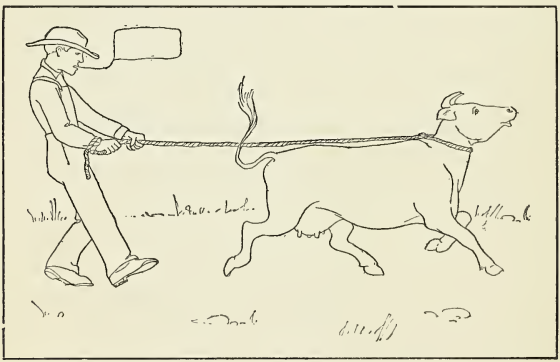
Certain types of material of appropriate character may be easily prepared. For example, the familiar riddle type such as —

I am small.
I like to play.
I am soft.
I like milk.
Sometimes you pet me.
What am I?

These exercises are especially effective since, if well conceived, the solution can be obtained only by comprehending the entire passage. They encourage the techniques of grasping and interrelating all of the sentences, of accumulating related ideas while discarding irrelevant suggestions, and of finally apprehending the upshot of the whole. Such exercises are usually keenly interesting.

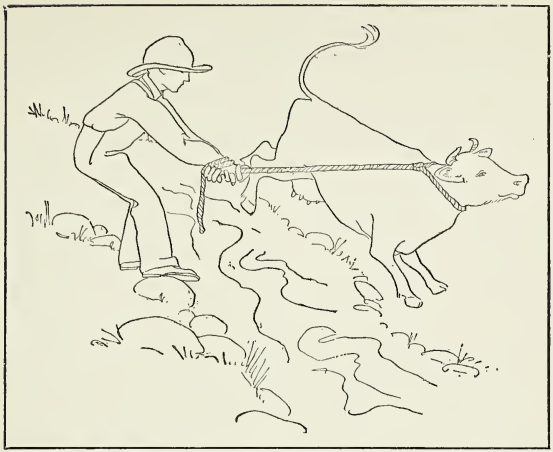
In remedial work and in attempting the difficult task of teaching children without a spoken language (congenitally deaf children) connected exercises of the following type have proved highly effective.

THE JUMPING COW

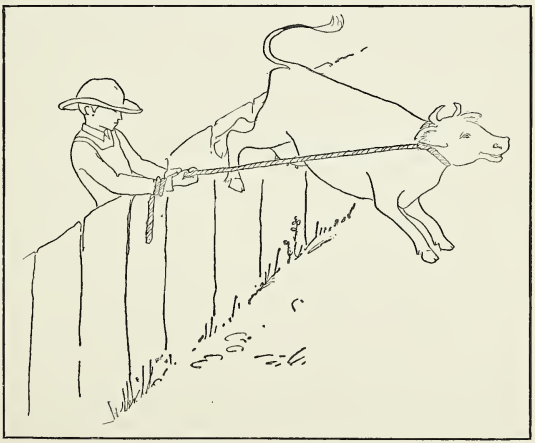


Farmer Hill bought a new cow. He tried to bring the cow home. Really, the cow brought Farmer John home. Down the road the cow came jumping. It came so fast that Farmer John could hardly hold the rope. Farmer John was pulling back and shouting "Stop." Write a word in the space to show what Farmer John shouted.

They came to a brook. The cow made a swift jump across the



brook. The rope gave Farmer John such a quick jerk that he fell right in the water. Make an × to show where poor Farmer John is going to fall.



They came to a fence. The cow jumped right over the fence. Poor Farmer John was jerked against the fence so hard that it fell down. How do you suppose Farmer John felt now? Mark the word that tells how he felt.

Happy, angry, merry, rich, fine.

At last the cow was put in the barn for the night. In the morning, Farmer John came to milk the cow. He got a pail of nice warm milk. Then the cow jumped into the air. It pushed over the pail of milk and ran out the barn door. Mark the picture which shows the cow after it was milked.

The story contains further episodes. For such connected passages and for isolated paragraphs, various comprehension exercises may be used. It will be convenient to suggest different types at this point.

Devices for Guiding and Measuring Comprehension

The use of illustrations as a means of testing comprehension. — In the episodes just given, illustrations were in some instances used as a means of testing comprehension. The significance of a passage may be indicated by several uses of the pictorial interest. For example,

1. *Selecting illustrations.* — The pupil may be given a series of illustrations from which he selects one which

best tells the story of each paragraph. These illustrations may be placed or pasted near the passage so that when the reading is complete, the whole story is illustrated. If desired, each picture may be numbered and by means of a key provided by the teacher, the pupil may correct his own responses. He should re-read all paragraphs upon which he makes an error.

2. *Drawing illustrations.* — Instead of selecting ready-made pictures, the pupil may be instructed to draw his own illustrations. Although this takes time and may sometimes conflict with interest in continuing the story, it gives an excellent incentive for drawing, namely, the desire to tell a story pictorially. Such illustrations may be at first rough sketches to be filled in with details and color after a re-reading of the story.

3. *Marking illustrations.* — Illustrations of episodes instead of being selected or drawn may be partly drawn to be completed by the pupil or completely drawn to be marked with an × or otherwise, according to the directions. These marks should have some relation to the most significant point in the passage. A few examples were given in the episode above.

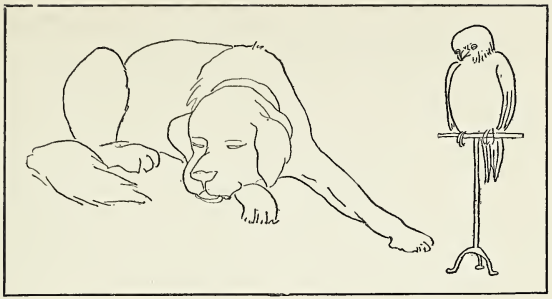
4. *Making titles for an illustration.* — The illustration accompanying a passage may be given a title which the pupil writes under it. This task requires the pupil to interpret both the paragraph and the picture which must be appraised together before a statement of the main significance of the picture can be written. Children often recognize this task as similar to the composition of captions for moving pictures and get a certain zest from the association.

The use of directions to be executed. — In the preceding examples the directions are executed merely as a means of demonstrating the comprehension of a narrative which is the main concern. Passages without such systematic use of the story but consisting wholly or almost wholly of directions to be executed in some practical way are also useful for increasing ability to comprehend whole paragraphs. Such directions may be of many types, such as:

1. Directions to cut and paste.
2. Directions to draw, illustrate, color.
3. Directions to write signs, posters, etc.
4. Directions to rearrange a group of objects, real or pictured.
5. Directions to manipulate objects, make things, assemble things, play games, etc.

In the use of such directions for the present purpose, care should be exercised not to limit the passages to a series of sentence directions which may be carried out with little reference to one another. Children who have difficulty in grasping whole paragraph ideas are inclined to attempt to complete an exercise by dealing with sentences one at a time. Such children especially need paragraphs and exercises which make this method of attack unsuccessful and which require comprehension of the whole passage.

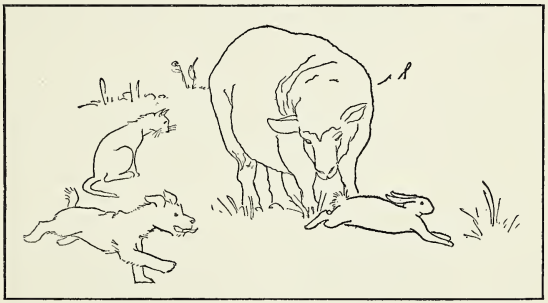
The following exercises, for example, which would be useful for training sentence comprehension, could be correctly executed without real paragraph comprehension.



This is John's dog. The dog's name is Rover. Rover is a brown dog. The bird is John's, too. The bird's head is red. The bird's wings and tail are black. The bird does not like the dog.

1. Color the dog brown.
2. Color the bird as it is in the story.
3. Draw a line from the bird to the dog.

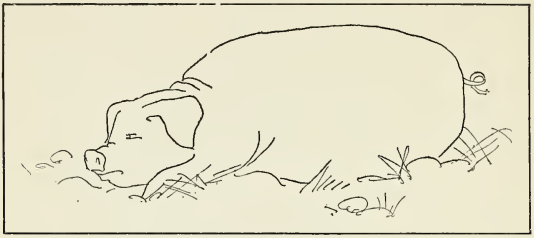
The following exercises, on the other hand, would require a more complete grasp of the whole unit:



Here are John's dog and cat. John's sheep and his rabbit are in the picture, too. For a long time the dog, cat, sheep, and rabbit played together and were happy. One day the dog and the cat had

a fight over a piece of meat. Now they will not play together. They are angry and John's other two pets are sad.

1. Color the sad pets white and the angry pets brown.



This big pig wants to sun his back. I see no sun in the sky, do you? Will you please draw a nice round sun where it can shine on the pig's back. When you have drawn the sun, color it so it looks warm.

Draw a hat on the man's head. Make it with only two lines. Draw it just like the other plain hat in the picture. Draw the hat on one side of the man's head. Now, does he look better?

The use of questions. — One of the simplest ways to stimulate, guide, and test comprehension is to utilize questions, preferably questions that may be answered

in a minimum of time and with a minimum of scoring difficulty or uncertainty. For many years, various types of such test devices have been studied. The following varieties have been found to be effective, in tests made under the writer's direction, for use in the primary as well as in higher grades.

1. *Questions answered by selecting one of several suggested answers given in a word, phrase, or sentence.* — For example:

Did you know that ants keep "cows"? Their "cows" are little green-flies which they keep for the sake of their "honey-dew." The ants "milk" their cows by stroking them with their feelers. They are kept in "cattle-pens" of earth. Draw a line under the words which tell how the ants are like farmers.

have pigs keep cows grow flowers gather eggs

A boy can jump several feet. A flea cannot jump nearly so far. But a boy is bigger than a flea. The flea can jump two hundred times his own length. If a boy could jump two hundred times his own length he could go a whole block in one leap. Draw a line under the word that tells who is the best jumper.

boy girl dog flea

Mary was to go to the city. She had never been there before. All morning she was busy getting ready. At last, it was time to go. The train whistled. My, how fast Mary's heart did beat. Underline the word that tells best how Mary felt.

Mary felt — sad — angry — excited — afraid.

Instead of single words, several phrases or titles may be utilized. The pupil is told to indicate the statement which best tells what the passage is about. To illustrate, the preceding paragraph about Mary's trip may be accompanied by the following statements:

Mary's first birthday party.
Mary's first trip to the city.
Why Mary was afraid.

Full sentences may be used such as:

Mary did not want to go away.
Mary was excited over her trip.
Mary was afraid of the train.

2. *True-false statements.* — Statements substantially of the form of those just given may be provided each to be marked true or false. For young children the selection of the best statement as in the samples above becomes difficult if many choices are provided, whereas a large number of statements may be individually marked true or false. Children usually enjoy detecting absurdities and erroneous statements. This method makes possible an extensive test of comprehension.

The Yes-No form of question is identical with the true-false except for the kind of marks made by the pupil.

3. *True and nonsense statements.* — A type of exercise found very attractive by young pupils is one which includes certain nonsense statements. First occurs a paragraph giving the episode or facts and then several statements like the following:

The girl was hungry at the bell.
The girl was angry at the boy.
The cat was angry at the ball.

Sentence No. 2 is correct and should be underlined; the others are, as interpretations of the paragraph,

sheer nonsense. In this exercise, the arrangement of the words — hungry, angry; bell, boy, and ball — serves to stimulate sharp word perception and to emphasize similarities and differences among common words.

4. *Completion exercise.* — The completion exercise includes a statement with a vital word missing. For example, following the paragraph about Mary's trip to the city might be such statements as:

Mary was —— about her trip.
It was Mary's first trip to the ——.
She was going to ride in the ——.

The right words may be written in, or selected from, a number printed on cards, or found to the right or beneath the statements on the same page. For young children the completion exercised must be very simple to be useful.

Methods of Checking Responses

In all types of training in comprehension, it is desirable to make it possible for the pupil to discover promptly whether his responses are correct or incorrect. When incorrect interpretations appear the pupil should re-read the passage in an effort to correct his erroneous impression and thus gradually to overcome the difficulties which lead to the errors. If the pupil can learn to correct his own interpretations, his progress is likely to be more rapid and certain than when he depends upon the teacher. The advantages which the pupil may realize from checking his own work are many.

He may detect his own successes and errors immediately and thus get greater returns from the effects of "satisfyingness" resulting from the correct response, and "annoyingness" from the incorrect, since the time interval between response and correction is briefer than usual. Errors, moreover, when checked immediately are more readily traced to their origins because the passage is more fresh in the pupil's mind. The pupil is also likely to be more interested in reëxamining the passage before he has forgotten it. To check and record his own successes and errors often assumes the nature of a fascinating game even to the young child and to acquire such ability gives the pupil a certain "set" in the direction of self-appraisal and criticism that makes him a more responsible learner. Such skills make it safe for the pupil to practice at any time that he may feel inclined; he is not dependent upon a teacher for help. Most important of all, the acquisition of ability to manage his own affairs in this task is a step toward initiative and independence, in general.

Two simple self-corrective devices which have been used by the writer in work with children in the primary grades are the "key" written or printed on a separate sheet or card which fits the page of exercises, and the set of answers printed on the extreme right edge or on the back of the exercise page. How the latter device may be used in connection with the types of exercises recommended on pages 81–83 is illustrated below, in the form of alternative problems about the contents of the "Mary's Trip" episode given on page 81.

Mary felt — sad — angry — excited — afraid	excited
Mary's first birthday party Mary's first trip to the city Why Mary was afraid	correct
Mary was excited about her trip Mary was frightened about her trip	true false
Mary was —— about her trip	excited

The strip at the right may be folded under at the dotted line or torn off to constitute a key which the teacher may keep. Those who establish their trustworthiness have the honor of keeping their answers always in their possession; others must call upon the teacher for the key. This procedure has been used successfully in the first grade. In the beginning, pupils in the first grade may need considerable guidance and observation but usually they learn quickly to use such devices wisely. The procedure, incidentally, saves the teacher's time.

Types of Comprehension to Be Encouraged

Various types of comprehension worthy of encouragement have already been suggested. The important requirement is that the passage be comprehended as a whole with proper apprehension and evaluation of the parts. Certain general types of reading demands, that may be set up, are suggested.

Reading to get the general mood represented in a paragraph. — This is a good type provided the passage

contains details that consistently indicate a happy, lonesome, sad, angry, or other mood of the individual or event portrayed. Various types of exercises may be used for recording the reader's interpretation. Reading to get such a general impression is natural to children and worthy of encouragement. It is a good way to foster rapid comprehension.

Reading to get the main idea. — This may be stimulated in any type of content. Several suggested main ideas may be presented from which the pupil selects, or he expresses the main thought in his own words. Directions to select or compose a title or topic sentence for a paragraph serve substantially the same purpose. Brief summaries of passages, or outlines of a story or episode covering the several paragraphs in the selection, brief account of "What I liked best," "What was funniest," etc., are other means of stimulating the attitude of detecting and retaining the gist of the material.

Questions that require interpretations not fully given in a passage. — Questions calling for an explanation of an action, for the reasons why the action occurred though they depend on the passage, go somewhat beyond mere grasp of it. Such interpretations are worthy of encouragement. In this category may be included various types of questions the answers for which the pupil searches during his reading. The question gives a set under the control of which the pupil reads. Questions which require the child to discover from the content of a passage "what has just happened before" or "what will probably come next" also provide excel-

lent training in that type of reading which requires not only comprehension of the passage but also thinking with the facts comprehended. Reading of this sort is needed to enable the child gradually to acquire the ability to read for different purposes and to think while he is reading.

In Chapter VIII will be found a further discussion of this problem and a technique of diagnosis of the important paragraph-reading skills which may be applied to the pupils in Grade III. Primary teachers who read that chapter may profit by learning the nature of skills that are expected and deficiencies that arise in the periods which follow their own work. The following references contain others' discussion of paragraph-comprehension and examples of remedial materials and methods.

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CHAPTER V

REMEDIAL INSTRUCTION FOR DEFICIENCIES IN PHRASE AND SENTENCE COMPREHENSION

Ability in phrase and sentence comprehension is measured by Test 2. The exercises, which are based upon a useful and familiar vocabulary, are arranged to test primarily the ability to grasp whole units, which increase in complexity. Just as this skill is less complex than paragraph comprehension so it is more subtle than the technique required merely to recognize a single word. The several skills, as we have stated, are not really three sharply contrasting types. On the contrary, they represent more nearly various stages in a hierarchy, a scale of increasing complexity of comprehension. Phrases, sentences, and paragraphs vary greatly among themselves in complexity and there is an overlapping of difficulty among the types.

A deficiency in both paragraph comprehension and sentence interpretation is more serious than difficulty in the paragraph-reading alone. Pupils subject to both limitations need both types of training. This fact should be kept in mind during the study of this chapter, in which will be considered primarily the devices for improving phrase and sentence interpretation. Some provision for training in the intermediate

stages between sentence and paragraph reading is also desirable. This may be provided, in part, by the use of paragraphs which are less fully unified than those suggested in the preceding chapter. Some attention will be given to this problem later.

Causes of Difficulty in Phrase and Sentence Comprehension

For deficiencies in phrase and sentence comprehension as measured by Test 2, there are many causes. In addition to such factors as low intelligence, lack of life experience, insufficient or inadequate training in reading in general, and lack of interest, factors discussed also in the preceding chapter in connection with difficulties in paragraph comprehension, the following are most evident:

1. Lack of reading vocabulary and difficulty in word perception. — Without ability to read single words effectively, pupils rarely attain skill in phrase and sentence reading. When such a deficiency in reading vocabulary exists along with phrase and sentence difficulty, a low score in both tests should appear. For such cases, training is needed not only in phrase and sentence reading but also in the acquisition of a vocabulary. Devices for assisting word study are given in the next two chapters.

Deficiencies in phrase and sentence comprehension often exist in combination with good scores on the word recognition test, however, showing that not all difficulties with the larger units are due to meagerness of read-

ing vocabulary. For such cases, the following causes are found;

2. **Overemphasis on vocabulary study.** — Phrase and sentence reading is hampered by too much, as well as by too little, attention to word mastery. Word study may be overemphasized in different ways:

a. Mere excess of zeal and of time in teaching, testing, and drilling on isolated words may give them an undue prominence and lead to a narrowing of attention to them.

b. A continuation of normal word study for too long a time before introducing reading of the larger units, due to the mistaken idea that pupils should have a very large vocabulary before attempting real reading, may result in inferior skill in reading larger units. A certain danger of producing "word readers" always attends a delay in introducing the reading of sentences and paragraphs.

3. **Overemphasis on phonetic and other analytic drill.** — It often happens in American schools that excessive drill on phonetic and other types of word analysis results in making pupils what we might call word-form conscious. There is a difference between being overattentive to words in reading, leading to what is called "word reading," and being over-responsive to word-forms. A pupil may become so "set" by analytic training as to be primarily concerned with form, that is, with correctly seeing the word-form as an ensemble of certain word parts such as phonetic elements or syllables. Thus a pupil may be so drilled in phonetic analysis as to feel impelled or "set" to see

plate as *pl* which goes with the family of *play, plan, plot,* etc., and *ate* which is part of the group, *Kate, late, mate,* etc. Our reactions to words are complex enough to permit such a type of perception to be established; and it often is. Too much attention to word forms and phonetic relations will usually lead to the neglect of thought.

4. Overemphasis on correct oral reading. — Whether phonetic study is adopted or not, extreme emphasis on correct oral reading may result in inadequate development of skill in comprehension. If accuracy in pronunciation is greatly stressed, the pupils are encouraged to neglect the thought in the interest of mechanical accuracy. Reading may become a motor instead of a comprehension exercise. Such effects, however, are not unavoidable outcomes of training in oral reading; they are due to unnecessary overemphasis of the formal phases of the reactions and the neglect of thought-getting.

5. Overemphasis on reading large (sentence or paragraph) units in the beginning. — Although it may seem paradoxical, difficulty in comprehending phrase and larger units (and other difficulties, too) may result from strenuous efforts on the part of the teacher to secure comprehension of large units from the start. Pupils cannot immediately read complex printed units. Unfamiliar with the words, punctuation marks, sentence division, means of moving the eyes across the line, etc., the beginner is faced with a task of extreme complexity. On the teacher's insistence that he do the impossible, the pupil may resort to various subter-

fuges,[1] some of which may interfere with the development of the abilities which make possible full comprehension in reading. The skills, since they are both complex and subtle, should not be unduly forced. They are developed best by a gradual process.

6. Lack of training in the identification of punctuation marks. — Too rapid an introduction of reading material of complex structure makes it difficult for the pupil to solve all of the puzzles of organization and symbols. Punctuation marks are among the mysteries of reading material. Failure to understand the significance of these elements may handicap a child's progress and, contrariwise, assistance in mastering these items is a means of facilitating comprehension of thought units.

7. Lack of training in the recognition of thought units. — Just as some children fail to learn to profit by punctuation marks and are really hampered by them unless special assistance is rendered, so some pupils fail to develop the knack of perceiving words in natural thought units without special help. As a means of helping children who have difficulty in the latter respect, several types of training in "phrasing" have been developed. Improvement sometimes accompanies training in phrasing of a not too artificial type. Such devices will be discussed later in the chapter.

[1] The writer has found evidence of such results in studies of several individual cases. What pupils do under such circumstances was shown clearly by G. T. Buswell in his monograph, *Fundamental Reading Habits*, 1922. Many children had acquired the habit of completely "faking" a reading "in a serious manner informing the experimenter when they had completed the reading."

8. **Lack of encouragement in depending on the context in efforts to recognize unfamiliar words.** — If the teacher encourages the pupil to depend upon phonetic or other types of attack upon the word-forms to work out the recognition of unfamiliar words encountered in reading, habits of utilizing the context to the full may be discouraged. That habits of relying on the context are very useful and that they are sometimes discouraged with serious effects will be explained in Chapters VI and VII.

9. **Lack of training at certain critical periods.** — Absence from school or a change to a group working at a different level or in a different manner occasionally results in the loss of training at a stage critical for the development of comprehension techniques. The pupil, finding it difficult or impossible to bridge the gap to a higher level, may continue as a word-by-word reader. If he changes from one system to another in which the pupils have learned a different reading vocabulary, he may, when he is confronted with many unfamiliar words, be led to overemphasize word study to the neglect of thought.

10. **Lack of proper materials and methods.** — Finally, a deficiency in comprehension of more complex materials may be produced not as the result of misplaced emphasis in training but as the effect of mere insufficiency of the right kind of training. Lack of practice material, of good reading matter, of questioning, or of other checks of comprehension of material read may alone result in underdevelopment of these skills.

These causes of difficulty in phrase and sentence reading are not the only ones but are probably the main ones. They may be considered profitably in connection with causes of difficulty in paragraph reading discussed in the preceding chapter. It is unnecessary here to elaborate the fact that merely to reveal the causes of difficulties is enough in some cases to indicate certain remedial measures. If too great an emphasis on accurate word pronunciation in oral reading is likely to jeopardize the development of effective comprehension, it is plainly advisable to shift the emphasis. This should be a phase of the remedial work. And similarly, other causes of difficulty which may be modified or removed should be taken into account. In addition to these measures, various exercises and materials should be included in the aggressive program of remedial treatment.

Remedial Materials and Methods

From the results on Test 2 some idea of the level of difficulty at which the pupil should work may be secured. As in reading unified paragraphs, the pupil should be given material that varies from a little below to a little above the level on which he can just succeed. Material that is rather easy may be used to encourage fluency; material slightly difficult, to stimulate the mastery of the techniques needed for higher level comprehension. The results on Test 1 indicate something of the range and level of word recognition and assist in the choice of vocabulary for use in composing practice material. For selecting other words, the Primary

Reading Vocabulary [1] arranged by the writer should be serviceable. For pupils above the primary grades, Thorndike's Word List [2] will provide guidance to a larger vocabulary. For suggestions concerning the means of conducting the remedial word periods, the reader should refer to Chapter II in this volume. In the following pages are given a few illustrations of several types of useful remedial materials.

Self-checking devices. — With most of the exercises described below it is possible to use the devices which enable the pupil to correct his own responses and thereby largely to take care of his own practice. The nature and value of these devices were discussed in Chapter IV, pages 83–85.

Types of Exercises to Be Constructed

The same general types of printed exercises suggested for paragraph reading may be used for phrase and sentence reading with even greater ease. A few types will be suggested. The references at the end of the chapter indicate further illustrations.

1. Action exercises. — Many exercises to be carried out by activity may be devised from words of a known vocabulary. Such phrases or sentences may be exposed singly by the flash card technique, or written on the board, or typed on paper. The teacher or a better pupil reader may follow the pupil's actions to check his comprehension. A sample series follows on page 97.

[1] Distributed by the Bureau of Publications, Teachers College.

[2] *The Teacher's Word Book*, published by the Bureau of Publications, Teachers College.

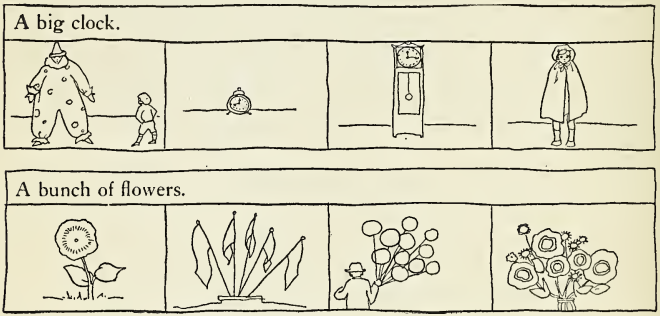
Stand up.
Go to the board.
Write your name.
Go to your seat.
Sit down.

Exercises may be made in a semi-story form in such a manner that the pupil may carry them out without the guidance of the teacher, who can estimate closely the accuracy of the pupil's comprehension by a brief survey of the layout when the work is completed. The following is a sample of such exercises that have been used.

PLAYING STORE

Play that your table is a store.
Put a few pencils on the table.
Put a few pieces of candy on the table.
Put some flowers on the table.
Put two apples on the table.
Bring the paper dolls to the table.
The dolls come to the store to buy.
One doll wants to buy a flower.
It costs ten cents.
The doll gives you ten cents.
You give the doll the flower.
Another doll wants to buy a pencil.
The pencil costs three cents.
The doll gives you three cents.
You give the doll a pencil.
Another doll wants to buy an apple.
The apples cost five cents.
The doll gives you ten cents.
You give the doll five cents and the apple.
Another doll wants to buy a newspaper.
The newspaper costs two cents.
The doll gives you two cents.
You give the doll the newspaper.

2. **Picture checking exercises.** — Each of the following is taken from a page of similar ones. As in the primary Test 2, these exercises may be used with phrases and sentences of different levels of complexity. The illustrations below and in the remainder of the chapter are much reduced in size.



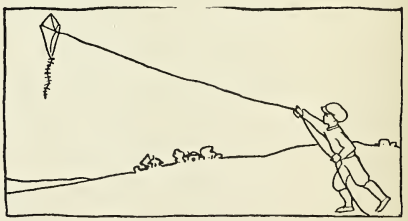
3. **Phrase checking exercises.** — Another form consists of a single picture which illustrates one of the phrases or sentences. For example:

A big white horse.

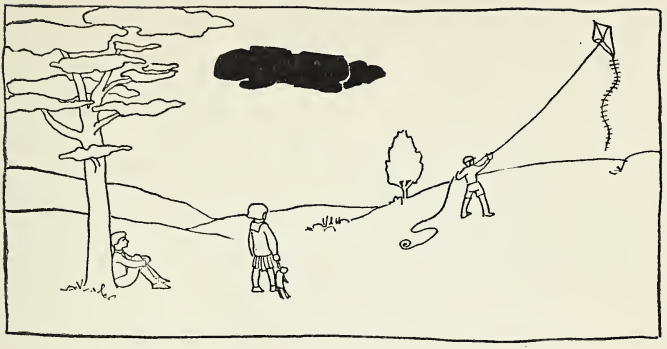
A boy with a kite.

A box of candy.

A big white hat.



Another form shows a group picture and a series of phrases or sentences, the latter to be connected with the proper illustrations by a line.



A big tree.

A boy sits under the tree.

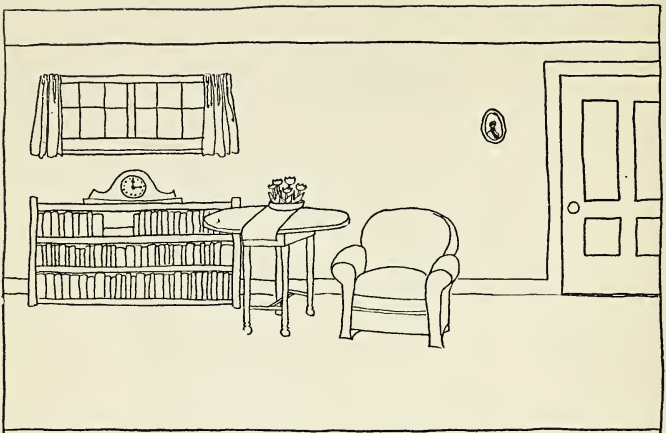
A black cloud.

A boy is flying a kite.

A little tree.

4. **Directions.** — Exercises which require cutting, coloring, drawing, etc., may be made in great variety. A few samples of types used with success with normal children follow. In Chapter XII reproductions of other types used with deaf children are shown.

5. **Question and answer exercise.** — Questions requiring simple answers may be arranged for many types of materials. Children seem to enjoy greatly reading lists of ready-made questions like those on page 106.



Color the flowers yellow and green.

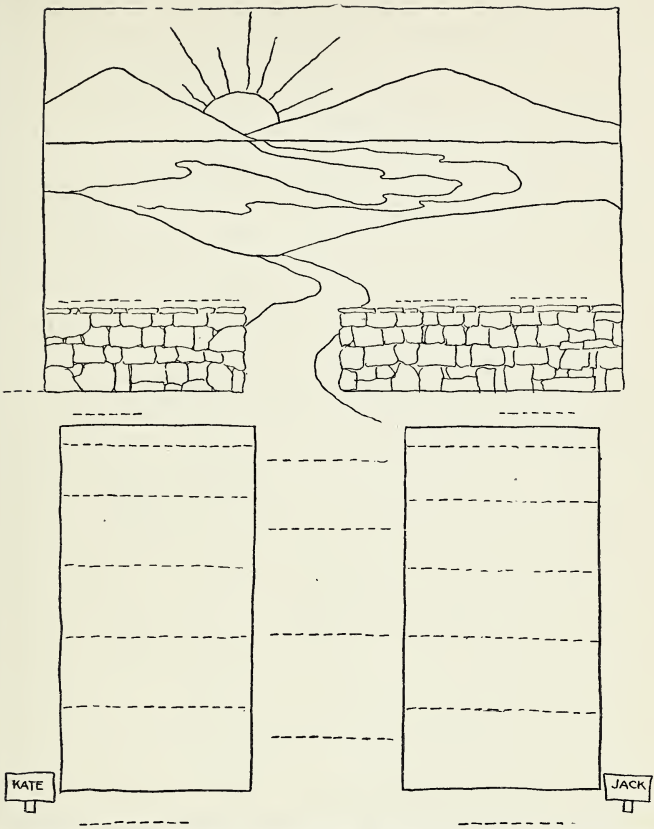
Color the clock red.

Color the door blue.

Color the table yellow and blue.

Color the window blue.

Color the chair red.



A "stage" drawing folded in the middle. Slits are cut at the dotted lines. The next page gives directions for fitting up the "stage." (This illustration and those following are uncorrected reproductions of materials actually used in mimeographed form.)

1. Write "Kate" under one watering can and color it red
2. Write "Jack" under one watering can and color it blue.
3. Cut out the two watering cans.
4. Color the gardens brown
5. Color the grass and the hills green.
6. Color the wall, the sun, and the sky.
7. Put the children by their gardens.
8. Put the watering cans by the children.

See in the dictionary

a b c d e f g h i j k l m n o p q r s t u v w x y z

garden

plant

spring
Spring

The pupil follows the directions as given and places the figures in the stage (see preceding page). The arrangement at the right is a picture-dictionary guide to the new words introduced in this assignment.

Spring

It is spring.
Jack and Kate each have a garden.
They want to have pretty flowers.
Their father shows them how to plant a garden.
He helps them plant their gardens.
He gives each a great big watering-can.
The children water their gardens.

---

1. It is thing.
   It is spring.
   It is sing.

2. They have a curtain.
   They have a grass.
   They have a garden.

3. They plant their gardens.
   They play their gardens.
   They place their gardens.

The pupil reads the selection at the top and then does the comprehension exercises given below. He marks out the sentences which are incorrect interpretations of the paragraph.

Night in Jack and Kate's Garden.

It's night in the garden
And on the hill
There is no light
And all is still.

It's night in the garden,
And in the street
These little houses
Hear little feet, -

The feet of flowers
They hear at night;
For flowers are people
When there is no light.

They run to the houses
And open the doors.
They hop in the windows
And sit on the floors.

This is a poem related to the general theme of the several projects, some of which are shown on the preceding pages. This poem is read silently or orally.

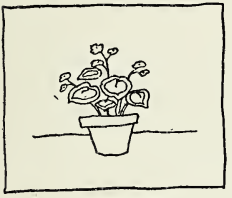
Flowers come up in the spring.

The boys play in the garden.

The boys carry drums.

The boys carry dogs.

Two bunches of flowers.
Three bunches of flowers.
Two boys with drums.



A pot of flowers.
A party of boys.
A bunch of flowers.

Plants grow in the spring.
The dogs and the boys play.
The cat and the dog play.

Comprehension exercises to test mastery of words and phrases introduced in the preceding projects. These five pages indicate the nature of the series of units used in connection with each new assignment of words.

A. Yes-No exercises:

Do dogs swim?	Yes	No	Yes
Is milk white?	Yes	No	Yes
Is fire cold?	Yes	No	No
Should children drink milk?	Yes	No	Yes

B. True-false exercises. — Cross the false ones out (or sort card sentence-strips into true and false piles, or mark true and false, etc.).

It is not nice to sneeze without covering one's mouth and nose.
One nickel and one nickel make a dime.
The policeman will not help you when you are lost.

C. Selection exercises:

Dogs like to eat — bones, soap, straw.		bones
What does a bird do?	It swims	
	It sings	It sings
	It talks	
Where does the sun set?	In the East	
	In the morning	
	In the West.	In the West.

D. Observation choices. — A picture may be drawn on the board, pasted in a book, or mimeographed at the top of a page. A number of questions concerning the picture are answered by underlining the proper word or phrase.

E. Picture completion exercises. — These exercises may take various forms, such as:

Put an × on the cat.
Put an ear on the cat.
Make a cat from the picture [an incomplete picture is shown].
Draw a cat by the fire. Make it look at the fire. Put some black spots on the cat's back. If your cat is thin, draw a plate for some milk for it. Draw something else that the cat likes.

Exercises to Be Used with Available Readers

Many types of exercises may be constructed to use with readers and other literature available in any classroom. These exercises may be typed, mimeographed, or printed on paper or cards which are given to the pupil with the book.

Many selections in classroom readers represent a middle stage between the unified paragraphs discussed in the preceding chapter and the single isolated or related sentences described in this chapter. It is desirable to have such intermediate material as a means of accomplishing a transition between the two extremes. A sampling of primary reading material will show various stages between the two types. The pupil does not in his learning leap abruptly from sentence reading to paragraph comprehension. Since the transition is accomplished gradually, intermediate material should be used to make the acquisition of the more complex skills possible without too discouraging difficulties.

The following types of exercises have been tried successfully under the writer's direction in Grades I and II.[1] They were made to accompany the Bolenius and the Elston Readers.

A. True-false statements. — The pupils read the selection in the reader and are then given either a sheet of such statements as the following to mark plus or minus or a group of cards, each containing one statement, to be sorted into true and false piles.

[1] Reports of these studies have been prepared and will probably appear in a forthcoming volume to be published by the Bureau of Publications of Teachers College.

The cat had milk to drink.	True
The cat had no milk to drink.	False
The hen was afraid of the cat.	False
The hen drove the cat away.	True

B. Completion exercises. — The completion exercises are questions or statements concerning the content of the passage. They may be printed on light paper board. Following are samples.

1. Who —— in the playhouse?	was
2. "I will call Tom," said ——.	Betty
3. Tom and Betty found a ——.	Rooster
4. The —— said: "Cock-a-doodle do."	Rooster

A number of card slips each with a word are provided to place in the vacant places. Often in the group are included words having elements in common with the correct words in order to stimulate perceptive accuracy. For example: *has* and *was; sing* and *ring; went* and *west; hat* and *has; hat* and *that,* etc.

C. Yes-No exercises. — These may be mimeographed in the following form:

1. Has Dolly Dot a play house?	Yes	No	No
2. Did Turkey Lurkey say, "I will tell Tom and Betty"?	Yes	No	Yes
3. Did Teddy Bear say, "I will tell Dolly Dot"?	Yes	No	No

D. Phrase selection. — These exercises, which may be mimeographed as were the Yes-No and utilize the same device for correction, may take many forms, of which a few are illustrated below. Combined with reading a story, these exercises give practice in phrase, sentence, and paragraph reading. The arrangement

of phrases helps to develop the habit of grasping them as a unit and serves to sharpen phrase perception.

	Who will told	
1.	Who will tell Dolly Dot to come?	Who will tell
	Who will well	
	"I will."	"I will."
2.	Said Rooster Pooster, "I who."	
	"I well."	
	She came.	She came.
3.	What did Dolly Dot do? She sang.	
	She rang.	

E. Sentence selection. — Another type consists of several sentences all of which, except one, are ridiculous interpretations of sections of the material which has been read. For example:

The boy had two cats.	x
The boy had three coats.	
The boy had two hats.	
Peter went to the country	
Peggy went to the country	x
Peter went to the seashore.	

F. Phrase-matching exercises. — An ingenious type of exercise, giving special incentive to rapid phrase reading, has been tried out by Miss Zirbes [1] in the second grade. It consists of questions combined with many possible answers, among which the correct ones are to be found. For example: [2]

The little girl's ball	fell into the well.
The frog	got the ball for her.
The little girl	made a promise.

[1] See references at end of chapter.

[2] To accompany story on p. 76, *Winston Second Reader.*

The frog did not want	her red slippers.
	her new dress.
	the little girl's playthings.
The frog wanted	to eat from her plate.
	to sleep in her bed.
	to drink from her cup.
	to come to her house.

G. Selection of sentence divided into phrases. — Miss Zirbes and others have used the divided sentence to encourage phrase reading. The material is arranged as follows: [1]

1.	The goats were going	across a road.
	The goats were going	across a river.
2.	Under the bridge was	the grass.
	Under the bridge was	the giant.
3.	Little Billy said,	"Eat Big Billy."
	Little Billy said,	"He will come soon."
4.	Big Billy said,	"Eat Biggest Billy."
		"Eat the biggest apple."
5.	Biggest Billy said,	"Then be off!"
		"Come and eat me then."
6.	Biggest Billy	pushed the giant into the river.
	Biggest Billy	fell into the river.

Such devices as the last ones given and also some of those suggested above which distort the normal appearance of a sentence should not be used to excess nor with confidence that they alone will fully develop skill in reading by similar units in undivided sentences. These devices are very helpful as means of calling attention to thought units and of giving exercise in grasping them as wholes, but to find for one's self similar units in connected material requires certain additional skills that must be established in the work with ordinary material.

[1] To accompany a story from Baker and Thorndike.

H. Sentences of marked phrases. — A transitional device for bridging the gap between reading the separate sentence-phrases and reading the connected sentences consists in underlining alternate phrases. For example:

The goats were going across the road.
Under the bridge was the giant.

This device produces less distortion of the sentence arrangement and, perhaps, serves all purposes as well as or better than the separation of units. But like the others, this "crutch" must be discarded before the pupil learns to depend too much upon it. Abundant additional exercise with unmodified sentences will be required.

Demonstration of Phrasing in Oral Reading

Often a pupil may be assisted by hearing the teacher read sentences aloud with slight hesitations between and vocal emphasis upon the phrase units which the pupil attempts to follow in another book. A demonstration of this type may set up a sort of rhythm of attack that the pupil may not otherwise acquire so readily. Once such a rhythm is obtained it may help to produce the serial perceptual attack which is, in subtle form, at the basis of good phrase reading.

The Use of Flash Cards

Flash cards of the type published by Horn and Shields [1] may be effectively used to encourage percep-

[1] *The Horn-Shields Flash Card Exercises:* New York, Ginn and Company, 1923.

tion of phrases and short sentences. The series includes cards for phrases of varied lengths and difficulties which appear frequently in children's literature. The merits of these cards are that when given according to directions they encourage thought-getting and not mere phrase calling, and that, by virtue of the short exposure, they stimulate efforts to read the phrases at a glance instead of habits of perceiving the words separately in a series of fixations. Properly used, they should be of service, especially for obstinate cases in the primary grades.

There are several limitations of flash card work that should be appreciated. Flash cards represent an unreal reading situation; the size of the type, the distance, arrangement, form of presentation (that is, the act of "flashing" the card) are all unlike those found in ordinary reading. Skill acquired in reading flash cards during rapid exposure exercises is not identical in all respects with skill required in reading ordinary printed sentences by phrase or larger units. The flash card method is essentially a "supplementary device." [1] The writer found in several experimental studies that flash card drill *alone* usually produced a disappointing transfer of skills to the normal reading situation.[2] Pupils who learned to read phrases readily on flash cards briefly exposed often showed little improvement in reading from the book by such units.

[1] The deficiencies of which were discussed in Chapter II.

[2] "Functions of Flash-Card Exercises in Reading: An Experimental Study," *Teachers College Record*, March, 1925, pp. 572–91.

The flash card drills should be used primarily for two purposes: to emphasize the need of comprehending several words in a single glance and to establish a "set" or habit of trying to take in phrases as wholes. The short exposure device should accomplish both of these purposes. To transfer the "set" or habit to ordinary reading is a task not fully accomplished by the flash card drill alone.

The teacher must take an active part in the transfer of the habit of trying to grasp phrases as a whole from the flash card to the ordinary reading situation. This transfer may be facilitated slightly by encouraging the pupil to try to take in phrases and to a greater extent by alternating flash cards with exercises such as have been described above. The various exercises in phrasing and in rapid reading are of primary value. The effects of flash card drill must be fused with the related experiences in other exercises and with training in normal reading.

Individuals are certain to vary in the amount and variety of exercises needed to attain satisfactory skill in phrase and sentence reading. Particular devices work better for some than for others. The judicious use of flash cards to encourage getting whole phrases and short sentences in a single "span of apprehension," and of phrasing exercises to assist the pupil in detecting natural thought division; the explanation of punctuation marks; the use of oral reading followed by explanation by the pupil; the use of oral questioning following silent reading, the emphasis on rapid comprehension; and other methods mentioned above may

all be employed to assist pupils deficient in phrase and sentence comprehension in certain cases. Since comprehension is not everywhere one and the same skill, there is merit in the use of a variety of exercises and test devices. A good reader is also a versatile reader. Versatility, alertness, and interest are all encouraged by the sagacious use of many such thought-provoking exercises. By varying the type of drill, furthermore, not only will the type of devices especially effective or ineffective for particular pupils be discovered but a sounder basis for transfer will be established. For developing ability to grasp phrases as a unit, for example, flash card drill should be combined with the phrase division and phrase underlining exercises, with oral phrasing demonstrations, and other exercises suggested. By using the several devices at the same time, each makes the use of the other more fruitful; each assists in the transfer of skills by providing larger degrees of similarity (identical elements) among the several functions and by carrying attitudes and skills over to real reading by easier steps.

REFERENCES

The following references deal with the diagnostic and remedial phases of phrase and sentence reading. Some of them give samples of remedial material:

1. BUSWELL, G. T., *Fundamental Reading Habits, A Study of Their Development.* Department of Education, University of Chicago, 1922.

2. GATES, A. I., *The Psychology of Reading and Spelling, etc.* New York: Teachers College: Bureau of Publications, 1922.

3. ——, "Functions of Flash-Card Exercises in Reading: An Experimental Study," *Teachers College Record,* March, 1925, pp. 572–91.

4. GRAY, C. T., *Deficiencies in Reading Ability.* New York: D. C. Heath, 1922, Chs. IV and V.
5. GRAY, W. S., *Remedial Cases in Reading: Their Diagnosis and Treatment.* Department of Education, University of Chicago, 1922.
6. ——, *Summary of Investigations Related to Reading.* Department of Education, University of Chicago, 1925. Ch. IX.

The following references give examples of practice materials. See also the references for Chapters IV, VII, and XII.

1. BUSWELL, G. T., *Practice Exercises in Careful Silent Reading, Sets 1 and 2.* Chicago: Wheeler Publishing Company, 1923.
2. HORN, E. and SHIELDS, G. *Silent Reading Flash Cards.* New York: Ginn and Company, 1923.
3. OSBURN, W. J., *Remedial and Follow-Up Work in Reading,* Bulletin No. 2. Bloomington, Illinois: Public School Publishing Company, 1925.
4. PENNELL, M. and CUSACK, A., *How to Teach Reading.* Chicago: Houghton Mifflin Company, 1923.
5. STONE, C. R., *Silent and Oral Reading.* Boston: Houghton Mifflin Company, 1923.
6. *Twentieth and Twenty-Fourth Yearbooks of the National Society for the Study of Education,* Bloomington, Illinois: Public School Publishing Company, 1921 and 1925, respectively.
7. WATKINS, E., *How to Teach Silent Reading to Beginners.* Philadelphia: J. B. Lippincott Company, 1922.
8. ZIRBES, L., *Practice Exercises and Checks on Silent Reading in the Primary Grades.* New York: The Lincoln School, 1925.

CHAPTER VI

TYPES, CAUSES, AND FURTHER DIAGNOSIS OF DIFFICULTIES IN WORD RECOGNITION

As was pointed out in the preceding chapters, the pupil who has a limited reading vocabulary or has difficulty in the recognition of words is nearly always incapable of good reading of phrases, sentences, and paragraphs. A method of learning words with accuracy and dispatch as a means of acquiring a wide vocabulary and fluency in the perception of words on the printed page is an important prerequisite of good reading ability. We shall, therefore, give special attention to the causes and remedies for difficulties in word learning and recognition.

In this chapter we shall discuss three closely related topics, namely, the methods pupils use in the process of studying words in order to be able to recognize them when they see them later; the methods they use in working out the recognition of unfamiliar words whenever they meet them, and the manner in which they perceive words which are already familiar in various degrees. The methods used by a particular pupil in trying to learn words are largely identical with the methods adopted in working out the recognition of unfamiliar words encountered in various contexts. In both cases the pupil usually depends upon certain

methods of observing and analyzing the word-form. Some of these methods are adopted in the pupil's earliest experiences in word study; others are acquired at various periods in his development. Different children in any grade typically differ considerably in their methods of word study. In the present chapter we shall discuss the various methods of attack and try to indicate the kind of equipment which produces the best practical results.

The way in which pupils perceive familiar words during ordinary reading depends considerably upon the methods used in studying new word-forms. Inasmuch as these three skills are closely interrelated, it will be unnecessary to treat each separately or to remind the reader of the distinctions except those of genuine importance. In presenting the suggestions for remedial work in the present and the following chapter, the writer has in mind the influence of the methods of word study and analysis recommended upon the type of word perception which may be developed in ordinary reading. As far as possible, the suggested methods of word study are limited to those which will facilitate effective perception of words in ordinary reading to the greatest possible degree.

Causes of Difficulties in Word Recognition

There are five major causes of deficiency in word recognition. These will be mentioned briefly, after which various methods of word perception will be described and the procedures to follow in diagnosing abilities of each type will be explained.

1. **Inferior mental capacity.** — In addition to ability to comprehend sentences and paragraphs, knowledge of word meanings and ease of acquiring a reading vocabulary are found to be rather closely associated with general intelligence. In the typical classroom a wide range of intellects may be expected. The diagnosis of this source of deficiency in reading should be made by a trained psychological examiner. The remedial procedure consists both in adjusting expectations of achievement to the level of intellect found and of providing more extensive, varied, and explicit exercises (such as those to be described later in this chapter and also in Chapter XII) for the duller pupils.

2. **Lack of general experience or of experience in using oral English.** — The child whose early life has provided neither rich nor varied experience or whose conversation has been limited largely to a foreign tongue is handicapped in the task of learning to read. For such children, special types of word study are to be arranged. Some of those suggested later have been tried out on a group of children very limited both in general and in language experience — a group of congenitally deaf children from poor families. In addition to the suggestions given in this chapter further recommendations for the teaching of such pupils will be made in Chapter XII.

3. **Study limited to unusual vocabulary.** — Pupils have been found who did poorly on Test 1 although the teacher demonstrated the fact that they could recognize an average or even large number of words for their grade. Examination of their achievements usually

showed that they had been taught a surprisingly large number of unusual words, many of them unsuitable for the primary grades. Sometimes many of these words were dragged in to make up large phonetic families; sometimes they were the necessary result of some freakish scheme of teaching primary reading. There are in use a regrettably large number of such methods. Test 1, it will be remembered, consists of a representative sampling of a list of words which have been very carefully selected as the most suitable — all things considered — for the primary grades. No matter what words a pupil may know, if he cannot read such words as those in this list, he will be handicapped in his efforts to read the more representative and important children's material.

4. **Lack of training in word recognition.** — However apt a pupil may be, he cannot acquire a reading vocabulary without study. When it is due only to lack of training, the deficiency may be remedied by obvious methods. When it is due to lack of application, the difficulty may be less easy to relieve. The use of more vigorous methods and attractive materials should be arranged.

5. **Inappropriate methods of perceiving words and of learning new words.** — Children of all levels of intelligence, despite abundant drill and serious application, sometimes fail to acquire the essential techniques of attacking new word-forms. These failures are due to various factors: to overemphasis and underemphasis of different types of training, as well as to inappropriate techniques acquired by unguided learning during ran-

dom efforts. To comprehend the causes of difficulties and the justification for various types of remedial exercises, we may consider the ways in which a pupil may learn to recognize a printed word.

How Children Learn to Recognize Words Under Experimental Conditions

The methods used by pupils to achieve familiarity with a word so that it may later be recognized have been demonstrated in considerable measure by various studies. The author and Miss Eloise Boeker studied the way young children learned to perceive words in their very first lesson;[1] Dr. Lois Meek[2] did the same, using a different type of word presentation and Dr. Helen Thompson[3] studied the methods adopted by deaf children in beginning and later lessons. Many studies have been made by means of pronunciation tests and other instruments[4] which have helped to demonstrate the methods utilized at different stages of advancement in reading.

These studies have shown that children acquire very different methods of mastering word-forms and that the ways in which the words are presented greatly

[1] Boeker, Eloise, "A Study of Initial Stages in Reading by Pre-School Children," *Teachers College Record*, November, 1923.

[2] Meek, Lois, *A Study of Learning and Retention in Young Children.* Teachers College Bureau of Publications, 1925.

[3] Thompson, Helen, *An Experimental Study of Beginning Reading of Deaf-Mutes.* Teachers College Bureau of Publications, 1927.

[4] See Gates, A. I., "A Test of Ability in the Pronunciation of Words," *Teachers College Record*, November, 1924.

influence the methods of perception adopted. For example, in the study by the author and Miss Boeker, the children observed primarily the length of words during study and depended on the observation of lengths during recognition when such a series of words as *cow, postman, dress, duck, football,* and *dandelion,* each on a card with a picture of the object, were presented one after another in random order. When the words were all of the same length and presented in the same way, most children perceived primarily some small but outstanding detail such as the dot over the *i* in *pig,* the "funny cross" in *box,* the similar beginning and ending of *window;* the "monkey's tail" on the *y* in monkey.

In Dr. Meek's study the word to be learned was presented simultaneously with five others similar in one or more details, as is shown in the accompanying table. Here the pupil was led to perceive the word as a whole with certain characteristic features.

SIMILARITIES	Ball	Flag	Doll	Lion	Duck	Rose
Initial letter . .	burr	foot	dine	leaf	does	rind
Final letter . .	feel	ring	seal	when	mark	hide
Middle 2 letters	sale	clam	sole	riot	much	lost
First 2 letters .	bake	fled	down	like	dump	rock
Final 2 letters .	kill	drag	bill	moon	sock	case

Although children taught by the same method adopted different perceptive attacks, each type of presentation tended, on the whole, to lead to a certain limited range of observation types. In these facts we find evidence that probably any method alone may

allow some pupils to acquire inadequate habits but that by management of the learning-situation much may be done to control the type of perceptive attacks adopted. Let us next consider the nature of the several methods of attack found among children under ordinary school conditions.

