

A STUDY OF THE RELATION BETWEEN MENTAL AND READING  
ABILITIES AND THE AMOUNT AND CHOICE OF READING  
DONE BY THE NINTH-A GRADE PUPILS OF THE  
LAWRENCE JUNIOR HIGH SCHOOL

by

Alice N. Engle

B. S. University of Kansas, 1926

Submitted to the Department of  
Education and the Faculty of the  
Graduate School of the University  
of Kansas in partial fulfillment  
of the requirements for the degree  
of Master of Science in *Education*

Approved by:

*J. M. Ruente*  
Instructor in Charge

*Raymond V. Schurz*  
Head or Chairman of Department

Date *July 1927*

— ACKNOWLEDGMENTS —

To Dr. Harry P. Smith, University of Kansas, for constructive criticisms given during this study.

To Professor Paul A. Witty, for suggestions in the preparation of the speed test in reading.

To Mr. J. E. Stonecipher, the principal of the junior high school; to Miss Marie Gopen, supervisor of English; and to the four teachers of the Ninth-A grade English classes for their aid in obtaining the data for this study.

## TABLE OF CONTENTS

|   | Page |
|---|------|
| Chapter I. Status of the problem; its relation to education; its importance as a study; related phases of the study --                | 1    |
| Chapter II. Related Studies and literature -----  | 7    |
| Chapter III. Specific field of this study   |      |
| 1. To find the relation between the   |      |
| (1) Intelligence quotients and comprehension in reading   |      |
| (2) Intelligence quotients and reading rate   |      |
| (3) Intelligence quotients and the number of books read   |      |
| (4) Rate of reading and comprehension in reading  |      |
| (5) The rate of reading and the number of books read  |      |
| (6) Comprehension in reading and the number of books read   |      |
| 2. To find the variability within the group in regard to intelligence, comprehension in reading, rate of reading, and the amount read |      |
| 3. Classification and discussion of data regarding the choice of material read -----  | 17   |
| Chapter IV. The method of securing data and the method of procedure -----   | 19   |
| Chapter V. Presentation, analysis, and interpretation of data, including tables, graphs, and discussions -----                        | 32   |

TABLE OF CONTENTS

(Continued)

Page

Chapter VI. Summary and conclusions,  
including answers to  
questions suggested in  
Chapter III ----- 73

Appendix - Inserts

Bibliography

## LIST OF TABLES

| Tables   | Page             |
|--|------------------|
| <p>I     The Raw Scores of the Terman Group Test; the Corresponding Stanford-Binet Mental Ages for October, 1924; the Chronological Ages for March, 1927; the Chronological Ages for October, 1924; the Intelligence Quotients; and the Mental Ages for 76 IX A grade pupils -----</p> | <p>28<br/>29</p> |
| <p>II    The Intelligence Quotients, the Reading Rates, the Composite Reading Scores in Comprehension, and the Number of Books read by each IX A grade pupil -----</p>   | <p>30<br/>31</p> |
| <p>III   Intelligence Scores of 76 IX A grade pupils -----</p>   | <p>34</p>        |
| <p>IV    Reading Comprehension Scores of 76 IX A grade pupils -----</p>  | <p>35</p>        |
| <p>V     Number of Words Read per Minute by 76 IX A grade pupils -----</p>   | <p>36</p>        |
| <p>VI    Number of Books Read by 76 IX A grade pupils -----</p>  | <p>37</p>        |
| <p>VII   Correlation of the Intelligence Quotients with the Reading Comprehension Scores -----</p>   | <p>46</p>        |
| <p>VIII  Correlation of Intelligence Quotients with Reading Rates -----</p>  | <p>47</p>        |
| <p>IX    Correlation of Intelligence Quotients with the Number of Books Read -----</p>   | <p>48</p>        |
| <p>X     Correlation of Reading Comprehension Scores with Reading Rates -----</p>  | <p>49</p>        |

LIST OF TABLES

(Continued)

| Table | Page  |
|-------|---|
| XI    | Correlation of Reading Rates with<br>Number of Books Read ----- 50  |
| XII   | Correlation of Reading Comprehension<br>Scores with Number of Books Read ----- 51   |
| XIII  | Coefficients of Correlation and the<br>Probable Errors between Intelligence<br>Quotients, Reading Comprehension Scores,<br>Rates of Reading, and the Number of<br>Books Read -- ----- 52  |
| XIV   | The Per Cent Each Type of Reading is<br>of the Total Number of Books Read by<br>the boys and the girls of this group -- 61  |
| XV    | The Per Cent of the Various Types of<br>Fiction Read by the Boys and the Girls<br>of this group ----- 69  |
| XVI   | The Ten Most Popular Authors with this<br>Group ----- 70  |
| XVII  | The Ten Most Popular Books with this<br>Group ----- 70  |
| XVIII | The Range of the Boys' and the Girls'<br>Intelligence Scores, Reading Comprehension<br>Scores, Reading Rates, Mental Ages,<br>Chronological Ages, Number of Books Read,<br>Total Number of Books Read, and the Average<br>Number of Books Read ----- 72 |

## LIST OF GRAPHS

|   | Page |
|---|------|
| I    Diagram Representing the Frequencies<br>of the Intelligence Quotients -----      | 38   |
| II   Diagram Representing the Frequencies<br>of the Comprehension Scores -----        | 39   |
| III  Diagram Representing the Frequencies<br>of the Number of Words Read Per Minute - | 40   |
| IV   Diagram Representing the Frequencies<br>of the Number of Books Read -----        | 41   |

CHAPTER I  
INTRODUCTION

The abiding interest of school children in their subjects of study has for many years been one of the criteria of good instruction.

Only in recent years have teachers of English attached much importance to pupils' voluntary reading. Investigations and careful study of the quality and amount of their reading, however, reveal much that may be a key to their assigned readings, both for class study and for collateral reading. Educators readily concede that the reading ability and interests of children play a highly important rôle in determining scholastic success and in preparing them for worthy citizenship.

W. O. Forman<sup>1</sup> made an investigation to find how junior high school pupils spend their leisure time. He selected a group of 175 boys, ranging in age from twelve to fifteen years. They were divided into groups on the basis of what they do on Saturday

<sup>1</sup>W. O. Forman. "The Use Made of Leisure Time by Junior High School Pupils." Elementary School Journal. July, 1926. p. 771.



mornings. The interesting thing about the study is that when the boys who did read asserted what they liked and disliked, the reading group shrank from thirty-seven to twenty-one.

In Thurber's<sup>2</sup> study of the reading done in the high school, he found little relation between the voluntary reading and the study of English. He states that the difference between the two is as great to the pupil as are Latin and geometry. He thinks that the causes of this divergence are three in number: (1) nature of the voluntary reading; (2) nature of English in the classical high school; and (3) nature of the English teachers.

Thurber also asserts that the tastes we now form are just the antitheses of our ideals, with the result that the teaching of English literature becomes a failure; that teachers cannot interest their pupils in what they like, until they show them that their teachers are also interested in what they like and naturally enjoy themselves. He protests against

<sup>2</sup>Samuel Thurber, Jr. "Voluntary Reading in the Classical High School." School Review. Vol. XIII, 1905. pp. 168-179.

giving essays, speeches, idyllic poetry, and biography, when the pupils want a plot, characters, action, and dialogue.

"Books", says Orion Smith,<sup>3</sup> "appeal to children only in so far as they are translated into their own real experience. Hence there should be a close relation between the pupils' voluntary reading and their English. The course in English ought to take its departure from the pupils' point of view."

In Uhl's<sup>4</sup> extensive study of pupils' interests in reading, he asserts that so long as pupils are within the classroom, they attend more or less closely to the literature under discussion. Yet, most of them when allowed to select books for their own recreation go, not to excellent literature, but to decidedly inferior literature. He assigns for this condition four reasons: (1) classroom experiences may be unpleasant; (2) the task of training so many pupils as now attend the high school may be an impossible one; (3) the literary equipment of the

<sup>3</sup>Franklin Orion Smith. "Pupils' Voluntary Reading." Pedagogical Seminary. Vol. XIV. p. 221.

<sup>4</sup>Willis L. Uhl. Materials of Reading. pp. 157-158.

literature classroom and library may be inadequate;

(4) the teacher of literature may be attempting to force the growth of her pupils too rapidly.

This last reason is substantiated by Irion<sup>5</sup> in an investigation which disclosed the fact that at least one-half of the ninth-grade pupils in his study did not read well enough to profit by the study of literature ordinarily assigned to that grade. In total literary comprehension, his subjects averaged a score of 49.79 per cent, and in reading comprehension 46.45 per cent. This means that their comprehension scores were approximately 50 per cent; or that one half of the students of the grade scored below the mean.

The teacher is concerned with both the amount and the quality of a pupil's reading. Stella Yowell,<sup>6</sup> in her study, found that the average child is not reading as much as he should read; that the lure of the motion-picture theater and the coming of the automobile are partially responsible for this condition. The competition for the leisure time of children is too great;

5. Theo. W. H. Irion. Comprehension Difficulties in the Study of Literature. Teachers College Contributions to Education. Vol. 189. 1925.

6. Stella Yowell. "Are Children Reading?" Journal of Educational Research. Jan., 1927. pp. 1-4.

reading as a form of entertainment is not popular.

If we accept the worthy use of leisure time as one of the goals of education, it is distinctly a part of the duties of the junior high school to learn the conditions that affect the pupils' reading. Difficulty with the mechanics of reading, vocabulary difficulties, eye weakness, lack of access to desirable material, and various other factors enter into the choice and amount of a pupil's reading matter.

Their "personality make-ups" of pupils differ widely: usually, the introvert enjoys "experiencing literature;" the extravert finds his interests in a realm outside of fancy and imagination. Some pupils enjoy having others read to them for an indefinite length of time, while their own reading affords them little pleasure. This trait is one that would tend to lessen their amount of reading.

A common criticism of English teachers to-day is that the reading habits of the students seem to have been but slightly influenced by the study of literature in the schools. This criticism is a deserved one, if

we accept the findings of Lehman's<sup>7</sup> study of voluntary reading done. Professor Lehman found that less than fifty per cent of the students in elementary and high schools and colleges had gained a "genuine taste for the long, coherent perusal of a full volume as a leisure-hour employment."

Many of the causes of these just criticisms regarding the amount and quality of reading done by all grades of pupils are being lessened by scientific studies made in the field of reading. Modern methods of improving the rate of silent reading by means of practice and by standardized tests are also helping to reduce inefficiency in reading.

A few of the most significant studies in related fields will be summarized briefly in the next chapter.

<sup>7</sup>Harvey C. Lehman. "Reading Books 'Just for Fun.'" The School Review. May, 1926. pp. 357-364.

## CHAPTER II

## RELATED STUDIES AND LITERATURE

In recent years teachers, and educators in general, have realized the significance of the subject of reading and its close connection with other subjects. They recognize the relation of the study and reading of literature to life.

Professor Leonard<sup>1</sup> expresses this general idea concerning literature: We have been made to feel by the study of literature that the educational value lies in what happens in one when he reads; that the aim of literature is to make one's experiences more satisfying; and that real literature is most appreciated and makes its best contributions when it is approached in a recreational mood of curiosity rather than in the way of study and work.

One of the first of the important studies made of children's interests in reading, and one of the questionnaire type, was made in 1897 under the direction of James E. Russell and was reported by

<sup>1</sup> Sterling Leonard. "Relation between Reading and Literature." Twenty-Fourth Yearbook. Part I. Chapter VI. 1925.

R. W. Bullock in the Proceedings of the National Educational Association for 1897. The children were asked fifteen questions in regard to the quantity, quality, harmfulness, interest, etc., of their reading. This study was carried on with children from the fifth grade through the high school. The questions were answered by 1500 children from all parts of Colorado. They were asked, also, to indicate their preferences for stories of adventure, of great men, of great women, love stories, ghost stories, detective stories, and war stories.

The following figures represent in per cent the reading tastes of the boys and girls of the ninth grade:

| Grade of Stories of | Boys | Girls |
|---------------------|------|-------|
| Adventure.....      | 95   | 65    |
| Travel.....         | 72   | 52    |
| Great Men.....      | 70   | 48    |
| Great Women.....    | 22   | 52    |
| Love.....           | 21   | 48    |
| Ghosts.....         | 14   | 19    |
| Detective.....      | 28   | 21    |
| War.....            | 84   | 35    |

Only in the high school course does Mr. Russell acknowledge any considerable use of love stories. The taste for these stories increases steadily to the end of the high school course.

In 1912 Allan Abbott<sup>2</sup> made a statistical study of the reading tastes of high school pupils. Mr. Abbott also used the questionnaire method. 2,649 boys and girls between the ages of fourteen and nineteen were studied and their tastes and interests in literature ascertained. Mr. Abbott compiled a list of 178 books from a list published by Harvard in 1897 in a pamphlet entitled "English in the Secondary Schools" and from a list reported by a sub-committee on College Entrance Requirements to the National Educational Association.

Of the late extensive studies made in the field of reading and literature, those of Jordon,<sup>3</sup> Hosic,<sup>4</sup>

<sup>2</sup>Allan Abbott. "Reading Tastes of High School Pupils." The School Review. Vol. X. 1912. p. 585.

<sup>3</sup>Arthur M. Jordon. Children's Interests in Reading. Contributions to Education, No. 107. Teachers College, Columbia University, New York City. 1921.

<sup>4</sup>James Fleming Hosic. Empirical Studies in Reading. Ibid. No. 114. 1921.



and Irion<sup>5</sup> are among the most important. All of these studies are reported in the Teachers College Series of Contributions to Education.

Jordon's studies were made in the schools of Fayetteville, Arkansas; Lawrence, Kansas; Stuttgart, Arkansas; and Washington, D. C. Responses to questionnaires were received from 3,598 pupils, extending from the sixth grade through the high school. The following questions constituted the questionnaire:

- I. (1) Will you kindly write down for me the name of the book you like best of all the books you have ever read?
- (2) Will you kindly write down for me the name of the book you like next best of all the books you have ever read?
- (3) Will you kindly write down for me the name of the book you like next best and next best of all the books you have ever read until you have written five books arranged in the order of your preference?

- II. (1) Will you kindly write down for me the name of the magazine you like best of all the magazines you have ever read?
- (2) Will you kindly write down for me the name of the magazine you like next best of all the magazines you have ever read?
- (3) Will you kindly write down the names of all the magazines you have ever read so altogether you have written three magazines, arranged in the order of your preference?

In connection with this study Jordon made investigations in eight libraries to supplement his findings in regard to children's tastes in reading. Following are a few of the facts that the entire study disclosed:

- (1) That the interests of boys and girls are dissimilar.
- (2) That the major interests in reading of boys from ten to thirteen years are included in four general types of fiction: (a) Books concerned with war and scouting; (b) those

- concerned with the Boy Scouts; and (d) those concerned with strenuous adventure.
- (3) That Altsheler, Barbour, Burton, and Clemens are the most popular authors among boys.
  - (4) That in an analysis of these books it is found that the popular writers appeal most often to the instincts of mastery, fighting, love of sensory life for its own sake, original attention, and approval and scornful behavior.
  - (5) That in non-fiction, the interest centers around what-and-how-to-do books.
  - (6) That the interest in biography and history is confined to those authors who can write history and biography in the form of an exciting story.
  - (7) That the interests of girls are principally concerned with fiction which portrays: (a) home; (b) school; (c) with fairy-stories; (d) stories with historical background; and (e) love and romance.

The purpose of Husic's study was to make an evaluation of literary textbooks for use in grades IV to VIII. His special subject chosen was that of literary reading in the intermediate and grammar grades of the elementary schools, and his point of view was that of method.

Both in the studies in the books and in the reports of the work of the teachers, Husic found a notable absence of any attempt to develop methods of study. Such habits as the pupils form they form unconsciously. He found no building up of general concepts of procedure appropriate to different types of reading.

Orion's study deals with data that would ascertain satisfactory answers to these three questions: (1) Is it possible to obtain an approximately accurate measure of a student's literary comprehension ability?

(2) Does this ability vary greatly with different types of literary material?

(3) When students fail in literary comprehension, wherein do their failures primarily consist?

This study is particularly related to the present one, inasmuch as the investigation was confined to the ninth grade and the fact that literary comprehension necessarily has played some part in the studied relations.

At this point, Orion's meaning of literary comprehension should be explained in order that it will not be confused with reading comprehension as used in this study. The following represents in outline form his analysis of literary comprehension:

#### Literary Comprehension

##### Reading comprehension

##### Narrow reading comprehension

Word knowledge . Knowledge of expressions.  
Ability to get the specific facts presented.

##### Broad comprehension

Ability to see the main points and grasp the significant conclusions reached by the author.

##### Ability to make further interpretation

Ability to make further interpretation and application.

Orion found that the reading comprehension of ninth-grade students varies considerably with different literary selections and that word knowledge seems to stand out as a very significant item in reading comprehension. He found the coefficient of correlation between literary comprehension and total reading comprehension to be  $.8359 \pm .02$ ; between total reading comprehension and the intelligence quotient to be  $.4389$ .

From his study Orion drew the following conclusions:

- (1) It is possible to measure with a fair degree of accuracy the literary comprehension of students in the ninth grade.
- (2) This ability varies markedly with different types of literature. In his study, the poetic types proved to be the more difficult.
- (3) Literary comprehension, as he measured it, correlates to a considerable degree with intelligence.
- (4) Literary comprehension, correlates to a

considerable degree with such a reading-comprehension measure as the Thorndike-McCall Scales.

Other studies to which merely the references will be given are the following: Henderson's in 1897;<sup>6</sup> Shaw's in 1897;<sup>7</sup> Wissler's in 1898;<sup>8</sup> Jones's in 1912;<sup>9</sup> Anderson's in 1912;<sup>10</sup> Crow's in 1924;<sup>11</sup> and Gray's in 1925.<sup>12</sup>

<sup>6</sup>H. C. Henderson. Report of the State Superintendent of Public Instruction of New York State. 1897, II; 978-91.

<sup>7</sup>J. C. Shaw. "Children's Reading." West Virginia Journal. October, 1897.

<sup>8</sup>Clark Wissler. "Interests in Children in Reading in the Elementary School." Pedagogical Seminary. Vol. V. pp. 523-40. (1898).

<sup>9</sup>C. Edward Jones. Sources of Interest in High School English. American Book Company. New York. 1912.

<sup>10</sup>Roxanna E. Anderson. "A Preliminary Study of the Reading Tastes of High School Pupils." Pedagogical Seminary. Vol. XIX. pp. 438-60.

<sup>11</sup>Charles Sumner Crow. Evaluation of English Literature in the High School. Contributions to Education. No. 14. Teachers College, Columbia University. 1924.

<sup>12</sup>William Scott Gray. "Summary of Investigations Relating to Reading." Supplementary Educational Monographs. No. 28. University of Chicago. 1925.

## CHAPTER III

## THE SPECIFIC FIELD OF THIS STUDY

General intelligence and reading ability form the basis for the acquisition of all the knowledges. Since the aims of all instruction are to enable a person to express and apply thought, knowledge, appreciation, and efficiency, a study of reading and mental abilities is of great value.

