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UNIVERSITY OF LOUISVILLE

THE SIXTH GRADE SUPPLEMENTARY HISTORY TEXT
(EDUCATIONAL STANDARDS AND THE EXTENT TO
WHICH FIVE BOOKS MEET THESE REQUIREMENTS)

A Dissertation

Submitted to the Faculty

Of the Graduate School of the University of Louisville

In Partial Fulfillment of the

Requirements for the Degree

Of Master of Science

Department of Education

By

HABEL MACDONALD SCHRODT

1939

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Name of Student: MABEL MACDONALD SCHRODT

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BOOKS MEET THESE REQUIREMENTS)

Name of Director: _____

Approved by a Reading Committee composed of the
following members:

1. _____
2. _____
3. _____
4. _____

Representative of the Department of English:

Date: 1939

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UNIVERSITY OF LOUISVILLE

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MABEL MACDONALD SCHRODT

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INTRODUCTION

CHAPTER I

INTRODUCTION

In the experience of the author the problem of what a child can learn from a textbook has arisen over and over again. Casual observation and conference with other teachers have led to the conclusion that many books, excellent as to content and course of study requirements, are practically worthless to the child because he cannot read them with a sufficient degree of understanding either to hold his interest or to justify the expenditure of time required to master the assignment.

THE PROBLEM

The problem of this study is to analyze five supplementary history books commonly used in the public schools of Louisville, Kentucky, with respect to:

1. Difficulty of vocabulary in terms of frequency of usage according to Thorndike's Classification¹
2. Word-length of sentences and phrases, counting five letters to the word
3. Determination of the degree of accuracy with which 172 sixth-A pupils from five of these schools read them

1. Thorndike, E. L., The Teacher's Word Book of Ten Thousand Words. 1923, p.iii.

4. Determination of the suitability of the five history books for the pupils who read them, as judged by analysis of vocabulary and by phrase- and sentence-length and by tests of comprehension as related to age and grade norms

The following five history books were chosen for the study because the writer wished to know their value as teaching tools in the grade in which she teaches:

- I. Europe the Mother of America, by Charles F. Horne and Olive Bucks. New York, Charles E. Merrill Company, 1930.
- II. Our Nation's Heritage, by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.
- III. The Old World Beginnings of America, by Mary C. Keltz. New York, Ginn and Company, 1932.
- IV. The American People and Their Old World Ancestors, by Grace Vollintine. New York, Ginn and Company, 1930.
- V. The Elementary World History, by Charles A. Beard and William C. Bagley. New York, The Macmillan Company, 1932.

The writer took from each of these books seventeen paragraphs which, in the opinion of four sixth grade teachers, one fifth grade teacher and one ungraded class teacher, were representative of the book as a whole.

Every word of the seventeen selections from each book was tabulated as to frequency of usage according to Thorndike's Classification² for:

2. Thorndike, E. L., The Teacher's Word Book of Ten Thousand Words. 1923, p.iii

1. The milliclassification of words from 1,000 to 10,000
2. The number of words beyond 10,000
3. The number of words beyond 6047-- 6047 being taken as the number of words a normal twelve-year-old child should know-- See page 4.

For the sentence- and phrase-length analysis, phrases and sentences were counted for each paragraph, as were the number of phrases to the sentence. Each phrase and sentence was then analyzed as to the number of words it contained, counting five letters to the word to insure uniformity of estimate.

To determine the degree of accuracy with which the pupils comprehended these representative selections, comprehension tests were built on the seventeen paragraphs for each book. To make the tests, four major ideas were chosen from each paragraph,³ each idea being tested with a multiple choice question.

These tests of comprehension were given to five different groups of sixth grade pupils, (one test to each group), by their home-room teachers under the direction of the school principals. Five different groups were used to avoid practice effects.

3. The third paragraph of The Elementary World History, by Beard and Bagley has six major ideas and the eighth paragraph of The Old World Beginnings of America, by Kelty contains seven major ideas; so six questions were made on the former and seven on the latter.