Methods of Studying and Recognizing Words

Dependence upon striking characters. — In the early stages of learning words, pupils are much disposed to seize upon characteristics that appear to them as outstanding (the dot over the *i*, etc.) as was suggested above. These are not always the features that we as adults observe.

A method of learning which depends on the perception of such features is fated to function effectively for only a short time. To perceive words by noting primarily only such minute characteristics leads to difficulties as soon as various words of similar visual families are encountered. Beyond the early stages of learning words, this method of attack is serviceable for only a small number of rather unique words.

A perseverance of first lesson habits of perceptive attack, with a resulting neglect of other methods of observation, is an occasional source of difficulty in word mastery. This dependence upon the perception of minor details may usually be detected when the pupil pronounces a series of isolated words. When the pupil encounters words more or less unfamiliar he is likely to substitute for the actual word some other which is like it in some detail but not much like it in

general shape. Thus *blue* may be called *black; when, what; play, day;* and so on.

Dependence upon the general configuration. — Instead of perceiving primarily some detail in a word one may envisage chiefly the general shape. Thus *hat, pay, run, catch* are words of very different configuration. To appraise the word as a whole is, in itself, highly desirable but insufficient. When relied upon exclusively this method leads to many errors in reading, especially when the material is slightly difficult or unfamiliar. The pupil then will often pronounce, not the word itself, but one more or less like it in general configuration. Thus *when* and *where; then* and *than; hear, hare, have, bear, bean; ball, bell, hall;* etc., may be confused. It is often very difficult to tell whether the pupil is depending primarily on some detail of the word or on the general configuration or both. Fortunately, the distinction is rarely of importance. Both types of recognition can usually be distinguished from the various slow, piecemeal methods soon to be described. In the former, the pupil typically reacts quickly and appears often to observe superficially or merely to guess. In the later case, the pupil usually studies the word-form at length.

A keen eye for the general shape of a word is a decided asset to the learner as it is to the experienced reader. As a means of learning, mere perception of the rough configuration is scarcely enough, although it frequently is quite sufficient for an experienced reader after years of reactions to the word. In the primary grades other clues are needed.

Use of letters; the spelling method. — In the course of time the pupil learns the names of the letters of which words are composed. Sometimes the letters are not fully mastered until the pupil can read many words. The writer found one pupil, half through Grade III, unable to name all the printed letters with certainty, although he could say his *a b c*'s. In such cases, pupils are unlikely to use the " spelling method " of studying a word or, at least, they are unlikely to spell out letter by letter the unfamiliar words encountered in reading. Although they do not actually name the letters, pupils may study words by looking at each letter in order in the printed word or by observing the letters as they write the word. In attempting to work out an unfamiliar word encountered in reading, they may also study it letter by letter. Such an attack can usually be discovered by observing the pupil's work in attempting to read isolated words that offer difficulty because of their length or unfamiliarity.

The spelling method is often successfully employed as a means of recognizing words. It is, however, a slow process of learning and of analyzing new words. It often interferes with the development of the more superficial type of word perception necessary and sufficient for rapid reading. It is mainly serviceable in the early encounters with certain non-phonetic words not pronounced in well-defined syllables, such as *ague, brought, child, does, laugh, once, count, height,* etc.

Pupils sometimes are found who rely too greatly upon the letter-by-letter attack. This habit may be produced primarily by early emphasis on the alphabet in

reading or in writing, or by early zeal in spelling, or by much early work or play with letters without sufficient or sufficiently prompt counteracting effects of syllabification, rapid word naming, rapid reading for the thought, and similar practices.

Phonetic analysis. — In American schools the favorite method of assisting the pupil to acquire a reading knowledge of new words is to teach him to work out the pronunciation by identifying and blending phonetic elements. Children are taught, in other words, to analyze the visual word into its constituent elements, of which there are many varieties, some used by one system, some by others. These elements may be single letters, two or three letter combinations or blends, such as *bl, tr, sch,* or syllables, such as *er, ing, ba,* etc. As the visual units are detected in the word the pupil gives their sound equivalents and then blends them together so that the total word is produced or suggested.

There can be little doubt of the value of this type of skill, could it be adequately and economically acquired. If pupils can learn to make such phonetic identifications and translations skillfully, this would be a good method of mastering many unfamiliar words. Phonetic skill, then, is of service in many instances, especially in dealing with the highly phonetic word of which unfortunately there are too few in English.

The phonetic attack, however, like the others mentioned above, is insufficient. The great mistake in American teaching has been the assumption that phonetic skill was all-important and sufficient, that the other types of training could be neglected, and that the

more phonetics the pupil got the better. These mistakes have resulted not only in waste but frequently in the production of a special type of difficulty in reading. So excessive has phonetic drill often been that pupils have become not only "word-form conscious" at the expense of interest in meanings but, even worse, they have also become word-detail conscious. Every word is a puzzle of phonetic parts; pupils have become phonogram jugglers. As they fail to perceive the meaning because of their excessive attention to the word-form so they also miss the whole word-form while dissecting its elements. Reading and word study become slow, laborious, mechanical performances. Serious deficiencies in word perception and reading ability are not infrequent results. Failing to secure the assistance in recognizing words which results from a certain way of seeing them as a whole-of-significant-parts and the help which may come from utilizing the context, these pupils, overtrained in phonetics, may become not only poor in sentence and paragraph comprehension but slow in acquiring a reading vocabulary. Thus phonetic skill in moderation is useful; in less degree, it leaves the pupil handicapped; in greater degree it may result in a more serious deficiency.

It should be noted that we have said merely that a moderate amount of phonetic *skill* is useful. We have so far said nothing about the means of acquiring such skill; certainly we have not said that the conventional systems of training are the best ones possible. In a later section we shall consider the merits of various methods of securing the skills desired.

Syllabication. — In this method the pupil attempts to break up the word into familiar syllables or parts of words. For example, he may break up the word *examination* into *ex-am-in-a-tion* or *exam-in-ation.* This procedure may be distinguished from the phonetic analysis in which such elements as *th, tr, bl,* or individual letters are sounded separately. The syllable method has many advantages even though it is not applicable to all words. The pupil should be encouraged not only to seek familiar word parts but gradually to enlarge the size of such parts so that such units as *inter, orious, ation,* and the like are recognized and pronounced as such without further analysis.

It should be realized that there is a difference between mere recognition of isolated syllables on the one hand and the identification of syllables in a word and the blending of these word parts on the other. Skill in breaking the word into syllables as a prerequisite to blending is the most important and difficult phase of this method. Some devices useful for this purpose will be described in the next chapter.

Visual analysis of words. — In phonetic analysis and syllabication, the pupil is expected to translate each element into its sound equivalent. A visual analysis without this phonetic character is also possible and useful. The pupil may " see " the several word parts one by one and thereby recognize the whole word without thinking of the sounds of the separate parts, just as he may observe the various features of a photograph of a face and finally recognize it as a picture of John Smith without thinking of any sound-equivalents of the sev-

eral features. Many of the word elements observed, indeed, may not be syllables or phonograms, but other divisions. Thus *bubble* may be seen as *b-ubble* or *bu-bble;* these being significant visual features for a particular child although not features easily rendered orally. The visual analysis is likely to be more productive, however, when it follows the types of divisions utilized in phonetic or syllabic analysis, since practice in the one then facilitates to some extent skill in the others. This method differs from the procedure mentioned under " observing striking word parts " inasmuch as it refers to observation not merely of one part but of all parts of the words. The two methods do, however, represent different amounts of the same type of attack. By taking into account all of the parts of the word, fewer errors are made as the result of substituting a wrong word identical in only one detail with the one observed.

Dependence upon context. — Pupils may learn to read a word, especially one known in spoken form, by deriving its probable meaning from the context in which it is found. Thus if the pupil is not familiar with the word *cigar* and has no aptitude for word-form analysis, he may nevertheless " guess " the word if it appears in the sentence — *The man was smoking a big black cigar* — in which the other words are familiar. The various types of word-form observation and analysis may and usually are combined with deduction from the context. Indeed, it is highly desirable that they should be simultaneously employed.

The method of trying to utilize the context as an aid

in recognizing words is a thoroughly wholesome one. It possesses the merit of placing comprehension foremost. When unfamiliar words are encountered this method introduces the minimum of distraction from the thought. If used exclusively or excessively, however, this method may lead to distortion of the thought and the practicing of errors in word perception. The result of these errors will be apparent in time both in misrecognition of words and in a limited reading vocabulary. This method alone is therefore insufficient.

That children should be permitted, indeed, encouraged, to "guess" unfamiliar words by utilizing the thought is a dictum that merits especial emphasis. Frequently teachers have such a sensitivity for mistakes in oral reading, such a horror of errors that they frown severely on "guessing" and "careless reading" and sometimes insist on a full stop while the pupil sounds or otherwise analyzes the word. This is really a mistake since it discourages the most intelligent and rapid device of learning new words. Excessive errors, of course, should not be permitted, but a moderate use of this method is highly desirable. A particular pupil needs material graded to his ability; material that expresses a clear idea with words mostly familiar and only one or two unfamiliar in the sentence. The exercises should be such, in other words, as to promise successful interpretation when the pupil makes a distinct effort to appraise the thought. As proficiency in the task increases, the material should offer greater scope to the pupil's ability.

Versatility of attack important. — In the preceding

discussions, it has been implied that no particular method is altogether futile or entirely sufficient. Each may serve on occasions and usually several may assist. This is due to the highly complex character of the English language. Certain words are easily mastered by a phonetic attack; others are unphonetic. Some can be easily divided into syllables; others cannot. Some possess striking configurative character; some greatly resemble a large number of other words in general shape. Some have striking minute details; in others, nothing is outstanding. Some words are encountered in context which may be most fruitfully utilized; others offer no contextual clues. There is, in sum, no single, all-sufficient device for becoming familiar with words. The best equipment consists of ability to use various methods coupled with a good feeling for the applicability of each to special cases. The best pupils are versatile. They utilize methods suitable to the situation or, at least, they quickly shift from a method proved futile to others. A pupil encountering a new word in a sentence may first guess at it from the context, checking the guessed form against the general appearance of the printed form. If the two seem not to agree, the pupil may observe the word carefully for familiar parts, such units as *-ring, -ment, ing, ere, er, ol,* etc. Whole words in compound words, or phonograms, or syllables, or striking visual features may be sought. If this type of observation fails, a more detailed analysis — syllabication, phonetic analysis, spelling (*i.e.* naming the letters), or visual study of letters and letter combinations — may be resorted to. Difficulties in word recog-

nition come frequently from relying exclusively on one method, especially upon a method ill adapted to the pupil's linguistic status at the time. Facility, on the other hand, results from a variety of skills and versatility in applying them.

Diagnosis of Methods of Learning and Perceiving Words

We have seen that pupils may learn new words by deductions from the context in which they are found and by a study of the characteristics of the word-forms. A number of the different aspects of the word-form may be primarily studied: The general configuration, certain features of the total pattern, or letters may be observed visually; letters, phonograms, syllables may be perceived and named or phonetically translated. Since it was suggested that most of the methods were of service in certain situations and that overemphasis of any method usually resulted in characteristic difficulties, it is apparent that tests should be devised to make possible a diagnosis of the pupil's particular strengths and weaknesses in studying unfamiliar words.

For this purpose, the author has been using three instruments which together make possible a fairly thorough diagnosis. The three tests are: (1) Gray's Oral Reading Passages; (2) Gates Graded Word Pronunciation Test; (3) Gates Phonetic Ability Test. Best results are achieved by using these three tests as a team, since certain interpretations depend primarily on the comparison of achievements on the three. We shall describe how the diagnoses may be made.

Use of Gray's Oral Reading Passages

Nature of Gray's Oral Reading Tests. — In order to ascertain to what extent the pupil can utilize the context as an aid in the recognition of words and to what extent certain other methods of word recognition function in the actual process of reading, Gray's Oral Reading Tests may be used. There are two types of this test: the original instrument known as Gray's Oral Reading Passages which consists of twelve short paragraphs of increasing difficulty and the newer " check tests " which comprises a scale of four steps in difficulty, each step containing several selections. Either test may be used for the same purpose. The finer gradations in the old test which made it possible to discover readily the most fruitful diagnostic level were an advantage partly offset by a somewhat laborious method of scoring. The later instrument provides for a more extended test on fewer levels. The writer frequently uses both instruments for very careful work: the first to locate the diagnostic level; the latter to extend the observation on that level as nearly as possible. Unfortunately the data given by Gray for the quantitative interpretation of the scores on the new test are not fully satisfactory for our present purposes.

Norms for the tests. — To obtain quantitative results from this type of test by a method less laborious than that demanded by the original procedure and less difficult to interpret than the results secured with the newer " Check Test," the author, utilizing a modified method of scoring, has given the " Passages " together

with the Gates Graded Word Pronunciation, the Phonetic, and other tests to a large number of pupils. From these results have been constructed tables by means of which raw scores may be converted into age and grades scores, thereby making results on the several tests comparable. These tables together with directions for administering and scoring the tests are given in the Appendix. The use of these tests as a means of diagnosing methods of word recognition will be described here.

Use of Gray's Oral Passages in Diagnosis. — How a pupil attempts to work out the recognition of words is revealed most clearly by his achievements and errors on passages that include unfamiliar words. Using Gray's Passages, the child may be tried on paragraphs that include an increasing number of unknown words.

The pupil who utilizes the context generally reads more or less fluently and gives a rendition that makes sense. He does not always convey the meaning actually printed. Especially when the material has become rather difficult, he may really read but little and fill in the remainder. The result may be a distortion of the thought to a greater or less degree; but the pupil is unmistakably trying to render a meaningful account. As the material becomes harder, many pupils shift the attack to smaller thought units. Beginning with efforts to grasp the paragraph as a whole, they may strive to understand whole sentences and later phrases. In fairly difficult reading these pupils are likely to change the order of words and phrases, to

substitute, insert, omit, and repeat. They may often be observed to repeat, either aloud or silently, a phrase or line preceding a difficulty in order to bring the context to bear upon it.

The pupils who do not utilize the context may be detected by the difference in attack upon the unfamiliar word. They may hesitate while they study at length the word-form. The word may be rendered according to the type of word-form clues utilized with little or no regard to its senseful connection with what precedes or follows. If their method of study is not deliberate and analytic, a tendency to pronounce a word resembling the one encountered as a whole or in some detail with little regard to the thought will frequently appear. When the material becomes very difficult, these pupils may render a quite meaningless jargon or merely conduct a series of prolonged studies of isolated words. Even on selections moderately difficult for them to read, they can recall little of the substance of the passage read. There are many who read for the thought until they encounter a number of unfamiliar words, whereupon they shift abruptly or grudgingly to a mechanical word study with little attention to the meaning.

With a little practice, it becomes possible to ascertain to what extent the thought actually is utilized. By comparing the age or grade equivalents in this test with those obtained from the Gates Pronunciation Test, the degree to which context is used is also suggested. This test also makes possible an appraisal of the pupil's versatility in the face of difficulties and the effective-

ness with which the attack is adjusted to the type of word difficulty encountered.

Use of Gates Graded Word Pronunciation Test

Nature of the test. — The Gates Pronunciation Test consists of one hundred words graded in difficulty. A reproduction of one form of the test is shown in the Appendix, page 374. Since this test consists of isolated words, the device of deriving the recognition from context clues is eliminated and the other devices may be observed in unadulterated form.

Method of diagnosis. — The pupil begins this test at a level at which errors are rare and continues until he reaches a level at which successes are rare. He is given two trials when needed on each word. After a little experience it becomes possible not only to detect the type or types of attack that the pupil utilizes, but also to keep records in such a way as to indicate the details of the procedure. The various methods of attack have been considered above. They may be indicated by such records as the following: *f-o-r-t-u-n-e* means a letter by letter attack; *fo-or-fo-or-t-t-un* indicates a phonetic attack in which the pupil repeated the sounding of certain syllables as shown; *for-tun* or *for-tune* indicates syllabication; *forty* means a whole word method without analysis resulting in error.

In using this test it is sometimes difficult to distinguish between analysis by visual perception only and the naming or sounding of letters, phonograms, or syllables. Usually the latter attacks are accompanied by lip movements which nearly always are found in the

work of children. When no lip movements or audible sounds appear, the examiner may profit by observation of the eye movements and by the pupil's own account of what he is doing. While it is true that some pupils are not fully aware of the methods they are utilizing, others can give a very accurate account of their procedure. Frequently the pupil will respond to a request to "do it out loud." Fortunately, in the large majority of instances little trouble is experienced in detecting the pupil's type of attack since the trials are accompanied by speech, whisper, or lip movements.

Comparing results on Gray's Oral and Gates Pronunciation Tests by means of norms. — The frequency with which a pupil succeeds in recognizing words that were not immediately known is a good indication of the general effectiveness of his method of attack. It should not always be assumed, however, that mere laborious success is all that is to be expected. Ease and dispatch, often secured by a change to less detailed devices, is highly desirable. Using the norms given in the Appendix, a suggestion of the degree to which the pupil uses the context as an aid in recognizing words may be secured by comparing the age or grade scores obtained in the two tests. These norms, which are based on results obtained by giving both tests to the same pupils, are arranged especially to make this comparison valid. If the pupil does appreciably better on the Gray's Passages than on the Gates' Words, it is highly probable that the context has been fruitfully utilized. If the age or grade scores are approximately the same, it is probable that the context is utilized to an average degree. If the

score is appreciably better on the Word Pronunciation Test, it is probable that the pupil makes relatively little use of the context — a deficiency that certainly should be remedied. If the pupil depends so greatly on the context and so little on word-form clues as to produce an unusual number of errors — word and phrase omissions, substitutions, change of position, etc. — and to distort the meaning, the remedial work should attempt to increase the standard of accuracy by building up skills in word-form perception which provide a supplement to the use of the context.

Use of Gates Phonetic Ability Tests

Gray's Oral Passages provide a means of observing phonetic and other analytic skills in the actual process of reading; Gates Pronunciation Test makes possible the discovery of the techniques utilized in working out the recognition of words when the influence of context is eliminated. A further test, constructed and tried out by the author, was designed to test abilities to recognize and deal in certain other ways with the individual word elements. The author regards the two preceding tests as of far greater utility than this one, since mere ability to recognize word elements in isolation does not guarantee aptitude in analyzing or recognizing words which contain these word-parts. If the pupil cannot deal with the whole words, however, it does not follow that he is unfamiliar with the word elements as such. This test, then, is primarily useful as a further diagnosis of those pupils who show little or no independent

ability to work out the recognition of new words in the preceding tests.

The test consists of several parts as shown in the reproduction in the Appendix, page 382. Full directions for the several examinations are given in the Appendix. In brief, they are conducted as follows:

1. **Reading letters.** — The pupil reads the two lines of capital letters as rapidly and accurately as possible. The time indicates fluency of recognition and pronunciation; the errors indicate deficiencies. After the test is completed the letters mispronounced should be presented again in order to ascertain whether they were really unknown or merely misrecognized in rapid work.

2. **Reading lower case letters.** — The two lines of lower case letters are used exactly as in Test 1.

3. **Phonetic translation.** — Lines 1, 2, 3, 4, 5 include phonograms found in studies by Osburn,[1] Washburne,[2] and others to be most common in the words frequently appearing in children's or representative literature. These are, in other words, the most widely encountered phonetic elements of their types. Each line represents a general type. The test enables the examiner to determine a pupil's knowledge of common phonograms of different types.

The sixth line comprises combinations of phonograms used in the first five lines. This test is used to see with what skill a pupil can recognize phonetic ele-

[1] Osburn, W. J., *Bulletin on Remedial and Follow-up Work in Silent Reading*, No. 1, Public School Publishing Company, p. 925.

[2] Washburne, C. W., Vogel, M., and Jaycox, E., *Elementary School Journal*, February, 1923.

ments in a larger word-form and work out a reasonable pronunciation of the total by blending or combining these units.

How well the pupil succeeds in these tests may be decided on the basis of the examiner's own convictions concerning the proper degree of knowledge of such elements and skill in handling them or by comparing the scores obtained with the averages or norms given in the Appendix. These tests show what degree of familiarity a pupil has achieved with the phonetic elements; whether he can readily name or sound the letters; pronounce or sound the larger phonograms and detect phonetic elements in new combinations. If the pupil has no facility in recognizing or sounding such units, one type of remedial work is indicated; if he can recognize and sound the elements here given, little more work along this line is needed. If, knowing the elements in isolation, he cannot readily handle such new combinations as are given in line 6, or such as constitute the unfamiliar words in the Gates Pronunciation or Gray's Reading tests, other types of follow-up work are suggested.

In the next chapter, the various types of remedial work suitable for pupils suffering from such difficulties as were presented in this chapter will be taken up in detail.

REFERENCES

The Gray's Oral Reading Tests are described in:

1. GRAY, W. S., *Studies of Elementary-School Reading through Standardized Tests.* Department of Education, University of Chicago, 1917. These tests are distributed by the Public School Publishing Company of Bloomington, Illinois.

The Gates Graded Word Pronunciation Tests are described in:

1. GATES, A. I., "A Test of Ability in the Pronunciation of Words," *Teachers College Record*, November, 1924, pp. 205–20. These tests are distributed by the Bureau of Publications of Teachers College, New York City.

The technical details concerning the Gates Phonetic Ability Tests will be given in a forthcoming monograph. References to various studies of topics related to those presented in this chapter are given in Chapter VII.

CHAPTER VII

REMEDIAL INSTRUCTION FOR DEFICIENCIES IN LEARNING AND PERCEIVING WORDS

In this chapter we shall discuss several methods of increasing the reading vocabulary, of developing effective methods of word perception, and of improving the technique of independent word recognition. To secure the fullest returns from a reading of this chapter, the points presented in the preceding chapter which dealt with causes of difficulty in word mastery, the various methods utilized by children in word study and the means of diagnosis, should be fresh in mind.

What Words to Learn

Selecting the words. — The first problem is that of selecting words to teach. Other things being equal, it is desirable for young pupils to learn the words that are most commonly encountered in the better children's readers and story books, that most frequently appear on signs, posters, etc., of interest to children, that are widely used in speech by children, and that are associated with things and events of significance in the lives of young folks. Such a list the author attempted to draw up in a Primary Word List. This list, as stated in Chapter III, contains 1500 words classified according to the parts of speech and arranged

in order of merit on the basis of a composite of criteria. While this list does not contain all the words worthy of learning, the words it does contain are all worth mastering. When this vocabulary is exhausted, the words in the Thorndike list should be taken up. By following these two lists the most widely useful reading vocabulary may be acquired with the least expenditure of effort.

How to Learn the Words

As was emphasized in the preceding chapter, the most effective method of learning words includes both the clear apprehension of the word's meaning and an effective perception of the word-form. To emphasize the recognition of the word's meaning, each learning situation should be so arranged that the response demanded will be erroneous unless the meaning is accurately apprehended. This is a very important matter. It is the essential characteristic of the methods to be recommended here for remedial work. Although the importance of perceiving a word acutely, of being able to see its general configuration and its details, of being able to divide it into syllables, to translate its phonetic elements, to sound and name its letters is recognized, we feel that training in methods of study of the word-form without regard to the meaning is insufficient. What we must attempt to do is to discover procedures in which these several perceptive abilities are developed as an intrinsic phase of comprehension exercises. We shall first give our attention to a group of such exercises.

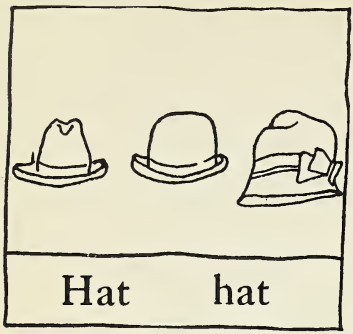
Study of Individual Words

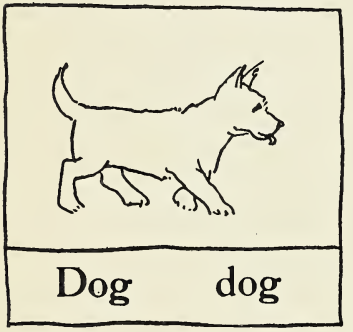
The picture dictionary. — One of the effective devices for developing an interest in, and mastering of, words is a picture-word dictionary. The procedure to be described has been used with gratifying results with deaf-mutes as young as four years of age without knowledge of language of any sort, with bright and dull normal children of various ages from four to eight, and with various types of pupils deficient in reading.

Each word was mimeographed beneath a picture which indicated its meaning. In one type of material used, two different words each appeared twice on a large sheet. (See illustration on page 281.) On the reverse side of the sheet at the middle of each quarter of the page the words were printed alone. The pupil cut the sheet, which was made of heavy paper, into the four cards. Two of these were fitted into the dictionary and the other two were reserved for flash drills and games to be described presently.

The dictionary dummy consisted of twenty-six cards fitted on large rings. The cards were alphabetized with capital and lower case letters printed on narrow extending strips.

The pupil's first task was to fit the cards into their proper places in the dictionary. This required correct perception of the initial letter and the discovery of the same letters in the dictionary dummy. In this way the alphabet was learned in an effective manner and for a practical purpose. The dictionary served as a reference book to be used when needed. It also served





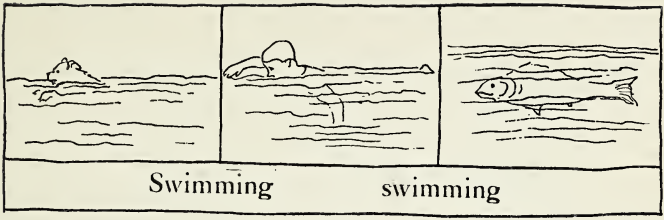
as a study and review book, since by going through the book in reverse order the words appeared alone. The pupil tried to recognize the words and immediately checked his reaction by turning the page to observe the pictures which indicated the meaning.

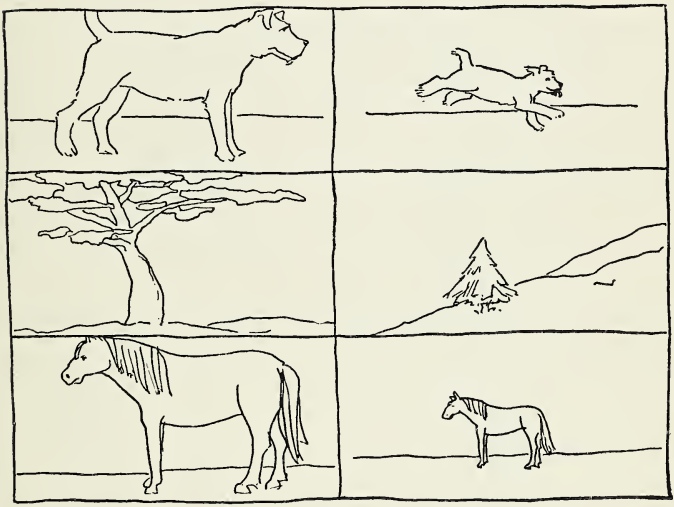
On the left are some samples of the way in which the word meanings were indicated on the cards.

Common nouns were shown by drawings.

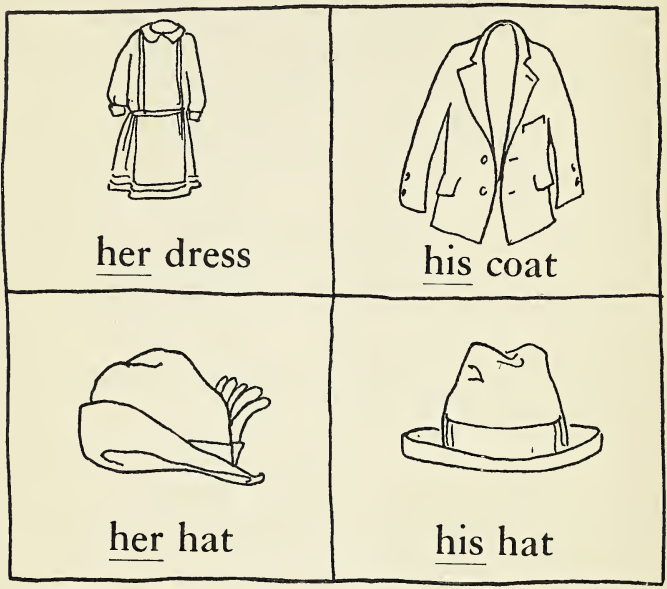
Most verbs were depicted by using three illustrations different in all respects save the action. This is shown in the first illustration on page 145.

Adjectives were usually shown by illustrations of one quality contrasted with illustrations of an unlike quality, as is shown in the second illustration on page 145.


Swimming
swimming


Big
big
Little
little

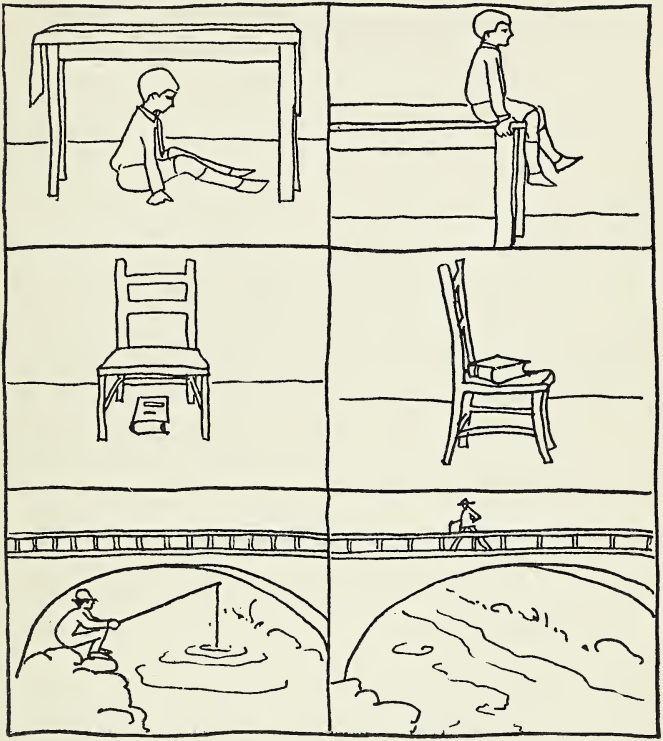
Pronouns were usually pictured in a like manner, thus:



Her
her

His
his

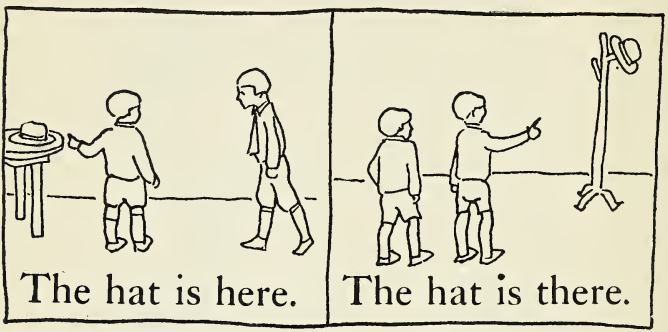
Many prepositions were shown in a similar way, for example:



Under
under

On
on

Certain words like *is, there, here,* etc., were illustrated by a combination of picture and context all the other words of which were known to be familiar. The principle of contrast was sometimes used as here shown.



Here
here

There
there

Children rapidly acquire the habit of analyzing these pictures in such a way as to detect the meaning they are intended to convey. In this practice they learn to make use of the context clues and the characteristics of the word-form at the same time.

The cards not used in the dictionary were utilized in a variety of ways of which we need offer but a few examples.

Cards used in study. — These cards may be turned picture side down and used in study and test exercises. The pupil retains the cards erroneously recognized in order to try them again later until all are correctly

read. One child may act as examiner for another who is asked to pronounce the words as they are presented. Some children, by giving hints to the pupil who is trying to recognize the words, encourage very desirable habits of using thought cues. In these tests the examiner, who has the word and picture side toward him when the word side is exposed to the subject, should himself make no errors and always be able to correct errors made by his subject.

Execution exercises. — The same cards may be used in exercises in which comprehension is indicated in a more active way. The teacher or pupil exposes the word side and asks the pupil to demonstrate, to draw, or otherwise to indicate the word's meaning.

Thus, for *stand* the pupil may rise; for *window,* he may point to the object; for *milk,* he may pretend to drain a glass or to milk a cow; for *automobile* he may imitate the steering movements or the honking of the horn. Since the subject may entertain the pupil examiner by using subtlety in his demonstrations, both often enjoy the work greatly.

Matching game. — The picture-word cards are arranged in overlapping order so that only the pictures are visible. Each child receives a number of word slips among which are all the words needed to match the pictures and some extras. The latter may be very unlike the correct words or very similar. In the latter case precise perception is stimulated and the game is made interesting for those who could very readily master a simpler problem. The pupils having matched the words and pictures correct their pairs by pulling

out the cards to expose the correct words beneath them.

Spinning wheel game. — Interesting variations of this game may be made by using various mechanical contrivances such as a large spinning wheel with pictures in the center and words at the circumference. The wheel around which the children sit is spun and each pupil selects the picture which illustrates the word that stopped before him. The pupil keeps the card if his recognition is correct. The child who gets the largest number wins.

Grab-box games and other activities enjoyed by children may be arranged with such cards.

Merits of word games. — These games and exercises are quite as interesting as many in which children spontaneously find keen pleasure. The psychological principles of word learning, so far as the arrangement of stimulus, response, and check is concerned, are properly utilized here. There is no good reason why real words rather than hieroglyphics should not be used in such pleasant occupations. Interest is high. The games are self-manageable; they may be played at home or elsewhere. The danger of practicing errors is practically negligible. Abundant review can easily be arranged and variety of activity provided. Children secure the zest of demonstrable progress and learn to take the whole project of learning words into their own hands. For children who have learned words slowly for whatever reason, such exercises have proved very useful.

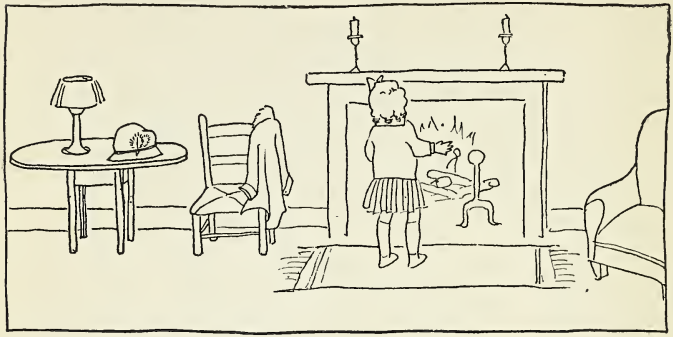
It should be noted that all these exercises and games require not only recognition of the word's form but

grasp of the word's meanings. The checking with the pictures requires the comparison of the meaning of the illustration with that of the word-form. Both this act of checking and the direct study of words in association with pictures stimulate the effort to use simultaneously the picture context and the characteristics of the word-form. To develop such habits of using both context and effective methods of word perception is precisely the achievement sought.

If a further variety of games is desired, they may easily be constructed by variations in the structure of the cards. For example, an interesting game patterned after "Authors" may be made of word cards which are similar to those used in "Authors" with words that fall into several classes such as animals, what cats do, furniture, parts of the body, etc. These cards are dealt out and as in the original game pupils attempt to make up "books" or classes by calling upon their companions.

Picture checking tests. — Several picture checking devices have proved to be useful in word study. One of the favorites which was used in the first stages of work with the deaf consists of a word accompanied by four pictures. An illustration is given below. The same type of exercise may be made more difficult by using only illustrations beginning with the same letters — such as bread, brown, brook, broom — precisely as in Primary Test 2. As in Test 2, these exercises may be used to secure a transition to more and more difficult materials, words, phrases, sentences, or even paragraphs and stories.

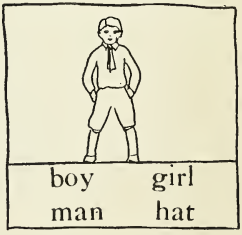
Exercises in which one picture and several words are given may also be used for variety, for example:



girl	hat	chair	window
boy	coat	rug	table

The pupil draws a line from the word to the object which shows its meaning.

Another form, similar to the Word Recognition Test, may be made in several ways.



In some respects these exercises are less satisfactory for practice — although entirely suitable as test instruments for occasional use — because the normal process

is to read the word first and then to find the thing which indicates the word's meaning. When the more complex pictures are used this type of exercise does encourage an appraisal of the picture context which is immediately utilized in the perception of the word and thereby stimulates the desirable combined reaction to context and word-form.

Drawing word meanings. — Another variation consists in using a series of words the meanings of which are to be shown by drawings which the pupil makes. For example:

rat	stop
run	fall

In each space the pupil draws a rough sketch, such as a picture of a hat, of a child and dog racing, of a policeman with his hand raised and a stop sign, of a child falling from a horse.

Exercises Designed to Produce Sharp Perception and Analysis of Word-Forms

In the preceding chapter, the value of various ways of seeing and analyzing words as a means of developing greater ability to learn and to recognize them was emphasized. To achieve these results five requirements must be fulfilled.

1. It is necessary to establish familiarity with various sorts of common word elements, letters, phonograms, syllables, and striking visual features, such as were discussed in the preceding chapter.

2. It is necessary to develop skill in several types of word-form analysis. The pupil must become sensitive to similarities and differences in word elements and configurations; he must develop not only familiarity with common word elements but also ability to see these characteristics in actual words. It has been shown that pupils may learn to recognize word elements in isolation or in a few familiar words and yet be unable to see them in other words. The ability to analyze whole words into such elements must be developed.

3. It is necessary to develop ability to construct the word from the elements analyzed. This process is often called " blending " but it is often more than mere phonetic synthesis. It often does and should include, in addition to sounding the word parts in succession, a unified impression developing out of apprehension of the general configuration and certain characteristic visual features. The word is recognized as the result of the contribution of each of these clues. The ability

to take advantage of the several clues simultaneously is the outcome of certain types of practice.

4. It is necessary to develop an effective way of perceiving words wherever they are encountered, whether in isolation or in the midst of a passage being rapidly read.

What is wanted is the habit of seeing a word as a group of familiar and simpler parts and of seeing it clearly rather than vaguely or confusedly or only a detail of it as one would first perceive a complex Chinese character. Just as the trained musician hears an orchestra as a whole and at the same time as a related group of familiar units whereas the novice hears only a confused, undefined storm of noise, so the effective reader sees the word at once as a whole of clearly perceptible parts whereas certain poor readers see only a confusion of letters. [1]

It has been found that the acquisition of speed and accuracy in reading depends greatly upon developing this comprehensive type of word perception skill.[2]

5. It is necessary to acquire ability to utilize the several types of word-form perception simultaneously with the word context when it is necessary to work out the recognition of an unfamiliar word. In the preceding chapter we discussed the difficulties of depending wholly on the meaningful setting of a word or upon the characteristics of the word-form. Both provide useful clues but both should be utilized at the same time.

Many teaching devices have been used to establish such skills as these. In several studies, the author

[1] This quotation is from tuthor'she a *Psychology of Reading and Spelling with Special Reference to Disability*, New York, Teachers College, 1922, p. 46. In this monograph the characteristics of perceptive reactions in reading and spelling are discussed in greater detail.

[2] See *op. cit.*

attempted to discover the contributions made by the more important of these types of devices. The recommendations which are made in this chapter are based upon the findings of these and similar investigations. (See references at the end of the chapter.)

General nature of the method. — The method to be recommended presently is based primarily upon the extensive use of what we have previously termed the intrinsic device. The procedure is intrinsic in the sense that there are no supplementary or special-period practices devoted exclusively to drill on the skills mentioned above. On the contrary, all practice is conducted partly for some other practical purpose. It is an activity that would be conducted anyhow; one that could be justified on the basis of entirely different outcomes, such as the development of comprehension in reading. The special skills are brought out by means of the mechanical arrangement of the material used. The reading materials are so presented that, in order to achieve some primary purpose such as comprehending the thought, the pupil must exercise one or more of the skills mentioned above. The words, moreover, are so arranged as to facilitate the acquisition of these skills.

In arranging materials for this type of practice there are three problems to be considered:

1. The essential requirements of the mechanical arrangement of words.
2. The choice of types of word elements.
3. The organization of exercises in which the special skills are exercised as an intrinsic phase of other work.

The arrangement of words. — The main requirement is that words be so arranged as to give emphasis to their common elements and distinctive characters and to require very accurate perception of the word-forms in order to solve the exercise correctly. There are two general types of arrangement which fulfill these requirements. Other arrangements may be made which combine the elements of these two types.

In one type, two or more words are arranged in a vertical column. The following are examples:

back	cap	made	bell	ball
baby	car	mad	tell	bell
ball	cat	radish	sell	sell
bath	can	sad	fell	tall

In the first column, the *ba* element is common; in the second the *ca;* in the third the *ad,* in the fourth the *ell,* in the fifth, the *ll.* In some columns the visual element has the same sound in all four words, in others such as the third, the visual element *ad* is the same but the sound equivalents differ. Each series, however, is mechanically arranged to throw into relief certain similarities and differences among the words. When the pupils are required to select from such a column the one word needed to solve some practical problem, they are forced to discriminate sharply and are assisted in identifying the common elements.

The second type of arrangement comprises a horizontal row of words which are alike in certain respects and unlike in others. For example:

bad, back, bath, bag
there, these, them, they
run, sun, fun, gun

This type of arrangement is usually a little more difficult than the preceding one for the reason that the similarities and differences are not so easily compared. The first type, in other words, brings out the like and unlike characters somewhat more strikingly than the second. For certain teaching purposes, especially in the beginning stages or in work with older pupils deficient in these skills, the vertical arrangement is especially helpful. Practice in choice among similar words arranged in rows is quite necessary, however, since the pupil must learn in the course of time to distinguish such similar words when they are viewed one after another on the printed line in ordinary material.

Various combinations of the two arrangements may be made in connection with several types of exercises. For example: a block of words such as

bell	tell	ball
sell	fell	fall

includes the elements of both arrangements. Other illustrations of the combination of both types will be found among the exercises which will be given shortly.

The choice of types of word elements. — In general, it may be said that words which are similar or identical in any respect may profitably be used in such arrangements as have just been described. Words may be alike in any of the following respects.

A. Words alike in some visual detail. — (1) Initial letter or letters alike as in *pull, pale; gate, garden; garden, garret.* (2) Middle letter or letters alike as in *put, rub; matter, lettuce.* (3) Last letter or letters alike,

as in *rat, met; under, mother.* (4) Both initial and middle initial and final, or middle and final letters, alike as in *bark, barn; mother, miller; mother, brother.* (5) One or more syllables alike as in *supper, supply; telephone, telegraph; brought, thought; sight, fight.* When syllables are alike, the words are also alike in certain letters as in the above categories, of course, but words may have several letters alike without identity of syllables, as in *ball* and *bell.* (6) One or more words alike as in *something, somebody, somewhere; night, nightgown;* etc.

B. Words alike in length. — In the examples given above some of the words having certain letters alike are identical in length or at least in the total number of letters, such as *pull* and *pale,* whereas others are of different length as in the case of *wet* and *weather.* Other things being equal, words are harder to distinguish when they are of the same length. When differences in length cannot be used as a clue to distinguish words, other characteristics must be relied upon. This fact should be recognized in arranging practice exercises. If it is desirable to concentrate attention on such an element as *un* it is better to use a series of the same word lengths such as *fun, gun, run* than to use words of different lengths such as *fun, running, sunny* since the latter words may be distinguished on the basis of length and other differences.

C. Words alike in general configuration. — Words may have certain elements in common and yet vary considerably in similarity in general configuration. For example, *sand, bane, mane,* and *band* all have the

same two letters *an* in common with *want*, yet in general appearance some resemble the last word more than others. Since it is desirable to cultivate skill in distinguishing words on the basis of general configuration, exercises of the types to be illustrated presently, composed of words carefully graded in this respect to fit the pupils' developing ability may be used.

D. Words alike in phonetic elements. — Words may have one or more identical letters or syllables which are sounded either in the same way or differently. In the former case, the elements are commonly called phonograms. A generous proportion of the common elements used in the exercises should be phonograms in order that ability to perceive and utilize the sound equivalents of word elements may be developed. It is not necessary or advisable, however, to restrict the exercises entirely to phonograms. Words like *made, mad, maid, sad* may be used in the same exercise. Such arrangements provide practice in detecting visual similarities, and may lead to a curiosity about the phonetic inconsistencies in English words that should not be unduly concealed. When questions are raised, opportunities are provided for certain useful explanations concerning visual and auditory characteristics of words. In rapid perception, moreover, children utilize visual characteristics of words without sounding them separately. Such skill should be cultivated.

E. Words made of letters in reverse order. — Many pupils are prone to call a word another which is really the first word reversed. Thus *was* and *saw, net* and *ten, ton* and *not,* and the like are confused. To assist

the pupil in clarifying the distinctions between such words, and others frequently confused though not exact reversals, such as *for* for *of*, *won* for *row*, etc., they may be included in such groupings as were recommended above. When placed in such arrangements, the differences between these words are shown in relief.

Use the most common word elements. — Certain word elements are found more frequently than others in the English language in general and in special selections of words from the whole vocabulary. It is advisable to use those elements which appear most frequently in the word list which the pupil has been studying and will be studying during a school year. The author has tabulated the frequency of the various types of elements given above which appear in his Primary Word List of 1500 words. The results, which are too extensive to give here, may be found in another publication listed at the end of this chapter. The titles of certain studies of other vocabularies are also given among the references.

Organization of practice exercises. — Words which include elements similar in any of the respects just reviewed may be arranged in various forms of word study exercises which are substantially the same as those illustrated in the preceding section in this chapter. For example, the words may be arranged under, over, beside, or around a picture which indicates the meaning of the word that should be identified. All of the games and activities conducted with these cards, as described above (see pages 148–53), may be duplicated.

When words similar in certain respects are used, various additional games may be easily arranged. The following are examples:

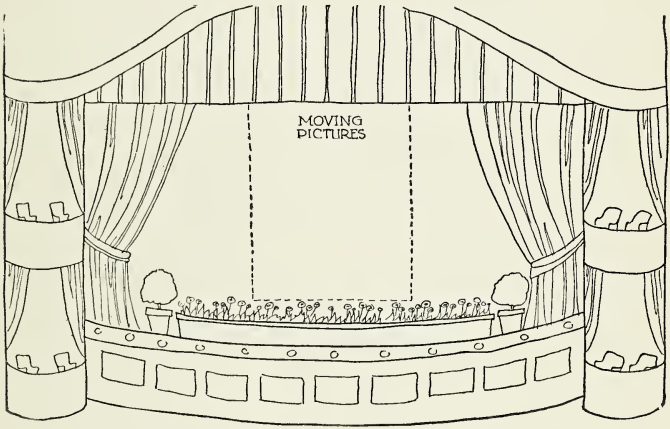
Domino game. — Use about twenty-four different cards, all words of the same length and every word on at least two dominoes. Thus *car* may be at one end, *cat* on other end of a domino-like card. Play like dominoes. Each child must pronounce the words. The player who gets rid of his cards first wins. Include many cards containing the elements to be emphasized.

Calling card game. — Use about twenty words and make two copies of each *i.e.* forty cards in all. Deal out about seven cards. The players discard words for which they have matches. They should take turns in calling for words needed to match the cards in their hands. The remaining cards are dealt out as necessary. The child that matches all of his cards first wins; others count their pairs. Words of special difficulty for the children playing should be freely used.

"Authors" game. — Sets of words with similar beginnings or endings *e.g. ball, bat, baby, base, bark* — may be used in the manner of the familiar "Authors" game.

The use of phrases and sentences in improving perception and analysis of words. — It is neither necessary nor desirable to confine all practice for the purpose of sharpening word perception and emphasizing the elements of word structure to exercises composed entirely of isolated words. The same types of perceptive reaction may be established with comprehension exercises

involving phrases, sentences, and paragraphs. Indeed, most of the exercises described in Chapters IV and V may be made to serve the present purpose admirably merely by requiring a choice among words and phrases which are similar in beginning, end, or some other part, or several parts, or in general configuration. Only a few examples of such exercises used in our experimental and remedial studies will be given.



Color the curtains blue.
Color the flower box blue.
Color the flowers red and green.
Color the wall brown.
Draw pictures on a strip of paper.
Color the pictures.
Cut the dots for the moving picture.
Put in the pictures.
Pull them into place.

Directions. — Directions chiefly to cut out, color, and arrange certain cut-out and stage picture materials were frequently arranged as shown on page 163.

These materials are so arranged that the eye can readily catch at once such combinations as *color* above *color*, *blue* above *box*, *blue* beside *box*, *flower* above *flowers*, *cut* above *put*, and the like.

The bird is above the tree.
The bird is about the tree.
The bug is above the tree.

True and false statements. — Sentences such as the ones here, in which the picture tells which statement is correct, serve the same general purpose. In this type of exercise similar phrases as well as similar words may be used, thus encouraging accurate phrase perception.

True and false statements depending on a reading selection. — The pupil first reads a selection written primarily to be interesting or useful, or passages from good printed readers, story books, etc., and then reads a series of phrases or sentences and indicates the statement which is correct. On page 165 are samples of comprehension exercises composed of three statements each.

Peter sees a brown toy squirrel.
Peggy sees a brave toy soldier.
Peter sees a brown toy school.

He has three ears.
He has three cars.
He has two ears.

The boy had a dog.
The toy was broken.
The boy saw a broom.

Completion exercises. — Completion exercises consisting of questions or statements concerning the context of passages previously read may be arranged in the following form:

1. "I want to —— tag," said Peter.
2. "I will call Tom," said ——.
3. "We shall play in the ——," said Peter.
4. They had a fine —— in the barn.

A number of cards with correct and similar but incorrect words (such as *play, plan,* and *hay; Peggy* and *Peter; barn, farm,* and *bark*) are provided with which to complete the statements.

Selection exercises. — Exercises of the following types may be arranged so as to require the careful perception of words or phrases.

told
Who will tell Peter to come?
bell

"I who,"
"I will," said Peggy.
"I well,"

He came.
What did Peter do? He sang.
He cried.

The selection of phrases or short sentences may be used in such puzzles as the following:

I can run.
I can purr.
I like milk.
I like mice.
What am I?
A coat
A cow
A rat
A cat

Other types of exercises suggested in previous chapters for use in developing paragraph, sentence, and phrase comprehension may be composed of similar words.

Merits and limitations of the intrinsic devices. — Exercises of these types can be arranged in any degree of difficulty of word discrimination and for any degree of subtlety of comprehension. They may be prepared for all sorts of material. Since they are arranged so as to make comprehension absolutely necessary in order to solve the exercise, they stimulate the use of the context as a means of assisting in the perception of the word-form. At the same time they demand highly accurate observation of the word-form which stimulates precise perception of the word structure. They provide further for the effective display of common word elements such as initial, final, and other letters, diphthongs, syllables, phonograms, words in compound words, general and partial word configurations. They provide also for the effective display of striking but easily overlooked differences between words such as *those* and *there, was* and *saw,* and the like.

As was mentioned above, the writer has put these exercises to various experimental tests from which have been discovered their general merits and defects. The results of these tests are, or will be, published in full elsewhere. They need merely to be summarized here as follows:

1. Children seem greatly to enjoy such exercises.
2. When exercises of this type were used for one group and an equivalent group used none, but devoted itself to regular reading without phonetic or other analytic drill, the pupils in the former group greatly excelled the latter in general accuracy of reading and independent ability to analyze and master new words.
3. Classes which used these devices greatly excelled other equivalent classes, which spent an equal amount of time in the most approved types of phonetic drill, in all phases of reading comprehension, and in ability to recognize unfamiliar word-forms in the process of reading. The groups trained by the intrinsic methods excelled the others trained by phonetic methods in various tests of silent reading, in the average by about 35 per cent.
4. The use of these devices has been markedly fruitful in the case of particular individuals for whom other methods, such as the conventional phonetic and "look-and-say" procedure, had been unproductive.
5. For certain few pupils, work with these exercises alone as above suggested, although very useful, is not altogether sufficient.

The fact that a certain small number of pupils do not acquire the technical skills mastered by the others

indicates a limitation in what may be done by such mechanical management of the learning situation. A similar limitation is likely to be found in all learning of complex skills which is guided exclusively by the arrangement of the study materials. In addition to such guidance, the assistance to be rendered by a teacher by word of mouth, demonstration, and other means is nearly always considerable and sometimes quite essential. Such guidance is to be used not to supplant but rather to supplement the training provided by adequately arranged lesson materials.

Further Methods of Instruction

In order to assist pupils to master the technique of learning and reading words, many types of instruction have been used and suggested. Which of these are most useful should now be considered. The various methods to be discussed are as follows:

1. Guidance in perceiving word elements
2. Guidance in word division; syllabication
3. Use of phonetic training
4. Use of flash cards
5. Encouragement in use of the context

Guidance in perceiving word-form elements. — In some of the experiments performed by the writer with such materials as have been described for calling attention to word parts, teachers were not permitted to give the pupils individual suggestions and guidance. Under these conditions a small number failed to develop the skills sought. When, in addition to using these materials, the teacher rendered assistance and gave relevant

instruction when needed, those who had experienced difficulty were greatly helped. The alert teacher, interested especially in assisting pupils who have shown deficiencies in learning to recognize words, will study the individual cases and render suggestions as needed.

