

21. of 27.

THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report  
of  
Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by Sister Ste Helene Guthrie for the degree of Master of Arts.

They approve it as a thesis meeting the requirements 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. E. Haggerty*  
Chairman

*W. S. Miller*  
per C. M. J.

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THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report

of

Committee on Examination

This is to certify that we the undersigned, as a committee of the Graduate School, have given Sister Ste Helene Guthrie 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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*L. D. Coffman*  
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*M. J. VanWagenen*  
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.....

THE MENTAL AND EDUCATIONAL DIAGNOSIS OF THE  
DERHAM HALL HIGH SCHOOL PUPILS.

UNIVERSITY OF  
MINNESOTA  
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A THESIS

submitted to the Faculty of the Graduate School of  
THE UNIVERSITY OF MINNESOTA

by

Sister Ste. Helene Guthrie

In partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

June

1918

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THE MENTAL AND EDUCATIONAL DIAGNOSIS OF THE  
DERHAM HALL HIGH SCHOOL PUPILS.

CHAPTER I.

I. Previous Investigations.

The widespread interest in the subject of mental tests as an indication of a pupil's ability along scholastic lines shows that this phase of education is being given more attention than any other. Teachers are anxious to know how to use and understand this objective standard of mental testing so that their own judgment may be reinforced and corrected. This subject of the correlation of mental ability has been given prominence, probably, because of the close connection between it and such vital topics as classification of pupils; courses of study; method of instruction; time devoted to subjects, etc.,

Though the preliminary attempts in this field which were begun by Dr. Rice were of recognized value, it is to the work which Professor Thorndike has accomplished in educational measurement during the past ten years that the present day psychologists turn. Even yet there is little available material published on the results obtained through the use of mental tests. The few articles which have been reported on the testing attempted so far may be found in the current issues of magazines, or in the monograph publications of the greater universities. A slight bibliography of ten, or

at the most, fifteen names covers the published accounts of the work done in high schools by means of educational measurements.

The first attempt to bring together the various ideals, methods and aims in this field of educational measurement may be found in The Measurement of Educational Products Part II of the Seventeenth Yearbook of the National Society for the Study of Education which presents a discriminating survey of the various aspects of this new educational movement as well as a selected bibliography of the field.

David E. Weglein,<sup>1</sup> in a monograph on The Correlation of Abilities of High School Pupils, published in 1917 offers one of the first studies based on the records of high school pupils. He refers, in this monograph, to the work done by W. P. Burris in correlating the marks from high school pupils in sixteen different high schools from the states of California, Minnesota, Pennsylvania and New York. The variety of grading in the different schools has, the author thinks, to be taken into consideration in judging the correlations. According to Mr. Weglein, the following table of coefficients was derived by Mr. Burris.

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I. Weglein, D.E. The Correlation of Abilities of High School Pupils  
John Hopkins Press, 1917. p. II

Table I.<sup>2</sup> Burris Coefficients of correlation between;

	English	Latin	Math.	History	Geometry	Science
Latin	.48					
Math.	.39	.40				
History	.40	.43	.33			
Science	.41	.44	.41	.40		
Algebra					.45	
Gen.Ave.	.54	.57	.53	.49		.57

Another interesting correlation mentioned is that by Brinckerhoff, Morris and Thorndike from The Relationship between the Abilities Involved in Secondary School Subjects, found in Columbia Contributions to "Philosophy, Psychology and Education," Vol. XI, No. 2, 1903. The coefficients which they were able to obtain are given in the table below:

Table II. Brinckerhoff, Morris and Thorndike Coefficients

	Latin	English	Math.	Science	History	German
Latin						
English	.50(70 <sup>3</sup> )	.				
Math.	.31(66)	.09(104)				
Science	.35(34)	.26(88)	.07(75)			
History	.44(57)	.41(100)	.26(108)	.61(55)		
German	.48(31)	.30(60)	.48(51)	.57(36)	.42(49)	
Drawing	.40(55)	.20(88)	.02(85)	.30(59)	.16(87)	

2. The tables used in this study read as follows; In column I are the subjects used for correlation with the various other subjects, therefore reading Latin in the first column and English in the second, it may be seen that the correlation that it was possible to get between Latin and English was .48; between Mathematics and English .40 etc.,

3. The numbers in brackets indicate the number of pupils in each class.

In a somewhat later article by Irving King and James M'Crory upon Freshman Tests at the State University of Iowa, published in the "Journal of Educational Psychology" in January 1918, pp. 32-46 the following statement is made: "The chief value of mental tests lies in the supplementary light they cast on disciplinary cases. By means of these results The Dean of Women and Adviser of Men were able to determine whether a student failing in his work, was failing from lack of mental ability or for other causes." The conclusion which these men reached was as follows: (1) "This series of tests shows fairly good correlation with academic work for the first semester; Pearson's coefficient of correlation was used.

Table III. King and M'Crory Coefficients of Correlation: From records of Freshmen at the State University of Iowa, 1916.

	Girls	Boys
Uni. Grades with Arithmetic Speed	.31	.36
Uni. Grades with " Accuracy	.40	.36
Uni. Grades with Completion	.22	.41
Uni. Grades with Opposites	.45	.84
Uni. Grades with Logical Memory	.35	.40
Uni. Grades with Visual Imagery	.32	.21
Uni. Grades with Analogies	.14	.40
Uni. Grades with Range of Information	.41	.44

The tests which had been selected for this group were (1) The Curtis Standard Arithmetic Test, Series B; (2) 24"mixed



relations"; (3) Two Tests of "opposites"; (4) Simpson Completion Test; (5) Visualization; (6) Range of Information; and (7) Logical Memory. With the exception of the Arithmetic test, the authors think that this series is suitable for testing freshmen. It was found that those of poor mental ability were more accurately located than those of good mental ability.

Another valuable study made in this field is the Correlation of Excellence in Different School Subjects Based on a Study of School Grades by Frailey and Crain which appeared in The Journal of Educational Psychology in 1914. They report on an investigation which was made of the records of 32 high school pupils in the Urbana High School from 1908 to 1912. The summary of their findings is as follows: (1) "There is a correlation of excellence in the various subjects of study; (2) the most perfect correlation exists among the brightest and among the most stupid children; (3) the least perfect correlation exists among the pupils of medium ability; (4) It is rare for a pupil to represent both extremes of the excellence distribution."

Referring again to the study made by Mr. Weglein on The Correlation of Abilities of High School Pupils, the following table may prove of interest as showing the results of correlation which exists between the various high school subjects. The group of pupils which he worked with was a select one in that only those who completed high school (121 pupils out of 341) are included in this investigation.

Table IV containing Weglein's distribution of coefficients according to departments and size of coefficients.  
Summary of all Four Years.

	.8	.7	.6	.5	.4	.3	.2	.1	0	-.1	-.2	-.3	-.4	Total	No. of	No. of	Per Cent
	to	to	to	to	to	to	to	to	to	to	to	to	to	No. of	Coef. =	Coef. =	of No. of
	.9	.8	.7	.6	.5	.4	3	.2	.1	0	-.1	-.2	-.3	Coef.	Coef. =	3 or	Coef. = .5
														more	5 or more	or more	or more
English		2	7	7	3	6	2	4	1					32	16	25	50%
Mathematics				1	4	1	7	2	3					18	5	13	28%
History	1	5	5	2	3	5		2	3					25	13	21	52%
Science	2	5	6	2	4	2				2	1		1	25	15	21	60%
Foreign L.	1	3	5	8	10	9	2	8	4	1	1			52	17	36	33%
Commercial	1	1	9	6	7	2	2	3				1	1	32	16	25	50%
Drawing		1	3		2	3	4	8	3	3		1		28	4	9	14%
Total														212	86	150	41%

From the above table it may be seen that there is considerable correlation among the records of these pupils for "150 out of 212 coefficients are equal to .3 or more, and 86 of them are equal to or greater than .5. From his study of the results the author draws the following conclusions: "The the correlation, which he found to exist, probably does not depend upon the "spread of ability" but upon similarity among subjects. This is shown by the very small amount of correlation between drawing and other subjects. Therefore since there is considerable correlation among the subjects, the practical question arises, can we not estimate the general standard of a pupil

in school by the grade which he has attained in some one subject? . . . since English has the largest number of pupils, and, moreover, since its coefficients rank so high (50 per cent of them are equal to or greater than .5), it seems to be the subject best fitted to form the basis of judgment of a pupil's progress. In this connection, we should bear in mind, also, that a coefficient of .72 was found between the general average in the first year and the subject of English I.

An article of considerable interest in this connection is one by J. Carleton Bell entitled Mental Tests and College Freshmen which appeared in The Journal of Educational Psychology, Sept. 1916. Mr. Bell refers to the data collected by Cattell at Columbia University in 1896, and from which Mr. Wissler in 1901 derived some valuable correlations. Mr. Bell found that while the correlation between marks in college subjects was fairly high (.50 to .60) that of class standing with tests or of the tests with each other was low. He concludes that "This may be due to the fact that the traits measured have very little inherent connection with each other, or that the tests and the methods of giving them were such as to obscure the relationships that exist, or finally that the group is so nearly homogeneous that the variations in the test results are chiefly due to chance. "Latin and Greek (.75) offered the highest correlation and class standing correlated

more highly with logical memory (.19) than with any other test. In fact the other mental tests correlated with class standing were negligible, as, for example; class standing and reaction time gave a correlation of  $-.02$ ; Class standing correlated with Cancellation of A's  $-.09$ ; Class standing with Association of time  $.08$ ; Class standing and naming of colors  $.02$ ; and class standing with auditory memory  $.16$ .

In the same report Mr. Bell refers to the coefficients obtained by Mr. Waugh at Beloit College in 1912. These correlations which Waugh secured between mental tests and class marks were much higher than those Wissler obtained at Columbia University, but Mr. Bell is unable to decide whether it is on account of the difference in tests or a difference in method. The tests were given individually to the freshmen in Beloit College, and Pearson's coefficient of correlation was used.

