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of
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The undersigned, acting as a Committee
of the Graduate School, have read the accompanying
thesis submitted by Sister Jeanne Marie (Bennett)
for the degree of Master of Arts.

They approve it as a thesis meeting the require-
ments of the Graduate School of the University of
Minnesota, and recommend that it be accepted in
partial fulfillment of the requirements for the
degree of Master of Arts.

M. W. Wagener
Chairman

Hermione L. Healy

JUN 2 1919 1918

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of
Committee on Examination

This is to certify that we the undersigned, as a committee of the Graduate School, have given Sister Jeanne Marie (Bennett) final oral examination for the degree of Master of Arts . We recommend that the degree of Master of Arts be conferred upon the candidate.

Minneapolis, Minnesota

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STANDARD VOCABULARY TESTS
FOR
MENTAL AND EDUCATIONAL DIAGNOSIS

A Thesis submitted to the
Faculty of the Graduate School of the
University of Minnesota

by

Sister Jeanne Marie Bonnett

In partial fulfillment of the requirements
for the degree of
Master of Arts

June

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I. The Field: Brief History of Previous Investigations

Reading ability constitutes a complex of mental and physiological processes. Its measurement, to be accurate, must take account of more than one factor. Simplification of the problem has directed attention to the speed, comprehension, and vocabulary involved. Vocabulary tests have been devised¹ and presented along with reading tests. Thorndike prepared twenty-three (23) lists of ten words each. They measure the visual vocabulary of a child, requiring him to mark an "F" for each word in a group, which means "flower"; "A", for "animal"; "N", for a "boy's name"; and "G", for "game". Standard me-²dians have been computed for the first scale only. The Haggerty³ Visual Vocabulary Test, devised in exactly the same way as the Thorndike Scales, is now being standardized for grades⁴ in Minnesota. Jones limited his study to the vocabularies of children. Selecting from ten most widely used primers, he arranged words according to the frequency of their recurrence. His method of finding the class average, however, is complicated and the value assigned to each word is only arbitrary.

1. Thorndike Scales. (\$.40 a hundred; \$3.00 a thousand of one kind. Postage extra. Sample set, \$0.06 by mail.) Address Bureau of Publication, Teachers College, Columbia University.

2. Appendix, p.63.

3. Haggerty Scales. Address Bureau of Co-operative Research, College of Education, University of Minnesota, Minneapolis, Minnesota.

4. Jones' Scales. (Manual and Material for testing 100 pupils, \$2.00.) Address Rockford Printing Company, Rockford, Illinois.

¹
 Starch's list of one hundred words selected at random from a
 small dictionary permits an attainment which, when multiplied
 by 180, is intended to indicate the size of a pupil's vocabu-
²
 lary. Kirkpatrick was one of the first educators to experi-
 ment with a vocabulary test. Knowledge of words, according to
 his assertion, depends upon two factors; namely, variety in
 one's word environment and one's readiness to respond to the
³
 elements thereof. Terman and Child prepared a list like that
 of Starch. They used it as one element in determining the in-
⁴
 telligence quotient (I.Q.) of individuals. Whipple chose one
 word from each of one hundred fields of knowledge; with this
 test he proposed to discover the range of information of those
⁵
 tested. J. Carleton Bell's study of Whipple's test finds the
 widest range of information in History and in Literature.

The words for the vocabulary tests thus far prepared
 have been taken from one or other of three sources: from an
 abridged school dictionary, from primers, or from various fields
 of knowledge. No study has been made of the relative values of
 these three sources of words for tests. It is not known whether

1. Starch English Vocabulary Tests. (\$0.45 a hundred.) Ad-
 dress University Supply Association, Madison, Wisconsin.
2. Kirkpatrick, E. A. A Vocabulary Test. Popular Science
 Monthly. 70; 1907. pp. 157-164.
3. Terman and Child. Vocabulary Test. (Record booklets for
 the Stanford revision of the Binet Scale supplied in packages of
 25. Price \$1.25 net. Postpaid.) Houghton Mifflin Company,
 Chicago, Illinois.
4. Whipple. A Range of Information Test. Manual of Mental
 and Physical Tests. Part II. 1915. p. 317.
5. J. Carleton Bell. A detailed Study of Whipple's Range of
 Information Test. The Journal of Educational Psychology. October
 1918. pp. 475-483.

a given word is equally as important in a list made up of words selected from a dictionary, as in a list made up of words selected from a school subject in which the words occur in context. Comprehension of a reading lesson depends upon knowledge of the words used in the lesson. Interpretation of the reading lesson gains from knowledge of other words besides. The words necessary for comprehension are the essentials; those, for interpretation are auxiliary assets. Before a word is used to represent a field of knowledge, the worth of the word as a representative of that field should be determined.

It has been assumed in the use of vocabulary tests that the score made by an individual in a given test would be in the same proportion to the total number of words in his vocabulary, as is the number of words in the test to the total number of words in the book or books from which the words were selected. Terman explained that the operation of chance made possible this assumption. Recently he has proved that the reliability of a single list of 180 words was not greatly inferior as a measuring scale, to a list of 900 words. The average of the correlations of five separate lists of 180 words¹ each, with the average score of all he found to be .906.²

Two types of response to the vocabulary tests have been required; definition and classification. Which type is more effective for measurement has not been decided. Differences in quality of definition have been detected but not inter-

1. Terman. The Measurement of Intelligence. 1916. p.229

2. Terman. The Vocabulary Test as a Measure of Intelligence. p.461. Journal of Educational Psychology. October 1918.

preted. Knowledge of words probably develops qualitatively as well as quantitatively by degrees; but no one has yet discriminated between these degrees for more than primary grade children. Visual vocabulary tests have proved efficient for these pupils. Whipple's Range of Information Test takes cognizance of more than one degree of knowledge. A "D" marked beside a word in his list indicates that the subject tested can give a dictionary definition of that word; "E", an explanation; "F" denotes familiarity with the word; while "N" indicates that the word is new or unknown. Psychologically, the first step for a child in acquiring word knowledge is response, either auditory or visual to his word environment. Another step would be his recognition of the word; another, his ability to pronounce or name it; another, his ability to use it; and still another, his ability to define it. At what age, chronological or mental, these degrees occur is not known; they are probably not separate or distinct from one another at any age; yet, one or the other may be more apparent at one age than at another. If these degrees of development are more obvious in children in certain grades, then the types of tests best suited respectively to those grades should be used in their measurement. Studies of types of tests, as well as kinds of responses given to one type, should be made.

While the vocabulary test has found quite ready acceptance as an educational scale, the validity of its use as a measure of intelligence has frequently been questioned. In the words of Kirkpatrick,¹ "Of all the inventions of the human race

1. Kirkpatrick. A Vocabulary Test. Popular Science Monthly. 70: 1907. p.157.

nothing compares in importance, as regards mental development, with language The vocabulary of a person represents in a condensed and symbolic form all that he has experienced and imagined. The breadth of his mental experience is indicated by the number of words that have for him a meaning, while the accuracy of his thinking is shown by the constancy and exactness of meaning with which he uses words. The study of vocabularies ought, therefore, to be an important branch of psychological investigation.¹ Terman has shown quite conclusively that the size of vocabulary increases in almost direct proportion to mental development, regardless of environment, sex, or chronological age; his correlation between vocabulary score and mental age is .91 for 631 school pupils distributed through grades from I to IX, exclusive. Moreover, he affirms that an I. Q. obtained with his vocabulary test alone will not differ more than 10 per cent from the I. Q. obtained with the whole Binet Scale.² Vocabulary tests may be used for either one or for both of two purposes: classification and diagnosis. The preparation and standardization of such tests as efficient scales is a service worth rendering.

1. Terman. The Vocabulary Test as a Measure of Intelligence. The Journal of Educational Psychology. October 1918. p. 460.

2. Terman. The Measurement of Intelligence. p. 230.

II. PURPOSE AND AIMS.

This thesis purposes to meet a practical need. Some means of selecting pupils for a standard high school is desired by Derham Hall, a college preparatory school for girls. The pupils coming, as they do, from grammar schools in the north, south, east, and west of our country present marks in entrance credits comparable in figures but not in significance. How to fix a standard requirement for all and how to classify the pupils for the first year, so that they can study to the best advantage are two problems demanding immediate solution.

Tests in the minimum essentials in eighth grade subjects might be used. But these essentials cannot be listed arbitrarily, nor can they be required after the pupils have completed their grade, if they have not been required before. Investigation of both the subjects taught and the methods of teaching employed in each school, from which pupils come to us, would need to be repeated each year because the schools, the subject matter, and the teachers frequently change within a year. Moreover, information tests of the usual type would require hours of time to be given, scored, and interpreted; they would be an imposition on pupils who had successfully passed examinations and had been recommended for promotion by schools recognized as reliable by state authorities. Finally, the results of such tests would be representative of a store of knowledge, rather than of the ability either to acquire or use knowledge.

Common to all school subjects are the vehicles of ideas: namely, words. Words constitute the elements of every

educational subject as well as of all social intercourse. Upon their mastery depends the acquirement of knowledge. A child cannot hope to get the thought of what he reads until he understands the meaning of the words used. One reason why he cannot work problems in algebra is that he does not know how to read them. We may assume that each year a child increases his vocabulary with his information. Kirkpatrick concluded from his study of children's vocabularies that a child learns from thirty to one hundred words per month. Simple vocabulary tests show a gradual increment in the size of vocabulary from grade to grade and illustrate distinct individual differences within each grade. Words serve as the key to a situation always present to the pupil, to which he must respond. Educational methods endeavor to direct the child's response. One method, to which much time and training are devoted, tends to increase and refine his vocabulary.

For teachers of each school subject the following question is of primary importance: "Do we measure out our subject matter in proportion to the needs, immediate or future, of our pupils?" There is no better way of determining what the child knows and, at the same time, what he does not know and therefore needs to know, than by procuring the expression of his ideas in words. Vocabulary tests require accuracy of discrimination and judgment in the definition of a word in terms of words or phrases associated with it. The associations must be recalled and recognized and from them must be selected only

1. Kirkpatrick. Fundamentals of Child Study. p.232. 1914.
2. Starch. Educational Measurements. p.38. 1916.

those judged most suitable as definitions. The quality of answers thus signifies quality of intelligence. Some answers indicate poor native ability; others, narrow environment; and others again, inadequate instruction. Hazy answers, guesses,¹ and use-definitions suggest low mentality. Exact, precise definitions, on the other hand, mark the discriminating ability² necessary for selective thinking. Terman affirms that the vocabulary test has a higher value than any other single test of his scale. The intelligence quotient obtained with this test alone varies not more than ten per cent from that secured by the entire scale.

Standard vocabulary tests based on what words children know, rather than upon a logical theory of what words they should know, may offer a more reliable means of diagnosing the intellectual and educational status of children than the vocabulary tests whose words have been taken at random.³ The first aim of this thesis is to prepare a number of vocabulary tests made up of words taken from an eighth grade subject; namely, history. The second aim is to ascertain the type of test best suited to eighth grade pupils. The third aim is to determine the value of the tests as educational measuring instruments and as intelligence scales.

1. Terman. The Measurement of Intelligence. pp.230-231.

2. Ibid.

3. Starch and Terman both selected at random, from a dictionary, the words for their tests. Starch. Educational Measurements, p. 38. Terman. The Measurement of Intelligence, p. 226.

III. DESCRIPTION of METHOD.

This study is divided into two parts. Part I consists of (A) the preparation of tests and the preliminary investigation made in the fall of 1917 and the spring of 1918 and (B) the reconstruction of the tests, to which the fall of 1918 was given. Part II offers an intensive analysis and an interpretation of the results obtained with the tests in the spring of 1919.

PART IA

§ 1. Material

The material for the selection of the tests consists of three thousand, four hundred and fifty-five words taken from eighth grade histories: (1) Channing's, (2) McMaster's, (3) Woodburn and Moran's American History. All the words on every fifth page of each history were listed alphabetically, except those which occur in the Ayres' Spelling Scale (1000 words) or which are purely historical terms. After each word was written the number of times it occurred in each history and its average frequency of occurrence in the three histories. For this material I am indebted to Professor M. E. Haggerty, whose kind suggestion and aid encouraged the work of this thesis.

§ 2. SELECTION and ARRANGEMENT

Type IA. To secure a representative list of the 'history group', described above, one word from each of the three columns on each of eighteen (18) pages of the listed words, was selected. Two words were used as examples and two words omitted, leaving a list composed of fifty words to be

defined. The words were re-arranged according to their increasing difficulty; the difficulty in each case being judged by seven high school teachers.

Type IB. A scale, to be valid, should comprise words found in children's vocabularies. 'Unusual' and 'difficult' are not synonymous. The words in the original list range in frequency of occurrence from 126 to 1. The word which occurs 126 times, because of its numerous associations gathered at successive repetitions, might be expected to be defined better than one occurring only once. A list of fifty words, arranged in the descending order of their frequency of occurrence, make up Test B of Type I.¹ The words near the bottom of the list are termed 'unusual'. What words are difficult can be determined only from the children's definitions.

Type IIA. This test includes thirty words selected also from the history group. Opposite each word, within the parenthesis, are four possible definitions. These explanations² were given by thirty students of Psychology. The child being tested underscores the one definition which, in his judgment, best distinguishes the word. Isolation of words from their context has been the bone of contention in vocabulary tests of Type I. Type II, while it suggests associations, requires discrimination between them. It furnishes no opportunity for individual answers, but, until a satisfactory method of grading the qualities of answers has been found, the simplicity and

1. 'force' occurs one hundred times on the average;
'vantage' occurs once.

2. The 1917-18 Class at The College of St. Catherine, St. Paul, Minnesota.

definiteness of this form may favor its use. Whether or not educational methods can be refined without hampering the child is an interesting and important question. Superiority as tests can and will be determined for either Type I or Type II from the correlation of results obtained with both.

IIB. This test is made up and arranged exactly the same as Test IIA. It is designed as a similar test. Its results are to be correlated with those of IIA.

Of the two types explained above the first shall be designated the definition type; the second, the selection type.

§ 3. Schools and Grades

For the preliminary study the A tests of Type I were given to two hundred and two pupils distributed in five grades; namely, seventh, eighth, ninth, tenth, and eleventh. The first two grades were taught at St. Mark's, a parochial school from which some girls who graduate are sent to Derham Hall each year. The pupils of this school are not a select group. Some come from poor homes; some, from wealthy homes; but the majority, from ordinary, comfortable but humble homes. The group may, therefore, be considered representative. The upper grades were tested in Derham Hall High School. The purpose of this study was to find out for which of the grades examined the tests were most appropriate as measures of performance and indicators of ability.

§ 4. Directions

Simple directions were used in giving the tests. For Type I the directions are as follows:-

"I wish to find out how many words you know. Here is a list of fifty-two words taken from eighth grade histories. When I pass the papers, please leave them face-down on your desks. I shall give three signals: One - take up your pencil; two - look at me; three - turn over your paper, read the directions at the top of the page, study the two examples, and then begin to write. Do you all know what I mean? The first pupil who finishes will please raise his hand. Five minutes longer will be allowed for the others to finish. Do not ask any questions of your neighbor. Keep your eyes on your own paper and think ! Do your best One - two - three!"

§ 5. Scoring

Personal judgment alone, susceptible as it is to change and prejudice, cannot be relied upon in correcting the tests. This fact becomes evident when the two persons¹ who were to score the tests conferred about what definitions should be accepted as right; what, as wrong. The standard set up was composed of dictionary definitions. But the fact that children express their thoughts in terms quite different from those used by adults, made this standard seem unjust. It was decided then that those answers should be considered right which indicated that the child knew what the word meant, regardless of his involved expression. Cases which were doubtful for one corrector were referred to the other and their value decided by mutual acceptance or rejection. This standard, like the first, was unsatisfactory. Both correctors acknowledged that re-grading

1. The author of this thesis and a High School teacher.

the papers might result in not insignificant changes. Such a method of grading should be abandoned as soon as a better could be devised. This better method is one of the products of Part II of this study.

For the grade of each paper, each correct definition received two per cent (2%). In tabulating the results, large sheets of plotting paper were used. One sheet records, for each grade tested: (1) the number of pupils, their names and ages, school and grade, together with the time required for each individual to complete the test; (2) the number of words defined correctly; the number defined incorrectly; and the number of words omitted; (3) the mark of each pupil; (4) the class median; (5) the number of times each of the fifty words was answered correctly by the whole class.

6. Results and Their Interpretation

Table I shows the number of pupils, the highest grade, the lowest grade, the range, and the class medians for the seventh, eighth, ninth, tenth, and eleventh grades tested with Type IA.

Table I

School	Grade	No. of Pupils	Highest Grade	Lowest Grade	Range	Median
St. Mark's	7	51	90	20	70	56
St. Mark's	8	55	98	34	64	74
Derham Hall	9	27	88	46	42	68
Derham Hall	10	40	100	48	52	86
Derham Hall	11	29	100	46	54	88

Evidently the test is not too difficult for the seventh grade

nor too easy for the eighth and ninth grades. The poorest pupil in any of these three classes did not receive zero; neither did the best pupil in any grade, seventh, eighth, or ninth, attain one hundred. The test is not a suitable instrument of measurement for grades ten and eleven because it does not include all individuals within its range; that is, it does not indicate how much more than one hundred the best pupil in those two classes could attain. For these two grades an extended scale is needed, one which shall have more difficult words to test the best pupils.