The suggestions may often take the form of pointing with a pencil or underlining the similarities and differences among the words that appear in such exercises as were shown above. The word elements may be pronounced or otherwise emphasized. What the pupil needs is some assistance in getting oriented toward the task. He may need only to have his attention called to the existence and frequency of such word parts. While most children make these discoveries early and easily by themselves, some do not, and the kind that do not are frequently those most in need of remedial treatment. Usually no more than a moderate amount of guidance, direction, and emphasis of these simple types is needed to increase greatly the returns to be achieved with the practice material suggested above. It is imperative, however, that the help be given when it is needed.

Guidance in word division. — While pupils using the practice materials rarely fail to develop a perceptive keenness for word elements and wholes, they may occasionally fail to acquire the device of dividing the word up into its constituent elements — syllables or phonograms or whole words in compound words. Most pupils seem to need no special help in acquiring this skill since, in pronouncing words, syllabic divisions are made which usually are observed to correspond to the

visual elements. Some, however, fail to learn adequately to break the word into parts either in reading or spelling. This skill is a highly useful one and it is very important that it be acquired.

Among many devices tried for this purpose, the author has found most simple and effective a procedure first studied in 1921 and since tested in comparison with others. During oral reading of interesting material, training is given whenever a word is encountered which offers difficulty. At first the teacher uses a card with which she covers all but the first syllable, asking the pupil to pronounce this syllable. Next the second syllable is exposed alone and pronounced, and so on. Then while the whole word is exposed the pupil himself picks out the several syllables and pronounces them in succession. The procedure is to begin with small units such as single phonograms or syllables and advance to larger units as the pupil gains ability. The teacher should help the pupil to discover such divisions as are suitable to his ability at the time and later encourage him to deal with more inclusive units if, indeed, this is necessary. The pupil is to be taught primarily neither a number of specific word units nor the ability to break up into elements a large number of specific words but, on the contrary, the *habit* of attempting to break up any new word into smaller units that can be handled separately and of combining them when an attack on the word as a whole would be futile. Often surprisingly little training will be needed to establish the disposition to break up words into parts in this way. Once this habit is established the other

forms of training suggested in this chapter will be more fruitful.

During the practice in breaking up words into their parts pupils may be directed, especially at first: (1) to skip no word of whose pronunciation they are uncertain; (2) to work out the pronunciation wherever possible by themselves; and especially (3) not to lose the meaning while engaged in analyzing the word but, if the task offers special difficulty, to re-read the whole sentence to secure the facilitating effect of the context and to learn to utilize both devices at once. The efficient teacher will always be alert to prevent a new device from upsetting other desirable habits and to see that the desirable reactions, new and old, are so integrated as to work together, each facilitating the others.

Use of phonetic training. — Extensive training in phonetics has been the main method used in American schools for building up several of the skills which contribute to ability to master new words. The deficiencies of this method suggested by psychological theory were pointed out in Chapter II in the discussion of the intrinsic versus the supplementary method. The wastefulness and limitation of extensive phonetic training of the traditional type have been demonstrated in experimental studies.[1]

The various exercises and forms of tuition offered above will, it seems quite certain, do all that phonetic drill will do, and more, with a great saving of time. If

[1] *New Methods in Primary Reading*, Bureau of Publications, Teachers College, New York City, 1928.

the procedures outlined above are followed, further drill in the phonetic translation of letters and phonograms is rarely needed. If the phonetic tests suggested at the end of the preceding chapter show a decided weakness in phonetic ability, it may be remedied best not by extensive work in the conventional phonetic drills but by practice in the methods given above with a small amount of drill in phonetic translation of word elements into sounds. In selecting the word elements and conducting practice the following suggestions should be followed: (1) select the elements most commonly found in children's words;[1] (2) use the larger phonograms when possible, other things being equal; (3) use different types of phonograms instead of restricting the study to one type such as those beginning with a consonant, etc.; (4) teach no more particular phonograms than may be necessary to give the pupil skill enough to learn the remainder by himself. As soon as the child makes a start in phonetic skill, give up the special training but encourage the phonetic attack, within limits, when difficulties are observed in oral or silent reading. It is only a habit of using the phonetic attack that is needed; if this habit is acquired mastery of important phonetic elements will then develop in proper time. (5) Be careful not to overemphasize the phonetic attack, especially the sounding of small phonetic units. This method is but one among many. Overemphasis of phonetics often has unfortunate effects. The other word study methods are equally serviceable and the pupil needs versatility of attack.

[1] See references at the end of this chapter.

Use of flash cards. — Flash cards are often suggested as a corrective for over-analytic, laborious, piecemeal attack upon word-forms such as is the frequent result of overemphasis on phonetic training. Flash cards are also suggested as a means of encouraging the perception of words quickly as wholes. In the primary grades the use of flash cards for word exposure is more readily justified than in higher grades chiefly because young pupils should learn to read quickly notices, placards, billboards, and the like. As a means of limiting the analytic type of word observation and of encouraging rapid word and phrase perception the flashing of cards is very effective so far as the same flash card situation is concerned, but the transfer of the perceptive reactions to the ordinary reading situations is often disappointing. To develop the latter skills flash cards must be used sparingly and with not too great confidence. When used they should be closely coupled with exercises for rapid reading of ordinary material. This may be done by alternating flash card work and reading. When the pupil changes from the former to the latter, the teacher may encourage him to try to recognize the words in a quick glance just as he has been doing in the flash card drill. If, in time, the pupil gets into the habit of trying to recognize the word with only a glance, skill in quick perception is likely to be forthcoming.

Encouragement in the use of the context. — In the preceding and present chapters, the importance of utilizing the context while trying to recognize unfamiliar word-forms has been stressed. It was pointed out

that some pupils depend too little and others too much upon the meaningful setting in which a word may be found. In one sense, it is impossible, however, to depend too much upon the context; the difficulty results not from comprehending the thought too fully but from neglecting to study the word-form. Dependence upon context clues alone is undesirable. These clues should be combined with those resulting from a quick analysis of the word. Depending too little upon the context clues is a deficiency found frequently among pupils who have been overtrained in methods of word-form analysis. Both of these extreme habits should be supplanted by a full use of the meaning clues combined with acute observation of the word-form.

For pupils who use the context too little, the practice exercises suggested above in this chapter should be useful. It may be advisable for the teacher to encourage these pupils to consider the thought more fully and to "guess" what the word should be. The teacher may, for example, ask the pupil to read the sentence or exercise quickly while centering his attention on the thought and while giving only a glance at the unfamiliar word. Then, she may ask him to look up, relate the thought, and try to guess what the unfamiliar word may be. No more than another quick glance at the word should be permitted. She may occasionally give orally, sample reproductions of the thought and her reasons for making certain guesses. In this way she can give the pupils a notion of how they may attempt to use the context in dealing with the next exercise. By means of questions and suggestions the pupil may be led to acquire

this method of work. Needless to say, an abundance of practice, especially with such exercises as were outlined above, must be provided.

For the pupil who depends on the context to the neglect of the word-forms, many of the exercises given above are well suited. These pupils need encouragement and sometimes special tuition in studying the characteristics of printed words. In oral reading as well as when using the exercises silently, it is possible to help such pupils by calling their attention to the important features of the word-form before they make their usual hasty guesses.

REFERENCES

For a very complete bibliography of studies on the topics treated in this chapter, the reader should refer to W. S. Gray's *Summary of Investigations Relating to Reading*, University of Chicago, 1925. Appended to Chapters IV and V are references giving other exercises, materials, and games.

The following titles refer to studies of the author and his students in which the materials and methods above recommended have been tried out.

1. Gates, A. I., *The Psychology of Reading and Spelling with Special Reference to Disability.* New York: Teachers College Bureau of Publications, 1922.
2. Gates, A. I., and Boeker, Eloise, "A Study of Initial Stages in Reading by Pre-School Children," *Teachers College Record*, 1923, pp. 469–90.
3. Gates, A. I., "Problems in Beginning Reading," *Teachers College Record*, March, 1925, pp. 572–91.
4. Meek, L. H., *A Study of Learning and Retention in Young Children.* New York: Teachers College Bureau of Publications, 1925.
5. Gates, A. I., "Functions of Flash Card Exercises in Reading; An Experimental Study," *Teachers College Record*, December, 1925, pp. 311–27.
6. ——, "Methods and Theories of Teaching the Deaf to Read," *Journal of Educational Research*, June, 1926, pp. 21–33.

7. GATES, A. I., "An Experimental Study of Teaching the Deaf to Read," *Volta Review*, June, 1926, pp. 295–98.
8. THOMPSON, HELEN, *An Experimental Study of the Beginning Reading of Deaf Mutes.* New York: Teachers College Bureau of Publications, 1927.
9. GATES, A. I., "The Construction of a Reading Vocabulary for the Primary Grades," *Teachers College Record*, March, 1926.
10. —— *New Methods in Primary Reading*, Bureau of Publications, Teachers College, 1928. This volume gives the results of experimental studies and a more extensive discussion of the use of the intrinsic methods than was presented in the present chapter.

The following references give tabulations of phonetic and other word elements which may be used in constructing such exercises as were recommended in the chapter.

1. VOGEL, M., JAYCOX, E., and WASHBURNE, C. W., "A Basic List of Phonics for Grades I and II," *Elementary School Journal*, February, 1923. The words analyzed are taken from school readers; only phonograms in which a vowel precedes a consonant (*-at, -an*) are considered.
2. OSBURN, W. J., *Remedial and Follow-Up Bulletin*, No. 1, Public School Publishing Company, 1925. Twenty-five hundred words from the Thorndike Word Book and 1000 words from the Ayres spelling list are analyzed; only phonograms in which the consonant precedes the vowel (*ca-, re-*) are considered.
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PART III

DIAGNOSIS AND REMEDIAL INSTRUCTION IN GRADES III AND ABOVE

CHAPTER VIII

DIAGNOSIS IN GRADES III AND ABOVE BY MEANS OF A TEAM OF GROUP TESTS

In arranging a program for diagnostic testing of pupils found in and above Grade III, we have sought not only adequate tests but also an optimum order of testing. We have endeavored, in other words, to develop a program in which the most important reading skills from the point of view of diagnosis are tested first. Pupils found to be satisfactory in these abilities need not be examined further. Those who are found deficient in these capacities may be studied by additional diagnostic tests to be described in later chapters. By following such a program all pupils are assured of a full diagnosis with the minimum of unnecessary testing.

The Theory Underlying the Team of Tests

Fundamental to the construction and arrangement of the new tests is the fact already suggested in Chapter IV that, beginning at Grade III or earlier, reading is not a single ability which is utilized in every situation but, on the contrary, a number of abilities. Reading is merely a term applied to a variety of ways of reacting to printed words. A versatile reader may read the same material in various ways. A competent adult may read a paragraph to get the main idea, to note all

details without differentiation, to secure the answer to a question in mind, to appraise the literary style, to note errors in punctuation, to observe the logical outline, or to perceive the emotional tone of the passage. He may read with passing interest only or to retain as much and as well as possible; he may read rapidly, merely skimming the sentences; or slowly and carefully, appraising each phrase. This list illustrates, but by no means exhausts, the different ways of reading.

Certain investigations have revealed the fact that different " ways " of reading depend upon highly complex reading techniques. The writer has found adults, graduate students, conspicuously deficient in several important reading skills. Some students can read very well for certain purposes but are seriously inept in other types of reading. In other studies[1] similar limitations have been observed in school children and evidence even more convincing has been found in the fact that extensive training which produces marked improvement in one type of reading ability may have little or no effect in developing another form of reading technique. In these studies it is apparent that the only way to insure the development of certain types of reading ability is to provide training in just those types. Each is dependent upon abilities which must be built up by specific practice.

These facts — that there are several types of reading abilities, that an individual may be competent in some

[1] See the author's article, "The General and Specific Effects of Training in Reading," *Teachers College Record*, March, 1924, and Dr. R. P. Carroll's, *An Experimental Study of Comprehension in Reading*, Bureau of Publications, Teachers College, 1927.

and not in other forms of reading, and that each type is best developed by instruction directed specifically to it — have a clear bearing on the problem of measuring reading ability and of following up the results revealed. In the first place, the typical reading test which yields a single gross score can scarcely measure general reading skill since no single ability exists. Scores from such tests fail to reveal many aspects of reading technique which are of prime importance as a guide to instruction. Even if an elaborate test did measure general reading ability, the mere information that a pupil or class is, in general, good or average or poor would be much less useful to the teacher than a knowledge of strengths and weaknesses in particular types of reading techniques. Instruction aimed at reading in general is likely to be wasteful and ineffective. The nature of reading abilities indicates the need of a number of tests, each of which measures specifically an important type of reading ability. If the pupil shows weakness in one or more of these reading techniques, the type of instruction required is indicated by the nature of the test itself.

How the Tests Were Selected

Although there are many types of reading techniques, it does not follow that it is necessary to measure every one for purposes of diagnosis. It is probable that a certain small number of tests may be found which indicate the significant strengths and weaknesses sufficiently well for practical purposes. To ascertain whether this was the case and to find the most useful

team of tests for diagnosis, considerable research has been performed. It will be unnecessary here to review all of these studies which have appeared or will appear in the technical journals. The types of studies conducted may, however, be indicated briefly as follows:

1. Preliminary studies with various types of test units, mostly in mimeographed form.
2. Judgments of about thirty experts on defects and merits of a series of sample test-unit types.
3. Certain studies of the effects of practice on reading of the types represented by the test units.
4. Study of correlations obtained between various types of reading tests.

As a result of these studies six types of tests were finally selected and two forms of each printed. With each of these types approximately 1,600 children have been tested and the results analyzed. Data of the following sorts have been studied for the purposes of finding the best team of tests.

1. The self-correlations of each test.
2. The intercorrelations of each test with all others.
3. The percentages of errors in the comprehension exercises of each test at each grade level.
4. The nature of the errors made.
5. The way selected types of readers work on the material during the test period.
6. The effects of giving the tests repeatedly.
7. Further studies of particular pupils who vary greatly in achievements in the different tests and children who are uniformly good or poor in all of the tests.

On the basis of the evidence from these different

sources, a team of four tests was finally selected as serving most adequately, within limits of practicality, the purpose sought, namely, to secure by objective means a diagnostic picture of the most significant features of a pupil's reading ability.

Some General Characteristics of the Tests

Testing reading skills. — Emphasis should be given to the fact that these tests are designed to measure skills, techniques, and acquired habits. They are arranged to gauge not the underlying mental capacities or native aptitudes for reading but the acquired skills which are subject to further development by training. None, furthermore, is a measure of depth or power of comprehension; none aims to determine how difficult a passage, or how complex a linguistic idea a pupil can understand. In each test, the passages are equal in difficulty and of such a level that they can be readily understood by an average pupil at the beginning of the third grade. The tests measure a pupil's ability to read easy material in different significant ways or for various important purposes. In other words, they appraise several reading techniques as they are exercised in intelligible material.

Vocabulary. — By reference to the lists drawn up in preparing the Gates Primary Word List and to Thorndike's Teacher's Word Book, the vocabulary of the tests has been made appropriate to the equipment of elementary school pupils in and above the third grade.

Content. — Great effort has been made to secure paragraphs of intrinsic interest and value to school

children and to have the material written in a style both attractive and intelligible to pupils. All of the materials were prepared by persons of special fitness after a period of apprenticeship in the task. The paragraphs used were selected as the best of a much larger number and each has been appraised by at least ten judges of special competence as well as by actual trial with children in experiments with preliminary editions of the tests.

Test units. — The units of each type of test are paragraphs of equivalent difficulty as determined by trial.

Indicating and scoring comprehension. — The success in reading is tested by exercises included with each paragraph. Comprehension of the type demanded is indicated by some simple mark — making an *X*, encircling a word, underlining a sentence, etc. The pupil's response requires but a small amount of time or distraction, leaving practically full time to reading. The scoring may be done by clerks.

Standardization. — The primary aim in constructing the tests was to make them diagnostic by objective means. To this end all factors have been standardized. All pupils are tested with identical materials; the instructions to be given are prescribed; the time is established; the scoring is done by mechanical routine; and standards of comparison in the form of grade and age scales of average achievements have been prepared.

THE FOUR TYPES OF TESTS

The four types of tests, for each of which two forms are now ready, are as follows:

Type A. Reading to Appreciate the General Significance of a Paragraph. (Time, 6 minutes.)

Type B. Reading to Predict the Outcome of Given Events. (Time, 8 minutes.)

Type C. Reading to Understand Precise Directions. (Time, 8 minutes.)

Type D. Reading to Note Details. (Time, 8 minutes.)

The nature of each will be briefly described. For statements made, experimental and statistical evidence appear in the literature to which reference is made at the end of the chapter.

Type A: Reading to Appreciate the General Significance of a Paragraph

This test consists of twenty-four paragraphs equivalent in difficulty to the following:

> It was a cold, gray, winter afternoon at the ocean. Not a ship was to be seen. A single gull flew about in the windy sky. On the beach a little boy stood. He had no playmate, not even a dog to keep him company. He wondered as he stood there if anyone in the whole wide world wanted a playmate more than he.
>
> Draw a line under the word that best tells how the little boy felt.
>
> cross lonesome weary joyful afraid

This test, among six originally printed and tried out, affords the easiest reading in the sense that the purposes of the test — to detect correctly the general impression portrayed — is fulfilled successfully with the least detailed analysis. When pupils are held to a constant speed of reading and permitted no re-reading, the comprehension score is greater on this test than on any other in the team. A general appraisal of the material usually suffices; pupils may get the general drift of the passage without full analysis or recall of all details. No test in the series has a simpler or less time-consuming device for recording comprehension. This test, then, most nearly approximates a measure of easy-going reading, of reading merely to get the general significance of the material. It is doubtless much like the recreational and casual reading commonly indulged in by adults. Test A is the best of the series to use when one wants a measure of " rate of easy reading " or " rate of casual reading."

Type B: Reading to Predict the Outcome of Given Events

Following each of the twenty-four paragraphs in this test are four statements, one of which suggests better than the others what event is likely to follow the happenings described in the paragraph. The pupil underlines the statement that he thinks best indicates what will happen next. The paragraph on page 187 is a sample.

This test was selected from several competitors for

One winter day a country boy was driving a team of horses. It began to snow, and the wind blew the snow in his face. All around him the falling snow was like a thick curtain. He drove the horses where he thought the road was. Soon he knew he was lost. Then he remembered that horses always know the way home, even in a bad storm.

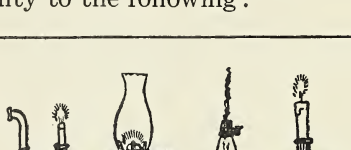
The horses ate the grass by the road
He let the horses find the way home
He made the horses stand still
He took his sister in out of the storm

the purpose of measuring the ability not merely to interpret the entire passage itself but to appraise its implications, to go beyond mere grasp of the ideas present. Of the several tests tried this one proved to possess the greatest reliability, to gauge most nearly the desired skills, to overlap techniques tested by the others the least, and to give the most desirable degree of difficulty in comprehension for the several grades. While this test correlates fairly highly with Test A, it measures a perceptibly different complex of reading techniques. It requires a somewhat more intimate grasp of the data, a more complete analysis, a more subtle interpretation of the whole situation than does Test A. Typical school children of all grades make more errors in the interpretation of the paragraphs of Test B than of Test A, although they tend to read more slowly, on the whole, in the former test. Type B, then,

not only requires a somewhat more careful and intimate analysis of the material than Type A but it demands a different type of mental reaction.

Type C: Reading to Understand Precise Directions

This test consists of twenty-four paragraphs equivalent in difficulty to the following:



There are many different kinds of lights. Here are four of them. 1 is gas light, 2 is lamp light, 3 is electric light and 4 is candle light. Tom's mother used a lamp and his grandmother used a candle. Draw a line under the kind of light Tom's mother used.

This test proved to be the best of several designed to measure an exacting type of reading. The facts given in these paragraphs are not intrinsically difficult and the directions to be executed require little time or ability. The difficulty of the task lies in the exact nature of the reading required. The kind of reading sufficient to get the general drift of the passage is insufficient to enable the typical pupil to execute the direc-

tions without error. The test measures ability to read with exactness and precision, to select and retain the relevant details while subordinating other facts, however interesting, which are not part of the directions to be executed.

The percentages of paragraphs executed correctly of those attempted by typical New York City school children show how inaccurate pupils in the several grades are in this type of reading.

Grade (midyear)	3	4	6	8
Approximate per cent correct	40	50	68	76

The errors were due primarily to deficiencies in the technique of reading here required. Children often read these directions too fast. A mere reduction in speed frequently resulted in nearly perfect execution of the directions. A retardation of rate was not always sufficient. There were defects in the subtle techniques of careful, precise reading that a mere slowing down did not remedy.

The techniques needed in Test C are not exactly those which make for success in Tests A and B; there is a contrast, if not an antagonism, between the former and the two latter. The rapid, sometimes nearly superficial, attack which is sufficient for the better readers in Test A, would result in numerous errors in C. The careful analysis and exact retention required in Test C would be unnecessary and wasteful in reading merely to appreciate the general significance of a paragraph.

Test C, then, measures ability in a precise, rigid, exacting type of reading comprehension. Inaccu-

racies in carrying out instructions are more frequent in this test than in any other in the team.

Type D: Reading to Note Details

This test consists of eighteen paragraphs equivalent in difficulty to the sample given below. Comprehension is indicated by underlining the word which correctly answers each question.

3. There are many hot pools in Yellowstone Park. They are a beautiful blue. Around the edges they are a lovely orange. This orange is made by the little shell animals that live there in the warm water. Often a hot pool is near a cold one. You could catch a fish in the cold pool. Then you could toss it over into the hot one to cook.

Around the edges of the pool the color is—
green orange pink blue

The orange color is made by—
fruit animals grass water

You could toss a fish into the hot pool to—
catch eat cook hatch

This test, unlike A or B, requires reading to recall several significant details given in a passage. While the Directions Test demands the recall of certain significant details, it requires the recollection of items more

definitely integrated, more exactly brought to the point, and is, therefore, a harder analysis to make accurately than the one required in this test. Test D demands the breaking up of a passage but an analysis of an easier sort than C. The percentage of correct comprehension for the Directions Test ranges from 40 at midyear in Grade III to 75 in Grade VIII, whereas in the Details Test the range is from 75 to 98. Especially in Grades III and IV, reading for details, such as this test demands, seems to be a relatively well-developed reading technique as is the skill in reading for a rather vague general impression (Test A). Yet reading for details is not the same as reading for a general impression. Each depends on certain specific techniques.

The four tests were selected so as to give representation to four important and more or less distinctive reading skills, to include reading both for general impressions and for exact details, to give play to different rates of reading (since the rate satisfactory for A is, for the typical grade pupil, too rapid for C) and different degrees of ease of perfect comprehension, and thus to make possible a diagnosis of strengths and weaknesses in important reading skills that could not be secured by a single test of any type.

How to Give and Score the Tests

Full directions for giving the tests are printed on the first page of each test blank. Detailed directions for scoring the papers are given in the Appendix together with the norms or, more strictly speaking, the scales of age and grade average achievements.

For each of the four tests, the following scores may be obtained:

1. *The number of test units attempted.* — In Types A, B, and C the test units are paragraphs since there is one comprehension exercise for each paragraph; in Type D there are three exercises for each paragraph, so the test unit is really one third of a paragraph. The number of test units attempted is determined by merely observing the number of the last exercise which was attempted.

2. *The number of test units correct.* — Following the instructions which are given in the Appendix the test units are corrected and the total number right is recorded.

3. *The percentage of accuracy.* — This score is merely the percentage which score 2, number correct, is of score 1, number attempted. Given scores 1 and 2, this percentage is read from a table.

Diagnosis Based on Raw Scores

Differences in accuracy of reading. — These three scores appear on each test paper and they alone make possible — quite apart from the age or grade " norms " or equivalents of these scores — certain diagnoses of a pupil's reading. For this purpose, Score 3, which gives the percentage of the material attempted which was correctly interpreted, is most significant. No matter what the " norms " may be, that is to say, no matter what the average child does in the tests, much is revealed by mere observation of the percentages of correct comprehension. Consider the following four

pupils, all of average mentality, in Grade IV in a typical classroom. The figures are the percentages of accuracy:

Pupil	Tests			
	A	B	C	D
A	100	100	100	100
B	68	60	30	70
C	95	90	40	100
D	75	65	90	100

Pupil A is a thoroughly accurate reader. In all four tests he made not a single error in comprehension. Pupil B, of about the same age, grade, and intelligence, is exceedingly inaccurate in his grasp of the material. In Tests A, B, and D, he errs on three or four exercises in every ten and in Test C (Directions) he misses seven out of ten. Whatever else may be discovered about these two pupils, the fact will remain that A is accurate in all types of reading and therefore not in need of cautions and drills in accuracy; whereas Pupil B is inaccurate in all types and is in need of help in this respect. Pupil C is fairly accurate in reading save in that type which requires very precise and well-integrated understanding, as in Test C. Pupil D is very accurate in getting details, either rigidly related ones as in Test C or more independent ones as in Test D, but he is inaccurate in the more general interpretation of a paragraph as a whole, as required in Tests A and B. Pupils C and D illustrate the value of using the team of tests. Had only Test D been used,

both would have been diagnosed as " perfectly accurate readers," whereas, in fact, Pupil C is very inaccurate in exacting reading (Test C) and Pupil D is very inaccurate in reading to predict something beyond the substance given (Test B) and in reading for the general impression (Test A). On the basis of one test, it is unwise to make a statement concerning a pupil's general accuracy. The team of four gives much greater insight.

In one important sense, a pupil may be said to read too fast whenever his comprehension falls — let us say — below 90 per cent in these passages. The author of the tests is convinced, after considerable study of various types of readers, that the majority of children should achieve a very high level of comprehension in these tests — a level much higher than most of them do. Most pupils read too inaccurately either because they apply a rate inadequate for the purpose or because they lack a group of techniques which are necessary for certain types of reading. Commonly both go together; where the specific techniques have not been developed, rate is poorly adjusted to the task. The rate may be either too fast or too slow; usually it is too fast. These inadequacies usually mean both lack of tools and lack of adaptability to the particular reading demand.

This meagerness of equipment often results in the tendency to read all materials for all purposes in about the same way, with the same rate and the same kind of mental analysis. The remedy consists in abundant, well-controlled practice in the particular kinds of reading in which deficiencies in comprehension appear.

Methods and materials for this purpose will be presented in the next chapter.

It is recommended that careful study be given to the percentages of accuracy in reading in the several tests with the assumption in mind that highly inaccurate reading in any of the tests by pupils in and above the third grade is undesirable and should be improved.

Diagnosis by Means of Age and Grade Scores

Comprehension in any test may be 100 per cent and yet the reading may be unsatisfactory. Reading may be inadequate because it is too slow and labored. To judge whether Pupil X's achievement of reading ten paragraphs correctly in the six minutes allowed for Test A is satisfactory or not, one must have some criterion, some standard of comparison. Experience has shown that teachers and other school officers differ markedly in their judgments concerning the amount of material that should be read and interpreted correctly in a given time. It is therefore advisable to have some common basis of comparison.

Highest attainments as norms. — The best standard of comparison as suggested in discussing the Primary Tests would be a table of figures indicating optimum attainments for the various ages and grades, a series of "norms" representing the achievements which should be expected of pupils of stipulated age, grade, and intelligence when taught in an optimum or ideal manner. It has been impossible thus far to secure such a series of norms. In the Appendix, however, are given the achievements of classes of average

mental ability making the highest scores of those measured in New York City. These scores indicate what has actually been done by classes of children of average intelligence.

Age and grade scales of average achievements. — As a more stable (*i.e.* reliable) standard of comparison, the average attainments of average classes of pupils in typical New York schools have been determined. The " norms " or, rather, the scales of averages were based on tests given to 1,600 or more pupils evenly distributed among Grades III to VIII. The same pupils took all four tests. Every class of pupils used was known to be a group of average intellectual level as indicated by the results of intelligence tests.

The fact that the " norms " are based on classes of average mentality is significant. These scales of averages are very useful provided the user remembers that they are averages, used solely as a basis of comparison and not as objectives set up or ideals to be attained.

The use of age or grade norms for number of exercises correct. — In a paragraph above it was said that although the percentage of accuracy is 100, a pupil's ability in some type of reading may be unsatisfactory. Below are the records of several such cases. These pupils are all approximately average in intelligence; their age, mental age, and grade are given together with the " number of paragraphs correct " scores which have been converted into reading ages and reading grades by the use of tables in the Appendix. The score for amount read correctly is the best single measure of gross achievement in these tests.

Pupil	Actual Age	Mental Age	Grade	Test A		Test B	
				Reading Age	Reading Grade	Reading Age	Reading Grade
E . . .	11.6	11.8	5.5	10.0	4.2	10.4	4.5
F . . .	10.5	10.7	4.6	11.4	5.5	10.8	5.0
G . . .	10.6	10.4	4.6	10.4	4.5	10.4	4.5
H . . .	10.8	10.8	4.6	9.5	3.8	9.2	3.5

Pupil	Test C		Test D	
	Reading Age	Reading Grade	Reading Age	Reading Grade
E	9.5	3.8	10.2	4.3
F	10.8	5.0	11.7	5.7
G	9.2	3.5	10.4	4.5
H	10.8	5.0	11.3	5.4

Pupil E shows inferior reading achievement in the amount he can read and correctly understand in all four tests. Although 11.6 years old with a mental age of 11.8 years, he reads correctly in Test A only as much as an average pupil of 10.0 years mental age, or only as much as the average pupil with but two-tenths of the fourth grade completed. E's ability in other tests is on about the same low plane.

Pupil F, unlike E, has achieved more in all tests than the average pupil of equivalent mental age or grade standing. In Tests A and D, he is especially strong.

Pupil G is almost exactly equal in gross reading ability to his mental level and grade standing in all tests except C, in which he is weak. If one were to be

satisfied with average achievement, G could be considered satisfactory in all except the precise kind of reading demanded by Test C, in which his "amount read correctly" score — whatever the percentage of accuracy may be — is over a year and about a grade below the average.

Pupil H shows strength in reading for details, especially for the easier, less definitely knit details (Test D), but weakness in reading to get the general significance (Test A) or for the general implications of a passage as in Test B.

Pupils G and H show how, in gross achievement, as in degree of accuracy in reading, an examiner might be misled if he should diagnose reading in general on the basis of the results of any one test since a pupil may be good in one, average in another, and poor in still another type of reading.

The use of age or grade norms for percentage of exercises correct. — The significance of the original percentage of accuracy score and of the score for amount read and interpreted correctly when transmuted into an age or grade equivalent has been indicated. Table VI in the Appendix gives the average percentages of correct reading for several ages and grades. These figures may be used for comparative purposes. They indicate what the average pupils from average New York City schools actually did on these tests. To repeat what has already been emphasized, the writer believes the accuracy of reading revealed in these tables is too low. He would prescribe training designed to yield more accurate comprehension to all these average

children in all grades for Test C and in the lower grades at least in the other three tests. It is recommended, therefore, that merely equaling the grade or age averages in accuracy of comprehension not be accepted as satisfactory but as indicating the need for special instruction.

The foregoing discussion indicates the general procedure to be followed and the quantitative data to be weighed in making a diagnosis of an individual. In the next chapter we shall discuss in detail the types or patterns of strengths and weaknesses in reading revealed by these instruments and the methods of remedial instruction to be followed. In the remainder of this chapter will be given a few suggestions for certain more general uses of the tests.

Appraising a Class as a Whole

In surveys of classes in different schools, it has been found that the team of tests reveals striking differences between the achievements of classes as a whole. The scores below, which will serve as an example, were obtained from six classes, one each in six different New York City schools. The average age and intelligence, the length of the school day, and other factors were for these classes identical or similar. The table on page 200 gives the average raw scores in Test C.

Test C, it may be recalled, requires very exact and careful reading and retention of directions. The class from School A reads very rapidly and superficially; only 25 per cent of the directions attempted are properly executed. School D shows a percentage of accuracy

School	Number Pupils	Average Number Paragraphs Read	Average Number Correct	Average Per Cent Correct
A	40	16.0	4.0	25
B	35	14.2	6.4	45
C	33	15.4	7.7	50
D	38	10.4	8.4	81
E	40	15.9	10.6	66
F	40	20.5	12.9	57

over three times as high — 81 per cent. The total number of paragraphs correctly read by Class A is barely a quarter of that read by Class F. The School A class is seriously in need of training both for accuracy and for fluency in this type of reading. The classes in Schools B and C are better than that in School A in both rate and fidelity, but both are really deficient, especially in accuracy. The School D class reads with much greater care than the others; the percentage of accuracy is 81. To maintain, or, better, to increase this degree of exactness, while gradually increasing the rate to a more creditable level, should be the plan of instruction in this class. Classes E and F need especially to develop greater accuracy in reading.

These records from New York City schools illustrate the wide differences in reading ability that one of the tests will reveal. The other tests show equally great variations; and often the school which is average or high in one test is average or low in another. Since the six schools here represented were known to be composed of pupils averaging approximately the same age, intelligence, social status, and previous training, the

differences among them are probably due to variations in the specific instruction in reading. The remedies are specific forms of instruction adjusted to the needs of each class. The team of tests, properly used, will reveal the nature of the types of instruction that are needed.

Other Uses and Characteristics of the Tests

Appraising general reading ability. — If, for some purpose, such as deciding on promotion or applying the Accomplishment Quotient technique, a single figure is desired to represent, as well as may be, a pupil's "general reading ability," the procedure is first to transmute the "number correct" score for each test into a reading age (or grade) and then average these four ages (or grades). This composite score will be a highly valid and reliable index of average or "general" reading skill.

Using less than the team of four tests. — The four tests have been designed for use as a team and best results will be obtained by employing the entire battery. If it is possible to give but three tests, the author would recommend Tests A, C, and D, which would require 22 minutes of working time. If only two tests are to be used, the writer would select Tests A and C, which would take 14 minutes. Special needs should be followed, of course, in preference to these recommendations.

Supplementing the team by other tests. — What tests may be profitably added to the present team depends mainly upon the purpose of the survey.

Where a broader measure of reading ability is desired, the best test to add is the Thorndike-McCall Reading Scale.[1] This test, unlike the four in the team, is composed of passages of increasing difficulty. The time is so liberal that most pupils will have done all they can do before the time is up. The test measures the level of comprehension difficulty that a pupil can master. The Thorndike-McCall serves admirably a very different purpose from those rendered by members of the team. In consequence, Thorndike-McCall and the team of four would make a very strong battery of tests.

Pupils who do very poorly on the team of tests should be studied by means of easier tests which diagnose more elementary phases of reading. For this purpose, the Primary Reading Tests should be used. The use of these tests and of certain additional diagnostic instruments will be discussed more fully later.

Reliability of the tests. — In tests like the present ones, in which pupils work under a time limit, the reliability of the results depends greatly upon the manner in which the tests are given and scored. Any error in timing the examination period will, of course, reduce the reliability of the tests. Time must be kept perfectly. Imperfect, hasty, or incomplete instructions may ruin a test. Errors in scoring and recording are equally fatal. Finally, the reliability of the test varies with the degree and uniformity of application of the pupils to the work once the examination is under way. The best and longest test will be unreliable in the hands

[1] Distributed by the Bureau of Publications, Teachers College.

of an examiner who cannot keep the pupils at maximum effort during the examination.

Properly given and scored, the particular tests provide a highly accurate measure of a class of fifteen or more pupils and a fairly reliable measure of an individual pupil. For more exact diagnosis of individual pupils, it is recommended that two forms of each test be given. When two forms are given the raw scores should be averaged. This average may be transmuted into age and grade scores by the use of regular tables.

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CHAPTER IX

REMEDIAL INSTRUCTION FOR THE MILDER DEFICIENCIES REVEALED BY THE TEAM OF GROUP TESTS

The team of tests described in the preceding chapter includes instruments for measuring four different types of reading. These four reading abilities are distinctive to a degree that makes it possible for a pupil to be poor in one while average or better in the others; or poor in two while average or good in two; poor in three while good in one; or poor in all four. A pupil may vary from the desirable degree of ability, moreover, in either speed or accuracy or both, in any one, two, three, or all four tests.

These various combinations of speed and accuracy in four different tests suggest a complex diagnostic picture. Although all manners of combinations may be found, the results in each individual case are quite simple and remedial instruction suitable may be applied if a few general directions are followed. These directions will be given in the present chapter.

The procedure in dealing with reading difficulties in Grades III and above will be to begin with the simpler cases and to proceed gradually to the more complex ones.

It will be obvious that the more a pupil falls below his grade, especially his mental grade,[1] the more serious his deficiency. It is also true that, in general, a given degree of retardation — say one grade — on all four tests is a more serious matter than an equal deficiency on three; a retardation on three is likewise more serious than equal backwardness on two, and so on. The least serious deficiencies, in other words, are those limited to one or two of the tests. For such backwardness, in moderate degree, the remedial treatment consists in presenting the pupil with abundant practice material in type similar to that comprising the test in which the deficiency is shown. Our first step, therefore, will be to suggest varieties of material which may be used to develop each of the four types of reading measured by the tests.

For suggestions concerning the use of these materials, in addition to those here given, the reader should review Chapters II and IV.

Remedial Materials for Deficiencies in Type A, Reading for the General Impression

Materials for encouraging this type of reading cover a wide range. The type of reading demanded in this test is used in reading newspapers, magazine articles, stories, novels, and various informative materials. There is, in other words, a wealth of material which children or adults may and should learn to read merely

[1] By which we mean, as explained above, the approximate grade position that pupils of this pupil's mental age would occupy were they classified on the basis of intelligence.

to get the general significance of the facts presented. They should, in such reading, be fluent rather than slow and laborious, and accurate in their grasp rather than vague and inaccurate. These are the two requirements in which pupils fail. They may fail because they have had little experience in such reading—in reading miscellaneous materials for pleasure, for example—or because antagonistic habits such as too intensive study of detailed ideas, words, phrases, etc., have hampered the acquisition of fluency and the attitude of seeking to grasp only the significant upshot of the selections.

In arranging remedial instruction for deficiencies in this type of reading, the most important requirement is the provision of devices that constantly urge the pupil to discover the outstanding point of the passage without getting lost in the details, and to apprehend this significant idea with increasing speed and accuracy. For a time, at least, the student will profit most from passages which include certain questions or exercises which require a demonstration of the grasp of the significant facts sought in the reading, which enable him to discover his errors and successes, and to measure his improvement both in rate and accuracy. That rapid progress in rate and accuracy of reading may be achieved by the use of such materials has been several times demonstrated.[1]

In addition to work with exercises, the pupils deficient

[1] For example, O'Brien, J. A., *Silent Reading.* New York: The Macmillan Company, 1921; and Gates, A. I. and Van Alstyne, D., "The General and Specific Effects of Training in Reading," *Teachers College Record,* March, 1924.

in this type of reading should be encouraged to read various papers, books, and articles which contain subject matter making the greatest personal appeal. It is very important that the pupil carry over to uncontrolled reading the "set" and techniques being acquired during the controlled training, not only to insure the functioning of the new habits in ordinary reading for pleasure, but also to obtain the increased interest in miscellaneous reading which may be expected to result from the pupil's discovery of his improvement in facility.

For remedial material, interesting matter of almost any sort, either already in print or made up for the purpose, may be used in combination with almost any type of question or direction device. To illustrate:

One of the best uses of airplanes is to find forest fires. You know that there are a great many forest fires in this country, and it is sometimes hard to find them until they are very large. Airplanes fly back and forth over the forest in the summer and as soon as fire is seen, the airplanes fly with the news to the fire fighters.

For such a paragraph many types of comprehension tests, such as the following, may be devised.

A. Mark the two things most important in this paragraph — airplanes — fishing — summer time — news — forest fires — vacations.

B. Mark the statement which tells best what this paragraph is about.

The largest airplane made
Flying in an airplane
Finding forest fires by airplane
Fires in forests

C. Underline *true* if the statement is true; underline *false* if it is false. The passage said that:

Airplanes are useful for finding forest fires. True — false
Airplanes are useful for carrying mail. True — false
Airplanes are useful to carry the fire fighters to the fires. True — false
Airplanes carry news to the fire fighters. True — false

D. Fill in the blank: The paragraph told how forest fires are discovered by the use of ——. The paragraph told how news of —— is carried by ——.

E. Underline the sentence which best tells the main idea of this passage.

F. Write a title for this paragraph which best tells what it is about.

G. In your own words, as briefly as possible, tell me what this paragraph is about.

Most of these devices may be typed and given to the pupil to be filled out in writing or they may be given orally or in print for the pupil to respond to orally. If given in the latter form, the teacher may keep time, check the responses, correct errors, and offer suggestions immediately. If the pupil works by himself, keys may be provided for most of the exercises so that the learner may correct his own errors.[1]

Practice in this type of reading need not be limited to work on isolated paragraphs; indeed it should not be so limited. Several connected paragraphs in stories and other materials are in many respects more serviceable. In working with such materials, exercises should be arranged which require grasp of the general drift or outstanding features of the whole body of ideas.

[1] See Chapter IV for the construction of keys.

Such exercises as writing " my impressions " or various types of reviews are excellent for this purpose.[1]

To select from a ready-made series of topic sentences combined with certain irrelevant statements, or " jokers," those which make an outline of a story or article constitutes a good exercise. Or, a series of outline statements may be written by the pupil with or without a brief review (skimming) of the various paragraphs. The outline may be in the form of answers to a series of questions, each based on a significant fact or episode. These connected facts or episodes may be suggested by arranging pictures or drawings in an order that outlines the article, or such a series of illustrations may be drawn by the pupil himself. Other ways of emphasizing the main idea or impression, of connecting one with others, of encouraging comprehension of such ideas as parts of a more inclusive unity, of stimulating rapid reviews under the control of this general set may be devised to serve effectively as remedial work for deficiencies of this type.

Remedial Materials for Deficiencies in Type B: Reading to Predict beyond Given Events

As indicated in the preceding chapter, special deficiency in Test B may be due to inability to grasp quickly and accurately the significance of a passage. In this case a low score on Test A would also be expected. A low score on Test B may be due to inabil-

[1] For some excellent suggestions see Zirbes, Laura, and others, *Practice Exercises and Checks on Silent Reading in the Primary Grades*, pp. 46–58.

ity to supplement the main idea of a paragraph in such a way as to see or predict related circumstances or events. This deficiency may exist among pupils whose achievements in Tests A, C, and D are average or better.

In the case of a special deficiency in ability to see beyond the facts actually given without marked backwardness in other types of reading, it may be assumed that the difficulty is a highly specific one which requires special remedial treatment. This deficiency has been recognized by various writers: by Thorndike in his article on "Reading as Reasoning," [1] and by W. S. Gray in his study of remedial cases [2] among which he found several whose difficulties were said to be due in part to "failure to develop thoughtful reading habits," "poor habits of thinking while reading," and the like. These phrases suggest the specific difficulty: the failure to think — more exactly, to think with and beyond the facts given — while reading. These pupils are sometimes described as literal but unimaginative readers. They read without creating, without supplementing, without relating the materials to other facts.

The materials and types of problems found in Test B provide merely one example of many varieties of content and application that fall within this category. For remedial work, the teacher may utilize many other sorts of materials and exercises. Almost any type of question or exercise which requires reasoning, the appraisal and evaluation of the given facts for the purpose of answering a question whose answer is implied

[1] See reference at end of Chapter IV.

[2] *Remedial Cases in Reading*, University of Chicago, 1922.

but not given in the material, would fall within this type. We shall give only a few examples.

Such fanciful materials as the following may be utilized as a means of securing various types of problem solving.

A mouse wished he had a bushy tail like a squirrel. A gray hen, feeling sorry for him, gave him some feathers. The mouse glued the feathers on his bare tail and went away happy. He sat on a tree and curled his tail over his back. A man with a gun came by. He cried out, "One more squirrel skin and my wife will have enough for her coat."

To direct and measure comprehension, one may use the multiple choice, true-false, or any other devices which require the pupil to check various possible implications of the paragraph, or one may ask the pupil to supply answers to various questions. Such issues as the following might be raised.

1. What did the man with the gun do?
2. What is the moral of this story?
3. Why did the mouse want a bushy tail?
4. Should the mouse have desired to be different?
5. Did the mouse want a bushy tail in order to fool the man?

More realistic story material is usually well suited to such questioning. A story which contains several episodes is especially suitable since the pupil's conclusions concerning each unit may often be tested by his understanding of the reading of the next or some later unit. By this means, interest is aroused and rewarded, progress is encouraged and guided by the content itself. Questions which are not precisely answered in the passage may also be provided. One or more of such types as the following will usually fit the requirements.

What will happen next?
What will John do next?
What will happen to John?
What is it that John really wants?
Did John do the right (or kind, etc.) thing?
What would John's mother think if she knew what he did?
What should John have done?
What ought John to do next?
How will Mary feel when she learns what John did? etc.

Practical informative material from almost all fields — history, geography, science, invention, health — are especially convenient for use to stimulate solving problems that require deductions from the material given. Since in the references given at the end of the chapter are suggested many concrete forms of questions and exercises suitable to this purpose, we shall not elaborate them here. Only one suggestion is needed: There is a difference between fluent reading designed to secure a general grasp of material related to some problem in mind and the careful and exact or detailed type of literal comprehension required in much reading of the "work type." These differences will be developed in discussing Tests C and D. In Test B, the essential factor is the projection of thought beyond the material read, not the mere assimilation, however thorough, of what is given.

Remedial Materials for Deficiencies in Type C: Reading for Precise and Exact Understanding

Test C measures ability to do a very exact, precise type of literal reading. It sets up a problem in which a pupil trained to get only the general significance or

main idea, however skillfully he may utilize that idea, is destined to make frequent errors. This test measures ability to read intensively, to get every significant factor accurately, to relate these items to the general problem and to be misled by no irrelevant details, however interesting. It is a kind of reading which most children and adults find difficult. Most of us, young and old, are likely to grasp a few outstanding ideas rather than to absorb every relevant item with precision. When such exactness is required, most adults secure it by re-reading. School children are less skilled in appraising their own difficulties and therefore less likely to re-read sufficiently, if at all. Skill in this type of comprehension is not limited to the rough technique of re-reading; there are certain subtle and important skills which, once mastered, function during each reading whether the original or repeated.

Various types of directions are about ideal materials for use in training this skill in exact reading.

Directions for playing all sorts of games.

Directions for drawing pictures, modeling, etc.

Directions for making all sorts of wood and metal objects.

Directions for using tools, household utensils, school apparatus.

Directions for using first aid materials.

Directions for conducting school affairs.

Directions concerning what to do in case of fire or other emergencies.

Directions for going places.

Ordinarily life provides innumerable instances for which exact execution of directions are necessary. Anything short of absolute accuracy will produce errors.

That school children are typically inaccurate in this type of reading is amply attested not only by the results of our tests but by the outcomes of study of this problem made by Dr. R. P. Carroll.[1] Dr. Carroll found, moreover, that training, such as we have here suggested, is very potent to increase efficiency in this type of reading. His practice materials were limited almost exclusively to directions.

Other materials may be used for the same purpose. Where a thorough and accurate understanding is desirable, the regular materials of history, geography, science, and other subjects are highly suitable. In the reading of arithmetic problems, great accuracy is necessary. Certain studies, indeed, have shown that many errors in arithmetic work are due to deficiencies in reading rather than in arithmetic proper. In the explanations and instructions in spellers, readers, and other texts as well as in boys' manuals, journals, and other guides to work or play, the same type of precision in reading should be secured.

There is no scarcity of material for developing this skill in reading. Failures seem to be due primarily to lack of practice under conditions which require high accuracy. Remedies are to be achieved by arranging the work so that errors become obvious and are not

[1] *An Experimental Study of Comprehension in Reading*, Teachers College Bureau of Publications, 1927.

tolerated and so that improvement is discerned and approved. Devices, of which we have now given sufficient illustrations, should be provided which, when used under proper supervision, will make this improvement possible.

Remedial Materials for Deficiency in Type D: Reading to Note Details

This test differs from A and B in that it does not require well-organized and integrated grasp of the main point of a passage, although reading for details is usually facilitated by comprehension of the total selection; it differs from B in requiring little reasoning beyond the confines of the data given; it differs from C in requiring less complete and precise comprehension of all of the facts and their relations. This test measures ability to find the answers to rather straightforward, detailed questions. It requires a search-for-a-particular-item kind of reading.

As noted in the preceding chapter, many pupils tend to do this type of reading relatively well. It may be observed that this kind of reading is somewhat akin to the understanding of sentences discussed in Chapters III and V. To be more exact, it is closely related to the reading of paragraphs-of-sentences which in Chapter V was suggested as marking a transition stage between the understanding of sentences and the grasp of unified paragraphs. In Test D certain skills are involved, however, which are not engaged in reading and responding to isolated phrases and sentences.

These are skills in noting the relations and positions of details, of retaining these details until the questions are encountered, or of locating them readily without laborious re-reading of every word when they are not retained. Several skills involved in working over a passage and sifting out its details are required, and these are important skills.

As for the other types of remedial work, all sorts of material may be used for this type. Most of the practice materials published for remedial use in reading and much of the study or " work " type of reading found in use in many schools tend to emphasize reading to comprehend and recall details.

As nearly as the writer can tell from reading the material, the Standard Test Lessons prepared by McCall and Crabbs and their students, for example, require primarily, if not exclusively, reading to note details. These exercises are arranged in booklets. The following is one of ninety-four pages from the booklet arranged for Grades III, IV, or V.

The scale at the bottom of the page gives the grade scores which correspond to different numbers of correct answers. These scores make it possible readily to compute improvement made by a pupil during practice. For this type of reading, the Standard Test Lessons should be very useful remedial material.

TEST LESSON 2

One spring day Harry saw a bird's nest tucked away in the hedge along the lane. He tried and tried to see into the little home without disturbing it, but could not. Suddenly he thought of something.

Away he ran to his workshop. Soon he came back carrying a little round mirror, a long narrow piece of tin and two little nails.

Harry pinched the tin around the edge of the mirror. When the ends met, he bent each out. Then he fastened the mirror to the end of a long pole by slipping the pole between the bent ends of the tin and nailing it fast. Harry held his mirror over the hedge, and to his delight, he saw three little blue eggs in a bed of feathers.

1. Harry fastened the mirror to the (*a*) hedge; (*b*) pole; (*c*) tree; (*d*) nest.
2. The number of eggs in the nest was (*a*) 2; (*b*) 4; (*c*) 5; (*d*) 3.
3. The bird's nest was in (*a*) a hedge; (*b*) a lane; (*c*) a tree; (*d*) the ground.
4. The piece of tin was (*a*) square; (*b*) round; (*c*) small; (*d*) long.
5. The tin was pinched around the (*a*) hammer; (*b*) nest; (*c*) nail; (*d*) mirror.
6. Harry found nails in the (*a*) workshop; (*b*) lane; (*c*) hedge; (*d*) mirror.
7. The hedge was along the (*a*) road; (*b*) lane; (*c*) creek; (*d*) garden.
8. The mirror and the tin were fastened to the pole with (*a*) three nails; (*b*) one nail; (*c*) four nails; (*d*) two nails.
9. He used the mirror to see into a (*a*) hedge; (*b*) lane; (*c*) nest; (*d*) tree.

No. right	0	1	2	3	4	5	6	7	8	9	10
Grade score	2.5	2.9	3.2	3.5	3.9	4.3	4.7	5.4	6.1	7.1	—

Further materials may be made to cultivate reading to note details in almost any type of content. Most of the several types of comprehension exercises suggested above (See Chapter IV especially) may be utilized. In the next chapter we shall give details for conducting remedial work designed to emphasize either speed or accuracy.

Some Illustrations of Deficiencies Limited to One or Two Types of Reading

Pupils deficient in but one or two types of reading have, for one reason or another, failed to develop the special techniques needed for proficiency in these forms of reading without having failed to acquire certain general and fundamental skills required for other types of fluent reading. Illustrations of concrete cases will be used to indicate several types.