Table V gives Waugh's Coefficients of correlation between:

Class standing and quickness of association (opposites)	.54
Class standing and Speed of learning (substitution)	.24
Class standing and Range of information (Whipple list)	.47
Class standing and Retention of ideas	.40
Class standing and Steadiness of hand	-.43

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The following conclusions were drawn by Mr. Bell after he had tested over seven hundred Freshmen at the University of Texas, in November, 1913. "It will be seen that the correlations between university marks are fairly high, ranging from mathematics-history=.34 to English-history and science-history=.59. Why marks in science should correlate so highly with those in history is not clear. Foreign languages have the highest average correlations with other subjects (.542) and mathematics the lowest (.484). The correlations of university marks with test scores are uniformly low, the highest being English-Completion=.31. Triangles and Selective Judgment have practically no correlation with any university marks, and the other tests show a considerable variation. The relatively high correlation of English with the two Directions and the Alternatives tests is interesting, as is also that between addition and mathematics, science and foreign languages. Considering the relations of the test scores to each other, one is immediately impressed by the connections between the two sets of Directions, the Alternatives and the Completion test. This is the only group of relatively high correlations that exists among the tests, if we except the Association-Recognition relationship (.30) in which there is a high degree of identity in procedure. Perhaps the connection between these four tests is due to the linguistic factor which is present in all of them. The ability to quickly sense the meaning of the printed words and perform the simple task that

is required is the thing that contributes to a high score in any one of these tests.

In so far, then, we would seem justified in assuming a more or less general "linguistic sense" or skill in dealing with linguistic problems, which is involved in all four of these tests, and which also contributes largely to success in college classes."

"On the other hand the Selective Judgment and Triangle tests, says Mr. Bell, "have practically no correlation with any of the tests or college subjects. If we compute the average correlation of each test with all the others and arrange them in descending order we have the following array: (1) Completion,.206; (2) Alternatives, .190; (3) Directions, No.1, .181; (4) Directions No.2,.155; (5) Addition,.144;(6) Association,.137; (7) Recognition,.131; (8) Triangles,.076; (9) Selective Judgment,.043.

## Chapter II.

The purpose of the present thesis is to determine what correlation exists between ability as measured in terms of mental tests and scholastic ability as shown by school grades. The considerable amount of work which has been done in studying the correlation existing between the abilities of high school pupils as indicated by the marks made in the mental tests with their grades earned in school shows that this method seems to be the most scientific in making a survey of any high school to determine whether the pupils are obtaining the grades in their school work which the mental tests show they are capable of making. The general average of the pupils in the Derham Hall High School has been used as the basis of correlation. By the term general average is meant the average obtained from the combined average of the subjects, which each pupil has carried from September 1917, to the last of January 1918, i.e., one half of the school year or one semester.<sup>1</sup>

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1. For example if a pupil pursued four subjects the first semester, English, Latin, History and Algebra and received 78% in one subject; 80% in another; 85% in a third; and 82% in the fourth, the general average would be the sum total of these marks divided by four. In all cases a fraction of less value than  $\frac{1}{2}$  was dropped, while if it was greater in value it was counted as a whole number.

The semester average thus secured for each high school class was then correlated with the mental tests. As a test of intelligence the Trabue L and M tests were combined with the Omnibus Test and correlated with the general average and then with the three remaining tests. The Haggerty vocabulary test, The Haggerty reading test and the Thorndike test measuring the understanding of sentences were combined as constituting accomplishment tests and then correlated with the general average in each of the four classes. The combination of the six tests was attempted to determine whether any of the tests overlapped.



CHAPTER III.  
GROUP TESTED.

This diagnosis deals with the school records of the Derham Hall High School, St. Paul, Minnesota. The pupils are girls only, and the enrollment at the time the study was made (September 8, 1917 to June 1918) varied from about 140 to 160 pupils.

As the pupils are girls only, the question of sex has been eliminated. The pupils included in this study are about equally divided - half are day pupils who come from the residential section of the city and remain in school from 8:25 in the morning until 1:05 or 3:45 in the afternoon. The other half are boarders who come, for the most part, from the smaller towns of Minnesota, North and South Dakota, Wisconsin and Montana. This last group remain at the school for the entire year, going home for ~~at~~ their vacation in June. The pupils are admitted at any time on presentation of the proper certificates but they are encouraged to come at the beginning of the semester and remain until the end. The high school is in session six days of the week with Wednesday and Saturday afternoons free.

## CHAPTER IV.

## COURSES OF STUDY OFFERED.

The regular course of study offered the Derham Hall High School Pupils entitles them, (after four years work, carrying four solid subjects each year), to a Scientific, Modern Language or a Classical Diploma. The Classical course requires the four years of Latin, with twelve additional units from any of the groups approved by the last requirement list sent out to accredited high schools by the University of Minnesota. The Scientific course requires four years of science, four years of English, two years of a modern language and five additional units. The Modern Language course requires four years of a modern language with the additional twelve units. Four years of English, one year of Elementary Algebra or Unified Mathematics, and one year of Plane Geometry or second year Unified Mathematics are required of all pupils who desire to be graduated. The mark in any subject is obtained by counting the class work and weekly tests two-thirds and the final examination one-third. The class grades are given in the per cent system marking on the basis of 100%. The highest mark any pupil may receive is 100%. The pass-

ing mark is 75%.

Except in rare cases no pupil is allowed to carry more than four solid subjects. (A solid subject is one which has five recitation periods a week and requires study at home.) Over and above these four solid subjects which are required of every regular high school pupil, each pupil must take one or two periods a week gymnasium work, two periods of chorus work and three periods of Christian Doctrine.<sup>1</sup> The elective system is in force; therefore promotion is made upon a subject basis.

In addition to the four solid subjects which every pupil is encouraged to carry, each one may take an extra subject, viz., Music, Drawing, Expression, or Domestic Science. The credit given for these courses depends upon the amount of time spent upon them. In no case are more than four vocational subjects counted in with the units which are offered for a diploma. The subjects offered for credit in any of the above mentioned courses are chosen from the entrance requirement list sent out by the University of Minnesota. The program of studies which was in force during the school year of 1917-1918 is on the next page.

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L. Non-Catholics do not take the work in Christian Doctrine. This subject supposes little preparation outside of the class period, and is given no credit.

# DERHAM HALL

## Program of Studies - - First and Second Semesters 1917-1918

OURS	FOURTH YEAR	THIRD YEAR	SECOND YEAR	FIRST YEAR
8:25	<b>Chemistry—Lab., Th.</b> Sister Clare Isabel C. H. 8 <b>Sewing—Fri.</b> Sister Flavia D. H. 4	<b>Drawing—</b> Sister Cosmas D. H. 40 <b>Sewing—Th.</b> Sister Flavia D. H. 4	<b>Ancient History—Free Th</b> Sister Eileen D. H. 39 <b>Sewing—Th.</b> Sister Blanda	<b>Latin Grammar—Free, W.</b> Sister Anna Margaret D. H. 37 <b>German I—Free Wed.</b> Sister Eleanor D. H. 10 <b>French I—Free Tues.</b> Sister Wilbrod D. H. 36
9:10	<b>Chemistry—Lab., Th.</b> <b>English—M., T., W., F., S.</b> Sister Ste Helene D. H. 38	<b>Mediaeval History—</b> Sister Frances Rita C. H. 120 <b>Gymnasium—M., F.</b> Miss Guyer	<b>German II—Free M.</b> Sister Alphonsine D. H. 12 <b>Caesar—Free M.</b> Sister Anna Margaret D. H. 10 <b>Gymnasium—M.</b> Miss Guyer	<b>Unified Math.—Free, Fri.</b> Miss Berger D. H. 35 <b>Sewing—Fri.</b> Sister Blanda D. H. 4
9:55	<b>Vergil—Gymnasium, W.</b> Sister Anna Margaret D. H. 10 <b>Higher Algebra—Free W.</b> Miss Berger D. H. 35	<b>English—</b> Sister Ste Helene D. H. 38 <b>Expression—T.</b> Sister Eileen	<b>English—Free, T.</b> Sister Eileen D. H. 39	<b>Algebra I B—</b> Sister Mary John C. H. 8 <b>Physiography—</b> Sister St. Lawrence <b>Sewing—S.</b> Sister Blanda D. H. 34
10:40	Intermission	Intermission	Intermission	Intermission
10:50	<b>Religion—T., Th., S.</b> Sister Eileen D. H. 39 <b>General Assembly—M.</b> <b>Singing A—W., F.</b> Sister Anna <b>Singing B—W., F.</b> Sister Carmelita	<b>Religion—T., Th., S.</b> Sister Mary John C. H. 8 <b>General Assembly—M.</b> <b>Singing A—W., F.</b> Sister Anna <b>Singing B—W., F.</b> Sister Carmelita	<b>Religion—T., Th., S.</b> Sister Clare Isabel D. H. 40 <b>General Assembly—M.</b> <b>Singing A—W., F.</b> Sister Anna <b>Singing B—W., F.</b> Sister Carmelita	<b>Religion—T., Th., S.</b> Sister Eva D. H. 37 <b>General Assembly—M.</b> <b>Singing A—W., F.</b> Sister Anna <b>Singing B—W., F.</b> Sister Carmelita
11:35	<b>I Sem. English History—</b> <b>II Sem. Sen. Am. History</b> Sister Eileen <b>Expression—F.</b> Sister Eileen D. H. 39	<b>Physics—Lab., F.</b> Sister Mary John <b>Gymnasium—M. W.</b> Miss Guyer	<b>Botany—</b> Sister Frances Rita C. H. 120 <b>Gymnasium—Fri.</b> Miss Guyer	<b>I Sem. General Science—</b> Sister Mary John C. H. 219 <b>Gymnasium—M.</b> Miss Guyer
12:20	<b>Gymnasium—M.</b> Miss Guyer	<b>Physics—Lab. (Con't.) F.</b> Sister Mary John C. H. 219 <b>Cicero—Free, F.</b> Sister Frances Rita C. H. 120	<b>Drawing—</b> Sister Cosmas D. H. 40 <b>Plane Geometry—</b> Miss Berger D. H. 35 <b>Reading—Th.</b> Sister Eileen D. H. 39	<b>English—</b> Sister Marie Cecelia D. H. 37 <b>Gymnasium—T.</b> Miss Guyer
2:15		<b>Domestic Science—T., Th.</b> Miss Kinsella C. H. 3	<b>French II—Free, Sat.</b> Sister Wilbrod C. H. 8	<b>Writing—T., Th.</b> Sister St. Lawrence D. H. 40
3:00		<b>Domestic Science—Con't.</b>	<b>French III—Free, Sat.</b> Sister Wilbrod C. H. 8	

## CHAPTER V.

## Method of Giving the Tests.

In the fall of 1917 practically all the pupils in the Derham Hall High School were given a series of mental tests. The general assembly period on Monday was found to be the time it was most convenient to give the tests as, by this arrangement, it was not necessary to disturb the class routine. About two hours and a half time was allowed for these mental tests distributed at various intervals throughout the first semester. Those pupils who missed the tests through absence were allowed to make them up on their return to school. They were not told before hand that they were to do this, and never showed any tendency to cheat in this respect.