A worthy use of leisure time and a preparation for good citizenship are two of the aims of education. Reading plays a large part as a means to aid the child in attaining both of these objectives.

The purpose of this study is to find answers to the following questions by making a study of a representative group of ninth-grade students.

- (1) Is there any relation between intelligence and comprehension in reading of freshmen in high school?
- (2) Is there a relation between intelligence and the rate of reading?
- (3) Is there a relation between intelligence and the amount read?



(4) Is the relation between reading rate and comprehension in this group as significant as modern investigations have generally found it to be?

(5) Does the rate of reading affect the number of books read?

(6) Does comprehension have any relation to the number of books read?

(7) How do the reading interests of this group compare with other similar groups studied elsewhere?

(8) What authors appeal most strongly to pupils of this grade? What books are most popular with the group?

(9) What types of fiction predominate in the reading of both the boys and the girls of this group?

## CHAPTER IV

THE METHOD OF SECURING DATA AND THE  
METHOD OF PROCEDURE.

The present study is based upon data secured from the English classes in the junior high school of Lawrence, Kansas. The study was made of one IX<sup>1</sup> A grade, two IX<sup>2</sup> A grades, and one IX<sup>3</sup> A grade classes.

These particular sections were chosen because of the writer's previous work and interest in teaching English to freshmen, both the literature and the composition, in a county community high school. The writer believes, also, as do many investigators who have made a careful study of the entire field of English, that much subsequent success or failure in the subject is due to the quality of work done in the freshman year of the high school.

The results of this study are based upon the lists of voluntary reading done by seventy-six pupils in the ninth grade and upon the following three tests which were given to them:

- (1) The Terman Group Intelligence Test: Form A had been given to all the pupils of the junior high school in October, 1924.
- (2) The Reading Examination: Form A for grades 2-8 of the Stanford Achievement Test<sup>1</sup> was given in March, 1927, for comprehension in reading. This test includes (a) paragraph meaning; (b) sentence meaning; and (c) word meaning. The sum of the three scores constitutes a total reading score.
- (3) A speed test was given to determine the number of words read by each pupil per minute.

The speed test was prepared by Professor Paul A. Witty and the writer.<sup>2</sup> It consisted of a preparatory test for a practice exercise. The extract was taken from James Fenimore Cooper's "The Spy." It was explained to the pupils that they were to be given a short exercise

<sup>1</sup>The separate leaflets for the reading test of the Stanford Achievement Test make this test for comprehension in reading more economical and convenient for a separate reading test than are the large leaflets from which composite scores for other subjects are obtained. The separate forms of each subject have been obtainable only within the last year.

<sup>2</sup>This test and the Stanford Achievement Test are inserted on page 76 of the Appendix.

to see how fast they could read and at the same time understand what they read. The numbers one, two, three, four, and so on were placed consecutively upon the board at the end of every fifteen seconds.<sup>3</sup> As each pupil finished the selection, he looked up, then placed under his name the number then upon the board. Thus, by dividing the number on the board by four to get the number of minutes it took the pupil to read the story, and then dividing the result into the entire number of words read, the result was the number of words read per minute. Six questions which could be answered by yes or no were asked upon the content and the answers placed on the back of the sheet.

After a short interval the Real Test--The Story was given by the same method of procedure, with the exception that no questions were given to be answered. The reader will note, however, that the pupils naturally expected questions to be asked as they had been asked over the practice test, which fact probably had some influence upon the rate of the reading of the

<sup>3</sup>A stop-match was used for the entire test.

real story.<sup>4</sup>

The tests for comprehension and rate were given to 110 pupils in March. When the scores of the pupils who had taken the Terman Group Intelligence Test were checked, the pupils from the country were not included for this study. The principal of the junior high school and the writer felt that they are a select group, and thus not representative for the purposes of comparison. Other pupils had moved away, or for various reasons had not taken the three tests. With these eliminations made, the group was limited to seventy-six in number.

Other factors to be considered are the fact that the junior high school in Lawrence represents a cross-section of the entire town. In this respect, it differs from similar studies that might be made in a larger city; also, the enrollment in Lawrence includes a small number of Indian and colored children, which fact would tend to affect the scores slightly.

It would be an interesting "race" study to find just how much the results were affected by this class of pupils.

<sup>4</sup>There were 1345 words in the Real Story.

Another point to be taken into consideration is the fact that when the reading tests were given, these IX A grade pupils had just completed the semester's work for the VIII A and IX B grades; thus, the results are not truly representative of IX A grade work.

The supervisor of English had given to these classes at the beginning and end of the first semester Miller's English Form and the Sentence Recognition Tests. This indicates that the schools are kept up in the testing programs.

The second part of the study is concerned with the choice of the material read voluntarily by the pupils listed in this study. During the first semester, the pupils were encouraged to read any books or as many books as they chose to read. The only requirement was that each pupil read at least two books listed in the graded and classified "Books for Home Reading for High School and Junior High School."<sup>6</sup> The cards containing the names and authors of the books read the first semester were secured from the supervisor of English.

<sup>6</sup> This list was copyrighted in 1923 by the National Council of Teachers of English. The "Fourteenth Impression" was issued February, 1927.

Since this was the semester for voluntary reading, the supervisor suggested that in some individual cases the reports were not very complete for the amount of reading done, as the pupils could see no point for recording their reading. Some of the pupils did a great deal of magazine and newspaper reading, which was not taken into account in this study. For these reasons, neither the number nor the choice of books read is entirely representative of all the reading done by the IX A grade pupils in this group.

Books represent a varying amount of reading matter, considering the size of print and the number of pages contained. For this reason, to count the number of books read may not seem to be an adequate estimate of the amount read. For the purpose of more fairly estimating the amount, the exact number of pages was found for 475 of the total 797 books read by the 76 pupils. These books averaged 345 pages each. Each pupil's number of books was then based upon the average-size book, 345 pages.

Since only the one test was given for comprehension in reading, the Stanford Achievement Test was considered the most satisfactory, inasmuch as it has been found to have a degree of "high reliability," has been carefully standardized, and age and grade norms have been established. In this test the exercises are arranged in ascending order of difficulty. The pupil's rate of work does not affect his score in the test.

The three parts of this test can be given in thirty minutes. No time limit was set for the test in the rate of reading, but in each of the four rooms about twenty minutes was needed to administer the test.

Since the Terman Group Intelligence Test had been given in October, 1924, and the tests for comprehension and speed had been given twenty-nine months later, the raw scores of the Terman Group Intelligence Test were converted into intelligence quotients for the purposes of easier interpretation. Following is the process by which this was done:

- (1) From the raw score of 1924 was found the mental age of each pupil in 1924 by means of the Stanford-Binet Mental Age Table.<sup>7</sup>

<sup>7</sup>"Terman's Group Test of Mental Ability" for Grades 7 to 12. Manual of Directions. World Book Co. Yonkers-on-Hudson, New York.



- (2) From the mental age of 1924 and the chronological age of 1924, the intelligence quotient of the pupil was computed by means of an Intelligence-Quotient Slide Rule.
- (3) On the assumption that the intelligence quotient remains constant, the mental age of 1927 was computed from it and the chronological age of 1927. Since the mental age over the chronological age equals the intelligence quotient, the pupil's mental age for 1927 was found by multiplying the chronological age of 1927 by his intelligence quotient.

An understanding of the terms "general intelligence" and "mental age" are fundamental in the use of measurements and test results. "General Intelligence" says Monroe,<sup>8</sup> for practical purposes may be thought of as a measurement of a pupil's capacity to do the work of the school."

8. Walter S. Monroe, Introduction to the Theory of Educational Measurements. Boston. Houghton Mifflin Company. 1923. p. 39.

The intelligence quotient is simply a method of expressing the relationship between the child's mental age and his chronological age. "Mental Age" is defined by Terman<sup>9</sup> as that degree of general ability which is possessed by the average child of corresponding chronological age. It indicates the level of development at a given time. Thus, a child is said to have a mental age of twelve years if his score is the same as the median score of twelve-year old children.

<sup>9</sup>Virgil A. Dickson. Mental Tests and the Classroom Teacher. New York. World Book Company. 1924. Chapter III.

TABLE I

TABLE SHOWING THE RAW SCORE OF THE TERMAN GROUP TEST;  
 THE CORRESPONDING STANFORD-BINET MENTAL AGE  
 OCTOBER, 1924; THE CHRONOLOGICAL AGE MARCH,  
 1927; THE CHRONOLOGICAL AGE OCTOBER, 1924;  
 THE INTELLIGENCE QUOTIENT; AND THE MEN-  
 TAL AGE FOR 76 IX A GRADE PUPILS.

| Pupil | Raw Score of<br>the<br>Terman<br>Group Test<br>Form A,<br>Oct., 1924 | Stanford-<br>Binet<br>Mental Age<br>Oct., 1924 | Chrono-<br>logical<br>Age,<br>March,<br>1927 | Chrono-<br>logical<br>Age,<br>October,<br>1924 | Intelli-<br>gence<br>Quotient | Mental<br>Age<br>March,<br>1927 |
|-------|--|--|--|--|-------------------------------|---------------------------------|
| 1     | 77   | 13-3   | 15-4   | 12-11  | 103                           | 15-10                           |
| 2     | 82   | 13-6   | 14-2   | 11-9   | 114                           | 16-2                            |
| 3     | 102  | 14-5   | 14-2   | 11-9   | 123                           | 17-5                            |
| 4     | 61   | 12-7   | 15-9   | 13-4   | 94                            | 14-10                           |
| 5     | 32   | 11-2   | 15-0   | 12-7   | 89                            | 13-4                            |
| 6     | 70   | 12-11  | 16-8   | 14-3   | 91                            | 15-2                            |
| 7     | 62   | 12-7   | 15-10  | 13-5   | 94                            | 14-11                           |
| 8     | 84   | 13-7   | 15-9   | 13-4   | 102                           | 16-1                            |
| 9     | 95   | 14-1   | 14-1   | 11-8   | 120                           | 17-0                            |
| 10    | 60   | 12-6   | 15-9   | 13-4   | 94                            | 14-10                           |
| 11    | 50   | 12-0   | 14-3   | 11-10  | 101                           | 14-5                            |
| 12    | 113  | 15-0   | 14-4   | 11-11  | 126                           | 18-1                            |
| 13    | 68   | 12-10  | 15-0   | 12-7   | 102                           | 15-4                            |
| 14    | 55   | 12-3   | 14-4   | 11-11  | 103                           | 14-10                           |
| 15    | 78   | 13-4   | 14-6   | 12-1   | 110                           | 15-11                           |
| 16    | 65   | 12-9   | 15-1   | 12-8   | 101                           | 15-3                            |
| 17    | 98   | 14-3   | 14-11  | 12-6   | 114                           | 17-0                            |
| 18    | 85   | 13-8   | 14-4   | 11-11  | 114                           | 16-4                            |
| 19    | 34   | 11-3   | 15-7   | 13-2   | 86                            | 13-5                            |
| 20    | 40   | 11-6   | 14-5   | 12-0   | 96                            | 13-10                           |
| 21    | 69   | 12-11  | 14-2   | 11-9   | 110                           | 15-7                            |
| 22    | 73   | 13-1   | 14-6   | 12-1   | 108                           | 15-8                            |
| 23    | 32   | 11-2   | 15-10  | 13-5   | 83                            | 13-2                            |
| 24    | 68   | 12-10  | 15-5   | 13-0   | 99                            | 15-3                            |
| 25    | 31   | 11-2   | 15-3   | 12-10  | 86                            | 13-1                            |
| 26    | 84   | 13-8   | 14-7   | 12-2   | 112                           | 16-4                            |
| 27    | 49   | 11-11  | 15-1   | 12-8   | 94                            | 14-2                            |

| Pupil | Raw Score of<br>the<br>Terman<br>Group Test<br>Form A,<br>Oct., 1924 | Stanford-<br>Binet<br>Mental Age<br>Oct., 1924 | Chrono-<br>logical<br>Age,<br>March,<br>1927 | Chrono-<br>logical<br>Age,<br>October,<br>1924 | Intelli-<br>gence<br>Quotient | Mental<br>Age<br>March,<br>1927 |
|-------|--|--|--|--|-------------------------------|---------------------------------|
| 28    | 105  | 14-7   | 14-10  | 14-5   | 112                           | 16-8                            |
| 29    | 36   | 11-4   | 16-8   | 14-3   | 79                            | 13-2                            |
| 30    | 48   | 11-10  | 14-5   | 12-0   | 99                            | 14-3                            |
| 31    | 73   | 13-1   | 15-0   | 12-7   | 104                           | 15-7                            |
| 32    | 72   | 13-0   | 14-6   | 12-1   | 108                           | 15-8                            |
| 33    | 54   | 12-2   | 14-8   | 12-3   | 99                            | 14-6                            |
| 34    | 97   | 14-2   | 13-9   | 11-4   | 125                           | 17-2                            |
| 35    | 86   | 13-9   | 15-1   | 12-8   | 108                           | 16-4                            |
| 36    | 112  | 14-11  | 13-8   | 11-3   | 133                           | 18-2                            |
| 37    | 127  | 15-7   | 14-7   | 12-2   | 127                           | 18-5                            |
| 38    | 71   | 13-0   | 15-5   | 13-0   | 100                           | 15-4                            |
| 39    | 98   | 14-3   | 15-8   | 13-3   | 107                           | 16-10                           |
| 40    | 65   | 12-9   | 14-3   | 11-10  | 108                           | 15-4                            |
| 41    | 80   | 13-5   | 14-4   | 11-11  | 113                           | 16-2                            |
| 42    | 62   | 12-9   | 14-5   | 12-0   | 105                           | 15-1                            |
| 43    | 42   | 11-7   | 16-11  | 14-6   | 80                            | 13-6                            |
| 44    | 39   | 11-6   | 15-10  | 13-5   | 86                            | 13-7                            |
| 45    | 57   | 12-4   | 14-7   | 12-2   | 101                           | 14-8                            |
| 46    | 111  | 14-11  | 13-7   | 11-2   | 134                           | 18-2                            |
| 47    | 66   | 12-10  | 14-2   | 11-9   | 109                           | 15-6                            |
| 48    | 58   | 12-5   | 16-0   | 13-7   | 92                            | 14-6                            |
| 49    | 94   | 14-0   | 14-0   | 11-7   | 121                           | 17-0                            |
| 50    | 71   | 13-0   | 13-4   | 10-11  | 119                           | 15-10                           |
| 51    | 48   | 11-0   | 14-2   | 11-9   | 94                            | 13-4                            |
| 52    | 78   | 13-4   | 14-6   | 12-1   | 111                           | 16-0                            |
| 53    | 43   | 11-8   | 16-0   | 13-7   | 86                            | 13-9                            |
| 54    | 58   | 12-5   | 14-5   | 12-0   | 103                           | 14-10                           |
| 55    | 64   | 12-9   | 14-7   | 12-2   | 104                           | 15-2                            |
| 56    | 72   | 13-0   | 14-2   | 11-9   | 110                           | 15-7                            |
| 57    | 68   | 12-11  | 14-9   | 12-4   | 104                           | 15-4                            |
| 58    | 152  | 16-9   | 14-2   | 11-9   | 143                           | 19-2                            |
| 59    | 81   | 13-5   | 14-6   | 12-1   | 111                           | 16-2                            |
| 60    | 40   | 11-6   | 15-2   | 12-9   | 90                            | 13-8                            |
| 61    | 87   | 13-9   | 15-0   | 12-7   | 109                           | 14-10                           |
| 62    | 70   | 12-11  | 14-8   | 12-3   | 105                           | 15-4                            |
| 63    | 95   | 14-1   | 14-10  | 12-5   | 113                           | 16-10                           |
| 64    | 77   | 13-3   | 14-2   | 11-9   | 112                           | 15-10                           |
| 65    | 119  | 15-3   | 13-2   | 10-9   | 142                           | 18-7                            |
| 66    | 79   | 13-4   | 14-10  | 12-5   | 108                           | 16-0                            |
| 67    | 61   | 12-6   | 14-5   | 12-0   | 104                           | 15-0                            |
| 68    | 46   | 11-10  | 14-6   | 12-1   | 98                            | 13-4                            |
| 69    | 75   | 13-2   | 15-9   | 13-4   | 98                            | 15-5                            |
| 70    | 100  | 14-4   | 15-6   | 13-1   | 110                           | 17-0                            |
| 71    | 39   | 11-6   | 16-9   | 14-14  | 80                            | 13-5                            |
| 72    | 80   | 13-5   | 13-5   | 11-0   | 122                           | 16-4                            |
| 73    | 125  | 15-6   | 13-6   | 11-1   | 140                           | 18-8                            |
| 74    | 48   | 11-11  | 16-8   | 14-3   | 84                            | 13-11                           |
| 75    | 65   | 12-9   | 14-2   | 11-9   | 108                           | 15-3                            |
| 76    | 60   | 12-5   | 15-5   | 13-0   | 96                            | 14-9                            |