§ 7. Correlations Between Similar Tests

Three schools, two in Minneapolis¹ and one in St. Paul,² provided one hundred fourteen pupils in the eighth grade, for a further study of the tests. Both types, definition and selection,³ were given to all the children. Tests IA and IB were scored as described on page 12. For Type II the directions were similar to those for Type I. "Thirty" was substituted for "fifty"; and attention was called to the fact that this was a new kind of test:

"This test is not like the other; the definitions of the words are printed. Four possible definitions have been placed after each word. But only one of the definitions is correct; the others are wrong. You are to read all the definitions and then draw a line under the one definition which you think best defines the word. Ready? One - two - three!"

1. Ascension Parochial School and Pro-Cathedral School.
2. St. Mark's Parochial School.
3. The results from the tests of Type IA given previously to St. Mark's eighth grade were used again for this part of the study.

Tests IIA and IIB offered no difficulty in scoring. The correct definitions had been determined when the tests were made up. Underlining the correct definition of a word counted one per cent. All the results of the respective tests were tabulated on separate record sheets. No word in any list was defined or omitted by all the pupils. The median of the correctly defined words for Tests IA and IB is 70. This signifies that the tests are about equal in difficulty and may be used interchangeably. Likewise the median for Tests IIA and IIB is 18.5. The correlations between the similar tests were determined according to the Pearson Product Moment Formula:-

$$r = \frac{\sum xy - n \cdot d_1 \cdot d_2}{n \sqrt{\frac{\sum x^2}{n} - d_1^2} \sqrt{\frac{\sum y^2}{n} - d_2^2}}$$

in which r is the coefficient of correlation; $\sum xy$ is the sum of the products of x , the deviation from the guessed average of one test, times y , the deviation from the guessed average of the other test; n is the number; d_1 and d_2 are the average deviations from the guessed averages of the two tests respectively. The coefficient of correlation between the similar tests IA and IB for the one hundred fourteen cases is .531. For Tests IIA and IIB the coefficient of correlation is .409.

A more consistent method of grading the papers of Tests IA and IB, by reducing to a minimum the too generous concessions made by reading into children's answers the meanings of the words, should raise the coefficient of correlation. The correct definitions of some words in Tests IIA and IIB, might be judged not simple enough for eighth grade pupils. Or they

might be unusual; that is, be meanings not often met with by the children. Again, some definitions, supposed to be wrong, proved to be right in colloquial usage. For instance, the word 'strain' had these four possible definitions:

(fragment, trace, stretch out, sprain).

The definition intended to be correct, was 'stretch out'. Inspection of the words underlined by the pupils showed that 'sprain' was the popular choice. Investigation revealed that the pupils' association was not incorrect. A sprain means 'strained ligaments'. 'Stretch out', on the other hand, need not always mean a strain. Many other such ¹examples might be given to illustrate the fact suggested above, that the persons tested, not those who would devise tests, must determine their own standard. Our one means of acquiring definitions is that of discovering those which are accepted and used by the majority of persons in a community, urban, municipal, or national. The presence of more words with poorly prepared definitions (by poorly prepared I mean prepared without due consideration of popular use) in either of Tests IIA and IIB would tend to effect a low correlation. Substitution of definitions, proved by use to be acceptable, for those definitions suspected of being inadequate, should raise the coefficient of correlation. However, the correlations obtained are not insignificant. They suggested that further study of words and their meanings for children would be worth while and should be made, in order to improve the tests as intellectual and educational measuring devices.

The objections raised against the use of the tests are chiefly three: (1) The results do not compensate for the

time and labor necessary to give and score the tests. This plea will have no grounds for support when the tests have become simplified and refined by standardization: when they become really useful tools; (2) The teacher can, during the first few weeks of school, form her judgment of the individuals in her class. Such a judgment, however, would tend to prevent the teacher from recognizing more than the most obvious capabilities of children; (3) Children do not like the tests. Episodes of children using the five minutes' intermission between two tests to digest the dictionary and asking permission to copy the tests for future protection show no formidable aversion.

PART IB

The further study suggested by results obtained from the preliminary study discussed in Part IA of this thesis was carried on in the fall of 1918.

§ 1. Lengthening of the Lists

The original 'history group' of words from which all the tests were made up, was first re-arranged from the alphabetical order to the order of frequency of occurrence of the words. This change in order of arrangement was made to facilitate the selection of words for the tests. The word which occurred the greatest number of times on the average in the three histories was to be placed first in the first test prepared; the next highest was to be placed first in the second test, etc. Some words, which had proved unsatisfactory as test words, were omitted in each of the four tests, IA and IB, IIA and IIB. Other words were added to each list. The number of words for Type I was raised from fifty to seventy. Tests IIA and IIB, with their

unsatisfactory words left out, were combined to make one list. Other words from the original group were added until the list numbered seventy words. This list will henceforward be designated Test IIA. A new list of seventy words also selected from the 'history group' was then prepared and called Test IIB. In each case the words were arranged in the order of their descending frequency of occurrence; that is, the first word in each list occurred the greatest number of times, on the average, in the three histories. Four possible definitions for each of the new words added (new in the sense of not having been included in the first lists prepared) were then suggested by two teachers¹ and a class of thirty pupils in Psychology. Thus four tests of seventy words each were prepared: two, Tests IA and IB, of the definition type; and two, Tests IIA and IIB, of the selection type.

§ 2. Preparation of Selection Tests IC and ID

From the one hundred fourteen tests given in the spring of 1918, a random sampling was made of one hundred of each Test IA and Test IB, the definition tests. The words of each test were written in order on large record sheets. After each word were listed the definitions given by one hundred eighth grade pupils. After each definition of each word was placed the number of times it was given. From these definitions for each word, one definition, which occurred four times or more among the answers of the pupils, was selected as the correct definition of the word. Three other definitions, occurring less frequently than the definition selected as correct, were chosen to

1. Class of 1918-19 at The College of St. Catherine, St. Paul, Minnesota.

be placed within the parenthesis with the correct definition. The order of arrangement of correct and incorrect definitions within the parenthesis after each word was changed now and then. If the order of arrangement were kept constant, success in the test might depend upon a child's discovering the principle involved. Thus if the correct word were always the third word in the group and the child recognized the fact, after underlining the third definition for each of a few words, he would need to pay little attention to the definitions given. Mere underlining the third word in each group, would enable him to gain one hundred per cent in the test. The problem of determining children's ability to generalize is foreign to the field of this thesis. Not the recognition of a certain order of arrangement of words, but the ascertaining of the meaning, the correct meaning, of words is intended in the vocabulary tests to provide a situation for the children tested. To avoid any interference of the generalization problem, the order of arrangement of definitions was changed often and without plan. Moreover, some of the correct definitions were expressed by one word; others, by a phrase. Word definitions and phrase definitions were distributed as by chance. Thus were prepared two selection tests for the words listed in Tests IA and IB. The new selection tests were called IC and ID respectively.

6 3. Weighting of Definitions for Words in Selection Tests IC, ID, IIA, and IIB

One of the commendatory advantages of standardized scales over ordinary examinations is their objectivity. They aim to minimize the effect of personal prejudice or favor on the grade

or mark given a child for performance or achievement.

'Standardized' means 'conformed to a standard'. And a standard is fixed when it has been accepted by a number of persons whose intelligence has been proved worthy of respect. In § 5. Part IA of this thesis the need of a better method of obtaining a standard key of definitions, was disclosed. Instead of two persons, ten persons acted as judges of not only the appropriateness or the unsuitableness of definitions but also of their relative values. The judges included six college seniors, all in a class of English Practice Teaching, and four college teachers.

Ten copies of each of the four selection tests were made. Ten weighting blanks were prepared and attached to the test copies. These blanks were designed to record (1) the number of the test, (2) the name of the person weighting the tests, and (3) the weight assigned to each of four definitions for each of seventy words in a list. The numbers of the words from one through seventy were put in a vertical column to the left of the blank; the numbers of the definitions (1, 2, 3, 4) succeeded one another horizontally across the top of the page. Parallel lines were then drawn to separate the words and the definitions. The possible weights for the four definitions within a parenthesis and their signification were as follows:-

- 3 signified an excellent definition,
- 2 signified a good definition,
- 1 signified a fair definition,
- 0 signified a poor or an absurd definition.

Thus for each test two hundred eighty judgments were required from one person alone. Copies of Test IC and their accompanying weighting blanks were presented to the seniors at their

usual class period. The task of weighting was carefully explained to them. The outline of a blank was drawn on the blackboard and arbitrary weights inserted in the separate spaces after word number-one. Then the first definition of the first word was read aloud by the instructor and the students, after having read the three other possible definitions in the parenthesis, decided what value it should receive. The instructor then watched the students put the weight in the space awaiting it. The second, the third, and the fourth definitions were treated in like manner. When the students understood exactly what they were to do, they were left to complete during the period, without conferring with one another or with the instructor, the process of weighting. During four separate periods within a week the seniors weighted all the definitions of the four selection tests. The teachers, after receiving a brief explicit explanation of the method of weighting, proceeded alone to file their judgments.

When all the blanks had been filled, they were collected and sorted into four piles, one pile for the weights of each test. Four large record sheets were prepared to receive the aggregation of weights. Each sheet had three thousand eight hundred fifty spaces (vertically, one space each for each of four definitions of each of seventy words, and one separating space between the definition spaces for each two successive words; horizontally, ten spaces each to receive the weights given by one of the judges, and an eleventh space for the average weight).

When the tabulation of all the weights had been completed and the average weight for each definition had been

determined, then the results were studied. The first fact observed was that a surprisingly great number of averages indicated a decided agreement of opinions among the judges. The averages for definitions in respective groups varied as 3, 0, 0, 0; or as 2, 0, 0, 0; or as 3, 1, 0, 0; or as 2, 1, 0, 0. More than ten groups, for each test, however, showed a variation of 3, 2, 2, 0; or 3, 1, 1, 0; or as 2, 1, 1, 3; or 2, 1, 1, 0; or 1, 1, 0, 0;

Tests	Number of groups omitted from 70
IA and IC	12
IB and ID	15
IIA and IIC	14
IIB and IID	19

These latter averages suggested that selection of the correct definitions for words of corresponding groups would offer special difficulty to the pupil tested. An effort was made to procure new and more satisfactory definitions for the groups in which the difficulty had been located. These new definitions were submitted for weighting to the senior and teacher judges. The results were tabulated on the record sheets and the average weight determined and entered for each definition.

The next step in the analysis of the weightings consisted in scanning each horizontal line of the record sheet to determine the number of 3's, 2's, or 1's, in each. The final weights for the definitions were assigned according to the following plan:-

7	three's out of 10, no two's, no one's, call final weight	2
6	" " " " one two, " " " "	2
6	" " " " no two's, one one, " " " "	2
7	two's, three one's, call final weight	2
6	" , four zero's, " " " "	1
7	one's, three " , " " " "	1
6	" , four " , " " " "	0
6	zero's, four one's, " " " "	0

Groups which showed variations such as 2, 0, 0, 0; 2, 1, 0, 0; or 1, 0, 0, 0, in their final averages were considered satisfactory. These groups were preserved for the tests. The words in each test were re-numbered. The order of their arrangement was not changed; that is, the word which occurred in the histories more frequently than any other word in the list, received first position. The words which occurred only once were placed indiscriminately at the lower end of the list. The number of the tests and the corresponding number of words in each is given in the following table:-

Table II								
Test	:	IC	:	ID	:	IIA	:	IIB
No. of Words	:	58	:	55	:	56	:	51

The four selection tests, reconstructed after this intensive study, are presented on the following pages: 25, 26, 27, 28, 29, 30, 31, 32 and 33.

6 4. Preparation of Definition Tests IIC and IID

From the Selection Tests IIA and IIB the words were used to make up two definition tests, IIC and IID. Copies of the four definition tests with their directions and examples are presented on pages 34, 35, 36, 37, and 38.

The purpose of preparing eight tests in the manner explained above, was to provide two sets, each of two types of tests, one set to serve as a check on the other. Thus two groups of eighth grade pupils might be chosen. Let one group be called the 'testing group'; the other, the 'control group'. Let the tests be assigned to the groups in the following way:-

Group I (Testing)

Group II (Control)

Tests IA and IB (definition) —* Tests IC and ID (selection)

Tests IIA and IIB (selection) *— Tests IIC and IID (definition)

Now it is possible to determine, by calculating coefficients of correlation and correcting for attenuation, the relationship or the relative values of two types of tests.

Part I describes the method of work employed in attaining the first end of this thesis; namely, the preparation of vocabulary tests. Two other aims remain; the first, to ascertain which of the two types, definition or selection, is more suited to the ability of eighth grade pupils; the second, to determine the value of the tests as measuring instruments for diagnosis. The achievement of these purposes will be the subject of Part II.

TEST IIA

Within the parenthesis after each word there are four possible definitions. Underline the one definition which best explains the word. Look at this example: house, (box, place to live in, brick, glass).

1. food (taken in, necessary to sustain life, eat, eatable)
2. settler (dog, first to buy, one who makes his home in a new country, old man)
3. goods (materials, not bad, what to buy, dresses, kinds of cloth)
4. port (landing place for ships, divide, near the sea, cape)
5. nominated (chosen, put in, named for office, elected)
6. debt (bill, money owed, charge, kindness, pay to)
7. voyage (on the train, walk around, long way, journey on the water)
8. tea (drink made from leaves, afternoon party, food, letter)
9. independence (not relying on another, acting joyful, gay)
10. disputed (owned, considered, argued, claimed by two)
11. republic (people's government, no ruler, revolution, president)
12. message (inform, word sent, letter saying, sermon)
13. peace (undisturbed state, doing nothing, signed, agree)
14. site (location, hill, can be seen, quote)
15. graft (acquiring money dishonestly, put on, insert, trick)
16. annexation (purchase, act of binding to, colonize, cancel)
17. veto (make null, object, oppose, forbid, attach)
18. preserve (guard, can, keep in good condition, obtain)
19. confiscated (destroyed, demolished, seized as forfeit, taken)
20. failure (omission to perform, weakness, lack, zero)
21. method (process, manner, plan, art)
22. neutral (peace, not for either side, destructive, friendly)

IIA

23. patriotism (fighting, sacrifice, pride, love of one's country)
24. owe (bill, give, be under obligation to, possess)
25. sympathize (share another's feeling, tend, cry, pity)
26. yield (afford, produce, grant, admit as true)
27. disappear (hide, conceal, put away, vanish)
28. display (not play, exhibit, lay out, pretend to)
29. climate (temperature, state of weather, heat or cold, atmosphere)
30. admiral (officer in the navy, chief, high man, captain)
31. permanent (fixed, last, changing, remaining)
32. idle (lazy, quiet, doing nothing, dreaming)
33. listen (hear, attend to, hearken, sound)
34. stable (firmly established, stall, balanced, soluble, look carefully)
35. series (class, events, stories, a connected succession)
36. caucus (race, mountain, political meeting, plant)
37. accuse (condemn, charge with, insult, offend)
38. enthusiasm (inspired with ardent interest, haste, impatience)
39. earned (won, profit, prized, worked for)
40. energy (lively, inherent power, strength, action)
41. rash (rough, not heeding, quick, undue hastiness)
42. shrink (cringe, blink your eyes, draw back, crouch)
43. crash (break down, sudden loud noise, outbreak, fall)
44. shattered (annihilated, fallen, in disorder, broken in pieces)
45. eagerness (active, striving, impatient desire, hurry)
46. smuggle (fire, import unlawfully, steal, deceive)
47. mutual (kind manner, common to two, lowly, on good terms)
48. depredation (excited condition, trouble, fear, act of laying waste)

IIA

49. receded (give up, rebelled, withdraw from, fought)
 50. deputy (authority, one commissioned to act, factor, office)
 51. front (face-view, preceding, outward side, end)
 52. traitor (one who betrays, spy, criminal, villain)
 53. sue (take to law, judge, follow, hope for)
 54. indulge (give way to, forego, commit, take part)
 55. efficient (producing results, charming, hard working, hot)
 56. justice (democratic, righteousness, truth, good)

Name _____ School _____
 Grade _____ age _____

TEST IIB

(The directions are the same as for Test IIA).