The Pearson Product Moment Formula was used to express the relationship between the abilities of high school pupils, as shown by the school records made by them in all the subjects each one was carrying for one semester with the marks made by the same pupils in the mental tests. The Formula is as follows:

$$r = \frac{\sum \xi n - n d_1 d_2}{n \sqrt{\frac{\sum \xi^2}{n} - d_1^2} \sqrt{\frac{\sum n^2}{n} - d_2^2}}$$

The Probable Error was found from the formula: P.E. =  $0.6745 \frac{1-r}{\sqrt{n}}$

The range of value which this coefficient of correlation may have is from 1 to -1. The coefficient<sup>1</sup> "expresses in a single number the relation between the items belonging to each one of a group of individuals, in the following manner: If the items of each kind are arranged in a series, the value of the coefficient of correlation between the two series would indicate the probability that, in general, would exist for individuals to have a similar rank, above or below the median or average in the other series. A positive coefficient between the two series correlated shows that a pupil ranking high in one series would, generally, tend to rank high in the other series; while a minus coefficient would tend to show that a pupil with a low rank in one series, might or probably would, rank high in the other series."

In order that the mental tests may be clearly recalled, copies of each one have been inserted in the appendix.

The tests selected were as follows:

(1) The Thorndike Scale Alpha 2. For Measuring the Understanding of Sentences. Part II, Given November 19, 1917. This test which will be fully described later purports to measure

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1. Weglein, D. E. Correlation of Abilities of High School Pupils, p. 15.

the understanding of reading matter. A series of paragraphs about which twenty four questions are asked constitute the test. One point was given for each question answered correctly; therefore 24 points constituted a perfect score. No credit was given an answer unless it was absolutely correct. Half correct answers were called wrong. Time- 30 minutes or sufficient for all to finish.

(2) The Haggerty Vocabulary test of 40 words arranged in order of difficulty. Given in December. No key is provided for this test. In case of a doubtful answer to a word, the dictionary was consulted. The combined judgment of three teachers on the faculty determined whether doubtful words were definite enough to receive credit. A score of  $2\frac{1}{4}$  was given for each word known correctly. To make the grades received in this test about equal in value with the marks given in the other tests each pupil's score was divided by  $3\frac{1}{4}$ . Time-sufficient to finish.

(3) The Haggerty Reading Test I. Given January 14, 1918. This test though modelled on Thorndike's Measuring the Understanding of Sentences, is much more difficult than the Thorndike test which was given as test I. From a series of paragraphs increasing in difficulty 29 questions are asked, which are to be answered from the paragraph printed above.

One point was allowed for each perfect answer. No credit was given if half the answer was right. 29 points constituted a perfect score. The test seems to be too hard for the first and second year of high school at least and is probably too hard for the third year. 45 minutes was allowed. The directions followed may be found in the copy of the test which is in the appendix.

(4) An Omnibus Test. Given January 21, 1918. This test contains eight different parts, namely, 10 words to write their opposites; words that fit words in a group, in the way shown by the first two; ten words that tell what kind of thing each thing named is; 20 examples in addition; 5 problems in arithmetic; 10 words to write opposites; 12 words that fit the third word in a line in the way that the second word fits the first; a series of sentences in which the pupils have to follow directions; and finally five sentences from Trabue Completion test. The score was secured by counting the number of errors (each mistake made was counted an error), multiplying the number of errors by 10 (seconds) and adding to the time score. This was called the "weighted time score." The method of scoring is too complicated to make the test popular.

(5) and (6) The Trabue Completion Test Language Scale L. and M. Seven minutes was allowed for each test. Trabue L.



was given first and Trabue M. immediately afterwards on February 9, 1918. These tests were given exactly as prescribed by Trabue in Completion-Test Language Scales, page 21. The directions were as follows: "The sheet which has been passed to you contains some incomplete sentences, which form a scale. This scale is to measure how carefully and rapidly you can think, and especially how good you are in English work. You are to write one word on each blank, in each case selecting the word which makes the most sensible statement. You may have just seven minutes in which to sign your name at the top of the page and write the words that are missing. As you notice the papers have been passed to you face downward. Do not turn them over until we are all ready. After the signal is given to start, remember that you are to write just one word on each blank and that your score depends on the number of perfect sentences you have at the end of seven minutes.<sup>1</sup> "At the end of seven minutes a signal was given, all stopped writing, the papers were collected, arranged alphabetically according to class and later scored. The

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1. Trabue, M.N. Completion-Test Language Scales Teachers College.  
Columbia University Contributions to Ed.,  
No. 77 p.21

papers were corrected from the answers given by Mr. Trabue. A score of 2 points was given each sentence answered perfectly. A score of 1 point was given if the word used to fill in the blank was accepted by Mr. Trabue in his key. The suggestions for scoring the papers found in Completion-Test Language Scales were used.<sup>2</sup> 16 points constituted a perfect score for each test.

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2. Ibid. p. 80.

## CHAPTER VI.

### DISCUSSION OF RESULTS.

#### I. The Thorndike Scale Alpha 2

##### For Measuring the Understanding of Sentences Part II.

The Thorndike Scale Alpha 2. For Measuring the Understanding of Sentences, Part II was the first test given to the entire high school. The large assembly room (seating capacity 105 pupils) and the senior study room, (seating capacity 45) adjoining, made it possible for all the pupils to take the test at the same time. The records of those pupils who left school before the end of the semester were not used. The scale consists of a series of groups of sentences which the pupil is asked to read. Each group of sentences is ranged in increasing difficulty, which has been determined by experimentation. After each paragraph a series of questions follows, which tests the pupils understanding of what he has read. Speed is not taken into account, the pupils being allowed all the time they need. The tests were passed by the girls who sat in the front seats. They were told to pass the blank side of the paper up, so that all might have the same amount of time in writing the

answers. At a given signal, the pupils were told to turn the paper, write their age and name at the top of the sheet, then to read Set I Difficulty 7, and begin to answer the questions. No help was given or received by any pupil while she was writing. Though Mr. Thorndike<sup>1</sup> suggested giving forty minutes for the test, thirty minutes was found to be ample time for all to finish. The papers were then collected, arranged alphabetically according to class, and scored. The answers compiled by Mr. Thorndike<sup>2</sup> and found in Teachers' College Record were used to score the papers. The test determined who were the weak pupils in each class as well as the superior ones.

Table VI shows the grades made in Thorndike Scale Alpha 2. For Measuring the Understanding of Sentences. Part II.

Year <sup>3</sup>	No. of Pupils	Highest Score	Lowest Score	Median
4	29	23 Points	14 Points	20½ Points
3	33	22 Points	12 Points	19 Points
2	44	24 Points	9 Points	18½ Points
I	32	21 Points	9 Points	15½ Points

1. Teachers College Record, Vol.XVI.No.5, Nov. 1915,p.41

2. Ibid., pp. 50-53

3. Reading across first line, column one indicates year; column two number of pupils in class; column three, highest score made by any pupil in the class; column four lowest score; and column five median score of the class.

Though the test seemed easy for the fourth year high school pupils, those who fell below the median constitute the poorest pupils in their school work. The girl who made the lowest score in the class, only 14 points, with the class median at  $20\frac{1}{2}$  points, had a general average of  $68\frac{1}{3}\%$  in her school work for the first semester. In every other mental test this same pupil was well below the median also, making a score of  $25\%$  in the Haggerty Vocabulary test with the class median at  $70\%$ ; in the Haggerty Reading Test I she made 8 points with a class median of 14; in Trabue L with the median of 10 points her score was 6; and with Trabue M with the median at 10 her score was 8. She seems to be totally unfit for high school work and yet, in four years, she has been able to get together enough units to enable her to take fourth year subjects. The girl in the fourth year who made the highest score in Thorndike, The Understanding of sentences, scored 23 points out of a possible 24. This pupil made the highest average ( $92\frac{2}{5}\%$ ) in her school work for the first semester. She was also carrying five subjects.

The following table number VII will show the correlation it was possible to get between Thorndike:Scale Alpha 2. For Measuring the Understanding of Sentences and the other mental tests given, as well as the correlation with the general average in each class.

Table VII<sup>1</sup>

	First Year P.E.	Second Yr. P.E.	Third Yr. P.E.	Fourth Yr. P.E.
Haggerty Vocabulary	.39 .10	.34 .09	.45 .10	.40 .10
Haggerty Reading	.36 .10	.62 .06	.07 .13	.44 .10
Trabue L.	.30 .11	.68 .05	.47 .09	.39 .11
Trabue M.	.26 .11	.54 .03	.30 .11	.44 .1
Omnibus	.15 .12	.05 .10	.49 .09	.017.12
General Average	.023.12	.38 .02	.16 .12	.54 .09

An inspection of table VII shows that the twenty-four coefficients obtained from correlating Thorndike, The Understanding of Sentences with the other tests are distributed as follows:

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1. Table reads as follows: first line across, first column correlation between Haggerty Vocabulary and Thorndike, The Understanding of Sentences in first year .39 with a P.E. of .10; second year .34 with a P. E. of .09; third year .45 with a P.E. of .10 and the last column shows the correlation between these two tests for the fourth year .40 with a P.E. of .10. The other tables showing correlations between tests read the same way.

			Year	
Two between .6 and .7	} Thorndike	and Trabue L	(2)	.68
		"	and H. Reading	(2)
Two " .5 and .6	} "	and Trabue M	(2)	.54
		"	and Gen. Ave.	(4)
Six " .4 and .5	} "	and Omnibus	(3)	.49
		and Trabue L	(3)	.47
		and H. Voc.	(3)	.45
		and Trabue M	(4)	.44
		and H. Reading	(4)	.40
		and H. Voc.	(4)	.40
Seven " .3 and .4	} "	and H. Voc.	(1)	.39
		and Trabue L	(4)	.39
		and Gen. Ave.	(2)	.38
		and H. Read.	(1)	.36
		and H. Voc.	(2)	.34
		and Trabue M	(3)	.30
		and Trabue L	(1)	.30
One between .2 and .3	"	and Trabue M	(1)	.26
Two " .1 and .2	} "	and Gen. Ave.	(3)	.16
		"	and Omnibus	(1)
Three " 0 and .1	} "	and H. Reading	(3)	.07
		and Gen. Ave.	(1)	.02
		and Omnibus	(4)	.01
One less than zero	"	and Omnibus	(2)	-.05

In no other mental test were the coefficients as high as those derived from correlating The Thorndike test for measuring the Understanding of Sentences with the other mental tests used, though the Haggerty Reading Test correlated higher with the general average.

This test, evidently, may be given in determining the groups of students of approximately the same abilities

whom it is possible to teach in the same class to the best advantage.