From the children tested five groups were chosen so as to be comparable in chronological age, mental age, and reading age as explained in Chapter III. The averages of these five comparable groups on the comprehension tests are considered indicative of the difficulties of the five history books examined-- See Chapter III.

To determine the relative value of the five history books for use in grade 6.8 (upper sixth) by pupils twelve years and five months old, three methods were used:

1. Vocabulary analysis of all words occurring in the selections both before and beyond 6047 (twelfth year)⁵ level
2. Analysis of phrase- and sentence-length as to number in paragraph and number of words to the phrase and sentence
3. A degree of accuracy on the history comprehension tests of 75 per cent or better⁶

A summary of the findings in previous studies on vocabulary, phrase- and sentence-length and comprehension

-
4. 12-5 age and 6.8 grade is the age-grade norm given for the upper sixth grade by the Metropolitan Achievement Tests, Intermediate Battery - Partial: Form A, For Grades 4, 5 and 6. Edited by Jacob S. Orleans, 1932.
 5. 6000 words are given by Louis M. Terman as the average for a twelve-year-old child. The Measurement of Intelligence, p. 226, 1926. 6047 is used in this study because it is a milliclassification boundary established by the Thorndike vocabulary scale.
 6. Ayer, Adelaide M., Some Difficulties in Elementary School History, Teachers College Contributions to Education, No. 212, New York, Teachers College, Columbia University, 1926, p. 32.

is given under "Literature" in Chapter II. "Experimental and Analytical Procedures" are given in Chapter III. The "Data" and the "Statistical Procedures" employed are given in Chapters IV, V, and VI. Chapter VII is a summary and interpretation of the entire study -- literature, vocabulary and sentence-and-phrase analyses, and experiment. An attempt is made to relate the findings to the situation as it actually exists in the sixth grades of the Louisville Public Schools. Original data are given in Appendix A. Copies of the tests used in the study are given in Appendix B.

CHAPTER II

LITERATURE OF THE FIELD

I. VOCABULARY IN READING

A. Summary of Vocabulary Investigations

During the last two decades a great number and variety of investigations have been made in the interest of the scientific study of education. These investigations have embraced practically all aspects of educational work and not a few of them have been concerned with the subject of vocabulary.

Many word studies have been made. These studies were primarily for the purpose of developing lists of words that were found in usage. In general they have been developed by the method of analyzing written correspondence and printed materials.

One type of study is illustrated by those that have been made in the interest of developing spelling scales. Probably the most important of these studies are Ayres' A Measuring Scale of Ability in Spelling, Ashbaugh's Iowa Spelling Scale and Buckingham's Spelling Ability, Its Measurement and Distribution.

Some other investigations have developed vocabulary tests by which they have estimated the vocabularies of individuals, (the number of words an individual can define). Doran did considerable work of this kind which was

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reported in 1907.¹ Kirkpatrick and Burch have also developed tests for estimating the vocabularies of pupils.² Most of these studies are based upon a list of 100 words chosen at random from a dictionary. The test consists in finding the percentage of the words in the chosen list which can be defined. If a pupil can define 50 per cent of the words on the list, it is assumed that he can define 50 per cent of all words in the dictionary from which the words are taken.

Other investigations have been developing the vocabularies that are peculiar to certain subjects of the curriculum. Humphrey has recently completed a study in which he investigated the vocabulary of textbooks in the field of junior high school mathematics.³

Another group of studies which are concerned with the special vocabularies of common school subjects are those developed by Pressey in which she listed the technical words that appeared in the textbooks in each subject and estimated the comparative importance in the subject of each word thus appearing.⁴ This list may be

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1. Doran, E. W., "A Study of Vocabulary." Pedagogical Seminary, Volume 14, 1907, pp. 401-38.
 2. Kirkpatrick and Burch, "Vocabulary Tests as Measures of School Efficiency." School and Society, Volume 2, 1915, pp. 713-18.
 3. Humphrey, E., The Determination of the Vocabulary of Mathematics Textbooks in the Junior High School. Master's Thesis, University of Chicago, Chicago, Illinois, 1926.
 4. Pressey, J. C., "The Determination of the Technical Vocabulary of the School Subjects." School and Society, Volume 20, 1914, pp. 91-96.

used as a standard for measuring the technical vocabulary of specific elementary school subjects.