TABLE II

TABLE SHOWING INTELLIGENCE QUOTIENTS, READING  
 RATE, READING COMPREHENSION, AND THE NUM-  
 BER OF BOOKS READ BY EACH IX A GRADE  
 PUPIL DESIGNATED BY NUMBER

| Pupil | Intelligence<br>Quotient | Reading Rate<br>Number of<br>Words per<br>Minute | Reading<br>Comprehension | Number of<br>Books Read |
|-------|--------------------------|--|--------------------------|-------------------------|
| 1     | 103                      | 304  | 201                      | 3                       |
| 2     | 114                      | 422  | 161                      | 4                       |
| 3     | 123                      | 200  | 160                      | 2                       |
| 4     | 94                       | 322  | 189                      | 16                      |
| 5     | 89                       | 177  | 145                      | 5                       |
| 6     | 91                       | 130  | 134                      | 2                       |
| 7     | 94                       | 228  | 181                      | 5                       |
| 8     | 102                      | 274  | 167                      | 16                      |
| 9     | 120                      | 343  | 222                      | 22                      |
| 10    | 94                       | 249  | 158                      | 3                       |
| 11    | 101                      | 183  | 158                      | 3                       |
| 12    | 126                      | 228  | 205                      | 2                       |
| 13    | 102                      | 365  | 187                      | 10                      |
| 14    | 103                      | 288  | 173                      | 24                      |
| 15    | 110                      | 274  | 188                      | 8                       |
| 16    | 101                      | 300  | 179                      | 24                      |
| 17    | 114                      | 343  | 230                      | 5                       |
| 18    | 114                      | 196  | 169                      | 16                      |
| 19    | 86                       | 249  | 127                      | 7                       |
| 20    | 96                       | 343  | 143                      | 21                      |
| 21    | 110                      | 261  | 198                      | 3                       |
| 22    | 108                      | 250  | 179                      | 11                      |
| 23    | 83                       | 365  | 157                      | 23                      |
| 24    | 99                       | 365  | 209                      | 8                       |
| 25    | 86                       | 177  | 125                      | 5                       |
| 26    | 112                      | 288  | 185                      | 10                      |
| 27    | 94                       | 177  | 118                      | 2                       |
| 28    | 112                      | 300  | 244                      | 16                      |
| 29    | 79                       | 238  | 138                      | 8                       |
| 30    | 99                       | 228  | 114                      | 3                       |
| 31    | 104                      | 228  | 171                      | 12                      |

| Pupil | Intelligence<br>Quotient | Reading Rate<br>Number of<br>Words per<br>Minute | Reading<br>Comprehension | Number of<br>Books Read |
|-------|--------------------------|--|--------------------------|-------------------------|
| 32    | 108                      | 288  | 162                      | 4                       |
| 33    | 99                       | 228  | 174                      | 19                      |
| 34    | 125                      | 304  | 211                      | 23                      |
| 35    | 108                      | 274  | 198                      | 16                      |
| 36    | 133                      | 288  | 209                      | 12                      |
| 37    | 127                      | 274  | 216                      | 6                       |
| 38    | 100                      | 305  | 191                      | 26                      |
| 39    | 107                      | 196  | 181                      | 6                       |
| 40    | 108                      | 211  | 176                      | 6                       |
| 41    | 113                      | 249  | 198                      | 12                      |
| 42    | 105                      | 249  | 149                      | 4                       |
| 43    | 80                       | 249  | 140                      | 4                       |
| 44    | 86                       | 148  | 116                      | 4                       |
| 45    | 101                      | 274  | 150                      | 6                       |
| 46    | 134                      | 304  | 232                      | 13                      |
| 47    | 109                      | 343  | 198                      | 12                      |
| 48    | 92                       | 196  | 124                      | 4                       |
| 49    | 121                      | 457  | 208                      | 23                      |
| 50    | 119                      | 274  | 196                      | 17                      |
| 51    | 94                       | 274  | 161                      | 15                      |
| 52    | 111                      | 228  | 190                      | 21                      |
| 53    | 86                       | 322  | 165                      | 5                       |
| 54    | 103                      | 261  | 164                      | 4                       |
| 55    | 104                      | 322  | 202                      | 31                      |
| 56    | 110                      | 218  | 208                      | 7                       |
| 57    | 104                      | 261  | 177                      | 7                       |
| 58    | 143                      | 420  | 257                      | 31                      |
| 59    | 111                      | 238  | 190                      | 5                       |
| 60    | 90                       | 228  | 138                      | 4                       |
| 61    | 109                      | 249  | 199                      | 16                      |
| 62    | 105                      | 290  | 175                      | 4                       |
| 63    | 113                      | 250  | 182                      | 3                       |
| 64    | 112                      | 228  | 193                      | 14                      |
| 65    | 142                      | 343  | 236                      | 18                      |
| 66    | 108                      | 228  | 198                      | 11                      |
| 67    | 104                      | 144  | 150                      | 4                       |
| 68    | 98                       | 218  | 149                      | 4                       |
| 69    | 98                       | 211  | 172                      | 6                       |
| 70    | 110                      | 274  | 189                      | 18                      |
| 71    | 80                       | 261  | 123                      | 4                       |
| 72    | 122                      | 238  | 171                      | 12                      |
| 73    | 140                      | 238  | 215                      | 11                      |
| 74    | 84                       | 228  | 137                      | 6                       |
| 75    | 1108                     | 261  | 207                      | 9                       |
| 76    | 96                       | 304  | 164                      | 12                      |

## CHAPTER V

PRESENTATION, ANALYSIS, AND INTER-  
PRETATION OF DATA

In order that test results may be more readily interpreted, an arrangement of scores of systematic order is important. The larger the number of cases, the more necessary is this step for interpretation. Scores may be arranged from the highest to the lowest or vice versa. A division into intervals becomes further necessary. In Table III the intelligence scores range from 75 to 143, making a range of 68 points. By arranging these scores in intervals of five units each, fourteen steps become a convenient division for representing the entire array and tabulating the frequencies with which the scores fall within each interval. A table of this type is called a frequency distribution. The second column in the table shows the number of frequencies, or the number of pupils making the scores represented in the first column.

Tables IV, V, and VI respectively, are designed on the same plan, and represent the scores in reading comprehension, number of words read per minute, and the number of books read by the 76 pupils studied in this group.



TABLE III

INTELLIGENCE SCORES FOR 76 IX A GRADE  
 PUPILS ARRANGED IN A FREQUENCY  
 DISTRIBUTION

| Intelligence Quotients | Frequencies |
|------------------------|-------------|
| 140-144.....           | 3           |
| 135-139.....           | 0           |
| 130-134.....           | 2           |
| 125-129.....           | 3           |
| 120-124.....           | 4           |
| 115-119.....           | 1           |
| 110-114.....           | 14          |
| 105-109.....           | 11          |
| 100-104.....           | 13          |
| 95-99 .....            | 7           |
| 90-94 .....            | 8           |
| 85-89 .....            | 5           |
| 80-84 .....            | 4           |
| 75-79 .....            | 1           |
| Total .....            | 76          |

Median 105.23  
 S. D. (σ) 14.25

Table III reads: Three pupils made a score of 140-149; no pupils had scores between 135-139; two pupils made a score of 130-134. The median or middle score was 105.23; the standard deviation was 14.25.

TABLE IV

THE READING COMPREHENSION SCORES FOR  
76 IX A GRADE PUPILS ARRANGED IN  
A FREQUENCY DISTRIBUTION

| Reading Comprehension Scores | Frequencies |
|------------------------------|-------------|
| 250-259.....                 | 1           |
| 240-249.....                 | 1           |
| 230-239.....                 | 3           |
| 220-229.....                 | 1           |
| 210-219.....                 | 3           |
| 200-209.....                 | 8           |
| 190-199.....                 | 11          |
| 180-189.....                 | 8           |
| 170-179.....                 | 10          |
| 160-169.....                 | 9           |
| 150-159.....                 | 5           |
| 140-149.....                 | 5           |
| 130-139.....                 | 4           |
| 120-129.....                 | 4           |
| 110-119.....                 | 3           |
| Total .....                  | 76          |

|                    |       |
|--------------------|-------|
| Median             | 178.  |
| S. D. ( $\sigma$ ) | 31.16 |

Table IV reads: One pupil made a score of 250-259; one pupil made a score of 240-249; three pupils made a score of 230-239. The median or middle score was 178; the standard deviation was 31.16.

TABLE V

THE NUMBER OF WORDS PER MINUTE READ BY  
76 IX A GRADE PUPILS ARRANGED IN  
A FREQUENCY DISTRIBUTION

| Number of Words per Minute | Frequencies |
|----------------------------|-------------|
| 450-469.....               | 1           |
| 430-449.....               | 0           |
| 410-429.....               | 2           |
| 390-409.....               | 0           |
| 370-389.....               | 0           |
| 350-369.....               | 3           |
| 330-349.....               | 5           |
| 310-329.....               | 3           |
| 290-309.....               | 8           |
| 270-289.....               | 12          |
| 250-269.....               | 7           |
| 230-249.....               | 10          |
| 210-229.....               | 14          |
| 190-209.....               | 4           |
| 170-189.....               | 4           |
| 150-169.....               | 0           |
| 130-149.....               | 3           |
| Total .....                | 76          |
| Median                     | 258.57      |
| S. D. (σ)                  | 77.80       |

Table V reads: One pupil made a score of 130-149; no pupils had a score of 430-449; two pupils had a score of 410-429. The median or middle score was 258.57; the standard deviation was 77.80.

TABLE VI

THE NUMBER OF BOOKS READ BY 76 IX A  
GRADE PUPILS ARRANGED IN A  
FREQUENCY DISTRIBUTION

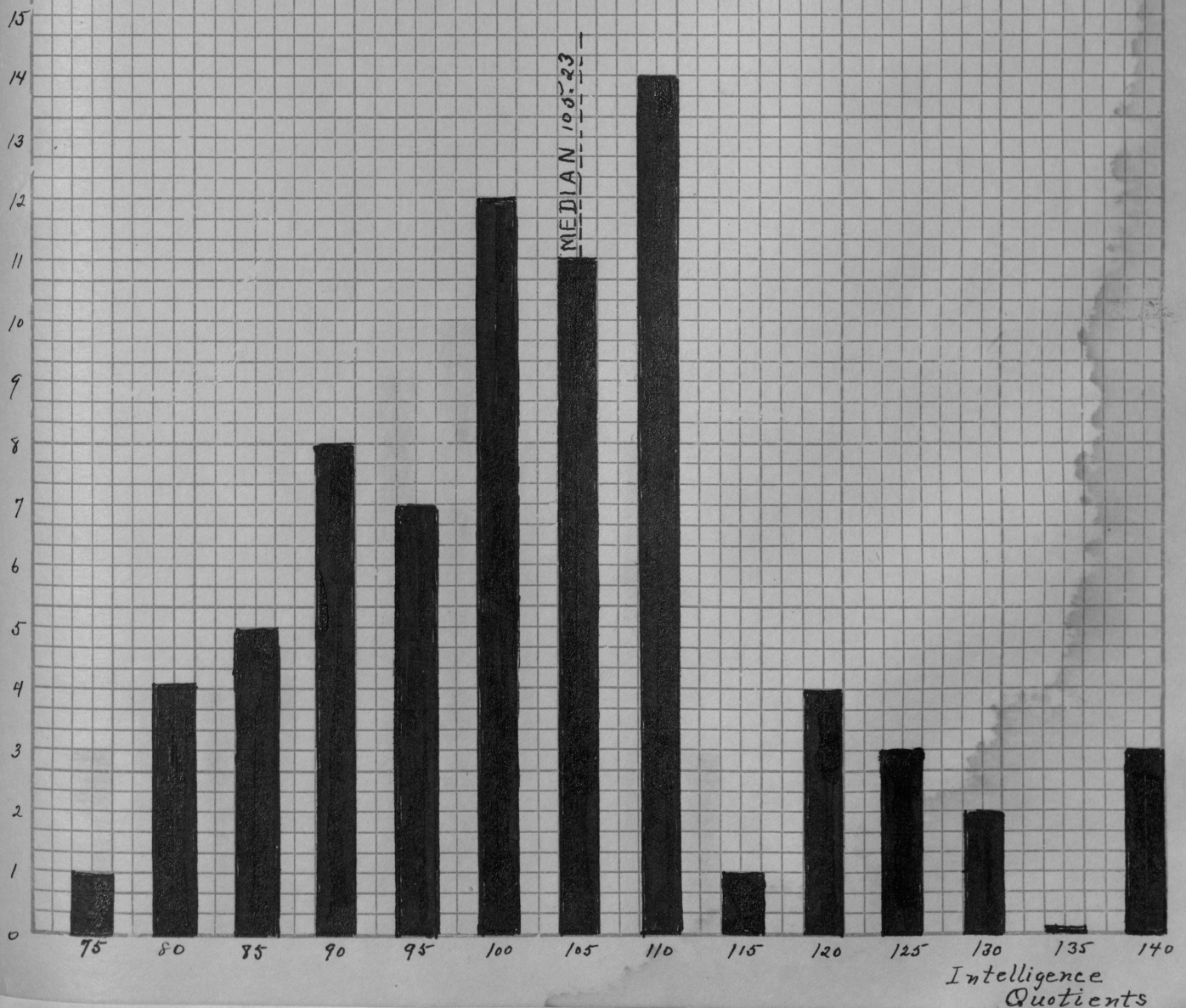
| Number of Books Read | Frequencies |
|----------------------|-------------|
| 30-31.....           | 2           |
| 28-29.....           | 0           |
| 26-27.....           | 1           |
| 24-25.....           | 2           |
| 22-23.....           | 4           |
| 20-21.....           | 2           |
| 18-19.....           | 3           |
| 16-17.....           | 6           |
| 14-15.....           | 3           |
| 12-13.....           | 7           |
| 10-11.....           | 5           |
| 8-9.....             | 4           |
| 6-7.....             | 9           |
| 4-5.....             | 18          |
| <del>2-3</del> ..... | 10          |
| Median               | 8.5         |
| S. D. (C)            | 7.4         |

Table VI reads: Two pupils read 30-31 books; no pupils read 28-29 books; one pupil read 26-27 books. The median or middle score was 8.5; the standard deviation was 7.4.

## GRAPH I

F

Frequencies of the Intelligence Quotients. (These are the data shown by Table III).



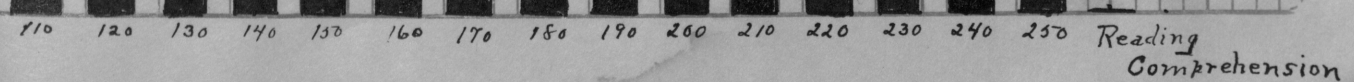
### GRAPH II

Frequency of the Comprehension Scores.  
(These are the data shown by Table IV).

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

110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 Reading Comprehension

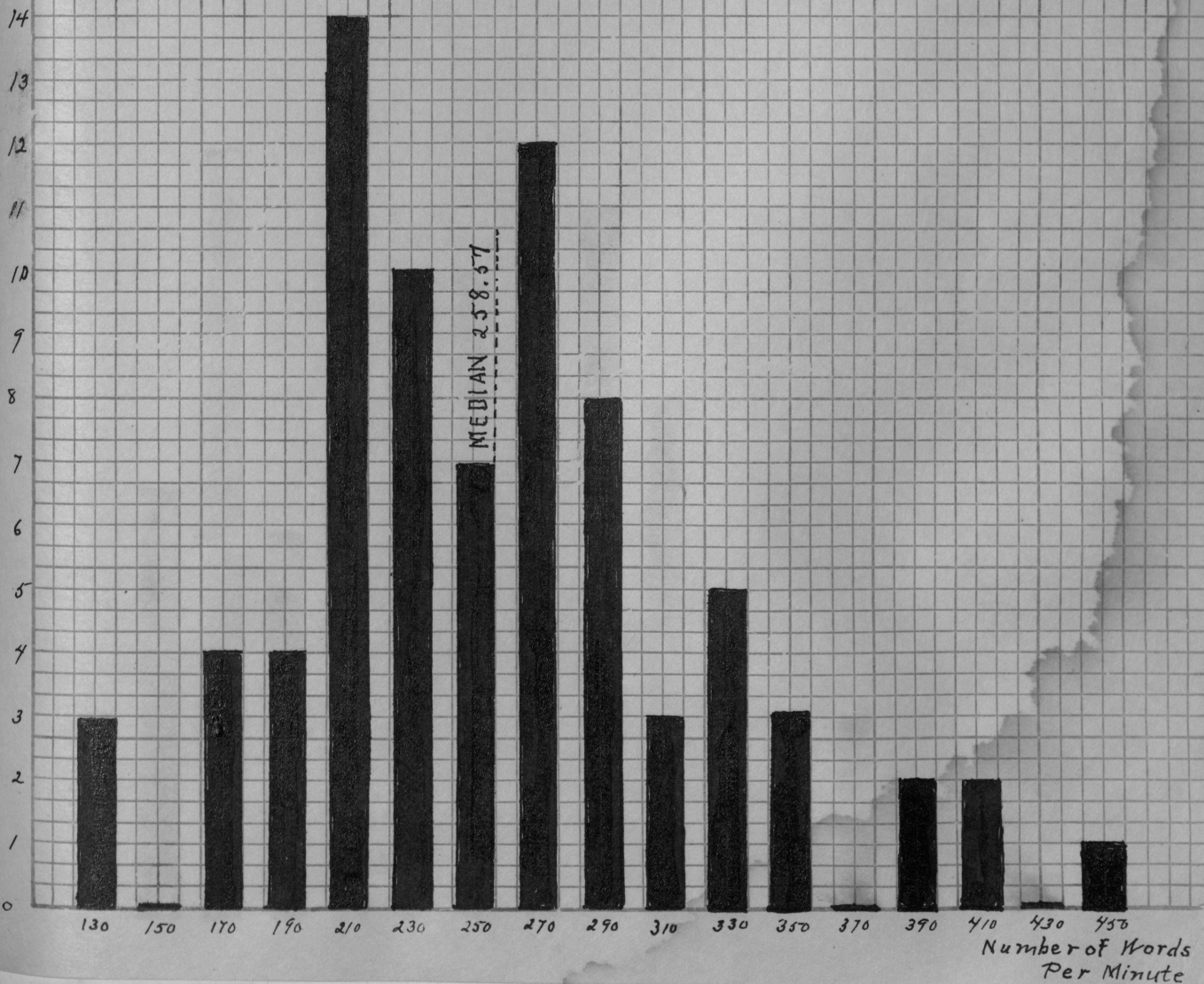
MEDIAN 178



## GRAPH III

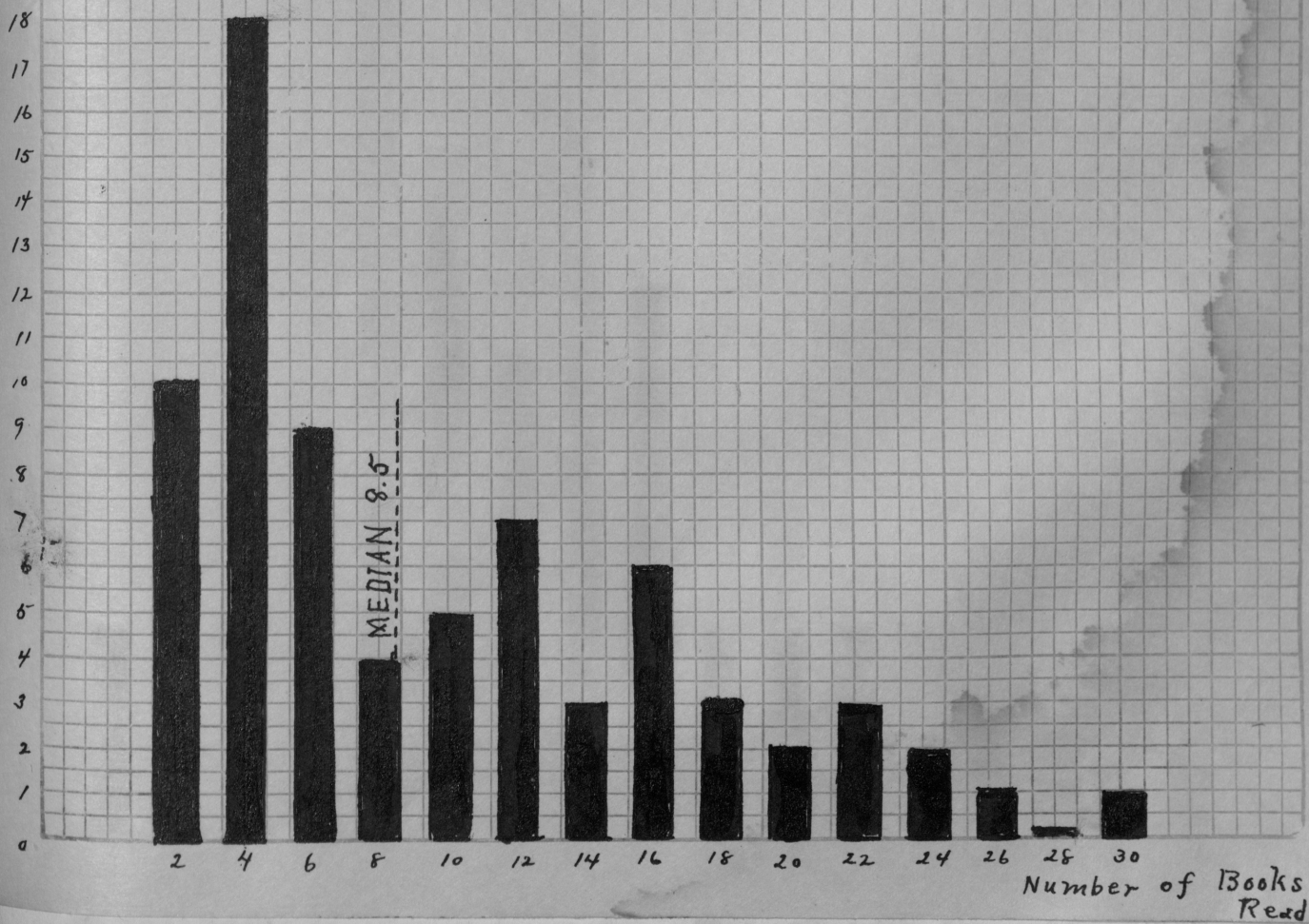
Frequencies of the Number of  
Words Read Per Minute.