1. possession (need, money, what we have, anything)
2. great (extra, not ordinary, spacious, eminent)
3. count (tell one by one, little city, write, spell)
4. victory (fight, win a battle, sign, board)
5. discover (find, wander, play, sail about)
6. raid (quick attack, force, destroy something, battle)
7. labor (look sad, work, liquor, read, dig)
8. native (inhabitant, one born in a place, old home)
9. float (sail, sink, fly, stay on top of the water)
10. stir (mix up, move, begin, combine with)
11. hang (pull up, suspend, stand, murder, try)
12. council (think, deliberate, board of advisors, group of men)
13. plural (crowd, more than one, many, two)
14. created (make out of nothing, invent, explore, find out)
15. decline (accept, refuse, steep, fall down)

IIB

16. pardon (forgive, hinder, condemn, smile at)
17. anchor (fasten securely, big iron, immovable)
18. barracks (room, wall surrounding, soldiers' quarters)
19. speed (quick rate of moving, hurry, limit, way to do)
20. convert (persuade, cause to turn, man, help)
21. suppress (restrain, silence, smother, check)
22. annoy (tease, irritate, keep at, prick)
23. aware (see, conscious, know, observe)
24. balance (equilibrium, watch, your step, weigh, same)
25. cargo (transport, load, baggage, freight on a ship)
26. maintain (hill, peak, plateau, keep up, hold)
27. discipline (strict training, flogging, scold, rough)
28. fibre (vegetable, string, hair-like particle of vegetable matter)
29. grate (part of a fire-place, scrape, harsh sound, scratch)
30. impose (help your friends, take advantage of, sponge, put down)
31. wharf (person who has no parents, landing place for ships, edge, animal)
32. revive (have life again, remember, call back, bring)
33. transform (make over, better, make something, opposite)
34. volley (game, short, discharge of bullets, bang)
35. race (contest of speed, large number of people, color, habit)
36. state (division, territory, condition, politics)
37. charm (enhance, alluring quality, tame, calm way)
38. clamber (climb up, clash, change, sound hurry)
39. normal (broad, average, store, run)
40. strain (draw at a tension, streak, pull, sprain)
41. community (people in a given area, number, space, some)
42. acute (sharp and distinct, pointed, little, small at one end)

IIB

- 43. student (one who seeks knowledge, teacher, paper, book)
- 44. dissuade (no different, change another's view, cross, deny)
- 45. resume (take up again, review, commence, agree)
- 46. terminate (stop, bring together, end, begin)
- 47. competent (ability to accomplish an act in the right way, accurate)
- 48. vulcanize (torment, criticize, repay, heat to make tough)
- 49. sentiment (feeling, affection, weep for, opinion)
- 50. precipitous (steep, slanting, decline, hasty)
- 51. diplomacy (power to carry on transactions without trouble, keenness, deliberation, thought)

.....
 (The information is the same as for Test IIA).

TEST IC

(The directions are the same as for Test IIA).

- 1. slave (one who must serve, captive, dependent, wretch)
- 2. shoulder (take up, joint, muscle connection of arm to body, near the neck)
- 3. colonist (goes away, one who settles in a new country, column, far)
- 4. battle (strike, best, struggle between opposite forces, war)
- 5. village (some houses, tract of land, small town, parish)
- 6. government (conduct, ruling office, regulation, habit)
- 7. nation (people under one government, country, race, power)
- 8. charter (hire, paper, statement of rights, privilege)
- 9. fort (house guarded, soldiers' home, canon, stronghold)
- 10. king (supreme authority, man in high position, high, govern)
- 11. island (section, land in the ocean, land surrounded by water, peak)
- 12. defeat (undo, destroy, win, conquer)

IC

13. demand (ask for, claim as due, inquire about, call out)
14. negro (African, black man, race of people, person)
15. meeting (company, prayer, union, assembly)
16. thousand (a number, ten times one hundred, very many, much)
17. extended (stretched, given, drawn out, pulled up)
18. route (way to be travelled, march, pass, course)
19. seize (grasp, take hold of quickly, rush upon, fasten)
20. existing (standing still, appearing, being, continuing)
21. limit (bound, farthest extent, fast train, unusual)
22. chose (selected, pleased, looked at, clothes)
23. discover (explore, find first, show, take off)
24. captain (wears cap, person who commands, tall man, master)
25. ocean (for ships, big waves, large body of water, no land)
26. military (soldiers, ammunition, army, not civilian)
27. farmer (lives on farm, tiller of soil, works on farm, raises things)
28. presidency (term, office of president, time, being president)
29. cabin (small house, room, keep, in a ship)
30. flour (to make, crushed grain, ground wheat, powder)
31. sugar (food, sweet product, drink in coffee, product of cane)
32. occur (often, happen, come up, time)
33. advise (help, give direction, suggest, example)
34. hostility (enmity, not good, against, kindness)
35. manufacturer (workman, maker, one who produces, business)
36. accomplish (make, do, carry out, gain)
37. steel (metal, mineral, hard substance, kind of iron)
38. damage (spoil, injure, destroy, ruin, hurt)
39. risk (venture, expose to danger, can be lost, peril)

IC

40. capture (catch, take by force, trap, get)
41. scale (in music, weighing machine, small bone, measure)
42. commemorate (celebrate, think of, remember, think of and honor)
43. oyster (eating substance, shell fish, soup, in water)
44. wholesome (healthy, good, all, sell, first)
45. drowned (sink under, suffocate, go down, killed in water)
46. plunged (jumped, went in quick, fell into, thrust)
47. tend (pay attention, take care of, mind, watch, look after)
48. zinc (stove, to wash dishes in, soft lead, mineral)
49. tour (travel, go around, long roundabout trip, ride, journey)
50. chairman (officer, on a committee, member of a club, one in charge of a meeting)
51. brandy (wine, liquid, liquor, medicine)
52. provoked (made mad, disgusted, angered, not pleased)
53. cylinder (part of an engine, wheel, round body, circular tube)
54. sovereign (good, kind, ruler, money)
55. renominated (elected over, named again, taken back, in office twice)
56. incompetency (not able, unfitness, incomplete, not good enough)
57. coyote (stone, on the prairie, sort of wolf, animal)
58. vulnerable (avoid, can be wounded, good attacked)
- ... (The information is the same as for Test IIA).

TEST ID

(The directions are the same as for Test IIA).

1. coast (shore-line, outside, near the sea, boundry)
2. western (right, a direction, opposite of east, a region)
3. legislature (body of men, law, something, law-making body)

ID

4. fleet (people, number of ships, army, great number)
5. minister (servant, preacher, agent, render aid)
6. convention (something you do, body of delegates, party, contract)
7. settlement (fixed, colony, an arrangement, definite place to live)
8. delegate (representative, congress, number, a man)
9. united (pleased, grown together, agreed, made one)
10. opposed (went against, not agreed, stopped, objected)
11. surrender (quit, go back, give in, give up)
12. colonial (like a colony, belonging to a colony, old, out of style)
13. sailor (a kind of hat, mariner, one who sails, blue suit)
14. purchase (grain, buy, take, value)
15. explore (roam around, search through, examine carefully, penetrate for discovery)
16. authority (right to govern, cruelty, refer to, officer of law)
17. fugitive (wanderer, deserter, one who flees from pursuit, something hard to catch)
18. land (arrive, something not water, solid part of earth's surface, floor)
19. declaration (statement, make known, say, written)
20. journey (trip, moving, road, go away)
21. plantation (large field, farm in the South, for cotton, place to plant)
22. custom (tax, something familiar, fashion, money)
23. means (revenue, measure, a part, that which aids in attaining an end)
24. petition (little, wall, document, request addressed to an authority)
25. abandon (desert, reject, resign, quarrel)
26. gain (loss, have more, part of union, win)

ID	
27. pressure	(push on, heavy weight, force, power)
28. doctrine	(belief, religion, lesson, faith)
29. hang	(kill, put up, execute, suspend)
30. excite	(make nervous, arouse, frighten, willing)
31. respect	(look up to, revere, be polite to, be nice)
32. value	(prize, worth, cost, amount)
33. alarm	(noise, sudden attack, a warning, to disturb)
34. attract	(to draw to, to invite, to please, to charm)
35. deprive	(to destroy, to rob, to take away, to refuse)
36. intention	(will, desire, object, purpose, determination to act)
37. complete	(all, finish, end, thru)
38. conduct	(behavior, actions, silence, order)
39. congregation	(assembly, crowd, many persons, thanks)
40. summary	(short story, beginning, brief, all in a few words)
41. confidence	(trust, hope, sure, truth)
42. levy	(exact by authority, force, that which is demanded, put on)
43. rival	(enemy, partner, competitor, speak back)
44. hinder	(stop, behind, prevent, back)
45. author	(composer, poet, maker, name)
46. laden	(burdened, heavy, down, hard)
47. legend	(a myth, a motto, marvelous, untrue story)
48. extract	(pull out, take away, take from, beverage)
49. testify	(test, tell, give evidence, find false)
50. naturalize	(make familiar, become a citizen, treat as native, take papers)
51. pedestrian	(peddler, walker, citizen, man or woman)
52. seditious	(rebellious, law, danger, very set)
53. jubilant	(loud, rejoicing, shouting, full)
54. mercenary	(mean, greedy for gain, hired, has mercy)
55. formidable	(strong, difficult, dreadful, tremendous)
.	(The information is the same as for Test IIA). . .

TEST IA

After each word write a word or phrase to show that you know the meaning of the word. Look at the two examples: shape form; linen cloth.

- | | |
|---------------------|------------------------|
| 1. slave _____ | 30. flour _____ |
| 2. shoulder _____ | 31. sugar _____ |
| 3. colonist _____ | 32. occur _____ |
| 4. battle _____ | 33. advise _____ |
| 5. village _____ | 34. hostility _____ |
| 6. government _____ | 35. manufacturer _____ |
| 7. nation _____ | 36. accomplish _____ |
| 8. charter _____ | 37. steel _____ |
| 9. fort _____ | 38. damage _____ |
| 10. king _____ | 39. risk _____ |
| 11. island _____ | 40. capture _____ |
| 12. defeat _____ | 41. scale _____ |
| 13. demand _____ | 42. commemorate _____ |
| 14. negro _____ | 43. oyster _____ |
| 15. meeting _____ | 44. wholesome _____ |
| 16. thousand _____ | 45. drowned _____ |
| 17. extended _____ | 46. plunged _____ |
| 18. route _____ | 47. tend _____ |
| 19. seize _____ | 48. zinc _____ |
| 20. existing _____ | 49. tour _____ |
| 21. limit _____ | 50. chairman _____ |
| 22. chose _____ | 51. brandy _____ |
| 23. discover _____ | 52. provoked _____ |
| 24. captain _____ | 53. cylinder _____ |
| 25. ocean _____ | 54. sovereign _____ |
| 26. military _____ | 55. renominated _____ |
| 27. farmer _____ | 56. incompetency _____ |

IA

28. presidency _____ 57. coyote _____
 29. cabin _____ 58. vulnerable _____

..... (The information is the same as for Test IIA).

TEST IB

(The directions are the same as for Test IA).

- | | |
|-----------------------|------------------------|
| 1. coast _____ | 29. hang _____ |
| 2. western _____ | 30. excite _____ |
| 3. legislature _____ | 31. respect _____ |
| 4. fleet _____ | 32. value _____ |
| 5. minister _____ | 33. alarm _____ |
| 6. convention _____ | 34. attract _____ |
| 7. settlement _____ | 35. deprive _____ |
| 8. delegate _____ | 36. intention _____ |
| 9. united _____ | 37. complete _____ |
| 10. opposed _____ | 38. conduct _____ |
| 11. surrender _____ | 39. congregation _____ |
| 12. colonial _____ | 40. summary _____ |
| 13. sailor _____ | 41. confidence _____ |
| 14. purchase _____ | 42. levy _____ |
| 15. explore _____ | 43. rival _____ |
| 16. authority _____ | 44. hinder _____ |
| 17. fugitive _____ | 45. author _____ |
| 18. land _____ | 46. laden _____ |
| 19. declaration _____ | 47. legend _____ |
| 20. journey _____ | 48. extract _____ |
| 21. plantation _____ | 49. testify _____ |
| 22. custom _____ | 50. naturalize _____ |
| 23. means _____ | 51. pedestrian _____ |
| 24. petition _____ | 52. seditious _____ |

IB

25. abandon _____ 53. jubilant _____
 26. gain _____ 54. mercenary _____
 27. pressure _____ 55. formidable _____
 28. doctrine _____ (Information same as for Test IIA)

TEST IIC

(The directions are the same as for Test IA).

- | | |
|-----------------------|-----------------------|
| 1. food _____ | 29. climate _____ |
| 2. settler _____ | 30. admiral _____ |
| 3. goods _____ | 31. permanent _____ |
| 4. port _____ | 32. idle _____ |
| 5. nominated _____ | 33. listen _____ |
| 6. debt _____ | 34. stable _____ |
| 7. voyage _____ | 35. series _____ |
| 8. tea _____ | 36. caucus _____ |
| 9. independence _____ | 37. accuse _____ |
| 10. disputed _____ | 38. enthusiasm _____ |
| 11. republic _____ | 39. earned _____ |
| 12. message _____ | 40. energy _____ |
| 13. peace _____ | 41. rash _____ |
| 14. site _____ | 42. shrink _____ |
| 15. graft _____ | 43. crash _____ |
| 16. annexation _____ | 44. shattered _____ |
| 17. veto _____ | 45. eagerness _____ |
| 18. preserve _____ | 46. smuggle _____ |
| 19. confiscated _____ | 47. mutual _____ |
| 20. failure _____ | 48. depredation _____ |
| 21. method _____ | 49. receded _____ |
| 22. neutral _____ | 50. deputy _____ |
| 23. patriotism _____ | 51. front _____ |

IIC

- | | |
|----------------------|---------------------|
| 24. owe _____ | 52. traitor _____ |
| 25. sympathize _____ | 53. sue _____ |
| 26. yield _____ | 54. indulge _____ |
| 27. disappear _____ | 55. efficient _____ |
| 28. display _____ | 56. justice _____ |

(The information is the same as for Test IIA).

TEST IID

(The directions are the same as for Test IA).

- | | |
|---------------------|----------------------|
| 1. possession _____ | 27. discipline _____ |
| 2. great _____ | 28. fibre _____ |
| 3. count _____ | 29. grate _____ |
| 4. victory _____ | 30. impose _____ |
| 5. discover _____ | 31. wharf _____ |
| 6. raid _____ | 32. revive _____ |
| 7. labor _____ | 33. transform _____ |
| 8. native _____ | 34. volley _____ |
| 9. float _____ | 35. race _____ |
| 10. stir _____ | 36. state _____ |
| 11. hang _____ | 37. charm _____ |
| 12. council _____ | 38. clamber _____ |
| 13. plural _____ | 39. normal _____ |
| 14. created _____ | 40. strain _____ |
| 15. decline _____ | 41. community _____ |
| 16. pardon _____ | 42. acute _____ |
| 17. anchor _____ | 43. student _____ |
| 18. barracks _____ | 44. dissuade _____ |
| 19. speed _____ | 45. resume _____ |
| 20. convert _____ | 46. terminate _____ |
| 21. suppress _____ | 47. competent _____ |

IID

- | | |
|--------------------|-----------------------|
| 22. annoy _____ | 48. vulcanize _____ |
| 23. aware _____ | 49. sentiment _____ |
| 24. balance _____ | 50. precipitous _____ |
| 25. cargo _____ | 51. diplomacy _____ |
| 26. maintain _____ | |

. (The information is the same as for Test IIA). . . .

PART II Final Study.

6 1. Giving the Tests

The time chosen to give the tests for this final study was the month of January 1919. At this time of the school year the children were expected to be at their best. They had been in school long enough to have become acquainted with their subjects; at the beginning of the term this would not have been true. Postponement of the giving of the tests to May, on the other hand, might have resulted in the obtaining of false indications of pupils' abilities. Absorbed in the thought of graduation, the pupils might not have done their best. Proof that 'graduation' early makes its demands upon seniors' attention, is shown by the fact that even in January, the month chosen because of its coming in the middle of the school year, even then, many pupils defined the word 'diplomacy' as "something pertaining to what you get when you graduate".

The desirability and the possibility of having two groups, a testing group and a control group, to act as checks on one another was referred to in Part I.¹ For the testing group,² two parochial schools in Minneapolis offered one hundred twenty pupils in the eighth grade. The same number of pupils from³ three schools in St. Paul, compose the control group. The first two schools have pupils from rich, poor, and middle class homes.

1. pp.23 and 24.
2. School I Ascension
School II Pro-Cathedral
3. School III St. Mark's
School IV St. Luke's
School V St. James'

They are free day schools for both boys and girls. Of the three schools in the control group, the pupils in one come from ordinary, comfortable homes; those in the second, from well-to-do families; those in the third, from relatively poor homes. There is predominance of nationality in the last named school only; the parents of most of the poor pupils are Russian-Poles. If this school were large in proportion to the other schools associated with it, the control group, to which it belongs, would be less homogeneous than the testing group. Now the influence of difference in nationality upon attainment is not to be measured in this study; hence, since it cannot be eliminated entirely as a factor, its magnitude must be decreased as much as possible. Difference in nationality should not be greater in one group than in the other. The school in question contributed the ¹ smallest number of pupils. Moreover, these children have had the same opportunity as those in the other schools to become acquainted with the words in their histories; and these words constitute the tests.

The tests were distributed as suggested in Part I.² Besides the two types of vocabulary tests, other educational tests were given to the testing group but not to the control group. These other tests were the Analogies B and D, Opposites^{3*} B and D, and the Trabue Language Completion Scales,⁴ B and C.

1.	Schools	Boys	Girls	Total No. of Pupils
	St. Mark's	24	29	53
	St. Luke's	19	23	42
	St. James'	<u>11</u>	<u>14</u>	<u>25</u>
2. p. 24.		54	66	120

4. Prepared by Marion Rex Trabue, Ph.D., Instructor in Educational Administration, Teachers College, Columbia University.

3* Prepared at the University of Minnesota.

These latter tests were given in order that the results obtained with them might be compared with those obtained with the vocabulary tests. The manner of presenting the tests was the same as that employed in the first preliminary study. The pupils tested, however, were different; those tested this year (1919) were in the seventh grade twelve months ago (1918), when the schools were visited for the first time.