Powers reports a study in which a number of textbooks in science were rated by the number of words found which were not in the Teacher's Word Book.⁵ The books in this case were read completely and all words not in the Teacher's Word Book, with their frequencies, were tested. This procedure produced comparable data estimating the relative difficulty of the vocabularies of the respective books.

A detailed study, Some Difficulties in Elementary School History, by Adelaide M. Ayer, has been made on the basis of a study of 23 fifth grade history textbooks widely used in the United States.⁶ Miss Ayer has listed the language difficulties in these books under the following heads:⁷

- I. Passages involving technical terminology essential at some point in the school course to the comprehension of history
- II. Difficult words and expressions not essential to the comprehension of history
 1. Miscellaneous technical terms
 2. Concepts of a geographical nature
 3. General abstract terms
 4. Literary embellishments
 5. Long involved sentences
 6. Abstract thought

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5. Powers, S. R., "The Vocabularies of High School Science Textbooks." Teachers College Record, Volume 26, 1925, pp. 358-82
 6. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212, New York, Teachers College, Columbia University, 1925
 7. Ibid., Chapter II.

Two of Miss Ayer's conclusions are:⁸

1. "The results of these tests show an astonishing inability on the part of both fifth and seventh grade pupils to comprehend fifth grade history paragraphs.
2. "The results of the study of the correspondence between reading comprehension in general and comprehension of fifth grade history paragraphs containing typical difficulties indicate that the content of much of the widely used fifth grade histories is sufficiently difficult for high school use."

Most of these difficulties in the elementary school history involve vocabulary that is uncommon in the experience of the child. Had Miss Ayer made and given a vocabulary test incorporating the difficult words of the paragraphs which she used in the comprehension tests, she would probably have found even greater inability to understand the meaning of the words.

In The Rating of the Vocabulary of Six American History Textbooks for the Seventh and Eighth Grades.⁹

Miss H. S. Smith attempted to rate the general difficulty of vocabulary of each textbook and to find what progressive difficulty of vocabulary there was within each of the texts. Each textbook was ranked on the basis of the three ratings:

1. Words not found in the Teacher's Word Book

8. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212, New York, Teachers College, Columbia University, 1926, pp. 48-49.

9. Smith, H. S., The Rating of the Vocabulary of Six American History Textbooks for the Seventh and Eighth Grades. Master's Thesis, University of Chicago, Chicago, Illinois, 1926.

2. Words not found in the first 2500 words of the Word Book
3. Words in the Pressey list of technical words.¹⁰

The first two standards used are reliable measures of general vocabulary difficulty. The Pressey list of technical and unfamiliar words is not a list of words selected on the basis of frequencies, and is not considered reliable to use as a standard to rate general difficulty of vocabulary. It, however, should be a fair measure of the technical vocabulary of history textbooks.

Gates' A Reading Vocabulary for the Primary Grades¹¹ gives a list of 1500 words which have been selected as suitable for use in all forms of reading material in grades first, second, and third. The percentage of words that are not found in the Gates primary list which occur in the reading content of textbooks measures the increasing burden of the vocabulary of a text beyond the primary grades. Experiments have shown that difficulties with arithmetic problems, for example, are sometimes due not to lack of ability in arithmetic, but to unfamiliarity with the words with which the problem is expressed. This indicates that words beyond the primary vocabulary are introduced in too great a number and with too little frequency to give the

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10. Pressey, J. C., "Determination of the Technical Vocabulary of School Subjects." School and Society, Volume 20, 1924, pp. 91-96.
 11. Gates, Arthur I., "The Construction of a Reading Vocabulary for the Primary Grades." Teachers College Record. Volume 27, 1926, pp. 46-51.

child an opportunity to become thoroughly acquainted with the new vocabulary of a higher grade. The Gates primary list may be used as a standard to measure the gradation of vocabulary of textbooks for the intermediate grades.¹²

The most elaborate and comprehensive study is Thorndike's The Teacher's Word Book.¹³ It contains a list of 10,000 words which were found to occur most frequently in forty-one different sources of printed material. He has also incorporated the lists derived by other investigators. The Teacher's Word Book probably is, the best standard for measuring the vocabulary of elementary grade textbooks.