(These are the data shown by Table V).



## GRAPH IV

Frequencies of the Number of  
Books Read. (These are the data  
shown by Table IV).





## CORRELATION EXPLAINED

Having the intelligence quotients, the scores for comprehension, the rates of reading, and the number of books read by each of the 76 pupils in this study we find it possible to determine the relation between any two of these variables.

When we desire to find the relation between two variables, for instance, general intelligence and mechanical ability, we wish to find out whether those who have a high degree of intelligence, also have a tendency to do well in mechanical work. Both traits would need to be measured by grades or marks or tests used for the specific purpose of ascertaining these abilities.

"The statistical device whereby relationship is expressed on a quantitative scale is called the "coefficient of correlation," and is designated by the letter 'r'," says Garrett.<sup>1</sup>

The coefficient of correlation is expressed decimally. A correlation of 1. is called a perfect

<sup>1</sup>Henry E. Garrett. Statistics in Psychology and Education. Longmans, Green and Co. New York 1926. p. 149.

correlation. Otis<sup>2</sup> says; "Perfect correlation between two variables denotes the maximum tendency for a high value in the other and vice versa."

On the other hand, if there is little or no correspondence in the degree or amount of capacity possessed by a given individual in the traits measured by the two tests, and the coefficient of correlation r will equal zero, this means that there is no correlation present.

Besides expressing a perfect correlation and no correlation at all, we may wish to express a negative correlation. A large degree of one ability may be associated with a small degree of another, or vice versa. When this inverse relation is present, r equals -1.00.

To illustrate, suppose that in a certain group of boys, we find that the boy who has the highest intelligence quotient ranks lowest in his mechanical work. The relation here is perfect, but negative

<sup>2</sup>Authur S. Otis. Statistical Method in Educational Measurement. World Book Co. Chicago. 1925.

and the coefficient of correlation equals -1.00. Actual instances of negative correlation are rare. Psychologists generally believe that there is correlation between abilities rather than compensation.

The entire range, then, of coefficients of correlation may be from -1.00 through 0 to 1.00. When coefficients are found at intermediate points on the positive scale, the values are interpreted as follows:

r from .00 to .20 denotes indifferent or negligible relation.

r from .20 to .40 denotes low correlation: present but slight.

r from .40 to .70 denotes substantial or marked relationship.

r from .70 to 1.00 denotes high relation.

Strictly speaking, the term "high correlation" should be applied only to coefficients which are .95 or above, says Garrett.<sup>3</sup>

Letting x and y represent two variables to be correlated, deviations are taken from their two averages and the formula becomes:

$$r = \frac{\sum x'y' - C_x C_y}{\sqrt{Q_x \cdot Q_y}}$$

<sup>3</sup>Henry E. Garrett. Statistics in Psychology and Education. Ibid. p. 298.

The probable error (P. E.) of correlation is the probable divergence of an obtained score from the true score. For instance, P. E.  $\pm .09$  means that there is a fifty-fifty chance that a correlation between two traits would not vary more than  $\pm .09$ . It shows how reliable the coefficient of correlation is. Garrett<sup>4</sup> says to be reasonably sure that there is some correlation present, an obtained  $\underline{r}$  should be at least four times its P. E. To be certain of a low degree of correlation an  $\underline{r}$  should be five or six times its P. E. The formula for finding the P. E. of an  $\underline{r}$  may be found from the formula, 
$$P. E. r = \frac{.6745 \times (1-r^2)}{\sqrt{n}}$$

TABLE VII

TABLE SHOWING THE CORRELATION OF INTELLIGENCE  
 QUOTIENTS AND COMPREHENSION IN READING  
 FOR 76 IX A GRADE PUPILS

| Reading<br>Compre-<br>hension | Intelligence Quotients |       |       |       |       |         |         |         |         |         |         |         |         | Totals |         |
|-------------------------------|------------------------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|---------|---------|--------|---------|
|                               | 75-79                  | 80-84 | 85-89 | 90-94 | 95-99 | 100-104 | 105-109 | 110-114 | 115-119 | 120-124 | 125-129 | 130-134 | 135-140 |        | 140-144 |
| 110-119                       |                        |       | 1     | 1     | 1     |         |         |         |         |         |         |         |         |        | 3       |
| 120-129                       |                        | 1     | 2     | 1     |       |         |         |         |         |         |         |         |         |        | 4       |
| 130-139                       | 1                      | 1     |       | 2     |       |         |         |         |         |         |         |         |         |        | 4       |
| 140-149                       |                        | 1     | 1     |       | 2     |         | 1       |         |         |         |         |         |         |        | 5       |
| 150-159                       |                        | 1     |       | 1     |       | 3       |         |         |         |         |         |         |         |        | 5       |
| 160-169                       |                        |       | 1     | 1     | 1     | 2       | 1       | 2       |         | 1       |         |         |         |        | 9       |
| 170-179                       |                        |       |       | 1     | 2     | 4       | 2       |         |         | 1       |         |         |         |        | 10      |
| 180-189                       |                        |       |       | 1     |       | 1       | 2       | 4       |         |         |         |         |         |        | 8       |
| 190-199                       |                        |       |       |       |       | 1       | 4       | 5       | 1       |         |         |         |         |        | 11      |
| 200-209                       |                        |       |       |       | 1     | 2       | 1       | 1       |         | 1       | 1       | 1       |         |        | 8       |
| 210-219                       |                        |       |       |       |       |         |         |         |         |         | 2       |         |         | 1      | 3       |
| 220-229                       |                        |       |       |       |       |         |         |         |         | 1       |         |         |         |        | 1       |
| 230-239                       |                        |       |       |       |       |         |         | 1       |         |         |         | 1       |         | 1      | 3       |
| 240-249                       |                        |       |       |       |       |         |         | 1       |         |         |         |         |         |        | 1       |
| 250-259                       |                        |       |       |       |       |         |         |         |         |         |         |         |         | 1      | 1       |
| Totals                        | 1                      | 4     | 5     | 8     | 7     | 13      | 11      | 14      | 1       | 4       | 3       | 8       | 0       | 3      | 76      |

$r = .783$   
 $P. E. = \pm .034$

TABLE VIII

SHOWING THE CORRELATION OF INTELLIGENCE  
 QUOTIENTS AND THE READING RATE FOR 76 IXA GRADE PUPILS

| Intelligence<br>Quotients | Reading Rate |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Total |     |     |    |
|---------------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|----|
|                           | 150          | 150 | 170 | 190 | 210 | 230 | 250 | 270 | 290 | 310 | 330 | 350 | 370 | 390 | 410 | 430 |       | 450 | 470 |    |
|                           | 149          | 169 | 189 | 209 | 229 | 249 | 269 | 289 | 309 | 329 | 349 | 369 | 389 | 409 | 429 | 449 | 469   | 480 |     |    |
| 75-79                     |              |     |     |     |     | 1   |     |     |     |     |     |     |     |     |     |     |       |     |     | 11 |
| 80-84                     |              |     |     |     | 1   | 1   | 1   |     |     |     |     |     | 1   |     |     |     |       |     |     | 4  |
| 85-89                     | 1            |     | 2   |     |     | 1   |     |     |     | 1   |     |     |     |     |     |     |       |     |     | 5  |
| 90-94                     | 1            |     | 1   | 1   | 2   | 1   |     | 1   |     | 1   |     |     |     |     |     |     |       |     |     | 8  |
| 95-99                     |              |     |     |     | 4   |     |     |     | 1   |     | 1   | 1   |     |     |     |     |       |     |     | 7  |
| 100-104                   | 1            |     | 1   |     | 1   |     | 2   | 3   | 3   | 1   |     |     | 1   |     |     |     |       |     |     | 13 |
| 105-109                   |              |     |     | 1   | 2   | 2   | 2   | 2   | 2   |     | 1   |     |     |     |     |     |       |     |     | 11 |
| 110-114                   |              |     |     | 1   | 3   | 2   | 2   | 3   | 1   |     | 1   |     |     | 1   |     |     |       |     |     | 14 |
| 115-119                   |              |     |     |     |     |     |     | 1   |     |     |     |     |     |     |     |     |       |     |     | 1  |
| 120-124                   |              |     |     | 1   |     | 1   |     |     |     |     | 1   |     |     |     |     |     | 1     |     |     | 4  |
| 125-129                   |              |     |     |     | 1   |     |     | 1   | 1   |     |     |     |     |     |     |     |       |     |     | 3  |
| 130-134                   |              |     |     |     |     |     |     | 1   | 1   |     |     |     |     |     |     |     |       |     |     | 2  |
| 135-139                   |              |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |     |     | 0  |
| 140-144                   |              |     |     |     |     | 1   | 1   |     |     |     | 1   |     |     |     | 1   |     |       |     |     | 3  |
| Totals                    | 3            | 0   | 4   | 4   | 14  | 10  | 7   | 12  | 8   | 3   | 5   | 3   | 0   | 0   | 2   | 0   | 1     |     |     | 76 |

$r = .319$   
 $P.E. = \pm .069$

TABLE IX

TABLE SHOWING THE CORRELATION OF INTELLIGENCE  
 QUOTIENTS AND THE NUMBER OF BOOKS  
 READ BY 76 IX A GRADE PUPILS

| Number<br>of Books<br>Read | Intelligence Quotients |       |       |       |       |         |         |         |         |         |         |         |         |         | Totals |    |
|----------------------------|------------------------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|----|
|                            | 75-79                  | 80-84 | 85-89 | 90-94 | 95-99 | 100-104 | 105-109 | 110-114 | 115-119 | 120-124 | 125-129 | 130-134 | 135-139 | 140-144 |        |    |
|                            | 79                     | 84    | 89    | 94    | 99    | 104     | 109     | 114     | 119     | 124     | 129     | 134     | 139     | 144     |        |    |
| 2-3                        |                        |       |       | 3     | 1     | 2       |         | 2       |         | 1       | 1       |         |         |         | 10     |    |
| 4-5                        |                        | 2     | 4     | 3     | 1     | 2       | 3       | 3       |         |         |         |         |         |         | 18     |    |
| 6-7                        |                        | 1     | 1     |       | 1     | 2       | 2       | 1       |         |         | 1       |         |         |         | 9      |    |
| 8-9                        | 1                      |       |       |       | 1     |         | 1       | 1       |         |         |         |         |         |         | 4      |    |
| 10-11                      |                        |       |       |       |       | 1       | 2       | 1       |         |         |         |         |         | 1       | 5      |    |
| 12-13                      |                        |       |       |       | 1     | 1       | 1       | 1       |         | 1       |         | 2       |         |         | 7      |    |
| 14-15                      |                        |       |       | 2     |       |         |         | 1       |         |         |         |         |         |         | 3      |    |
| 16-17                      |                        |       |       |       |       | 1       | 2       | 2       | 1       |         |         |         |         |         | 6      |    |
| 18-19                      |                        |       |       |       | 1     |         |         | 1       |         |         |         |         |         | 1       | 3      |    |
| 20-21                      |                        |       |       |       | 1     |         |         | 1       |         |         |         |         |         |         | 2      |    |
| 22-23                      |                        | 1     |       |       |       |         |         |         |         | 2       | 1       |         |         |         | 4      |    |
| 24-25                      |                        |       |       |       |       | 2       |         |         |         |         |         |         |         |         | 2      |    |
| 26-27                      |                        |       |       |       |       | 1       |         |         |         |         |         |         |         |         | 1      |    |
| 28-29                      |                        |       |       |       |       |         |         |         |         |         |         |         |         |         | 0      |    |
| 30-31                      |                        |       |       |       |       | 1       |         |         |         |         |         |         |         | 1       | 2      |    |
| Totals                     | 1                      | 4     | 5     | 8     | 7     | 13      | 11      | 14      | 1       | 4       | 3       | 3       | 2       | 0       | 3      | 76 |

$r = .306$   
 P. E. =  $\pm .07$

TABLE X  
SHOWING THE CORRELATION OF COMPREHENSION  
AND READING RATE FOR 76 IXA GRADE PUPILS

Reading Rate

| Reading<br>Comprehension | 130 | 150 | 170 | 190 | 210 | 230 | 250 | 270 | 290 | 310 | 330 | 350 | 370 | 390 | 410 | 430 | 450 | 470 | Total |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|                          | 149 | 169 | 189 | 209 | 229 | 249 | 269 | 289 | 309 | 329 | 349 | 369 | 389 | 409 | 429 | 449 | 469 | 489 |       |
| 110-119                  | 1   |     | 1   |     | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     | 3     |
| 120-129                  |     |     | 1   | 1   |     | 1   | 1   |     |     |     |     |     |     |     |     |     |     |     | 4     |
| 130-139                  | 1   |     |     |     | 2   | 1   |     |     |     |     |     |     |     |     |     |     |     |     | 4     |
| 140-149                  |     |     | 1   |     | 1   | 2   |     |     |     |     | 1   |     |     |     |     |     |     |     | 5     |
| 150-159                  | 1   |     | 1   |     |     | 1   |     | 1   |     |     |     | 1   |     |     |     |     |     |     | 5     |
| 160-169                  |     |     |     | 2   |     |     | 1   | 3   | 1   | 1   |     |     |     |     | 1   |     |     |     | 9     |
| 170-179                  |     |     |     |     | 4   | 1   | 2   | 1   | 2   |     |     |     |     |     |     |     |     |     | 10    |
| 180-189                  |     |     |     | 1   | 1   |     | 1   | 3   |     | 1   |     | 1   |     |     |     |     |     |     | 8     |
| 190-199                  |     |     |     |     | 3   | 3   | 1   | 2   | 1   |     | 1   |     |     |     |     |     |     |     | 11    |
| 200-209                  |     |     |     |     | 2   |     | 1   | 1   | 1   | 1   |     | 1   |     |     |     |     | 1   |     | 8     |
| 210-219                  |     |     |     |     |     | 1   |     | 1   | 1   |     |     |     |     |     |     |     |     |     | 3     |
| 220-229                  |     |     |     |     |     |     |     |     |     |     | 1   |     |     |     |     |     |     |     | 1     |
| 230-239                  |     |     |     |     |     |     |     |     | 1   |     | 2   |     |     |     |     |     |     |     | 3     |
| 240-249                  |     |     |     |     |     |     |     |     | 1   |     |     |     |     |     |     |     |     |     | 1     |
| 250-259                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 1   |     |     |     | 1     |
| 260-269                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| Totals                   | 3   | 0   | 4   | 4   | 14  | 10  | 7   | 12  | 8   | 3   | 5   | 3   | 0   | 0   | 2   | 0   | 1   | 0   | 76    |

r = .418  
P.E. = ±.064



TABLE XI  
SHOWING THE CORRELATION OF RATE OF READING  
AND NUMBER OF BOOKS READ BY 76 IX A GRADE PUPILS

| Number of Books Read | 130 | 150 | 170 | 190 | 210 | 230 | 250 | 270 | 290 | 310 | 330 | 350 | 370 | 390 | 410 | 430 | 450 | 470 | Totals |
|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
|                      | 149 | 169 | 189 | 209 | 229 | 249 | 269 | 289 | 309 | 329 | 349 | 369 | 389 | 409 | 429 | 449 | 469 | 489 |        |
| 2-3                  | 1   |     | 2   | 1   | 2   | 1   | 2   |     | 1   |     |     |     |     |     |     |     |     |     | 10     |
| 4-5                  | 2   |     | 2   | 1   | 3   | 3   | 2   | 1   | 1   | 1   | 1   |     |     |     | 1   |     |     |     | 18     |
| 6-7                  |     |     |     | 1   | 4   | 1   | 1   | 2   |     |     |     |     |     |     |     |     |     |     | 9      |
| 8-9                  |     |     |     |     |     | 1   | 1   | 1   |     |     |     | 1   |     |     |     |     |     |     | 4      |
| 10-11                |     |     |     |     | 1   | 1   | 1   | 1   |     |     |     | 1   |     |     |     |     |     |     | 5      |
| 12-13                |     |     |     |     | 1   | 2   |     | 1   | 2   |     | 1   |     |     |     |     |     |     |     | 7      |
| 14-15                |     |     |     |     | 1   |     |     | 1   |     | 1   |     |     |     |     |     |     |     |     | 3      |
| 16-17                |     |     |     | 1   |     | 1   |     | 3   | 1   |     |     |     |     |     |     |     |     |     | 6      |
| 18-19                |     |     |     |     | 1   |     |     | 1   |     |     | 1   |     |     |     |     |     |     |     | 3      |
| 20-21                |     |     |     |     | 1   |     |     |     |     |     | 1   |     |     |     |     |     |     |     | 2      |
| 22-23                |     |     |     |     |     |     |     |     | 1   |     | 1   | 1   |     |     |     |     | 1   |     | 4      |
| 24-25                |     |     |     |     |     |     |     | 1   | 1   |     |     |     |     |     |     |     |     |     | 2      |
| 26-27                |     |     |     |     |     |     |     |     | 1   |     |     |     |     |     |     |     |     |     | 1      |
| 28-29                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 0      |
| 30-31                |     |     |     |     |     |     |     |     |     |     | 1   |     |     |     | 1   |     |     |     | 2      |
| Totals               | 3   | 0   | 4   | 4   | 14  | 10  | 7   | 12  | 8   | 3   | 5   | 3   | 0   | 0   | 2   | 0   | 1   | 0   | 86     |

$r = .511$   
 $P.E. = \pm .057$

50.

50.