Pupil A. Fair in Three Types — Inferior in Directions
GRADE 4.6 MENTAL GRADE 4.8

Test	Amount Correct Grade	Per Cent Correct Grade	Actual Per Cent Correct
A	4.5	4.9	84
B	4.5	4.6	77
C	3.2	3.1	35
D	4.7	4.8	90

Pupil B. Fair in Three Types — Special Deficiency in Test B
GRADE 4.8 MENTAL GRADE 5.0

Test	Amount Correct Grade	Per Cent Correct Grade	Actual Per Cent Correct
A	5.0	5.1	85
B	3.7	4.1	77
C	5.5	5.8	68
D	4.9	5.4	94

Pupil A. — Pupil A is a good example not of all-round inferiority but of deficiency in one type. Although about average for one of his grade and mentality in Types A, B, and D, this pupil is clearly low in

precise reading. In both the "amount correct" score and in the "percentage of accuracy," he is more than a year below his actual grade, his mental grade, and his grade scores in the other tests. This pupil needs specific training in careful reading to increase both rate and accuracy.

Pupil B. — Pupil B is fair in all types of reading except in Test B which measures reading while reasoning with and beyond the facts actually given. In this task, pupil B is over a grade lower than in the other types of reading. B's skill apparently does not extend beyond literal reading. He lacks the techniques required to go beyond the data given. Practice as described above for such cases is the remedy.

These two cases illustrate the type which possesses a deficiency in but one kind of reading. Difficulties are found even more frequently in two types of reading combined with average or better ability in the other types. Of the six possible different combinations of deficiencies in two types, only a few need be given in illustration.

Pupil C. — Pupil C's reading achievements in rate and accuracy are up to his grade and mental level in Test C, the exact reading of directions, and in Test D, reading for details. In Tests A and B, while this pupil ranks fairly well in accuracy, he is over a grade retarded in rate of accurate reading. This is a picture of a pupil whose main strength is in the careful, analytic type of comprehension. He is most accurate in reading for details (Test D). In reading to comprehend the more general aspects of the thought, this pupil's prog-

ress is too slow and labored. He needs more experience, carefully controlled and directed, in the less precise type of reading.

PUPIL C. FAIR IN TESTS A AND D — DEFICIENCIES IN TESTS B AND C
ACTUAL GRADE 5.8 MENTAL GRADE 5.9

TEST	AMOUNT CORRECT GRADE	PER CENT CORRECT GRADE	ACTUAL PER CENT CORRECT
A	4.5	6.5	90
B	4.2	5.3	81
C	6.0	6.0	70
D	5.8	6.4	97

PUPIL D. FAIR IN TESTS A AND D — DEFICIENCIES IN B AND C
ACTUAL GRADE 4.5 MENTAL GRADE 4.8

TEST	AMOUNT CORRECT GRADE	PER CENT CORRECT GRADE	ACTUAL PER CENT CORRECT
A	5.0	5.1	85
B	3.9	3.6	53
C	3.5	4.1	50
D	4.8	4.9	91

Pupil D. — Pupil D shows fair ability or better in Tests A and D but low attainments in B, which requires reasoning beyond, as well as accurate grasp of, the facts given, and in Test C, the exacting type of reading. Although these difficulties are related each requires special treatment.

Pupil E. — Pupil E is a type whose deficiencies might be mistaken for merits by a casual observer of the records. This pupil has the merit of being unusually accurate, but the accuracy is the result of painfully slow

PUPIL E. SLOW, LABORED READING IN ALL TYPES — FAIR ACHIEVEMENT IN TEST C

GRADE 5.2 MENTAL GRADE 5.0

TEST	AMOUNT CORRECT GRADE	PER CENT CORRECT GRADE	ACTUAL PER CENT CORRECT
A	3.5	12.0	100
B	3.3	6.0	84
C	4.5	12.0	100
D	3.1	9.5	100

reading. He rarely made a mistake in the tests, but only in Test C was his " amount correct " score approximately up to his actual or mental grade. This test requires deliberate, careful reading. Pupil E has acquired only this single reading technique which he applies uniformly to all materials and tasks. He needs training to increase speed and fluency in other types of reading.

PUPIL F. INACCURATE, HASTY READING IN ALL TYPES

ACTUAL GRADE 4.8 MENTAL GRADE 4.6

TEST	AMOUNT CORRECT GRADE	PER CENT CORRECT GRADE	ACTUAL PER CENT CORRECT
A	4.2	3.6	64
B	3.7	3.5	52
C	3.8	3.0	33
D	4.6	3.7	78

Pupil F. — Pupil F is noticeably deficient in accuracy in all four types of reading. He hurries through the material with an indefiniteness of grasp that results in only partial comprehension. His scores for " amount correct " are low because he comprehends

correctly so few of the paragraphs read. Even in Test A in which the reader is required to secure only a general impression of the passage, this pupil frequently fails. He obviously needs remedial work in all types of reading to increase his ability to comprehend the thought and to establish for himself some criteria of accuracy.

In the typical classroom, the pupils who show any special deficiencies at all will resemble in degree and kind the cases just discussed. For such pupils the best remedial procedure will consist in the use of such materials and instruction as have been described in this chapter. In addition to applying such measures, the teacher should become familiar with the various habits and attitudes which may exert an influence upon reading aptitude. The deleterious effects of such handicaps as irregular eye-movements, pronounced articulation during reading, use of the finger to keep place, etc., will be considered in the next chapter.

More Serious Deficiencies

In typical school classes of forty pupils or thereabouts, which have been surveyed by the writer, from one to eight — usually three or four — may be found who show deficiencies more serious than any of those described in this chapter.

The number of serious deficiencies in reading will vary according to the distribution of intelligence in the group, the method of teaching utilized, the skill of the teacher, and other factors. These children may be identified by their achievements on the tests. They

are the pupils who in Grades III and IV fail nearly or completely in all four tests and who in higher grades secure grade scores from the four tests which, when averaged, yield a composite score lower than the norm for Grade IV. These are the pupils who have always experienced extreme difficulty in learning to read and who have really never learned to read with skill. For such pupils further diagnoses are necessary. The procedures to be followed will be given in the chapters following.

REFERENCES

For assistance in preparing material of the types suggested in this chapter, the reader may consult the references listed on pages 87 and 88. The *Twenty-fourth Yearbook of the National Society for the Study of Education*, Public School Publishing Company, Bloomington, Illinois, 1925, will be especially helpful.

CHAPTER X

FURTHER DIAGNOSIS AND REMEDIAL INSTRUCTION FOR PUPILS DEFICIENT IN ALL TYPES OF SILENT READING

In the preceding chapter were presented representative types of reading deficiencies of the less serious degrees as revealed by the team of four tests. As long as a pupil does fairly well in one type of silent reading, the prognosis for rapid improvement in the others is good. If the pupil reads satisfactorily some one of the tests, the indication is that the difficulties in the others are due not to total failure to acquire the fundamental mechanical habits of reading but to inadequate development of certain special skills required for particular types of comprehension. If he has succeeded in acquiring skill in one type of comprehension, the probability that he can acquire skill in another type is great. For such pupils the diagnostic and remedial measures given above should be sufficient.

Certain pupils will be found, however, who are deficient in great or small degree in all four types of reading. Some will be about equally retarded in all four types; others will be retarded more seriously in some than in others. But as long as the pupil is deficient in some degree in all tests, we may expect to find

one or more common factors which contribute to difficulty in every effort to read. In this chapter will be outlined a line of investigation to follow in the search for these causes of difficulty. Where specific remedial measures are known to be of value, they will be given.

How Slow Reading Is Revealed

A pupil's score may be below the norm for his mental ability in all four tests because he reads very slowly. Tables in the Appendix indicate the rate of reading which is the average for pupils of average mentality at different age and grade levels. How fast a pupil reads may be gauged by comparing with these figures the number of paragraphs attempted. Even if the pupil reads accurately, his total reading achievement (that is the amount correctly interpreted in a given time) cannot be high if his rate is very slow. If such a slow speed is revealed, the following possibilities should be investigated to account for it.

General Characteristics of Slow Reading

Narrow eye-voice or eye-perception span. — A slow rate of reading is usually characterized by what has been called a narrow eye-voice span. During oral reading it is found, by the use of suitable apparatus, that the slow reader's eye is fixating the word he is pronouncing or a point but slightly in advance of the word being pronounced. The rapid reader, on the other hand, is usually looking two or three words ahead of the one being pronounced. The distance between the word fixated by the eye and the word

being pronounced is the eye-voice span. In silent reading, the rapid reader usually is fixating, similarly, a point in advance of the word or phrase being articulated silently — or most explicitly recognized — whereas the slow reader is fixating the word he is then perceiving. This ability to look ahead and gain a vague impression of the advance material is a highly important skill contributing to fluency and speed in comprehension. It consists of embracing in one conscious grasp not only the word at the height of comprehension and the immediately preceding context but also a partial apprehension of the words ahead. What is grasped, then, is not merely an isolated word but an idea which has come from somewhere and is moving somewhere. The idea covers a certain range, culminating at a point, but spreading both forward and backward. This spread of the idea facilitates progress in reading. The words ahead are recognized not wholly by exact study of their visible form but partly by the help of the immediately preceding and related thought. This complex mental act makes it possible for the good reader to recognize the words without stopping long or giving much attention to their visual form. The thought being comprehended puts in readiness the word-ideas suggested by a barest glimpse of the word-forms ahead. Prolonged and close study of the word-form itself thus becomes unnecessary and attention may be devoted primarily to grasping and appraising the thought. Rapid and comprehensive reading is the result.

The complex and harmoniously operating abilities which make possible such a span of thought are essen-

tial characteristics of rapid reading. In slow readers they are undeveloped or only partially developed. What are the causes of these deficiencies and how may such skills be acquired?

Causes of deficiencies in the eye-voice or eye-perception span. — The causes of this deficiency are numerous. Many of them were presented in Chapters IV and V in discussing causes of poor paragraph and sentence comprehension among pupils of the primary grades. Some of these factors we shall presently reconsider in addition to certain habits which may interfere with the acquisition of fluent reading.

No single difficulty accounts for all instances of narrow eye-perception span. There is consequently no single device to use to enlarge the span or otherwise to increase the rate of reading. There is, however, a general procedure to be followed. It consists in applying remedial work of a kind designed to stimulate, exercise, measure, and make manifest increasing speed in reading combined with certain variations and modifications of the procedure arranged to decrease or eliminate certain inhibiting habits and with certain special forms of training designed to strengthen certain subordinate but essential skills.

Standard Procedure for Increasing Speed

The standard procedure which has been suggested in the preceding chapters, will be outlined here in the form of directions.

1. Select highly interesting material.
2. Select material that is fairly easy and which con-

tains very few unfamiliar words for the first stage of work. It is advisable to arrange all conditions, if possible, so that the pupil may make obvious improvement from the first. This is the strongest incentive to making progress.

3. Select comprehension devices that hold up the work of reading or interfere with continuous development of the thought as little as possible, especially at first.

4. Introduce the remedial practice with vigor and the most hopeful attitude possible.

5. Measure, record, and display evidence of improvement. Be enthusiastic about the progress that is being made.

6. Do not continue practice for speed beyond the beginnings of fatigue or boredom. Practice when it is tiring or annoying encourages return to the old habits.

7. Repeat the practice at intervals during the day as frequently as is consistent with convenience and interest.

8. Curtail other reading, especially oral reading or any other form that is likely to be especially slow and antagonistic to the new techniques, for a time, so as to give the latter the fullest possible opportunity to function.

9. Gradually introduce the other types of reading; when possible, under your observation. Your presence acts as a reminder to read rapidly.

10. Anticipate and be prepared to render abundant, cheerful aid and encouragement when the pupil encounters confusions, failures in comprehensions, periods of

nervousness and despair, and irritations in the early stages or when he encounters plateaus later. The task of supplanting old habits by new ones is often trying.

11. Keep an eye on the pupil for some time after he has apparently brought the new techniques under control. A relapse is always possible.

12. Help the pupil as much as possible by verbal instruction, demonstration, etc. This point may be discussed further.

Verbal instructions will, of course, vary with the age and intelligence of the subject. It is desirable, usually, to explain to the pupil the nature of his difficulty and as clearly as possible the things he should do to improve as well as the benefits to be enjoyed when he has increased his speed. The teacher may demonstrate how she reads rapidly. She may encourage him to speed up while she times his reading of a paragraph or page. On occasions, she may give him a series of sentences or short paragraphs, urging him to go as far as he can in a given number of seconds. These procedures, in which the emphasis on speeding up is especially strong, should be used with care. They may be used at first to demonstrate the attitude to be taken and the kind of results to be achieved and later as a stimulant or test or as a means of producing variety. Extreme insistence on speed, when employed extensively, may overstimulate and perhaps excite or irritate the pupil. In the main, work with fairly long selections under the milder stimulus of a timed control and quiet encouragement should be relied upon.

Whatever other devices may be used, practice of this

general type will be necessary to increase speed of reading. The further exercises and devices are introduced to counteract certain particular deleterious habits or to develop certain needed abilities.

Slow Silent Reading Due to Excessive Articulation

Diagnosis. — Give the pupil some simple material such as Type A of the Gates Silent Reading Tests and observe his lips while he reads. If he whispers the words or moves his lips distinctly, it is probable that he is organizing elaborate articulatory activities of tongue, throat, vocal cords, and the general musculature of the speech organs to frame every word perceived. In many children such complex movements are rather cumbrous and slow — much slower than the rate at which reading material may be covered by visual perception with less definite articulation. The reading rate is held down to the speed of inner speech.

Complete articulatory response is not essential to good silent reading. Proof of this is to be found in the work of the author and his students who taught deaf-mute children, ages three to eight (who could not speak any of the words but merely mastered their visual appearances as they learned the appearances of faces, hats, flowers, beads, etc.), to read with facility and full understanding. Normal children could learn to read in the same way. To eliminate articulation completely in those who show it in excessive degree is neither nec-

essary nor advisable. It is only useful to abbreviate the action of the speech organs. A slurred vocal-motor accompaniment of reading should not interfere with rapidity in reading. In occasional cases, to reduce articulation by means of practice described below will alone enable pupils to reach much greater speed; in many cases it will facilitate other remedial measures which, carried out alone, would be less fruitful.

Remedial treatment for excessive articulation in silent reading. — For this training it is often advisable to eliminate for a time all types of reading, especially oral reading, which may provide the occasion for a relapse to the habit that is to be broken. Provide easy but interesting material that may be divided into several approximately equal units, such as paragraphs or pages. Pupils should be informed of the important facts, such as that:

1. Their reading is very slow, perhaps because of saying the words too much while they are reading.

2. They can overcome this habit; they can learn to read much faster and consequently get more pleasure out of reading.

3. To read faster, they must try to read faster; they must make themselves read faster.

4. To read faster, they must try to keep their speech organs inactive. Keep the tongue still; push it hard against the roof of the mouth; compress the lips or, sometimes, hold the tongue between the teeth.

5. Whenever they read, they should try to read faster and to read without saying the words to themselves.

The teacher should supervise the work for some time. Comprehension must not be disregarded, since pupils may develop during the practice a new type of rapid reading without understanding that is resorted to at the teacher's demand but discarded whenever comprehension is demanded. Though comprehension should be insured, it is important that the teacher realize that in his first endeavors to master the new type of reading without inner speech and at a higher rate, the pupil is likely to comprehend incompletely. As he masters the new skills, comprehension should improve. At first, therefore, permit incomplete comprehension while encouraging improvement.

The other devices suggested above in the discussion of the standard procedure for increasing speed should be used in these cases also.

Slow Reading: Use of the Finger to Keep Place

Diagnosis. — Occasionally the habit of pointing to the words as they are read persists without attracting the teacher's attention. This habit, slavishly followed, will curtail the development of speed. The fact that a pupil does not use his finger every time the teacher asks him to read under test conditions is not a sure proof that the pupil does not use this crutch considerably under other circumstances. He may have been warned not to use it but have been unwilling or unable to give it up in private reading. By inquiry or observation, determine whether the habit functions at any time.

Remedial treatment. — The remedial procedure to be adopted for pupils subject to this habit should be

the same in general character as that prescribed for excessive articulation. Substituting instructions concerning the bad effects of using the finger, follow the same procedure of training for rapid reading — the use of special materials, timed exercises, brief intensive periods of practice, and encouragement to make the same efforts to improve in all reading work.

Alleged Habituation of Improper Eye Movements

As a rule, rapid reading is characterized by regular, rhythmical eye-jumps across the page. At each stop, the ocular span embraces two or more words. The progression from stop to stop is continuous and fairly uniform. Slow reading, on the other hand, may be accompanied by regular but short eye-jumps with a fixation for each word or by many irregular movements, regressive as well as progressive. In many cases, the eyes leap back and forth repeatedly over the same word or phrase in quite irregular or in somewhat typical patterns of direction and duration. Where elaborate photographic records of eye movements are available they often prove helpful in diagnostic study since certain patterns indicate certain types of difficulty, but under school conditions such data are difficult to obtain.

Knowledge of the exact nature of eye movements is at present chiefly interesting and useful in diagnosis. It cannot be said with assurance that inappropriate eye movements such as short, jerky, or irregular movements are the *primary causes* of slow reading even if they usually accompany such reading. Probably the

irregular eye movements and the slow reading are the joint results of other factors. Remedial work, then, directed exclusively to correcting the eye movements might be expected to be futile. The author, indeed, found this to be true in certain cases subjected to such treatment [1] and has failed to find in the work of others evidence of success resulting from the direct training of eye movements. In one respect this situation is fortunate since the eye movements are so vaguely conscious as to make it difficult for the pupil to apprehend them in the process of learning.

Improper eye movements, in other words, result from such causes as excessive articulation or finger-following and from many other causes to be treated presently. If these causes are properly removed, it will be unnecessary to treat the eye movements specifically.

Reading Word by Word

Causes of word-by-word reading. — Many of the slowest readers, as was said above, react to but one word at a time, whereas the rapid readers typically look ahead at words not yet at the center of attention and hold over the effects of the preceding context. Reading by a series of more or less separate reactions to individual words, instead of embracing many word ideas in one complex span, may be the result of the factors just considered — insufficient practice in rapid reading for the thought, overemphasis on precise articulation, or excessive finger-following. Sometimes there seems

[1] See the *Psychology of Reading and Spelling*, pp. 56 ff.

to be no very definite cause except, perhaps, mere failure to push beyond the word-by-word stage.

Apart from the influence of inertia, general lack of interest or practice in rapid reading, the inhibiting effects of excessive articulation and finger-following, there are a number of other factors which may also interfere with the development of fluent and rapid reading. The most important of these factors were considered in the preceding chapter (Chapter IV) in connection with deficiencies in the reading comprehension of primary pupils. These factors we shall review briefly, introducing at the same time certain suggestions concerning diagnosis and remedial treatment for the older pupils.

As related to slow reading, the main difficulties are:

1. Inability to utilize context clues
2. Special difficulties with thought units, punctuation, etc.
3. Small reading vocabulary
4. Deficiencies in methods of word perception and word study

Needless to say, the pupil who cannot utilize effecively context clues, who cannot differentiate thought units such as common phrases readily, who is hindered rather than helped by punctuation marks, who has not acquired familiarity with common types of sentence structure, who encounters in the ordinary material for his grade a large number of words that are unfamiliar, and who is slow and uncertain in working out the recognition of such words by analysis of the word-form will find it quite impossible to read with fluency and

speed. Pupils who read slowly in the tests but whose difficulties are probably not fully accounted for by excessive articulation, finger-following, or mere lack of practice in rapid reading should be further studied in order to enable the examiner to indicate which of these additional factors may be responsible for their troubles.

Inability to Utilize Context Clues

To ascertain to what extent the pupil is able to utilize context clues, substantially the same techniques may be used as were recommended above (Chapter VI) for study of the primary pupils. Gray's Oral Passages in connection with the Gates Pronunciation Test provide an opportunity to observe whether the pupil mainly studies word-forms or guesses from word-form clues or utilizes the thought considerably. The types of errors made will enable the teacher to secure an idea of the method adopted. If the pupil is found to be deficient in this important skill, remedial exercises similar in kind to those described in Chapter VII but adjusted to the pupil's reading level should be applied until ability is realized.

Special Difficulties with Thought Units, Punctuation, Sentence Structure, etc.

Difficulty in utilizing the context is often accompanied by inability to appreciate properly the grouping of thought units in a paragraph. The pupil names the familiar word-forms and struggles with the unfamiliar forms in isolation from their context. He will show

little regard for the various clusters of words which belong together as parts of a thought unit.

It is often not easy to tell which of these difficulties — difficulty in utilizing the context or difficulty in apprehending thought units — is the cause of the other. They often, but not invariably, go together. We sometimes find a pupil who understands quite well what he reads although he reads without indicating by emphasis or pauses the natural thought divisions and relations. He apparently gets the thought despite poor recognition of thought groupings and divisions. He should, however, be able to read with greater comprehension, ease, and speed were he more sensitive to such thought units. His handicap may be responsible for some degree of slowness in reading.

Diagnosis. — Pupils who are hindered rather than helped by common punctuation marks, who lack a feeling for the significance of different kinds of familiar sentence structure, or who for other reasons show little ability to recognize thought units and to appreciate the common relations of word groupings usually may be detected by the manner in which they conduct oral reading. Gray's Oral Passages are very useful for this purpose. Such pupils break up the sentences without proper regard to the natural word groups. They may read in a monotonous tone without emphasis or proper pauses. They may read smoothly or jerkily, word by word. They may introduce all degrees of expression from slight to very pronounced, but *kinds* of expression that are improper for the passage — that is to say, they may emphasize the wrong words, pause at the

wrong places, combine in a unit words which form part of two groupings, and so on.

Remedial treatment. — When the pupil is found to be deficient in the use of punctuation marks, the apprehension of word groupings, and the management of sentence organization, remedial measures should be introduced. The methods to be followed in this work have been given in sufficient detail above to make intelligible the procedures to be followed. (See pages 95–115.)

Small Reading Vocabulary

Most of the difficulties previously described in this chapter, such as slow and uncertain comprehension, inability to grasp word units, to look ahead of the word being pronounced, etc., may be due entirely to the inability to recognize without special study more than a small number of words and to clumsiness and slowness in perceiving those that are known. Such a possibility, obviously, should be considered.

For very poor readers, the range of word recognition may be measured by the Primary Test, Type 1, Word Recognition, described in Chapter III. For pupils who obtain substantially perfect scores on this test, the Thorndike Test of Word Knowledge,[1] may be used. These are both group tests.

The reading vocabulary may also be ascertained by use of an individual test, the Gates Pronunciation Test, described in Chapter VI and the Appendix.

[1] Distributed by the Bureau of Publications, Teachers College, Columbia University.

This test is applicable to all levels of ability; norms are provided for Grades I to VIII inclusive. Whether the group tests are given or not, it is recommended that the Pronunciation Test be given to all seriously deficient readers, since this instrument provides the means of measuring the range of recognition of a representative sampling of the most commonly used words, all of which are found in the Thorndike Word Book or the Gates Primary Test, or both, and of appraising not only the ease and accuracy of recognition but also the type of attack employed when unfamiliar words are encountered. Since the remedial measures to be applied to pupils whose reading vocabularies are small depend in large measure upon the methods of word study revealed, a diagnosis of these methods should also be made.

Deficiencies in Methods of Word Study and Perception

In dealing with difficulties in the primary grade, the influences of difficulty in utilizing the context, in breaking up word-forms into syllables or other parts, in phonetic translation, in "seeing" words as wholes of familiar parts, in grasping quickly "sight" words, etc., were examined. The methods of detecting strengths and weaknesses in these skills by use of the Gates Pronunciation Test, Gray's Oral Passages, and the Gates Phonetic Tests were explained in detail and the remedial materials and methods to be followed were illustrated. For the study of backward readers in the third and higher grades, the same diagnostic techniques

should be applied and similar remedial measures followed. The information needed for such work is to be found in Chapters VI and VII.

Inaccuracy in Reading

In the preceding sections of this chapter we have been discussing primarily the causes and characteristics of slowness in reading. Inaccuracy in reading now demands our attention.

Inaccurate reading due to absorption of attention in word recognition. — Inaccuracy in reading often accompanies slowness, and the difficulties which cause the one also cause the other. Thus we find that a poor span of reading apprehension, slow, uncertain word-by-word reading, small reading vocabulary, poor methods of word attack, and the like result in slow, stumbling reading which is accompanied by erroneous and incomplete grasp of the thought. When the pupil is subject to such mechanical difficulties, he is often mainly absorbed in the work of word recognition. The result is a more or less complete neglect of the thought. By failing to secure the thought adequately, one of the most fruitful aids in recognition of words, the use of the context, is lost and thus a vicious circle of difficulties, each increasing the others, is formed.

To remedy inaccuracy and incompleteness of comprehension in such cases, the diagnoses and remedial measures described in the foregoing sections of this chapter should be followed with one variation — more attention should be devoted to encouraging, checking, and displaying comprehension. This does not

mean that absolutely accurate and full grasp should be demanded from the first. As the various corrective measures are put into effect, periods of distraction and confusion are to be expected. During these stages, the practice should be arranged to stimulate thought getting and to demonstrate improvement when it does appear. The practice materials with ready-made questions and exercises serve admirably for this purpose. But it should be realized that the slow, inaccurate reader has the double task of overcoming obstacles to securing greater speed as well as accuracy. Both should be developed simultaneously. Just as difficulties in the one add to deficiencies in the other, so advances in the one facilitate improvements in the other.

Inaccurate comprehension due to excessive speed in reading. — Given a certain degree of all-round skill, the faster a pupil reads beyond a certain optimum rate, the more inaccurate the comprehension will be. Since the fundamental skills vary from zero up, almost any speed may be for certain pupils too great for accurate comprehension. Many pupils, in other words, comprehend very inaccurately and incompletely because they are exceeding their optimum rate. Some of these excessive rates may be below the average speed of average pupils of their age and grade. If these excessive rates are still not rapid, the fundamental causes of inaccuracy are likely to be those just reviewed. The effects are merely exaggerated by the uncommon speed. The remedial measures for these pupils are those which apply to the specific difficulties discovered, combined with the standard practice for rate. In using the lat-

ter exercises the only variation needed is to exercise special vigilance to stimulate comprehension. While speed must be held within reasonable bounds and not permitted to run riot, care must be exercised not to discourage advance in rate, which when really achieved means the removal of handicaps which previously interfered with full accuracy of comprehension. The emphasis should be not a negative discouragement of rapid reading but a positive encouragement of clear and full comprehension.

Inaccurate comprehension due to overemphasis of the motor skills in reading. — Inadequate comprehension may sometimes be due to overemphasis of the motor phases of reading. Excessive zeal for accurate articulation, fluent oral reading, or excessive pressure for speed in silent reading may lead to a neglect of comprehension. The pupil at length finds mere rapidity of word-form recognition or articulation more satisfying than thought getting. The writer has seen a few instances — among many hundreds of very poor readers observed — in which the pupils were expert in word reading but gave scarcely any attention to the meaning. Reading had become primarily a form of vocal-motor gymnastics with little more thought content than singing the scale — *do, re, mi, sol.*

Inaccurate comprehension due to excessive zeal in thought getting. — Although it may seem paradoxical, difficulties in comprehension may be the final outcome of excessive zeal in getting the thought rather than the form. Such a result may come about, for example, by developing too early an extreme dependence on the

context as a means of recognizing unfamiliar word-forms. The result of this habit occasionally is failure to acquire the other methods of recognizing a word from acute observation or analysis of the word-form, important even if subordinate skills. These deficiencies retard the development of the reading vocabulary and of the ability to perceive words quickly and accurately. These deficiencies, in turn, retard reading rate and thus increase the difficulty as well as the need of recognizing unfamiliar words from context clues. Slow reading, burdened with heavy thought in order to "guess" the unfamiliar word-forms correctly, or more rapid reading resulting in omissions, alterations, and substitutions of words with little change in the thought are common results. Not infrequently, moreover, especially in reading novel or difficult material or in reading more rapidly than usual, the pupil's weakness for perception of word-forms results in more or less serious mutilation of the thought.

Other Causes of Serious Difficulties in Reading

We have not yet mentioned all of the factors which contribute to serious backwardness in reading. We have, however, described most of those which consist essentially in inadequate habit formation, whether it is due to failure to develop a needed skill or to the acquisition of an unfortunate one. These sources of difficulty are, fortunately, the ones that may be most readily remedied. They are the ones of first concern to the teacher who must conduct the remedial work. They

are the ones, finally, which teachers can, with practice, learn to diagnose accurately and treat effectively.

In the next chapter will be considered other sources of difficulty in reading which, in considerable measure, consist of deficiencies in the fundamental machinery, in the organic nature of the subject. Some may be remedied; others cannot be readily or greatly changed. But even in the latter cases, though the capacities cannot themselves be changed, the pupil's learning may be greatly facilitated by the adoption of methods specially adjusted to the limitations found. Teachers should know about these sources of difficulty and the related remedial measures, since they will usually be expected to use and understand the latter even if they do not conduct the diagnoses of the former. Some teachers, indeed, will learn to do both.

REFERENCES

The following books contain discussions of some or all of the problems presented in this chapter.

1. Brooks, F. D., D. Appleton and Company, 1925.
2. O'Brien, J. A., *Silent Reading*, The Macmillan Company, 1922.
3. Smith, W. A., *The Reading Process*, The Macmillan Company, 1922.

PART IV

DIAGNOSIS AND INSTRUCTION FOR CASES OF EXTREME READING DIFFICULTY OR DISABILITY

CHAPTER XI

DIAGNOSIS OF FUNDAMENTAL CAPACITIES IN CASES OF EXTREME READING DISABILITY

In this chapter we shall be concerned with the detailed diagnosis designed to reveal special weaknesses in the fundamental capacities and functions upon which reading depends. Such extensive appraisals of the fundamental mechanisms concerned in reading are not necessary except for the most serious case of backwardness in learning. To conduct these examinations properly, special skill and training in the technique of mental testing is needed.

The organization of this discussion will be as follows: In the present chapter we shall discuss the nature of the tests and the significance of results; in Chapter XII, a program of remedial instruction designed for certain types of disabilities; in Chapter XIII, samples of complete diagnoses of individual cases and a summary of the diagnoses of 411 cases; and in the Appendix, detailed instructions and norms for the tests.

The tests and examinations described in this chapter with certain exceptions have been devised by the writer during several years of study of serious reading disabilities. Some of them have been presented previously in the technical literature; some are here pub-

lished for the first time. The test program may be outlined as follows:

I. General intelligence; non-reading tests
II. Visual functions
    1. Vision
    2. Visual perception
    3. Visual analysis and recognition
    4. Visual apprehension and memory span
III. Auditory functions
    1. Auditory acuity
    2. Auditory discrimination
    3. Auditory apprehension and memory span
IV. Motor functions
    1. Eye control
    2. Control of limbs, hands, fingers
    3. Speech
    4. Handedness
V. Associative learning: capacity and technique
    1. Visual → visual association
    2. Auditory → visual association
VI. Nervous and emotion stability

Theory Underlying the Tests

The theory underlying these tests has been suggested earlier. It is the hypothesis that good reading depends upon the highly coördinated operation of many different bodily mechanisms and that defects or deficiencies in any such organic apparatus may interfere with the acquisition of reading skill. Deficiencies in some

capacities are more serious than in others; and inferiority in several is more serious than in any one. By diagnosis these defects are to be discovered. If they cannot be remedied, instruction may be arranged to place smaller demands on the deficient capacities and greater upon the more efficient. By this device of compensation, better reading ability may be achieved.

The further theory upon which the writer has been working is that it should be possible, by proper choice and repetition of tests and by the use of proper methods of administering and scoring, to approximate the native capacities of pupils for such tasks as perceiving various kinds of small visual items, analyzing and discriminating complex visual wordlike figures, discriminating wordlike sounds, learning by associating wordlike figures with sounds or pictures and doing other tasks similar to those actually demanded (with slightly different content) in reading and learning to read. One cannot be certain how closely the results of the tests approximate a picture of the native capacities sought. The assumptions and problems are substantially the same as those involved in attempting to test intelligence. As in the case of intelligence tests, the scores from these diagnostic instruments represent a mixture of the effects of native aptitude and of acquired information and techniques. And as in the case of intelligence measurement, the diagnosis of each type of function — such as speed and accuracy for visual perception for small items, associative learning, etc. — is based upon a composite score obtained by pooling the results of several tests each of which measures some

(presumably) important aspect of the capacity. The writer's belief is that, in much the same way that intelligence tests provide under certain conditions a useful symptom or approximation of native intellectual capacity, the present tests provide a rough but useful indication of certain aptitudes. They might be called tests which reveal primarily aptitude for certain types of learning involved in the process of mastering words and learning to read.

Some of the series of tests which follow are more reliable and valid than others. Some have been applied to many cases of different types, revised, and reapplied over a period of nine years; others have been less intensively used. All are here presented, not as instruments fully refined and understood, but as tests in the making in the hope that other students may, by using them, facilitate the process of change and improvement.

Sources of Data on the Tests

In order to give some idea of the data upon which the present tests and suggestions are based, the number of pupils to which they have been applied in connection with tests of reading ability, intelligence, and other abilities, may be summarized:

	APPROXIMATE NUMBER OF PUPILS TESTED
1. Earlier and present forms of tests of speed and accuracy in visual perception, from four to nine tests in each case	1600
2. Present series of tests of visual analysis and recognition	500
3. Visual apprehension and memory span	500
4. Auditory discrimination, older forms	100
5. Auditory discrimination, present form	560

	APPROXIMATE NUMBER OF PUPILS TESTED
6. Auditory memory span, present form	580
7. Visual apparatus, appraised from results of our tests	680
8. Visual apparatus, examination by specialists	107
9. Auditory apparatus, appraised from results of our tests	660
10. Auditory apparatus, examination by specialist	10
11. Observations for motor defects of limbs, hands, fingers	526
12. Observation for speech defects	623
13. Expert examinations of speech defects	18
14. Tests or questionnaire, or observation of handedness	500
15. Tests of associative learning, old and present forms	1000
16. Tests, questionnaire, observations concerning nervous and emotional stability	400

In these figures are included all the cases to which were given all, or practically all, of the series of diagnostic tests, examinations, and observations in use at the time. These cases may be summarized separately to indicate the number of complete case studies made.

1. Total number made between 1919 and 1927	650
2. Total number of these classified as seriously deficient in reading	305
3. Total number given entire present series including tests of reading ability, Gates Pronunciation, Gray's Oral Reading and intelligence tests	465
4. Number of these classified as seriously deficient in reading	115

Approximately four hundred additional cases have been given a large number of the tests — enough to make possible diagnosis concerning certain phases of their equipment.

Data on remedial treatment. — Suggestions for follow-up instruction have been made for 678 cases studied by some or all of the diagnostic tests and methods. Of

these, 411 were classified as seriously deficient in reading. Remedial treatment has been applied to many of these cases, in conformity with suggestions made by the writer, for which satisfactory follow-up records have not been secured. The cases for which individual remedial work was carried out under his direction and from which satisfactory records of progress have been secured number 169. This number does not include those given remedial work of definite types — flash cards, phonetics, the new intrinsic devices, the materials for the deaf and other groups — used in studies by the method of control and experimental groups.

The suggestions contained in the present and the following chapter are based upon such analyses of these data as the writer has been able to make.

I. Intelligence

So familiar is the rôle of intelligence in influencing the acquisition of reading ability that extended discussion of its function is unnecessary. In a study of sixty fourth grade pupils, the correlation between the Stanford-Binet mental age and the composite of scores from the four Gates Silent Reading Tests was 0.66 when the influence of age was eliminated. For the same pupils the correlation between the National Intelligence Test and the reading score was higher, 0.78. This difference is due largely to the fact, probably, that the National test is dependent on reading ability. Very poor readers earn very low scores on this test.[1] The implication of these facts is obvious: To appraise the

[1] See, for example, *The Psychology of Reading and Spelling*, Chapter IV.

intelligence of excessively poor readers do not use a test that requires reading. In the writer's own work, either the Stanford-Binet individual or the Pintner Non-Verbal Group test has been used.

That dull children usually experience greater difficulty in acquiring all the information and skill required for reading is well known. In the next chapter will be illustrated a form of instruction that has been found to be very helpful for the dull.

II. Visual Functions

1. Appraising the efficiency of the visual apparatus. — Serious defects in vision may be primarily responsible for difficulties in learning to read. To distinguish *these* from *there* requires fairly clear vision, and to acquire the delicate eye movements needed in rapid reading demands fairly good eye muscle coördination. In most instances of disability an expert eye examination is desirable to test the possibility of such defects.

It should be realized that the mere correction of a visual defect is not sufficient, as a rule, to remove the reading disability. Laboring under the handicap of defective vision, pupils usually acquire various inappropriate reading habits. It is necessary to detect these habits, by such methods as have been outlined above, and to apply the remedial treatment appropriate to the type of difficulties found.

The tests described in the next section, dealing with visual perception, provide a preliminary and rough appraisal of visual difficulty. They will, at least,

indicate the absence and suggest the probable presence of eye troubles.

2. **Appraising efficiency in visual perception.** — Good vision alone does not guarantee good visual perception, although very poor sensory organs make efficient visual perception difficult or impossible. It is, therefore, often desirable to appraise visual perception for small printed items, that is to say, visual perception for objects more or less closely similar to words. For this purpose the author has devised a series of tests which have been extensively used in the study of reading cases. Two groups of tests, each including materials approximating in different degrees the characteristics of actual words have been constructed. They are as follows:

Series A. Same-different series

Test 1. Perception of geometrical designs. — This test consists of a page of exercises like those shown in the Appendix, page 389. The directions indicate the task, which is to underline the pair of items that are unlike.

Test 2. Perception of digits. — This test consists of a page of pairs of numbers. (See Appendix, page 393.) The form of the task, the scoring, etc., is the same as in Test 1.

Test 3. Perception of words. — This test is like the other two except that words are used. (See Appendix, page 394.) When originally devised, a test of nonsense words was included. The latter test was discarded since it was found that the three were sufficient.

A second series of two tests, which may be used instead of the above or in combination with them when a more accurate measure is desired, has also been prepared.

Series B. Selection test

Test 1. Selection of geometrical figures. — This test is illustrated in the Appendix, page 396. The ability measured is similar to that gauged by Test 1 of series A.

Test 2. Selection of words. — This test corresponds to Test 3 in series A. It is illustrated on page 398 in the Appendix.

The scores for these tests should be translated into age or grade scores, by means of directions given in the Appendix, for interpretation. The most typical results are of the following two types:

1. The pupil secures lower grade or age scores in the tests composed of words than he does in the others.

This situation is the one most commonly found among poor readers. Among very poor readers, the scores on the perception of word tests will be distinctly below the average whereas the scores on perception of other items may be average, or nearly so, or at any point above the average. Such results indicate that the pupil has no eye defects that seriously interfere with learning to read (although he may possess eye defects that make reading fatiguing) and that he is not subject to any general deficiency in visual perception. His perceptive difficulty is confined to dealing with words; it is due to faulty habits of perceiving words and not to any organic deficiency for perceiving small or

more or less wordlike items. The various sources of such defective word-recognition and the proper remedial measures have been discussed in the preceding chapters, especially in Chapters VI and VII.

2. The pupil secures low grade or age scores in all of the perception tests.

The scores may be uniformly or more or less unequally below the norms and, of course, the average of the several scores may be below the norms in various degrees. The main thing is the degree to which the average score is low; the lower it is the more serious the handicap.

Eliminating errors in testing due to lack of effort, etc., the sources of such low scores in the perception tests are two: (1) defects of the eye-apparatus or (2) deficiencies in visual perception for small complex items. The first possibility should be eliminated by further ocular tests and the defects removed. If no visual defects appear, or if they are removed by the use of lenses and the poor performances in these tests remain, the diagnosis is *general deficiency in the visual perception of small items.* Such a deficiency, though fairly rare in the writer's experience among poor readers, is a serious handicap. It means slowness, clumsiness, inaccuracy in the perception of such details as are the distinguishing characteristics of words. A pupil subject to such deficiency will need to be especially carefully trained by the use of materials and devices, previously described (see Chapter VII), arranged to sharpen word perception and develop independent skill in word learning as well as in rapid and careful

reading. These children, especially if they are a little dull, are very difficult to teach. They require unusual and persistent attention. Additional materials especially adapted to their needs will be given in the next chapter.

Visual analysis and recognition. — When the scores in the perception tests just described are all low, indicating inefficiency in visual apprehension, the writer usually conducts the following two tests to ascertain whether the pupil shows inferior ability in analyzing and apprehending a complex visual figure in such a way as to be able immediately to recognize it when it is exposed among others more or less similar. When the pupil shows no general deficiency in the preceding visual perception tests except in those using words as material, the following tests are not needed.

Test 1. Geometrical figures. — This test consists of a series of twelve cards on one side of each of which is a figure which is exposed to view for five seconds and on the other side six figures one of which is the same as the design exposed. The figures increase somewhat in complexity from the first to the last. (See reproductions of the figures in the Appendix.) The pupil's task is to analyze and apprehend the figure so that it may be unerringly recognized.

Test 2. Wordlike characters. — Test 2 also consists of twelve figures, of increasing complexity, all of wordlike character. That is to say, they are composed of units similar to a new type of alphabet, arranged in a row to resemble roughly a printed word in general configuration. To a child they probably look much as

English printed words do to a Chinese pupil seeing them for the first time. They present approximately a test in gaining familiarity with words for the first time. The results of these tests which are of interest to us in studying a case of poor reading are as follows:

1. *The pupil does very poorly in Test 2 but nearly average, average, or better in Test 1:*

This situation indicates that the pupil's inability is specifically connected with wordlike characters. It indicates that he lacks an important technique necessary to seize adequately upon the distinguishing characteristics of wordlike visual objects. It shows a lack of vigorous analytic skill, such inefficient methods as Dr. Meek found among inexperienced pupils in their first lessons in learning words. Such deficiencies may appear among very bright pupils. In all probability this deficiency may be remedied by proper training in word observation.

2. *The pupil does nearly average, average, or better in Test 2 or in both Tests 1 and 2:*

Such a result indicates that the pupil is not deficient in the fundamental mental machinery and technique required to learn such configurations as words. If he is not learning real English words it is because he has acquired some unfortunate attitude toward the task, or certain inappropriate techniques. To discover average or better ability in Test 2 or both 2 and 1 is to eliminate one cause of difficulty.

3. *The pupil does very poorly in both tests:*

Such a result indicates deficiency in a fundamental analytic ability of importance for learning to recognize

words. Combined with poor scores in the series of perception tests described above, deficiencies in these two tests increase the need for special guidance and the use of slow-moving, easily graded materials such as are described in the next chapter.

A pupil who does poorly in the perception tests may do well in both of these discrimination tests. They do not measure the same thing; the correlations between them in fact are not high. Such cases suggest the presence of skill in the important discriminative abilities combined with deficiencies in the factors which make possible rapid perception of small visual items. The prognosis is better for these cases than for those deficient in both types of tests.

The reliability of the two discrimination tests is, unfortunately, not high. They should be given with great care and interpreted with caution. If more extensive tests of this sort prove, in studies now being made, to be worth the time required to secure higher reliability, better instruments will be presented later.

Visual apprehension and memory span. — A test in immediate memory or " memory span " for visual items was devised and tried out. It consists of simple geometrical figures exposed one at a time at the rate of one per second. Three equivalent series of 3, 4, 5, 6, 7, and 8 items each were arranged. The method of scoring is that used in the memory for digits test of the Stanford-Binet scale. The writer has found little evidence that a weakness in this type of memory span is the specific cause of difficulty in reading. It is occasionally one among many deficiencies which account for some of

the most extreme forms of difficulty in learning to read. Further remarks on the significance of poor memory span will be reserved for a later section devoted to immediate memory for items presented orally.

III. Auditory Functions

1. Tests of auditory acuity. — In the writer's own work, special tests for auditory acuity are given only when reason for such a test is suggested by the pupil's difficulty in hearing the instructions during the examination. The auditory discrimination test described immediately below is used regularly. If the results in it are very poor, expert examination of the auditory apparatus is sought.

2. Tests of auditory discrimination. — This is a functional test of abilities related closely to certain skills of importance in reading. It consists of reading, one at a time, of series of nonsense words. The list of fifteen words begins with words of three or four syllables, such as *dopar,* and ends with three of six syllables, such as *hippotackulbosack.* The nonsense word is spoken like an ordinary word without hesitation. The pupil reproduces the word at once. Full directions are given in the Appendix.

If the pupil does well in this test, one of the sources of difficulty in learning to read is eliminated. If the pupil cannot hear well, or cannot accurately discriminate and momentarily retain the sounds of spoken words, he will encounter difficulties in associating spoken words with visible printed word-forms, in mastering phonic and phonetic skills, and in following oral les-

sons, explanations, and instructions. If the pupil does well in this test and is not hard of hearing, he has at least an important part of the equipment for profiting by auditory instruction.

If the pupil does very poorly in this test and is not merely hard of hearing, some defect in auditory discrimination is indicated. If he is also hard of hearing, the situation is more serious. Under many school conditions in which oral instruction, phonetic work and the like, are prominent, the combined handicap may be sufficient to cause failure in reading. The first step in such a case is to seek expert assistance in relieving the ear defects if possible. The next step is to change the method to one which places the least dependence on the weak auditory abilities and the most upon visual devices. Such a method, by means of which deaf-mutes have been taught to read, will be outlined in the next chapter.

3. Auditory apprehension and memory span. — The tests of auditory memory span have been applied to a large number of pupils of all levels of reading skill to ascertain the specific influence which these capacities have on reading ability. All these tests were given by the technique used in the Stanford-Binet Intelligence Scale. The four kinds of material, given in full in the Appendix, are digits, letters, nonsense syllables, and words.

A deficiency in all these tests may be expected in pupils who have defective hearing and auditory discrimination. Among those who are normal in these respects, a wide range of memory span may be found.

To some extent, memory for auditory items among these pupils will vary with intelligence. Among 60 pupils, age constant, the average of the scores from the four tests is correlated with Binet mental age 0.42, and among 77 similar cases the correlation with the National Intelligence Test is 0.35. Intelligence and hearing together do not fully account for the memory span, however. When these factors are rendered constant, the correlation of memory span and reading ability is positive but very low and, in particular, the very poor readers — other things being equal — show but few more small memory spans than the good readers. That poor memory span can contribute to difficulty in reading is a reasonable assumption, but the writer has rarely found the results of these tests especially illuminating except as showing, in occasional cases, one more among many weaknesses which together result in reading difficulty.

The choice of treatment for pupils deficient in immediate memory span would be influenced by the effects of training designed to increase the memory span itself. Extensive studies[1] have shown the difficulty, indeed, probable impossibility, of substantially increasing the memory span by prolonged and intensive training. For pupils weak in immediate memory a procedure outlined in the next chapter should be followed, and no direct effort need be made to improve the memory capacity.

[1] Gates, A. I., and Taylor, Grace, "An Experimental Study of the Nature of Improvement Resulting from Practice in a Mental Function," *Journal of Educational Psychology*, December, 1925, pp. 583–93.

IV. Motor Functions

1. **Eye-muscle control.** — Genuine deficiencies in the functions of the eye-muscles resulting in strabismus or motor incoördination may seriously handicap the pupil in learning to read. This matter has been discussed in the preceding chapter.

2. **General motor control.** — The writer is now inclined to think that difficulties such as clumsiness, slowness, and incoördination of the limbs, arms, hands, and fingers have little to do directly and specifically with troubles in reading though they exert an influence indirectly by increasing self-consciousness or by contributing to defect in the related subject of spelling in which fluent and accurate writing is a factor in the learning process.[1] For such pupils, instruction which leads to greater fluency and accuracy in writing may contribute to the development of clearer perception of words.

A method of remedial treatment for all cases of extreme disability which utilizes primarily the approach through writing will be discussed in the next chapter. This method is designed to improve simultaneously spelling, writing, and visual perception of words.

3. **Motor control in speech.** — Defective articulation has been found in a small proportion of the cases of serious backwardness in reading encountered by the writer and his students. It has usually been impossible

[1] For a discussion of this possibility see Hollingworth, L. S., *The Psychology of Special Disability in Spelling*, Teachers College Bureau of Publication, 1918; and Gates, A. I., *The Psychology of Reading and Spelling*, Teachers College Bureau of Publication, 1922.

to perceive exactly the nature of the causal connection between the two. The writer's impression is that speech defects may result in bad reading habits if the subject is required to do much oral reading. If, because of large amounts of oral work, the habit of reading with full and exact inner speech is developed, the difficulties of articulation will be fastened upon reading. Means of dealing with inner speech have already been given in the preceding chapter. Speech defects may also lead to unfortunate habits as the result of the embarrassment occasioned by errors in articulation during oral reading. In one such case, the pupil had adopted the policy of keeping going at any cost in oral reading in order to avoid stammering which was likely to occur if he hesitated to work out the recognition of an unfamiliar word. The result was hurried reading, much of it misreading. Not only was practice in exact recognition and word analysis neglected but errors were continually practiced. Such pupils should be so managed as to develop habits of silent reading with the minimum of articulation and treated with great sagacity in oral reading.

4. **Handedness.** — W. F. Dearborn and S. T. Orton have stressed the important rôle which left-handedness may play in producing disability in reading. Orton gives no clear data concerning the frequency of left-handedness among cases of reading disability but he does attempt to connect reading difficulties with mirror writing, which is more common in left- than in right-handed persons. He believes that mirror writing and the tendency to make the errors of reversal of words

in reading (calling *was, saw,* for example) to be due to a peculiar nervous organization of left-handed children.

Dearborn, working with Carmichael, offers more definite data on the frequency of extreme reading difficulty among the left-handed and an interesting psychological theory to account for the correlation of the two. Dearborn writes:

> In the cases of non-readers studied by the writer, now numbering about twenty-five, at least a third have been left-handed. This is, of course, somewhat larger in proportion than would be expected in a group of otherwise normal or superior children such as all of these pupils are. The way in which left-handedness may possibly operate as an initial handicap in reading, just as it has been shown to be in writing, is suggested by the following observations. The outgoing movement of the left hand is from the center of the body toward the left.[1] The left-handed person, possibly because he watches what his preferred hand does and thus establishes the habit may show a preference for this same direction in his eye-movements. The reading of "saw" as "was" is a very commonly observed error although it is by no means confined to the left-handed reader. In tachistoscopic experiments there is a tendency for the left-handed to catch the end letters of the word first, just as the right-handed commonly get the initial letters first. The reading of "when" as "now" would seem unintelligible except as one had observed this tendency. The confusion of letters which are the same in form but different in position such as, *p, g*; *d, b*; *n, w*; has been explained as due to the fact that our earliest memories of the letters may be muscular. The eye-movements may be quite as important as hand movements in fixing these memories.

[1] Both Dearborn and Carmichael give evidence of this tendency in scribbling, drawing, and writing occasioned partly at least, they believe, by the fact that the child beginning at a point near the center of the body can see what he has done when moving from right toward the left, whereas when moving from left to right he cannot see his work since his hand covers the view.

Experiments and observations of the present writer are in harmony with the general theory here offered. In discussing the results of one investigation it was argued that such errors as *was* for *saw*, etc., developed from habits of looking primarily at the end rather than the beginning or by surveying the word by regressive movements beginning at the end rather than near the beginning or by studying the word in one direction after the other. That left-handed pupils should be more disposed than right-handed to such sequences in perception seems entirely reasonable.

Among sixty-six cases of serious reading difficulties checked for handedness by the writer, four or five were probably markedly left-handed, a percentage much smaller than that given by Dearborn. All of these, however, showed a disposition stronger than that found for the average of the whole sixty-six to make errors of the reversal type. The indication of the present survey, like that of Dearborn's, is to the effect that extreme left-handedness may provide a disposition toward inappropriate habit formation in learning to read. The examiner, therefore, should make inquiry concerning the handedness of young pupils who have marked difficulties in word recognition.

The left-handed pupil who develops difficulties of the types just mentioned needs special help and practice with those methods found most useful for cases of inadequate word perception. The similarities and differences, common elements and contrasts of words need to be emphasized; the means of attacking words in a straightforward manner, breaking them into units,

reacting to the units singly or in combination as the case demands (methods discussed in Chapters VI and VII) should be emphasized. For various serious and stubborn cases, the introductory device of carefully writing words under guidance as explained in the next chapter will often be very helpful.

V. Associative Learning

Defects of " visual memory " or " auditory memory," " inability to associate auditory and visual " or " visual and visual symbols " or more vaguely, damage to the visual or auditory word centers, " congenital word-blindness," " congenital alexia," and the like have been very frequently alleged to be the causes of inability to learn to read. Many physicians, opthalmologists, and oculists still find such terms convenient substitutes for real analyses of cases of reading disability. These possibilities we have tried to test by means of instruments designed to measure the functions alleged to be defective.

After considerable trial of various types of tests of associative learning of the sorts that approximate the actual forms of learning required in the beginning stages of mastering words, six tests have been selected. Three of these measure the associative learning of pairs of visual symbols; three others require the association of auditory and visual items.