For purposes of comparison it is interesting to note that Mr. F.S. Breed in School and Society for March 2, 1918, pp. 266-270 draws the following conclusions after giving the Starch Reproduction Test No.6 and the Thorndike Question Test, Setc, in nine Michigan towns ,and securing 400 usable papers from the sixth grade:(1) When the Starch reproduction test and a question test, Set c from Thorndike Scale Alpha, were used in nine groups to measure comprehension in reading, the wide variation in rank attending variation in method showed the unreliability of one or both tests, administered, for the comparative measurement of these groups; (2) similarly, an average correlation of .11 between the two series of individual scores in the nine groups showed the unreliability of one or both tests for the measurement of individuals in the groups; (3) these results, considered in connection with other experimental findings, indicate that the reproduction and question methods as such, apart from particular adaptations of the same, do not yield measures of the same ability; (4) in the absence of an experimental determination of the relative efficiency of the two methods, there are theoretical reasons



for preferring, of the two methods, a properly devised question method; (5) there is need of testing the basic assumptions of many educational tests."

From the data which Mr. Breed has collected he does not seem to take into account that the two tests were too short to expect a high correlation even if the two abilities were closely related.

On the whole the Vocabulary test did not pick out as accurately the pupils of poor mental ability as did the Thorndike test, though some of the scores for the poorest pupils agreed with Thorndike. As may be seen from table IX the coefficients were ranged as follows:

		Year	
One between .7 and .8	Haggerty V. and Trabue M.	(4)	.71
Two between .6 and .7	( " and " M.	(1)	.67
	) " and HaggertyR	(1)	.66
One between .5 and .6	( " and Trabue M	(2)	.54
Seven " .4 and .5	( " and H. R.	(4)	.48
	) " and Trabue M	(3)	.47
	) " and Thorndike	(3)	.45
	( " and H. R.	(2)	.42
	) " and Omnibus	(3)	.42
	( " and Trabue L	(4)	.41
	) " and Thorndike	(4)	.40
Five between .3 and .4	( " and Thorndike	(1)	.39
	) " and Gen.Ave.	(4)	.37
	( " and Trabue L	(2)	.34
	) " and Thorndike	(2)	.34
	( " and Gen.Ave.	(3)	.32
Three between .2 and .3	( " and Omnibus	(1)	.29
	) " and Trabue L	(1)	.28
	( " and Gen.Ave.	(2)	.26
Four between .1 and .2	( " and Trabue L	(3)	.18
	) " and Gen.Ave.	(1)	.15
	( " and Omnibus	(4)	.13
	) " and HaggertyR	(3)	.12
One between 0 and .1	" and Omnibus	(2)	.04

## 2 The Haggerty Vocabulary Test.

The second mental test given a week later was the Haggerty Vocabulary test of 40 words. The method of procedure for all the tests was the same as that used in the first test. The papers were passed to the pupils with the blank sheet up and at a given signal they were asked to turn the paper and "do what it says to do." The age median and the number of pupils remained the same as that given in the first test. The following table shows the highest, the lowest, and the median score for each class in the Vocabulary test.

Table VIII.

Year	Highest Score	Lowest Score	Median Score
4	90%	25%	70%
3	85%	47½%	70%
2	87½%	50%	67½%
I	82½%	32½%	62½%

Table IX was obtained by correlating the Haggerty Vocabulary scores with the scores made in the other tests.

Table IX.

	First Yr. P.E.	Second Yr. P.E.	Third Yr. P.E.	Fourth
Thorndike	.39 .10	.34 .09	.45 .10	.40 .10
Haggerty R.	.66 .07	.42 .02	.12 .12	.48 .09
Trabue L	.28 .11	.34 .01	.18 .12	.41 .10
Trabue M	.67 .06	.54 .03	.47 .09	.71 .06
Omnibus	.29 .11	.04 .10	.42 .10	.13 .12
General Ave.	.15 .12	.26 .00	.32 .11	.37 .10

An inspection of the table IX will show that the twenty-four coefficients are located thus:

1 between .7 and .8  
2 between .6 and .7  
1 between .5 and .6  
7 between .4 and .5  
5 between .3 and .4  
3 between .2 and .3  
4 between .1 and .2  
1 between 0 and .1

This test was one of the most satisfactory as judged by the correlation secured from the general average of the pupils' marks. It is both easy to give and to mark, takes little time and should be included (or an equivalent) in a series of tests intended for use with high school pupils.

### 3. The Haggerty Reading Test 1.

On January 14 the third mental test was given. This was The Haggerty Reading Test 1. The Method of procedure was the same as that used in the other tests. Each pupil was given a pamphlet, which contained paragraphs selected from standard writers, told to write the name of the school, date, class to which she belonged, and then on a given signal to turn the books over to page one and "do what it says to do." A copy of this test has been included in the thesis as well as the directions for giving the test and a key for correcting it, which was obtained in mimeograph form from the Bureau of Co-operative Research at the University of Minnesota.

From table which follows the highest, lowest and median score for each class may be seen:

TABLE X.

## Haggerty Reading Test I.

Year	Highest Score	Lowest Score	Median Score
IV	25 points	6 points	14 points
III	17 "	5 "	9 "
II	19 "	1 "	9 "
I	10 "	1 "	6 "

TABLE XI.

Correlating the Haggerty Reading with the other tests we find the following results:

	P.E. First Year		P.E. Second Year		P.E. Third Year		P.E. Fourth Year	
Haggerty V.	.66	.07	.42	.02	.12	.12	.48	.09
Trabue L.	.26	.11	.39	.01	.27	.12	.46	.09
Trabue M.	.22	.11	.40	.02	.13	.12	.65	.07
Omnibus	.40	.10	-.05	.10	.15	.12	.07	.06
Thorndike	.36	.10	.62	.06	.07	.13	.44	.10
General Ave.	.36	.10	.45	.02	.31	.11	.61	.09

From the above table XI we note the following:

- 4 coefficients are between .6 and .7
- 7 coefficients are between .4 and .5
- 4 coefficients are between .3 and .4
- 3 coefficients are between .2 and .3
- 3 coefficients are between .1 and .2
- 2 coefficients are 0 .
- 1 coefficient is negative.

Fifteen out of the twenty-four coefficients are greater than .3. The nine coefficients below .3, with one exception come from the first and third year, and also from the same tests in both years. The tests having coefficients less than .3 are;

Haggerty Reading and Trabue L.	(I and III Year)
Haggerty Reading and Trabue M.	(I and III Year)
Haggerty Reading and Omnibus	(I, III, IV. Year)
Haggerty Reading and H. Voc.	(Third Year)
Haggerty Reading and Thorndike	(Third Year)

This test, the Haggerty Vocabulary test and the Test of Thorndike seem best fitted for testing the mental ability of the high school pupils. When grouped together they gave a much better correlation with the pupil's general average than did the other tests. The test tended to pick out the brightest and the most stupid pupils in each class. The highest correlation was secured between this Reading Test of Dr. Haggerty's and the general average of all the pupil's marks for the First Semester. It was the only test with a

coefficient of .3 or better for each class when the general average was correlated.

Ability to read, therefore, may be said to be a rather definite measure of a student's general intelligence as judged from the correlation which exists between these marks.

#### 4. Omnibus Test I, IA and IB.

An Omnibus Test which has been previously explained was given to the high school pupils on January 21. The various divisions of the test show that a variety of functions were being tested. This test proved the most unsatisfactory in that all the coefficients were extremely low when it was correlated with the other tests. There was no correlation between the Omnibus test and the general average. Some of the pupils who failed to make the score required on Record Sheet II (see Appendix, page,) were doing fairly good class work and others who obtained the required number of points were failing in their class work.

The following table XII will show how low the coefficients were:

TABLE XII.

Showing correlation between the Omnibus Test and the other tests given.

	First Year		Second Year		Third Year		Fourth Year	
	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.
Trabue L	.03	.12	.13	.10	.11	.12	.32	.11
Trabue M	.06	.12	.08	.10	.13	.12	.15	.12
H. Read.	.40	.10	-.05	.10	.15	.12	.07	.06
H. Voc.	.29	.11	.04	.10	.42	.10	.13	.12
Thorndike	.15	.12	-.05	.10	.49	.09	.017	.12
Gen Ave.	.22	.11	-.14	.10	.28	.11	.26	.11

5 and 6 Trabue L and M Completion-Test Language Scales.

The fifth and sixth tests given on February 12 were the Trabue Completion tests. Two language scales were used L and M. The following tables with correlations will give the results obtained:

Table XIII shows the correlation of Trabue L with:

	First Year		Second Year		Third Year		Fourth Year	
	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.	P.E.
Trabue M.	-.063	.12	.60	.03	.28	.11	.63	.07
H. Reading	.26	.11	.39	.01	.27	.12	.46	.09
H. Voc.	.28	.11	.34	.01	.18	.12	.41	.10
Thorndike	.30	.11	.68	.05	.47	.09	.39	.11
Omnibus	.03	.12	.13	.10	.11	.12	.32	.11
GEN. Ave.	.44	.10	.37	.01	.10	.12	.39	.11



Arranging the coefficients of correlation found in table XIII we find that they may be grouped as follows:

- 3 coefficients are between .6 and .7
- 4 coefficients are between .4 and .5
- 7 coefficients are between .3 and .4
- 4 coefficients are between .2 and .3
- 4 coefficients are between .1 and .2
- 2 coefficients are below .1

TABLE XIV

Shows the correlations of Trabue M with

	First Year P.E.		Second Year P.E.		Third Year P.E.		Fourth Year P.E.	
H. Reading	.22	.11	.40	.02	.13	.12	.65	.07
H. Voc.	.67	.06	.54	.03	.47	.09	.71	.06
Trabue L	-.063	.12	.60	.03	.28	.11	.63	.07
Thorndike	.26	.11	.54	.03	.30	.11	.44	.10
Omnibus	.06	.12	.08	.10	.13	.12	.15	.12
Gen. Average	-.014	.12	.37	.01	.35	.11	.33	.11

From table XIV the following list may be secured:

- 1 coefficient was between .7 and .8
- 4 coefficients were between .6 and .7
- 2 coefficients were between .5 and .6
- 3 coefficients were between .4 and .5
- 4 coefficients were between .3 and .4
- 3 coefficients were between .2 and .3
- 3 coefficients were between .1 and .2
- 2 coefficients were between 0 and .1
- 2 less than zero.