TABLE XII  
 SHOWING THE CORRELATION OF READING COMPREHENSION  
 AND NUMBER OF BOOKS READ BY 76 IXA GRADE PUPILS.

| Reading<br>Comprehension | Number of Books Read |     |     |     |       |       |       |       |       |       |       |       |       |       |       | Totals |
|--------------------------|----------------------|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
|                          | 2-3                  | 4-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | 22-23 | 24-25 | 26-27 | 28-29 | 30-31 |        |
| 110-119                  | 2                    | 1   |     |     |       |       |       |       |       |       |       |       |       |       |       | 3      |
| 120-129                  |                      | 3   | 1   |     |       |       |       |       |       |       |       |       |       |       |       | 4      |
| 130-139                  | 1                    | 1   | 1   | 1   |       |       |       |       |       |       |       |       |       |       |       | 4      |
| 140-149                  |                      | 4   |     |     |       |       |       |       | 1     |       |       |       |       |       |       | 5      |
| 150-159                  | 2                    | 1   | 1   |     |       |       |       |       |       |       | 1     |       |       |       |       | 5      |
| 160-169                  | 1                    | 4   |     |     |       | 1     | 1     | 2     |       |       |       |       |       |       |       | 9      |
| 170-179                  |                      | 1   | 3   |     | 1     | 2     |       |       | 1     |       |       | 2     |       |       |       | 10     |
| 180-189                  | 1                    | 1   | 1   | 1   | 2     |       | 1     |       | 1     |       |       |       |       |       |       | 8      |
| 190-199                  | 1                    | 1   |     |     | 1     | 2     | 1     | 3     |       | 1     |       |       | 1     |       |       | 11     |
| 200-209                  | 2                    |     | 1   | 2   |       | 1     |       |       |       |       | 1     |       |       |       | 1     | 8      |
| 210-219                  |                      |     | 1   |     | 1     |       |       |       |       |       | 1     |       |       |       |       | 3      |
| 220-229                  |                      |     |     |     |       |       |       |       |       |       | 1     |       |       |       |       | 1      |
| 230-239                  |                      | 1   |     |     |       | 1     |       |       | 1     |       |       |       |       |       |       | 3      |
| 240-249                  |                      |     |     |     |       |       |       | 1     |       |       |       |       |       |       |       | 1      |
| 250-259                  |                      |     |     |     |       |       |       |       |       |       |       |       |       |       | 1     | 1      |
| 260-269                  |                      |     |     |     |       |       |       |       |       |       |       |       |       |       |       | 0      |
| Totals                   | 10                   | 18  | 9   | 4   | 5     | 7     | 3     | 6     | 3     | 2     | 4     | 2     | 1     | 0     | 2     | 76     |

r = .459  
 P.E. = ±.06

TABLE XIII

TABLE OF COEFFICIENTS OF CORRELATION AND PROBABLE  
 ERRORS BETWEEN INTELLIGENCE QUOTIENTS, COMPREHENSION IN READING, RATE OF READING, AND THE  
 NUMBER OF BOOKS READ BY 76 IX A  
 GRADE PUPILS

| Items Correlated  | r    | P. E. |
|---|------|-------|
| 1. Intelligence Quotients and Reading Comprehension.....    | .783 | ±.034 |
| 2. Intelligence Quotients and Reading Rate.....             | .319 | ±.069 |
| 3. Intelligence Quotients and the Number of Books Read..... | .306 | ±.07  |
| 4. Comprehension in Reading and Reading Rate.....           | .418 | ±.064 |
| 5. Reading Rate and Number of Books Read.....               | .511 | ±.057 |
| 6. Number of Books Read and Reading Comprehension.....      | .459 | ±.06  |

EXPLANATION AND DISCUSSION OF THE  
RESULTS AS SHOWN BY THE CORRELATION  
TABLES

Table VII shows that the correlation between the intelligence quotients and comprehension in reading was .783, with a probable error of  $\pm .034$ . Since the probable error shows how reliable the coefficient of correlation is, the data show, in this case, that were we to select other groups comparable with this one and compute the correlations between their intelligence quotients and their scores for reading comprehension, there is a fifty-fifty chance that the coefficients of correlation would range from .649 to .817.

According to the usual values assigned to coefficients of correlation, this is a very high coefficient. These figures bear out the idea that general intelligence is, to a high degree, the measure of a pupil's capacity to do the work of the school, since comprehension in reading is basic for practically every other subject.

The question may then be raised as to whether the reading ability of the pupil is so closely related to intelligence that little can be done to raise it above his mental ability.

Dudley found in his study, "Can the High School Pupil Improve His Reading Ability?" that the correlation between reading ability and intelligence was 0.79 in dull classes; in the control group it was 0.80. He also found that those with the lowest intelligence made the greatest gains in reading ability.

In Table I it can be seen that the range of the intelligence quotients is sixty-four points; the range of the mental ages is six years and one month. As explained on p.26, the mental age is that degree of general ability which is possessed by the average child of corresponding chronological age; general intelligence is thought of as a pupil's capacity to do the work of the school.

In Table VII the correlation between the reading comprehension and the intelligence quotients is seen to be .783. It is interesting to note that when the mental ages were

substituted for the intelligence quotients in this correlation the result was .791, a difference of .008. Because this group does not represent a random sampling, but a select group of one grade, the difference in the use of either of these two variables is negligible.

The coefficient of correlation between the intelligence quotients and the reading rates of this group was found to be .319, with a probable error of .069. This does not indicate a very high correlation between these variables, but several factors may have affected the results in this study. It was explained in Chapter IV that the test given to ascertain the rate of reading was not a standardized test; so no norms are established for it. Table V shows that the median for the number of words read per minutes was 258.57.

Courtis<sup>1</sup> says: "The most evident measurable elements in skill in silent reading are the

1. S. A. Courtis, "Standards in Rates of Reading," Fourteenth Yearbook, Part I, p. 45.

number of words per minute and the degree of assimilation of the content. The first is easily measured; the second only indirectly through some form of reproduction."

Courtis<sup>1</sup> found by experiment that children in Trade VIII, asked to read at their natural rate of speed, read prose at the rate of 280 words per minute and reproduced fifty per cent of the ideas in a four-hundred-word passage after one reading.

An important factor, then, in a pupil's reading ability is his power to reproduce accurately and fully.

There are three factors that will partly explain the difference in rate of the Lawrence group and the Courtis group: (1) This group was just beginning the IX A grade work. (2) The IX A<sup>3</sup> group had a number of very slow readers whose rates tended to lower the total average. (3) Because questions were asked over the practical exercise and some of the pupils failed to answer

1. S. A. Courtis, "Standards in Rates of Reading." Fourteenth Yearbook, Part I, p. 65.

them, they read the real story more slowly and carefully.

The writer does not know how much drill had been given to this particular group for speed in reading.

Experimenters have noted some very marked improvements in the rate of reading, due to drill given in the grades, the high school, or the college.

Professor Witty's records in his classes in Psychology of Reading at the University of Kansas show the following results as obtained by records of progress and by tests. The average mean gain in rate and comprehension in the winter classes was 46%; in the summer classes 32%. Points gained in ability to summarize at intervals of five or six weeks were as follows:

|    |    |    |
|----|----|----|
| 66 | 78 | 82 |
| 61 | 74 | 88 |
| 52 | 72 | 78 |
| 56 | 78 | 86 |

At the beginning of the term, the correlation



between rate and comprehension was  $.78 \pm .09$ ; four and a half weeks later it was  $.81 \pm .07$ ; near the close of the term it was  $.86 \pm .04$ .

The results, on the whole, disclose (1) an increase in rate and comprehension; (2) an improvement in ability to study by increasing the rate of reading.

The correlation between comprehension and rate of reading (Table X) is  $.418$ , with a probable error of  $\pm .064$ . Of the six correlations found in this study, this one varies most from our expectations. Because recent studies have shown that both these variables, by drill, can be improved and do usually have a high correlation; we naturally seek to justify low correlations. The same explanation that was given for the results in Table VIII apply to these results.

In connection with the study of reading abilities and their improvement, possibly no phase has been more carefully studied than the relation of rate and comprehension; Wyman and

Wendell<sup>3</sup> in their study found that the best test for reading ability is the Terman Group Test for mental ability; that what teachers call reading ability correlates more highly with what the Terman test measures than with what the so-called reading tests measure; that rate of reading can not be considered a test of reading at all in so far as our criteria measure reading ability.

They found a correlation between reading ability and the Terman Group Test to be  $.98 \pm 0.05$ .

A careful critic, however, might well challenge their criteria for measurement, because subjective judgments of teachers entered into an estimate of the reading ability of the group studied.

The correlation between the rate of reading and the number of books read in this group was .511, with a probable error of  $\pm .057$ . This is a marked correlation and about what we would predict between these two variables. The rapid

3. J. Benson Wyman and Miriam Wendle, "What Is Reading Ability?" Journal of Educational Psychology, Vol. 12. p. 530.

reader is naturally gratified with his progress, and his interest, too, would help to increase his rate of reading as well as the number of books read.

The correlation between the rate of reading and the number of books read was .459; the probable error was  $\pm .06$ . Here again, there is a "marked" tendency for the one variable, comprehension, to be accompanied by a high value as to the amount of reading. It is only natural for a child to read widely if he is able to read understandingly.

TABLE XIV

SHOWING THE PER CENT EACH TYPE IS OF  
 THE TOTAL NUMBER OF BOOKS READ  
 BY THIS GROUP

| Types                   | Boys  | Girls |
|-------------------------|-------|-------|
| Fiction                 | 33.69 | 62.43 |
| Plays                   | .267  | .267  |
| Poems                   | .0    | .534  |
| Essays                  | .0    | .0    |
| Interesting Non-Fiction | 1.203 | 1.07  |
| Travel and Adventure    | .267  | .133  |
| Biography               | .0    | .0    |
| Letters                 | .0    | .0    |
| Speeches                | .0    | .0    |
| Total                   | 35.56 | 64.43 |

Before any conclusions are drawn regarding the per cent of various types of reading shown in Table XIV, it is interesting to note the close relationship between the results of this study and a few of the similar ones referred to in Chapter II. Following is a table showing the per cent of the various types that Thurber<sup>1</sup> found in his study of the voluntary reading done in the high school:

| Light modern<br>fiction | Essays<br>Biography<br>Science | Poetry | So-called<br>Literature |
|-------------------------|--------------------------------|--------|-------------------------|
| 91                      | 5                              | 1      | 2                       |

With a slightly different classification, Jordan's<sup>2</sup> study of the reading done by ninth-grade pupils disclosed the following per cent for each of the various grades of stories:

<sup>1</sup> Samuel Thurber, Jr. "Voluntary Reading in the Classical High School." School Review. Vol. XIII. pp. 168-179.

<sup>2</sup> Arthur M. Jordan. Children's Interests in Reading. No. 107. Teachers College, Columbia University. New York City. 1921.

| Grades of Stories | Boys | Girls |
|-------------------|------|-------|
| Adventure         | 95   | 65    |
| Travel            | 72   | 52    |
| Great Men         | 70   | 48    |
| Great Women       | 22   | 52    |
| Love              | 21   | 48    |
| Ghosts            | 14   | 19    |
| Detective         | 28   | 21    |
| War               | 84   | 35    |

In comparing the results of these three studies, we find that the majority of pupils representative of the age of ninth-grade pupils, thirteen to sixteen years, are interested in stories containing dramatic, heroic, and interesting action, stories of adventure, interesting characters, and child life. They want stories dealing with the life of to-day, with the experiences of young people, with growth and transformation.

The practical value of discovering children's interests in reading selections lies chiefly in the

application of a knowledge of those interests to the choice and organization of subject matter.

Washburne and Vogel's<sup>3</sup> study attempted to find the age and degree of reading ability necessary for the children's enjoyment of the books they read. Washburne<sup>4</sup> said: "To be able to recommend to each child a book which will fit both his age and his reading ability, with reasonable certainty that he will enjoy the book, is an important desideratum in elementary education."

<sup>3</sup>Carleton . Washburne and Mabel Vogel. Winnetka Graded Book List. American Library Association. Chicago. 1926.

<sup>4</sup>Washburne and Vogel. Ibid. p. 11.

The results in Table XIV, at a glance, may challenge validation. One may question, What does the large predominance of fiction index in regard to the interests of this group of readers?

In the Books for Home Reading<sup>1</sup>, fiction is subdivided into

1. First Year and Junior High School.

(Representative authors are Kingsley, Clemens, Tarkington, Burnett, S. E. White, and others).

2. Novels.

(Authors in this group are Stevenson, Masefield, Cable, Rinehart, Galsworthy).

3. Short Stories.

(Authors are Kipling, Noyes, Ollivant, Conrad, O'Henry.)

4. Collections of Short Stories.

(Authors are Heydrick, Smith, Lasalle, O'Brien.)

1. This list of books is explained on p. 23.



Because this division is rather a broad and indefinite one, another classification seems justified and better suited to the books actually read by this group. There is necessarily an overlapping in any attempted classification. One can readily see the difficulty in determining whether Daddy Long-Legs should be classed under the caption of "humorous fiction" or under "stories portraying school life;" of placing Huckleberry Finn under "historical novels" or "character sketches."

After an analysis of the list of 730 books of fiction read by these pupils, Table XV represents an attempt to classify the reading as nearly as possible according to the nine dominant elements found in the lists of the 76 pupils.

An examination and comparison of this list with the tables of Thurber and Jordan show that the boys of this age are especially interested in stories of war and strenuous adventure; the girls' interests center around the home, school, and sentimental novels.

It should be noted in comparing the figures for boys and girls that the boys number 30, while 46 of the total 76 pupils are girls.

An examination of the list further discloses the tendency for the boys to choose more of their books from this list of Books for Home Reading than do the girls.

The writer does not know whether or not the pupils listed the books in the order of their reading, but in a number of cases it was noticeable that when a boy read a novel of the sentimental type, he seldom followed it with a book of the same type or by the same author; with the girls the tendency was just reversed.

Most of the books in these lists were selected from the city library where the pupils were familiarized with the list. Various groups in the list are accompanied by brief descriptions to guide the reader in his choice; for instance: "Kipps ( A young cockney gets money and learns lessons)."

Considering the proportion of fiction and non-fiction listed in the "Books for Home Reading", we

would scarcely expect a smaller proportion of their reading to be chosen from fiction than the table shows. Furthermore, as fiction is that literature which comprises all works of the imagination, narrative or dramatic in form; since the junior high school age is the one at which these forms appeal most strongly; and since there is in this class the best type of "human interest" writers to select from, we can readily see that from a psychological basis, the choice of the large proportion of fiction is only a normal one from which these pupils would select their reading.

Might it not be an interesting study of pupils' characters, their moral and vocational tendencies, to analyze critically the lists of voluntary reading in their "formative" period of life?

With mental maturity, with training and development of the pupils' tastes for the so-called literature, the non-fiction types will increase during the later years in the high school and the college; but fiction will always retain a prominent place in the list of the average adult reader.

TABLE XV

SHOWING THE PER CENT OF THE  
 VARIOUS TYPES OF THE ENTIRE  
 AMOUNT OF FICTION<sup>1</sup> READ BY THE  
 BOYS AND GIRLS OF THIS GROUP

| Fiction  | Boys | Girls |
|--|------|-------|
| Novels with a Purpose- Character<br>Sketches, etc.     | 8.6  | 12.5  |
| Stories of Adventure -Far North,<br>West, War, Romance | 56.1 | 16.6  |
| Juvenile Stories                                       | 4.4  | 7.1   |
| Detective, Mystery, and Fairy Stories                  | 14.2 | 6.2   |
| Humorous Fiction                                       | 3.7  | 7.5   |
| Sentimental Novels                                     | 2.6  | 16.6  |
| Stories Portraying Home and School<br>Life             | 2.6  | 28.5  |
| Historical Novels                                      | 1.4  | 2.3   |
| Nature and Animal Stories                              | 5.9  | 3.02  |

1. This classification is based on the 730 books of fiction read by the 76 pupils in this group.

TABLE XVI

## THE TEN MOST POPULAR AUTHORS WITH THIS GROUP

| Rank | Author     |
|------|------------|
| 1    | Grey       |
| 2    | Hueston    |
| 3    | Curwood    |
| 4    | Terhune    |
| 5    | Rinehart   |
| 6    | Webster    |
| 7    | London     |
| 8    | Wright     |
| 9    | Tarkington |
| 10   | Bower      |

TABLE XVII

## THE TEN MOST POPULAR BOOKS WITH THIS GROUP

| Rank | Name of the Book          | Author     |
|------|---------------------------|------------|
| 1    | Prudence of the Parsonage | Hueston    |
| 2    | Prudence's Sisters        | Hueston    |
| 3    | Circular Staircase        | Rinehart   |
| 4    | Prudence's Daughters      | Hueston    |
| 5    | Anne of Green Gables      | Montgomery |
| 6    | Miss Minerva's Baby       | Sampson    |
| 7    | Lad, a Dog                | Terhune    |
| 8    | Laddie                    | Porter     |
| 9    | U. P. Trail               | Grey       |
| 10   | Freckles                  | Porter     |

## VARIABILITY WITHIN THE GROUP

The recognition of individual differences and an attempt to provide adequately for them are engaging the best thought and methods of instruction of present-day educators. Morgan states the general idea when he says: "The object of investigation of individual differences is not to smooth out all differences but to prevent gross deviations in the directions of undesirable traits."<sup>1</sup>

It is the teacher's duty to seek to discover elements of differences in her pupils in order that her instruction may be adapted to the various needs of each of them, and that she may thus have a better basis for modifying behavior.

Many investigations have been made to ascertain general sex differences and differences in their school achievements. An examination of Table XVIII verifies Thorndike's statement<sup>2</sup> in that the individual differences within one sex so outweigh the difference between the sexes in intellectual and semi-intellectual traits that for practical purposes sex differences may be disregarded.

1. John J. Morgan. The Psychology of the Unadjusted Child. The MacMillan Company, New York, 1924, p. 4.
2. Edward L. Thorndike, Educational Psychology. Mason Printing Corporation, New York, 1924, Chapter IX.

TABLE XVIII

SHOWING THE RANGE OF THE BOYS' AND THE GIRLS' INTELLIGENCE SCORES, READING COMPREHENSION SCORES, READING RATES, MENTAL AGES, CHRONOLOGICAL AGES, NUMBER OF BOOKS READ, TOTAL NUMBER OF BOOKS READ, AND THE AVERAGE NUMBER OF BOOKS READ.

|                                 | Boys            | Girls         |
|---------------------------------|-----------------|---------------|
| Intelligence Scores             | 80-143          | 79-142        |
| Reading Comprehension Scores    | 114-257         | 116-232       |
| Reading Rate - Words per Minute | 130-457         | 148-365       |
| Mental Ages                     | 13-4 to<br>19-2 | 13-2<br>16-11 |
| Chronological Ages              | 13-4<br>16-8    | 13-2<br>16-11 |
| Number of Books Read            | 2-31            | 3-31          |
| Total Number of Books Read      | 279             | 518           |
| Average Number of Books Read    | 9.3             | 11.26         |

## CHAPTER VI

## SUMMARY AND CONCLUSIONS

Following an analysis of the data obtained in the study of the mental and reading abilities and the reading interests of 76 IX A grade pupils in the junior high school of Lawrence, Kansas, answers to the questions asked in Chapter III may be summarized in the following conclusions:

1. A high correlation was found between intelligence and comprehension.
2. A low correlation was found between intelligence and the rate of reading.
3. The lowest correlation in the study was found between intelligence and the number of books read.
4. The correlation between rate and comprehension is much lower than recent investigators have found it to be in their studies and drill classes.
5. There was a marked correlation between the rate of reading and the amount of reading done.



6. The correlation between reading comprehension and the number of books read was but slightly less than the relation between the rate and amount of reading done.