1. **Associative learning: visual → visual symbols.** — The three tests of visual-visual association represent the learning of three types of figures in connection with pictures which give the " meaning " of the characters.

Each test consists of ten cards each with a " new word " (*i.e.* symbol) beneath a picture. The pupil is given presentation and test lessons. (See Appendix for details.) In the test lessons the pupil is shown the symbol alone and asked to name the thing which had been presented with it. These lessons are very similar in type to those used in teaching words to young pupils. (See Chapter VII.)

Test A 1 consists of very simple figures associated with pictures of common objects such as apple, flower, shoe, etc. In this test no difficulty is presumably encountered in distinguishing or recognizing the symbols which are simple and familiar visual patterns such as a square, circle, cross, etc.

Test A 2 is the same as Test A 1 except that it includes somewhat more unusual and complex visual symbols.

Test A 3 is the same as the others except that it contains symbols that are more complex, more unusual, and more like words of a new language. It was found that for the totally untrained child, this test presents substantially the same problems as the learning of four-letter English words in association with pictures.

The materials used in these three tests are reproduced in the Appendix.

2. Associative learning: auditory → visual symbols. — These three tests are conducted in the same general manner as was used in the visual-visual lessons. The tests include three types of visual symbols, like the others, but, instead of pictures, spoken sounds of words were used as symbols.

Test B 1 consists of figures similar to those used in

A 1 above, associated with such sounds as long *i*, *gee*, *kay*, long *o*, etc.

Test B 2 consists of figures similar to those used in A 2. These figures are associated with such spoken words as *man*, *can*, *dog*, *arm*, etc.

Test B 3 consists of characters, similar to those used in A 3, associated with such spoken words as *saw*, *nut*, *top*, etc.

These tests measure a combination of associative capacity and acquired technique in learning. It seems impossible entirely to separate the two. Low scores in these examinations indicate a lack of associative capacity or inadequate learning technique or both. Such scores, therefore, suggest the possibility of, but do not demonstrate a deficiency in, associative functions, or in special association brain areas. The only significant results which these tests may yield at present are as follows:

1. *The pupil does average or better in most of these tests:*

Such a result indicates that the pupil's difficulties in reading should not be attributed to lack of associative capacity or to lack of associative learning-technique, or to "word-blindness," defective brain association areas, and the like.

2. *The pupil does average or better in a miscellaneous half of the tests, poorer than average in the other half:*

This result indicates the status of the average pupil. It means a degree of ability that could not be in any appreciable measure responsible for the failure to learn to read.

3. *The pupil is below the average in all of one group and equal to or above the average in the other group of three tests:*

Defects of pupil's hearing or vision eliminated, this situation may be due to native variations in capacity or to differences in technique for dealing with the two types of stimuli — pictures observed by the eye or sound perceived by the ear, respectively. The writer's judgment is that such differences are of little significance in relation to the problem of learning to read unless the deficiency in one group is very marked.

4. *The pupil is below average in Tests A 3 and B 3 which utilize wordlike characters, but nearly average, or average, or better than average in the other tests which use simpler and less wordlike characters:*

Such a result would indicate that the pupil had no organic deficiencies in the associative mechanisms but some type of deficiency either in vision or in the technique of analyzing complex wordlike characters. In such cases, the tests of vision, of visual perception, and of visual discrimination described above should be applied. If the pupil shows visual defect, the usual remedies should be used. If his visual perception is poor, the suggestions made above for such cases should be followed. If vision, visual perception, and visual analysis are all fair or better, the probability is that the deficiency in the learning test A 3 or B 3 or both, is due to some type of deficiency in the specific observation or learning techniques here tested. Such a deficiency alone would be of no great significance except as it suggests that in the pupil's efforts to learn real

words the difficulty is likewise a defect in special techniques. For this deficiency, the suggested treatment is special tuition in methods of perceiving and analyzing words and in methods of vigorous application such as have already been given.

5. *The pupil is below the average in all or nearly all of the tests:*

Varying with the extent to which the scores fall below average, degrees of handicap for associative learning of the general type utilized in learning words are indicated. Even when not due to some general deficiency of the sense organ, visual perception, general intelligence, nervous stability, etc., marked inferiority in these tests does not indicate necessarily the impossibility of learning to read, as is demonstrated by the fact that among those who do poorly in these tests are found some who are fair or better readers. Other things being equal, a poor showing in these tests does indicate a handicap for an important phase of reading, namely, for the task of learning words. It should be realized, however, that learning to recognize and associate printed words with meanings conveyed by pictures or oral words is not the whole of reading, and that weakness in such learning, while it would slow up the development of the pupil's reading vocabulary, would not alone cause complete disability.

Low scores in these tests indicate the need of giving special attention to the technique of learning new words. This test has been found to be especially useful also when the pupil's intent or motivation in connection with reading is in question. If a pupil can acquire

readily such associations as are presented in these tests, there is no fundamental reason why he cannot learn English words which present an essentially similar task. While bad techniques may have been acquired in learning the English word-forms, they are rarely irremovable. If the pupil can do very well with these tests and at the same time shows almost total inability to learn English words, the motivation may well be questioned. This matter will be taken up in the next chapter.

The concept of " word-blindness." — The following clear statement of the significance of the term is quoted from Cyril Burt:

> Strictly, the term "word-blindness" denotes a condition, most commonly occurring as the sequel to an apoplectic stroke, where a haemorrhage destroys a portion of the visual area of the brain, and so leaves the patient destitute of memories for word-forms as seen. The patient sees black marks upon white paper, but fails to recognise them as standing for sounds or ideas; views them as an unlearned Englishman might view a text in Greek. It has been supposed that an analogous condition might exist from birth; that, owing to imperfect development of the same portion of the brain, the child might be unable to store up, in the shape of memories, word-forms as seen. For the existence, however, of such "congenital word-blindness" the evidence is far from conclusive. When, therefore, a child is definitely backward in some linguistic subject — backward in that subject by at least 30 per cent of his age, and in that subject twice as backward as in any other school subject or in general intelligence (for so would run my definition of "specific disability") — it still seems wiser to speak only of "special disability in reading" (or spelling, or whatever the subject may be); and, instead of assuming some gross cerebral defect, such as post-mortem inspection could alone reveal, to proceed further, and enquire by actual experiment to what particular defects in various alternative mental functions the disability is to be ascribed.[1]

[1] Cyril Burt, *Mental and Scholastic Tests.* London: P. S. King and Son, 1921, p. 284.

To this statement the writer should merely add the comment that he has not yet encountered a case of disability which seemed to be best described as "word-blindness."

VI. Nervous and Emotional Stability

In this category may be included a large number of traits presumably based in whole or part upon organic instability of some sort. Nervousness, emotionality, flightiness, chronic inattentiveness, unaccountable laziness, instability not explicable as an acquired, unfavorable attitude toward the special subject, are examples of the conditions often alleged to be due to organic deficiencies or at least to be relatively stable characteristics of the individual.

Diagnoses of pupils who present such characteristics should be performed by a competent psychological examiner who should seek the advice of other specialists when it is needed.

For the remedial treatment of children whose mental and emotional control is generally inadequate, the following suggestions, in addition to others mentioned in Chapter II, should be followed with special care. Further concrete suggestions concerning both materials and methods will be offered in the next chapter.

Combinations of Deficiencies

This completes an account of the organic deficiencies and defects which the writer is accustomed to take into account in attempting to make a fairly complete diagnosis of disability in reading. Deficiencies in certain

traits such as visual or auditory imagery, as distinguished from the sensory, motor, and neural functions outlined above, are not included — although other students speak of the rôle of such processes in reading — since no one knows precisely what such functions are, on what mechanisms they depend, nor how to appraise them accurately in children. Of the deficiencies treated in this chapter, any one may contribute in some degree to difficulty in reading. In extreme degree certain ones alone may quite inhibit learning under ordinary conditions and methods. Several defects, even if each exists in mild form, in the same pupil may likewise produce a reading failure. Some of the defects may be corrected and most of them may be in some degree compensated for. Remedial treatment consists in making such corrections as are possible and in instituting the most effective means of adjusting the learning method to the pattern of strengths and weaknesses found in a particular case. The next chapter will be devoted to remedial measures that are suited to cases showing some of the deficiencies presented in the chapter now completed.

The references for the three chapters of Part IV are placed together for the sake of convenience at the end of Part IV, page 353.

CHAPTER XII

REMEDIAL INSTRUCTION FOR EXTREME GENERAL DISABILITY AND CERTAIN SPECIAL DEFICIENCIES IN READING

In this chapter will be treated special remedial measures suitable for pupils who have made little or no progress in reading and for those subject to certain special defects described in the preceding chapter. Although many of the single remedial devices and types of material here described have already been mentioned, the present discussion will be helpful since it will illustrate the selection and organization of materials and methods to fit particular types of pupils.

Instruction for Pupils Seriously Deficient in Hearing

In this group may be included pupils who have little or no knowledge of spoken English or who, because of sensory or other defects, cannot be easily taught through the ear. The method as arranged may be carried out by pantomime and demonstration without the use of the voice, although this extreme measure is inadvisable when the voice can be heard. The following material and procedures described are taken from a course arranged for handling pupils in groups. They have been successfully tried in the most difficult situa-

tion, namely the teaching of congenital deaf-mutes who began the work with no knowledge of the English language in any form, neither sounds, lip movements, speech, written or printed words.

The materials used for this method consist of a number of pads which contain all of the exercises and other matter and a blank dictionary book made of light card in which the dictionary cards are placed as they are reached. Samples of the material and methods are taken from the pads as now arranged.

The main characteristics of this method are as follows:

1. The presentation of each word in a variety of contexts — in connection with real objects, actions, demonstrations; with various pictures of single objects, and complex events; with activities dealing with realities by means of printed commands and exercises; with things to do such as cut, color, draw, arrange, solve problems; with varied contexts in story and other paragraph form.

2. Prevention of the practice of errors by acquiring the mastery of each step in the work before others are attempted. The steps are graded for this purpose and attainments are measured by objective tests.

3. Provision for wide individual differences with plenty of reserve material for the very slow learners.

4. A sufficient variety of materials and exercises to make it possible to avoid the monotony of repetition even for the slowest learner.

5. Provision for the development of all phases of silent reading without oral directions and without phonetic or other auditory or oral methods.

The particular devices mainly utilized are as follows:

Introducing words. — The pupils are first taught to recognize their own names which are made on cards in print-script. Next, they are introduced to words, mostly sentence words, such as *come, sit, bow, go.* These words are presented first in large type similar to that used in ordinary flash cards. When first presented, the meaning of the word is indicated by connecting the word-form with the concrete object, such as a *hat,* or by dramatization of the action, as in the case of *stand, walk,* etc., or by the arrangement of the situation, such as *under.*

In order to prevent the association of the word with only the situation with which it is introduced and to develop its general class significance, it is immediately associated with various objects, actions, and situations. When feasible the word is presented with others of an opposite or unlike meaning; thus, *big* is presented in contrast with *little, under* with *over, boy* with *girl, one* with *two* or *three, walk* with *run* or *swim.*

A few of the particular devices used to extend the significance of a word are as follows: The teacher after dramatizing each word for the entire group, holds up the word card while the children respond by the action. Then she combines the word with a name card, such as, "Dorothy, stand." "Peter, stand." "Dorothy, sit." "Robert, stand." etc. In the case of *flowers,* the children point to flowers in the room, or put their word-card *flowers* by any flowers in the room. If possible the teacher should have several bunches of flowers or flowering plants of different kinds in the room for this

Sit

Stand

Go

Bow

Word card

lesson. Several children may be allowed to label with their own cards all the flowers in the room.

The meaning of the word *flowers* may be further extended by having a chart with the word *flowers* printed on it and allowing the children to draw or paste pictures of flowers beside it.

During the day these word cards will be found useful in many situations. If the teacher wishes a child to come to her, the child's name and the sentence, " come to me," may be held up. If the teacher wishes a child to sit down, the child's name and the word " sit " may be used. As the vocabulary increases, printed directions may be used in carrying out various necessary classroom activities.

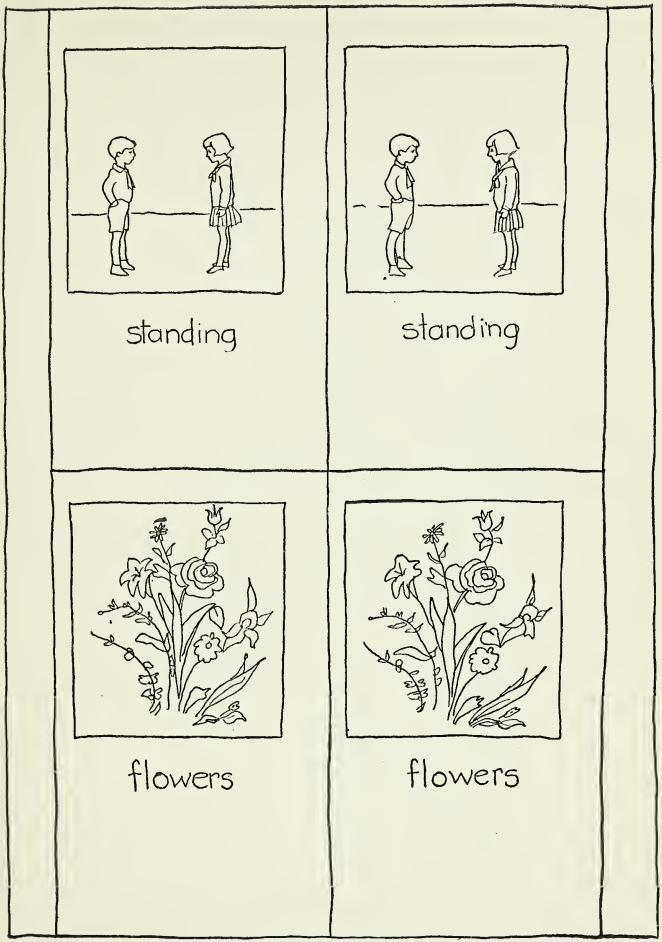
Use of the record sheet. — When two or three children show accurate recognition of the words in the group work, they may leave the group, and use the Record Sheet and their own word cards for individual study. The teacher shows these children how one child (the " teacher ") should hold up the printed side of the card and how a second child (the " pupil ") should dramatize the word, and how a third child (the " recorder ") should identify the word on the card with the same word on the Record Sheet. A cross should be placed after the word every time it is responded to incorrectly. The three columns on the Record Sheet are for the records of the three children who play. If only two children play, the " pupil " may also record his response with the " teacher's " approval. The children take turns being " teacher," " pupil," and " recorder."

Use of the dictionary cards. — The dictionary cards

Go			
Come			
Stand			
Bow			
Sit			
Go			
Stand			
Bow			
Come			

Record sheet

for each new word appear at the proper places in the material. Two cards for each word appear on each page. The pupil cuts them out, places one in the dictionary (first having been shown how to use the alpha-



Dictionary card

bet index) and the other in an envelope for use in individual and group study and games. A sample of the dictionary card sheet is given on page 281.

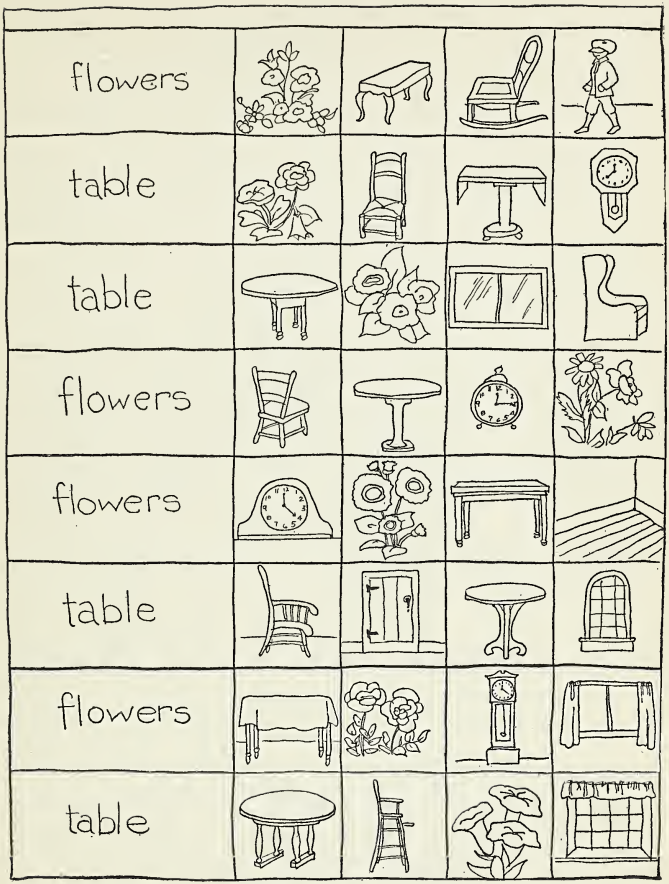
Introducing abstract words. — Words which signify abstract facts such as *a, the, his, by, and, mother, pretty, soft, who,* etc., are introduced gradually after a certain number of common nouns and verbs have been learned and after skill in the use of several word, phrase, and sentence comprehension devices has been acquired. It will be advisable to indicate the nature of these devices which serve the three-fold purpose of enlarging the meaning of words already introduced, of providing the setting for introducing the abstract word meanings, and of developing skill in phrase, sentence, and paragraph comprehension.

Practice materials for word, phrase, sentence, and paragraph meaning. — In these exercises the words are repeatedly introduced in new contexts and in different types of self-corrective exercises. Some of them are so arranged as to increase the sharpness of perception. The most commonly used materials are the following:

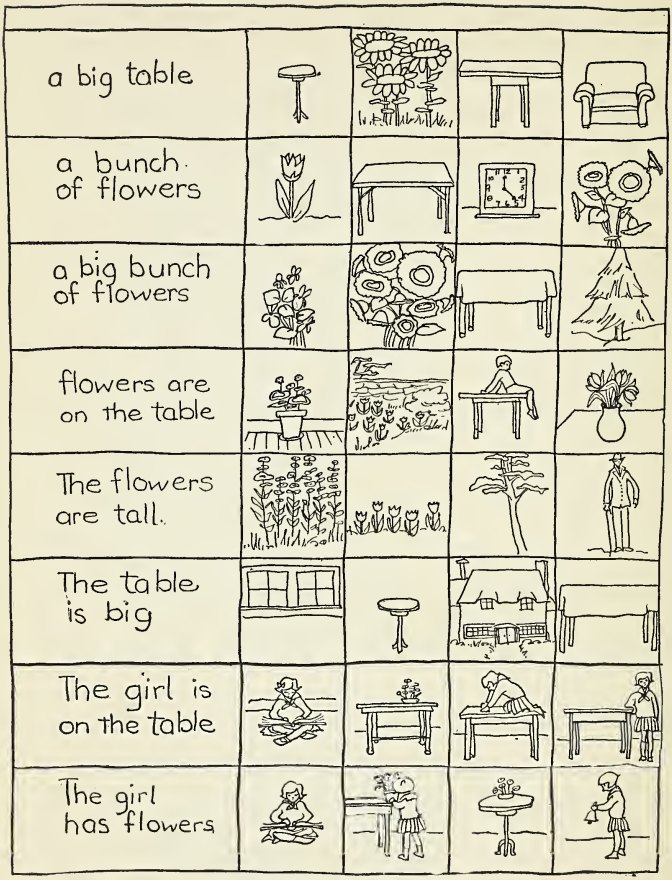
A. Word selection exercises in which certain words reappear in each set in different pictorial settings. (See illustration on page 283.)

B. Phrase selection exercises in which words may reappear in different verbal as well as pictorial contexts. (See illustration on page 284.)

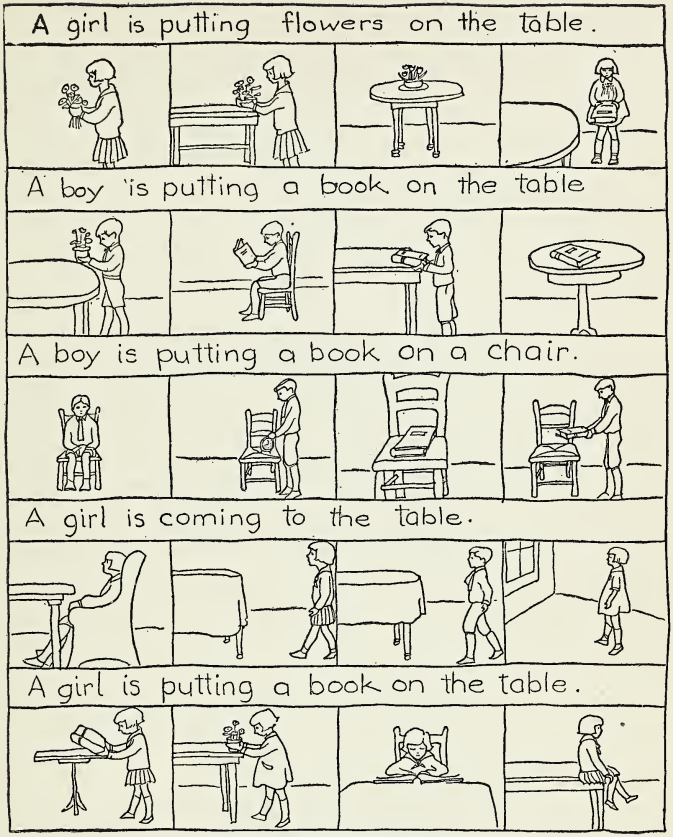
C. Sentence selection exercises similar to *B.* (See illustration on page 285.) For the deaf these materials must be more carefully constructed, the vocabulary more rigidly controlled, the amount and variety of prac-



Word selection exercise



Phrase selection exercise



Sentence selection exercise

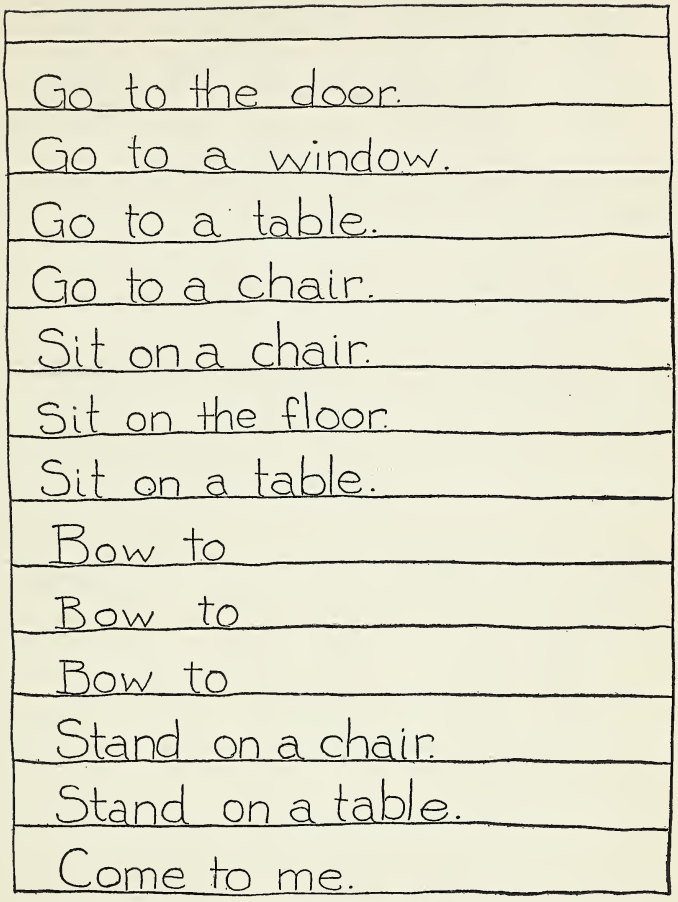
tice made more extensive than for the normal child of average intelligence.

D. Directions sheets and commands which increase gradually from brief phrases to whole paragraphs are used frequently to keep alive the contact with reality and provide relief from seat work. Most of these are arranged to contribute to the development of the meaning of some abstract word; for example, the following series for *on* and *to* which come in the first few lessons.

E. Directions to cut, color, draw, solve problems, and the like are used in abundance. Since these exercises are excellent materials for introducing and enlarging the meaning of many abstract words, we may indicate here the general procedure followed.

Introducing prepositions, adjectives, etc. — Prepositions and adjectives are first dramatized in natural contexts and treated in a manner similar to that used with action words. In the first practice page in which the new preposition is introduced, the other words are kept constant and the word contrasted with others, "The book is — by the table — on the table — under the table — over the table." Other exercises for prepositions are shown on pages 285, 287, and 289; and for adjectives on pages 284 and 290.

In the case of pronouns and auxiliary verbs, much practice is given in the context on the practice pages and in the directions and questions. The child sees the word in sentences, just as the hearing child hears it in oral conversation and just as adults read it, merely recognizing it as part of good English usage. In the



Direction sheet (*A*)

Color the book red.

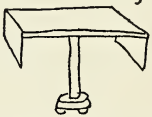
Color the door blue.

Color the hat red.

Draw a girl.

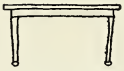
Draw a boy.

Color the table yellow.



Color the boy.

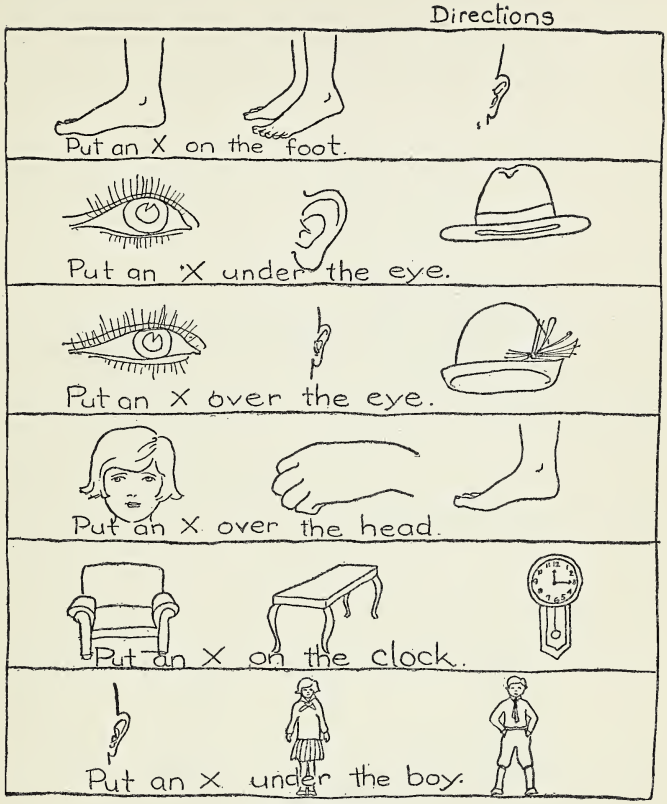
Draw a window.



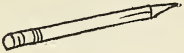
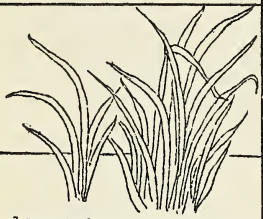
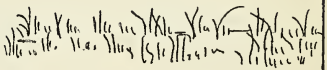
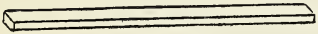
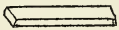
Draw a glass.

Color the coat green.

Direction sheet (*B*)



Direction sheet (*C*)

Long long	Short short
 a long pencil	 a short pencil
 long grass	 short grass
 a long piece of wood	 a short piece of wood
 a girl with a long dress on	 a girl with a short dress on

The contrast exercise

direction, " Color the boy *who* is running," the child gets the meaning without reading the *who*, but by repetition he becomes accustomed to seeing it there and acquires some idea of its significance. Similarly with " Flowers *are* on the table," " Where *does* the dog go? " etc.

Many forms of exercises are used, some of which are illustrated on pages 292, 293, and 294.

Paragraph comprehension exercises. — Every word introduced is used not only in all the exercises just mentioned but in many different paragraph contexts. The paragraphs and passages are of many kinds, including reading for many purposes. In many cases stories are composed entirely of words already so well known that the child is left free to enjoy the content. In other cases, paragraphs are arranged with new or little used words in order to provide exercise in utilizing the context in discovering the word's meaning. Jingles, puzzle paragraphs, and a series of " Story-Books " are used at regular intervals. Nearly every unit is provided with checks upon comprehension in the form of problems in selecting pictures, carrying out directions, choosing phrases or key words, etc. Illustrations are given on pages 295 and 296.

Results of experiment on deaf-mutes. — By such devices as these, we sought for the deaf-mute pupils (1) the development of genuine ideas in association with word-forms, (2) the development of appropriate perceptions, eye movements, and other mechanical habits of reading, (3) the development of ability to read connected materials in useful ways for useful purposes,

Name Date Questions

What is playing?

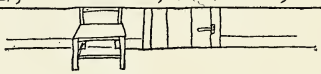
A book. A boy. A ball. A baby.

What is eating?

A cat. A doll. A dog. A bed.

What is under the table?

A sled. A book. A fire. A shoe.



What is by the door?

A child. A clock. A chair. A table.

What is by the door?

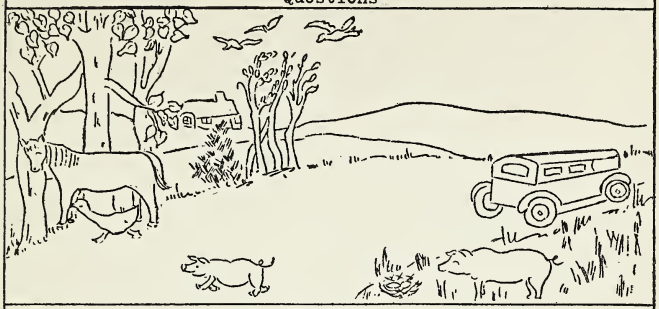
A fire. A flower. A foot. The feet.

What is jumping over the chair?

A door. A finger. A doll. A dog.

Question sheet (*A*)

Questions



What is going across the road?

a pig, a pie, a pencil, a chicken

What is going down the road?

an animal, an automobile, a policeman, a duck

What is on the big trees?

bread, birds, leaves, trees

What is flying over the little trees?

bridges, birds, leaves, trees

Where is the nest?

in an automobile

in the road

in the tree

in the grass

Where is the duck?

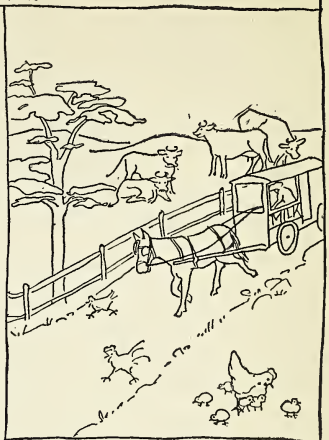
by the pig
by the house
by the hen

by the horse

Question sheet (*B*)

Questions

Picture 1



Picture 2

Which is a picture of a country road ?
Picture 1 , Picture 2

Which is a picture of a city street ?
Picture 1 , Picture 2.

What is the policeman doing ?
He is climbing a tree.
He is stopping the automobiles.
He is standing by the animals.
He is looking at the birds.

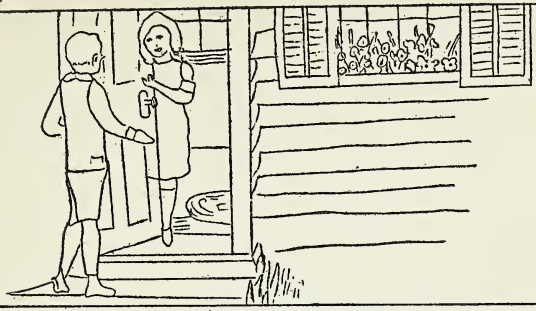
Where is the horse and wagon?
on the water, on the road , on the street , on the right.

What is running across the road ?
a child , a car, a horse , a chicken.

How many cows are in the picture ?
many, one, six , four

Question sheet (*C*)

Name Date Verbs 3.



Today a boy comes to a house. He goes to the door. He stands by the door. A girl opens the door. The boy bows to the girl. The boy and the girl go into the house. The boy stands by the window. The girl shows him the flowers in the window. The girl brings him a bun and a glass of milk. The boy eats the bun, and drinks the milk.

Yesterday a boy _____ to a house. He _____ to the door. He _____ by the door. A girl _____ the door. The boy _____to the girl. The boy and the girl _____ into the house. The boy _____ by the window. The girl _____him the flowers in the window. The girl _____ him a bun and a glass of milk. The boy _____ the bun, and _____ the milk.

stood	went	drank	stood	shut
came	drink	bowed	eat	opened
ate	showed	bring	went	opens
should	walk	ate	milk	brought

Paragraph comprehension exercises (*A*)

Paragraph Meaning

He stands in the street.
  He stops autos and horses.
They stand where they are
  While the little girl crosses.
Draw a picture of him.

It looks like a house
    With windows and door.
Children go in it
    And stand on the floor.

One child buys an apple
    And one buys a cake.
One buys the milk
    For baby to take.

Draw a picture of it.

Paragraph comprehension exercises (*B*)

and (4) the development of intrinsic interest and satisfaction in reading.

Results of a first year of investigation with these materials upon deaf-mute children may be briefly summarized. Two groups of congenitally deaf children who had practically no language ability of any sort were the subjects. The two groups were equivalent in age, intelligence, and other relevant respects. The average age in each group at the beginning of the study was six years and ten months. One group used our materials and the other followed the regular deaf-school methods during an hour on five days weekly from October 1, 1925, to June 1, 1926.

The results, which are given in detail in the dissertation of Dr. Helen Thompson, the full title of which is given at the end of this chapter, are given in part in the accompanying table. The figures show that the group taught by our methods excelled those instructed by the regular deaf-school methods by large amounts. A more convincing demonstration of the value of the new method appears in the comparison of the attainments of the deaf group with the achievement of normal first grade pupils in the public schools. The deaf-mute group obtained a score almost identical with the average attainments of pupils in Detroit schools on the Detroit Reading Test and the scores on the preliminary forms of the three Gates Reading Tests are as good as, if not a trifle superior to, the average achievements of normal New York pupils.

In the comparison of the achievements of the deaf-mute groups with those of normal children, several

TABLE SHOWING SCORES ON FOUR READING TESTS OBTAINED BY THE EXPERIMENTAL GROUP, USING METHOD OUTLINED ABOVE, AND CONTROL GROUP, USING REGULAR DEAF-SCHOOL METHODS. THE THREE GATES TESTS ARE PRELIMINARY EDITIONS NOT IDENTICAL WITH THOSE DESCRIBED IN THIS BOOK. AVERAGE SCORES FOR NORMAL CHILDREN AT END OF GRADE I ARE ALSO GIVEN:

	DETROIT READING TEST SCORES	GATES PARAGRAPH READING TEST SCORES	GATES SENTENCE READING TEST SCORES	GATES WORD READING TEST SCORES
Experimental group . . .	19.9	5.4	18.5	23.4
Control group	5.5	0.1	11.1	13.7
Normal pupils at end of Grade I	20.0	5.7	18.0	21.2

limitations of the former should be considered. The main ones are as follows:

1. The deaf-mutes came from exceptionally poor homes; they were in a charitable institution.

2. The deaf-mutes had zero ability in all forms of language.

3. The deaf-mutes' reading was limited entirely to an hour or less for five days a week; they had very little experience in writing, speaking, etc., during the year, compared to the normal child.

4. Because of lack of previous experience the deaf-mutes were poorly adjusted to any kind of book work.

5. The teachers of the experimental deaf-mute group were inexperienced both in managing deaf-mutes and in using our materials.

6. The materials used, being all mimeographed at the time, were crude in type, drawing, etc., and in clumsy forms.

7. The total period for the deaf-mutes was nearly two months less than the year for normal New York City children.

When allowances are made for this limitation of these children, their achievements are seen to be notable.

For a more complete description of these materials, statements of the underlying theories and of results achieved by their use, the reader may consult references given at the end of the chapter.

Methods of Instruction for Pupils Who Can Speak Little or No English

Pupils who enter school with little or no familiarity with the English language often encounter difficulties and develop inhibiting reading habits. These difficulties have led to the publication of special readers for these pupils. The remedial materials work very well with them. If the young deaf-mute without school experience can learn to read by such means, the pupil who knows a foreign language and can hear should experience less difficulty. Such pupils progress rapidly with the material without the various demonstrations suggested for the deaf. If a few general directions can be given in their native tongues, they will need little more help. It is desirable, also, to parallel speech with reading; they should sometimes speak the words and sentences as they read.

Methods of Instruction for Dull Pupils

The type of materials and methods used for the deaf are well adapted to pupils whose slowness and difficulty

in reading is due primarily to dullness. What the exceedingly dull child needs is short assignments of new words, abundant and varied practice, plenty of physical and motor activity, such as cutting, coloring, etc., to keep his interest, extensive and frequent review to compensate for poor retention, and gradual and well arranged advancement through the hierarchies of reading habits. For such pupils, more use may be made of commands, directions, cutting, coloring, drawing exercises, and the active individual and group games. The abundance of practice exercises on the words representing abstract facts is especially suitable to their needs. Oral reading and writing of words should be encouraged as in the case of normal pupils and various forms of oral instruction by the teacher should be employed.

With such materials several pupils too dull to learn by ordinary methods have been taught to read with various degrees of proficiency. Children with Intelligence Quotients below fifty rarely learn to read well for the reason that their capacity to grasp verbal ideas is limited.

Methods for Pupils Deficient in Visual Perception, Visual Analysis, Recognition, Memory Span, and Associative Learning

During the discussions of means of detecting these deficiencies in the preceding chapter, reference was made to the necessity of having for such cases material organized for slow development. The material just described is suitable with little modification for such

pupils. In addition to the use of this material, these pupils will need especially abundant and varied practice of the type described in an earlier chapter (Chapter VII), designed to elicit sharper perception of words and to encourage word analysis. Careful observation of errors in recognition is highly desirable. For those deficient in the learning tests, demonstrations of and instructions in more efficient learning techniques should also be used.

Methods for Children Subject to Emotional and Nervous Instability

Some of the desirable features of instruction of children who are unstable, flighty, disinterested, easily exhausted, and so on, were given in the preceding chapter. To avoid the monotony of stilted drill (as in phonetics), to provide reading activities that permit muscular action and the incorporation of interesting projects in coloring, cutting, illustrating, etc., and various individual and group games, to have sufficient variety of interchangeable practice exercises to permit pupils to select the types they especially like, and to change from one to another if boredom threatens, and yet to have reading function in realistic ways were objectives in the construction of the course described above. The deaf children taught provided an excellent test of the material in these respects. Since they could not be interested by explaining to them the joys and profits which learning to read would provide, the interest appeals had to be made intrinsic. These children, fur-

thermore, were not well disciplined scholars and were much inclined to follow their own whims. Nevertheless they became keenly interested. Similar materials have held the keen interest of unstable children who were negativistic toward more conventional methods.

For pupils who are bright as well as unstable, a more rapidly moving program is to be preferred. This may be arranged by the elimination of certain parts of the materials at each step. The author has in preparation a course of study better suited to the needs of brighter children.

Methods for Children Subject to Motor Deficiencies

In this group are included pupils who show general motor incoördination, speech defects, writing deficiencies, and extreme left-handedness. One should consider in each case whether it is advisable to attempt to correct the motor defect and to continue to make full use of the mechanism in reading while correcting the motor deficiency, or to shift the emphasis in reading to forms of response that are not subject to the muscular handicap.

Speech defects. — Needless to say, any speech defect discovered should be remedied if possible. Sometimes oral reading may be a despised or at least a disturbing task, since in performance the pupil's errors in speech are exaggerated by difficulties in word recognition. This situation may lead to unfortunate oral reading habits which may spread to silent reading. For such

children, skill in rapid silent reading should be achieved. The general method described in Chapter X may be used for this purpose. It may be noted here — and this is a point of importance to be brought up again presently — *that our deaf children were taught to read with no articulation of words.* Many of these children, indeed, had no idea of the pronunciation of any of the words and some of them had no idea that vocal responses were ever made to the printed word. They learned words presumably by visual apprehension quite as they had learned to recognize different flowers, hats, or faces by visual perception alone.

In due time, the defects of articulation having been removed or improved, oral reading should be developed anew. In some cases where the connection of oral deficiency and reading has not been so close and unfortunate, oral reading is a useful means for improving speech. Phonic training in considerable degree and phonetic translations in some measure are then often fruitful.[1]

Deficiencies in writing. — Poor writing may be associated with general motor incoördination, left-handedness, nervous instability, and other causes, or may be the result of specific writing deficiencies due to native limitations of the writing members or to insufficient or improper training. A connection between poor writing and poor spelling has been noted several times[2] and the author has produced evidence that both poor writing and poor spelling are sometimes

[1] See Chapter VII for suggestions concerning phonetic training.

[2] See Hollingworth, L. S., *The Psychology of Special Disability in Spelling.* New York: Teachers College Bureau of Publications, 1918.

closely associated with ineffective types of word perception.[1] In such cases a method of study designed to improve word perception, spelling, and writing simultaneously should be followed. Such methods will be discussed in some detail presently. When slowness and difficulty in writing are likely to be persistent as, for example, when they are due to organic deficiency, the best method of instruction is a visual procedure of the general type above described. In this method, the motor defects should interfere the least with the development of silent reading skill.

Left-handedness. — The observations, by Carmichael and Dearborn, of frequent reversal errors — *was* for *saw*, etc. — of extremely left-handed poor readers have been confirmed by Orton and by the writer. The theory advanced by Dearborn and Carmichael that such errors in perception may be the result of the left-handed pupil's tendency to write from the center of the body toward the left and to view his writing and other items, including printed words, in the same manner seems plausible. For such pupils the remedy found most successful by the writer consists in exercises arranged to produce observation of word-forms in the proper direction. One means of achieving this end is to provide practice, under guidance, in writing the words. Since this general attack has been found by Fernald and Keller and by the writer to be effective for use with the most extreme cases of inability to learn to recognize words, we shall discuss it in some detail in this connection.

[1] In Gates, A. I., *The Psychology of Reading and Spelling.*

Remedial Measures for the Most Extreme Cases of Disability

The method described earlier in this chapter rarely fails, when coupled with careful guidance and instruction, to produce ability to learn to recognize words and eventually to read. Rare cases have been found, however, who have been unable to progress satisfactorily under such a procedure. The writer has maintained before [1] and continues to believe that the main difficulty with such children is their inability to hit upon an effective method of perceiving — of "seeing," analyzing, making out the characteristic features — of word-forms. That a variety of factors such as those enumerated in the preceding chapter are involved in this difficulty is admitted. The essential failure, however, in the non-reader is the inability to apprehend effectively the character of the word-form. What these pupils need, then, is an abundance of specific devices to guide them to the right technique of perceiving the word-form.

Many methods for this purpose, such as arranging words to show similarities and differences, calling attention to the unique and common elements by pointing to them with finger or pencil, and by exposing the word, part at a time, pronouncing the parts as shown, and the

[1] In the *Psychology of Reading and Spelling*, 1922; in "A Study of Initial Stages in Reading by Pre-School Children," *Teachers College Record*, November, 1923; in "Methods and Theories of Teaching the Deaf to Spell," *Journal of Educational Psychology*, May, 1926; and in "A Study of the Rôle of Visual Perception, Intelligence and Certain Associative Processes in Reading and Spelling," *Journal of Educational Psychology*, October, 1926.

like have already been discussed in Chapter VII. All of these devices are of value and should be used. In addition to these, the device of writing the word in a certain way is also very helpful; indeed, Fernald and Keller have found it alone sufficient to give the most pronounced non-reader a start in the right direction.

The Combined Visual Study and Writing (Spelling) Method for "Non-Readers"

As originally arranged in 1919, by the writer, this method was used for several years and published in 1922. The following quotation gives the essence of the procedure:

It should be understood that the purpose of analytical work is not the perception of longer words piece by piece, nor a fund of information about the composition of words nor a stock of serial recitations such as, "the following contain *ock*—sock, flock, knock, block, crock, etc." What is wanted is the habit of seeing a word as a group of familiar and simpler parts or of seeing it more clearly, rather than seeing it vaguely or confusedly as one would at first perceive a complicated Chinese character. . . .

The method adopted comprised two phases: (1) training in observation and analysis of words in the process of learning to spell, and (2) training in observation and piecemeal attack, when necessary, during the process of reading.

The first phase embraced the following features: (1) careful observation of the printed word during pronunciation by syllables; (2) attempts to visualize the appearance of the word with eyes closed during silent articulation by syllables for the purpose of providing a check on the success of observation; and (3) writing of the word with silent articulation by syllables. The purpose of this procedure is the development of habits of observing words carefully, together with a method of attack for pronunciation and spelling.

As later organized, this method included the use of such materials as have been described in this chapter and in Chapter VII. For dealing with non-readers a print-like type of writing or "manuscript writing" is employed rather than script. The procedure is, with certain exceptions, like that of Fernald and Keller which may now be given for comparison.

The Fernald and Keller method. — Under the title, "The Effects of Kinaesthetic Factors in the Development of Word Recognition in the Case of Non-Readers," Fernald and Keller[1] have described a method used with success by them in treating several children who had previously acquired little or no ability to recognize words during several years of classroom training. Their description of the procedure is here quoted:

1. *Learning first words.* — The child was asked to tell some word he would like to learn. The word was written in large script on the blackboard or with crayola on cardboard. The child looked at the word, saying it over to himself and tracing it as if he wished to do so. The tracing was done with the first two fingers of the right hand (or of the left hand if the child was left-handed) resting on the copy. It was never done in the air or with pencil. When the child was sure he knew the word, the copy was erased and he attempted to write the word, saying the syllables to himself as he wrote them. If he was unable to write the word correctly, the entire process was repeated until the word could be written without the copy. At no stage of the performance was he allowed to copy the word. After a few words had been learned in this way, he was shown the word in print as well as in script. The next day he was shown the word in print only. If he failed to recognize it, it was written for him. If he still failed to recognize it, it was retaught as on the first presentation.

2. *Spontaneous sentences.* — After the first few days the child

[1] *Journal of Educational Research*, December, 1921, pp. 355–77.

began to ask for sentences instead of words. A sentence was then written and he learned the words comprising it, finally writing the entire sentence as many times as he wished — always from memory, never from copy.

The sentences the child had requested were then printed on cardboard or were typewritten. These sentences and others, made of the same words, were read by the child. The same words were repeated in different sentences from day to day.

3. *Words in context or story selected by the child.* — As soon as the child was able to make out simple sentences, he was taken to the library and allowed to select a book. The first paragraphs read were worked over in the following manner. Before the reading, each word which had not already been learned was exposed through an adjustable slit in a piece of cardboard. If the child failed to read the word it was pronounced for him. He pronounced and then wrote the word (as before without looking at the copy). If he had difficulty in writing the word after seeing it in print, it was written for him and taught from the script as in the case of the first words.

4. *Apperception of phrases.* — After the words in the new paragraph had been taken up in this manner, brief exposures of the words were given until the child was sure of them. When recognition was immediate for every word, the slit was adjusted to phrases, and flash exposures of the various phrases were given. The exposures were never long enough to permit the phrases to be read word by word. As many successive exposures as were necessary for recognition were given. After the entire paragraph had been worked over in this way, the child was told to read the paragraph to himself and report what he had read.

5. *Silent reading for content.* — As soon as possible the child was encouraged to read to himself. There was no difficulty in any of our cases in getting him to do this after his progress had gone into the fourth phase as described above.

Comparison of Fernald and Keller's method with the writer's. — The writer's method of dealing with these supposedly helpless failures differs from the ingenious and highly successful procedure of Fernald and Keller in ways that have been already suggested but will be

here summarized for convenience. The numbers used correspond to the steps similarly numbered in the quotation just given.

1. The confusion of script with printed form is avoided by having the pupil write in print-like or "manuscript" characters. Since these children can rarely write any words, the print-like writing is learned as easily or more readily than script. Script, when introduced later, is mastered with ease.[1]

2. Instead of depending upon the pupils' requests for words, and sentences, the writer attempts to avoid difficulties and to insure safer progress by following a carefully arranged developmental order. Recognition exercises, directions to mark, color, illustrate, etc., such as have been described above, are introduced to the child. The use of these materials, the writer believes, provides many advantages over the recognition exercises based on sentences given by the child. (See Step 2 in the Fernald and Keller outline.) The writer's experience is that carefully arranged practice materials soon prove to be much more interesting than those which the pupils suggest. They also have the great advantage of enabling the pupil to work in the absence of the teacher.

In the writer's system of remedial work, much greater stress is placed on calling attention to similarities and differences in words, part by part, and as wholes, and much greater use is made of such perception exercises as were described in Chapter VII.

3. To permit the child so early to select his own

[1] The writer has experimental data on this point that will be published soon.

reading materials is likely to result in unsuitable content. It is important not to permit the pupil with years of failure in reading to attempt much material that is too difficult for him. A graded and organized series of progressive steps is better.

The device of picking out the new words and exposing them through a slit seems to the writer to be unwise. If the material is of suitable difficulty, that is, if the new words are not too numerous (see pages 282, 286, and 291), the pupil should by all means encounter some of them for the first time in real reading. It is highly important to encourage the use of the context as an aid in recognizing words. At earlier stages, new words should frequently be presented first in simple sentences which make guessing relatively easy.

4. While some use of the flash card device is often productive, continuous employment of such a procedure as the one outlined in Step 4 is probably wasteful. Emphasis on repeated rapid readings of ordinary material or of sentences composed of different arrangements of a small number of words is preferable. The reasons for this opinion have been given in Chapters V and VII.

5. For some time, the use of various checks on comprehension in free silent reading is advisable to encourage accurate interpretation and to develop the several types of important reading techniques. The writer finds that children with a history of reading failure are likely to form inappropriate mechanical habits when their reading is not checked and appraised more carefully than in the Fernald and Keller method.

Theoretical Interpretation of the Writing Method of Teaching Reading

Although the writer's method is, in the essential activity of writing the word, like that of Fernald and Keller, his interpretation of the function of the device is very different. The theory advanced by Fernald and Keller will be quoted in full.

> Perhaps we can go no further in theory than to say that in the specific cases studied, lip and hand kinaesthetic elements seem to be the essential link between the visual cue and the various associations which give it word meaning. In other words, it seems to be necessary for the child to develop a certain kinaesthetic background before he can apperceive the visual sensations for which the printed words form the stimulus. Even the associations between the spoken and the printed word seem not to be fixed without the kinaesthetic links.
>
> The motor tendency is still obvious after the children become fluent readers. They seem far to outclass other children in the same grades in their ability to look at new words, say them to themselves, and write them. All of these children still make pronounced lip movements of saying the words (not the letters) when learning a new word, even after they have reached a point where they never trace a word or speak it aloud. The children who traced in the beginning tend to make arm and hand movements in learning a new word or attempting to recall a difficult one. They are hopelessly confused as soon as they attempt to spell orally or to write a new word without saying it to themselves.
>
> It would seem that the methods of teaching reading have always neglected the kinaesthetic factors, except those which in no way express the word as written or printed. It has been taken for granted that, in the case of all children, the visual cue is adequate to arouse those associations which make this cue stand for word meaning.

The theory that children must form an extensive, kinaesthetic concomitant of reading, the writer believes,

is refuted by the achievements of the deaf children who readily learned to read without being able to speak, write, lip-read, hear, or otherwise react to words except by visual means. The writer's belief is that the device of writing the word enables most non-readers to learn to read not because of the effects of a " kinaesthetic background " but because the task of writing the word from memory serves to elicit and control a careful and effective form of observation of the word. It is learning how to perceive the words visually, it is the acquisition of ability to see them both in whole and in parts and of skill in breaking up the word into manageable units that leads to success in reading.

Incidentally, some of the difficulties with articulation mentioned in Chapter X are likely to result from a too vigorous or too exclusive adoption of the Fernald and Keller theory. In the quotation given, the presence of " pronounced lip movements," " making arm and hand movements when learning new words "; becoming " hopelessly confused as soon as they attempt to write a new word without saying it to themselves " are, to the writer, evidences of overemphasis of the kinaesthetic factors.

The Problem of Motivation in Non-Readers

Such a plan as outlined in the preceding section should succeed with any pupil, whatever his history and experience, provided he is not hopelessly deficient in general intelligence or learning capacity. The writer has encountered several cases, however, who did not learn promptly by these methods. His experience is

that when one finds pupils who learn a little and then forget it, he should immediately investigate the possibilities of an unusual motivation, of incentives that make it, on the whole, more satisfying for the pupil to be a non-reader than a reader. All of the pupils, observed by the writer, who failed to respond to the writing method of remedial treatment were probably of this sort. In dealing with such pupils, one must discover the motive and, if possible, so change the circumstances as to make it more satisfying to the pupil to be a reader than to be a non-reader.