From McCall's article in School and Society for January sixth, 1917 entitled, Correlation of some psychological and Educational Measurements, with special attention to the measurement of mental ability, we find that a coefficient of .21 was obtained by correlating Trabue language scale with Arithmetic (adding). The children tested were 88, 6B grade public school children from a typical New York City school. <sup>1</sup>King and M'Crory got practically the same correlation with series B .22 and 16 for speed and accuracy for the girls and .25 and .13 for the boys, testing the Freshmen at the State University of Iowa. King and M'Crory go on to say that they are not ready to recommend the completion test for use in judging the university student in as thorough-going fashion as McCall does for the sixth grade pupil when he says "The completion test will be a substantially perfect measure of his mental ability. Bell found in his study of the freshmen at the University of Texas that the completion test showed the highest correlation of any of the test scores with the class marks. King and M'Crory found that for the boys two other tests correlated higher than the completion tests with class marks and two others practically the same, while for the girls, the coefficient for completion was next the lowest of any of the tests with class

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1. Freshman Tests at the State University of Iowa by King & M'Crory, The Journal of Educational Psychology, Jan. 1918. Vol. IX. No. 1 p. 37.

marks. Dr. King found when he tested a group of 16 Juniors in the College of Applied Science and correlated the results with the combined judgments of three instructors in that department, that he got a coefficient of .35 between the completion test and these combined judgments. The judgments were given simply as to the ability of the men in question. The results obtained at the University of Iowa show no important sex differences in the completion test. No reason is assigned for the girls making the better score, on the whole than the boys.

The correlations between Trabue L and M with the general average are from the above tables XIII and XIV found to be just as significant as these just referred to with the exception of the Trabue L and the general average for the Third Year; and Trabue M and general average for the first year. The teachers marks are, no doubt, at fault here.

Another interesting correlation was obtained from a<sup>1</sup> certain seventh grade class of 30 children, in which some of the graduate students at Teachers College made a number of tests.

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1. Trabue, M.R., Completion-Test Language Scales, Teachers College Cont. No. 77. p. 78.

The Language Scale A of Trabue correlated as follows:

with Thorndike's Reading Scale Alpha,  $r=.47$   
and with Thorndike's Reading Scale A,  $r=.49$ .

In a sixth grade of 33 pupils Mr. Trabue obtained the following correlation from Trabue Language Scale A with Thorndike's Scale Alpha,  $r=.47$ . From table VII it may be seen that it was possible in the different high school classes to get correlations between Thorndike, The Understanding of Sentences and Trabue Language Scale L and M as good or better than those secured from the grades. The conclusion Mr. Trabue makes is as follows: "These coefficients are not numerous enough or reliable enough to prove anything conclusively. They do suggest, however, that there is a positive and rather intimate relation between ability to complete sentences and ability in other tests of language and general intelligence."

The following table XV will indicate, then, the correlations which were found for the First Semester between the General Average of the school subjects and the grades made in the various tests.

Table XV.

The General Average, First Semester with:

	First Yr. P.E.	Second Yr. P.E.	Third Yr. P.E.	IV Yr. P.E.
Omnibus	.22	.11	-.14	.10
H. Voc.	.15	.12	.26	.00
H. Read.	.36	.10	.45	.02
Thorndike	.02	.12	.37	.02
Trabue L	.44	.09	.37	.01
Trabue M	.01	.12	.37	.01
Voc. R. & T	.17	.11	.48	.08
Trabue L, M, & O	.25	.11	.26	.00
All the tests	.23	.11	.46	.08

After correlating the first semester averages with the mental tests, it was decided that this study would be more valuable if the marks for the year could be correlated with the mental tests. Table XVI. Will give the correlation it was possible to get between first semester marks and the marks for the yearly averages and also the correlation between the mental tests and the yearly averages.

Table XVI

Showing correlation between grades for year 1917-1918  
and scores made in mental tests:

	Fourth Yr. P.E.		Third Yr. P.E.		Second Yr. P.E.		First Yr. P.E.	
Omnibus	.26	.11	.05	.12	-.02	.00	.09	.12
H. Voc.	.21	.11	.20	.00	.45	.02	.38	.10
H. Read.	.44	.09	.19	.12	.58	.03	.38	.10
Thorndike	.20	.12	.09	.12	.66	.04	.046	.09
Trabue L.	.32	.10	.08	.12	.54	.03	.44	.09
Trabue M	.29	.10	.06	.13	.55	.03	-.004	.12
Voc. R. & T.	.37	.10	.19	.12	.63	.04	.30	.11
Trabue L, M&O	.41	.10	.036	.13	.44	.02	.20	.11
ALL the Tests	.42	.09	.15	.12	.62	.04	.69	.06
Ist Sem. Marks	.47	.09	.69	.07	.82	.07	.99	.00

## CHAPTER VII.

## S U M M A R Y.

From the results obtained from the different tests, the school marks, and the experiences of the year, it would seem just to form the following conclusions:

- (1) There seems to be a marked relationship between under-age in relation to the group and ability.
- (2) By giving mental tests before assigning pupils to classes in September, those of the same or nearly the same mental ability might be put into the same group.
- (3) There is no marked difference between the correlations for the semester with the mental tests and those for the year. The correlation between the marks for the first semester and the marks for the year is high.
- (4) These tests with the exception of the Omnibus Test, show a fairly good correlation with the marks received in high school work for the semester.
- (5) The correlation between high school grades and mental tests varies from  $-.14$  (in second year, Omnibus test with general average) to  $.61$  (in fourth year, Haggerty Reading with General average.)
- (6) The highest correlation between mental tests was  $.71$  (fourth year, Haggerty Reading and Trabue M.)
- (7) The tests pick out those of poor mental ability as well as those of superior ability.

(8) Acceleration in school work indicates superior ability.

(9) One pupil, as a result of these mental tests and the judgment of her teachers, is going to be allowed to finish high school in three years.

(10) The tests were valuable in determining whether a pupil was failing through lack of ability or for some reason which it was possible to control. For example, a pupil in the first year high school made 21 points out of a possible 24 points in the first test Thorndike, The Understanding of Sentences. She was 5½ points above the median of her class, but was failing in her school work. Her teachers were allowing her to remain in class, but had no hope of her passing. She was not thought to have much ability. After this test had been scored, the teachers were told that she probably had ability to learn but that she was not using it. The pupil herself was shown the mark she received and urged to get down to study. Though she was not able to undo the poor work of the first four months her grades have improved, and she will no doubt be able to make a passing mark in each subject she is taking, thus saving her a year in her high school life.



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## OMNIBUS TEST I, IA AND I B.

## DIRECTIONS FOR GIVING THE TEST AND FOR SCORING AND INTERPRETING THE RESULTS

## I. Method of giving test:

1. Distribute tests with page 4 up.
2. Have blanks on page 4 filled in.
3. When this is complete, say: "When I say 'Ready', turn this test over to page 1 and do what it says to do."
4. Give signal for turning papers.
5. Record time when each subject completes page 3.

## II. Method of scoring:

## 1. Individual scores:

- a. Use perforated stencils to score for errors. Score an error wherever paper does not conform to correct answers as given on stencils. Make a mark on margin of paper for each error.
- b. On record sheet I, record the names of the students in alphabetical order.
- c. In column marked "Time," record time in minutes and seconds for each student.
- d. Compute number of errors made on pages 1, 2, and 3. This is the error score. Record in proper column.
- e. Multiply the error score by 10 (seconds) and add to the time score. This is the "weighted time score." Record in proper column.

## 2. Special groups:

On record sheet II write under "Group A" the names of all students who score equal to or less than the scores indicated for the several years; under group X record the names of all students who score equal to or more than the scores indicated for the several years. (See scores at bottom of Record Sheet II.)

## 3. Percentile graph:

- a. Arrange weighted time scores in order, placing lowest weighted time as highest score and so on. Divide the scores into ten equal groups.
- b. Use record graph I, II, III, or IV. Find the lowest score of the class and mark a point on ordinate 1 at the point corresponding to this score.
- c. On ordinate 2 make a point corresponding to the score of the individual who stands just ten per cent of the distance from the lowest score and continue for each successive ten per cent.
- d. Connect these points by a line and the resulting curve will be the percentile graph of the group.

## III. Interpreting scores:

1. The percentile graph when completed will give a picture of the abilities represented in the class and show the degree to which it approximates a group of students of the same school advancement.
2. Record Sheet II will show the pupils to be immediately singled out for special attention.
  - a. Those in Group A may and should be expected to do superior high school work. Failure to do so should invite immediate investigation to discover the cause for the individual's falling below his possibilities.
  - b. Those in Group X may not be expected to do superior work. Under highly favorable conditions they may do a fair grade of work. Lest any pupil in this group be unfairly measured in the test, additional tests should be given to confirm or correct the initial measurement.
  - c. From studies already made it appears probable that not more than one student in twenty can pass from Group X to Group A in school marks in the course of a semester's work.

# RECORD SHEET I.

	NAME	SCORES				NAME	SCORES			
		TIME Min. Sec.	ERRORS Number	WEIGHTED TIME Min. Sec.			TIME Min. Sec.	ERRORS Number	WEIGHTED TIME Min. Sec.	
1					26					
2					27					
3					28					
4					29					
5					30					
6					31					
7					32					
8					33					
9					34					
10					35					
11					36					
12					37					
13					38					
14					39					
15					40					
16					41					
17					42					
18					43					
19					44					
20					45					
21					46					
22					47					
23					48					
24					49					
25					50					

Median Score:

OMNIBUS TEST I.

READ THE GENERAL DIRECTIONS BEFORE YOU DO ANYTHING ELSE  
GENERAL DIRECTIONS

Do what the printed instructions tell you to do.

Do not ask the examiner any questions about this test.

Do not ask any other person who is taking the test any questions or watch any one to see what he or she does.

Work as rapidly as you can without making any mistakes.

If you do make a mistake, correct it neatly.

Do 1 first, then 2, then 3, and so on.

Do not use any paper except this test blank.

Follow the directions in order. Do not go over work a second time.

1. Write your name here at once,.....  
First name. Last name.  
and write your age here:.....years, ..... months.

Instructions for 2, 3 and 4

After each word printed below you are to write some word, according to the further directions. Write plainly, but as quickly as you can. If you cannot think of the right word in about three seconds, go ahead to the next.

2. Write the opposites of the words in this group, as shown in the first two:

good— <i>bad</i>	white _____	early _____
day— <i>night</i>	far _____	dead _____
long _____	up _____	hot _____
soft _____	smooth _____	asleep _____

3. Write words that fit the words in this group, in the way shown in the first two:

drink— <i>water</i>	wear _____	answer _____
ask— <i>questions</i>	shoot _____	weave _____
sing _____	scold _____	wink _____
build _____	win _____	mend _____

4. Write words that tell what kind of thing each thing named is, as shown in the

first two:

lily— <i>flower</i>	July _____	canoe _____
blue— <i>color</i>	shark _____	banana _____
oak _____	quinine _____	Atlantic _____
measles _____	beef _____	Alps _____

Go on to the next page at once.