7. The reading interests of this group disclose similar tastes found in larger groups of the same grade studied elsewhere.

8. The favorite authors with the boys of this group are those whose books deal with Boy Scouts, school sports, heroism, and strenuous adventures; the girls' interests tend to center about stories portraying home and school life, about romance, and the sentimental novel.

## APPENDIX

## Inserts:

- A. The Terman Group  
Intelligence Test.
- B. The test devised for  
reading rate.
- C. Stanford Achievement  
Test--Reading Examination:  
Form A, for Grades 2-8.

# TERMAN GROUP TEST OF MENTAL ABILITY

For Grades 7 to 12

Prepared by Lewis M. Terman, Stanford University, California

## EXAMINATION: FORM A

1. Name .....  
First name
Last name
2. Boy or girl ..... Grade ..... High or Low .....
3. Age last birthday ..... Date of birthday .....  
Month
Day
Year
4. Name of city (or county) .....
5. Name of school .....
6. Name of teacher .....
7. Date of this examination ..... 19.....  
Month
Day
Year

Do not turn the page until you are told to.

| TEST                 | SCORE | REMARKS OR FURTHER DATA |
|----------------------|-------|-------------------------|
| 1. Information       |       |                         |
| 2. Best Answer       |       |                         |
| 3. Word Meaning      |       |                         |
| 4. Logical Selection |       |                         |
| 5. Arithmetic        |       |                         |
| 6. Sentence Meaning  |       |                         |
| 7. Analogies         |       |                         |
| 8. Mixed Sentences   |       |                         |
| 9. Classification    |       |                         |
| 10. Number Series    |       |                         |
| Total                |       |                         |

## TEST 1. INFORMATION

Draw a line under the ONE word that makes the sentence true, as shown in the sample.

- SAMPLE. Our first President was  
Adams Jefferson Lincoln Washington
- 1 Coffee is a kind of  
bark berry leaf root ..... 1
- 2 Sirloin is a cut of  
beef mutton pork veal ..... 2
- 3 Gasoline comes from  
grains petroleum turpentine seeds ..... 3
- 4 Most exports go from  
Boston San Francisco New Orleans New York. 4
- 5 The number of pounds in a ton is  
1000 2000 3000 4000 ..... 5
- 6 Napoleon was defeated at  
Leipzig Paris Verdun Waterloo ..... 6
- 7 Emeralds are usually  
blue green red yellow ..... 7
- 8 The optic nerve is for  
seeing hearing tasting feeling ..... 8
- 9 Larceny is a term used in  
medicine theology law pedagogy ..... 9
- 10 Sponges come from  
animals farms forests mines ..... 10
- 11 Confucius founded the religion of the  
Persians Italians Chinese Indians ..... 11
- 12 The larynx is in the  
abdomen head throat shoulder ..... 12
- 13 The piccolo is used in  
farming music photography typewriting ..... 13
- 14 The kilowatt measures  
rainfall wind-power electricity water-power .... 14
- 15 The guillotine causes  
death disease fever sickness ..... 15
- 16 A character in "David Copperfield" is  
Sindbad Uriah Heep Rebecca Hamlet ..... 16
- 17 A windlass is used for  
boring cutting lifting squeezing ..... 17
- 18 A great law-giver of the Hebrews was  
Abraham David Moses Saul ..... 18
- 19 A six-sided figure is called a  
scholium parallelogram hexagon trapezium .... 19
- 20 A meter is nearest in length to the  
inch foot yard rod ..... 20

Right.....

## TEST 2. BEST ANSWER

FORM A

Read each question or statement and make a cross  
before the BEST answer, as shown in the sample.

- SAMPLE { Why do we buy clocks? Because
- 1 We like to hear them strike.
  - 2 They have hands.
  - × 3 They tell us the time.

- 1 Spokes of a wheel are often made of hickory because
  - 1 Hickory is tough.
  - 2 It cuts easily.
  - 3 It takes paint nicely.
- 2 The saying, "A watched pot never boils," means
  - 1 We should never watch a pot on the fire.
  - 2 Boiling takes a long time.
  - 3 Time passes slowly when we are waiting for something.
- 3 A train is harder to stop than an automobile because
  - 1 It has more wheels.
  - 2 It is heavier.
  - 3 Its brakes are not so good.
- 4 The saying, "Make hay while the sun shines," means
  - 1 Hay is made in summer.
  - 2 We should make the most of our opportunities.
  - 3 Hay should not be cut at night.
- 5 If the earth were nearer the sun
  - 1 The stars would disappear.
  - 2 Our months would be longer.
  - 3 The earth would be warmer.
- 6 The saying, "If wishes were horses, beggars would ride," means
  - 1 Wishing doesn't get us very far.
  - 2 Beggars often wish for horses to ride.
  - 3 Beggars are always asking for something.
- 7 The saying, "Little strokes fell great oaks," means
  - 1 Oak trees are weak.
  - 2 Little strokes are best.
  - 3 Continued effort brings results.
- 8 A steel battleship floats because
  - 1 The engines hold it up.
  - 2 It has much air space inside.
  - 3 It contains some wood.
- 9 The feathers on a bird's wings help him to fly because
  - 1 They make a wide, light surface.
  - 2 They keep the air off his body.
  - 3 They decrease the bird's weight.
- 10 The saying, "A carpenter should stick to his bench," means
  - 1 Carpenters should not work without benches.
  - 2 Carpenters should not be idle.
  - 3 One should work at the thing he can do best.
- 11 The saying, "One swallow does not make a summer," means
  - 1 Swallows come back for the summer.
  - 2 A single sign is not sufficient proof.
  - 3 Many birds add to the pleasures of summer.

*Right*..... × 2 = *Score*.....

### TEST 3. WORD MEANING

FORM A

When two words mean the SAME, draw a line under "SAME."  
When they mean the OPPOSITE, draw a line under "OPPOSITE."

|         |                              |                     |                        |  |
|---------|------------------------------|---------------------|------------------------|--|
| SAMPLES | {                            | fall — drop .....   | same — opposite        |  |
|         |                              | north — south ..... | same — <u>opposite</u> |  |
|         |                              |                     |                        |  |
| 1       | expel — retain .....         | same — opposite     | 1                      |  |
| 2       | comfort — console .....      | same — opposite     | 2                      |  |
| 3       | waste — conserve .....       | same — opposite     | 3                      |  |
| 4       | monotony — variety .....     | same — opposite     | 4                      |  |
| 5       | quell — subdue .....         | same — opposite     | 5                      |  |
|         |                              |                     |                        |  |
| 6       | major — minor .....          | same — opposite     | 6                      |  |
| 7       | boldness — audacity .....    | same — opposite     | 7                      |  |
| 8       | exult — rejoice .....        | same — opposite     | 8                      |  |
| 9       | prohibit — allow .....       | same — opposite     | 9                      |  |
| 10      | debase — degrade .....       | same — opposite     | 10                     |  |
|         |                              |                     |                        |  |
| 11      | recline — stand .....        | same — opposite     | 11                     |  |
| 12      | approve — veto .....         | same — opposite     | 12                     |  |
| 13      | amateur — expert .....       | same — opposite     | 13                     |  |
| 14      | evade — shun .....           | same — opposite     | 14                     |  |
| 15      | tart — acid .....            | same — opposite     | 15                     |  |
|         |                              |                     |                        |  |
| 16      | concede — deny .....         | same — opposite     | 16                     |  |
| 17      | tonic — stimulant .....      | same — opposite     | 17                     |  |
| 18      | incite — quell .....         | same — opposite     | 18                     |  |
| 19      | economy — frugality .....    | same — opposite     | 19                     |  |
| 20      | rash — prudent .....         | same — opposite     | 20                     |  |
|         |                              |                     |                        |  |
| 21      | obtuse — acute .....         | same — opposite     | 21                     |  |
| 22      | transient — permanent .....  | same — opposite     | 22                     |  |
| 23      | expel — eject .....          | same — opposite     | 23                     |  |
| 24      | hoax — deception .....       | same — opposite     | 24                     |  |
| 25      | docile — submissive .....    | same — opposite     | 25                     |  |
|         |                              |                     |                        |  |
| 26      | wax — wane .....             | same — opposite     | 26                     |  |
| 27      | incite — instigate .....     | same — opposite     | 27                     |  |
| 28      | reverence — veneration ..... | same — opposite     | 28                     |  |
| 29      | asset — liability .....      | same — opposite     | 29                     |  |
| 30      | appease — placate .....      | same — opposite     | 30                     |  |

Right.....Wrong.....Score.....

## TEST 4. LOGICAL SELECTION

In each sentence draw a line under the TWO words that tell what the thing ALWAYS has. Underline TWO, and ONLY TWO, in each line.

- SAMPLE. A man always has  
body cap gloves mouth money
- 1 A horse always has  
 harness hoofs shoes stable tail ..... 1
  - 2 A circle always has  
 altitude circumference latitude longitude radius ..... 2
  - 3 A bird always has  
 bones eggs beak nest song ..... 3
  - 4 Music always has  
 listener piano rhythm sound violin ..... 4
  - 5 An object always has  
 smell size taste value weight ..... 5
  - 6 Conversation always has  
 agreement persons questions wit speech ..... 6
  - 7 A banquet always has  
 food music persons speeches toastmaster ..... 7
  - 8 A pistol always has  
 barrel bullet cartridge sights trigger ..... 8
  - 9 A ship always has  
 engine guns keel rudder sails ..... 9
  - 10 A debt always involves  
 creditor debtor interest mortgage payment ..... 10
  - 11 A game always has  
 cards contestants forfeits penalties rules ..... 11
  - 12 A magazine always has  
 advertisements paper pictures print stories ..... 12
  - 13 A museum always has  
 animals arrangement collections minerals visitors ..... 13
  - 14 A forest always has  
 animals flowers shade underbrush trees ..... 14
  - 15 A citizen always has  
 country occupation privileges property vote ..... 15
  - 16 Controversy always involves  
 claims disagreement dislike enmity hatred ..... 16
  - 17 War always has  
 airplanes cannons combat rifles soldiers ..... 17
  - 18 Obstacles always bring  
 difficulty discouragement failure hindrance stimulation .. 18
  - 19 Abhorrence always involves  
 aversion dislike fear rage timidity ..... 19
  - 20 Compromise always involves  
 adjustment agreement friendship respect satisfaction ... 20

Right .....

## TEST 5. ARITHMETIC

Find the answers as quickly as you can.  
Write the answers on the dotted lines.  
Use the bottom of the page to figure on.

- 
- 1 How many hours will it take a person to go 66 miles at the rate of 6 miles an hour? *Answer* .....
  - 2 At the rate of 2 for 5 cents, how many pencils can you buy for 50 cents? *Answer* .....
  - 3 If a man earns \$20 a week and spends \$14, how long will it take him to save \$300? *Answer* .....
  - 4  $2 \times 3 \times 4 \times 6$  is how many times as much as  $3 \times 4$ ? *Answer* .....
  - 5 If two pies cost 66 cents, what does a sixth of a pie cost? *Answer* .....
  - 6 What is  $16\frac{2}{3}$  per cent of \$120? *Answer* .....
  - 7 4 per cent of \$1000 is the same as 8 per cent of what amount? *Answer* .....
  - 8 A has \$180, B has  $\frac{2}{3}$  as much as A, and C has  $\frac{1}{2}$  as much as B. How much have all together? *Answer* .....
  - 9 The capacity of a rectangular bin is 48 cubic feet. If the bin is 6 feet long and 4 feet wide, how deep is it? *Answer* .....
  - 10 If it takes 7 men 2 days to dig a 140-foot ditch, how many men are needed to dig it in half a day? *Answer* .....
  - 11 A man spends  $\frac{1}{4}$  of his salary for board and room, and  $\frac{3}{8}$  for all other expenses. What per cent of his salary does he save? *Answer* .....
  - 12 If a man runs 100 yards in 10 seconds, how many feet does he run in  $\frac{1}{5}$  of a second? *Answer* .....

*Right* .....  $\times 2 =$  *Score* .....



## TEST 6. SENTENCE MEANING

Draw a line under the right answer, as shown in the samples.

|         |   |  |            |           |    |
|---------|---|--|------------|-----------|----|
| SAMPLES | { | Is coal obtained from mines? . . . . .                       | <u>Yes</u> | No        |    |
|         |   | Are all men six feet tall? . . . . .                         | Yes        | <u>No</u> |    |
| 1       |   | Does a conscientious person ever make mistakes? . . . . .    | Yes        | No        | 1  |
| 2       |   | Is an alloy a kind of musical instrument? . . . . .          | Yes        | No        | 2  |
| 3       |   | Is scurvy a kind of medicine? . . . . .                      | Yes        | No        | 3  |
| 4       |   | Are mysterious things often uncanny? . . . . .               | Yes        | No        | 4  |
| 5       |   | Are destitute persons often subjects of charity? . . . . .   | Yes        | No        | 5  |
| 6       |   | Are anonymous letters ever properly signed? . . . . .        | Yes        | No        | 6  |
| 7       |   | Is the mimeograph sometimes used by stenographers? . . . . . | Yes        | No        | 7  |
| 8       |   | Is a curriculum intended for horses? . . . . .               | Yes        | No        | 8  |
| 9       |   | Are proteids essential to health? . . . . .                  | Yes        | No        | 9  |
| 10      |   | Does "perfunctory" mean the same as "careful"? . . . . .     | Yes        | No        | 10 |
| 11      |   | Are premeditated deeds always wicked? . . . . .              | Yes        | No        | 11 |
| 12      |   | Do alleged facts often require verification? . . . . .       | Yes        | No        | 12 |
| 13      |   | Are sheep carnivorous? . . . . .                             | Yes        | No        | 13 |
| 14      |   | Are aristocrats subservient to their inferiors? . . . . .    | Yes        | No        | 14 |
| 15      |   | Are venerable people usually respected? . . . . .            | Yes        | No        | 15 |
| 16      |   | Is clematis sometimes cultivated? . . . . .                  | Yes        | No        | 16 |
| 17      |   | Are ultimate results the last to appear? . . . . .           | Yes        | No        | 17 |
| 18      |   | Are cerebral hemorrhages helpful to thinking? . . . . .      | Yes        | No        | 18 |
| 19      |   | Are all people religious who have hallucinations? . . . . .  | Yes        | No        | 19 |
| 20      |   | Are intermittent sounds discontinuous? . . . . .             | Yes        | No        | 20 |
| 21      |   | Are sable colors preferred for nations' flags? . . . . .     | Yes        | No        | 21 |
| 22      |   | Does social contact tend to reduce eccentricities? . . . . . | Yes        | No        | 22 |
| 23      |   | Are tentative decisions usually final? . . . . .             | Yes        | No        | 23 |
| 24      |   | Is rancor usually characterized by persistence? . . . . .    | Yes        | No        | 24 |

Right . . . . . Wrong . . . . . Score . . . . .



TEST 8. MIXED SENTENCES

FORM A

The words in each sentence below are mixed up. If what a sentence means is TRUE, draw a line under "TRUE." If what it means is FALSE, draw a line under "FALSE."

|         |   |   |             |              |    |
|---------|---|---|-------------|--------------|----|
| SAMPLES | { | hear are with to ears . . . . .                         | <u>true</u> | false        |    |
|         |   | eat gunpowder to good is . . . . .                      | true        | <u>false</u> |    |
| 1       |   | true bought cannot friendship be . . . . .              | true        | false        | 1  |
| 2       |   | good sea drink to is water . . . . .                    | true        | false        | 2  |
| 3       |   | of is the peace war opposite. . . . .                   | true        | false        | 3  |
| 4       |   | get grow they as children taller older. . . . .         | true        | false        | 4  |
| 5       |   | horses automobile an are than slower. . . . .           | true        | false        | 5  |
| 6       |   | never deeds rewarded be should good . . . . .           | true        | false        | 6  |
| 7       |   | four hundred all pages contain books. . . . .           | true        | false        | 7  |
| 8       |   | to advice sometimes is good follow hard . . . . .       | true        | false        | 8  |
| 9       |   | envy bad greed traits are and . . . . .                 | true        | false        | 9  |
| 10      |   | grow an than strawberries oak tree higher . . . . .     | true        | false        | 10 |
| 11      |   | external deceive never appearances us . . . . .         | true        | false        | 11 |
| 12      |   | never is man what show a deeds. . . . .                 | true        | false        | 12 |
| 13      |   | hatred bad unfriendliness traits are and . . . . .      | true        | false        | 13 |
| 14      |   | often judge can we actions man his by a . . . . .       | true        | false        | 14 |
| 15      |   | in are always American cities born presidents . . . . . | true        | false        | 15 |
| 16      |   | certain always death of cause kinds sickness . . . . .  | true        | false        | 16 |
| 17      |   | are sheet blankets as as a never warm. . . . .          | true        | false        | 17 |
| 18      |   | never who heedless those stumble are . . . . .          | true        | false        | 18 |

Right . . . . . Wrong . . . . . Score . . . . .

TEST 9. CLASSIFICATION

FORM A

SAMPLES { 1 bullet cannon gun sword pencil  
2 Canada Chicago China India France

In each line cross out the word that does not belong there.  
Cross out JUST ONE WORD in each line.

- 
- 1 Frank James John Sarah William ..... 1
  - 2 Baptist Catholic Methodist Presbyterian Republican.. 2
  - 3 automobile bicycle buggy telegraph train ..... 3
  - 4 Collie Holstein Shepherd Spitz Terrier..... 4
  - 5 hop run skip stand walk ..... 5
  
  - 6 death grief picnic poverty sadness ..... 6
  - 7 bed chair dish sofa table..... 7
  - 8 hard rough smooth soft sweet ..... 8
  - 9 mechanic doctor lawyer preacher teacher ..... 9
  - 10 Christ Confucius Mohammed Moses Cæsar ..... 10
  
  - 11 butterfly hawk ostrich robin swallow ..... 11
  - 12 cloth cotton flax hemp wool..... 12
  - 13 digestion hearing sight smell touch..... 13
  - 14 down hither recent up yonder ..... 14
  - 15 anger hatred joy pity reasoning ..... 15
  
  - 16 Australia Cuba Iceland Ireland Spain ..... 16
  - 17 Dewey Farragut Grant Paul Jones Schley ..... 17
  - 18 give lend lose keep waste ..... 18

Right.....