§ 2. Scoring

When all the tests had been given they were sorted into separate piles. The piles for the tests written by each sex of each school were labelled respectively. The papers of every child were then arranged in alphabetical order of the names on the papers. These names were next copied on record sheets prepared for each school tested. The selection tests with their definitions and respective weights determined in § 3 of Part I were used as keys for the scoring of the tests. These keys are presented in the Appendix ¹. It would be possible, and no doubt advantageous, to prepare sheets of transparent celluloid to cover the selection tests. The weight of the perfect definition, and of the good definition if there be one, in each parenthesis group might be so placed on the celluloid that it would coincide with the definition for which it was intended. If the best definition in a group were underlined, a score of 2 might be placed beside the number of the word defined. If the next best definition were underlined, the score, 1, might be placed beside the number of the word defined. The sum of the scores for the words of a test would then constitute the mark

1. pp. 67-77.

achieved by the pupil. The celluloid keys have proved serviceable in the correction of the hundreds of army tests given at the University of Minnesota both last year and this year. They save time; the weight need not be looked up for each definition: it either coincides or does not coincide with the definition underlined. They also prevent slips in memory. Some parenthesis groups contain definitions weighted as 2, 0, 0, 0; others, as 1, 0, 0, 0; and others, as 2, 1, 0, 0. It is no mean task for one to memorize the definitions and their corresponding weights for each test.

There are three reasons why the celluloid keys were not used for scoring the vocabulary tests: first, the celluloid could not be procured when it was needed; second, the one who scored the tests had become so familiar with the words, definitions, and weights through long study and analysis, that she could easily visualize the keys; third, the celluloid keys could not be used conveniently for correcting the definition tests. Comparison of the arrangement of words and weights in a key and the arrangement of words in the blanks of the definition tests will show at once why this is true; the two could never coincide.

1

One person alone scored all the papers. Selection Test IC was scored first. Then Definition Test IA, made up of the same words as Test IC, was corrected. For both tests the prepared key, which had been memorized, was used as a standard for reference. For Test IA not the exact words, but the correct meaning of words was required. The same procedure was followed in scoring the other three pairs of tests:-

1. The author of this thesis.

- (2) Selection Test ID and Definition Test IB,
- (3) " " IIA " " " IIC,
- (4) " " IIB " " " IID.

Later the weight given on each paper to each definition of the selection tests was recorded. The primary purpose for this tabulation was to find out how many times, in one hundred twenty, a definition received a score of 2, or 1.¹ The record showed, besides the information desired, the fact that very few errors in assigning corresponding weights to definitions had been made. This proved that the key could, without vitiation of results, be applied from memory.

Keys were likewise used to grade the papers of the association tests B and D and the Trabue tests B and C.²

In columns allotted to each of the tests on the record sheets the scores in each test for the pupils were entered after the names, respectively. One hundred twenty pupils in the testing group and an equal number in the control group were found to have scored in all the tests. The one hundred twenty scores made in each test were then copied on another record sheet. From this sheet the scores for the frequency tables and the correlations were obtained.

1. These results are illustrated in Tables, 13, 14, 15, and 16, in the Appendix, pp. 78-86.

2. Keys for the Association Tests B and D were obtained from the University of Minnesota; those for Trabue B and C Tests, from the Appendix of the Monograph entitled Completion-Test Language Scales, pp. 81-87.

6 3. Medians and Per Cents of Overlapping

The frequency tables for all the tests are shown in Table 4, pages 45 and 46. The median of the scores in a given test was found by counting in one-half the number of measures ¹ ($1/2 \times 120 = 60$) from the lower end and locating that measure above which and below which there were an equal number of measures. The medians for the various tests, calculated according to this method, are as follows:-

Table 3

Table 3														
Test	IA-IB	IC-ID	IIA-IIB	IIC-IID	AnB-AnD	OpB-OpD	Trab.B-Trab.C							
M.	32.5	33	57	56	72.5	68	35	36	51	56	61	56	13	13

The medians of similar tests (similarity indicated by grouping in pairs the tests in Table 3, above) are comparable. This fact, in regard to Tests IA and IB and Tests IIA and IIB, ² verify the result obtained in the preliminary study.

Although the definition tests were corrected according to the same standard key as were the selection tests, the medians of tests of two types, made up of the same words, vary considerably. The difference between these medians is constant for the four pairs of tests. This can be shown by comparison of the amounts of overlapping of the tests. Thus: knowing the median for each of the definition tests, one can find by referring to the frequency table ³ how many individuals in the selection tests reached or surpassed the median score of that definition test. By dividing the number in a given selection test of those reaching or surpassing the median of a given definition test, by one hundred twenty (the total number of cases), a per cent of overlapping can be calculated.

1. The upper end might just as well have been used.

2. p. 15.

3. pp. 45-46.

Table 4
Frequencies for all tests given.

Step	IA	IB	IC	ID	IIA	IIB	IIC	IID	AnB	AnD	OpB	OpD	Trab.B.	Trab.C
0									2	1	2	1		
1														
2			3											
3	2													
4	2								1	6				
5	1													
6										2	1		2	
7	1	1												1
8		1							2	4			5	2
9	1	1							1				6	2
10	1	1					1		2	5			14	10
11	1	1						1	1				9	8
12		2							2	6			10	19
13		2											24	23
14	1	2					1		6	4			24	23
15	1	3											13	13
16	2	2			1		2	1	2	3			9	12
17	2	2					2			2			3	2
18	2	1						2	3	2			2	2
19	4	1					3		1					1
20	4	4					1	3	1	3				2
21	1	2				1	3	1				1		
22	3	2					3	4	3	2				
23	3	4	1	1			5	2	2		1			
24	4	2					4	4		3				
25	2	4					1	2	1					
26	4	5					3	2	3	1		1		
27	3	3		1		1		4	1					
28	5	1	1	1			4	4	2	1				
29	2	4		1	1		3	4	1			2		
30	1	2					2	6	2	1	1			
31	3	3	2	1			1	4	1					
32	4			1		1	7	6	2	1				
33	2	2			1		4	4	1		1	2		
34	1	4		1			7	2	3	1			1	
35	4	3					5	3			1			
36	5	6		1			4	4	2		3	1		
37	4	4			1		5	3	1					
38	3	1	1		1		3	3	2	3			1	
39	5	3	1	1	1		1	2					1	
40	4	2		2		3	4	7	2		1	1	1	
41		2	1	2			3	3			3	1	1	
42	2			2			4	4	2	2			4	
43	2	4	1	1			3	3			1		5	
44	3	4	5	1	2	1	3	2	2	1	2		1	
45		3	5		2		1				1		3	
46	3	1	1	5	1		1	3	1		2			
47	1	2	4	4	1	1	3	4			1		5	
48	4	3	3	1	1	1	3	1			4		4	
49	2	2	1	3	1		1	1			2		3	
50	4	4	1	4			2				1		2	

Table 4. Continued
Frequencies for all tests given.

[illegible]

The following table shows the per cent of overlapping of each median of the definition tests, for each of the selection tests:-

Table 5

Definition Test	Median	Selection Test	Per cent of Overlapping
IA	32.5	IC	.966
		ID	.950
		IIA	.983
		IIB	.975
IB	33	IC	.966
		ID	.950
		IIA	.975
		IIB	.975
IIC	35	IC	.966
		ID	.941
		IIA	.975
		IIB	.975
IID	36	IC	.966
		ID	.933
		IIA	.975
		IIB	.975

Evidently eighth grade pupils can select the correct definition for many more words than they can formulate definitions for. In every school tested the pupils underlined the correct definitions of a test in about one-half the time they required to fill the blanks of a definition test. The words in both cases were the same; the type of test only was different. Moreover, the children, when asked which type of test they preferred, invariably answered in favor of the selection type. These facts raise interesting questions: 1. Do the two tests test the same thing? 2. What functions are tested by each test? 3. Which functions, those tested by the selection type or those tested by the definition type, are involved more frequently in eighth grade school work? 4. Do our methods of teaching demand definition or selection to the greater advantage? The first two questions will be answered definitely by this thesis. The other

two questions can be answered only after a thorough investigation and study of the work and the methods of work done in the eighth grade.

In order to measure any variable, as many accompanying conditions as possible should be kept constant. According to the general law of causality, a variation does not occur without a determinant. For instance, think of a quiet pool on a sunny summer day. Not a ripple will appear on the smooth surface until some disturbing element produces it. The starting of little waves may be attributed to any one or to all of several factors; namely, a sudden gust of wind, a pebble sent skipping from a child's hand, the upward dart of a fish, or the movement of a reed or water-lily freeing an insect prisoner. The verity or falsity of each known cause would need to be investigated. Suppose all but one cause proved improbable. The remaining cause might then be carefully examined. If a variation in the intensity of this cause should be observed to be accompanied by a proportional variation in the effect, then the relationship of one variation to the other might be recorded. A greater gust of wind other influences being constant, might be said to produce a greater ripple or a series of ripples in the water.

Likewise in mental testing we look to the varying known factor for explanation of an observed effect. Schools, time, manner of testing, and even the words of the tests themselves were kept constant. The variable factor in the vocabulary tests is the type. From results we know that selection tests require less time and effort to be given and scored, than

do the definition tests; that they are preferred by eighth grade pupils. The amount of similarity or difference between the definition tests, and the selection tests as determined by actual correlation will be discussed in (b) of § 4. An indication of what each type has in particular can be inferred from the comparison of coefficients of partial correlations presented in § 5.

§ 4. (a) Correlations and Their Significance

In calculating the correlations between the tests the ¹ Pearson product-moment-formula was used. The first coefficients determined were those which indicated the correlations between similar tests. These coefficients and the tests for whose correlations they stand are presented in the following table:-

Table 6				
Group	Tests			Coefficient
<u>Testing</u>	Analogyes B and	Analogyes D	plus	.802
	Opposites B "	Opposites D	"	.815
	Trabue B "	Trabue C	"	.473
	Vocabulary IA "	Vocabulary IB	"	.779
	" IIA "	" IIB	"	.793
<u>Control</u>	Vocabulary IC and	Vocabulary ID	"	.684
	" IIC "	" IID	"	.6768

The highest correlation obtains between the Opposites Tests; the next highest, between the Analogies. All the correlations between similar Vocabulary Tests are considerably higher than the correlation between the Trabue Tests. Two tests are similar if they provide similar situations for a pupil's response. The situations are similar if their solution depends upon the employment of similar functions; for instance, two

1. Explained on p. 15

situations both involving the completion of sentences, or the definition of words, or the supplying of words related in a definite way to other words. The function required in each of the five pairs of tests given is suggested in the name of the test:

Analogies ... discovery and exemplification of relationship
between words,

Opposites ... association by contrast,

Language completion ... expression of complete thought,

Definition ... explanation of the meaning of a word,

Selection ... discrimination and choice.

These functions, however, are probably not simple nor elementary; they are complexes of elements which are very difficult to distinguish. It is hardly possible to assert exactly what functions a test tests; what it does not test. Although two tests have been made up in exactly the same way, of words taken from the same source, the tests may not be equal in difficulty. The words will differ in the number of letters they contain, in the number of times they occur in the same text-book, in the number of times they occur in other connections; such as, reading or conversation, and, therefore, in the number of associations which they have. The difficulty of all the words taken together which constitute a test, is indicated usually by the score or mark of the test. This score or mark of a vocabulary test is the sum of the weights given to the wholly or partially correct definitions or selections. Two tests of one type are considered similar if the marks obtained by the same individual in both tests, are comparable. The marks will be identical very seldom.

For most pupils the scores in two tests of the same type differ somewhat; in a few cases they differ considerably. The formula used in calculating the coefficients of correlation takes cognizance of these variations. If identical marks were received by all individuals in two tests of the same type, the coefficient of correlation between the two tests would be plus 1; if each pupil who received a high mark in one test, invariably made a low score in the other, the coefficient would be minus 1. If no relationship could be detected between the marks in two tests for each of a large number of pupils, a relationship might be inferred not to exist; the coefficient would then be 0. In actual investigation the degree of relationship varies, for two tests of the same type, from 0 to plus 1. Now, identity of marks might occur for a few individuals but not for all individuals. Direct divergence, a high mark in one test and a low mark in the other, might occur for a very few pupils. Between these extremes many different degrees of similarity or divergence might be expected to occur. The number of cases taken for the calculation of a correlation must be large enough to include representatives of as many degrees of similarity or divergence as possible. In general, the greater the number of cases involved, the more reliable is the coefficient as an index of correlation. The reliability of a coefficient obtained for any given number of cases may be determined by noting how many times its probable error (P.E.) the obtained coefficient is. This probable error may be calculated from the Pearson formula:-

$$P. E. _r = 0.6745 \frac{1 - r^2}{\sqrt{n}}$$

The lowest correlation obtained between the tests given to the one hundred twenty pupils tested for this study, is .473, between Trabue B and Trabue C. This coefficient is about ten times its probable error. The highest coefficient obtained is .815, between Opposites B and Opposites D; this is about forty times its probable error. The coefficient of correlation between definition tests IA and IB is thirty-two times on P. E. All the coefficients of correlation obtained are worthy of consideration.¹ The similar tests, for which they were calculated, may be used interchangeably as checks upon one another.

§ 4b. Corrections for Attenuation

Equally as interesting and important as the relationship between two tests of a given type, is the relationship between two test of different types. The raw correlations between the tests of all the types used for this study are presented in Table 7. They are arranged in the descending order of the magnitude of their coefficients. The stars placed beside certain test numbers denote that the correlations have previously been presented in Table 6. For the sake of convenience in comparison these coefficients have been re-presented.

Table 7.

No.	Tests	Coefficients
* 1.	Opposites B and Opposites D - - - - -	.815
* 2.	Analogies B " Analogies D - - - - -	.802
* 3.	Vocabulary IIA and Vocabulary IIB - - - - -	.793
* 4.	" IA " " IB - - - - -	.779
5.	" IIA " Opposites B - - - - -	.69
* 6.	" IC " Vocabulary ID - - - - -	.684
* 7.	" IB " Opposites B - - - - -	.682
8.	" IIC " Vocabulary IID - - - - -	.6768
9.	" IA " Opposites D - - - - -	.656
10.	" IIB " " D - - - - -	.652

1. Whipple. Manual of Mental and Physical Tests, p.40. Part I. 1914)

Table 7 Continued

No.	Tests	Coefficients
11.	Vocabulary IB and Vocabulary IIA	.89
12.	" IA " " IIB	.612
13.	" IB " Trabue B	.509
14.	Trabue C " Opposites D	.490
* 15.	" B " Trabue C	.473
16.	Trabue B " Analogies D	.442
17.	" B " Opposites D	.440
18.	Opposites B " Analogies D	.430
19.	" D " " D	.417
20.	" B " Trabue C	.417
21.	Vocabulary IA " " C	.405
22.	Opposites B " " B	.399
23.	" D " Analogies B	.386
24.	" B " " B	.351
25.	Trabue C " Vocabulary IIB	.337
26.	Vocabulary IIA " Analogies B	.335
27.	Trabue C and Analogies B	.328
28.	Vocabulary IIB and Analogies D	.308
29.	" IA " " D	.305
30.	" IB " " B	.279
31.	Trabue C " " D	.265
32.	" B " " B	.232

It is generally conceded among statisticians that the correlations obtained in any investigation are not so great as they would be, could all chance errors be eliminated. The result of the operation of chance errors, according to Whipple,¹ is the attenuation of the true coefficients of correlation. Correction for this factor can be made and more nearly true coefficients determined by substituting the raw coefficients obtained, in the following formula:-

$$r_{pq} = \frac{r_{p_1 q_2} \times r_{p_2 q_1}}{r_{p_1 p_2} \times r_{q_1 q_2}}$$

in which r_{pq} is the coefficient corrected for attenuation;
 $r_{p_1 q_2}$ is the raw correlation between Test I of Type I (p) and Test II of Type II (q). Correction for attenuation has been

1. Whipple, Manual of Mental and Physical Tests, p. 53 (Part I)

made for seven relationships. The results appear in Table 8.

Table 8

Op. and:Voc.I	:Trabue	:Trabue	:Trabue	:Op. and	:An. and
Voc.IB : " II and:	Voc.I and:	and Op.and	An.:	An.	Voc. I
.847	.8025	.74	.69	.617	.516
					.35

From these expressions of highest relationship between five types of tests rather surprising inferences can be made. Vocabulary Test I, the definition type, is most closely related to the Opposites Test; next closely to the Vocabulary Test II, the selection type; next closely to the Trabue Test; and least closely to the Analogies Test. The Opposites Test is more nearly related to the Vocabulary Test and to the Trabue Test, than to the Analogies Test. The Trabue Test correlates higher with the Vocabulary Test and the Opposites Test than with the Analogies Test. These facts raise the question, what functions are involved in the Analogies Test that are not involved in the other types of tests used? Evidently, in so far as a special ability is tested by the Trabue Language-Completion Scale, that same ability is not tested particularly by the Analogies Test. It is safe to say that the Analogies is not a language test.