One of these pupils was a boy of less than average intelligence, appearance, wit, strength, agility, and most other prized traits. He had distinguished himself from the ordinary child in his early years because of his difficulties in reading. Soon he had become quite conspicuous, and in time a notorious character — "The guy that nobody could teach to read." He was sent to the oculist, to the doctor, to the principal. He had this tutor and that supervisor attempt to teach him. Always he made a little progress until, after he had exhausted the novelty of the new instructor or place, he lost all he had gained. The next examiner found his ability to be nearly zero. He was carried downtown to a neurologist, a fact celebrated by his friends and family. He was taken uptown to a psychologist. After several enjoyable trips, the report went around that these specialists had failed to teach him to read. At length the boy was removed from town for medical attention. He disliked the new locality. To earn the privilege of returning to his home and school, it

became necessary to learn to read and write well enough to correspond with the persons of influence in his case. Ability in these lines began immediately to sprout. He did not even require an expert's guidance to learn to read and write.

The other cases differ slightly in type. One was a boy who loved approval and hated to be second best in anything. Before entering school he was usually first in aggressiveness, pugnacity, and physical prowess. On entering the schoolroom, he maintained his supremacy in these and related activities, but his nature was such that he did not excel in reading. Immediately reading was relegated to the realm of things babyish and girlish and beneath the dignity of a real " he-boy." The task in which he could not excel was scorned. To maintain his position effectively, he must not be guilty of reading, especially of reading badly. Between reading perfectly, and not reading at all, he chose the latter alternative. This whole situation, of course, was not so apparent as it is here described. Few people suspected the motives. The teachers believed he could not learn. The remedy adopted was to provide the boy with an opportunity to learn to read without knowledge on the part of his acquaintances, the idea was that some day he would astonish his group by suddenly demonstrating his unsuspected ability. Whether the effect would be that of mystifying his friends or of provoking their admiration of what might appear to be a case of learning in a day once he was ready would matter little since either alternative would be quite to his credit. This method, while it was probably not

ethically sound, proved to be effective so far as reading is concerned. As an experimental study it revealed the potency of motivation and showed that what this boy really needed was not mere instruction in reading, but guidance in mental adjustment and general behavior.

A third case grew out of a conflict which had its genesis in the over-anxiety of a mother. Greatly concerned about the child's mental development and eager to get the child to read before starting to school, the mother at first urged and pleaded and, these failing, later tried insistence and trickery to achieve her purpose. The child, at first merely bored, at length became obstinate in the contest with her mother. In this contest the pupil won; no incentive or contrivance would induce her to learn to read. She pleaded inability and perhaps in time believed in her own contention. A change of attitude on part of the mother to indifference toward reading or even pretended satisfaction in the child's failure so reversed the effect of the disability that the child proceeded to learn, an achievement realized without unusual difficulty.

These cases are non-readers, but not reading disabilities. They are often most puzzling. It is often impossible to do anything with them until the inhibiting motives are discovered and replaced by favorable incentives. The examiner should learn to be alert for evidence of such unfavorable attitudes. Other phases of the child's equipment of capacity and habits should also be studied. It is often not enough merely to straighten out the motivation, since bad study habits

long exercised may also require persistent and skillful attention. The improper attitudes, moreover, which are often the results of difficulties encountered at some or all stages of learning may be removed only by skilled instruction. The proper urges to learn sometimes cannot be secured at one stroke, but may be gradually developed along with, and perhaps as the result of, the increase in skill.

CHAPTER XIII

SOME REPRESENTATIVE CASE STUDIES AND A SUMMARY OF THE DIAGNOSES OF FOUR HUNDRED ELEVEN BACKWARD READERS

In this chapter will be given detailed diagnoses of a few individual cases selected from a larger number in the author's files. At the time the diagnoses were made, most of these pupils were experiencing serious difficulties in reading. The cases presented indicate a variety, but by no means all possible types, of difficulty. Some of them were studied several years ago by instruments which were in part less adequate than those now available. In some of the cases remedial measures were applied which are not identical with those that would now be recommended. Some of these cases are described in preference to similar ones studied more recently because records of several years of observation of the effects of the remedial treatment are available.

Case 1. Deficiencies in Methods of Learning and Perceiving Words

The quantitative results for this case are given in the accompanying reproduction of the record sheet.

Case 1, a public school pupil, was near the end of Grade II when examined. He was then 9.7 years old.

His mental age was 9.8 years which is about that of the average pupil of the same age. He had failed of promo-

DIAGNOSIS OF READING QUANTITATIVE RECORDS

NAME CASE 1 AGE 9.7 yrs. BIRTHDAY

SCHOOL (Public) ROOM GRADE 2.8 DATE: April 10, 11, 1925

	RAW SCORE	AGE SCORE	GRADE SCORE
I. Intelligence			
1. Stanford-Binet. .		9.8	4.0
2.			
II. Primary Reading Tests			
1. Word Recognition	6	6.8	1.4
2. Phrase and Sentence Reading . .	2	6.7	1.2
3. Paragraphs; Directions	0		
III. Grades III–VIII Reading Tests			
A. General impression	0		
B. Predict outcome .	0		
C. Precise directions	0		
D. Details	0		
IV. Oral Reading and Pronunciation			
1. Gray's Oral Passages	0		
2. Gates Word Pronunciation . . .	6		
V. Phonetic Abilities			
A 1. Capital letters .	41		
A 2. Small letters .	38		
A 3. Sound letters .	18	8.3	2.8
A 4. Sound phonograms	32	7.9	2.4
A 5. Sound combined phonograms . .	4.5	7.2	1.7
B 1. Give letters for sounds . . .	9.5	10.2	4.4
B 2. Give letters for syllables . . .	7.0	8.9	3.2
B 3. Give letters for two-syllables .	3.5	8.3	2.8
B 4. Spell words . .	5.0	7.2	1.7
VI. Visual Perception			
A 1. Perception, figures	23	11.0	5.2
A 2. Perception, digits	35	9.3	3.6
A 3. Perception, words . . .	22	7.3	1.8
B 1. Selection, figures	15	10.2	4.4
B 2. Selection, words	10	7.1	1.6
VII. Visual Analysis and Recognition			
1. Geometrical designs	7.0	9.8	4.0
2. Wordlike characters	6.0	8.6	3.0
VIII. Visual Memory Span			
1. Span for figures	4.0	9.5	3.8
IX. Auditory Functions			
1. Auditory acuity	O.K.	. .	. .
2. Auditory discrimination	6.0	10.0	4.2
X. Auditory Memory Span			
1. Digits	6.0	10.4	4.5
2. Letters	5.0	9.0	3.3
3. Nonsense words .	4.0	9.2	3.5
4. Words	5.0	10.4	4.5
XI. Associative Learning			
A 1. Visual-visual .	7.0	9.1	3.4
A 2. Visual-visual .	8.0	10.6	4.7
A 3. Visual-visual .	5.0	7.7	2.2
B 1. Visual-auditory	7.0	9.3	3.6
B 2. Visual-auditory	8.0	7.8	2.4
B 3. Visual-auditory	5.0	7.3	1.8

tion in the previous year because of his almost complete inability to read and was expected to fail again.

Reading achievements. — Measured with the three Primary Tests, Case 1 showed ability to identify a half dozen words but was unable to read a sentence or paragraph. His difficulty was of long standing. He was believed to be incapable of learning to read.

Intelligence. — The boy was given the entire series of tests in order to see whether his deficiencies were constitutional or due to acquired habits. In intelligence, he was average; his Intelligence Quotient on the Stanford-Binet was 101. Such a score indicates, incidentally, that he can comprehend spoken, even if not printed, language as well as the average pupil. Two possible causes of the reading disability are thereby eliminated.

Vision and visual perception. — The scores for visual perception are shown under heading VI in the Record. Note that in speed and accuracy of perceiving geometrical figures (Tests A 1 and B 1) he secured a higher score than the average child of his age and intelligence. In the perception of digits (Test A 2), his attainment is lower but only a trifle low for his age. In perceiving words (Tests A 3 and B 2) he is far below the average ability. These results indicate that he is not subject to any general deficiency in ability to perceive small visual items to a degree that could account for his failure to learn to read. They indicate, also, that he probably has no serious defects of the visual apparatus. He is, however, seriously deficient in ability to perceive rapidly and accurately printed words. When the

deficiency in perception is confined to words, it is more likely to be due to unfavorable habits than to organic defects.

Visual analysis and recognition. — The results of the two tests for visual analysis and recognition (Tests VII, 1 and 2) give no occasion for concern. Case 1 does as well as might be expected in the first, and somewhat less well in the second which is composed of characters similar in certain respects to printed words. The latter deficiency is not serious enough to account for the inability to learn to recognize words.

Memory span. — Averaging the results for the visual memory span test (VIII, 1) and the auditory series for digits, letters, nonsense, and senseful words (X, 1, 2, 3, 4) we secure a composite age of 9.7 years, which, by a mere coincidence, is exactly equal to the pupil's mental age. The pupil's difficulty in reading, therefore, cannot be attributed to a poor immediate memory.

Auditory acuity and discrimination. — Test IX, 1, showed Case 1 to have normal hearing and normal ability to discriminate and retain, momentarily, complex word-sounds. This fact eliminates auditory defects from the possible causes of disability in reading.

Associative learning. — The first two tests in visual-visual association indicate approximately average ability; the third, which utilizes wordlike characters, shows a clear deficiency. Tests B 2 and B 3 of the visual-auditory series show a similar inferiority. In observing the work in these tests, the examiner was impressed with the pupil's clumsy technique especially when rather complex visual configurations were used. In the Rec-

ognition Test (Test VII, 2) the pupil labored distressingly in studying similar figures but earned a score only a year lower than his chronological age. In the learning tests, similar effort was expended, but, when the added requirement of associating the symbol with a picture or spoken word was undertaken, his achievements were two or more years below the norms for his age. To analyze complex figures, then, appears to be somewhat of a difficulty; a difficulty sufficient to interfere considerably with associative learning of such symbols. The low score in the learning test was probably largely due to inefficiency in visual analysis of the material to be learned since in the tests composed of simpler figures, his learning scores were higher. It does not appear that this pupil is subject to defective visual or auditory memory, to deficient visual-visual or visual-auditory association brain tracts, to congenital alexia, and the like. He suffers more, probably, from deficient techniques of perceiving and learning wordlike characters.

Phonetic abilities. — A pupil who cannot read and who can recognize but few words can scarcely be expected to excel in tests of phonetic ability. Case 1, nevertheless, had developed some skill in giving the sounds which letters represent and even of working out some of the phonograms by a laborious method. He could also, when given certain letter or syllable sounds, tell the letters which stood for them. He could spell orally about as many words as he could read. Although he could say his *abc*'s, he made errors in reading some of the letters (Tests V, A 1 and A 2) and read

some of the others so slowly that his time score fell below our norms. In these tests, the examiner felt that the pupil demonstrated about as much phonetic skill as might reasonably be expected of a pupil of so limited reading ability.

Methods of studying and perceiving words. — The Gray's Oral Passages and the Gates Pronunciation Tests were applied in the manner outlined in Chapter VI. The pupil's difficulties in word recognition were so great that he received a zero score in Gray's Oral Test. In the Gates Pronunciation Test only six words were correctly pronounced. In his work in these two tests and in the tests of phonetic abilities, it became apparent that the pupil's methods of observing and studying word-forms were extraordinarily inadequate. He had no consistent method. He observed one detail after another; sometimes progressing from left to right, sometimes in the reverse direction, sometimes beginning at the middle of the word and moving in either direction. He sought primarily minute characteristics and rarely observed the larger combinations of letters which comprise syllables and phonograms. Often he merely looked at one part of the word. Sometimes he named certain letters, sometimes he sounded them. The general configuration of the word was rarely observed, apparently, and there was scarcely a word that he could recognize after an instant's exposure.

No other deficiency was found except the clumsy technique in associative learning mentioned above. Although he was greatly discouraged, the pupil's desire to learn seemed genuine. He was not an unstable boy

but he displayed considerable strain and nervousness when trying to learn or read words. That he appeared to be emotionally sensitive and somewhat "scatter-brained" in this work may be attributed to several years of chagrin and discomfort connected with it. In other tasks, these symptoms were not apparent.

Diagnosis. — The final diagnosis was that while Case 1 showed no deficiencies in the capacities required for learning to read he had acquired techniques of word study and perception which practically prohibited progress. The word features which he laboriously studied were mainly those which are not useful in distinguishing one word from many others. His methods of observation, moreover, were so detailed and irregular that only rarely could he repeat the analysis sufficiently to recognize the same word-form. His was a real case of failing to see the forest because of the trees.

Remedial instruction. — Case 1 was first given, by a competent teacher working under the writer's advice, twelve periods, from 30 to 45 minutes each, of drill with materials of the type outlined in Chapter VII (pages 161–66). The teacher also gave instruction of the types outlined in the last section of Chapter VII designed to call attention to the more significant features of words. Although progress was made, the pupil had great difficulty in learning to perceive and analyze the word-forms in the new ways. Accordingly, the writing method as outlined in Chapter XII was applied vigorously for ten days in combination with the other practices. In the middle of this work, the pupil seemed rather suddenly to grasp the method. He began to learn words

and to remember them. Seeing his progress, the boy quickly developed an eagerness for learning and reading words that was almost pathetic. He studied words during every spare minute; he tried his skill on papers, posters, signs — whenever he saw a word he tried to figure it out and to remember it. His progress became amazingly rapid. He learned nearly a hundred words during the first week after the training took effect. After three more weeks he could read First Readers with ease; a month later, his reading on standard tests equaled that of the average pupil at Grade 2.5. After approximately three months of miscellaneous reading during the summer vacation, Case 1 earned on the Gates Silent Reading Tests the following scores:

A. General Impression; Reading Age, 10.0; Reading Grade, 4.2.

B. Predict Outcome; Reading Age, 9.7; Reading Grade, 3.9.

C. Precise Directions; Reading Age, 9.8; Reading Grade, 4.0.

D. Details; Reading Age, 10.1; Reading Grade, 4.3.

At this time the pupil's age was 10.3 years and his mental age about 10.4 years. During the period of six months he had developed from practically a non-reader to nearly an average reader for his age and intelligence.

Case 2. Deficiency in Word Analysis

This case was first studied in October, 1923, when the pupil was 8.5 years old — Intelligence Quotient,

116 — and, although he had been in schools two and one-half years, he was only beginning the second half of Grade II. His reading scores were then: Burgess Test, failure; Gray's Oral Passage, Reading Age 6.4 years; Gates Pronunciation Test, 6.4 years. The pupil's reading ability was barely above zero despite the fact that his mental age was nearly 11 years. The diagnosis which follows is quoted from the note sent to the teacher at that time:

—— has been examined for his difficulty in reading with the following results:

His Mental Age and Intelligence Quotient are high; his failure in reading cannot possibly be attributed to dullness.

In a series of tests of visual acuity and speed and accuracy of visual perception of small printed items of various sorts, —— secures high scores for his age in all tests except those composed of words. This means that he has no organic defects of vision or of capacity for visual perception that could interfere with his reading. The low scores in the word perception tests must be due to other defects.

We have tested ——'s hearing and found it normal. We have also examined his skill in discriminating and retaining a series of complex word sounds long enough to reproduce them. He made a perfect score on this test, which means that auditory defects are not present.

——'s memory span or "immediate memory" for visual items and for digits, letters and nonsense words presented orally was tested and no deficiencies in these capacities appeared. We also gave —— two tests for learning ability that resemble the task of learning a series of words (the "words" are really made up of an artificial alphabet) and found that he could learn these words rather better than the average person for his age both when the "meaning" of the words were given visually by a picture or orally in the form of a familiar word. These results indicate that —— really possesses the fundamental mental machinery for learning printed words; at least words of a "foreign" language. The doctor's suggestion that —— is subject to "word-blindness" and the parents' idea that he

has a hidden brain defect caused by a fall are, we believe, erroneous. *The trouble is probably entirely one of faulty methods of learning English words.* The fact that he could learn our artificial or "foreign" words is strong evidence for this belief.

The nature of ——'s difficulties could be detected in some measure by observing the way he works when he tries to learn or to read familiar words. He makes so many gross errors such as *what* for *was*, *turn* for *return*, *this* for *sit*, as well as so many more common ones such as *they* for *there*, *was* for *were*, etc., that he rarely gets any sense from what he is reading. Yet, he reads very rapidly, acting the while as if the jargon really meant something to him.

We tried out —— for his ability to break a word up into parts such as syllables and phonograms, to spell simple words in small parts, to recognize and also to sound single letters, phonograms like *br*, *in*, *up*, etc., syllables like *ber*, *ought*, etc. While he showed some ability to translate some of these elements into sounds, he has almost no ability to recognize these word elements in whole words and almost no ability to break a word up into its elements. He appears to give a word a quick superficial glance in which he gets only a vague impression. He lacks the technique of seeing a word acutely, of seeing not only its vague outline but also its distinctive parts. He lacks skill also in analyzing a word into its elements. (Incidentally, he makes errors in reading the alphabet; *b* and *d*, *p* and *q* were confused, and he hesitated on *n*, *r* and other letters.)

Recommendations. — We should recommend that —— be given a vigorous drill in exercises which require him to look more closely at words and which include words so arranged as to bring into relief the common elements and differences. He should learn his letters by using a dictionary and perhaps by means of simple drills. He should become aware of common word elements, should learn to translate the familiar phonograms, and, above all, he should learn to observe a word more carefully for the purpose of detecting its significant parts. Enclosed are some suggestions for the remedial work in reading together with a method of studying in spelling which should serve some of the same purpose.

Results of remedial work. — This pupil was handled entirely by the classroom teacher after a conference

with the examiner. He progressed rapidly after some initial difficulties.

The following records show his progress:

Date of Examination	Pupil's Age	Tests	Reading Age
October 21, 1923	8.5	Several	6.4
January 10, 1924	8.7	Gray's Oral Gates Pronunciation	8.1 8.4
May 3, 1924	9.1	Stanford Word Reading Stanford Sentence Stanford Paragraphs Gray's Oral	8.8 9.0 9.1 9.3
October 1, 1924	9.5	Thorndike-McCall	10.5
May 1, 1925	10.1	Thorndike-McCall	12.0
October 1, 1925	10.5	Thorndike-McCall	11.1
May 1, 1926	11.1	Thorndike-McCall	13.3
December 9, 1926	11.7	Gates Test A Gates Test B Gates Test C Gates Test D Average	14.8 18.0 13.6 14.4 15.2

The records show a steady improvement in reading ability in comparison with the pupil's age, until, in the last tests, his reading age exceeds his chronological age by three and one-half years. At this time the pupil's mental age, estimated from the Intelligence Quotient obtained earlier, was approximately 13.6 years. The reading age exceeds this figure by 1.6 years; the Accomplishment Quotient in reading, in other words, is approximately 112.

Case 3. Deficiencies in Word Analysis and Phonetic Abilities

Cases 3 and 4, which gave very similar diagnostic pictures, are introduced to show the effects of two different types of remedial treatment.

Case 3 was in the second grade of a private school when tested during the last days of November, 1925. The following letter to the teacher gives the diagnosis:

Diagnosis. — —— had on December 1, 1925, a chronological age of 7.9 years, an I. Q. of 113, and an M. A. of 8.9 years. It is, therefore, apparent that the difficulty in reading is not due to inferior intelligence. His achievements on reading tests are as follows: In the Thorndike-McCall 7.7 years; in the Burgess Test, complete failure; in Gray's Oral Reading Test, very poor — an age of 6.6 years; in the Gates Pronunciation Test, 6.3 years; in the Gates Reading of Paragraphs Test, 6.4 years.

We find no serious deficiencies in comprehension of connected material when presented orally, in memory span for digits, letters, unconnected words, or series of syllables of a foreign-language-like type.

We found no defects in ability to hear complex sounds nor in ability to reproduce a series of such sounds which were read to him.

In tests of certain associative processes, that is, in ability to learn through simple associations, no significant backwardness was shown.

We found evidence of some visual difficulty when —— worked without his glasses. On inquiry the physician reported that he had a $\frac{20}{30}$ + astigmatism in both eyes. This astigmatism is insufficient in all likelihood to account for the difficulty in reading, but it is enough, possibly, to make continuous reading without glasses a bit fatiguing.

In a study of ——'s native ability in visual perception for various kinds of materials we found it to be slightly below the average for his chronological age. We interpret our results here to mean that he is a bit slow in grasping items visually, and according to our tests he is slower without glasses than with them. This difficulty might account for certain slowness in the rate of reading, but is not enough to account for inability to learn to read or spell.

Although the case was not reported for backwardness in spelling, our examinations show that his technique in learning to spell and in trying to spell words is very poor, and his general ability in spelling is very low. He can spell only a few of the very simplest words orally. His method is that of letter by letter spelling, and in many instances he goes far astray in his efforts. His ability to spell by means of writing the word is no better. It is apparent that he has not habituated the spelling of words as a unit, even in the case of the shortest words. Each word is written, as it is spelled orally, in a laborious letter by letter procedure.

Examining the several factors which function in spelling we found that —— was able to give the letter which represented several typical letter sounds which were spoken to him, but that when syllables such as *nub*, *sig*, *dar*, etc., were pronounced, he was quite incapable of finding the letters which would represent reasonably well these sounds. —— is one of the rare cases we have found which shows almost complete inability in this type of phonetic work. When two or more of these syllables are combined, he is left utterly at sea.

Our diagnosis of the case is that the most serious difficulty lies in his inability to translate sounds into letters in the case of spelling and to recognize such units as syllables in words in reading. The remedial treatment should include training to grasp such word units as syllables and to translate them into letters during spelling. He should also be taught a technique of dividing up a word into syllables or other smaller units as well as reading word wholes for the sense. He should have more experience in writing. He should be taught to write very short words as wholes, and words which contain more than one syllable in syllable units.

Inasmuch as —— is, so far as our experience goes, a rare type, we should very much hope that a competent teacher could devote herself especially to the remedial work with this case. We shall be glad to outline for this person what we think may be a suitable course of training.

Remedial treatment. — This pupil, taken in hand by an experienced teacher then serving as part-time assistant in the school, was not given the treatment the writer first intended to recommend but instead

for experimental purposes fairly extensive work in phonetics. Case 3 was given frequent but not daily drills of fairly brief duration until about 17 hours had been consumed in intensive work on the phonetic translation of consonants, vowels, and familiar phonograms. He was taught to recognize many of the phonograms in isolation and to recognize them in various words belonging to the family. Some attention was given to naming as well as sounding the letters when he could not recognize a word and in smaller degree he was encouraged to use the context to assist recognition. This practice was scattered over a period of nearly three months during which the pupil participated in the regular reading work of the class.

Results. — On a test composed of 66 phonograms of various types — *et, op, eep, ame,* etc. — Case 3 got only two correct in a test given in February at the beginning of instruction. At the end of the instruction early in May, he pronounced correctly 43 of the list.

In ability to translate phonograms, there was considerable gain. Despite the teacher's difficulty in getting the boy's interest in the work, the results show that even in such extreme cases, this type of phonetic skill may be acquired. To use the skill in the face of the practical reading situation is another matter, however. The tests showed a slight gain in scores in the Pronunciation and Oral Reading Tests, but as the teacher observed, " his power of phonetic attack, when applied to actual reading situations, is still very weak." In two tests of silent reading his age scores were 7.8 and 7.6 respectively, which represent a fair but not great

gain. His chronological age was then 8.3 years. On January 10, 1927, after nearly a semester of regular classroom work, the pupil was tested with the Gates Silent Reading Tests with results as follows: Test A, Age 8.6 years; Test B, 8.8 years; Test C, 9.2 years, and Test D, 8.3 years. At this time his age was 9.0 years and his mental age 10.2 years. He still lagged behind his apparent possibilities and lacked several important reading techniques.

Case 4. Deficiencies in Word Analysis and Phonetic Abilities

Case 4, who was studied about the same time, revealed a diagnostic picture so nearly identical with that of Case 3 that few details need to be given. This boy was 7.4 years old, with an I.Q. of 112; somewhat younger than Case 3 but of approximately the same brightness. Studying in the second grade of another school, his reading ability was almost equally poor. He did not know the phonetic elements and had little technique of word analysis.

Remedial treatment. — Case 4 was treated by a teacher, then one of the writer's students, in the general manner outlined in Chapter VII. The phonetic elements were brought out by means of exercises, instruction, and demonstration closely related to tasks of reading comprehension. During the period that Case 3 received 17 hours of training, Case 4 was given 20 hours of special work. Case 4 showed a greater improvement in every respect, especially in ability to recognize the

words encountered in ordinary reading. At the end of the practice period, this pupil's reading achievements were as follows:

Chronological age	7.8
Mental age	8.7
Gates Pronunciation Test, average	8.5
Gray's Oral Passages	8.4
Gates Silent Reading, average	8.3

In all three tests he had advanced from near zero ability to achievements superior to the average for his age and nearly equal to his mental age. At this time he gave every indication of a continued rapid progress.

These two cases alone are, of course, not sufficient evidence of the superiority of the newer methods over the more conventional phonetic devices even when the latter are administrated by a superior teacher and when applied to pupils whose phonetic deficiencies are marked. They are, however, fairly typical of results obtained with many other cases.

Case 5. Various Deficiencies Due to Lack of Experience

The diagnosis for this case is contained in the following letter sent to the pupil's father and to a tutor who took charge of the remedial work.

The following report on the findings concerning your son is divided into three sections: the first concerns various native or organic factors; the second contains techniques in the field of reading and related subjects; the third contains factors concerning more general behavior.

General intellectual capacity was measured by means of an individual test. His Mental Age is 13.8 years; Chronological Age,

11.5; Intelligence Quotient, 120. His intelligence is, roughly speaking, twenty per cent above the average.

The ability to grasp and understand complex verbal materials presented orally was tested systematically and found to be above normal for the age. The ability to comprehend materials in print, so far as depth and power are concerned, is above the average for the chronological age. Knowledge of the meaning of words and verbal concepts was found to be likewise above the average for the age. The memory span, by which we mean the number of items a person can retain for a limited time after one presentation, was tested with several varieties of material, and in every case found to be excellent. A series of tests designed to appraise the several associative processes involved in reading were next given. In all of these examinations the subject's abilities were found to be good.

We do not believe that convulsions during childhood or later accidents which Mrs. —— mentioned have in any way injured or inhibited the functions of any of the associative tracts in the brain. Any such diagnosis as *word blindness, congenital alexia,* etc., would in our judgment be quite incorrect.

In a few tests of visual acuity and facility it appeared that certain difficulties are encountered when the subject reads without glasses, although these difficulties are slight. They would be insufficient, we believe, to account for inability to read. In a series of tests designed to gauge perceptive abilities for visual materials we found in general normal abilities, but in some instances the reactions were a bit slow. This slowness was exaggerated somewhat when the glasses were not worn. The perceptive slowness is, however, only slight, and could not account for the difficulties in reading.

The auditory abilities were tested; first for ability to discriminate tones, next to hear and repeat complex unfamiliar foreign-language-like sounds, and finally for unusual combinations of sounds found in English words. In all of these traits the subject demonstrated excellent ability. In phonetic abilities, that is, the abilities to translate a given sound into some series of letters which represents the sound more or less adequately, the boy is average for one of his reading experience. This is not the same as saying that he is a good speller, but it is meant to indicate that certain abilities essential in learning to spell are present.

In the finer motor abilities of eyes, fingers, articulatory organs,

etc., nothing was found of significance save certain difficulties in speech, which were due to wearing braces on the teeth.

The above account gives a brief summary of the organic and native capacities which are used in reading. A serious defect or deficiency in any one of these traits is often sufficient to occasion great difficulty in learning to read and spell; a defect or deficiency in several of them would make trouble in reading even more probable. The account may be summed up by the statement that in none of these capacities was deficiency found. We must look elsewhere for the cause of the trouble in reading.

The subject's reading achievements are as follows:

Pronunciation of isolated words,	Reading Age 7.7
Oral reading of passages,	Reading Age 7.0
Silent reading, Age	6.8

These scores represent little better than first grade levels of work.

A study of ——'s methods of reading indicate no striking defects or bad habits but a general lack of all-round development. As the arrangement of scores above shows, the boy can work out the pronunciation of single words better than he can do continuous reading. When he is required to read for the sense, mechanical difficulties creep in. The abilities here are not incorrect in form or kind; they are merely inadequately developed for the purpose. If he is to read faithfully the words given him, nearly all of his attention must go into the mechanical work of recognizing the word-forms, and very little surplus attention is left over for grasping the meaning. What happens is that either he reads to get the sense, and as a consequence distorts the actual series of words by omissions or insertions, or he reads with care the actual words presented and consequently fails fully to understand what he has read. Which one of these devices he may use depends considerably upon the situation. In oral reading before persons whom he wishes to impress favorably it is likely to be the former; when reading to himself it is more likely to be the latter.

In spelling, the subject's level is about the same as in reading. In spelling, the technique is largely correct in kind, but inferior in facility. It is the right kind of technique inadequately trained. This is probably due not only to the fact that he does not conduct

extensive correspondence, but also to the limitations of his experience in reading. In some measure our spelling is helped out by our experience in reading.

This section of the study may be summed up by the statement that the techniques concerned in reading are not markedly poor in form or kind, but immature and undeveloped. The remedy suggested is extensive experience both in reading and writing, particularly the former. The problem is how to secure extensive experience of this kind. For that reason we attempted as best we could under the circumstances to find out what may have been the underlying motive for the lack of interest in reading, and also what may be an adequate corrective motive.

The remainder of the report which suggested possible motives for the boy's disinclination to read need not be given. It was suggested that he be tutored in private by a competent person.

Remedial measures. — The remedial measures took the general form outlined in Chapters IV and IX. Relatively simple materials related to subjects of interest to the boy were procured and various types of comprehension questions were made up for these materials. Paragraphs combined with comprehension checks were also typed for use in speed drills. The words which gave difficulty were copied and utilized in word learning exercises and contests. Some oral reading was required during which the tutor explained the technique of attacking unfamiliar words. The use of the context and of syllabication were stressed. The pupil was also encouraged to write letters and compositions. The typewriter was introduced and he began to copy material for which he was paid on a " quality basis " by his father. Throughout the work emphasis was placed mainly upon the practical results of compre-

hension although the tutor zealously observed the growth of mechanical skills and gave suggestions as the occasion demanded. The boy's responsiveness to competition and his enthusiasm for plotting curves of development were constantly utilized.

Results. — After three weeks of work in periods of from thirty to sixty minutes a day on five days of each week, the pupil had begun to improve and to show an interest in the work. During the next month, the development was very rapid. At the end of that period, he earned a reading age of 10.2 years on the Thorndike-McCall and about 9.5 years on the Burgess tests, which measure rate of reading fairly easy material. Three months later, his Thorndike-McCall score was 13.6 years, and his Burgess score was 12.5 years. He was then an eager and capable reader in many fields. His writing and spelling had also greatly improved although both were still faulty.

Case 6. Weakness in Several Necessary Capacities

Diagnosis. — Case 6 is like Case 5 in showing weakness in the various reading skills without seriously inadequate kinds of techniques. But unlike Case 5, who was lacking in motivation and enterprise while showing no deficiencies in the fundamental capacities for learning, Case 6 was a diligent worker who revealed several native limitations. These deficiencies appear in the records on the next page.

	AGE
Chronological	8.3
Mental (Stanford-Binet)	8.0
Tests of Visual Perception	
Perception of figures	7.2
Perception of digits	7.4
Perception of words	6.7
Selection of figures	7.0
Selection of words	6.5
Tests of Visual Analysis and Recognition	
Geometrical designs	7.9
Wordlike characters	7.5
Tests of Memory Span	
Visual figures	7.8
Digits	7.5
Letters	8.9
Nonsense words	9.2
Words	7.5
Tests of Auditory Functions	
Auditory discrimination	10.0
Tests of Associative Learning	
Visual-visual, Test 1	7.0
Visual-visual, Test 2	9.2
Visual-visual, Test 3	7.8
Visual-auditory, Test 1	7.5
Visual-auditory, Test 2	8.0
Visual-auditory, Test 3	7.5

Although this pupil is but a trifle below the average for his age in intelligence and immediate memory and is better than average in auditory discrimination, he is moderately deficient in speed and accuracy of visual perception, in visual analysis and recognition, and in associative learning. To the examiner he appeared to be slow and painstaking without being highly accurate; studious without being competent. His slowness in

these tests suggested a cause of his difficulty in reading. Although he studied hard he did not master words or acquire reading skills quickly. The knowledge and skills that he possessed seemed to be sound but they were acquired slowly.

Remedial measures. — This pupil was first given some of the practice materials and devices designed to increase speed. The emphasis on speed proved to be too great. Although his rate of performance was increased, errors which made their appearance suggested the danger of developing inappropriate habits. The amount of speed drills was, therefore, immediately reduced although not entirely eliminated. A variety of the comprehension exercises, word games, and seat work activities, such as reading of directions to be executed together with abundant interesting story materials were provided to give the pupil a varied experience. Under these conditions he has shown increased satisfaction and improvement in reading. His progress, while substantial, has not been notably rapid. Although his reading scores became somewhat better than the average for his age in both speed and accuracy, he is not, and probably never will be, as quick a learner as the average pupil. By means of effective methods of instruction and abundant practice he should continue to develop sound and fairly proficient reading skills.

This case illustrates a type frequently encountered. A combination of several native limitations which are sufficient to retard progress greatly when ordinary methods are used may be largely compensated for by

more suitable teaching adjusted to the pupil's individual needs.

Case 7. Auditory Deficiency

Case 7, a few weeks before he was examined, had been taken from school because of poor hearing and difficulty in reading. His age was 8.7 years and his Stanford-Binet mental age was 9.0 years. His lack of interest in social activities, his listless attitude, his prematurely gloomy temperament were doubtless largely due to the handicap of defective hearing and the chagrin resulting from failures in school work.

Diagnosis. — In reading ability, he was approximately the equal of the average child near the end of the first grade except that he made more errors than the normal child. He read hurriedly and inaccurately. His perceptive attack was unsystematic and superficial. In the school which he had attended, the traditional phonetic method was used extensively and applied orally for the most part. Much time was devoted to phonic drill, to naming words which rime or which contain certain phonetic elements. Much of this instruction the pupil missed because of his partial deafness.

Our examination showed that he had great difficulty hearing an ordinary voice at a distance of ten feet or more and very great difficulty when he could not observe the speaker's face. In the classroom he was forced either to miss much that the teacher said or to fail to follow the reading in the book. The teacher's report that he was exceedingly poor in phonetics was largely true according to our tests. The remedy which

the teacher had applied for his failures consisted of more phonetics. The pupil had really learned a number of phonograms but he had not learned how to find them or use them effectively in dealing with unfamiliar words.

The results of the other tests applied to Case 7 need not be given since they show no other significant deficiencies. Inability to analyze words, difficulty in using the context clues, vagueness and lack of system in observing word-forms were the important deficiencies uncovered.

Remedial treatment. — The tutor to whom the child had been assigned accepted the advice to drop the traditional phonetic method entirely and to use a visual approach coupled with suggestions concerning the characteristics of words on which he failed, the organization of practice materials showing these words in comparison with other similar ones, and occasional hints concerning methods of dividing up words. In general, the method applied to deaf children (see Chapter XII) was used together with considerable practice in writing and spelling words (see pages 306–12). After about two weeks required to get the pupil started in the new method, steady and rapid progress began. At the end of two months he had mastered nearly a thousand words and had developed ability to work out the recognition of almost any unfamiliar word-form. Skill in phonetic translation became one of his several acquisitions. It was no longer necessary to provide formal instruction since his vocabulary was developing rapidly during his ordinary reading, which had become very extensive.

Like most pupils partly or fully deaf, he secured the greatest pleasure as well as profit from his reading.

Case 8. Reading Difficulty Associated with Left-Handedness and Visual Defect

Diagnosis. — This pupil was found to have, in addition to disability in reading and spelling, three other difficulties. He was a very poor writer, occasionally subject to mirror-writing; he had defective speech and occasionally stuttered; he had defective vision (astigmatism) which though corrected may have interfered with his reading in the early grades before it was discovered. In all other respects covered by the series of diagnostic tests he was average or better.

In Chapter XI we indicated how any one of the defects found in Case 8 might influence reading unfavorably. When several sources of difficulty coexist during the periods crucial to the formation of reading habits, it is impossible to disentangle the contribution of each. Since this pupil made more than the usual number of reversal errors — *no* was substituted for *an*, *on* for *go* *what* for *now* in the first twenty words attempted in the Pronunciation Test — it is probable, if the theories earlier mentioned in Chapter XII are valid, that the left-handedness had a deleterious effect. Since the child had been required, a few months after beginning the first grade, to write with the right hand it is possible that this was responsible not only for the subsequent development of a speech defect but also for some of the confusion and irregularity that characterized his obser-

vations of words. Difficulties in oral reading nearly always exaggerated this pupil's speech difficulty and led him to guess wildly at words in order to get on with an embarrassing task. The visual defect, uncorrected in the first grade, probably also increased the difficulties in word perception, if it was not primarily responsible for them. Here then was a child whose efforts to learn to read might have overcome any one of his limitations, in large measure at least, but who was defeated by the combined action of several handicaps, each of which probably exaggerated the effects of the other.

Remedial measures. — Since this pupil had not really learned to write and, therefore, had no well-formed habits to break, and since he appeared to be decidedly left-handed, he was instructed to write with this member. He was first given practice (in the manner described in Chapter XII) in writing his name and other familiar words in manuscript or print-like type. The common elements of several words were pointed out and underlined and he was encouraged to look for these phonograms and syllables in words and to write them as units while he pronounced them. Various word recognition activities and the reading of phrases, sentence and paragraph comprehension exercises were soon introduced. Exercises designed to encourage sharp observation of word-forms were supplied in abundance. From a reading age in the Pronunciation Test and Gray's Oral which averaged 6.8 years at the beginning of instruction, the pupil advanced in six weeks to an average reading age of 7.9 years and after

an additional six weeks, to 9.3 years. His age at the time of the last test was 9.6 years and his mental age 10.2 years. His spelling age based on the list of 36 words in our series, on the last date was 8.9 years. Development in speed and quality in writing was less rapid but considerable.

A Summary of Diagnoses of Four Hundred Eleven Backward Readers

The individual cases here reviewed are typical of many others that have been studied during the past eight years by the writer and his students. These eight cases do not by any means exhaust the varieties of diagnostic patterns that have been found. Indeed, every conceivable combination of acquired defects or of constitutional deficiencies and mixtures of both types are found. Space is not here available for further detailed pictures. As a substitute we may offer a summary of the frequencies with which the various defects and deficiencies have been diagnosed.

Method of selecting the cases. — To tabulate the frequencies with which different deficiencies are found among the cases that have been studied by the writer and his assistants offers a rather difficult problem. In the first place there is the difficulty of deciding precisely when a pupil is to be called a case of serious backwardness or " disability " in reading. Obviously, there is no sharp division into " disabilities," average, and other groups in reading. All degrees of retardation are found. Cyril Burt, imitating the arbitrary pro-

cedure of considering persons with an intelligence score of .70 per cent or less of their age as "feeble-minded," classifies all pupils who are retarded in reading age by 30 per cent or more, or who are retarded twice as much in reading as in any other subject to be instances of special disability.

Both of these criteria offer difficulties. It would require approximately two years of school work to make possible a Reading Quotient as low as .70 in the case of a pupil of average age, even if he failed completely to learn. To rule out cases who are deficient in spelling and writing as well as in reading is, sometimes, merely to discard those who have suffered especially widely and severely from the effects of their reading defect. For these reasons, the writer has adopted another method of selecting his cases.

The cases utilized in securing data for the tabulations below should not be defined as disabilities. They were cases that seemed to the writer, at least, as seriously retarded and might, therefore, be termed "seriously backward." They were selected by the following arbitrary method:

1. All had intelligence quotients of 85 or higher; 82 per cent were 100 or above; 50 per cent were above 105.5.

2. Every pupil had attended school for at least two years.

3. All were retarded in reading age 50 per cent or more of the number of years they had attended school. In other words, their progress was only half, or less than half, of the average rate.

The number of cases. — The cases used in this study fall into three groups as follows:

1. Cases studied with all of the methods and tests described in this book, between September, 1925, and January 1, 1927	76
2. Cases studied with all the instruments available at the time so far as they seemed useful for the particular case between October, 1921, and September, 1925	79
3. Cases studied with all types of tests except those for phonetic ability and word pronunciation	256
Total number of cases	411

Limitations in the estimates. — When an effort is made to determine the frequency with which different deficiencies are found in an unselected group of backward readers, other difficulties are encountered. These pupils are not an unselected group. Those of less than 85 I.Q. were eliminated, for one thing. This makes it impossible to venture any reliable estimate of the influence of inferior intelligence upon reading deficiency. A larger proportion of certain deficiencies would appear in this total group than in an unselected one, for the reason that we deliberately sought for a number of pupils with poor hearing, or who were left-handed, etc., in order to secure more data on the influence of these particular factors. The writer has, therefore, eliminated from the number analyzed those who were thus arbitrarily selected, but this has probably been imperfectly done. Over 90 per cent of the pupils studied were taken from the public schools of greater New York in which the method of teaching reading has certain uniform features. An equal number of backward readers instructed in a radically different manner would probably show more numerous difficulties of certain

ACQUIRED DEFECTS — INAPPROPRIATE TECHNIQUES

	NUMBER EXAMINED	PER CENT MILDLY DEFICIENT	PER CENT SERIOUSLY DEFICIENT
I. Defects in learning techniques			
1. Defects in techniques of associative learning of all types applied	142	12	6
2. Defects in techniques of learning, all types of word-like character	189	18	10
3. Defects in techniques of learning English words only, exclusive of defects in methods of perception and analysis	189	22	12
II. Defects in methods of visual analysis and discrimination			
1. For all sorts of wordlike characters	101	7	5
III. Inappropriate techniques of Analyzing word-forms			
1. Difficulties in detecting common word elements, syllabication, etc. (*i.e.* of discovering significant details)	152	6	87
2. Overemphasis of attention to details	152	20	42
3. Difficulties in perceiving quickly and accurately total word-forms . . .	152	6	94
4. Overemphasis of attention to general features of word-form	152	30	25
5. Overemphasis of phonetic attack	152	25	18

ACQUIRED DEFECTS — INAPPROPRIATE TECHNIQUES — (*Continued*)

	NUMBER EXAMINED	PER CENT MILDLY DEFICIENT	PER CENT SERIOUSLY DEFICIENT
IV. Inappropriate methods of using context in recognizing new words			
1. Too little use of context .	152	45	36
2. Too exclusive dependence on context	152	10	8
V. Techniques inadequate for rapid and accurate word perception.			
1. Slow, halting process not obviously due to difficulties with the individual words	40	3	0.5
2. Excessive rapidity not obviously due to method of observing particular words	40	2	1.0
VI. Unfavorable attitudes toward task			
1. Probably the result of the difficulties in reading . .	172	40 [1]	30 [2]
2. Probably due to other causes and partly responsible for backwardness in reading	172	10 [1]	2 [2]

[1] To a slight extent.
[2] To a great extent.

ORGANIC DEFECTS: DUE TO INHERITANCE, ACCIDENTS, DISEASE, ETC.

	NUMBER EXAMINED	PER CENT MILDLY DEFICIENT	PER CENT SERIOUSLY DEFICIENT
I. Intellectual inferiority, among our cases	0	0	0
II. Special deficiency in comprehension of oral language, due to defects in hearing — among our cases	126	0	0
III. Visual defects			
1. Indistinct vision . . .	148	12	2
IV. Deficiencies in speed and accuracy of visual perception, not due to defective vision			
1. For all types of small visual items	403	15	4
V. Deficiencies in visual analysis and recognition			
1. For all types of complex visual data	75	12	2
2. For wordlike characters only	75	15	4
VI. Deficiencies in auditory functions			
1. In auditory sensitivity ("hard of hearing") . .	236	1	0.3
2. In auditory discrimination without defects in sensitivity	76	2	0.4

ORGANIC DEFECTS: DUE TO INHERITANCE, ACCIDENTS, DISEASE, ETC.—(*Continued*)

	NUMBER EXAMINED	PER CENT MILDLY DEFICIENT	PER CENT SERIOUSLY DEFICIENT
VII. Deficiencies in memory span			
1. For visual items, not due to poor vision	76	7	2.0
2. For auditory items, not due to poor hearing . .	94	6	1.0
VIII. Deficiencies in motor functions			
1. Eye muscle control . .	148	2	0.5
2. General motor control .	80	4	1.0
3. Articulation	175	3	2.0
4. Left-handedness . . .	66	10	4.0
IX. Deficiencies in capacity for associative learning			
1. General deficiency not accounted for by any of the above factors . . .	403	7	2.0
2. Deficiency in visual-visual association, not accounted for by any of the above factors	403	3	0.5
3. Deficiency in visual-auditory association only, not accounted for by any of the above factors . . .	403	3	0.5
X. Constitutional nervous and emotional instability . . (All types combined)	52	5	2.0

types and fewer of others. Finally, the diagnoses are influenced considerably by the examiners' points of view. The distributions which follow, then, must be understood as representing not wholly objective appraisal of quite representative cases of backwardness in reading but a rough picture of a local product obscured by the author's biases, whatever they may be.

Explanation of the table. — The tabulation states the number of cases examined for each habit, defect, or organic deficiency (including those judged on the basis of other tests to be normal and, therefore, not tested) and the percentage of this number diagnosed as mildly or seriously deficient. The percentages represent the author's estimates made under the limitations described above, of the relative frequency of the defect.

Comments on the summary of diagnosis. — The first comment is a repetition of the statement that much of the summary is based on the writer's judgment. For example, it is impossible at this time to tell whether low scores in some of the diagnostic tests, such as the series of six tests of associative learning or the five tests of speed of visual perception, are due to limitations of the pupil's native capacities or to inadequate acquired techniques of dealing with these particular test functions. The probability is that low scores are usually due to both types of deficiencies and sometimes much more to one than to the other. By taking the pupil's achievements in all of the tests into account and by utilizing the results of observations of the pupil's methods of work in the several tests, an effort has been

made to distinguish between the two types of deficiencies. The tabulation, consequently, shows certain functions entered under both "Acquired Defects" and "Organic Deficiencies." In these cases, the percentages indicate the relative number of cases judged to show *mainly* one or the other weakness.

The main impressions to be gained from the tabulations are as follows:

1. When pupils of Intelligence Quotients of 85 or better are alone considered, as in this tabulation, the number of cases subject to serious reading backwardness or complete inability to learn as the result of the failure to acquire essential techniques or as the result of acquiring inappropriate technique or both, as is usually the case, is an overwhelming majority of those studied.

2. Deficiencies presumed to be organic, either native or acquired, such as defective vision, hearing, visual perception, certain associative capacities, etc., are found in both extreme and milder form in considerably greater degree than among pupils of similar intelligence but of superior reading ability.[1]

Summary of acquired defects. — Among the deficiencies in skill which characterize the poor readers, one should note the almost universal appearance of difficulties in the techniques of analyzing, studying, and perceiving of word-forms. The author believes these deficiencies in visual perception and analysis of words to be the most common cause of failure and difficulty in

[1] The writer has results obtained from giving the entire battery of tests to 694 pupils; and most of the battery to approximately 1740 pupils. See tabulations in Chapter I.

reading. Aside from the frequency of various particular difficulties listed under this general category, the tabulation shows a relatively large number of cases of clumsy, unsystematic, and otherwise deficient methods of associative learning of the sort similar to that required in learning words in association with meaning given orally or by means of visible illustrations and an even greater percentage of deficiency of utilizing the reading context as an aid in learning unfamiliar words. The attitude toward reading among the poor readers is unfavorable to some degree in 82 per cent of the cases, according to the writer's appraisal. He estimates, however, that in at least seven cases out of eight, this disinterest or distaste is due to the difficulty in reading itself rather than to other causes.

Summary of native defects. — No single organic deficiency stands out above the others in prominence. Native sluggishness in the visual perceptual responses, dullness in visual analysis of complex wordlike characters, left-handedness, poor vision, poor visual memory span, weakness in associative learning capacity, and nervous and emotional instability are judged to be present most frequently in a noticeable degree.

It should be understood that one pupil may have anywhere from one to all of these deficiencies at once. Indeed, all sorts of combinations of the mainly organic and the mainly acquired defects are to be expected. To decide upon a course of remedial treatment, it is more important to know the nature of the acquired techniques; but knowledge of the nature of the native deficiencies is often of value in arranging remedial work

and makes possible a better prognosis of the results of a course of training.

REFERENCES TO PART IV

It is expected that other case studies and a more detailed statistical study of all of the cases examined by the writer will be published later.

The following publications describe studies of the author and his students which preceded the preparation of this section.

1. GATES, A. I., *The Psychology of Reading and Spelling with Special Reference to Disability.* Teachers College Bureau of Publications, 1922.
2. ——, "Study of Depth and Rate of Comprehension in Reading by Means of a Practice Experiment," *Journal of Educational Research,* 1923, pp. 37–50.
3. ——, "A Study of the Rôle of Visual Perception, Intelligence and Certain Associative Processes in Reading and Spelling," *Journal of Educational Psychology,* October, 1926, pp. 433–46.
4. ——, *New Methods in Primary Reading,* Bureau of Publications, Teachers College, 1928.

Two other monographs dealing with the technical analysis of the diagnostic tests and with the effects of various types of remedial instruction applied to individual cases are in preparation for publication.

The following are references to studies of the use of the remedial materials with deaf-mute subjects.

The underlying theories are given in Gates, A. I., "Methods and Theories of Teaching Reading Tested by Studies of Deaf Children," *Journal of Educational Research,* June, 1926, pp. 21–32; "An Experimental Study of Teaching the Deaf to Read," *Volta Review,* June, 1926, pp. 295–98; and "Methods and Theories of Teaching the Deaf to Spell," *Journal of Educational Psychology,* June, 1926. The results of an experimental study with illustrations of the materials and methods used are given in a doctor's dissertation by Helen Thompson entitled *An Experimental Study of the Beginning Reading of Deaf Mutes,* Teachers College Bureau of Publications, 1927.

Copies of a complete set of material, comprising approximately 1040 pages, in mixed mimeograph and printed form, have been placed in the Teachers College Library. The author has a limited number of these sets which will be sold at cost as long as they last.

The author is preparing sets of material of other types suggested for use with reading difficulties of several sorts. Some of these may be ready late in 1927.

The following are references to excellent studies of the more serious cases of reading disabilities.

1. BRONNER, A. F., *The Psychology of Special Abilities and Disabilities.* Boston: Little, Brown and Company, 1917.
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5. FILDES, L. G., "A Psychological Inquiry into the Nature of the Conditions Known as Congenital Word Blindness," *Brain,* Vol. XLIV, 1921.
6. FREEMAN, F. N., "Clinical Study as a Method in Experimental Education," *Journal of Applied Psychology,* June–September, 1920.
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8. ——, *Remedial Cases in Reading: Their Diagnosis and Treatment,* Supplementary Educational Monographs, No. 22, June, 1922, University of Chicago.
9. HEILMAN, J. D., *A Study in the Mechanics of Reading.* Research Bulletin No. 4, State Teachers College, Greeley, Colorado, 1919.
10. HINSHELWOOD, J., *Congenital Word Blindness.* London: Lewis and Company, 1917.
11. HOLLINGWORTH, L., *Psychology of Special Disability in Spelling.* Teachers College, Columbia University, 1918.
12. ——, *Special Talents and Defects.* New York: The Macmillan Company, 1923.
13. ORTON, S. T., "Word Blindness in School Children," *Archives of Neurology and Psychiatry,* November, 1925.
14. SCHMITT, C., "Developmental Alexia: Congenital Word Blindness, or Inability to Learn to Read," *Elementary School Journal,* May–June, 1918.
15. WALLIN, J. E. W., "Congenital Word Blindness, Some Analyses of Cases," *The Training School Bulletin,* September–October, 1920.
16. WHITE, A., *Reading Ability and Disability of Subnormal Children.* Department of Public Welfare, New York City, 1921.
17. WOOLLEY, H. T., and FERRIS, E., *Diagnosis and Treatment of Young School Failures* (Government Printing Office Bulletin, No. 1, Washington, D. C., 1923), Bureau of Education, Department of Interior.

APPENDIX

DIRECTIONS AND NORMS FOR ALL TESTS

This section is really a Manual of Directions for using all the writer's tests which have been discussed in the book. Directions for giving the tests and scoring results are given together with the norms which make it possible to translate raw scores into age or grade scores. The data from which the various scores were derived are found in various articles to which references will be made.

The tables of "norms" or, strictly speaking, of averages have been constructed in such a way as to make the results on the various tests comparable. This was done by giving all of the tests — about 35 for most grades — to 465 children fairly evenly distributed among Grades I to VI inclusive. Some of the tests had already been given to many hundreds of other pupils. All the available data for these latter tests were assembled to make the most reliable estimate of the grade locations of the various scores on each. Thus a grade scale for average pupils was made for those tests most widely applied. All the other tests were given grade scores to correspond; that is to say, the average scores in the various tests were assigned the same grade values as the scores these same pupils earned in the tests that were more widely applied.