## TEST 10. NUMBER SERIES

FORM A

|         |   |    |    |    |    |    |    |    |
|---------|---|----|----|----|----|----|----|----|
| SAMPLES | { | 5  | 10 | 15 | 20 | 25 | 30 | 35 |
|         |   | 20 | 18 | 16 | 14 | 12 | 10 | 8  |

In each row try to find out how the numbers are made up, then on the two dotted lines write the TWO numbers that should come next.

|          |      |                 |      |                 |                 |                 |               |       |       |
|----------|------|-----------------|------|-----------------|-----------------|-----------------|---------------|-------|-------|
| 1st Row  |      | 8               | 7    | 6               | 5               | 4               | 3             | ..... | ..... |
| 2d Row   |      | 3               | 8    | 13              | 18              | 23              | 28            | ..... | ..... |
| 3d Row   |      | $11\frac{3}{4}$ | 12   | $12\frac{1}{4}$ | $12\frac{1}{2}$ | $12\frac{3}{4}$ | .....         | ..... |       |
| 4th Row  |      | 8               | 8    | 6               | 6               | 4               | 4             | ..... | ..... |
| 5th Row  |      | 1               | 2    | 4               | 8               | 16              | 32            | ..... | ..... |
| 6th Row  |      | 4               | 3    | 5               | 4               | 6               | 5             | 7     | ..... |
| 7th Row  |      | 16              | 8    | 4               | 2               | 1               | $\frac{1}{2}$ | ..... | ..... |
| 8th Row  |      | 8               | 9    | 12              | 13              | 16              | 17            | ..... | ..... |
| 9th Row  | 7    | 11              | 15   | 16              | 20              | 24              | 25            | 29    | ..... |
| 10th Row | 31.3 | 40.3            | 49.3 | 58.3            | 67.3            | 76.3            | .....         | ..... |       |
| 11th Row |      |                 |      | $\frac{1}{25}$  | $\frac{1}{5}$   | 1               | 5             | ..... | ..... |
| 12th Row |      | 3               | 4    | 6               | 9               | 13              | 18            | ..... | ..... |

*Right* .....  $\times 2 =$  *Score* .....

Harvey Birch was a staunch patriot who served as an American spy during the Revolutionary War. The satisfactory performance of his duty required that not even the American soldiers should suspect his being an American spy. American officers suspected him of trying to obtain valuable information for the British. As a result he was greatly distrusted and harassed by them. It was not until after his death, when a paper found on his person was read, that the true nobility of his service to his country was understood. The paper, signed by Washington, reads as follows:

"Circumstances of political importance, which involve the lives and fortunes of many, have hitherto kept secret what this paper now reveals. Harvey Birch has for years been a faithful and unrequited servant of his country. Though man does not, may God reward him for his conduct."

Captain Lawton of the American army was particularly bitter against Birch ever since the unaccountable disappearance of the latter when entrusted to the care of his most faithful troops. The following is an account of the incident, taken from "The Spy."

A twelve month had not elapsed, since Birch had been seen lingering near the headquarters of the commander-in-chief, and at a time when important movements were expected hourly to occur. So soon as the information of this fact was communicated to the officer whose duty it was to guard the avenues of the American camp, he dispatched Captain Lawton in pursuit of the pedlar.

Acquainted with all the passes of the hills, and indefatigable in the discharge of his duty, the trooper had, with much trouble and toil, succeeded in effecting his object. The party had halted at a farm-house for the purposes of refreshment, and the prisoner was placed in a room by himself, but under the keeping of the two men before mentioned; all that was known subsequently is, that a woman was seen busily engaged in the employments of the household near the sentinels, and was particularly attentive to the wants of the captain, until he was deeply engaged in the employments of the supper-table.

Afterwards, neither woman nor pedlar was to be found. The pack, indeed, was discovered open, and nearly empty, and a small door, communicating with a room adjoining to the one in which the pedlar had been secured, was ajar.

(THE END)

Look up and get your number.

The gathering mists of the evening had begun to darken the valley, as the troops under Captain Lawton made their reappearance at its southern extremity. The march of the troops was slow, and their line extended, for the benefit of ease. In the front rode the Captain, side by side with a fellow officer, apparently engaged in close conference, while the rear was brought up by a young cornet, humming an air, and thinking of the sweets of a straw bed after the fatigues of a hard day's duty.

Stretching forward his body in the direction he was gazing, as if to aid him in distinguishing objects through the darkness, the Captain asked, "What animal is moving through the field on our right?"

"'Tis a man," said Mason, looking intently at the suspicious object.

"By his hump 'tis a dromedary!" added the Captain, eyeing it keenly. Wheeling his horse suddenly from the highway, he exclaimed—"Harvey Birch!—take him, dead or alive!"

Mason and a few of the leading cavalymen only understood the sudden cry, but it was heard throughout the line. A dozen of the men, with the Lieutenant at their head, followed the impetuous Lawton, and their speed threatened Birch with sudden capture.

Birch had prudently kept his position on the rock until evening had begun to shroud the surrounding objects in darkness. From this height he had seen all of the events of the day as they occurred.

He had watched, with a beating heart, the departure of the troops under Dunwoodie, and with difficulty had curbed his impatience until the obscurity of night should render his moving free from danger. He had not, however, completed a fourth of his way to his own residence, when his quick ear distinguished the tread of the approaching horse.

Trusting to the increasing darkness, he determined to go on. By crouching and moving quickly along the surface of the ground, he hoped yet to escape unseen. Captain Lawton was too much occupied in conversation to allow his eyes to indulge in their usual wandering; and the pedlar, perceiving by the voices that the enemy he most feared had passed, yielded to his impatience, and stood erect, in order to make greater progress. The

moment his body arose above the shadow of the ground, it was recognized by Lawton, and the chase commenced.

For a single instant Birch was helpless, his blood curling in his veins at the nearness of the danger. But it was only for a moment. Casting his pack where he stood, and instinctively tightening the belt he wore, the pedlar betook himself to flight. He knew that by bringing himself in a line with his pursuers and a wood, his form would be lost to sight. This he soon effected, and he was straining every nerve to gain the wood itself, when several horsemen rode by him but a short distance on his left, and cut him off from this place of refuge.

The pedlar threw himself on the ground as they came near him, and was passed unseen. But delay, now, became too dangerous for him to remain in that position. He accordingly arose, and, still keeping in the shadow of the wood, along the skirts of which he heard voices crying to each other to be watchful, he ran with incredible speed in a parallel line, but in an opposite direction, to the march of the horsemen.

The confusion of the chase had been heard by the whole of the men, though none distinctly understood the order of Lawton but the few who followed him. The remainder were lost in doubt as to the duty that was required of them; and the young cornet was making eager inquiries of the trooper near him on the subject, when a man, at a short distance in his rear, crossed the road at a single bound. At the same instant, the powerful voice of Lawton rang through the valley, shouting—"Harvey Birch!—take him, dead or alive!"

Fifty pistols lighted the scene, and the bullets whistled in every direction round the head of the devoted pedlar. A feeling of despair seized his heart, and in the bitterness of that moment he exclaimed—"Hunted like a beast of the forest!"

He felt life and its accompaniments to be a burden, and was about to yield himself to his enemies. Nature, however, prevailed. If taken, there was great reason to believe that he would not be honored with the forms of a trial, but that most probably the rising sun would witness his execution; for he had already been condemned to death, and only escaped that fate by stratagem. These considerations, with the approaching footsteps of his pursuers, roused him to new exertions. He fled again.

A fragment of a wall, that had withstood the ravages made by war, fortunately crossed his path. He hardly had time to throw his exhausted limbs over this wall, before twenty of his enemies reached its opposite side.

Their horses refused to take the leap in the dark, and amid the confusion of the rearing chargers and the curses of their riders, Birch was enabled to gain a sight of the base of the hill on whose summit was a place of perfect security.

The heart of the pedlar now beat high with hope, when the voice of Captain Lawton again rang in his ears, shouting to his men to make room. The order was obeyed, and the fearless trooper rode at the wall at the top of his horse's speed, plunged the spurs in his charger, and flew over the obstacle in safety. The triumphant hurrahs of the men, and the thundering tread of the horse, too plainly assured the pedlar of the emergency of his danger. He was nearly exhausted, and his fate no longer seemed doubtful.

"Stop, or die!" was uttered above his head, and in fearful nearness to his ears.



Birch stole a glance over his shoulder, and saw, within a bound of him, the man he most dreaded. By the light of the stars he beheld the uplifted arm and the threatening sword. Fear, exhaustion, and despair seized his heart, and the intended victim fell at the feet of Lawton's horse. The horse struck the pedlar, and both steed and rider came violently to the earth.

As quick as thought Birch was on his feet again, with Lawton's sword in his hand. Vengeance seems but too natural to human passions. There are few who have not felt the tempting pleasure of making our injuries rebound on their authors; and yet there are some who know how much sweeter it is to return good for evil.

All the wrongs of the pedlar shone on his brain with a dazzling brightness. For a moment the demon of revenge within him controlled his actions, and Birch waved the powerful weapon in the air. The next moment, however, he let it fall harmless on the reviving but helpless trooper and vanished up the side of the friendly flock.

"Help Captain Lawton there!" cried Mason, as he rode up, followed by a dozen of his men; "and some of you dismount with me and search these rocks; the villain lies here concealed."

"Hold!" roared the discomfited Captain, raising himself with difficulty to his feet; "if one of you dismount, he dies. Tom, my good fellow, you will help me to straddle Roanoke again."

The astonished soldier obeyed in silence, while the wondering horsemen remained as fixed in their saddles as if they composed part of the animals they rode.

"You are much hurt, I fear," said Mason, with a feeling of sympathy in his manner, as they reentered the highway.

"Something so, I do believe," replied the Captain, catching his breath, and speaking with difficulty; "I wish our bonesetter was at hand to examine into the state of my ribs."

"Captain Lawton," said the orderly of his troop, riding to the side of his commanding officer, "we are now passing the house of the pedlar spy; is it your pleasure that we burn it?"

"No!" roared the Captain, in a voice that startled the disappointed Sergeant; "are you an incendiary? would you burn a house in cold blood? Let a spark approach, and the hand that carried it will never light another."

Adapted.

—James Fenimore Cooper.

Look up and get your number.

# Stanford Achievement Test

By TRUMAN L. KELLEY, GILES M. RUCH, and LEWIS M. TERMAN

## READING EXAMINATION: FORM A

FOR GRADES 2-8

Name..... Grade..... Boy or girl.....

Age..... When is your next birthday?..... How old will you be then?.....

Name of school..... Date.....

| TEST                          | SCORE |
|-------------------------------|-------|
| 1. Reading: Paragraph Meaning |       |
| 2. Reading: Sentence Meaning  |       |
| 3. Reading: Word Meaning      |       |
| TOTAL READING SCORE           |       |
| READING AGE                   |       |

*Note. This examination contains all the questions in the reading tests (Tests 1, 2, and 3) of the Primary and Advanced examinations. See page 5 of the Manual of Directions for the Stanford Achievement Test. Test 1 is found on the back page by turning the booklet from the bottom up.*

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago  
Copyright 1922 by World Book Company. Copyright in Great Britain. All rights reserved. SAT:RE:A-6

PRINTED IN U.S.A.

[ 1 ]

**To the Examiner: Do not administer this test without first reading carefully the Manual of Directions. The Manual must be ordered extra.**



## TEST 1. READING: PARAGRAPH MEANING

Sample: Dick and Tom were playing ball in the field. Dick was throwing the ball and.....  
was trying to catch it.

Write JUST ONE WORD on each dotted line.

- 1 Fanny has a little red hen. Every day the hen goes to her nest and lays an egg for Fanny to eat. Then she makes a funny noise to tell Fanny to come and get the.....
- 2 A kitten can climb a tree, but a dog cannot. This is very lucky for Nellie's kitten. Every time Joe's big dog comes along the kitten climbs a tree and the..... cannot follow.
- 3 Anna had never seen a squirrel in her life, although she had always wanted to very much. One day when she was playing under a tree she heard a funny little noise over her head. She looked up, and what do you think she saw? Up there in the..... was the very thing she had always wanted to see, a .....
- 4 John and Joe played one day till they were very hungry; so John went into the house and asked his mother for something to ..... When he came out again he had a big apple for himself and another for .....
- 5 One day when Jane was sweeping she found a dime on the floor under the bed. They could not find out whose dime it was, so Jane's mother gave it to her. Now, every time Jane ..... the floor she looks carefully under the bed for another.....
- 6 Helen and Kate pulled their sled through the deep snow to the top of the hill and soon were coasting swiftly down again. They did this over and over. The ..... was so deep that they found it hard work to drag the ..... to the top.
- 7 Once a black raven wanted to have white feathers like a swan. The raven saw that the swan lived in the water, and thought it was the water that made the swan's feathers so white. So the ..... decided to wash his feathers every day to see if it would not make them .....
- 8 Birds' eggs are almost as different from each other as are the birds themselves. The robin lays four or five blue eggs. The dove lays two white eggs. The sparrow lays six or eight speckled eggs. If we should find a nest with four blue eggs in it, we could be pretty sure that it was the nest of a ..... rather than of a ..... or dove.
- 9 Once there lived on a mountain near a village an immense giant whose cruelty kept the people of the village in great terror. However, there was one person in the village who was not afraid of the giant. This was a young soldier who carried a magic sword that a fairy had given him. Once when the ..... came down from the ..... the soldier attacked him with his magic ..... and killed him.
- 10 Once a hen was so foolish as to go to a fox and ask him to look after her chicks while she went to the barnyard to find some worms for her chicks. The fox was of course quite willing. The hen was gone a long time. When she finally returned, she found that the fox had eaten all her chicks. Since then no ..... has employed a ..... as a nurse.

Turn the page and go right on.

## TEST 1, CONTINUED

- 11 When the bear appeared near the hut, Walter was alone. His father had driven to the village, that morning, several miles away. Fortunately he had left his gun hanging on the wall loaded and ready for service. Walter was excited, but he did not hesitate. Quickly seizing the ..... he ..... the .....
- 12 In a certain village a ton of coal costs just as much as a cord of wood, but it produces twice as much heat. Therefore the poor families in this village should be advised to burn ..... rather than .....
- 13 "Come on," called Joe, "let's go for a swim down by Jones' Point, where the river is deep." "No," said Pete, "let's swim down by Duggan's, where the water is warmer." "It isn't because the water is warm that you want to go to ....., but because you can't swim," said .....
- 14 Richard and Miss Cabot quickly found their way alone to the house of Mr. Smith on Craven Street. Miss Cabot left Richard in the carriage, walked quickly to the door, and sending up her card by the servant, requested to see Mr. Smith. The ..... soon returned and begged her to come in. As soon as she had done so, Miss Cabot introduced herself to Mr. .... and begged him to come out and talk with ....., who was waiting outside in the carriage.
- 15 Joe made up a game which he called "Jac-alack." One person called Jack must climb a tree and hang by his arms from a low bough. The others stand behind him and say in unison, "Alas, alack, he fell on his back," and while they are saying it, one of them hits Jack with a bean bag. If Jack can see or guess who did it, he may drop down, and the guilty person takes his place. Otherwise he has to ..... there for another turn and sing out, "Alas, alack, another whack." It is quite a game and Jack must have strong .....
- 16 It is well established that the bee, which is commonly supposed to be so industrious, really works only two or three hours a day. The man who works eight or ten hours a day is therefore far more ..... than the .....
- 17 Boys and girls know my name. And mothers and fathers, too. Big folks love me. You do, too. The first letters in the first four sentences of this paragraph spell my name; so write it here.....
- 18 Energy is a measure of the fullness of life and is indispensable for genius. No energy at all is death. Idiots are feeble and listless. Nearly all the leaders of mankind have been noted for their remarkable .....
- 19 Deciduous trees lose their leaves in winter, while evergreens, as their name implies, do not. Therefore, in forests composed of ..... trees the ground is less shaded in winter than is the case in forests whose trees are .....
- 20 Some historians believe that the spread of anti-slavery feeling among the people of the North previous to the Civil War was due less to the moral issue involved than to the fact that they recognized the system of ..... as a menace to the industrial system of free labor.

Go right on to next page.

## TEST 1, CONTINUED

- 21 If I were writing about the rich, I should be inclined to divide them, according to their attitude toward life, into workers and parasites. The motto of the worker is, "I owe the world a life," and the motto of the ..... is, "The ..... owes me a living."
- 22 Caution, when not present in excess, is a desirable trait. Often it saves one from disappointment or failure. Occasionally, however, one finds a person so extremely ..... that his will is paralyzed and he is totally unable to set about any new undertaking. Too much ..... is indeed often ..... than too little.
- 23 A whale is not a fish, even though it does live in water. A fish has no lungs, is cold-blooded, and absorbs oxygen from the water through its gills; but a whale is warm-blooded and has a genuine set of lungs. In consequence, in bodily structure the ..... is ..... like a shark, which is a true fish, than it is like a horse.
- 24 The brook on our farm has many whims. It ripples over bright and shiny rocks, and falls into a placid little pool so clear that I can see the pebbles on the bottom and can see myself down there, too. As I look straight down, it is hard to tell whether what I see is my nose or a ....., but as I move a little, that which I see stands still, so I know it is not ..... Farther on the brook forgets the placid pool and tumbles over roots and rocks. It does, indeed, have many .....
- 25 To pant for recognition, to yearn to impress one's personality upon one's fellow-men, is the essence of ambition. The ambitious person may think that he merely thirsts to "do something" or "be somebody," but really what he craves is to figure potently in the minds of others; to be greatly loved, admired, or feared. To reap a success which no one ..... does not satisfy the yearnings of the ..... individual.
- 26 Washington was a very silent man. Of no man in the world's history do we have so few sayings of a personal kind. As for talking about himself, that was something in which he almost never indulged. Yet it would be a great error to interpret his ..... as an indication that he was in any sense cold or unfeeling.
- 27 As a rule, it is more economical to remember things by associating them clearly and vigorously than by going through many repetitions of them. Thus, a clear understanding of the causes for the Democratic victory in the national election in 1916 will be ..... effective in remembering the fact than a dozen ..... of the statement "Woodrow Wilson was elected in 1916."
- 28 Fundamentally, education depends upon the capacity of a person to profit by past experiences. Past situations modify present and future adjustments. Education in its broadest sense means acquiring experiences that serve to ..... existing inherited or acquired tendencies of behavior.
- 29 "Naïve" and "unsophisticated" are frequently confused. The former suggests a type of behavior which is artless, spontaneous, and free from the restraints of custom. The latter implies fully as great lack of knowledge of social usage, and, in addition, conduct which is primitive and perchance inelegant. Thus, the ..... youth was the first to enter the car, and his ..... little sister warmly kissed him in the presence of the king. We may also say that a country boy is ..... with respect to city life and customs.

Test 1. Number of blanks correctly filled .....  $\times 2 =$  Score .....

**TEST 2. READING: SENTENCE MEANING**

Samples: Can dogs bark?.....Yes No  
 Does a cat have six legs?.....Yes No

Read each question and draw a line under the right answer.