§ 5. Partial Correlations

A formula¹ has been devised for the calculation of a coefficient which will indicate the relationship of two dissimilar tests when the elements which they possess in common with the third test, dissimilar to both tests, are excluded:-

$$r_{ab\bar{c}} = \frac{r_{ab} - r_{ac} \times r_{bc}}{\sqrt{1 - r_{ac}^2} \sqrt{1 - r_{bc}^2}}$$

1. (Partial Correlation Formula-Karl Pearson)

Table 9

1.	Trabue B and Op.B			Trabue C and Op.D	31
	An.B	.349	.437	An.D	
2.	Voc.IB	.077	.325	Voc.IA	32
3.	" IIA	.172	.378	" IIB	33
4.	Trabue B and An.B			Trabue C and An.D	34
	Op.B	.107	.0648	Op. D	
5.	Voc.IB	.105	.151	Voc.IA	35
6.	" IIA	.112	.168	" IIB	36
7.	Voc. IB and IIA			Vo Voc. IA and IIB	37
	Op.B	.339	.322	Op.D	
8.	An.B	.615	.572	An.D	38
9.	Trabue B	.528	.552	Trabue C	39
10.	Voc. IB and Trabue B			Voc.IA and Trabue C	40
	Op.B	.355	.127	Op.D	
11.	An.B	.476	.355	An.D	41
12.	Voc. IIA	.352	.267	Voc.IIB	42
13.	Voc. IIA and An.B			Voc. IIB and An.D	43
	Voc.IB	.2108	.161	Voc. IA	
14.	Trabue B	.271	.244	Trabue C	44
15.	Op.B	.137	.052	Op.D	45
16.	Voc. IIA and Trabue B			Voc.IIB and Trabue C	46
	Op.B	.2008	.0265	Op.D	
17.	An.B	.359	.281	An.D	47
18.	Voc.IB	.109	.123	Voc.IA	48
19.	Op.B and An.B			Op.D and An.D	49
	Trabue B	.291	.342	Trabue C	
20.	Voc.IB	.227	.302	Voc.IA	50
21.	" IIA	.175	.299	" IIB	51
22.	Voc. IB and Op.B			Voc.IA and Op.D	52
	Voc.IIA	.426	.429	Voc.IIB	
23.	An.B	.650	.611	An.D	53
24.	Trabue B	.574	.574	Trabue C	54
25.	Voc.IIA and Op.B			Voc.IIB and Op.D	55
	Voc.IB	.444	.420	Voc.Ia	
26.	An.B	.637	.606	An.D	56
27.	Trabue B	.635	.594	Trabue C	57
28.	Voc.IB and An.B			Voc.IA and An.D	58
	Voc.IIB	.0856	.155	Voc.IIA	
29.	Trabue B	.1805	.228	Trabue C	59
30.	Op.B	.0579	.045	Op.D	60

r_{abc} stands for the correlation between the two dissimilar tests, a and b, when the elements of the third test, c, common also to a and b, are excluded; r_{ac} represents the coefficient of correlation between the first and the third test; r_{bc} , between the second and the third test.

Partial correlations have been worked out to show thirty pairs of relationships. These results are given in Table 9, page 55.

If the average is found of all the raw correlations (Table 7), both straight (IA and IIA; IB and IIB) and cross (IA and IIB; IB and IIA) for each of two tests, and if this average is then compared with the partial correlation (Table 9) obtained between two tests when the elements have been eliminated which they possess in common with the third test, then the relationship between the two tests or the peculiar testing quality of either test may be interpreted. For instance:-

1. The average of all the r's between vocabulary Tests I and II, is .631. Compare this average with each of the following partial correlations in Table 9:- 7, 8, 9; 37, 38, 39. Now it is evident that in the relation between the two vocabulary tests, what is common to the Analogies Test and these two, plays a negligible role; what is common to the Trabue Test and these two plays only a slight part; but what is common to the Opposites Test and these two accounts for a good proportion of relation between the two vocabulary tests.

2. The average of all the r's obtained between the Opposites and Analogies Test is .396. Compare this average with partial correlations:- 19, 20, 21; 49, 50, 51. One may infer

from this comparison that whatever in the relation between the Opposites and the Analogies Tests is due to what is also common to the vocabulary tests is small; and whatever is due to what is also common to the Trabue Test is even smaller.

3. Compare the average r , .292, between Vocabulary I and the Analogies with partial correlations:- 28, 29, 30; 58, 59, 60. The relation between the Vocabulary (definition) and the Analogies is largely accounted for by what either the Vocabulary (selection) or the Opposites has in common with these two tests; but to a very small extent accounted for by what is common to the Trabue Tests and these two tests.

4. Compare the average r , .669, between Vocabulary I and Opposites with partial correlations:- 22, 23, 24; 52, 53, 54 and observe that the relation between the Vocabulary (definition) and the Opposites Tests is accounted for much less by what is common also to the Analogies Test than by what is common to them and to either the Trabue or the Vocabulary (selection) Test.

5. Compare the average r , .457, between Vocabulary I and Trabue Tests with partial correlations:- 10, 11, 12; 40, 41, 42. More of the relationship between the Vocabulary (definition) Tests and the Trabue Tests is due to the elements common to them and to the Opposites or to the Vocabulary (selection) than is due to them and to the Analogies Tests.

6. Finally, the average r of the three average r 's between Trabue and Opposites, Trabue and Analogies, and Opposites and Analogies is .382. Whatever is common to the Trabue Tests, the Opposites Tests, and the Analogies Tests is due to what is common also to the Vocabulary (definition) Test. The vocabulary

involved is probably the common element in these tests.

Part IIB. Conclusion

The three ends for which the work of this thesis was undertaken have been attained. 1. Four Vocabulary Tests of each of two types have been prepared. A key has been standardized for each test. 2. The Selection Type has proved more effective than the Definition Type as an instrument for measurement of eighth grade pupils. 3. Correlations indicate that the two types of tests do not measure exactly the same functions. The correlation, corrected for attenuation, between the two types of tests, .802, is not so high as that between Type I and the Opposites Test, .842.

Compare the two raw correlations obtained between Types I and II of the Vocabulary Tests, .65 and .612, with those obtained between each type and the Opposites, Trabue, and Analogies respectively:-

	<u>Vocabulary I</u>	<u>Vocabulary II</u>
Opposites	.656 .682	.652 .690
Trabue	.405 .509	.337
Analogies	.279 .305	.308 .335

Both types of Vocabulary Tests are more nearly related to the Opposites than to each other. Both types are more nearly related to each other than to the Trabue or to the Analogies Tests. The Definition Type is more nearly related than is the Selection Type to the Opposites and to the Trabue. The Selection Type is more nearly related to the Analogies than is the Definition Type. Knowledge of these relationships should guide one in choosing

tests for special abilities or functions. The Analogies Tests should not be expected to test the same functions as those tested by the Trabue or the Opposites Tests. The Definition Type of Vocabulary Test, on the other hand, might be grouped with the Opposites Test to test quite similar functions.

The practical need which occasioned the study presented in this thesis can best be met when the tests themselves have been made as perfect as possible. The process of standardization of the Vocabulary Tests is still incomplete. The tests should be given to very many children in the eighth grade and also in other grades. When the results have been accumulated they should be analyzed in order

- (a) to evaluate the separate words in each list,
- (b) to re-arrange the words in the order of difficulty determined for a great number of children,
- (c) to locate definite steps of difficulty with a definite constant interval between successive steps,
- (d) to calculate standards of achievement for eighth and ninth grade pupils.

This final standardization, however, is beyond the scope of this thesis. It is possible to recommend the Vocabulary Tests as they are, for mental and educational diagnosis because of the following merits which they possess:-

1. They are group tests.
2. They can be quickly given and scored.
3. They test the response to a situation, always present to the pupil and always important for him.
4. They distinguish between individuals in a class.

5. They indicate mental development.

6. The Selection Type has proved more suited than the Definition Type, to the abilities of eighth grade pupils.

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Table 10

Median Scores in Visual Vocabulary by the Thorndike Scale A.
(Taken from p.69 of Educational Tests and Measurements by Monroe,
DeVoss, and Kelley.)

	Grades						
	III	IV	V	VI	VII	VIII	
Median score	4.00	5.26	6.00	6.66	7.29	7.91	
Number of children . .	1650	2095	2028	1860	1625	1313	

Table 11

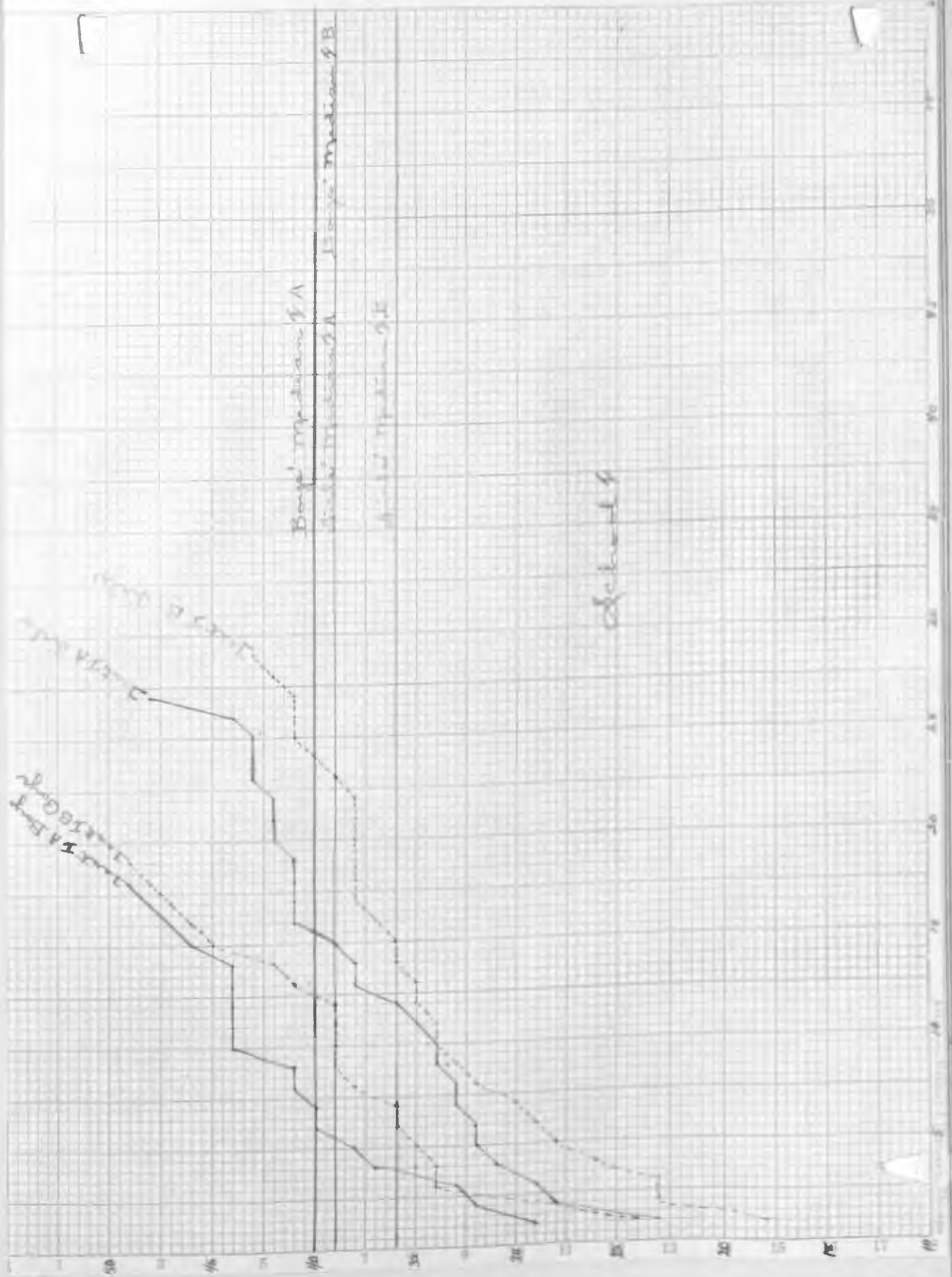
Tentative scores for various years as determined from tests
made in four schools. (Taken from p.40 of Educational Measurements
by Starch)

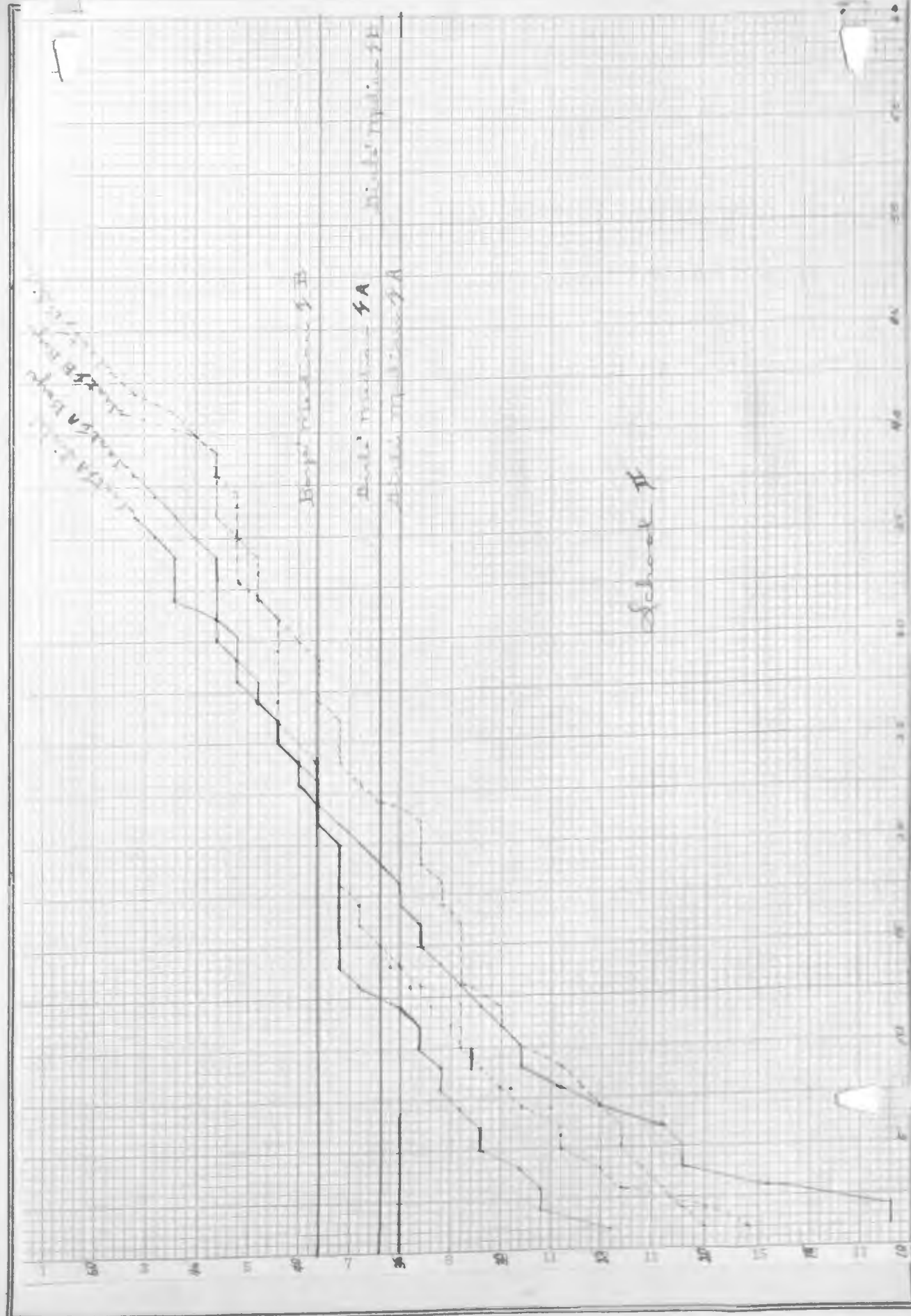
	Elementary					High School				University			
Grade	4	5	6	7	8	1	2	3	4	1	2	3	4
Scores	30	33	36	39	42	45	47.5	50	53	56	58.5	61	63

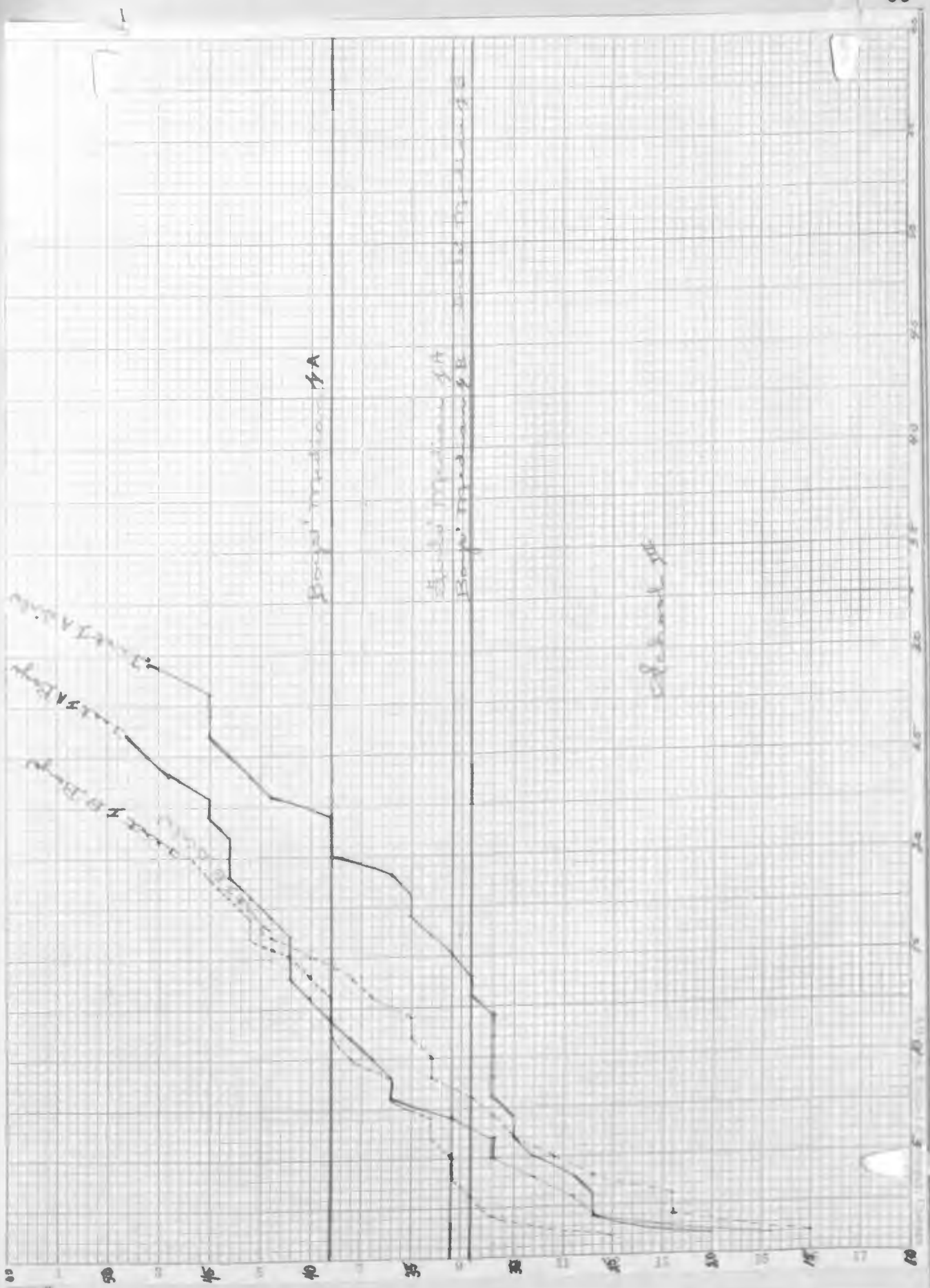
Table 12

Standards for different years as determined by the vocabulary
reached by 60 to 65 per cent of the subjects at the various mental
levels. (Taken from p.226 of The Measurement of Intelligence.
Terman.)