The age scores were arranged by the somewhat arbitrary device of deriving them from the more stable grade scores on the assumption that grade 1.0 equals age 6.4; grade 2.0 equals age 7.5, and so on. This procedure was based upon the assumption that the average pupil begins an average grade at 6.4 years and advances at the rate of a grade in 1.1 years. This device makes age and grade scores interchangeable, an arrangement which is convenient and which also makes the age score for one test comparable with those for others. If the age-grade equivalents here assumed (not without indications pointing to this as a reasonable parallel)[1] are not perfect, it matters little since our task is merely that of comparing achievement on one test with attainments on other tests.

A number of the tests described later do not discriminate well among the abler pupils or the older pupils who are only average in the ability in question. The tests were designed primarily to determine whether the pupil has the minimum essential or less ability. They are, in other words, chiefly useful in discovering deficiencies. In the case of the test for auditory discrimination of wordlike sounds, for example, it matters much whether the pupil can get the words we present but it matters little whether he could discriminate much longer and harder sound combinations, since, for the practical purposes of learning the language, the higher skills are not essential. In order to conserve time, this test is not carried far above the minimum level of

[1] See McCall, W. A., *How to Measure in Education*, New York: The Macmillan Company, 1922, pp. 32–37.

ability necessary for learning in reading. This cutting off of the possible upper test levels results, frequently, in little difference between the average pupil (who is normal) in Grade II and in Grade VI. In such instances to have as much ability, in auditory discrimination, for example, as the average pupil half through Grade II is sufficient.

Intelligence Tests

No directions for intelligence tests will be given, but it may be well to remind the student that tests which require reading — such as the National and most other "verbal" tests — are not satisfactory for use with children who have reading defects. If the reading tests are omitted, the Stanford-Binet is the most useful individual test. Among group instruments a non-verbal test such as Pintner's Non-Verbal should be used.

In Chapter III the meaning and uses of "mental age" and "mental grade" scores were explained. Nearly every Manual gives the data needed to compute the mental age but not the mental grade. Table I enables the examiner to translate the former into the latter. The mental grade indicates the approximate position which, theoretically at least, the average pupil earning the equivalent score on the mental test would occupy in an average or typical school. Since the reading grades, given in the following tables, were arranged in the same way, it may be said that the average pupil should be expected to have a reading grade equal to his mental grade.

TABLE I

TABLE TO TRANSLATE MENTAL AGE INTO MENTAL GRADE

The first column gives the mental age from the test in years and tenths; the second column gives the corresponding mental grade in grades and tenths; 1.00 means the beginning of Grade I.

Mental Age	Mental Grade	Mental Age	Mental Grade	Mental Age	Mental Grade	Mental Age	Mental Grade
6.4	1.00	9.1	3.40	11.8	5.90	14.5	8.30
6.5	1.10	9.2	3.50	11.9	5.95	14.6	8.40
6.6	1.20	9.3	3.60	12.0	6.00	14.7	8.45
6.7	1.30	9.4	3.70	12.1	6.10	14.8	8.50
6.8	1.40	9.5	3.80	12.2	6.20	14.9	8.60
6.9	1.45	9.6	3.85	12.3	6.30	15.0	8.65
7.0	1.50	9.7	3.90	12.4	6.40	15.1	8.70
7.1	1.60	9.8	4.00	12.5	6.45	15.2	8.75
7.2	1.70	9.9	4.10	12.6	6.50	15.3	8.80
7.3	1.80	10.0	4.20	12.7	6.60	15.4	8.90
7.4	1.90	10.1	4.30	12.8	6.70	15.5	9.00
7.5	2.00	10.2	4.40	12.9	6.80	15.6	9.10
7.6	2.10	10.3	4.45	13.0	6.90	15.7	9.20
7.7	2.20	10.4	4.50	13.1	7.00	15.8	9.30
7.8	2.30	10.5	4.60	13.2	7.10	15.9	9.40
7.9	2.40	10.6	4.70	13.3	7.20	16.0	9.50
8.0	2.50	10.7	4.85	13.4	7.30	16.2	9.70
8.1	2.60	10.8	5.00	13.5	7.40	16.4	9.90
8.2	2.70	10.9	5.10	13.6	7.45	16.6	10.10
8.3	2.80	11.0	5.20	13.7	7.50	16.8	10.30
8.4	2.85	11.1	5.30	13.8	7.60	17.0	10.50
8.5	2.90	11.2	5.40	13.9	7.70	17.2	10.60
8.6	3.00	11.3	5.45	14.0	7.80	17.4	10.70
8.7	3.05	11.4	5.50	14.1	7.90	17.6	10.80
8.8	3.10	11.5	5.60	14.2	8.00	17.8	10.90
8.9	3.20	11.6	5.70	14.3	8.10	18.0	11.00
9.0	3.30	11.7	5.80	14.4	8.20		

The Gates Primary Reading Tests

Giving the tests. — Since the directions are printed in full on the title page of each test, they will not be

repeated here. It cannot be too strongly asserted that the utmost care should be exercised to make sure that every child understands what he is to do and to see that every child does all he can do. The work of individual pupils should be surveyed as soon and as often as possible after the test has been started. Pupils in the primary grades require much fuller explanation and demonstration and much more supervision during the tests than do older pupils. Pupils making gross errors or losing considerable time should be retested under more careful supervision.

It is preferable to give the tests in the order in which they are numbered, although there is no serious objection to any other order.

Certain paragraphs may be legitimately interpreted by a child in two or more different ways. Any of these interpretations should be scored correct. In the notes below are mentioned paragraphs of this type.

Special Notes on Form I.

3. Line drawn under *part* as well as under whole length of the long train is scored correct.

11. The *X* must touch some part of the boy; if entirely *under* or *over*, score wrong.

13. One line under any four soldiers or any other method of underlining four soldiers (such as four separate lines one under each of four different soldiers) is correct.

15. Any line running between, even if not touching, ball and box is correct.

16. Any *X* that clearly indicates child's intent to indicate the umbrella is correct.

19. Line may run from hat to any hook, or to several hooks.

20. *X* is likely to overlap more than one line. If it was apparently meant to indicate top line, count correct.

25. An *X* anywhere on the "go" sign is scored correct.

26. Any clear indication of the right road by means of a line is correct.

Special Notes on Form II. — Read general directions preceding notes on Form I and notes on Form I to help get the general point of view in scoring.

13. A cross under or touching "lost leg," or two crosses, one under or touching lost leg, other under "stump," is correct.

14. Center of cross must be in block bounded by First, Green, and High Streets. Score strictly.

15. Line touching or almost touching both robin and nest correct.

19. One line under or through barn is correct.

25. Horizontal line to left of "boy" is correct.

Keys for scoring the tests. — Keys for scoring the tests are readily made by marking a copy of the test with a colored pencil. In Types 1 and 2, the correct answers are so obvious that they may be entered after a glance at the exercise and will, therefore, not be duplicated here.

Scoring Types 1 and 2. — In Types 1 and 2 the score is the number of exercises correct minus one-third ($\frac{1}{3}$) the number incorrect. Each test sheet should be scored by marking plainly with a *C* every correct exer-

cise and with an *X* (or *W*) every incorrect one. Count the number of *C*'s and place the total at the left top of the title page. To the right of this number place a dash. Enter next the number of *X*'s (or *W*'s). It is better later to compute $\frac{1}{3}$ the number of errors, draw a line through the number of *X*'s, enter the computed one-third next, and subtract to get the final score.

In computing one-third the number of errors, use the nearest whole number.

In scoring, an exercise is marked wrong if more than one word in Type 1, or more than one picture in Type 2, is marked. Omissions are scored neither right nor wrong but are disregarded. When erasures, etc., appear, the examiner uses his judgment concerning the pupil's intent.

Scoring Type 3. — In Type 3, the score is the number of exercises correct. As in the preceding type, a test should be marked to serve as a key.

This test, in general, is to be scored rigidly since it is designed to measure precise reading. The results must be considered, however, with the child's writing limitations and his types of interpretation in mind. The following notes should give the " set " for scoring.

An exercise is always scored incorrect unless the type of mark specified is used; *e.g.* if the direction is to " Put an *X* on " the object, any other mark, such as a circle or a line, even if placed on the right object, is scored wrong.

Unless the right mark is placed in the position called for in the directions, such as *on, under, over,* the exercise is scored wrong. In deciding on the correctness of the

position, allowances must be made for the young child's imperfect motor control. Thus, while intending to place the *X under*, the child may make a mark partly *on* as well as under the object. This should be scored correct if the pupil apparently intended to put it *under*. The smaller the picture of the object to be marked, the greater the likelihood of overlapping marks. In all these cases, the scoring should be rigid after reasonable allowances are made for the pupil's motor

TABLE II

AGE AND GRADE AVERAGE SCORES FOR TEST I, WORD RECOGNITION

Score	Reading Grade	Reading Age	Score	Reading Grade	Reading Age
1 . . .	1.20	6.60	25 . . .	2.30	7.80
2 . . .	1.24	6.64	26 . . .	2.33	7.83
3 . . .	1.27	6.67	27 . . .	2.37	7.87
4 . . .	1.30	6.70	28 . . .	2.40	7.90
5 . . .	1.35	6.75	29 . . .	2.43	7.93
6 . . .	1.40	6.80	30 . . .	2.47	7.97
7 . . .	1.45	6.90	31 . . .	2.50	8.00
8 . . .	1.50	7.00	32 . . .	2.55	8.05
9 . . .	1.55	7.05	33 . . .	2.60	8.10
10 . . .	1.60	7.10	34 . . .	2.65	8.15
11 . . .	1.65	7.15	35 . . .	2.70	8.20
12 . . .	1.70	7.20	36 . . .	2.80	8.30
13 . . .	1.75	7.25	37 . . .	2.90	8.50
14 . . .	1.80	7.30	38 . . .	3.00	8.60
15 . . .	1.85	7.35	39 . . .	3.10	8.80
16 . . .	1.90	7.40	40 . . .	3.20	8.90
17 . . .	1.95	7.45	41 . . .	3.25	8.95
18 . . .	2.00	7.50	42 . . .	3.30	9.00
19 . . .	2.05	7.55	43 . . .	3.35	9.05
20 . . .	2.10	7.60	44 . . .	3.40	9.10
21 . . .	2.15	7.65	45 . . .	3.45	9.15
22 . . .	2.20	7.70	46 . . .	3.50	9.20
23 . . .	2.23	7.73	47 . . .	3.55	9.25
24 . . .	2.27	7.77	48 . . .	3.60	9.30

limitations. Base the score on what was his probable intent.

Age and grade averages for the three tests. — In column 1 of Table II is given the score; in column 2 is given the equivalent grade status or reading grade; in column 3 is given the equivalent age status or reading age. The reading grade 1.20 means that the pupil has completed two-tenths of Grade I; 2.00 means the beginning of Grade II; 2.50 means half through Grade II; and so on. The reading age 6.60 means six and six-tenths years; etc. Tables III and IV are read similarly.

TABLE III

AGE AND GRADE AVERAGE SCORES FOR TEST 2, WORD, PHRASE, AND SENTENCE READING

Score	Reading Grade	Reading Age	Score	Reading Grade	Reading Age
1 . . .	1.20	6.60	19 . . .	2.30	7.80
2 . . .	1.30	6.70	20 . . .	2.35	7.85
3 . . .	1.35	6.75	21 . . .	2.40	7.90
4 . . .	1.40	6.80	22 . . .	2.45	7.95
5 . . .	1.45	6.90	23 . . .	2.50	8.00
6 . . .	1.50	7.00	24 . . .	2.55	8.05
7 . . .	1.55	7.05	25 . . .	2.60	8.10
8 . . .	1.60	7.10	26 . . .	2.70	8.20
9 . . .	1.65	7.15	27 . . .	2.80	8.30
10 . . .	1.70	7.20	28 . . .	2.90	8.50
11 . . .	1.80	7.30	29 . . .	3.00	8.60
12 . . .	1.90	7.40	30 . . .	3.10	8.80
13 . . .	2.00	7.50	31 . . .	3.20	8.90
14 . . .	2.05	7.55	32 . . .	3.30	9.00
15 . . .	2.10	7.60	33 . . .	3.40	9.10
16 . . .	2.15	7.65	34 . . .	3.50	9.20
17 . . .	2.20	7.70	35 . . .	3.60	9.30
18 . . .	2.25	7.75			

TABLE IV

AGE AND GRADE AVERAGE SCORES FOR TEST 3, READING OF DIRECTIONS

SCORE	READING GRADE	READING AGE	SCORE	READING GRADE	READING AGE
1 . . .	1.30	6.70	14 . . .	2.00	7.50
2 . . .	1.35	6.75	15 . . .	2.10	7.60
3 . . .	1.40	6.80	16 . . .	2.20	7.70
4 . . .	1.45	6.90	17 . . .	2.30	7.80
5 . . .	1.50	7.00	18 . . .	2.40	7.90
6 . . .	1.55	7.05	19 . . .	2.50	8.00
7 . . .	1.60	7.10	20 . . .	2.60	8.10
8 . . .	1.65	7.15	21 . . .	2.80	8.30
9 . . .	1.70	7.20	22 . . .	3.00	8.60
10 . . .	1.75	7.25	23 . . .	3.10	8.80
11 . . .	1.80	7.30	24 . . .	3.20	8.90
12 . . .	1.85	7.35	25 . . .	3.40	9.10
13 . . .	1.90	7.40	26 . . .	3.60	9.30

THE GATES SILENT READING TESTS FOR GRADES III TO VIII

Full directions for giving these tests — Types A, B, C, and D described in Chapter VIII — are printed on the first page of each test. Plenty of time should be allowed and great care taken to make sure that every pupil understands exactly what he is to do before the test is begun. The time is printed on the first page of each test.

Order of giving the tests. — Special studies have shown that the order of giving the tests makes practically no difference. They may very well be given in the order A, B, C, D.

Directions for scoring the tests. — A convenient way to record the scores is to put on, or beside, each exercise, with a colored pencil, a large *C* when correct and an *X* when attempted but wrong.

On the first page, top or margin, enter (1) the total number of attempts and (2) the total number correct; then, using Table IV, enter the percentage which (2) is of (1).

Following are keys to the correct solutions of the exercises. A copy of the tests should be marked to accord with the key and used to facilitate scoring.

Scoring Key for Type A

Entries give correct response.

Form 1

1. excited	7. joyful	13. playful	19. angry
2. lonesome	8. happy	14. sad	20. excited
3. sad	9. afraid	15. homesick	21. joyful
4. worried	10. happy	16. lonesome	22. sad
5. frightened	11. lonesome	17. weary	23. cross
6. angry	12. afraid	18. joyful	24. angry

Form 2

1. joyful	7. joyful	13. weary	19. excited
2. cross	8. angry	14. joyful	20. afraid
3. happy	9. worried	15. happy	21. homesick
4. lonesome	10. lonesome	16. homesick	22. playful
5. cross	11. sad	17. playful	23. happy
6. excited	12. excited	18. worried	24. weary

Scoring Key for Type B

The entries are the numbers of the correct statements.

Form 1

1. 2	7. 4	13. 3	19. 4
2. 2	8. 2	14. 2	20. 3
3. 4	9. 3	15. 4	21. 3
4. 3	10. 3	16. 1	22. 1
5. 3	11. 3	17. 2	23. 4
6. 3	12. 2	18. 3	24. 2

Form 2

1. 4	7. 3	13. 2	19. 1
2. 3	8. 2	14. 3	20. 2
3. 2	9. 2	15. 1	21. 2
4. 4	10. 4	16. 4	22. 3
5. 2	11. 3	17. 2	23. 4
6. 4	12. 2	18. 3	24. 2

Scoring Key for Type C

The paragraphs themselves tell how the passages should be scored. Make out a key by marking properly one of the tests with a colored pencil. In general, the paragraph is marked wrong unless the directions are executed exactly. For example, if the directions say "put a line under," putting a line over, or around, or through, or marking with an *X*, etc., is marked wrong. Where a pupil makes an unusual but nevertheless reasonable interpretation of the passage, he should be marked correct. Following are comments on certain passages.

Form 1

1. Line must be around the 5.
2. Cross anywhere on the middle figure.
4. A cross on or near the highest twig is scored correct.
5. A line either under the lamp and over the 2, or under or through the 2 is correct.
7. A cross on or just in front of, or in front and a little above the head is correct.
11. Three short lines under the apple, walnut, and banana or one line running under all three is scored correct.
12. A cross on or at either side, since either is correct depending on the point of view.

15. A line from the kite to either of the boy's hands or to a place near either hand.
17. A cross anywhere on the middle span.
19. A circle near the top or above the first tower.
20. A cross at or near the bottom of the tree under the *X*.

Form 2

2. A circle anywhere on the table on the side below the bloom is correct.
4. Three lines, one under each.
7. Wrong if scores are entered for any day except Wednesday, or if any score other than 10 is placed by Wednesday.
8. Line may be either continuous or broken.
9. Line may be either directly under the stamp (above the 2) or under the 2, or through the 2.
10. A cross on either the first, second, or last kitten.
11. A 2 anywhere near the upper drawing.
12. A circle on, just under, or anywhere close to the string.
15. A cross under the first swing, or through or under the 1.
18. A cross anywhere below or to the left of the front of, or hole in, the bird house.
19. An *X* above or on the head of the middle horse.
20. A line around any four; or four encircled separately.
21. An *O* anywhere in the brook.
24. A small cross on or near the rear and a larger cross on or near the front of the train.

Scoring Key for Type D

In this test, each exercise counts 1. The highest possible score, then, is 54. In scoring, it is advisable to underline the correct answers, given below, on a copy of the test on which the exercises are numbered consecutively from 1 to 54.

Form 1

1. *a.* firefly
   b. firecracker
   c. happy
2. *a.* soda fountain
   b. mud
   c. washing soda
3. *a.* orange
   b. animals
   c. cook
4. *a.* drowning
   b. bark
   c. follow her
5. *a.* toad
   b. at once
   c. brown
6. *a.* castle
   b. dancer
   c. leg
7. *a.* tadpole
   b. tail
   c. legs
8. *a.* palaces
   b. path
   c. walls
9. *a.* primrose
   b. "first rose"
   c. gold
10. *a.* fall
    b. girls
    c. happy
11. *a.* hard
    b. skin
    c. thousands
12. *a.* sun
    b. night
    c. dark
13. *a.* sickness
    b. open
    c. windows
14. *a.* red
    b. moth
    c. tiny insects
15. *a.* lizard
    b. yellow
    c. three
16. *a.* swimming
    b. hands
    c. log
17. *a.* paint pots
    b. different colors
    c. hot
18. *a.* tree
    b. cry
    c. sugar

Form 2

1. *a.* bench
   b. daisies
   c. butter
2. *a.* family
   b. China
   c. fun
3. *a.* boxes
   b. wood
   c. water
4. *a.* bees
   b. feathers
   c. lace
5. *a.* fur
   b. bear
   c. scratch
6. *a.* unhappy
   b. butterflies
   c. home
7. *a.* umbrellas
   b. hooks
   c. pepper shakers
8. *a.* jelly
   b. snakes
   c. colors
9. *a.* map
   b. airplane
   c. moving pictures
10. *a.* near North Pole
    b. snow
    c. no streets
11. *a.* nightingale
    b. brown
    c. zoo
12. *a.* frills
    b. petals
    c. red
13. *a.* gallflies
    b. brown
    c. firecrackers
14. *a.* clothing
    b. trees
    c. fire
15. *a.* wood
    b. rock
    c. dry
16. *a.* stories
    b. mothers
    c. stories
17. *a.* fingers
    b. above ten
    c. stone tools
18. *a.* strong
    b. roar
    c. afraid

Tables of age and grade scores. — The age and grade scores with the raw scores to which they are equivalent are given in Tables V and VI. Certain figures in these tables differ from those printed in the first *Manual* published with these tests. The changes were made to make the results from the tests more comparable with those of the various diagnostic tests to follow. The examiner should use these tables instead of those found in the first edition of the *Manual.*

Table VII gives the *best* scores made on these tests by classes of average pupils tested in New York City. The significance of this table is explained in Chapter VIII.

Age and grade equivalents of the number of exercises correct. — Table V is to be read as follows: In Test A, a pupil who gets 6 paragraphs correct is equal to the average pupil in Grade 3.5, that is, half through Grade

TABLE V

AGE AND GRADE AVERAGE SCORES FOR THE GATES SILENT READING TESTS

TEST A

Number Paragraphs Correct	Reading Grade	Reading Age	Number Paragraphs Correct	Reading Grade	Reading Age
1	2.8	8.3	13	6.0	12.0
2	2.9	8.5	14	6.5	12.6
3	3.0	8.6	15	7.0	13.1
4	3.1	8.8	16	7.5	13.7
5	3.3	9.0	17	8.0	14.2
6	3.5	9.2	18	8.5	14.8
7	3.7	9.4	19	9.0	15.5
8	3.9	9.7	20	9.5	16.0
9	4.2	10.0	21	10.0	16.5
10	4.5	10.4	22	10.5	17.0
11	5.0	10.8	23	11.0	18.0
12	5.5	11.4	24	11.5	19.0

III. This pupil may be said to have a grade reading score of 3.5 in this test. The score of 6 paragraphs correct is also equal to that of the average pupil of 9.2 years. The pupil may be said to have, in this test, a reading age of 9.2. Other tables are read in the same way.

TEST B

Number Paragraphs Correct	Reading Grade	Reading Age	Number Paragraphs Correct	Reading Grade	Reading Age
1	2.8	8.3	13	6.0	12.0
2	2.9	8.5	14	6.5	12.6
3	3.0	8.6	15	7.0	13.1
4	3.1	8.8	16	7.5	13.7
5	3.3	9.0	17	8.0	14.2
6	3.5	9.2	18	8.5	14.8
7	3.7	9.4	19	9.0	15.5
8	3.9	9.7	20	9.5	16.0
9	4.2	10.0	21	10.0	16.5
10	4.5	10.4	22	10.5	17.0
11	5.0	10.8	23	11.0	18.0
12	5.5	11.4	24	11.5	19.0

TEST C

Number Paragraphs Correct	Reading Grade	Reading Age	Number Paragraphs Correct	Reading Grade	Reading Age
1	2.8	8.3	13	6.5	12.6
2	2.9	8.5	14	7.0	13.1
3	3.0	8.6	15	7.5	13.7
4	3.2	8.9	16	8.0	14.2
5	3.5	9.2	17	8.5	14.8
6	3.8	9.5	18	9.0	15.5
7	4.0	9.8	19	9.5	16.0
8	4.2	10.0	20	10.0	16.5
9	4.5	10.4	21	10.5	17.0
10	5.0	10.8	22	11.0	18.0
11	5.5	11.4	23	11.5	19.0
12	6.0	12.0	24		

TEST D

Number Paragraphs Correct	Reading Grade	Reading Age	Number Paragraphs Correct	Reading Grade	Reading Age
1	2.6	8.1	28	4.6	10.5
2	2.7	8.2	29	4.7	10.6
3	2.8	8.3	30	4.8	10.7
4	2.8	8.3	31	4.9	10.8
5	2.8	8.4	32	5.0	10.9
6	2.9	8.5	33	5.4	11.3
7	2.9	8.5	34	5.8	11.7
8	2.9	8.5	35	6.2	12.2
9	3.0	8.6	36	6.6	12.7
10	3.0	8.7	37	7.0	13.1
11	3.1	8.8	38	7.4	13.6
12	3.2	8.9	39	7.8	14.0
13	3.3	9.0	40	8.2	14.4
14	3.4	9.1	41	8.6	14.9
15	3.5	9.2	42	8.9	15.3
16	3.6	9.3	43	9.2	15.7
17	3.7	9.4	44	9.5	16.0
18	3.8	9.5	45	9.8	16.3
19	3.9	9.6	46	10.1	16.6
20	4.0	9.7	47	10.4	16.9
21	4.1	9.8	48	10.7	17.5
22	4.2	9.9	49	11.0	18.0
23	4.2	10.0	50	11.1	18.2
24	4.3	10.1	51	11.2	18.4
25	4.3	10.2	52	11.3	18.6
26	4.4	10.3	53	11.4	18.8
27	4.5	10.4	54	11.5	19.0

Age and grade averages of per cent correct. — Table VI gives, in column 1, the percentage of correct responses and in following columns the age and grade averages for each test. Read the table as follows: In Test A, 50 per cent correct is the score of an average pupil in an average New York City school at the age of 8.6 years or at the beginning of Grade III, *i.e.* 3.0. In Test B, 50 per cent correct is the average score for 9.2 years and Grade 3.5; and so on. It should be

remembered that these figures represent very mediocre accuracy.

TABLE VI

AGES AND GRADE AVERAGE SCORES FOR PERCENTAGES OF EXERCISES CORRECT IN GATES SILENT READING TESTS

PER CENT CORRECT	TEST A		TEST B		TEST C		TEST D	
	AGE	GRADE	AGE	GRADE	AGE	GRADE	AGE	GRADE
34	...	...	8.3	2.8	8.6	3.0	...	...
36	...	...	8.5	2.9	8.8	3.2	...	...
38	...	...	8.6	3.0	9.0	3.4	...	...
40	...	...	8.8	3.1	9.2	3.5	...	...
42	...	...	8.9	3.2	9.3	3.6	...	...
44	8.3	2.8	9.0	3.3	9.4	3.7	...	...
46	8.4	2.9	9.0	3.3	9.6	3.8	...	...
48	8.5	2.9	9.1	3.4	9.8	4.0	...	...
50	8.6	3.0	9.2	3.5	9.9	4.1	8.1	2.6
52	8.7	3.0	9.2	3.5	10.0	4.2	8.1	2.6
54	8.8	3.1	9.3	3.6	10.2	4.4	8.2	2.7
56	8.9	3.2	9.4	3.7	10.4	4.5	8.2	2.7
58	9.0	3.3	9.4	3.7	10.6	4.8	8.2	2.7
60	9.1	3.4	9.5	3.8	10.8	5.0	8.3	2.8
62	9.2	3.5	9.6	3.8	11.0	5.2	8.3	2.8
64	9.3	3.6	9.7	3.9	11.2	5.4	8.4	2.9
66	9.4	3.7	9.8	4.0	11.4	5.6	8.5	2.9
68	9.5	3.75	9.9	4.1	11.7	5.8	8.5	2.9
70	9.6	3.8	10.0	4.2	12.0	6.0	8.6	3.0
72	9.7	3.9	10.1	4.3	12.6	6.5	8.8	3.1
74	9.8	4.0	10.2	4.4	13.1	7.0	9.0	3.3
76	9.9	4.1	10.4	4.5	13.7	7.5	9.2	3.5
78	10.0	4.2	10.6	4.7	14.2	8.0	9.4	3.7
80	10.2	4.3	10.8	5.0	14.8	8.5	9.6	3.8
82	10.5	4.6	11.4	5.5	15.5	9.0	9.8	4.0
84	10.8	4.9	12.0	6.0	16.0	9.5	10.0	4.2
86	11.1	5.2	12.6	6.5	16.5	10.0	10.2	4.4
88	11.4	5.5	13.1	7.0	17.0	10.5	10.4	4.6
90	12.0	6.0	13.7	7.5	18.0	11.0	10.6	4.8
92	12.6	6.5	14.2	8.0	18.2	11.2	10.8	5.0
94	13.1	7.0	15.5	9.0	18.4	11.4	11.3	5.4
96	13.7	7.5	16.5	10.0	18.6	11.6	12.2	6.2
98	15.0	9.5	17.5	11.0	18.8	11.8	14.0	7.8
100	19.0	12.0	19.0	12.0	19.0	12.0	16.0	9.5

Highest average class scores of New York schools tested. — Table VII presents the best average scores made by an entire class among the various classes tested in New York City. The grades are given as 3.5, etc., since tests were given at mid-years. All classes tested were of average mental ability. These figures are much higher than the averages of all classes upon which the "norms" are based. It seems reasonable to assume that any average class, with excellent teaching, might equal the actual achievements pictured in this table.

TABLE VII

HIGHEST AVERAGE-CLASS SCORES ON GATES SILENT READING TESTS

GRADE	TEST A		TEST B		TEST C		TEST D	
	NUMBER CORRECT	PER CENT CORRECT	NUMBER CORRECT	PER CENT CORRECT	NUMBER CORRECT	PER CENT CORRECT	NUMBER CORRECT	PER CENT CORRECT
3.5 . .	7.7	80.2	8.1	72.0	7.0	65	23.5	90
4.5 . .	13.9	93.3	13.5	77.0	11.9	81	31.5	94
5.5 . .	14.5	92.2	14.7	90.5	12.6	85	32.3	95
6.5 . .	16.4	94.8	17.2	90.0	14.8	86	39.3	96
7.5 . .	19.5	97.0	20.7	96.0	17.8	86	49.0	97
8.5 . .	20.6	98.2	21.3	98.0	18.8	90	47.0	97

In the *Manual of Directions* (Bureau of Publications, Teachers College, New York City) for these tests is given a table from which the percentage of correct responses may be read without computation.

FOR THE GATES GRADED WORD PRONUNCIATION TEST

Details concerning the construction and use of this test were published under the title, "A Test of Ability

GATES GRADED WORD PRONUNCIATION TEST

Name..... Grade..... Age..... Years..... Months.....

School..... Date..... Total Score.....

Examiner's Name..... Remarks.....

FORM I

so	we	an	is	do	
as	go	us	at	or	10
the	not	did	can	hen	
how	may	out	son	net	20
king	here	door	ball	came	
grow	late	hear	east	year	30
every	about	after	broom	child	
paper	blind	peach	climb	point	40
window	family	bridge	lonely	scratch	
perhaps	plaster	harvest	servant	frighten	50
passenger	wander	eighty	counter	shepherd	
interest	chocolate	motion	citizen	elegant	60
dispute	portion	continue	mansion	brilliant	
conductor	brightness	punishment	guardian	restaurant	70
intelligent	construct	impatient	protection	temperature	
position	profitable	instrument	reverence	astonishment	80
irregular	schoolmaster	manufacture	revolution	unnecessary	
lamentation	community	examination	intelligence	national	90
satisfactory	illustrious	countenance	congratulate	preparation	
superstition	affectionate	substantial	philosopher	treacherous	100

in the Pronunciation of Words," in the *Teachers College Record*, November, 1924. A reproduction of one of the four equivalent forms of the test is given below.

The general directions followed in recording the responses are as follows:

1. If the word is correctly pronounced, no entry or mark on the word is made.

2. If the child fails on the first trial, write the mispronunciation above the word.

3. If the child fails on the first trial, give a second trial. If he fails on the second trial draw a line through the printed word. If he succeeds on the second trial do not draw a line through the word. No credit is given for success on a third or later trial.

If these directions are followed, the sheet should show the following records: (*a*) Success on first trial is indicated by an unmarked word. (*b*) Failure on first trial is indicated by one mispronunciation written above the word. (*c*) Success on second trial is indicated by one mispronunciation written above an unmarked word. (*d*) Failure on second trial is indicated by a line drawn through the word. You do not need to enter the second mispronunciation unless it is desired for qualitative analysis.

4. If the child does not respond, saying, "I don't know it," etc., encourage him to try. If he will not, call it a failure and indicate this by drawing a line through a word. Thus, complete failure is always indicated by a line through a word; success by word not marked out.

5. Disregard slight peculiarities of pronunciation.

The question is: Does the child know this word? If he habitually mispronounces it because of the influence of training in a foreign tongue, a dialect, etc., that does not matter for our purposes.

6. Have each child continue until he misses ten words consecutively.

7. To secure final score: Give a credit of one point for each word correctly pronounced on the first trial. Give a credit of one-half point for each word correctly pronounced on the second trial. Total these credits and write the sum at the top in the place indicated.

Appraising the methods of word recognition. — The means of appraising the pupil's methods of attacking unfamiliar words are described in Chapter VI. The directions there given should be thoroughly understood and referred to during the first several experiences until the examiner acquires facility in diagnosis by means of this instrument.

Norms. — The age and grade equivalents of the raw scores are given in Table VIII. These figures do not agree with those previously published in the reference given above. They have been modified as the result of a change in the method of scoring introduced to reduce the length of time required to administer this test.

Gray's Oral Reading Passages

The use of Gray's Oral Reading Passages as a means of measurement and diagnosis was explained in Chapter VI. In order to make the quantitative results from this test directly comparable with those secured by

TABLE VIII

The first two columns give the age and grade scores or equivalents of the raw scores for the Gates Pronunciation Test in column 3, and Gray's Oral Passages in Column 4.

Age Score	Grade Score	Word Pronun. Test	Gray's Oral	Age Score	Grade Score	Word Pronun. Test	Gray's Oral
6.7 . .	1.30	15	. .	9.6 .	3.85	75	22
6.8 . .	1.40	23	1	9.7 .	3.90	76	23
6.9 . .	1.45	26	2	9.8 .	4.00	77	23
7.0 . .	1.50	29	4	9.9 .	4.10	78	24
7.1 . .	1.60	32	6	10.0 .	4.20	79	24
7.2 . .	1.70	34	8	10.1 .	4.30	80	25
7.3 . .	1.80	36	10	10.2 .	4.40	81	25
7.4 . .	1.90	38	11	10.4 .	4.50	82	26
7.5 . .	2.00	40	12	10.5 .	4.60	83	26
7.6 . .	2.10	43	13	10.6 .	4.70	84	27
7.7 . .	2.20	46	14	10.8 .	5.00	85	27
7.8 . .	2.30	49	14	10.9 .	5.10	86	28
7.9 . .	2.40	52	15	11.0 .	5.20	87	28
8.0 . .	2.50	54	15	11.1 .	5.30	88	29
8.1 . .	2.60	56	16	11.2 .	5.40	89	29
8.2 . .	2.70	58	16	11.4 .	5.50	90	30
8.3 . .	2.80	60	17	11.5 .	5.60	91	. .
8.4 . .	2.85	62	17	11.6 .	5.70	92	. .
8.5 . .	2.90	64	18	11.7 .	5.80	93	. .
8.6 . .	3.00	65	18	11.8 .	5.90	94	. .
8.7 . .	3.05	66	19	12.0 .	6.00	95	. .
8.8 . .	3.10	67	19	12.1 .	6.10	95	. .
8.9 . .	3.20	68	20	12.4 .	6.40	96	. .
9.0 . .	3.30	69	20	12.7 .	6.60	96	. .
9.1 . .	3.40	70	21				
9.2 . .	3.50	71	21				
9.3 . .	3.60	72	21				
9.4 . .	3.70	73	22				
9.5 . .	3.80	74	22				

means of the Gates Pronunciation Test, both have been given to a large group of pupils by the author and from the data obtained the age and grade scores given in Table VIII were developed. It should be observed

that the method of scoring used is different from that employed by Gray. Our method is described below. The instrument used was the original Gray's Oral Passages and not the more recent Gray's Oral Reading Check Test. Since but one form of the original test is available, we have constructed several equivalent forms known as the Horace Mann Oral Reading Passages which may be secured from the author.

Directions. — When everything is ready, hand the pupil a copy of the standardized paragraphs and give the following directions: "I should like you to read some of these paragraphs for me. Begin with the first paragraph when I say 'Begin.' Stop at the end of each paragraph until I say 'Next.' If you should find some hard words, read them as best you can without help and continue reading." In case a pupil hesitates several seconds on a difficult word, pronounce it for him and mark it as mispronounced.

While the pupil is reading, record (1) the time required to read each paragraph and (2) the errors made.

The time record is secured by noting the exact second at which the pupil begins reading a paragraph and the time when he completes it. The number of seconds required to read the paragraph should be recorded in the margin to the right of the paragraph. The following constitute errors: (1) mispronunciation of a whole word or part of a word; (2) omission of whole or part; (3) repetition of two or more words; (4) insertion of a whole, or part of a word. The errors should be recorded as is shown on page 379.

1. Underline whole word mispronounced, as run
2. Underline part of word mispronounced, as family
3. Draw a circle around an omitted word, as (be)
4. Draw a circle around part of word omitted, as come(s)
5. Write an *R* on first word repeated if two or more words are repeated.
6. Draw a ∧ and note word, if word is inserted, as

then
" when he ∧ came."

Do not count slight mispronunciations, or habitual mispronunciations such as " famly " for " family " as errors.

The total number of errors should be noted in the margin to the right of the paragraph.

Each pupil should be allowed to continue reading until he has made many errors in each paragraph in order to observe his methods of attacking unfamiliar words. (See Chapters VI and VII.)

The score on each paragraph is computed from the following table:

Time in Seconds	Number of Errors							
	0	1	2	3	4	5	6	7
40 or more	4	4	3	2	1	0	0	0
30–39	4	4	3	2	1	1	1	0
25–29	4	4	3	2	2	1	1	0
20–24	4	4	3	3	2	1	1	0
19 or less	4	4	4	3	2	1	1	0

The total score, which may be converted into age and grade scores on the same basis as the other tests

in this series, by means of Table IX, is the sum of the scores for all the paragraphs read.

Gates Tests of Phonetic Abilities

The materials used in giving these tests and the significance of the results revealed were described in Chapter XI. The tests in this series all utilize a visual stimulus — printed letters or syllables — and require the pupil to name the letters, or to sound the letters or syllables, that is, to give a phonetic translation of the printed forms. A reproduction of the test blank appears on page 382. The directions for giving the tests follow.

Test A 1. Capital Letter Reading Test. — The first two lines of capital letters are presented to the pupil, who is asked to read them as rapidly as he can. Record the time in seconds and on another blank enter the errors made. After the test is completed, point to the letters missed to see whether they are unknown or merely were mis-recognized during the test. In this way one may discover what letters should be taught. Table IX gives the average scores in terms of the number of seconds required to read the letters. The average number of errors made by normal children was so small that no norms for this score were prepared. Since the pupil who has a faulty knowledge of the letters will require more time to read the series, the score for the time required gives a very satisfactory indication of the pupil's ease and fluency in recognizing and naming the letters.

Test A 2. Lower Case Letter Reading Test. — Follow directions given for A 1. The average scores appear in Table IX.

Test A 3. Phonetic Test: translating printed letters into sounds. — For this test the first line of letters under the heading "Phonetic Test" is used. The pupil is asked to make the sound of that letter. If he does not understand, give him the hissing sound for *s*, the first letter in the line. If the child gives any recognizable sound equivalent to a letter it is counted correct. Thus either the hard or soft sound of *c* and *g* is correct or any one of the several sounds for the vowels, *a, e, i, o, u.* The naming of these vowels, of course, gives one of their sounds and is therefore called correct. For *oo* the sound of *oo* as in *good,* or *oo* as in *food,* is correct. The sound of *e* for *i,* of *q* for *k,* of *j* for *g* are scored incorrect. The score is the total number correct. The highest possible score is 20. Table IX gives the average scores in the range of grade positions from 1.6 to 5.6. When a little over halfway through Grade I, the average pupil gets 18 of these correct.

Test A 4. Phonetic Test: translating printed phonograms into sounds. — This test includes lines 2, 3, 4, and 5 under Phonetic Tests. The pupil is handed the test and asked to read the phonograms. If he can say the phonogram at once, he should do so. If not, he may sound the letters to get the whole, but he is not given credit unless he does say the phonogram as a unit. Thus to say *co* earns credit; but merely to sound *c* and *o* singly without combining them into *co* is

GATES TEST OF PHONETIC ABILITIES

TEST A 1

A E W R B K D I Y M T F X
O V C U S H J N Z G Q L P

TEST A 2

a e w r b k d i y m t f x
o v c u s h j n z g q l p

TESTS A 3, A 4 and A 5.

1. s t c p d f b r m l w g h n v e i a o u

2. co re be ma fo di su ca ro wi

3. st pr th ch br sh gr sp pl tw

4. un op an ed ip ot en ir ap in

5. ade ock ame ing ent ook eep ick ight ound

6. plin spap pran unpo roing opick iname

This reproduction is considerably smaller than the test, which is set in century bold.

given no credit. Any reasonable translation of the phonograms into sounds is counted correct. Thus *mā* or *mă* or *mä* for *ma; ōt* or *ŏt* for *ot, ūne* or *ŭn* for *un,* etc., are scored correct.

If the pupil gets a phonogram correct on the first

trial he gets a credit of one; if he gets it right on a second trial, he is scored one-half. A sounding of the letters singly before pronunciation of the unit is counted as one trial. Success on a third trial is given no credit. The score is the sum of the credits. The highest possible score is 40. Table IX gives the average scores.

TABLE IX

The first two columns give the age and grade scores or equivalents of the raw scores for each test. See text for description of tests.

Age Scores	Grade Scores	Read Capital Letters (Seconds)	Read Small Letters (Seconds)	A 3 Sound Letters	A 4 Phonetic Elements	A 5 Combined Phonograms	B 1 Letter Sounds	B 2 Spell Syllables	B 3 Spell Combined Syllables	B 4 Spell Words
7.1 .	1.6	30.0	30.0	15.0	28.0	4.4	6.5	4.2	1.0	4.5
7.3 .	1.8	27.0	27.0	16.0	30.0	4.6	7.0	4.8	2.0	5.5
7.5 .	2.0	24.0	24.0	16.5	31.0	4.7	7.5	5.2	2.4	6.0
7.7 .	2.2	22.0	22.0	17.0	31.5	4.8	8.0	5.5	2.8	7.0
7.9 .	2.4	20.0	20.0	17.4	32.0	4.8	8.5	5.7	3.1	8.0
8.1 .	2.6	18.0	19.0	17.7	32.5	4.9	9.0	5.9	3.3	9.0
8.3 .	2.8	16.0	18.0	18.0	33.0	4.9	9.3	6.1	3.5	10.0
8.6 .	3.0	15.5	17.0	18.1	34.0	5.3	9.3	6.5	3.8	11.0
8.9 .	3.2	15.1	16.0	18.2	35.0	5.6	9.3	7.0	4.1	12.0
9.1 .	3.4	14.7	15.5	18.3	36.0	5.9	9.4	7.5	4.3	13.0
9.3 .	3.6	14.5	15.0	18.4	36.7	6.1	9.4	8.0	4.5	14.0
9.5 .	3.8	14.3	14.6	18.5	37.3	6.3	9.4	8.4	4.7	15.0
9.8 .	4.0	14.0	14.3	18.7	37.5	6.3	9.4	8.5	5.0	16.0
10.0 .	4.2	13.6	14.0	18.9	37.7	6.4	9.4	8.6	5.3	17.0
10.2 .	4.4	13.2	13.8	19.1	37.9	6.4	9.5	8.7	5.6	18.0
10.5 .	4.6	12.9	13.5	19.3	38.1	6.5	9.5	8.7	5.8	19.0
10.65.	4.8	12.6	13.2	19.5	38.3	6.5	9.5	8.8	6.0	20.0
10.8 .	5.0	12.3	13.0	19.5	38.5	6.6	9.6	8.8	6.2	21.0
11.0 .	5.2	12.2	12.8	19.6	38.7	6.6	9.6	8.9	6.4	22.0
11.2 .	5.4	12.1	12.7	19.6	38.9	6.7	9.7	9.0	6.5	23.0
11.5 .	5.6	12.0	12.5	19.6	39.0	6.7	9.7	9.1	6.6	24.0

Test A 5 Phonetic Test: combination of phonograms. — For this test the last line (line 6) of the Phonetic Test is used. All of these combinations are made up of phonograms used singly in Test A 4. The pupil is asked to pronounce these " words." As in Test A 4

credit is given only for reasonable renderings of the sounds of the " words " as wholes although the pupil may secure half credit by first sounding the individual letters or phonetic units and then saying the whole. Any reasonable pronunciations are credited, *e.g.* "*plīne*" or "*plĭn*" for "*plin*"; "*spāpe*" or "*spăp*" for "*spap*"; "*unpoo*" for "*unpo*"; "*rowing*" or "*rawing*" for "*roing*"; "*ĭnāme*" or "*ĭnăm*" or "*īnăm*" or "*īnām*" for "*iname.*" The scoring, in other words, is liberal. Give full credit for success on first trial; half credit for success on the second. The score is the sum of these credits; the highest possible score is 7. The average scores are given in Table IX.

Tests for Phonetic Abilities: Auditory Stimulus

All of the tests just given, A 1 to A 5, inclusive, offer a visual (printed letter or word-form) stimulus and call for a translation into equivalent sounds. Another series in which the sounds are offered and the pupil is required to give the letter-equivalents, that is, to *spell* the item, was given to all the pupils tested with the other tasks. These tests, which are primarily useful in the study of spelling ability, are often illuminating in connection with reading problems, especially those which also show difficulty in spelling. For these pupils, training in their particular spelling weaknesses is often a fruitful means of improving ability in word recognition in reading.[1]

In this series there are four tests, as shown on page 385.

[1] For a discussion, see pages 125–26,138–39 and the writer's *Psychology of Reading and Spelling*, pp. 44–48, 65–85.

Test B 1. Giving letter equivalents of letter sounds

Test B 2. Giving letter equivalents of single syllables

Test B 3. Giving letter equivalents of combinations of two syllables

Test B 4. Giving letter equivalents of familiar words

The general plan of these tests is similar to that found in the A series. The examiner should be able to discover whether the pupil's difficulty lies chiefly in the lack of ability to spell the units, the letters, or single syllables or in inability to spell combinations of syllables as wholes and if the latter whether there is also inability to break the nonsense or senseful words, or both, into smaller units which can then be spelled. These tests, especially the last one, enable the examiner to determine the pupil's method of attack upon words whose spelling is not habituated. The examiner may observe whether the pupil tries to spell the word as a whole, by syllables, letter by letter, or by sound units (phonograms such as *br, st, in,* etc.); whether he proceed slowly or rapidly, with or without rhythm and the like.[1]

Test B 1. Letter equivalents of letter sounds. — Sound the following letters, one at a time. Ask the pupil to tell what letter the sound stands for: *S, T, R, P, I* (as in *it*), *OO* (as in *root*), *M, F, K, G* (as in *get*).

For the hissing *S* sound either *s* or *c* is correct; for *oo* either *oo, o,* or *u* is counted correct; for *k* either *k* or *c*. *E* for the *i* sound; *q* for the *k* sound; or *j* for the *g* sound is incorrect. The score is the total number

[1] For a discussion of these methods see the writer's *Psychology of Reading and Spelling,* pp. 64–70.

correct; the highest score is 10. The average scores are given in Table IX.

Test B 2. Letter equivalents of syllables. — Pronounce each of the following syllables and ask S. to spell them:

1. *ub* (as in *tub*)
2. *ip* (as in *tip*)
3. *tie* (as in *necktie*)
4. *sot* (*s* as in *sat; ot* as in *hot*)
5. *gib* (*g* as in *get; ib* as in *bib*)
6. *zar* (sounded as *Czar*)
7. *nuk* (*uk* as in *fluke*)
8. *arp* (as in *harp*)
9. *eck* (as in *neck*)
10. *mip* (*ip* as in *tip*)

In scoring, any reasonable representations of the sounds are called correct. The following key covers the most common responses.

Stimulus	Credit of 1 Point	Credit of ½ Point	No Credit
ub	ub	ob, oub, ube	ab, obe, aub
ip	ip, hip	eip, ipe	ep
tie	tie, ti, ty, tye	tuy	
sot	sot, sote	sat	
gib	gib	geb, gibe	
zar	zar, sar	zor, zhar, shar	sor, zer
nuk . . .	nuk, nook, knuk, knock	noc, nok, knok, nock	
arp . . .	arp	orp, arep	
eck . . .	eck, ek, ec	eack, eak, ekk, wek	ak
mip . . .	mip	mep	

Test B 3. Letter equivalents of nonsense words of two syllables. — Pronounce each of the following words on page 387 and ask pupil to spell them.

1. *nubit* (long *u* and short *i*)
2. *argos* (*ar* as in *are; go* as in *going; s* as in *she*)
3. *sopot* (both *so* and *pot* pronounced like the English word)
4. *urfo* (*ur* as in *fur; fo* as in *four*)
5. *piptuk* (short *i*; *tuk* is pronounced like the word *tuck*)
6. *zignuk* (*zig* as in *zig-zag;* the *u* is long)
7. *iptie* (*ip* as in *tip; tie* same as English word *tie*)
8. *ubzar* (*ub* as in *tub; zar* is called *Czar*)

The following scoring key covers the responses thus far encountered.

Stimulus	Credit 1 Point	Credit ½ Point	No Credit
1. nubit . .	nubit, nubbit, newbit	nubeit, nobit, newbet, nubet, nobbit, newbid	nobat, nobet
2. argos . .	argos, argose	argoos, argus, argeos, arges	orgoos, orgus
3. sopot . .	sopot, sopat, soappat, sewpot	soppoat, soupot	sopart
4. urfo. . .	erfo, urfo, irfo (e) urpho	urfol, erful, earfo, urful, arfo, irfol	erfold, urfor, earfor
5. piptuk .	piptuk, piptuck, piptuc, piptoc, piptock, piptok	peptuck, peptock	peptook
6. zignuk .	(s)zignuk, (s)zignook, (s)zignuke, (s)zignok		
7. iptie . .	iptie, ipti, ipty, hiptie	eiptie, iptui	
8. ubzar . .	ubzar, ubzhar, ubsar	ubsor, ubzor, obsar, upzar, obzar	obsor, obzor, ubzir, obsir

The score is total of credits. Table IX gives the average scores.

Test B 4. Spelling of Words. — Pronounce all of the following words. Record by plus when correct; when wrong write the misspelling in such a way as to indicate how it was done. Thus, *prisn* means spelled without division as a whole; *p-r-i-s-n,* means letter by letter with hesitations between them; *pr-pri-prisn; pri-sen,* etc., indicate other procedures. The words follow on the next page.

1. me	10. catch	19. marriage	28. arrangement
2. it	11. teach	20. circular	29. information
3. do	12. built	21. estimate	30. magnificent
4. but	13. afraid	22. elaborate	31. acquaintance
5. are	14. travel	23. amusement	32. hippopotamus
6. day	15. prison	24. necessary	33. architecture
7. nine	16. factory	25. difficulty	34. extraordinary
8. card	17. visitor	26. approaches	35. miscellaneous
9. mail	18. measure	27. restaurant	36. conscientious

The score is total number correct on the first attempt. The norms for this test, arranged to correspond to the average scores for the other tests in this series are given in Table IX.

The pupils should be asked to attempt to spell words well beyond their level of ability to spell correctly on the first attempt. It is often advisable, for diagnostic purposes, to ask the pupil to make several attempts to spell many of the unfamiliar words.[1]

Tests of Visual Functions

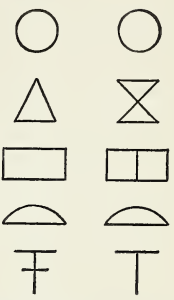
Visual Perception Series A, Same-Difference Series

Test A 1. Perception of geometrical designs. — (1) Pass out papers face down, with directions not to turn them over. (2) Have children write name, grade, school and date on back. (3) Place the pairs of figures, shown on page 389, on the board.

Then say, " On the other side of these papers are some pictures like these, and when I tell you to turn over

[1] For a discussion of results obtained from this test see the writer's *Psychology of Reading and Spelling*, etc., pp. 64 ff.

your papers, I want you to put a line under those that are *different.* You see, some of these pairs are the same and some are different. Now I am going to do it. Shall I put a line under these two? [No.] Under these two? [Yes], etc." going through all four. If a child says "yes" for one that is the same, correct him and point out the difference.



"If you make a mistake, do not erase. Draw a few lines through it like this, ≠ ≠ ≠ ≠ ≠ [illustrating on the board]."

"When I say 'Go' turn over your paper and make sure that you have some printing at the top like this [illustrate]. Start over here and work down this column, drawing a line under all those that are different, then work down this column, etc. [illustrating for all five] working as fast as you can."

"All ready! Pencils up! Turn over and start!"

After exactly **2 minutes,** say "Stop! Draw a line around the figure you were studying."

Scoring: Count as the last attempt the figure encircled. If none was encircled count as last the figure midway between the last figure underlined and the next one that would have been underlined had the pupil reached it. Compute the number of exercises attempted. The score is this number of attempts minus three times the number of errors. Count as errors: (1) Underlining a pair of figures which are *not* different. (2) Failing to underline a pair which *are* different.

Test VI, *A 1*. Perception of Figures [1]

Look at each pair of objects. Draw a line around each pair, when the two pictures are NOT alike.

[1] Reduced about one-half.

The average scores are given in Table X.

TABLE X

The first two columns give the age and grade scores or equivalents of the raw scores for each test. See text for description of tests.