5. Add 17 to each of these numbers. Write the answers as shown in the first three:

29	46
18	35
60	77
64	
49	
62	

57	
68	
74	
53	
67	
25	

10	
61	
71	
33	
38	
28	

65	
41	
50	
42	
52	

6. Get the answers to these problems as quickly as you can:

- If you buy 2 tablets at 7 cents each and a book for 65 cents, how much change should you receive from a two-dollar bill? Answer (.....)
- If James had 4 times as much money as George he would have \$16. How much money has George? Answer (.....)
- How many pencils can you buy for 50 cents at the rate of 2 for 5 cents? Answer (.....)
- A man spent  $\frac{3}{5}$  of his money and had \$8 left. How much had he at first? Answer (.....)
- A man bought land for \$100. He sold it for \$120, gaining \$5 per acre. How many acres were there? Answer (.....)

7. Write opposites for this group of words, as shown in the first two. If you cannot think of the right word in about 10 seconds, go ahead to the next:

- |                           |                 |                 |
|---------------------------|-----------------|-----------------|
| bravery— <i>cowardice</i> | strong _____    | straight _____  |
| friend— <i>enemy</i>      | sane _____      | prompt _____    |
| stupid _____              | obnoxious _____ | wholesome _____ |
| hard-working _____        | handsome _____  | fickle _____    |

8. Write in each line a fourth word that fits the third word in that line in the way that the second word fits the first, as shown in the first two lines. If you cannot think of the right word in about 10 seconds, go ahead to the next.

- |                                   |   |
|-----------------------------------|---|
| color—red :: name— <i>John</i>    | straw— <i>hat</i> :: leather _____      |
| page—book :: handle— <i>knife</i> | cloud— <i>rain</i> :: sun _____         |
| eye—see :: ear _____              | hammer— <i>tool</i> :: dictionary _____ |
| Monday—Tuesday :: April _____     | uncle— <i>aunt</i> :: brother _____     |
| do—did :: see _____               | dog— <i>puppy</i> :: cat _____          |
| bird—sing :: dog _____            | little— <i>less</i> :: much _____       |
| hour—minute :: minute _____       | wash— <i>face</i> :: sweep _____        |
| house—room :: book _____          |   |

Go on to the next page at once.



THORNDIKE SCALE ALPHA 2. FOR MEASURING THE UNDERSTANDING  
OF SENTENCES. PART II.

Write your name here. . . . .

Write your age . . . . . years. . . . months

Set IV. Difficulty 7

Read this and then write the answers to 1, 2, 3, and 4. Read it again if you need to.

You need a coal range in winter for kitchen warmth and for continuous hot-water supply, but in summer when you want a cool kitchen and less hot water, a gas range is better. The xyz ovens are safe. In the end-ovens there is an extra set of burners for broiling.

1. What effect has the use of a gas range instead of a coal range upon the temperature of the kitchen? . . . . .
2. For what purpose is the extra set of burners? . . . . .
3. In what part of the stove are they situated? . . . . .
4. During what season of the year is a gas range preferable? . . . . .

Read this and then write the answers to 5, 6 and 7. Read it again if you need to.

Hay-fever is a very painful, though not a dangerous disease. It is like a very severe cold in the head, except that it lasts much longer. The nose runs; the eyes are sore; the person sneezes he feels unable to think or work. Sometimes he has great difficulty in breathing. Hay-fever is not caused by hay, but by the pollen from certain weeds and flowers. Only a small number of people get this disease, perhaps one in fifty. Most of those who do get it, can avoid it by going to live in certain places during the summer and fall. Almost every one can find some place where he does not suffer from hay-fever.

5. What is the cause of hay-fever? . . . . .
6. How large a percentage of people get hay-fever? . . . . .
7. During what seasons of the year would a person have the disease described in the paragraph? . . . . .

Set V. Difficulty 8

Read this and then write the answers. Read it again if you need to.

It may seem at first thought that every boy and girl who goes to school ought to do all the work that the teacher wishes done. But sometimes other duties prevent even the best boy or girl from doing so. If a boy's or girl's father died and he had to work afternoons and evenings to earn money to help his mother, such might be the case. A good girl might let her lessons go undone in order to help her mother by taking care of the baby.

1. What is it that might seem at first thought true, but really is false? . . . . .

2. What might be the effect of his father's death upon the way a boy spent his time? . . . . .

3. Who is mentioned in the paragraph as the person who desires to have all lessons completely done? . . . . .

4. In these two lines draw a line under every 5 that comes just after a 2, unless the 2 comes just after a 9. If this is the case draw a line under the next figure after the 5;

5 3 6 2 5 4 I 7 4 2 5 7 6 5 4 9 2 5 3 8 6 I 2 5  
4 73 5 2 3 9 2 5 8 4 7 9 2 5 6 I 2 5 7 4 8 5 6

Read this and then write the answers to 5, 6, 7 and 8. Read it again if you need to.

In Franklin, attendance upon school is required of every child between the ages of seven and fourteen on every day when school is in session unless the child is so ill as to be unable to go to school, or some person in his house is ill with a contagious disease or the roads are impassable.

5. What is the general topic of the paragraph?.....

6. How many causes are stated which make absence excusable?.....  
.....

7. What kind of illness may permit a boy to stay away from school, even though he is not sick himself?.....

8. What condition in a pupil would justify his non-attendance?.....  
.....

Set VI. Difficulty 8 2/3

Read this and then write the answers to 1, 2, 3 and 4. Read it again if you need to.

We often think of a rich man as one who has much money, as if money and wealth meant the same thing. However, money is only one sort of wealth and some money is not exactly wealth. A twenty dollar bill, for example, is only someone's promise to pay so much gold. Wealth means land, houses, food, clothes, jewels, tools, gold silver, coal, iron, - anything that a man can have that satisfies some want. Money means something which a person can exchange for any one of many sorts of wealth. The main value of any piece of wealth, such as a barrel of flour, a house, or a cow is the direct use you can make of it. The value it has by reason of what you can exchange it for is of less importance. The main value of any piece of money, such a silver dollar, a ten-dollar bill, or a nickel, is not any direct use you can make of it. Its main value is by reason of what you can exchange it for.

1. In what does the main value of wealth lie, according to the paragraph? . . . ; . . . . .
2. In what does the main value of money lie, according to the paragraph? . . . . .
3. Name something that is money, but is not exactly wealth. . . . .
4. What do you suppose is the thing which is defined by business men as "a medium of exchange" . . . . .

Set VII. Difficulty 9.

Read this paragraph and then write the answers to questions 1,2, 3, 4 and 5. Read the paragraph again if you need to.

The most serious objection against the government ownership of railways is connected with the question of rates. Every change in rates means a change in the relative advantages of one part of the country as compared with another part of the country.

Under national ownership and management of the railways there would be a continual struggle of section with section for advantageous rates, and unless the rate problem could be worked out in some simple, easily comprehended way which would commend itself to the public at large, this struggle of section with section could scarcely fail to prove disastrous.

Perhaps the greatest single danger in the private ownership of railways is that it tends first to form classes, and then to array class against class. It forms classes in the very nature of the case. First we have the classes in the railway service. About one per cent of those engaged in the service are officers and the rest employees, and the contrasts among these employees in remuneration and in conditions of employment are vast, and, whether they ought to do so or not, do have a tendency to cultivate bitterness and class division.

There is still another way in which the private ownership of railways tends to class formation, and that is through the favoritism shown to individuals in the community, which is largely responsible for the bad features of the trust movement. Everywhere throughout the United States we can find manufacturers and shippers who have been favored, and if there are any favored it is necessarily at the expense of others. We have favored classes, and this tends to promote class formation and to incite one class to hate another.

1. What is stated as the cause that would produce sectionalism?
2. Under the present condition of ownership of railways, in what two ways does class formation occur?//.....
3. Which is the supposedly favored class in the railway service?
4. What is stated to have been a main cause of the undesirable results of the replacement of many small manufacturing and selling concerns by a few large ones? . . . . .
5. By what means, according to the paragraph, might disaster from sectionalism under public ownership be avoided? . . . . .

TEST I

READ THE GENERAL DIRECTIONS BEFORE YOU DO ANYTHING ELSE

GENERAL DIRECTIONS

1. Do what the printed instructions tell you to do.
2. Do not ask the examiner any questions about the test.
3. Do not ask any other person who is taking the test any questions or watch any one to see what he or she does.
4. The following pages contain a series of paragraphs with questions. You are to read the paragraphs and write answers to the questions.
5. All questions are to be answered from the paragraphs.
6. Make answers brief and definite.
7. Write the date here:.....
8. Write your name here:.....
9. Write your age here:.....years.....months
10. Do not skip pages. Answer the questions in order.
11. Turn the page and do what it says to do.

Read this paragraph and then write answers to questions 1, 2, 3, and 4. All questions must be answered from the paragraph.

All this was said apart. Perhaps a germ of love was springing in their hearts, so pure that it might blossom in Paradise, since it could not be matured on earth; for women worship such gentle dignity as his; and the proud, contemplative, yet kindly soul is oftenest captivated by simplicity like hers. But while they spoke softly, and he was watching the happy sadness, the lightsome shadows, the shy yearnings of a maiden's nature, the wind through the Notch took a deeper and drearier sound. It seemed, as the fanciful stranger said, like the choral strain of the spirits of the blast, who in old Indian times had their dwelling among these mountains, and made their heights and recesses a sacred region. There was a wail along the road, as if a funeral were passing. To chase away the gloom, the family threw pine branches on their fire, till the dry leaves crackled and the flame arose, discovering once again a scene of peace and humble happiness. The light hovered about them fondly, and carassed them all. There were the little faces of the children, peeping from their bed apart, and here the father's frame of strength, the mother's subdued and careful mien, the high-browed youth, the budding girl, and the good old grandma, still knitting in the warmest place. The aged woman looked up from her task, and, with fingers ever busy, was the next to speak.

QUESTIONS

- 1. In what country did the event described in this paragraph occur?...
- 2. Name three characteristics of the stranger.....
- 3. Give three words descriptive of the home in which the stranger stopped .....
- 4. How many persons were there in this home on this night?.....

*Read this paragraph and then write answers to questions 1, 2, 3, 4, and 5. All questions must be answered from the paragraph.*

The speech of Judge Hoar was perfect, and to that handful of people, who heartily applauded it. When a good man rises in the cold and malicious assembly, you think, "Well, it would be more prudent to be silent. Why not rest on a good past? Nobody doubts your talent and power; and, for the present business, we know all about it, and are tired of being pushed into patriotism by people who stay at home." But he, taking no counsel of past things, but only of the inspiration of his today's feelings, surprises them with his tidings, his better knowledge, his larger view, his steady gaze at the new and future event, whereof they had not thought, and they are interested like so many children, and carried off out of all recollection of their malignant nonsense, and he gains his victory by prophecy, where they expected repetition. He knew beforehand that they were looking behind, and that he was looking ahead, and therefore it was wise to speak. What a godsend are these people to a town! and the Judge, what a faculty!—he is put together like a Waltham watch, or like a locomotive just finished from the Tredegar Works.