8 years	20 words	vocabulary	3,600
10 years	30 words	vocabulary	5,400
12 years	40 words	vocabulary	7,200
14 years	50 words	vocabulary	9,000
Average adult	65 words	vocabulary	11,700
Superior adult	75 words	vocabulary	13,500







Key to Tests IA and IC

1. (1) one who must serve - 2	11. (1) section - - - - - 0
(2) captive - - - - - 0	(2) land - - - - - 0
(3) dependent - - - - - 0	(3) in the ocean - - - - - 0
(4) wretch - - - - - 0	(4) land surrounded by water - - - - - 2
2. (1) take up - - - - - 0	12. (1) undo - - - - - 0
(2) joint - - - - - 0	(2) destroy - - - - - 0
(3) muscle connection of arm to body - - - - 1	(3) win - - - - - 0
(4) near the neck - - - - 0	(4) conquer - - - - - 2
3. (1) goes away - - - - - 0	13. (1) ask for - - - - - 0
(2) one who settles in a new country - - - - 2	(2) claim as due - - - - 2
(3) column - - - - - 0	(3) inquire about - - - - 0
(4) far - - - - - 0	(4) call out - - - - - 0
4. (1) strike - - - - - 0	14. (1) African - - - - - 0
(2) beat - - - - - 0	(2) black man - - - - - 1
(3) struggle between op- posite forces - - - - 2	(3) race of people - - - - 0
(4) war - - - - - 0	(4) person - - - - - 0
5. (1) some houses - - - - - 0	15. (1) company - - - - - 0
(2) tract of land - - - - 0	(2) prayer - - - - - 0
(3) small town - - - - - 2	(3) union - - - - - 0
(4) parish - - - - - 0	(4) assembly - - - - - 2
6. (1) conduct - - - - - 0	16. (1) number - - - - - 0
(2) ruling office - - - - 0	(2) ten times one hundred - 2
(3) regulation - - - - - 1	(3) very many - - - - - 0
(4) habit - - - - - 0	(4) much - - - - - 0
7. (1) people under one gov- ernment - - - - - 2	17. (1) stretched - - - - - 0
(2) country - - - - - 1	(2) widened - - - - - 0
(3) race - - - - - 0	(3) drawn out - - - - - 1
(4) power - - - - - 0	(4) pulled up - - - - - 0
8. (1) hire - - - - - 0	18. (1) way to be traveled - - - 2
(2) paper - - - - - 0	(2) march - - - - - 0
(3) statement of rights - 2	(3) pass - - - - - 0
(4) privilege - - - - - 0	(4) course - - - - - 0
9. (1) stronghold, placed defended against enemies - - - 2	19. (1) grasp - - - - - 0
(2) house guarded - - - - 0	(2) take hold of quickly - - 2
(3) soldiers' home - - - - 0	(3) rush upon - - - - - 0
(4) cannon - - - - - 0	(4) fasten - - - - - 0
10. (1) supreme authority - - 1	20. (1) standing still - - - - - 0
(2) man in position - - - - 0	(2) appear - - - - - 0
(3) high - - - - - 0	(3) being - - - - - 2
(4) governor - - - - - 0	(4) continuing - - - - - 0
	21. (1) bound - - - - - 0
	(2) farthest extent - - - - 2
	(3) fast train - - - - - 0
	(4) unusual - - - - - 0

Key to Tests IA and IC

22.	(1) selected - - - - - 2	33.	(1) help - - - - - 0
	(2) pleased - - - - - 0		(2) give direction - - - - 2
	(3) looked at - - - - - 0		(3) suggest - - - - - 0
	(4) clothes - - - - - 0		(4) example - - - - - 0
23.	(1) explore - - - - - 0	34.	(1) enmity - - - - - 2
	(2) find first - - - - - 2		(2) not good - - - - - 0
	(3) show - - - - - 0		(3) against - - - - - 0
	(4) take off - - - - - 0		(4) kindness - - - - - 0
24.	(1) wears cap - - - - - 0	35.	(1) workman - - - - - 0
	(2) person who commands - - 1		(2) maker - - - - - 0
	(3) tall man - - - - - 0		(3) one who produces - - - 1
	(4) master - - - - - 0		(4) business - - - - - 0
25.	(1) for ships - - - - - 0	36.	(1) make - - - - - 0
	(2) big waves - - - - - 0		(2) do - - - - - 0
	(3) large body of water - - 2		(3) carry out - - - - - 2
	(4) no land - - - - - 0		(4) gain - - - - - 0
26.	(1) soldiers - - - - - 0	37.	(1) metal - - - - - 2
	(2) ammunition - - - - - 0		(2) mineral - - - - - 0
	(3) army - - - - - 0		(3) hard substance - - - - 0
	(4) not civilian - - - - - 1		(4) kind of iron - - - - - 0
27.	(1) lives on farm - - - - - 0	38.	(1) spoil - - - - - 0
	(2) tiller of soil - - - - - 2		(2) injure - - - - - 2
	(3) works on farm - - - - - 0		(3) destroy - - - - - 0
	(4) raises things - - - - - 0		(4) ruin - - - - - 0
28.	(1) term - - - - - 0	39.	(1) venture - - - - - 1
	(2) office of president - - - 2		(2) expose to danger - - - 2
	(3) time - - - - - 0		(3) can be lost - - - - - 0
	(4) being president - - - - - 0		(4) peril - - - - - 0
29.	(1) small house - - - - - 1	40.	(1) catch - - - - - 0
	(2) room - - - - - 0		(2) take by force - - - - 1
	(3) keep - - - - - 0		(3) trap - - - - - 0
	(4) in a ship - - - - - 0		(4) get - - - - - 0
30.	(1) to make - - - - - 0	41.	(1) in music - - - - - 0
	(2) crushed grain - - - - - 0		(2) weighing machine - - - 2
	(3) ground wheat - - - - - 2		(3) small bone - - - - - 0
	(4) powder - - - - - 0		(4) measure - - - - - 0
31.	(1) food - - - - - 0	42.	(1) celebrate - - - - - 0
	(2) sweet product - - - - - 0		(2) think of - - - - - 0
	(3) drink in coffee - - - - - 0		(3) remember - - - - - 0
	(4) product of cane - - - - - 2		(4) think of and honor - 1
32.	(1) time - - - - - 0	43.	(1) eating substance - - - 0
	(2) often - - - - - 0		(2) shell fish - - - - - 2
	(3) happen - - - - - 1		(3) soup - - - - - 0
	(4) come up - - - - - 0		(4) in water - - - - - 0

Key to Tests IA and IC

- | | |
|---|--|
| 44. (1) healthy - - - - - 2 | 55. (1) elected over - - - - - 0 |
| (2) good - - - - - 0 | (2) named again - - - - - 2 |
| (3) all - - - - - 0 | (3) taken back - - - - - 0 |
| (4) sell - - - - - 0 | (4) in office twice - - - - - 0 |
| 45. (1) sink under - - - - - 0 | 56. (1) not able - - - - - 0 |
| (2) suffocate - - - - - 0 | (2) unfitness - - - - - 2 |
| (3) go down - - - - - 0 | (3) incomplete - - - - - 0 |
| (4) killed in water - - - 1 | (4) not good enough - - - - 0 |
| 46. (1) thrust - - - - - 2 | 57. (1) stone - - - - - -0 |
| (2) jumped - - - - - 0 | (2) on the prairie- - - - - 0 |
| (3) went in quickly - - - 0 | (3) sort of wolf,
wolf-like dog - - - - - 1 |
| (4) fell into - - - - - 0 | (4) animal - - - - - 0 |
| 47. (1) pay attention - - - - 0 | 58. (1) avoid - - - - - -0 |
| (2) take care of - - - - 2 | (2) can be wounded - - - - 2 |
| (3) mind - - - - - 0 | (3) good - - - - - 0 |
| (4) watch - - - - - 0 | (4) attacked - - - - - 0 |
| 48. (1) stove - - - - - 0 | |
| (2) to wash dishes in - - 0 | |
| (3) soft lead - - - - - 2 | |
| (4) mineral - - - - - 0 | |
| 49. (1) travel - - - - - 1 | |
| (2) go around - - - - - 0 | |
| (3) long round about trip 2 | |
| (4) ride - - - - - 0 | |
| 50. (1) officer - - - - - 0 | |
| (2) one in charge of a
meeting - - - - - 2 | |
| (3) on a committee - - - 0 | |
| (4) member - - - - - -0 | |
| 51. (1) wine - - - - - 0 | |
| (2) liquid - - - - - 0 | |
| (3) liquor - - - - - 2 | |
| (4) medicine - - - - - 0 | |
| 52. (1) made mad - - - - - 0 | |
| (2) disgusted - - - - - 0 | |
| (3) angered - - - - - 1 | |
| (4) not pleased - - - - - 0 | |
| 53. (1) part of an engine - - 0 | |
| (2) wheel - - - - - 0 | |
| (3) round body - - - - - 0 | |
| (4) circular tube - - - - 2 | |
| 54. (1) good - - - - - 0 | |
| (2) kind - - - - - 0 | |
| (3) ruler - - - - - 2 | |
| (4) money - - - - - 0 | |

Key to Tests IB and ID

- | |
|---|
| 1. (1) shore-line - - - - - 1 |
| (2) outside - - - - - 0 |
| (3) near the sea - - - - - 0 |
| (4) boundary - - - - - 0 |
| 2. (1) right - - - - - 0 |
| (2) direction - - - - - 0 |
| (3) opposite of east - - - 2 |
| (4) region - - - - - 0 |
| 3. (1) body of men - - - - - 0 |
| (2) law - - - - - 0 |
| (3) congress - - - - - 0 |
| (4) law-making body - - - 2 |
| 4. (1) people- - - - - 0 |
| (2) number of ships - - - 2 |
| (3) army - - - - - 0 |
| (4) great number- - - - - 0 |
| 5. (1) servant - - - - - 0 |
| (2) preacher - - - - - 0 |
| (3) agent - - - - - 0 |
| (4) render aid - - - - - 2 |
| 6. (1) something you do- - - 0 |
| (2) body of delegates,
meeting - - - - - 2 |
| (3) party - - - - - 0 |
| (4) contract - - - - - 0 |

Key to Tests IB and ID

7.	(1) fixed - - - - - 0	(3) one who flees from pur-	
	(2) colony- - - - - 1	suit - - - - - 2	
	(3) arrangement - - - - - 0	(4) something hard to catch-	0
	(4) definite place to		
	live - - - - - 0	18.	(1) arrive - - - - - 0
8.	(1) representative- - - - 2		(2) not water- - - - - 0
	(2) congress- - - - - 0		(3) solid part of earth's
	(3) number - - - - - 0		surface - - - - - 2
	(4) man - - - - - 0		(4) floor - - - - - 0
9.	(1) pleased - - - - - 0	19.	(1) statement - - - - - 2
	(2) grown together- - - - 0		(2) make known - - - - - 0
	(3) agreed - - - - - 0		(3) say - - - - - 0
	(4) made one- - - - - 2		(4) written - - - - - 0
10.	(1) went against- - - - - 2	20.	(1) trip - - - - - 1
	(2) not agreed - - - - - 0		(2) moving - - - - - 0
	(3) stopped - - - - - 0		(3) road - - - - - 0
	(4) objected- - - - - 0		(4) go away - - - - - 0
11.	(1) quit - - - - - 0	21.	(1) large field - - - - - 0
	(2) go back - - - - - 0		(2) farm in the South- - - - 2
	(3) give in - - - - - 0		(3) for cotton - - - - - 0
	(4) give up - - - - - 2		(4) place to plant - - - - - 0
12.	(1) like a colony - - - - 0	22.	(1) money - - - - - 0
	(2) belonging to a colo-		(2) tax - - - - - 2
	ny - - - - - 2		(3) something familiar - - - 0
	(3) old - - - - - 0		(4) fashion - - - - - 0
	(4) out of style - - - - 0	23.	(1) revenue - - - - - 0
13.	(1) kind of hat - - - - - 0		(2) measure - - - - - 0
	(2) mariner - - - - - 2		(3) part - - - - - 0
	(3) blue suit - - - - - 0		(4) that which aids in at-
	(4) one who sails - - - - 0		taining an end -- - - - 2
14.	(1) gain - - - - - 0	24.	(1) little - - - - - 0
	(2) buy - - - - - 2		(2) document - - - - - 0
	(3) take - - - - - 0		(3) request addressed to an
	(4) value - - - - - 0		authority - - - - - 2
15.	(1) roam around - - - - - 0		(4) wall - - - - - 0
	(2) search through - - - - 0	25.	(1) desert,
	(3) examine carefully- - - 0		forsake - - - - - 2
	(4) penetrate for dis-		(2) reject - - - - - 0
	covery - - - - - 1		(3) resign - - - - - 0
16.	(1) right to govern - - - 2		(4) quarrel - - - - - 0
	(2) cruelty - - - - - 0	26.	(1) loss - - - - - 0
	(3) refer to - - - - - 0		(2) have more - - - - - 0
	(4) officer of law - - - - 0		(3) part of union- - - - - 0
17.	(1) wanderer - - - - - 0		(4) win - - - - - 1
	(2) deserter - - - - - 0	27.	(1) push on - - - - - 0
			(2) heavy weight - - - - - 0

Key to Tests IB and ID

(3) force - - - - - 2	(2) actions - - - - - 1
(4) power - - - - - 0	(3) silence - - - - - 0
	(4) order - - - - - 0
28. (1) belief - - - - - 1	39. (1) assembly- - - - - 1
(2) religion - - - - - 0	(2) crowd - - - - - 0
(3) lesson - - - - - 0	(3) many persons - - - - - 0
(4) teaching - - - - - 2	(4) thank - - - - - 0
(4) faith - - - - - 0	
29. (1) kill - - - - - 0	40. (1) short story - - - - - 0
(2) put up - - - - - 0	(2) beginning - - - - - 0
(3) execute- - - - - 0	(3) brief - - - - - 0
(4) suspend- - - - - 2	(4) all in a few words- - - 2
30. (1) willing- - - - - 0	41. (1) trust - - - - - 2
(2) make nervous - - - - - 0	(2) sure - - - - - 0
(3) arouse - - - - - 2	(3) hope - - - - - 0
(4) frighten - - - - - 0	(4) truth - - - - - 0
31. (1) look up to - - - - - 0	42. (1) exact by authority- - - 1
(2) be nice - - - - - 0	(2) put on- - - - - 0
(3) revere - - - - - 2	(3) force - - - - - 0
(4) be polite to- - - - - 0	(4) that which is demanded- 0
32. (1) prize - - - - - 0	43. (1) enemy - - - - - 0
(2) worth - - - - - 2	(2) partner - - - - - 0
(3) cost - - - - - 0	(3) competitor, - - - - - 2
(4) amount - - - - - 0	antagonist- - - - - 0
	(4) speak back - - - - - 0
33. (1) noise - - - - - 0	44. (1) stop - - - - - 0
(2) sudden attack - - - - - 0	(2) behind - - - - - 0
(3) warning - - - - - 1	(3) not do - - - - - 0
(4) disturb - - - - - 0	(4) prevent - - - - - 2
34. (1) draw to - - - - - 2	45. (1) composer- - - - - 2
(2) invite - - - - - 0	(2) name - - - - - 0
(3) please - - - - - 0	(3) poet - - - - - 0
(4) charm - - - - - 0	(4) maker - - - - - 0
35. (1) destroy - - - - - 0	46. (1) burdened- - - - - 2
(2) rob - - - - - 0	(2) heavy - - - - - 0
(3) take away - - - - - 2	(3) hard - - - - - 0
(4) refuse - - - - - 0	(4) stooped - - - - - 0
36. (1) will - - - - - 0	47. (1) myth - - - - - 2
(2) desire - - - - - 0	(2) motto - - - - - 0
(3) object - - - - - 0	(3) marvelous - - - - - 0
(4) purpose, - - - - - 2	(4) untrue story- - - - - 0
motive - - - - - 2	
37. (1) all - - - - - 0	48. (1) pull out- - - - - 2
(2) through - - - - - 0	(2) take away - - - - - 0
(3) finish - - - - - 2	(3) take from - - - - - 0
(4) end - - - - - 0	(4) beverage - - - - - 0
38. (1) behavior - - - - - 2	49. (1) test - - - - - 0