Age Score	Grade Score	A 1 Perception of Figures	A 2 Perception of Digits	A 3 Perception of Words	B 1 Selection of Figures	B 2 Selection of Words	1. Visual Analysis and Recognition	2. Visual Analysis and Recognition	Visual Memory Span
7.1 .	1.6	6	20	21	4	10	4.8	4.5	3.2
7.3 .	1.8	7	22	22	4	11	5.0	4.7	3.3
7.5 .	2.0	8	24	24	5	12	5.4	5.0	3.3
7.7 .	2.2	9	26	26	5	13	5.7	5.2	3.4
7.9 .	2.4	11	28	29	6	14	6.0	5.5	3.4
8.1 .	2.6	13	30	32	6	15	6.3	5.8	3.5
8.3 .	2.8	14	31	34	7	16	6.6	6.0	3.5
8.6 .	3.0	15	32	35	8	17	6.7	6.0	3.6
8.9 .	3.2	16	33	36	9	18	6.8	6.1	3.7
9.1 .	3.4	17	34	38	10	19	6.9	6.1	3.8
9.3 .	3.6	18	35	40	11	19	7.0	6.2	3.9
9.5 .	3.8	19	36	41	12	20	7.0	6.2	4.0
9.8 .	4.0	20	37	42	13	20	7.0	6.3	4.0
10.0 .	4.2	20	38	43	14	21	7.1	6.4	4.1
10.2 .	4.4	21	39	44	15	21	7.1	6.5	4.1
10.5 .	4.6	21	39	45	16	22	7.1	6.6	4.2
10.65.	4.8	22	40	46	17	22	7.2	6.7	4.2
10.8 .	5.0	22	40	47	17	23	7.2	6.7	4.3
11.0 .	5.2	23	41	48	18	23	7.3	6.8	4.4
11.2 .	5.4	23	41	49	18	24	7.4	6.9	4.5
11.5 .	5.6	24	42	50	19	25	7.5	6.9	4.6
12.0 .	6.0	25	43	52	19	26	8.0	7.0	4.8
12.6 .	6.5	27	45	56	20	27	8.3	7.1	5.0
13.1 .	7.0	29	46	58	20	28	..	..	..
13.7 .	7.5	30	47	60	21	29	..	..	..
14.2 .	8.0	31	48	61	22	30	..	..	..
14.8 .	8.5	32	49	62	23	30	..	..	..

Test A 2. Perception of Digits. — Follow same procedure used in Test A 1, substituting the word "numbers" for "pictures." Demonstrate on board with the numbers shown on the next page.

42	42
31	34
169	169
2734	2734
6983	6973

Point out that if one digit is different it makes the two whole numbers unlike and, therefore, the pair should be underlined.

The time for this test is **1 minute 30 seconds.**

This test is scored in the same manner as Test A 1. The norms are given in Table X.

Test A 3. Perception of Words. — Follow the same procedure as in Test A 1. For the board demonstration use:

to	to
and	and
girl	girb
horse	horse

The time is **1 minute, 30 seconds.** Score as in Test A 1; see Table X for age and grade norms.

Visual Perception. Series B: Selection Tests

Test B 1. Selection of Geometrical Figures. — The test sheet contains figures which are to be matched by selecting the proper figure from others which are very similar in appearance. The nature of the material is shown in the reproduction below. Pass out the papers face down, with instructions not to turn them over.

1. Have the children write name, grade, school on the back.

Test VI, *A 2*. Perception of Digits [1]

Look at each pair of figures. Draw a line under each pair that is NOT the same.

21	12	3280	3380	56391	56391
42	42	4870	4870	48203	46203
36	36	9658	9658	95721	95721
98	99	3721	2721	84386	84336
53	53	4800	4830	05928	65928
47	47	9605	9005	36542	36542
66	60	4219	4219	19850	19850
13	13	3345	3345	21722	12722
44	44	6060	6060	20066	20066
18	19	7186	9186	53222	53222
263	263	4392	4382	59184	59814
448	448	5084	5084	30369	30669
583	563	5299	5399	15161	15151
974	074	1312	1312	23942	23942
286	286	4708	4708	38476	38476
509	509	2205	2265	22493	22493
636	633	6374	6370	13648	12648
742	742	9282	9283	54393	53393
906	986	5050	5050	95048	95048
345	245	3913	3918	16611	16611
002	002	0066	0666	83650	86350
563	563	7241	7271	00606	00606
872	672	5660	5660	85302	85502
483	483	9342	6342	31176	31176
196	106	3876	3876	97148	97148
754	754	5738	5738	05938	05038
322	332	1611	1011	18562	18625
809	800	5273	5273	58328	58328
244	244	4617	4617	78825	78825
597	579	7083	7088	62633	62622

[1] Reduced about one-half.

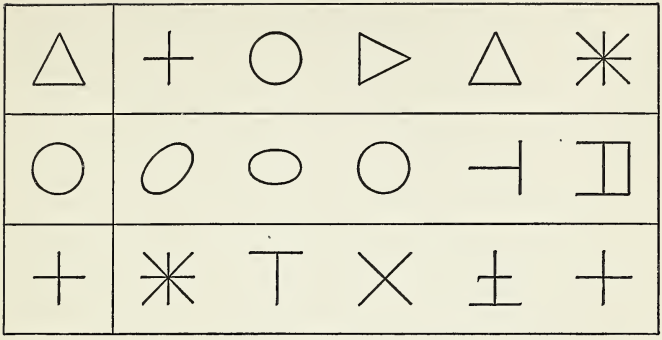
Test VI, *A 3*. Perception of Words [1]

Look at each pair of words. Draw a line through every pair that is NOT spelled the same.

it	it	ground	grourd	children	chuldren
as	ar	behind	bekind	mountain	mountain
am	am	butter	butter	remember	remember
he	ha	rushed	rushed	thousand	thonsand
me	me	marble	mardle	question	quastion
toy	toy	window	window	newspaper	nemspaper
say	soy	number	nuwber	slipping	stipping
lys	lips	person	pierson	buckwheat	buckwheat
run	rin	repair	repair	something	something
for	far	pocket	pockit	represent	represant
got	got	famous	famous	wonderful	wonderfil
sun	sin	strange	strange	necessary	necessary
rat	rut	people	peopel	discovery	disrovery
pay	pay	during	dusing	physician	physucian
ink	inh	basket	basket	lightning	lightning
more	mose	scratch	scratch	frightened	frightened
slap	slap	haycock	haycork	blacksmith	blachsmith
beat	baet	growing	growing	neighborly	neaghborly
home	home	dickery	dickary	sidestreet	sidestreet
that	tlat	perfect	perfect	convention	conveution
pray	piay	strength	slength	instrument	instrument
inch	inoh	complete	complete	difficulty	difficulty
also	also	several	several	convenient	convinient
best	best	without	withaut	impossible	imposrible
hard	hord	forward	formard	throughout	throughout
reach	reack	surprise	surpsise	candlestick	candelstick
sunny	sunny	village	village	watermelons	watermelons
hatch	hatch	whether	whetker	middlesized	middlesized
drive	drine	officer	officer	wonderfully	wondenfully
mercy	mercy	instead	instaed	celebration	cetebration
known	knoun	crackers	crackers	opportunity	opportunity
laugh	laugh	haystack	haystock	manufacture	manufaclure
could	couhd	brakeman	brakman	information	information
often	often	friendly	friendly	opportunity	opportunitg
world	morld	election	eliction	destruction	destruction

2. Draw the figure on page 395 on the board.

[1] Reduced about one-half.

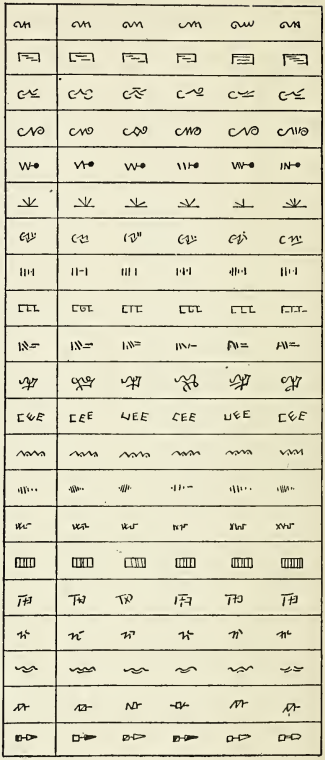


3. Say, " We are going to play a game and you must listen carefully, so you can play it just right. Do not turn over your paper until I tell you to. We are going to do something like this: Up in the corner of your paper [show the paper, then point to the board] is a little box with a picture in it. You are to look at that picture and then look along the line [indicate] until you find the one that looks *exactly* like it. Now I am going to do it. These are not the same pictures that you have, but are simply to show you what to do. Shall I draw a line under this one? Under this one? " [Indicating until children say "yes" under the right one. If any of the children give the wrong responses, correct them and point out the difference between the figures.]

" Now, you look along this line [indicating] until you find one just like this one." Repeat the same procedure until all three examples are completed.

" If you make a mistake, don't stop to erase, simply draw two or three lines through it like this ≠ ≠ ≠ and I'll know you do not want to mark that one."

TEST VI, *B 1*. SELECTION OF FIGURES [1]



"Do not turn your paper — I'm going to show you what to do." Take up paper. "When I say 'Go' you are to turn it over and make sure that you have some printing at the top; then start over here [indicate]

[1] Reduced about one-half.

and work down this side [indicate] until you finish this side, then start up here [indicate] and go down this second column, working as fast as you can."

"Now remember to mark the one *exactly* like the one in the box and remember that there is only one on each line *exactly* like it."

"All ready! Pencils up! Turn over and start!"

After exactly 3 minutes, say, "Stop! Pencils up!"

Scoring. — The score on this test is the number of exercises attempted minus twice the number of errors. Count as an error only the marking of a wrong figure or marking more than one figure in an exercise. If the exercise is not marked, count it as no attempt. The average scores are given in Table X.

Test B 2. Selection of Words. — The material for this test is a long sheet containing a series of exercises of increasing difficulty. Part of the test is reproduced in the accompanying figure.

Steps 1 and 2 in giving this test are the same as in Test B 1.

3. Draw the following on the board:

T	L	S	N	T	V
cat	boy	cak	can	crt	cat
the	til	the	tor	girl	and

4. This step is the same as in Test B 1. The time for this test is 2 minutes. The results are scored as in Test B 1. Table X gives the average scores.

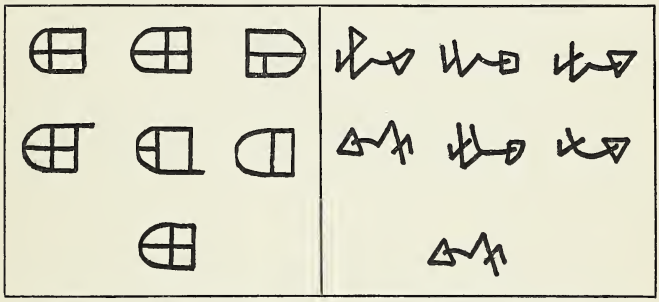
Test VI, *B 2*. Perception of Words

frame	flame	train	frome	frame	brame
glass	gloss	grant	grave	glare	glass
bathe	both breathe	branch father	lathe bathe	great mathe	brother theab
round	ground around	round sound	drang dower	mound anoint	soured frown
please	glass plant	release place	ease phase	please grease	places sneeze
rather	father another	brother feather	other feature	mother taller	smother rather
smarts	swears flirts	hearts warts	smarts mould	remark market	snarts tarts
ground	frouned grant	around ground	hound grounb	pound surround	round friend
through	thought though	fought rough	through throught	thruogh thing	trouble brought
weather	either wither	mouth weather	rather mother	neither whimper	frights freight
accident	accidental dentrifice	acident accodent	occident accidint	ossifice orifice	precident accident
harmony	hungry harmonica	howmany harrison	hurricane harmony	hominy armory	barbecue primary

[1] This is a reproduction (slightly reduced) of page 2 of a four-page test.

Directions and Norms for Tests of Visual Analysis and Recognition

Test 1. Geometrical Designs. — This test consists of a series of visual figures (see following reproductions) each of which the subject is permitted to study five (5) seconds (carefully timed with a stop watch), whereupon, by reversing the card, a group of six figures (one of which is a duplicate of the original) is shown. The subject is asked to point to the figure which is the same

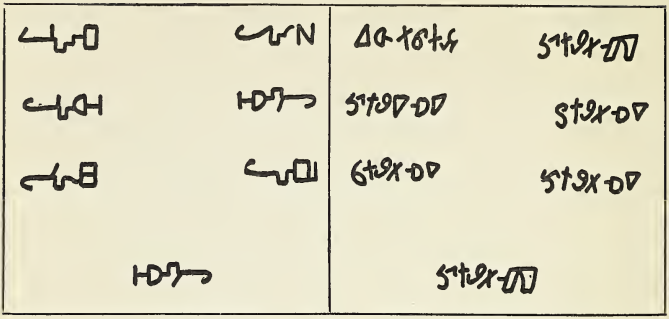


The first and last exercise in Test 1, Visual Analysis and Recognition, considerably reduced in size. In the tests proper, the single symbol is on one side of the card, the group of six is on the other.

as the one originally shown. Carefully instruct the subject concerning the procedure. The exposure time is five (5) seconds. Record results as correct or incorrect.

Test 2. Wordlike Characters. — This test is given in the same manner as (1) above except that the exposure time is *eight* (8) seconds instead of five. Time the exposure very carefully. Record as above.

In giving these two tests, the examiner should be careful not to expose a card to the subject while mak-



The first and last exercise in Test 2, Visual Analysis and Recognition, considerably reduced in size. In the test proper, the single symbol is on one side of the card, the group of six is on the other.

ing the records. Only one trial is given for each item.

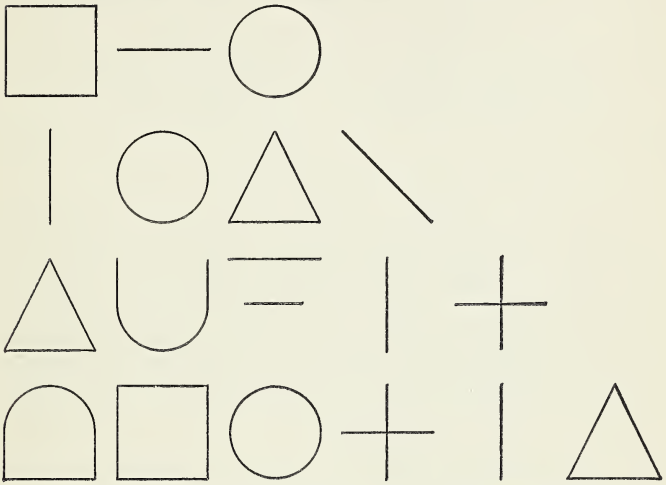
The score for each test is the number of correct recognitions. Table X gives the scale of average age and grade scores.

Directions and Norms for Tests of Visual Apprehension and Memory Span

Test 1. Item by Item Presentation. — The materials are three sets of visual symbols ranging from sets of 3 to sets of 8. The presentation is much the same as that used in Stanford-Binet Memory for Digits Test. Present the card and tell the child to look at each symbol as you point to it. Hold your finger over each symbol for about one second. When all the figures have been exposed, remove the card and ask the pupil to draw the series in the order in which he saw them. The score is the length of the longest list on which the subject is correct in one of the three trials.

In giving this test, cover up all of pupil's previous work before starting each presentation and test.

The average results are given in Table X.



Tests of Auditory Acuity and Discrimination

Test 1. See page 259 for comments.

Test 2. Tests of Auditory Discrimination. — The syllables are to be read as ordinary words without hesitation between the parts. The subject is to say the word immediately after the examiner has pronounced it. The examiner should record successes with a plus sign and errors with a minus sign. He should write as nearly as he can the incorrect responses. The score is the number of syllables in the longest list in which the subject gave one or more words correctly. See Table XI for the norms. The words follow.

2 Syllables	*3 Syllables*	*4 Syllables*
1. dopar	4. hominu	7. debatibus
2. unco	5. artizub	8. kickasager
3. sebu	6. mitigate	9. sapinnotur

5 Syllables	*6 Syllables*
10. durangobalin	13. hippotackulbosack
11. shakhomuzzelhop	14. simultanertampus
12. muriseeapeldin	15. artifickkonibble

Tests of Auditory Memory Span

Tests of auditory apprehension and immediate memory. — The items are to be presented about one per second. Follow the procedure used in the Stanford-Binet Tests for Digits. The score is the number of items in largest series in which the subject is correct in 1 out of 3 trials. In any series of three items stop when the subject gets one correct.

1. **Memory for digits:**

3	*4*	*5*	*6*	*7*
364	2863	19348	372541	4718523
582	5194	62573	863759	7463892
716	8279	94182	516832	1859465

2. **Memory for letters:**

3	*4*	*5*	*6*	*7*
BLD	STPA	NCTLU	BFRTMA	RFBMTFA
AXQ	GLBK	FXMGK	LKNCFX	NKLFCXD
RBM	OMQR	HWXOC	CRGPHY	HCPMRAU

3. **Memory for nonsense words.** — Give as above; do not count wrong because of moderate mispronunciations of the individual syllables.

3	4	5
nup-an-gob	hif-pek-sev-ruck	hix-rup-lab-weg-onk
zic-put-hock	dag-wiff-tor-donk	kob-jeb-zak-pel-tuz
dac-nib-koff	mup-ore-pum-gug	hob-tum-uke-sag-doop

6	7
lis-vem-nuz-lep-zun-gif	arz-tut-bok-sem-huc-hif-fod
tak-nog-ruf-yen-quam-zim	zik-nor-cug-mep-huz-bal-suz
poe-tig-ark-sim-lub-cag	pam-quat-loz-mer-fic-gub-ick

4. Memory for words:

3				4			
hat	barn	cow		peg	board	ink	girl
top	bell	mop		man	floor	watch	cup
soap	bat	tree		door	cart	pan	stick

5	6
spoon house card pet tool	fork horse pin wrench chair hat
pen fish tree coat mild	plum tar stick hop bread fish
tub ball cork cheese boy	girl cup belt rope door soap

7

knife song pin bread horse shell top
clam bat coat pan cow shoe hen
ball up big hat watch store board

Tests of Handedness

Although many different tests have been proposed as a completely valid indication of handedness, none has been satisfactorily shown to be adequate. The *Manuscope*, advocated by B. S. Parson and based on the assumption that the primary factor in determining handedness is the "eyedness" of a person, the right-eyed person being right-handed and the left-eyed, left-handed, offers interesting possibilities. In addition

TABLE XI

THE FIRST TWO COLUMNS GIVE THE AGE AND GRADE SCORES OR EQUIVALENTS OF THE RAW SCORES FOR EACH TEST. SEE TEXT FOR DESCRIPTION OF TESTS

Age Score	Grade Score	Auditory Discrimination	Memory for Digits	Memory for Letters	Memory for Syllables	Memory for Words	Visual-Visual Association	Visual-Visual Association	Visual-Visual Association	Visual-Auditory Association	Visual-Auditory Association	Visual-Auditory Association
7.00	1.50	4.5	4.8	4.2	3.2	3.8	6.1	6.1	4.5	5.7	7.3	4.9
7.25	1.75	4.6	4.9	4.3	3.3	3.9	6.2	6.2	4.6	5.8	7.5	5.0
7.50	2.00	4.8	5.0	4.4	3.4	4.1	6.4	6.4	4.8	6.0	7.7	5.2
7.75	2.25	5.1	5.1	4.6	3.5	4.1	6.5	6.5	5.0	6.1	7.9	5.4
8.00	2.50	5.3	5.2	4.7	3.6	4.2	6.6	6.6	5.1	6.2	8.1	5.6
8.25	2.75	5.6	5.3	4.8	3.7	4.3	6.7	6.7	5.2	6.3	8.3	5.8
8.60	3.00	5.7	5.4	4.9	3.8	4.4	6.8	6.8	5.3	6.5	8.5	5.9
8.95	3.25	5.8	5.5	5.0	3.9	4.5	6.9	6.9	5.4	6.7	8.6	6.0
9.20	3.50	5.9	5.6	5.1	4.0	4.6	7.1	7.1	5.5	6.9	8.7	6.1
9.45	3.75	5.9	5.7	5.2	4.1	4.7	7.3	7.3	5.6	7.1	8.8	6.2
9.80	4.00	5.9	5.8	5.3	4.2	4.8	7.5	7.5	5.8	7.3	8.9	6.4
10.05	4.25	6.0	5.9	5.4	4.3	4.9	7.7	7.7	6.0	7.5	9.1	6.7
10.40	4.50	6.0	6.0	5.5	4.4	5.0	7.9	7.9	6.1	8.0	9.2	7.0
10.65	4.75	6.0	6.1	5.6	4.5	5.1	8.0	8.0	6.2	8.5	9.3	7.4
10.80	5.00	6.0	6.2	5.7	4.6	5.2	8.0	8.0	6.2	8.6	9.3	7.5
11.05	5.25	6.0	6.3	5.8	4.8	5.3	8.0	8.0	6.2	8.6	9.3	7.5
11.40	5.50	6.0	6.4	6.0	4.9	5.4	8.0	8.0	6.3	8.6	9.3	7.6
11.65	5.75	6.0	6.6	6.1	5.0	5.6	8.0	8.0	6.3	8.7	9.3	7.6
12.00	6.00	6.0	6.7	6.2	5.2	5.7	8.1	8.1	6.3	8.7	9.4	7.6
12.25	6.25	6.0	6.8	6.3	5.3	5.8	8.1	8.1	6.3	8.7	9.4	7.7
12.60	6.50	6.0	7.0	6.4	5.5	6.0	8.1	8.1	6.4	8.8	9.4	7.7
12.85	6.75	6.0	7.1	6.5	5.6	6.1	8.1	8.1	6.4	8.8	9.4	7.7

to testing for eyedness, the writer has used the more familiar examinations of the pupil's relative skill with the two hands in such activities as the following:

Steadiness, by means of the tracing board or converging lines drawn on paper.

Tapping, by means of the tapping board or a blunt pencil.

Strength of grip, by means of the dynamometer.

Threading large needles.

Using scissors.

Driving nails with a hammer.

Pupils spontaneous choice of hands when asked to wind a clock, turn a faucet or light-switch, juggle balls, etc.

By such methods, a pupil extremely left-handed can usually be readily detected. Where a reliable history of the pupil's earlier hand preferences and facilities is available, it should be taken into account.

The apparatus mentioned above may be purchased from C. H. Stoelting and Company, Chicago, Illinois. B. S. Parson in his *Left-handedness*, New York: The Macmillan Company, 1924, Chapter VII, discusses tests and explains the theory and use of the manuscope.

Tests of Associative Learning: Visual-Visual Symbols

Test A 1. — The materials for this test are a set of 10 cards, each with a simple geometrical figure and picture. Explain to the pupil that you are going to show a number of pictures below each of which is a figure. Tell him to try to remember the figure so that when it is shown alone he can tell which picture went with it. The figures are exposed one at a time for five (5) seconds each. Either by use of a stop-watch or by counting, learn to time the exposures accurately. After presenting the series, shuffle the cards and give the test. This is done by exposing the figure alone;

asking the pupil to tell which picture went with it. The examiner, either in the presentation or test, should not give the name of the object orally. If the pupil is correct, the examiner should turn the card so he may see it, with the statement: "Yes, that is it." If the subject is incorrect, the examiner should show the picture and say: "No, this is it." If the pupil does not respond at the end of 4 seconds, show him the picture, saying, "This is it." The examiner then goes on with the next item. Do not wait more than 4 seconds for an answer. Remove the card from sight after 5 seconds before the record is made. The third presentation is like the first; the fourth, fifth, and sixth are tests like the second. The order is: (1) presentation; (2) test; (3) presentation; (4) test; (5) test; (6) test. In all, four (4) tests are given. Shuffle the cards before each presentation or test so that the order is new each time.

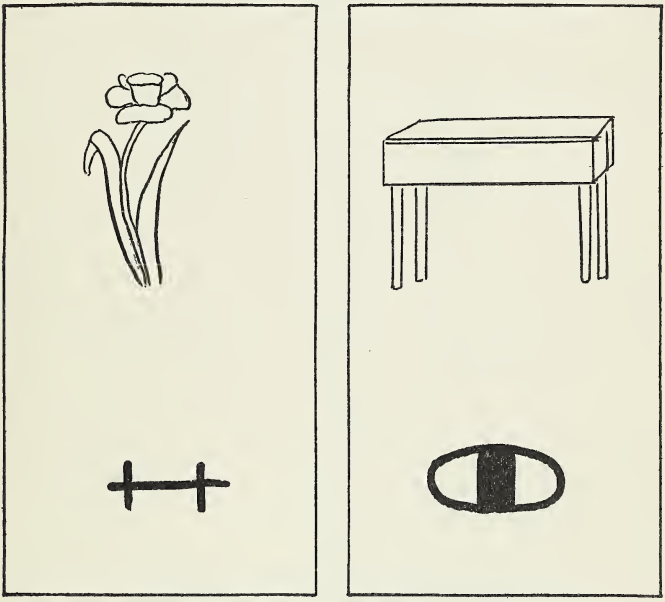
Record the pupil's responses on a prepared Record Sheet such as the one illustrated at the end of this Appendix. For Test A 1 the Record Sheet contains a form like the following:

NUMBER ON THE TEST CARD

TEST	1	2	3	4	5	6	7	8	9	10	TOTAL
1.											
2.											
3.											
4.											
Total											

Line 1 is used to record the results of the first test, and so on. For the presentation scores, no records are kept. Column 1 is for the records of Card 1, and so on. Enter the word the child gives to identify the picture

LEARNING TEST *A 1*

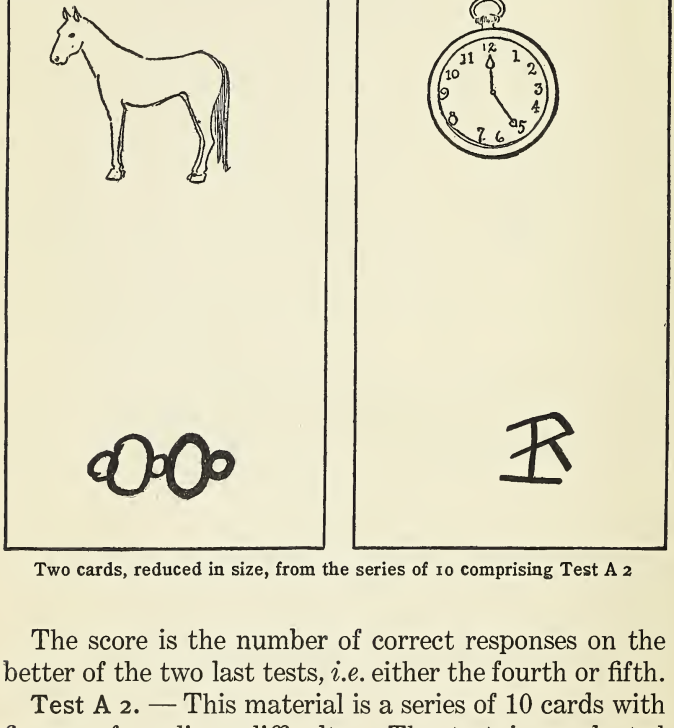


Two cards, reduced in size, from the series of 10 comprising Test A 1

associated with each symbol presented; put an *O* for failure to respond. Later the number of correct responses may be easily determined. It should be understood that all the child is expected to do is to use a word which for him means the right picture. If he

does not use a conventional word it does not matter; he needs only to indicate by any word or description the correct picture.

LEARNING TEST *A 2*

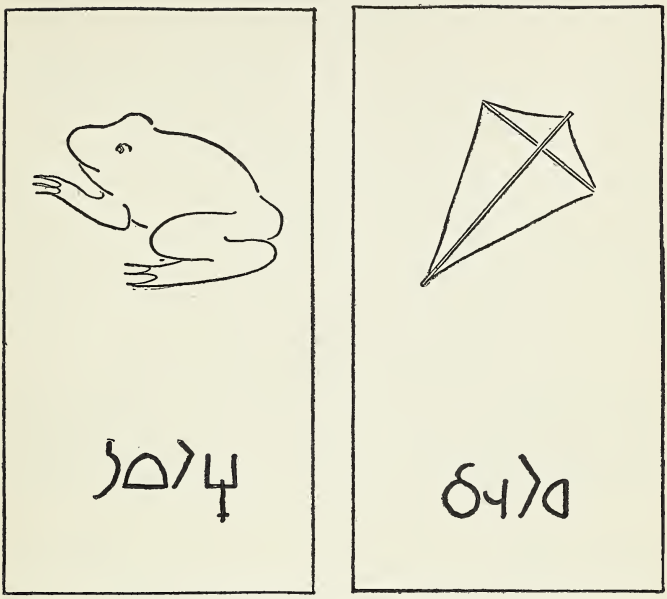


Two cards, reduced in size, from the series of 10 comprising Test A 2

The score is the number of correct responses on the better of the two last tests, *i.e.* either the fourth or fifth.

Test A 2. — This material is a series of 10 cards with figures of medium difficulty. The test is conducted and scored exactly as in A 1.

LEARNING TEST *A 3*



Two cards, reduced in size, from the series of 10 comprising Test A 3

Test A 3. — The material is a series of 10 cards with wordlike figures. The test is conducted and scored as in A 1 and A 2 except that five (5) tests instead of 4 are given. The order is: (1) presentation; (2) test; (3) presentation; (4) test; (5) test; (6) test; (7) test. The score is the number correct on the better one of the two last tests.

Table XI gives the average scores for these three tests. It will be noted that there is very slight increase in ability corresponding to grade and age status.

Associative Learning: Visual —→ Auditory Symbols

Test B 1. — A series of 10 cards each containing a simple visual figure are used. Each figure is to be presented while the sound — indicated on the back — is to be given orally. The exposure time is five (5) seconds for each item; the sound is to be given twice during the exposure. Complete the list at this rate. Shuffle the cards. Present them one at a time, each for five seconds, asking the pupil to give the sound which accompanied it before. If he is correct say "Yes, that is [give right sound]"; if wrong say "No, that is ——." If the pupil does not answer, say, "The sound is ——." Complete the series. Shuffle, then present the series as in the first case, *i.e.* 5 seconds exposure, saying the sound twice each time. Then

Learning Test *B 1*

Four symbols from the 10 which comprise the Visual-Auditory Associative Learning Test B 1

shuffle and repeat the test presentation until four (4) tests have been given in all. The order is: (1) presentation; (2) test; (3) presentation; (4) test; (5) test; (6) test.

Using prepared record sheets, note the results of each test as with the visual-visual series. The score is the number of correct responses on the better of the last two tests, as in the previous series.

Test B 2. — A series of 10 cards with figures to be associated with spoken words. Test conducted and scored as B 1.

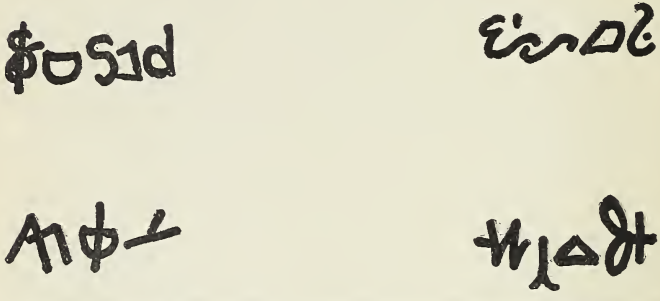
LEARNING TEST *B 2*

Four symbols from the 10 which comprise the Visual-Auditory Associative Learning Test B 2

Test B 3. — A series of 10 wordlike figures to be associated with spoken words. Test conducted as was

B 1 and B 2 except that a total of five (5) tests are to be given instead of four. The order is: (1) presentation; (2) test; (3) presentation; (4) test; (5) test; (6) test; (7) test.

LEARNING TEST *B 3*



Four symbols from the 10 which comprise the Visual-Auditory Associative Learning Test B 3

If, in any of these three examinations, the pupil learns the whole series before the tests are completed, continue to the end but record the number of the test presentation on which the first entirely correct score was secured, *e.g.* " All correct on 3d test."

The age and scores equivalent to the raw scores in these three tests are given in Table XI.

HISTORY OF HOME AND SCHOOL EXPERIENCE

In Chapter XI the importance of the pupil's attitude toward reading, his emotional stability, health, and the like was suggested. Since students are accustomed to take such factors into account in diagnosing diffi-

culties in reading we shall not include here a description of questions and examination methods.

The questionnaire blank which the author has used in securing information from teachers, parents, or others concerning the scholastic history of a case is reproduced below.

Test Record Blanks

For convenience in recording and summarizing the data obtained from tests and examinations, a Record Booklet has been made. It is reproduced below. The first page is arranged for a quantitative summary of all test results; the remaining pages are work sheets for use in recording responses of the subject and observations of the examiner.

Where to Secure Test Materials

The tests and Record Booklet described in this book may be secured from the Bureau of Publications, Teachers College, New York City, except as otherwise noted in the preceding pages.

READING: CASE HISTORY

Name of pupil Date Age Grade
Name of examiner Filled out by

1. Did the pupil learn to read before entering school?
   (*a*) Taught by parents, tutor, other children?
   (*b*) How taught?
2. At what age did pupil begin to try to read?
3. Type of earliest instruction, at home or school.
   (*a*) Which learned first: letters, words, sentences?
   (*b*) Did pupil receive instruction in phonics or any type of word analysis? If so, what kind and how much?
   (*c*) Did pupil show an early interest in reading?

4. Has the pupil ever missed school for any long period, *i.e.* two months or more? If so, when? For how long?
5. How many times has the pupil changed schools? When (in terms of grade status, at time of changes)?
6. When was the pupil's difficulty in reading (or spelling) first noticed?
7. Does the pupil like to read books or magazines? Does he read much by himself? Did he ever like to read? Does he like to write letters or compositions?
8. Has pupil ever learned to speak or read a foreign language? Which ones? When learned?
9. In what subjects does the pupil do the best work? In what the poorest work?
10. Has the pupil ever been given any special remedial work? Please specify: (*a*) when (*b*) how much (*c*) what type (*d*) results.
11. How does the pupil express himself orally? Very poorly; poorly; average; above average; excellently?
12. How does the pupil comprehend spoken language? Very poorly; poorly; average; above average; excellently?
13. What do you think are the reasons for the pupil's difficulties?

SUMMARY OF DIAGNOSIS OF READING

Quantitative Records

Name.....Age.....Birthday.....

School.....Room.....Grade.....Date.....

	Raw Score	Age Score	Grade Score
I. Intelligence			
1. Stanford Binet.....			
2.	✓		
II. Primary Reading Tests			
1. Word Recognition.....			
2. Phrase and Sentence R			
3. Paragraphs: Directions			
III. Grades 3–8 Reading Tests			
A. General Impression...	✓		
B. Predict Outcome.....	✓		
C. Precise Directions....	✓		
D. Details.....	✓		
IV. Oral Reading and Pronunciation			
1. Gray's Passages.....			
2. Gates Word Pronunciation.....	✓		
V. Phonetic Abilities			
A 1. Capital Letters.....	✓		
A 2. Small Letters.....	✓		
A 3. Sound Letters.....	✓		
A 4. Sound Phonograms..	✓		
A 5. Sound Combination Phonograms.....	✓		
B 1. Give letters for sounds			
B 2. Give letters for syllables.....			
B 3. Give letters for two syllables.....			
B 4. Spell words.....			

	Raw Score	Age Score	Grade Score
VI. Visual Perception			
A 1. Perception, Figures..			
A 2. Perception, Digits...			
A 3. Perception, Words...	✓		
B 1. Selection, Figures....			
B 2. Selection, Words....	✓		
VII. Visual Analysis and Recognition			
1. Geometrical designs...			
2. Word-like characters..			
VIII. Visual Memory Span			
1. Span for figures.....	✓		
IX. Auditory Functions			
1. Auditory acuity.....			
2. Auditory discrimination			
X. Auditory Memory Span			
1. Digits.....			
2. Letters.....			
3. Non-sense words.....			
4. Words.....			
XI. Associative Learning			
A 1. Visual-visual			
A 2. Visual-visual			
A 3. Visual-visual			
B 1. Visual-auditory			
B 2. Visual-auditory			
B 3. Visual-auditory			

RECORD SHEETS FOR DIAGNOSIS OF READING

I, II, III, Enter data on preceding page.

IV. Description of methods of attacking words in Gates Pronunciation and Gray's Oral Reading Tests.

V. Tests of Phonetic and Spelling Ability.

(Tests A 1, A 2, A 3, A 4 and A 5 to be recorded on the printed test sheets.)

B 1. Record responses in blanks following letters; + if correct, error as made.

1	2	3	4	5	6	7	8	9	10
S	T	R	P	I (it)	OO	M	K	F	G

B 2. Plus if correct; record errors as made.

1 ub	2 ip	3 tie	4 sot	5 gib
6 zar	7 nuk	8 arp	9 eck	10 mip

B 3. Record as in B(2).

1 nubit	2 argos	3 sopot	4 urfo
5 piptuk	6 zignuk	7 iptie	8 ubzar

COMMENTS ON PUPILS' PERFORMANCES IN THE TESTS ABOVE

B 4. Spelling of 36 words. Record + for correct; indicate misspellings.

SUMMARY CONCERNING SPELLING METHOD USED

VI. Summary concerning Visual Perception Tests and Records of Additional Tests of Vision.

VII. Visual Analysis and Recognition.

Tests 1 and 2. Mark + for correct, − for error for each card.

Card	1	2	3	4	5	6	7	8	9	10	11
(1)											
(2)											

Diagnosis:

VIII. Visual Memory Span — Have child draw each set of figures on a sheet: cover up records of earlier attempts, summarize, score here.

Items in series	3	4	5	6	7	8
Attempts correct:						

IX. Auditory Functions.

1. Diagnosis concerning auditory acuity.

2. Auditory Discrimination — syllables. Mark + if correct; record errors.

	2	3	4	5	6
1.					
2.					
3.					

X. Auditory Memory Spans.

1. Memory of Digits. Mark + if correct; record if wrong.

3	4	5	6	7
364	2863	19348	372541	4718523
582	5194	62573	863759	7463892
716	8279	94182	516832	1859465

2. Memory for Letters.

3	4	5	6	7
BLD	STPA	NCTLU	BFRTMA	RFBMTFA
AXQ	GLBK	FXMGK	LKNCFX	NKLFCXD
RBM	OMQR	HWXOC	CRGPHY	HCPMRAU

3. Memory for non-sense words. Mark + if correct; encircle any syllables omitted, misplaced or grossly mispronounced.

3	4	5
nup-an-gob	hif-pek-sev-ruck	hix-rup-lab-weg-onk
zic-put-hock	dag-wiff-tor-donk	kob-jeb-zak-pel-tuz
dac-nib-koff	mup-ore-pum-gug	hob-tum-uke-sag-doop

6	7
lis-vem-nuz-lep-zun-gif	arz-tut-bok-sem-huc-hif-fod
tak-nog-ruf-yen-quam-zim	zik-mor-cug-mep-huz-bal-suz
poe-tig-ark-sim-lub-cag	pam-quat-loz-mer-fic-gub-ick

4. Memory for words. Record as in Test 3.

3	4	5
hat barn cow	peg board ink girl	spoon house card pet tool
top bell mop	man floor watch cup	pen fish tree coat mild
soap bat tree	door cart pan stick	tub ball cork cheese boy

6	7
fork horse pin wrench chair hat	knife song pin bread horse shell top
plum tar stick hop bread fish	clam bat coat pan cow shoe hen
girl cup belt rope door soap	ball up big hat watch store board

XI. Associative Learning.

A(1). Easy figures, visual-visual. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
Total											

A(2). Medium difficult figures. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
Total											

A(3). Word-like figures. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
5.											
Total											

VISUAL–AUDITORY LEARNING

B(1). Simple figures — letter sounds. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
Total											

B(2). Simple figures — word sounds. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
Total											

B(3). Word-like figures — word sounds. NUMBER ON CARD.

Test	1	2	3	4	5	6	7	8	9	10	Total
1.											
2.											
3.											
4.											
5.											
Total											

COMMENTS ON PUPILS' TECHNIQUE OF LEARNING

XII. Tests of Handedness. Describe tests and give diagnosis.

XIII. Deficiencies in Motor Functions: General motor control, writing or hand control, speech difficulties, eye-muscle co-ordination. Describe tests and observations, suggest significance.

XIV. Nervous and Emotional Stability. Indicate evidence and significance.

XV. Motivation and General Attitude toward Reading.

XVI. Home and School History: Relevant data concerning native tongue, methods of teaching in reading and spelling, changes of methods or school, etc.

XVII. General Summary: Diagnosis and Suggestions for Remedial Work.

QUESTIONS AND EXERCISES

The following questions and exercises are given to assist the reader in studying the text. They may also be used for group discussion. To get the greatest returns from study of the volume, the reader should try out the diagnostic procedures on actual pupils and suggest the appropriate remedial measures. Group discussions of the results of diagnosis and suggested remedial treatment will be especially helpful.

Chapter I

1. What school subjects and activities are dependent upon ability to read? Can you name any school subjects above Grade II that could be pursued as well without reading as with it?

2. Give your explanation of the fact, found in the investigation by Percival, that in the lower grades nearly every child who failed of promotion was also a "failure in reading." Do you think this is because reading is intrinsically difficult, badly taught, supremely important, or what?

3. Criticize or defend this statement: "Children do not fail to learn to read in Grade I because they are not taught properly; they fail because they are not sufficiently mature intellectually to feel a need for reading. If once they experience a real need for learning to read, any normal children will learn readily with little or no help."

4. Can you give evidence that children often acquire unfortunate habits despite keen interest in acquiring a skill? Give examples from typewriting, speaking, tennis, etc.

5. Why do pupils despite vigorous interest and effort and skillful teaching sometimes develop inappropriate techniques in reading?

6. What is the distinction between a "mere measurement" and a "diagnosis" in reading?

7. How does a program of diagnosis and remedial treatment in reading resemble and differ from, if at all, the practices of the physician?

8. Discuss this statement: "Education, like medicine, should emphasize prevention rather than cure. But education, like hygiene, is not omnipotent. Until it is, it will be necessary to diagnose and remedy defects."

9. Do you think it probable that an improved method of teaching — which is the means of prevention of difficulties — may be very effectively developed out of experiences in diagnosis and remedial instruction? What better method could you suggest?

10. Outline the main points in this chapter.

Chapter II

1. Outline the chapter.

2. Give concrete illustrations of the fact that what a person actually learns are always *reactions*.

3. Record separately the time required to say the *abc*'s forward and backward. Explain the results in terms of the reaction hypothesis.

4. Summarize the chief defects of the "supplementary" device and the merits of the "intrinsic" method. Give some illustrations of each type of device.

5. Suggest some effective graphic or other means of displaying a pupil's progress.

6. Why should a teacher treat a pupil who is having difficulty in reading with more optimistic tact than usual? Is it ever wise to scold such a pupil? To insist upon application to the task?

7. When the physician decides a child must be given remedial treatment for some physical difficulty, he often introduces pretty disagreeable measures without much ado. Should the teacher ever do likewise? Defend your view and cite concrete cases if you can.

8. Can you add to the list given in the text other suggestions for motivating the work of the poor reader?

9. Is it a general rule that we like the activities we can readily learn and dislike those that give us difficulty?

10. For what other reasons do children dislike learning to read?

Chapter III

1. In order to secure really diagnostic results from the series of tests, why is it necessary to follow rigidly the "standardized" directions for giving and scoring these tests?

2. Explain exactly what the author means by a "norm." Does he mean an ideal score? Just what kind of score does the "norm" represent?

3. Explain how the "norms" or "average scores" can be highly useful without representing goals of attainment for every person.

4. What, in your opinion, are the relative merits of "age" and "grade" scores? Explain just how each of these scores was secured and what each represents.

5. Reading merely the tabulated scores for cases A to N (pages 60–62), make a diagnosis of the special weaknesses of each of these pupils. Later compare your diagnosis with those given in the text.

6. Why should three tests of different phases of reading ability yield a better measure of "general reading ability" than a test, requiring equal time, but of one type of reading?

7. Suggest other uses to which these tests may be put.

Chapter IV

1. Outline the chapter.

2. Arrange the various causes of difficulty in paragraph comprehension in order of the frequency with which they appear among your pupils. Compare with the order given by other teachers. Explain the differences that appear.

3. Which causes of difficulty are the hardest to remedy? The easiest to remedy?

4. Describe or bring samples of types of materials which you have found to be especially useful for encouraging paragraph comprehension.

5. Criticize materials found in children's readers, practice exercises, story books, etc. with respect to unity of the thought contained in the paragraphs.

6. Which of the devices for guiding and measuring comprehension do you like best? Least?

7. Suggest types of devices not presented in the text.

8. What are the special merits and limitations of the self-corrective devices discussed on pages 83 ff.?

9. Discuss the relative importance of different types of paragraph comprehension.

10. What is the main difference between paragraph and sentence comprehension?

Chapter V

1. Outline the chapter.
2. Arrange the various causes of difficulty in phrase and sentence comprehension in order of the frequency with which you have encountered them. Compare results with those of others and explain the differences.
3. Which of the causes listed are most difficult to remedy? Which the easiest?
4. Does your experience suggest other causes of difficulty of this type?
5. Criticize any of the exercises illustrated in this chapter and suggest improvements.
6. Would the use of exercises such as those on page 102 in connection with a picture dictionary be a good method of teaching the alphabet?
7. Suggest, in detail, methods of demonstrating the phrasing of reading material in order to help pupils observe thought units.
8. Criticize or defend the author's statements concerning flash cards. Consult the experimental studies if possible.
9. Suggest the best uses that may be made of flash cards.

Chapter VI

1. Outline the chapter.
2. What are the main causes of difficulty in word recognition? Can you add any other causes of this type of difficulty?
3. Arrange the causes in the order of frequency with which you find them operating among your own pupils. Is this order typical? If not, why not?
4. Arrange the causes in order of the difficulty one encounters in trying to remedy them.
5. Enumerate the different ways in which words are perceived. Criticize the author's opinions regarding the value of these different ways of perceiving words.
6. Why is the author not in favor of extensive use of the familiar types of phonetic methods? Re-read Chapter II in connection with this question.
7. Is it probable that the method a pupil uses in spelling could have any effect upon the method of perceiving words in reading? Illustrate.

8. Diagnose the spelling ability of a pupil who is a poor reader. Does he try to spell unfamiliar words rapidly as wholes, or slowly letter by letter, or a syllable at a time, or by no constant method? Now, study his method of trying to recognize unfamiliar printed words. Can you discover any relation between the two types of work.

9. Why does the author believe that there is no single method of attack which is adequate to solve every task of word recognition?

10. Would the methods most suitable for English words necessarily be most useful for French, Spanish, or other languages? Explain.

Chapter VII

1. Outline the chapter.

2. Suggest improvements upon the author's method of selecting a most useful vocabulary for the primary grades. Of the criteria he adopted, which do you consider most important?

3. Suggest the desirable and undesirable features of the use of various card games for learning words.

4. Defend the practices suggested in this chapter against the possible criticism that they emphasize words rather than larger thought units.

5. Look up the results of the word-element studies listed at the end of the chapter and discuss the author's proposed methods as well as phonetic and other practices in the light of facts found.

6. Discuss the relative merits of the various exercises suggested as means of furthering the analysis and perception of words.

7. See if you cannot invent some better exercises in which the same general principles are incorporated.

8. What are the main values and limitations in the use of flash cards for the development of effective habits of word perception?

9. Suggest some additional means that may be used to help the pupil to learn to break up words into syllables and to pronounce the word syllable by syllable.

10. Recall pupils who depended too little and others who depended too much on the context in trying to recognize unfamiliar words. Give your reasons for their defects and suggest the proper remedial work.

Chapter VIII

1. Enumerate several reading purposes or "ways of reading" not mentioned in the text. Which of these are important for the typical adult? Which are needed only by persons in special occupations such as proof reading?

2. Are these various ways of reading absolutely independent of each other? What activities or reactions, if any, are common to several or all types of reading?

3. Suggest certain types of reading which are so unlike certain other types that training in the one might interfere with skill in the other.

4. How does the author defend the selection of only four types of reading from the many possible varieties for the team of tests?

5. Of the four types of reading selected for the tests, which are most important and which least important for the average adult? For the college student?

6. Why does the author maintain that a teacher should not be satisfied necessarily when her class equals the "norms" in these tests?

7. Study the records of pupils A to H, given in the text, and make your own diagnosis of the main difficulties of each. Compare with the author's comments in the text.

8. Make a list of points on which you would disagree in emphasis, or otherwise, with the author.

Chapter IX

1. What types of school training in reading are likely to tend to produce deficiencies in speed in reading to get the general impression? What training might produce inaccuracy in this type of reading?

2. If a pupil rarely reads newspapers, story books, etc. for pleasure, in what type of reading is he most likely to be backward?

3. Which type of reading is required in the work with a textbook in arithmetic?

4. Should children in Grade IV be expected to read with absolute accuracy such paragraphs and questions as are used in the team of four tests?

5. Of the four types of reading used in the tests, which are most similar? Which are least similar?

6. Suggest sources of material for use in developing each of the four types of reading.

7. Describe some pupils of your acquaintance who are more or less similar to the type cases described in the text.

8. Why does the author say that a pupil deficient in only one or two types of reading is usually much easier to treat than one who shows a weakness in all four types? Is it merely a matter of the number of equally serious deficiencies?

Chapter X

1. Enumerate the most important causes of slowness in reading. Which of these are the most difficult, which the easiest, to remedy?

2. What is meant by the eye-voice span?

3. Give some cases from your own experience of the influence of excessive articulation on reading.

4. What are the main differences between the remedial treatment for pupils who articulate too much and those who are slow for other reasons?

5. Examine your own reactions during rapid reading. Do you see the whole of each word? Do you articulate silently or audibly? Do you somehow frame the spoken word without really articulating at all? Do you hear the word in your "mind's ear"? Do you react to it otherwise? Do any of these reactions tend to reduce your rate of reading?

6. Are you aware of your own eye movements during reading? How would you improve the character of your eye movements if you found them to be faulty?

7. What are some of the causes of inability to utilize context clues properly?

8. What are the main causes of inaccuracy in reading? Which of these may be avoided or remedied?

9. Explain the statement that extraordinary zeal in thought-getting may produce inaccurate comprehension.

10. Is it the rule that fast readers are more inaccurate than slow readers?

Chapter XI

1. Give the general theory on which the author worked in constructing the series of diagnostic tests.

2. Are there any abilities or capacities that you would like to add to the list of those for which tests were prepared?

3. According to the author's diagnoses, what are the more important specific capacities upon which reading depends?

4. What is the distinction between visual acuity and visual perception?

5. Does the author suggest that one may, by training in perceiving some kind of small visual items, improve one's perception for all sorts of visual objects?

6. What is the distinction between memory in general and "memory span"? Do you think the latter ability could have much to do with reading?

7. Have you observed any relation between muscular dexterity or handedness and reading ability?

8. Have you observed any relation between stuttering or other speech defects and reading? What was the nature of the relation? How should the pupil have been handled?

9. What special precautions should be exercised in dealing with a highly nervous or emotional child who has difficulty with reading?

10. Give your opinion of the theory advanced by Dearborn and Carmichael concerning the relation of left-handedness and reading difficulty.

Chapter XII

1. Why should the child born deaf experience special difficulty in learning to read?

2. Make a list of words that would probably be very hard to teach a deaf child.

3. What advantages in learning to read would a normal child of six years who cannot speak English have over the deaf child of the same age?

4. What are the chief difficulties experienced by very dull children in learning to read? Is reading usually their hardest subject?

5. Compare the author's suggestions with those given by Fernald and Keller on pages 306–11. What are the strong and the weak points in each?

6. Compare your own methods of handling the non-reader with the two methods considered in Question 5.

7. Should the classroom teacher attempt to conduct the remedial work for the non-readers or should it be done by a special officer?

8. Do you think there are many children who, while possessing ability to learn to read, do not do so or, at least, not as well as they could, because of unfortunate attitudes toward the task?

9. Give some concrete examples of unfortunate motivation in reading and suggest some probable causes and remedies.

Chapter XIII

1. Comment on Cases 1 to 8, inclusive, indicating what facts you would have tried to discover that are not mentioned in the text.

2. Suggest variations in the remedial treatment which you think would have been an improvement.

3. Analyze the table on pages 346–50. What type of difficulty, native or acquired, was assumed by the author to be the most common cause of trouble in reading?

4. Does the frequency of defects due to inappropriate techniques reflect any general deficiencies in current methods of teaching reading?

5. Compare the author's list of causes of reading deficiencies with any other summary you may find or with your estimate of the situation in your own school. Explain the differences found.

6. Supplement the list with causes of difficulty which do not appear.

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