QUESTIONS

1. On what occasion do you think Judge Hoar made the speech mentioned in this paragraph?.....  
.....
2. Why did Judge Hoar decide to speak?.....  
.....
3. What attitude had the crowd toward the speaker at the beginning of his speech?.....  
.....
4. What is the author's estimate of the speaker?.....  
.....
5. How did the speech affect the audience?.....  
.....

### III

*Read this paragraph and then write answers to questions 1, 2, 3, 4, and 5. All questions must be answered from the paragraph.*

The particular objection that I have to the undergraduate forming his course of study on his future profession is this—that from start to finish, from the time he enters the university until he finishes his career, his thought will be centered upon particular interests. He will be immersed in the things that touch his profit and loss, and a man is not free to think inside that territory. If his bread and butter is going to be affected, if he is always thinking in the terms of his own profession, he is not thinking for the nation. He is thinking for himself, and whether he be conscious of it or not, he can never throw these trammels off. He will only think as a doctor, or a lawyer, or a banker. He will not be free in the world of knowledge and in the circle of interests which make up the great citizenship of the country. It is necessary that the spirit of scholarship should be a detached, disinterested spirit, not immersed in a particular interest. That is the function of scholarship in a country like ours, to supply, not heat, but light to suffuse things with the calm radiance of reason, to see to it that men do not act hastily, but that they act *considerately*, that they obey the truth whether they know it or not. The fault of our age is the fault of hasty action, of premature judgments, of a preference for ill-considered action over no action at all. Men who insist upon standing still and doing a little thinking before they do any acting are called reactionaries. They want actually to react to a state in which they can be allowed to think. They want for a little while to withdraw from the turmoil of party controversy and see where they stand before they commit themselves and their country to action from which it may not be possible to withdraw.

### QUESTIONS

1. What is the function of scholarship in a democracy?.....  
.....
2. In what sense is the word "reactionaries" used?.....  
.....
3. What is the writer's objection to a pre-professional college course?  
.....
4. What is the spirit of scholarship?.....  
.....
5. What inhibits a man's freedom to think?.....  
.....



IV

Read this paragraph and then write answers to questions 1, 2, 3, 4, and 5. All questions must be answered from the paragraph.

No picture, then, and no history, can present us with the whole truth; but those are the best pictures and the best histories which exhibit such parts of the truth as most nearly produce the effect of the whole. He who is deficient in the art of selection may, by showing nothing but the truth, produce all the effect of the grossest falsehood. It perpetually happens that one writer tells less truth than another, merely because he tells more truths. In the imitative arts we constantly see this. There are lines in the human face, and objects in landscape, which stand in such relations to each other, that they ought either to be all introduced into a painting together or all omitted together. A sketch into which none of them enters may be excellent; but, if some are given and others left out, though there are more points of likeness, there is less likeness. An outline scrawled with a pen, which seizes the marked features of a countenance, will give a much stronger idea of it than a bad painting in oils. Yet the worst painting in oils that ever hung at Somerset House resembles the original in many more particulars. A bust in white marble may give an excellent idea of a blooming face. Color the lips and cheeks of the bust, leaving the hair and eyes unaltered, and the similarity, instead of being more striking, will be less so.

QUESTIONS

1. How may the historian or artist without showing an untruth be untrue? .....
2. What determines whether details should be included or omitted in historical writing or in a painting?.....
3. What is the test of excellence of a picture or a history?.....
4. In what way may an outline sketch be better than a painting?.....
5. What is the distinction made between "truth" and truths"?.....

Read this paragraph and then write answers to questions 1, 2, 3, 4, and 5. All questions must be answered from the paragraph.

We do not come into the world each ticketed off by any outward mark for our special destination. There may perhaps be some minds of such marked individuality as to betray it at a very early period of life: there may be even infant prodigies, in whom the future poet or artist, the coming orator or statesman, can be discerned ere he has well left the nursery; but I fear that such fore-castings are in general due only to partial or parental observations, or to the biographer's tendency to read back the success of subsequent life into the incidents of childhood. To an impartial observer, so far as mental characteristics go, all babies are very much alike. The inarticulate vocal manifestations of the future poet or musician are no more melodious than those of his tuneless brother. The incipient divine or philosopher does not foreshadow his career in a premature air of thoughtful gravity impressed on his countenance. Even when we come to the stage at which education begins—a few rare instances of precocity excepted—individual aptitude is only very slightly discernible. It is not till a later, in the case of those of the best minds a much later period—viz., when the schoolboy stage is past, and that of student life has considerably advanced—that a youth can be said to be possessed of the materials by which the choice of a career can be wisely determined; in other words, of that knowledge of the various branches of human thought, and that experimental knowledge of himself and of the direction and limits of his powers, by which he becomes capable of such a decision as to his future destiny.

QUESTIONS

- 1. To what two causes does the writer attribute the tendency to discern special aptitudes in children?.....
- 2. What exceptions does he make to the general rule that "all babies are very much alike"?.....
- 3. What is necessary to a wise choice of a career?.....
- 4. Why should those with the best minds choose their vocations later than those of mediocre ability?.....
- 5. In not to exceed ten words, express the main thought of this paragraph .....

VI

Read this paragraph and then write answers to questions 1, 2, 3, 4, and 5. All questions must be answered from the paragraph.

The one word for the one thing, the one thought, amid the multitude of words, terms, that might just do: the problem of style was there!—the unique word, phrase, sentence, paragraph, essay, or song, absolutely proper to the single mental presentation or vision within. In that perfect justice, over and above the many contingent and removable beauties with which beautiful style may charm us, but which it can exist without, independent of them yet dexterously availing itself of them, omnipresent in good word, in function at every point, from single epithets to the rhythm of a whole book, lay the specific, indispensable, very intellectual, beauty of literature, the possibility of which constitutes it a fine art.

One seems to detect the influence of a philosophic idea there, the idea of a natural economy, of some pre-existent adaptation, between a relative, somewhere in the world of thought, and its correlative, somewhere in the world of language—both alike, rather, somewhere in the mind of the artist, desiderative, expectant, inventive—meeting each other with the readiness of “soul and body reunited,” in Blake’s rapturous design; and, in fact, Flaubert was fond of giving his theory philosophical expression.

“There are no beautiful thoughts,” he would say, “without beautiful forms, and conversely. As it is impossible to extract from a physical body the qualities which really constitute it—colour, extension, and the like—without reducing it to a hollow abstraction, in a word, without destroying it; just so it is impossible to detach the form from the idea, for the idea only exists by virtue of the form.”

QUESTIONS

1. What, according to the author, gives to literature its beauty?.....  
.....
2. What is the relation between the intellectual and the contingent beauties of literature?.....  
.....
3. What two things has the author in mind when he says “both alike”?  
.....
4. In not to exceed five words write a title for the above passage.....  
.....
5. To what does the phrase “that perfect justice” refer?.....  
.....

Do not turn this paper over until the Examiner gives the signal.

1. Write the name of your school here :.....

2. Write the date here :.....

3. Put a cross in the square after the name of the class to which you belong :

- |           |                   |                          |
|-----------|-------------------|--------------------------|
| Freshman  | { First semester  | <input type="checkbox"/> |
|           | { Second semester | <input type="checkbox"/> |
| Sophomore | { First semester  | <input type="checkbox"/> |
|           | { Second semester | <input type="checkbox"/> |
| Junior    | { First semester  | <input type="checkbox"/> |
|           | { Second semester | <input type="checkbox"/> |
| Senior    | { First semester  | <input type="checkbox"/> |
|           | { Second semester | <input type="checkbox"/> |

When the examiner gives the signal, turn the test over to page 1 and

DO WHAT IT SAYS TO DO.

NAME \_\_\_\_\_

GRADE \_\_\_\_\_

Write only one word on each blank

Time Limit : Five minutes

AGE (on last birthday) \_\_\_\_\_

TRABUE  
LANGUAGE SCALE L

1. Children \_\_\_\_\_ are rude \_\_\_\_\_ not easily win friends.
2. Plenty \_\_\_\_\_ exercise and \_\_\_\_\_ air \_\_\_\_\_ healthy  
\_\_\_\_\_ and girls.
3. In \_\_\_\_\_ to maintain \_\_\_\_\_ health, one should have nourishing  
\_\_\_\_\_ .
4. \_\_\_\_\_ happiness can not be \_\_\_\_\_ with money.
5. One's \_\_\_\_\_ do \_\_\_\_\_ always express his thoughts.
6. To \_\_\_\_\_ to wait, after having \_\_\_\_\_ to go \_\_\_\_\_ ,  
\_\_\_\_\_very annoying.
7. It is sometimes \_\_\_\_\_ to \_\_\_\_\_ between two \_\_\_\_\_  
of action.
8. One can \_\_\_\_\_ do his \_\_\_\_\_ at one \_\_\_\_\_ while  
\_\_\_\_\_ of another.

NAME \_\_\_\_\_

GRADE \_\_\_\_\_

Write only one word on each blank

Time Limit : Five minutes

AGE (on last birthday) \_\_\_\_\_

TRABUE  
LANGUAGE SCALE M

1. One can not foretell \_\_\_\_\_ will happen in the \_\_\_\_\_ .
2. The dog \_\_\_\_\_ a useful \_\_\_\_\_ because \_\_\_\_\_ his  
intelligence and faithfulness.
3. Many people \_\_\_\_\_ their health because \_\_\_\_\_ do not  
\_\_\_\_\_ the \_\_\_\_\_ of hygiene.
4. Nothing can \_\_\_\_\_ one's happiness \_\_\_\_\_ effectively than a  
guilty \_\_\_\_\_ .
5. To \_\_\_\_\_ many things \_\_\_\_\_ ever finishing any of them  
\_\_\_\_\_ a \_\_\_\_\_ habit.
6. The \_\_\_\_\_ seems \_\_\_\_\_ and dreary \_\_\_\_\_ a  
discouraged \_\_\_\_\_ .
7. \_\_\_\_\_ that are \_\_\_\_\_ to one by an \_\_\_\_\_ friend should  
be pardoned \_\_\_\_\_ readily than injuries done by one \_\_\_\_\_  
is not angry.
8. It is \_\_\_\_\_ that a full-grown man should \_\_\_\_\_ a ghost  
\_\_\_\_\_ he is \_\_\_\_\_ .