Key to Tests IB and ID

- | | |
|---------------------------------|------------------------------------|
| (2) find false - - - - - 0 | 4. (1) landing place for ships - 2 |
| (3) tell - - - - - 0 | (2) divide - - - - - 0 |
| (4) give evidence - - - - 2 | (3) near the sea - - - - - 0 |
| | (4) cape - - - - - 0 |
| 50. (1) make familiar - - - - 0 | 5. (1) chosen - - - - - 0 |
| (2) become a citizen - - - 2 | (2) put in - - - - - 0 |
| (3) treat as native- - - - 0 | (3) named for office - - - - 2 |
| (4) take papers - - - - - 0 | (4) elected - - - - - 0 |
| 51. (1) peddler - - - - - 0 | 6. (1) bill - - - - - 0 |
| (2) walker - - - - - 2 | (2) moneyowed - - - - - 2 |
| (3) citizen - - - - - 0 | (3) charge - - - - - 0 |
| (4) man or woman - - - - - 0 | (4) kindness, pay to - - - - - 0 |
| 52. (1) rebellious- - - - - 1 | 7. (1) on the train - - - - - 0 |
| (2) law - - - - - 0 | (2) walk around - - - - - 0 |
| (3) danger- - - - - 0 | (3) long way - - - - - 0 |
| (4) very set- - - - - 0 | (4) journey on water - - - - 2 |
| 53. (1) shouting- - - - - 0 | 8. (1) drink made from leaves - 2 |
| (2) loud - - - - - 0 | (2) afternoon party - - - - 0 |
| (3) full - - - - - 0 | (3) food - - - - - 0 |
| (4) rejoicing - - - - - 2 | (4) letter - - - - - 0 |
| 54. (1) mean - - - - - 0 | 9. (1) not relying on another - 2 |
| (2) greedy for gain - - - 2 | (2) acting joyful - - - - - 0 |
| (3) hired - - - - - 0 | (3) gay - - - - - 0 |
| (4) has mercy- - - - - 0 | (4) able - - - - - 0 |
| 55. (1) strong - - - - - 0 | 10. (1) owned - - - - - 0 |
| (2) difficult- - - - - 0 | (2) considered - - - - - 0 |
| (3) dreadful - - - - - 1 | (3) argued - - - - - 2 |
| (4) tremendous - - - - - 0 | (4) claimed by two - - - - - 0 |

Key to Tests IIA and IIC

- | | |
|---|-------------------------------------|
| 1. (1) taken in - - - - - 0 | 11. (1) people's government - - - 2 |
| (2) necessary to sustain life - - - - - 0 | (2) no ruler - - - - - 0 |
| (3) eat - - - - - 0 | (3) revolution - - - - - 0 |
| (4) eatable - - - - - 1 | (4) president - - - - - 0 |
| 2. (1) dog - - - - - 0 | 12. (1) inform - - - - - 0 |
| (2) first to buy- - - - - 0 | (2) word sent - - - - - 2 |
| (3) one who makes his home in a new country - - - - - 2 | (3) letter - - - - - 0 |
| (4) old man - - - - - 0 | (4) sermon - - - - - 0 |
| 3. (1) materials - - - - - 2 | 13. (1) undisturbed state - - - - 2 |
| (2) not bad - - - - - 0 | (2) doing nothing - - - - - 0 |
| (3) what to buy - - - - - 0 | (3) signed - - - - - 0 |
| (4) dresses - - - - - 0 | (4) agree - - - - - 0 |
| | 14. (1) location - - - - - 2 |
| | (2) hill - - - - - 0 |
| | (3) can be seen - - - - - 0 |
| | (4) quote - - - - - 0 |

Key to Tests IIA and IIC

- | | |
|---|---|
| 15. (1) acquiring money dishonestly - - - - - 1 | 25. (1) share another's feeling - - - - - 2 |
| (2) put on - - - - - 0 | (2) tend - - - - - 0 |
| (3) insert - - - - - 0 | (3) cry - - - - - 0 |
| (4) trick - - - - - 0 | (4) pity - - - - - 0 |
| 16. (1) purchase - - - - - 0 | 26. (1) afford - - - - - 0 |
| (2) act of binding to - - - 2 | (2) produce - - - - - 2 |
| (3) colonize - - - - - 0 | (3) grant - - - - - 0 |
| (4) cancel - - - - - 0 | (4) admit as true - - - - - 0 |
| 17. (1) make null - - - - - 2 | 27. (1) hide - - - - - 0 |
| (2) object - - - - - 0 | (2) conceal - - - - - 0 |
| (3) oppose - - - - - 0 | (3) put away - - - - - 0 |
| (4) forbid, attach - - - - - 0 | (4) vanish - - - - - 2 |
| 18. (1) guard - - - - - 0 | 28. (1) not play - - - - - 0 |
| (2) can - - - - - 0 | (2) exhibit - - - - - 2 |
| (3) keep in good condition - - - - - 2 | (3) lay out - - - - - 0 |
| (4) obtain - - - - - 0 | (4) pretend to - - - - - 0 |
| 19. (1) destroyed - - - - - 0 | 29. (1) temperature - - - - - 0 |
| (2) demolished - - - - - 0 | (2) state of weather - - - 1 |
| (3) seized as forfeit - - - 2 | (3) heat or cold - - - - - 0 |
| (4) taken - - - - - 0 | (4) atmosphere - - - - - 0 |
| 20. (1) omission to perform - 2 | 30. (1) officer in the navy - - 2 |
| (2) weakness - - - - - 0 | (2) chief - - - - - 0 |
| (3) lack - - - - - 0 | (3) high man - - - - - 0 |
| (4) zero - - - - - 0 | (4) captain - - - - - 0 |
| 21. (1) process - - - - - 2 | 31. (1) fixed - - - - - 1 |
| (2) manner - - - - - 0 | (2) last - - - - - 0 |
| (3) plan - - - - - 0 | (3) changing - - - - - 0 |
| (4) art - - - - - 0 | (4) remaining - - - - - 0 |
| 22. (1) peace - - - - - 0 | 32. (1) lazy - - - - - 0 |
| (2) not for either side - 2 | (2) quiet - - - - - 0 |
| (3) destructive - - - - - 0 | (3) doing nothing - - - - 2 |
| (4) friendly - - - - - 0 | (4) dreaming - - - - - 0 |
| 23. (1) fighting - - - - - 0 | 33. (1) hear - - - - - 0 |
| (2) sacrifice - - - - - 0 | (2) attend to - - - - - 2 |
| (3) pride - - - - - 0 | (3) hearken - - - - - 0 |
| (4) love of one's country - 2 | (4) sound - - - - - 0 |
| 24. (1) bill - - - - - 0 | 34. (1) firmly established - - 2 |
| (2) give - - - - - 0 | (2) stall - - - - - 0 |
| (3) be under obligation to - - - - - 2 | (3) balanced - - - - - 0 |
| (4) possess - - - - - 0 | (4) soluble - - - - - 0 |
| | 35. (1) class - - - - - 0 |
| | (2) events - - - - - 0 |
| | (3) stories - - - - - 0 |
| | (4) connected succession - 2 |

Key to Tests IIA and IIC

- | | |
|--------------------------------|-------------------------------------|
| 36. (1) race - - - - - 0 | 47. (1) kind manner - - - - - 0 |
| (2) mountain - - - - - 0 | (2) common to two - - - - - 2 |
| (3) political meeting- - 2 | (3) lowly - - - - - 0 |
| (4) plant - - - - - 0 | (4) on good terms - - - - - 0 |
| 37. (1) condemn- - - - - 0 | 48. (1) excited condition - - - - 0 |
| (2) charge with- - - - - 2 | (2) trouble - - - - - 0 |
| (3) insult - - - - - 0 | (3) fear - - - - - 0 |
| (4) offend - - - - - 0 | (4) act of laying waste - - - - 2 |
| 38. (1) inspired with ardent | 49. (1) give up - - - - - 0 |
| interest - - - - - 2 | (2) rebelled- - - - - 0 |
| (2) haste - - - - - 0 | (3) withdrew from - - - - - 2 |
| (3) impatience - - - - - 0 | (4) fought - - - - - 0 |
| (4) | |
| 39. (1) won - - - - - 0 | 50. (1) authority - - - - - 0 |
| (2) profit - - - - - 0 | (2) one commissioned to act - 2 |
| (3) prized - - - - - 0 | (3) factor - - - - - 0 |
| (4) worked for - - - - - 2 | (4) office - - - - - 0 |
| 40. (1) lively - - - - - 0 | 51. (1) face-view - - - - - 2 |
| (2) inherent power - - - - 2 | (2) preceding - - - - - 0 |
| (3) strength - - - - - 0 | (3) outward side- - - - - 0 |
| (4) action - - - - - 0 | (4) end - - - - - 0 |
| 41. (1) rough - - - - - 0 | 52. (1) one who betrays - - - - - 2 |
| (2) not heeding - - - - - 0 | (2) spy - - - - - 0 |
| (3) quick - - - - - 0 | (3) criminal - - - - - 0 |
| (4) undue hastiness- - - 2 | (4) villain - - - - - 0 |
| 42. (1) cringe - - - - - 0 | 53. (1) take to law - - - - - 2 |
| (2) blink your eyes- - - 0 | (2) judge - - - - - 0 |
| (3) draw back- - - - - 2 | (3) follow- - - - - 0 |
| (4) crouch - - - - - 0 | (4) hope for- - - - - 0 |
| 43. (1) break down - - - - - 0 | 54. (1) give way to - - - - - 2 |
| (2) sudden loud noise- - 2 | (2) forego - - - - - 0 |
| (3) outbreak - - - - - 0 | (3) commit - - - - - 0 |
| (4) fall - - - - - 0 | (4) take part - - - - - 0 |
| 44. (1) annihilated- - - - - 0 | 55. (1) producing results - - - - 2 |
| (2) fallen - - - - - 0 | (2) charming - - - - - 0 |
| (3) in disorder- - - - - 0 | (3) hard working - - - - - 0 |
| (4) broken in pieces - - 2 | (4) hot - - - - - 0 |
| 45. (1) active - - - - - 0 | 56. (1) democratic - - - - - 0 |
| (2) striving - - - - - 0 | (2) righteousness - - - - - 2 |
| (3) impatient desire - - 2 | (3) truth - - - - - 0 |
| (4) hurry - - - - - 0 | (4) good - - - - - 0 |
| 46. (1) fire - - - - - 0 | 57 |
| (2) import unlawfully- - 2 | <u>Key to Tests IIB and IID</u> |
| (3) steal - - - - - 0 | 1. (1) need - - - - - -0 |
| (4) deceive- - - - - 0 | (2) money - - - - - -0 |
| | (3) what we have - - - - - -2 |

Key to Tests IIB and IID

(4) anything- - - - - 0	12. (1) think - - - - - 0
2. (1) extra - - - - - 0	(2) deliberate - - - - - 0
(2) not ordinary- - - - - 0	(3) board of advisors- - - 2
(3) spacious- - - - - 1	(4) group of men - - - - - 0
(4) eminent - - - - - 0	13. (1) crowd - - - - - 0
3. (1) tell on by one- - - - 1	(2) more than one - - - - - 2
(2) little city - - - - - 0	(3) many - - - - - 0
(3) write - - - - - 0	(4) two - - - - - 0
(4) spell - - - - - 0	14. (1) made out of nothing - - 2
4. (1) fight - - - - - 0	(2) invent- - - - - 0
(2) win a battle- - - - - 1	(3) explore - - - - - 0
(3) sign - - - - - 0	(4) find out- - - - - 0
(4) board - - - - - 0	15. (1) accept - - - - - 0
5. (1) find - - - - - 2	(2) refuse - - - - - 2
(2) wander - - - - - 0	(3) steep - - - - - 0
(3) play - - - - - 0	(4) fall down - - - - - 0
(4) sail about - - - - - 0	16. (1) forgive - - - - - 2
6. (1) quick attack - - - - 2	(2) hinder - - - - - 0
(2) force - - - - - 0	(3) condemn - - - - - 0
(3) destroy - - - - - 0	(4) smile at - - - - - 0
(4) something, battle - - - - - 0	17. (1) fasten securely - - - - 1
7. (1) look sad - - - - - 0	(2) big iron - - - - - 0
(2) work - - - - - 2	(3) immovable - - - - - 0
(3) liquor - - - - - 0	(4) stay - - - - - 0
(4) read, dig - - - - - 0	18. (1) room - - - - - 0
8. (1) inhabitant - - - - - 0	(2) wall - - - - - 0
(2) one born in a place - 2	(3) surrounding - - - - - 0
(3) old home- - - - - 0	(4) soldiers' quarters - - 2
(4)	19. (1) quick rate of moving - 2
9. (1) sail - - - - - 0	(2) hurry - - - - - 0
(2) sink - - - - - 0	(3) limit - - - - - 0
(3) fly - - - - - 0	(4) way to do - - - - - 0
(4) stay on top of the water- - - - - 2	20. (1) persuade - - - - - 0
10. (1) mix up - - - - - 2	(2) cause to turn - - - - - 1
(2) move - - - - - 0	(3) man - - - - - 0
(3) begin - - - - - 0	(4) help - - - - - 0
(4) combine with - - - - 0	21. (1) restrain - - - - - 2
11. (1) pull up- - - - - 0	(2) silence - - - - - 0
(2) suspend- - - - - 2	(3) smother - - - - - 0
(3) stand - - - - - 0	(4) check - - - - - 0
(4) murder, try - - - - - 0	22. (1) tease - - - - - 1
	(2) irritate- - - - - 2
	(3) keep at - - - - - 0
	(4) prick - - - - - 0

Keys to Tests IIB and IID

- | | |
|---|------------------------------------|
| 23. (1) see - - - - - 0 | 33. (1) make over - - - - - 1 |
| (2) conscious - - - - - 2 | (2) better - - - - - 0 |
| (3) know- - - - - 0 | (3) make something - - - - - 0 |
| (4) observe - - - - - 0 | (4) opposite - - - - - 0 |
| 24. (1) equilibrium - - - - - 2 | 34. (1) game - - - - - 0 |
| (2) watch - - - - - 0 | (2) short- - - - - 0 |
| (3) your step - - - - - 0 | (3) discharge of bullets - - 2 |
| (4) weigh, same - - - - - 0 | (4) bang - - - - - 0 |
| 25. (1) transport - - - - - 0 | 35. (1) contest of speed - - - - 2 |
| (2) load - - - - - 0 | (2) large number of people - 0 |
| (3) baggage - - - - - 0 | (3) color - - - - - 0 |
| (4) freight on a ship - - 2 | (4) habit - - - - - 0 |
| 26. (1) hill - - - - - 0 | 36. (1) division - - - - - 0 |
| (2) peak - - - - - 0 | (2) territory - - - - - 0 |
| (3) plateau - - - - - 0 | (3) condition - - - - - 2 |
| (4) keep up, hold - - - - - 1 | (4) politics - - - - - 0 |
| 27. (1) strict training - - - 2 | 37. (1) enhance- - - - - 0 |
| (2) flogging - - - - - 0 | (2) alluring quality - - - - 2 |
| (3) scold - - - - - 0 | (3) tame - - - - - 0 |
| (4) rough - - - - - 0 | (4) calm way - - - - - 0 |
| 28. (1) vegetable - - - - - 0 | 38. (1) climb up - - - - - 1 |
| (2) string - - - - - 0 | (2) clash - - - - - 0 |
| (3) hair-like particle of vegetable - - - - - 2 | (3) change- - - - - 0 |
| (4) slice - - - - - 0 | (4) sound, hurry - - - - - 0 |
| 29. (1) part of a fire-place- 2 | 39. (1) broad - - - - - 0 |
| (2) scrape - - - - - 0 | (2) average - - - - - 2 |
| (3) harsh sound - - - - 0 | (3) store - - - - - 0 |
| (4) scratch- - - - - 0 | (4) run - - - - - 0 |
| 30. (1) help your friends - - 0 | 40. (1) draw at a tension- - - 2 |
| (2) take advantage of - - 2 | (2) streak - - - - - 0 |
| (3) sponge- - - - - 0 | (3) pull - - - - - 0 |
| (4) put down - - - - - 0 | (4) sprain - - - - - 0 |
| 31. (1) person who has no parents - - - - - 0 | 41. (1) people in a given area - 2 |
| (2) landing place for ships - - - - - 2 | (2) number - - - - - 0 |
| (3) edge - - - - - 0 | (3) space - - - - - 0 |
| (4) animal - - - - - 0 | (4) some - - - - - 0 |
| 32. (1) have life again - - - 2 | 42. (1) sharp and distinct- - - 2 |
| (2) remember - - - - - 0 | (2) pointed - - - - - 0 |
| (3) call back - - - - - 0 | (3) little - - - - - 0 |
| (4) bring - - - - - 0 | (4) small at one end - - - 0 |
| | 43. (1) one who seeks knowledge 2 |
| | (2) teacher - - - - - 0 |
| | (3) paper - - - - - 0 |
| | (4) book - - - - - 0 |

Key to Tests IIB and IID

44. (1) no different - - - - - 0
 (2) change another's view- 2
 (3) cross - - - - - 0
 (4) deny - - - - - 0
45. (1) take up again - - - - 2
 (2) review - - - - - 0
 (3) commence- - - - - 0
 (4) agree - - - - - 0
46. (1) stop - - - - - 0
 (2) bring together- - - - 0
 (3) end - - - - - 2
 (4) begin - - - - - 0
47. (1) ability to accomplish
 an act in the right
 way - - - - - 2
 (2) accurate - - - - - 0
 (3) fit - - - - - 0
 (4)
48. (1) tarment - - - - - 0
 (2) criticize - - - - - 0
 (3) repay - - - - - 0
 (4) heat to make tough - - 1
49. (1) feeling - - - - - 2
 (2) affection - - - - - 0
 (3) weep for - - - - - 0
 (4) opinion - - - - - 0
50. (1) steep - - - - - 2
 (2) slanting - - - - - 0
 (3) decline - - - - - 0
 (4) hasty - - - - - 0
51. (1) power to carry on
 transactions with
 trouble - - - - - 0
 (2) keenness,
 tact - - - - - 2
 (3) deliberation - - - - - 0
 (4) thought - - - - - 0

Table 13

Frequency of Occurrence and Difficulty of Words in Tests IA and IC, with Coefficient of Correlation.