- 
- 1 Is milk white?.....Yes No 1  
 2 Do we sleep in beds?.....Yes No 2  
 3 Is the day as dark as night?.....Yes No 3  
 4 Is green a color?.....Yes No 4  
 5 Is smoke always yellow?.....Yes No 5  
 6 Do men and women dress just alike?..Yes No 6  
 7 Do ships sail on the sea?.....Yes No 7  
 8 Are all chimneys made of brass?.....Yes No 8  
 9 Are rocks hard?.....Yes No 9  
 10 Is everybody as huge as a giant?.....Yes No 10  
 11 Do pupils always have excellent memories?.....Yes No 11  
 12 Are brooms used to sweep bedrooms?.....Yes No 12  
 13 Are machines ever useful?.....Yes No 13  
 14 Are sugar and salt sold in stores?.....Yes No 14  
 15 Are geese generally clad in bonnets?.....Yes No 15  
 16 Do lambs roar?.....Yes No 16  
 17 Does crime always bring happiness?.....Yes No 17  
 18 Does justice sometimes seem cruel?.....Yes No 18  
 19 Could one cradle hold eighty infants?.....Yes No 19  
 20 Is a beetle very different from a mole?.....Yes No 20  
 21 Does the friendship of a cheerful person make us unhappy?...Yes No 21  
 22 Is a dime less than a nickel?.....Yes No 22  
 23 Is the guilty thief always located?.....Yes No 23  
 24 Is it ever important to hurry?.....Yes No 24  
 25 Might a prisoner feel sorrow at the ruin he has caused?.....Yes No 25  
 26 Are all antique benches made of bamboo?.....Yes No 26  
 27 Are battleships dedicated to warfare?.....Yes No 27  
 28 Can we discern things clearly in a dense fog?.....Yes No 28  
 29 Might a person suffer confusion during an examination?.....Yes No 29  
 30 Are marmalade and gruel made of milkweed?.....Yes No 30  
 31 Could delicious chocolate be served at a festival?.....Yes No 31  
 32 Do all university professors give instruction in science?.....Yes No 32  
 33 Does it take courage to perform a very dangerous task?.....Yes No 33  
 34 Should one always be censured for playing a flute by the fireplace?.....Yes No 34  
 35 Are homely people always loathed and disliked?.....Yes No 35  
 36 Is it deemed delightful to suffer a bloody defeat?.....Yes No 36  
 37 Would a man be fortunate if he could flee from a famine?.....Yes No 37  
 38 May careful observation be of considerable help in decreasing mistakes?..Yes No 38  
 39 Does speaking with brevity necessarily mean that one is peevish?.....Yes No 39  
 40 Are chimes ever played in a cathedral?.....Yes No 40

Go right on to next page.

## TEST 2, CONTINUED

|    |  |     |    |    |
|----|--|-----|----|----|
| 41 | Do repeated interruptions sometimes exasperate us?.....                | Yes | No | 41 |
| 42 | Should thieves be encouraged by giving them magnificent rewards?.....  | Yes | No | 42 |
| 43 | Are locusts and gnats generally believed to enjoy immortality?.....    | Yes | No | 43 |
| 44 | Might an accidental outbreak cause anxiety?.....                       | Yes | No | 44 |
| 45 | May shortages often be prevented by foresight?.....                    | Yes | No | 45 |
| 46 | Is an annual appeal made once a week?.....                             | Yes | No | 46 |
| 47 | May occasional opposition awaken us to greater endeavor?.....          | Yes | No | 47 |
| 48 | Is every earl destined to become a genius or a conqueror?.....         | Yes | No | 48 |
| 49 | Might a person show unfeigned enjoyment of a symphony?.....            | Yes | No | 49 |
| 50 | Are we irresistibly led to confide in every near-by idler?.....        | Yes | No | 50 |
| 51 | Do any considerable percentage of motorists use headlights?.....       | Yes | No | 51 |
| 52 | Does an auctioneer boost prices with earnestness?.....                 | Yes | No | 52 |
| 53 | Is it advisable to use dynamite as a lubricant?.....                   | Yes | No | 53 |
| 54 | Is a person in a frenzy likely to make wild gestures?.....             | Yes | No | 54 |
| 55 | Should the captain of a yacht consider the weather forecast?.....      | Yes | No | 55 |
| 56 | Would it take a considerable income to provide a sumptuous wardrobe?.. | Yes | No | 56 |
| 57 | Is it disgraceful to teach a defenseless person decimals?.....         | Yes | No | 57 |
| 58 | Is the idea of burial usually attractive?.....                         | Yes | No | 58 |
| 59 | May allies make exertion to enter into a federation?.....              | Yes | No | 59 |
| 60 | Should enthusiastic homage make a man indignant?.....                  | Yes | No | 60 |
| 61 | Could the imperious actions of a lordly person become notorious?.....  | Yes | No | 61 |
| 62 | Is all adventurous activity to be deplored?.....                       | Yes | No | 62 |
| 63 | Should a person be advised to sacrifice a good opportunity?.....       | Yes | No | 63 |
| 64 | Is a harmonious alliance sometimes expedient?.....                     | Yes | No | 64 |
| 65 | Could an eloquent lawmaker do anything heinous?.....                   | Yes | No | 65 |
| 66 | Is boric acid a chemical made of graphite?.....                        | Yes | No | 66 |
| 67 | Are all festivities characterized by extravagance?.....                | Yes | No | 67 |
| 68 | May imposition upon others become habitual?.....                       | Yes | No | 68 |
| 69 | Is a scarecrow a kind of inoffensive imitation?.....                   | Yes | No | 69 |
| 70 | Does bliss always befall desperate people?.....                        | Yes | No | 70 |
| 71 | Could congressional action cause the people to be dissatisfied?.....   | Yes | No | 71 |
| 72 | May seeing a person drunk decrease one's admiration for him?.....      | Yes | No | 72 |
| 73 | Could an inexperienced person be jovial and fascinating?.....          | Yes | No | 73 |
| 74 | Is one often assaulted by a boon companion?.....                       | Yes | No | 74 |
| 75 | Ought accursed liars to be suppressed?.....                            | Yes | No | 75 |
| 76 | Might an involuntary impulse impel one to be malicious?.....           | Yes | No | 76 |
| 77 | Is one necessarily inhospitable who dislikes an obnoxious guest?.....  | Yes | No | 77 |
| 78 | Does extreme audacity sometimes make us stand aghast?.....             | Yes | No | 78 |
| 79 | Is humanity subject to joyous emotions?.....                           | Yes | No | 79 |
| 80 | Might a hysterical person given to rashness be intolerable?.....       | Yes | No | 80 |

Number right .....

Number wrong .....

Test 2. Score (subtract) .....



## TEST 3. READING: WORD MEANING

Samples: Bread is something to catch drink eat throw wear

A robin is a bird cat dog girl horse

In each sentence draw a line under the word that makes the sentence true.

- 1 March is the name of a day food month week year ..... 1
- 2 A fat person is always bad blue cold heavy little ..... 2
- 3 A thing that is perfect is always close early hard little right ..... 3
- 4 A farmer often raises bears corn gold paper pictures ..... 4
- 5 Cotton is cool dark heavy soft sweet ..... 5
- 6 A husband is sometimes a father flower mother sister town ..... 6
- 7 A path is a place to eat dress die live walk ..... 7
- 8 A maiden is a bird boy girl king plant ..... 8
- 9 A lion is blue fine hot strong sweet ..... 9
- 10 Islands are land ships soldiers time water ..... 10
- 11 The ocean is fire land paper water wood ..... 11
- 12 Rice is a battle beast bell cloud grain ..... 12
- 13 A dove is a bird boat fish horse sheep ..... 13
- 14 To be silent is to be heard loud quick still wild ..... 14
- 15 Olives are to burn drink eat ride wear ..... 15
- 16 To crush is to break escape guard hold plant ..... 16
- 17 Rapid means long much quick small soft ..... 17
- 18 A moment means color form money time place ..... 18
- 19 To stitch is to reward sew starve suggest tempt ..... 19
- 20 A question is something we answer build eat grow kill ..... 20
- 21 Harbors are for churches cows gardens horses ships ..... 21
- 22 To polish is to bribe brighten smite thrive traverse ..... 22
- 23 To pronounce is to sail show speak stand watch ..... 23
- 24 A physician is a child doctor master noise valley ..... 24
- 25 A customer is a person who buys draws fishes hunts sells ..... 25
- 26 To wander is to improve locate roam situate wail ..... 26
- 27 To be sober is to be funny grave happy noisy wild ..... 27
- 28 An orphan is one who has no clothing education hair parents teeth ..... 28
- 29 To be active is to be hospitable humorous ignoble indolent sprightly ..... 29
- 30 To be wretched is to be proud silent swift unhappy valuable ..... 30
- 31 Independence means blame custom freedom mercy virtue ..... 31
- 32 Agriculture refers to authority appearance defense farming mystery ..... 32
- 33 To inquire is to appear ask rest sleep watch ..... 33
- 34 A tavern is a companion funeral parcel park hotel ..... 34
- 35 To be saucy is to be affectionate agreeable devoted dignified rude ..... 35
- 36 An argument is a discussion gully gymnasium penance perjury ..... 36
- 37 Jealous means affectionate appeased benevolent envious sympathetic ..... 37
- 38 Meek means gaudy gentle mean strength tight ..... 38
- 39 Gorgeous means frisky gigantic hereditary magnificent malicious ..... 39
- 40 A barge is a kind of animal boat castle fruit vegetable ..... 40

Go right on to next page.

## TEST 3, CONTINUED

|    |                                |              |             |              |               |              |       |    |
|----|--------------------------------|--------------|-------------|--------------|---------------|--------------|-------|----|
| 41 | Situation refers to            | noise        | number      | place        | pleasure      | time         | ..... | 41 |
| 42 | To plan is to                  | banish       | bestow      | design       | betray        | defeat       | ..... | 42 |
| 43 | Behavior refers to             | position     | conduct     | progress     | revenge       | temper       | ..... | 43 |
| 44 | A vagabond is a                | kite         | lantern     | nightingale  | tramp         | scholar      | ..... | 44 |
| 45 | Ambition means                 | aspiration   | frivolity   | loitering    | remorse       | slothfulness | ....  | 45 |
| 46 | A sluggard is                  | ambitious    | considerate | divine       | earnest       | lazy         | ..... | 46 |
| 47 | Victorious means               | baffled      | frustrated  | triumphant   | unstable      | vagrant      | ....  | 47 |
| 48 | To mingle is to                | mislead      | blend       | sanction     | screech       | scurry       | ..... | 48 |
| 49 | To heed is to                  | escape       | fancy       | hurry        | notice        | prove        | ..... | 49 |
| 50 | Dignified means                | lonely       | monstrous   | prominent    | spiritual     | stately      | ..... | 50 |
| 51 | An opponent is a               | delicacy     | antagonist  | detective    | diplomat      | hostess      | ..... | 51 |
| 52 | To prophesy is to              | assess       | bemoan      | cancel       | disclaim      | foretell     | ..... | 52 |
| 53 | Imperial affairs concern       | cities       | garments    | kingdoms     | machines      | patterns     | ..... | 53 |
| 54 | To massacre is to              | investigate  | lament      | manifest     | misunderstand | slaughter    | ..... | 54 |
| 55 | To be prompt is to be          | formal       | frightful   | hospitable   | punctual      | purified     | ....  | 55 |
| 56 | Listless means                 | indifferent  | loathsome   | malicious    | merciless     | presumptuous | ..... | 56 |
| 57 | To lament is to                | flatter      | humor       | injure       | lend          | mourn        | ..... | 57 |
| 58 | A prologue is a kind of        | introduction | knell       | prohibition  | sermon        | tempest      | ..... | 58 |
| 59 | Lifeless means                 | inanimate    | indefinite  | infamous     | undecided     | untidy       | ..... | 59 |
| 60 | An impression is a             | century      | compass     | copy         | globe         | pasture      | ..... | 60 |
| 61 | Crafty means                   | accurate     | proficient  | slavish      | submissive    | wily         | ..... | 61 |
| 62 | Liberality means               | promotion    | robbery     | reproof      | scandal       | generosity   | ..... | 62 |
| 63 | Jubilant means                 | abrupt       | abject      | confused     | triumphant    | doleful      | ..... | 63 |
| 64 | A bulwark is a                 | hospital     | hotel       | protection   | punishment    | purchase     | ..... | 64 |
| 65 | A legacy is an                 | inheritance  | inscription | levy         | receptacle    | regulation   | ..... | 65 |
| 66 | Maintenance means              | contention   | continuance | corruption   | cowardice     | resource     | ..... | 66 |
| 67 | To meditate is to              | escort       | gossip      | ponder       | transgress    | withhold     | ..... | 67 |
| 68 | Covetous means                 | avaricious   | bountiful   | gaudy        | gray-headed   | harassed     | ....  | 68 |
| 69 | Minimum means the              | largest      | least       | most         | newest        | oldest       | ..... | 69 |
| 70 | To chastise is to              | promise      | publish     | punish       | purchase      | trifle       | ..... | 70 |
| 71 | A sequel is something that     | excels       | follows     | interrupts   | precedes      | yields       | ..... | 71 |
| 72 | Ceaseless means                | boisterous   | diminished  | discontented | ended         | incessant    | ..... | 72 |
| 73 | Emphatic means                 | forcible     | frantic     | incurable    | pernicious    | reluctant    | ..... | 73 |
| 74 | To subvert means to            | overturn     | shorten     | sling        | sojourn       | spurn        | ..... | 74 |
| 75 | To be infamous is to be        | doubtful     | polished    | shameful     | sorrowful     | valuable     | ..... | 75 |
| 76 | To be languid is to be         | courteous    | domestic    | doubtful     | spiritless    | jolly        | ....  | 76 |
| 77 | An associate is an             | adversary    | ally        | antagonist   | emigrant      | ensign       | ..... | 77 |
| 78 | To be vigilant means to be     | aloof        | betrothed   | betwixt      | lawless       | watchful     | ..... | 78 |
| 79 | Decisive means                 | conclusive   | dazzled     | genuine      | profane       | prudent      | ..... | 79 |
| 80 | A scullion is a                | grasshopper  | gymnasium   | haycock      | hedgehog      | servant      | ....  | 80 |
| 81 | Usury has to do with           | chivalry     | fiction     | homage       | loans         | manufactures | ....  | 81 |
| 82 | Perspective has to do with     | drawing      | expenses    | mining       | religion      | warfare      | ..... | 82 |
| 83 | An insurrection is a           | fugitive     | rebellion   | publication  | punishment    | hermit       | ..... | 83 |
| 84 | A reprobate is one who is very | cowardly     | ugly        | wealthy      | wicked        | youthful     | ..... | 84 |
| 85 | Candid means                   | illegitimate | impeccable  | imperious    | incisive      | ingenuous    | ..... | 85 |

Test 3. Score.....

## BIBLIOGRAPHY

- ANDERSON, ROXANNA E. "A Preliminary Study of Reading Tastes of High School Pupils."  
Pedagogical Seminary. Vol. XIX.
- COURTIS, S. A. "Standards in Rates of Reading."  
Fourteenth Yearbook. Part I. 1915.
- CROW, CHARLES SUMNER. Evaluation of English Literature in the High School. Contributions to Education. No. 14. Teachers College, Columbia University. New York City. 1924.
- DICKINSON, CHARLES E. "A Study of the Relation of Reading Ability to Scholastic Achievement."  
School Review. October, 1925.
- DICKSON, VIRGIL A. Mental Tests and the Classroom Teacher. World Book Co. 1924. Chapter III.
- DUNK, FANNIE WYCKE. Interest Factors in Primary Reading Material. Contributions to Education. No. 113. Teachers College, Columbia University. New York City. 1921.

- FORMAN, W. O. "The Use Made of Leisure Time by Junior High School Pupils". The Elementary School Journal. July, 1926.
- GARRETT, HENRY E. Statistics in Psychology and Education. Longmans, Green and Co. New York. 1926.
- GRAY, WILLIAM SCOTT. "Summary of Reading Investigations (July 1, 1925, to June 30, 1926). 'I. The Elementary School Journal. Feb., 1927. pp. 456-466.
- "Summary of Investigations Relating to Reading". Supplementary Educational Monographs. No. 28. Department of Education, University of Chicago. 1925.
- GREEN, WARD H. "Comprehension in Literature." English Journal. Dec., 1926. University of Chicago Press. Chicago, Ill.
- HOSIC, JAMES FLEMING. Empirical Studies in School Reading. Contributions to Education. No. 114. Teachers College, Columbia University. New York City. 1921.

IRION, THEO. W. H. "Economy in the Teaching of High School Literature." English Journal.  
Feb. 1927.

-----Comprehension Difficulties in the Study of Literature. Teachers College Contributions to Literature. Vol. 189. Teachers College, Columbia University, New York City. 1925.

JONES, C. E. Sources of Interest in High School English. American Book Company. New York City. 1912.

JORDON, ARTHUR M. Children's Interests in Reading. Contributions to Education. No. 107. Teachers College, Columbia University. New York City. 1921.

LEHMAN, HARVEY C. "Reading Books 'Just for Fun'". The School Review. May, 1926.

LEONARD, STERLING A. "Relation between Reading and Literature." Twenty-Fourth Yearbook. Part I. Chapter VI. Public School Publishing Co. 1925.

MIXER, LILIAN B. "Voluntary Reading in the English High School". School Review. Vol. 13. 1905.

MONROE, WALTER S. Introduction to the Theory of Educational Measurements. Houghton Mifflin Company, Boston. 1923.

- OTIS, ARTHUR S. Statistical Method in Educational Measurement. World Book Company, Chicago. 1925.
- PRESSEY, LUELLE COLE. "Specific Elements Making for Proficiency in Silent Reading When General Intelligence Is Constant". School and Society. Nov. 6, 1926.
- PRESSEY, S. L. AND PRESSEY L. W. "The Relative Value of Rate and Comprehension Scores in Monroe's Silent Reading Test as Measures of Reading Ability." School and Society. Vol. XI. June 19, 1920.
- RASCHE, WILLIAM F. "Reading Habits Outside the School-room." School Review. Oct., 1925.
- RUGG, HAROLD O. Statistical Methods Applied to Education. Houghton Mifflin Company, Chicago, Ill. 1917.
- RUSSELL AND BULLOCK. "Some Observations of Children's Reading." N. E. A. Proceedings. 1897.
- SHAW, J. C. "Children's Reading". West Virginia Journal. October, 1897.

- SMITH, FRANKLIN ORION. "Pupils' Voluntary Reading."  
Pedagogical Seminary. Vol. XIV. 1907.
- THORNDIKE, EDWARD L. "The Psychology of Thinking in  
the Case of Reading." Teachers College,  
Columbia University. New York City.
- "Reading as Reasoning: a Study of Mistakes  
in Paragraph Reading." Journal of Educational  
Psychology. Vol. VIII. 1917.
- "Reading and the Study of Literature."  
Teachers College Record. May, 1901.
- THURBER, SAMUEL, JR. "Voluntary Reading in the Classical  
High School". School Review. Vol. XIII. 1905.
- UHL, WILLIS L. The Materials of Reading. Silver,  
Burdett and Company. New York. 1924.
- VOSTROSKY, C. "Children's Tastes in Reading."  
Pedagogical Seminary. Vol. VI. pp. 523-38.
- WALLACE, J. A. "A Plan for Outside Reading." School  
Review. Vol. XXI.
- WASHBURN, CARLETON, AND VOGEL, MABEL. Winnetka Graded  
Book List. American Library Association.  
Chicago. 1926.

- WILLETT, G. W. "The Reading Interests of High School Pupils". English Journal. Vol. VIII. 1919.
- WISSLER, CLARK. "Interests of Children in the Reading Work of the Elementary Schools". Pedagogical Seminary. Vol. V.
- WYMAN, BENSON J. AND WENDELL, MIRIAM. "What is Reading Ability?" Journal of Educational Psychology. Vol. XII.
- YOWELL, STELLA. "Are Children Reading?" Journal of Educational Research. Jan., 1927.