In the blank space after each word write a word or phrase which will show that you know the meaning of the word. The first two blanks are properly filled as examples of how the others should be filled.

- |             |                        |                 |       |
|-------------|------------------------|-----------------|-------|
| 1. Large    | <u>big</u>             | 22. frequent    | _____ |
| 2. hat      | <u>to wear on head</u> | 23. purchase    | _____ |
| 3. clock    | _____                  | 24. valiant     | _____ |
| 4. glove    | _____                  | 25. avarice     | _____ |
| 5. scorch   | _____                  | 26. allege      | _____ |
| 6. haste    | _____                  | 27. tolerate    | _____ |
| 7. curse    | _____                  | 28. clamor      | _____ |
| 8. brass    | _____                  | 29. exterior    | _____ |
| 9. elbow    | _____                  | 30. garb        | _____ |
| 10. crimson | _____                  | 31. sullen      | _____ |
| 11. grumble | _____                  | 32. corrupt     | _____ |
| 12. glance  | _____                  | 33. declivity   | _____ |
| 13. mast    | _____                  | 34. patella     | _____ |
| 14. troops  | _____                  | 35. frustrate   | _____ |
| 15. defend  | _____                  | 36. belligerent | _____ |
| 16. sincere | _____                  | 37. cordial     | _____ |
| 17. repose  | _____                  | 38. incessant   | _____ |
| 18. shrewd  | _____                  | 39. judicious   | _____ |
| 19. forfeit | _____                  | 40. contiguous  | _____ |
| 20. recent  | _____                  | 41. sapient     | _____ |
| 21. smite   | _____                  | 42. ephemeral   | _____ |

9. Do what it says to do as quickly as you can, but be careful to notice just what it does say:

With your pencil make a dot over any one of these letters F G H I J. Place a comma after the longest of these three words: *boy mother girl*. Then, if Christmas comes in March make a cross right here \_\_\_\_\_, but if not, pass along to the next question and tell where the sun rises \_\_\_\_\_ If you believe that Edison discovered America, cross out what you just wrote, but if it was some one else, put in a number to complete this sentence: "A horse has \_\_\_\_\_ feet." Write *yes*, no matter whether China is in Africa or not \_\_\_\_\_; and then give a wrong answer to this question: "How many days are there in the week?" \_\_\_\_\_ Write any letter except *g* just after this comma \_\_\_\_\_, and then write *no* if 2 times 5 are 10 \_\_\_\_\_ Now, if Tuesday came after Monday, make two crosses here \_\_\_\_\_; but if not, make a circle here \_\_\_\_\_ or else a square here \_\_\_\_\_ Be sure to make three crosses between these two names of boys: George \_\_\_\_\_ Henry. Notice these two numbers: 3, 5. If iron is heavier than water, write the larger number here \_\_\_\_\_ But if iron is lighter write the smaller number here \_\_\_\_\_ Show by a cross when the nights are longer: in summer? \_\_\_\_\_ in winter? \_\_\_\_\_ Give the correct answer to this question: "Does water run uphill?" \_\_\_\_\_ and repeat your answer here \_\_\_\_\_ Do nothing here (5 plus 7 equals \_\_\_\_\_), unless you skipped the preceding question; but write the first letter of your first name and the last letter of your last name at the ends of this full-drawn line: \_\_\_\_\_

10. Write one and only one word in each blank.

1. Boys and \_\_\_\_\_ soon become \_\_\_\_\_ and women.
2. Hot weather comes in the \_\_\_\_\_ and \_\_\_\_\_ weather \_\_\_\_\_ the winter.
3. Plenty \_\_\_\_\_ exercise and \_\_\_\_\_ air \_\_\_\_\_ healthy \_\_\_\_\_ and girls.
4. \_\_\_\_\_ happiness can not be \_\_\_\_\_ with money.
5. It is very annoying to \_\_\_\_\_ toothache, \_\_\_\_\_ often comes at the most \_\_\_\_\_ time imaginable.

THE END

Record your time at once in the upper right hand corner of page 1.



Do not turn this paper over until the Examiner gives the signal.

OMNIBUS TEST I.

1. Write the name of your school **here** \_\_\_\_\_
2. Write the date here \_\_\_\_\_
3. Put a cross in the square after the name of the class to which you belong :

Freshman	{	First semester	<input type="checkbox"/>
		Second semester	<input type="checkbox"/>
Sophomore	{	First semester	<input type="checkbox"/>
		Second semester	<input type="checkbox"/>
Junior	{	First semester	<input type="checkbox"/>
		Second semester	<input type="checkbox"/>
Senior	{	First semester	<input type="checkbox"/>
		Second semester	<input type="checkbox"/>

When the examiner gives the signal, turn the test over to page 1 and  
DO WHAT IT SAYS TO DO.

GROUP A\*

GROUP X\*\*

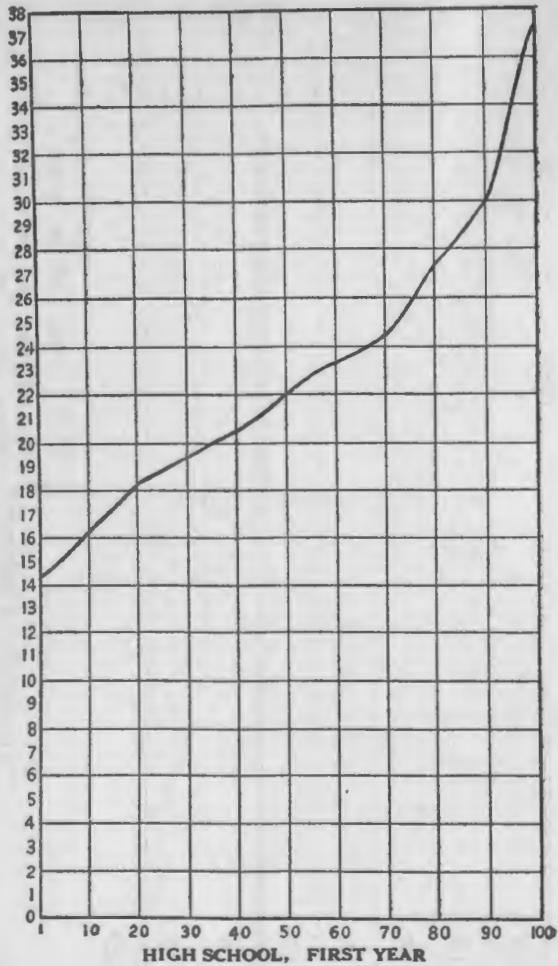
NAME	WEIGHTED TIME		NAME	WEIGHTED TIME	
	Minutes	Seconds		Minutes	Seconds
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		

\*All scoring as follows: {  
 First year 19 or less  
 Second year 18 or less  
 Third year 16 or less  
 Fourth year 15 or less

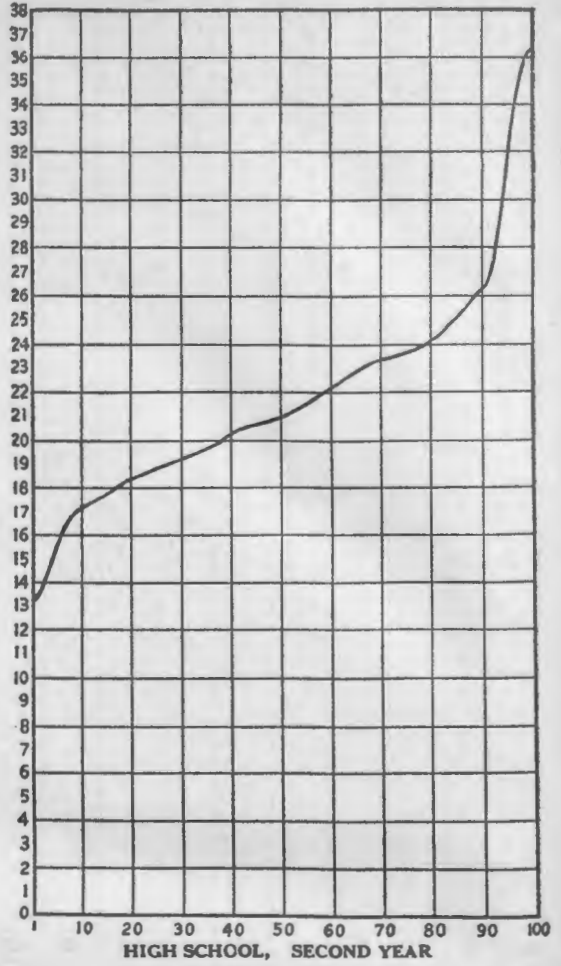
\*\*All scoring as follows: {  
 First year 26 or more  
 Second year 24 or more  
 Third year 21 or more  
 Fourth year 19 or more

In the case of Form IB add 1 to each of above scores.

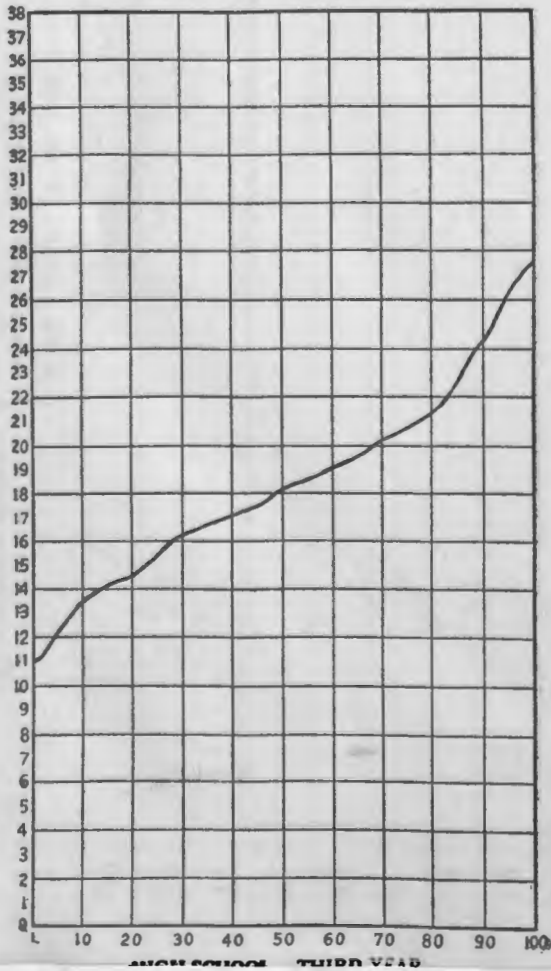
PERCENTILE GRAPH I



PERCENTILE GRAPH II



PERCENTILE GRAPH III.



PERCENTILE GRAPH IV.