	Chambers	McMaster	Woodburn and Morris	Average Frequency	Rank (Frequency)	Rank (Difficulty)	Coef. of Correlation	$\frac{2-1}{1-1}$	Number of 1's	Number of 2's
1. slave	140	105	135	126.6	1	6	.832	109	0	109
2. shoulder	5			1.6	43.5	34	.427	56	112	0
3. colonist	110	21	81	70.6	2	1	.992	130	0	130
4. battle	80	39	54	57.6	3	11.5	.763	100	0	100
5. village	15	27	51	31	15	5	.862	113	0	113
6. government	35	48	63	48.6	4	33	.446	58.5	117	0
7. nation	25	12	99	45.3	6	11.5	.763	100	0	100
8. charter	5	72	45	40.6	7	10	.770	101	0	101
9. fort	75	27	39	47	5	29	.473	62	0	62
10. king	30	30	57	39	10.5	47	.286	37.5	75	0
11. island	40	57	21	39.3	9	4	.885	116	0	116
12. defeat	45	27	45	39	10.5	25.5	.503	66	0	66
13. demand	30	51	27	36	12	29	.473	62	0	62
14. negro	30	30	45	35	13	51.5	.225	29.5	59	0
15. meeting	20	12	63	31.6	14	8	.801	105	0	105
16. thousand	90	18	12	40	8	18	.679	89	0	89
17. extended	25	33	30	29.3	16	53	.148	19.5	39	0
18. route	15	15	48	26	18	7	.809	106	0	106
19. seize	35	27	18	26.6	17	24	.511	67	0	67
20. existing	10	39	18	22.3	20	43	.313	41	0	41
21. limit	50	21	6	25.6	19	15.5	.702	92	0	92
22. chose	25	9	30	21.3	21	3	.893	117	0	117
23. discover	20	27	12	19.6	22	25.5	.503	66	0	66

Table 13 Continued

24. captain	30	15	6	17	23.5	29	.473	62	124	0
25. ocean	5	18	21	14.6	25	2	.916	120	0	120
26. military	30	18	3	17	23.5	55	.129	17	34	0
27. farmer	15	9	18	14	26	22	.572	75	0	75
28. presidency	6	30	12	27	15.5	.702	92	0	92	
29. cabin	5	27	3	11.6	28	37	.385	50.5	101	0
30. flour	5	15	12	10.6	29	20	.664	87	0	87
31. sugar	24	3	9	30.5	23	.526	69	0	69	
32. occur	5	6	12	7.6	33	44	.309	40.5	81	0
33. advise	15	3	9	9	30.5	36	.412	54	0	54
34. hostility	3	9	4	36.5	39.5	.335	44	0	44	
35. manufacturer	5	15	6	8.6	32	38	.339	44.5	89	0
36. accomplish	10	6	3	6.3	34	17	.687	90	0	90
37. steel	5	3	6	4.6	35	39.5	.335	44	0	44
38. damage	6	6	4	36.5	42	.320	42	0	42	
39. risk	3	3	2	41	9	.782	102.5	25	90	
40. capture	10			3.3	38	41	.328	43	86	0
41. scale	5	3		2.6	39.5	21	.656	86	0	86
42. commemorate	5		3	2.6	39.5	56	.103	13.5	27	0
43. oyster			3	1	52	14	.709	93	0	93
44. wholesome			3	1	52	13	.748	98	0	98
45. drowned	5			1.6	43.5	49	.274	36	72	0
46. plunged	5			1.6	43.5	58	.0457	6	0	6
47. tend			3	1	52	46	.297	39	0	39
48. zinc		3		1	52	45	.302	40	0	40
49. tour			3	1	52	32	.447	58.5	39	39
50. chairman		3		1	52	35	.419	55	0	55
51. brandy		3		1	52	19	.671	88	0	88

Table 13 Continued

52. provoked		3	1	52	54	.133	17.5	35	0
53. cylinder		3	1	52	50	.244	32	0	32
54. sovereign	5		1.6	43.5	27	.488	64	0	64
55. renominated	3		1	52	57	.084	11	0	11
56. incompetency		3	1	52	48	.282	37	0	37
57. coyote		3	1	52	51.5	.225	29.5	59	0
58. vulnerable	3		1	52	31	.458	60	0	60

$$r = .4942$$

Table 14

Frequency of Occurrence and Difficulty of Words in Tests IB and ID, with Coefficient of Correlation.

	J	M	N	av.	Rank (I.B.)	Rank (D.I.)	% of 123 Cases	$\frac{2-1}{1-2}$	I's	D's
1. coast	50	66	48	54.6	1	48	.247	30.5	61	0
2. western	55	51	54	53.3	2	20	.609	75	0	75
3. legislature	10	72	48	43.3	4	13	.715	88	0	88
4. fleet	100	36	6	47.3	3	1.5	.959	118	0	118
5. minister	55	18	42	38.3	5	55	.008	1	0	1
6. convention	5	30	57	30.6	7	1.5	.959	118	0	118
7. settlement	65	30	18	37.6	6	45	.268	33	66	0
8. delegate	10	42	33	28.3	8	8.5	.829	102	0	102
9. united	15	12	51	26	10	27.5	.504	62	0	62
10. opposed	20	15	42	25.6	11	31	.455	56	0	56
11. surrender	45	24	15	28	9	15	.699	86	0	86
12. colonial	20	24	27	23.6	13	33	.406	50	0	50
13. sailor	30	15	27	24	12	30	.471	58	0	58

Table 14 Continued

14. purchase	5	27	27	19.6	15	3	.934	115	0	115
15. explore		12	21	11	26.5	49	.223	27.5	55	0
16. authority	30	15	15	20	14	5	.878	108	0	108
17. fugitive	20	6	27	17.6	17	22	.593	73	0	73
18. land	35	18	3	18.6	16	6	.869	107	0	107
19. declaration	10	15	18	14.3	20	14	.707	87	0	87
20. journey	30	18	3	17	18	32	.434	53.5	107	0
21. plantation	20	21	6	15.6	19	20	.609	75	0	75
22. custom	15	18	9	14	21	42	.276	34	0	34
23. means	10	12	15	12.3	23	25.5	.544	67	0	67
24. petition	5	9	21	11.6	25	29	.487	60	0	60
25. abandon	15	9	12	12	24	16	.691	85	0	85
26. gain	30	3	6	13	22	42	.276	34	68	0
27. pressure			3	1	51	42	.276	34	0	34
28. doctrine	15		18	11	26.5	51	.195	24	48	0
29. hang	5	21	3	9.6	29	45	.268	33	0	33
30. excite	5	15	9	9.6	29	38.5	.292	36	0	36
31. respect		6	21	9	31.5	53	.138	17	0	17
32. value	5	12	12	9.6	29	34	.390	48	0	48
33. alarm		12	12	8	33	47	.260	32	64	0
34. attract	15	6	6	9	31.5	30	.609	75	0	75
35. deprive		9	9	6	35.5	27.5	.504	62	0	62
36. intention		3	12	5	37	52	.162	20	0	20
37. complete	15		3	6	35.5	11	.772	95	0	95
38. conduct		6	6	4	38.5	4	.906	111.5	9	107
39. congregation		6	6	4	38.5	36	.365	45	90	0
40. summary	20			6.6	34	35	.374	46	0	46
41. confidence	5	6		3.6	40	8.5	.829	102	0	102

Table 14 Continued

42. levy		3	1	51	50	.215	26.5	53	0
43. rival	5			1.6	45.5	40	.284	35	0 35
44. hinder	6			2	43	23	.585	72	0 72
45. author		6	2	43	12		.756	93	0 93
46. laden	3	3	2	43	10		.821	101	0 101
47. legend	5	3		2.6	41	45	.268	33	0 33
48. extract	3			1	51	24	.552	68	0 68
49. testify		3	1	51	17		.650	80	0 80
50. naturalize		3	1	51	18		.642	79	0 79
51. pedestrian	5			1.6	45.5	38.5	.292	36	0 36
52. seditious		3	1	51	37		.337	41.5	83 0
53. jubilant		3	1	51	7		.861	106	0 106
54. mercenary		3	1	51	25.5		.544	67	0 67
55. formidable		3	1	51	54		.048	6	12 0

$$r = .16425$$

Table 15

Frequency of Occurrence and Difficulty of Words in Tests IIA and IIC, with Coefficient of Correlation.

	J	K	L	M	Rank (F ₁₀)	Rank (D ₁₀)	% of 132 Cases	$\frac{2-1}{2+1}$	1/2	2/3
1. food	90	18	21	43	1	56	.0947	12.5	21	0
2. settler	65	30	21	38.6	2	2	.9770	129	0	129
3. goods	20	51	24	31.6	3	31	.6130	81	0	81
4. port	35	36	21	30.6	4	2	.977	129	0	129
5. nominated	5	33	39	25.6	6	45	.43	57	0	57
6. debt	15	54	9	26	5	17	.757	100	0	100
7. voyage	10	24	36	23.3	8.5	17	.757	100	0	100

Table 15 Continued

8. tea	30	33	12	25	7	9	.84	111	0	111
9. independence	25	9	36	23.3	8.5	2	.977	129	0	129
10. disputed	10	27	24	20.3	10	33.5	.598	79	0	79
11. republic		33	18	17	12.5	14	.77	103	0	103
12. message	10	9	33	17.3	11	33.5	.598	79	0	79
13. peace	15	15	21	17	12.5	7.5	.87	115	0	115
14. site	5	15	15	11.6	15	15	.77	102	0	102
15. graft			3	1	53	4	.916	121	0	121
16. annexation	5	6	21	10.6	16	37.5	.56	74	0	74
17. veto		21	15	12	14	28	.628	83	0	83
18. preserve	5	3	21	9.6	17	13	.818	108	0	108
19. confiscated		3	3	2	44	47	.378	50	0	50
20. failure	10	12	6	9.3	18	27	.63	84	0	84
21. method	10	3	12	8.3	19.5	49	.348	46	0	46
22. neutral	10	15		8.3	19.5	11	.83	110	0	110
23. patriotism			18	6	23.5	43	.458	60.5	121	0
24. owe	10		6	5.3	26	22	.711	93	0	93
25. sympathy	5	6	6	5.6	25	5.5	.878	116	0	116
26. yield		15		5	27.5	46	.401	53	0	53
27. disappear	10	9		6.3	22	17	.757	100	0	100
28. display		9	6	5	27.5	23	.71	94	0	94
29. climate		6	6	4	30	37.5	.56	74	0	74
30. admiral	20			6.6	21	7.5	.87	115	0	115
31. permanent	15	3		6	23.5	55	.121	26	52	0
32. idle			9	3	35	41	.53	70	0	70
33. listen	5		6	3.6	31	54	.219	29	0	29
34. stable		9		3	35	44	.43	58	0	58
35. series	10		3	4.3	29	39	.55	73	0	73

Table 15 Continued

36. caucus			9	3	35	52.5	.25	33	0	33
37. accuse			9	3	35	29.5	.62	82	0	82
38. enthusiasm			9	3	35	11	.83	110	0	110
39. earned	6			2	44	25	.689	91	0	91
40. energy	5	3	0	2.6	39	48	.35	47	0	47
41. rash	3		3	2	44	52.5	.25	33	0	33
42. shrink	3		3	2	44	32	.606	80	0	80
43. crash	10			3.3	32	36	.575	76	0	76
44. shattered	5		3	2.6	39	35	.583	77	0	77
45. eagerness			6	2	44	21	.712	94	0	94
46. smuggle	6			2	44	26	.67	89	0	89
47. mutual	5		3	2.6	39	50	.303	40	0	40
48. depredation	3		3	2	44	51	.265	35	0	35
49. receded	5			1.6	48.5	42	.49	65	0	65
50. deputy	3			1	53	24	.69	92	0	92
51. front	5			1.6	48.5	20	.72	95	0	95
52. traitor	3			1	53	11	.83	110	0	110
53. sue			3	1	53	5.5	.878	116	0	116
54. indulge			3	1	53	29.5	.62	82	0	82
55. efficient	3			1	53	19	.75	99	0	99
56. justice			3	1	53	40	.53	71	0	71

$$r = .16425$$

Table 16

Frequency of Occurrence and Difficulty of Words in Tests IIB and IID, with Coefficient of Correlation.

	J	Σ	N	av.	Rank (IIB)	Rank (IID)	r of IIB and IID	$\frac{1}{2}(J + I)$	I^2	J^2
1. possession	40	27	15	27.3	2	1	.977	129	0	129

Table 16 Continued

2. great	65	12	9	28.6	1	51	.034	4.5	9	0
3. count	25	24	18	22.3	3	37.5	.084	64	128	0
4. victory	15	21	24	20	6	39	.481	63.5	127	0
5. discover	20	27	12	17.6	7	9	.916	121	0	121
6. raid		18	15	11	9	15.5	.833	110	0	110
7. labor	10	30	9	16.3	8	6.5	.939	124	0	124
8. native	55		9	21.3	4	35	.530	70	0	70
9. float	10	21	30	20.3	5	21	.765	101	0	101
10. stir	5	3	21	19.6	11.5	29	.727	96	0	96
11. hang	5	21	3	9.6	11.5	40	.446	59	0	59
12. council		21	6	9	14.5	29	.727	96	0	96
13. plural	5	12	12	9.6	11.5	11	.909	120	0	120
14. created		18	9	9	14.5	5	.942	124	0	124
15. decline	5	15		6.6	16.5	25.5	.750	99	0	99
16. pardon		3	3	2	32	3.5	.946	125	0	125
17. anchor	15	3		6	18	43	.378	50	100	0
18. barracks	5			1.6	34.5	3.5	.946	103	0	103
19. speed	20	9		9.6	11.5	12	.871	115	0	115
20. convert	20			6.6	16.5	46	.359	47.5	95	0
21. suppress		9	3	4	21.5	33	.613	81	0	81
22. annoy	10	0	3	4.3	20	49	.253	33.5	67	50
23. aware		6	3	3	27	29	.727	96	0	96
24. balance	5		6	3.6	23.5	44.5	.363	48	0	48
25. cargo	5	3	3	3.6	23.5	36	.500	66	0	66
26. maintain			3	1	44	48	.344	45.5	91	0
27. discipline	5	3		2.6	30	13.5	.863	114	0	114
28. fibre	15			5	19	35	.538	71	0	71

Table 16 Continued

29. grate		3	1	44	2	.954	126	0	126
30. impose	6	3	3	27	25.5	.750	99	0	99
31. wharf	10		3.3	25	23	.757	100	0	100
32. revive	12		4	21.5	23	.757	100	0	100
33. transform	5	3	2.6	30	42.5	.439	58	116	0
34. volley	5	3	2.6	30	20	.780	103	0	103
35. race		3	1	44	9	.916	121	0	121
36. state	5		1.6	34.5	50	.053	7	0	7
37. charm		3	1	44	32	.659	87	0	87
38. clamber	3		1	44	42.5	.363	48	96	0
39. normal		3	1	44	27	.734	97	0	97
40. strain	5		1.6	34.5	19	.810	107	0	107
41. community	5		1.6	34.5	17.5	.818	108	0	108
42. accute	9		3	27	23	.757	100	0	100
43. student		3	1	44	9	.916	121	0	121
44. dissuade	3		1	44	31	.674	89	0	89
45. resume	3		1	44	6.5	.939	124	0	124
46. terminate	3		1	44	15.5	.833	11	0	11
47. competent		3	1	44	13.5	.863	114	0	114
48. vulcanize		3	1	44	49	.325	43	86	0
49. sentiment		3	1	44	38.5	.484	64	0	64
50. precipitous		3	1	44	42.5	.439	58	0	58
51. diplomacy		3	1	44	17.5	.818	108	0	108

$$r = .01882$$