The foregoing brief accounts of some of the vocabulary investigations and of Miss Ayer's study of Difficulties in Elementary School History should give the reader a general notion of what investigators in this field have been doing.

II. COMPREHENSION IN READING

A. Vocabulary-Sentence-Burden and Comprehension

Reading of the simplest type has been defined as getting meaning from the printed page. No definition could be more misleading than this. One does not get meaning

12. Gates, Arthur I., "The Construction of Reading Vocabulary for the Primary Grades." Teachers College Record, Volume 27, 1926, pp. 46-51.

13. Thorndike, E. L., The Teacher's Word Book of Ten Thousand Words. 1923.

from the printed page. In the first place there is no meaning on the page; only symbols of meaning are there. Furthermore, printed symbols do not give meaning to the reader; they merely stimulate meaningful mental activity. This he does by recalling, manipulating, and combining concepts that the printed symbols stand for. If the reader does not possess the concept or meaning that the printed symbol represents, it is utterly impossible for him to read the symbol and achieve meaning, even though he may learn to recognize the symbol mechanically in either visual or auditory form. Thus it is clear that the real and fundamental source of meaning in reading lies in the concepts that the reader takes with him to the printed page.¹⁴ It is equally clear that reading of the simplest type may be defined as the making of correct meaning under the stimulation of printed symbols.

This point of view emphasized the significance of better understanding of the nature of the reading vocabulary. In the first place, it is clear that an individual's real reading vocabulary is composed only of those words with which he is able to make meaning when he comes in contact with their printed symbols. Some words will be useful in all their different meanings;

14. This point of view was first emphasized by Dr. Ernest Horn, College of Education, State University of Iowa, Iowa City, Iowa. A detailed and scholarly treatment of the problem is presented in Methods of Instruction in the Social Studies. New York, Charles Scribner's Sons, 1937.

others will be known in connection with only one or two of their several meanings. Most certainly no word form is part of an individual's reading vocabulary when he does not understand the particular meaning for which it stands in a given setting, even though he is able to pronounce or to recognize it visually as something he has seen before. A child's reading vocabulary is made up of the meanings which he has acquired and to which he has attached closely the appropriate printed symbols.

The reading vocabulary required of the school child at every grade level is much greater than one is commonly led to believe. It is often assumed that the more frequently a word recurs, the more likely are the children to comprehend its meaning. Upon this supposition alone many teachers base their choice of readers. That there may be real obstacles to comprehension in recurring¹⁵ words is shown in the evaluation of fourteen primary readers by Miss Ethel L. Fennell.¹⁶

She points out that a probable reason for difficulty in the comprehension of reading lies in the fact that textbook writers, in their effort to familiarize children with certain words, have provided numerous recurrences of these words but have disregarded the fact that

15. "Recurring words" means "words of identical form"

16. Fennell, Ethel L., "Recurring Words and Their Relation to Difficulty in Comprehension." Elementary School Journal, Volume 29, 1928, pp. 42-53.

frequently the words recur with entirely different meanings.

In all, she found 222 different words that recurred at least once in the readers. For these 222 words, a total of 842 meanings were discovered, making, on the average, 3.79 different interpretations for each word in the entire set of fourteen readers.

If each word recurred with only two or three meanings, the problem would be sufficiently great, but in reality it is even more complex. More than half the recurring words, 122 of the 222, have two different meanings to comprehend; 38 require three different interpretations; and 21, four interpretations. The rest of the recurring words, however, have a greater number of meanings. 7 have five meanings; 4 have eight; 6 have nine; and 3 have ten. "By" requires twelve different interpretations; "good," fourteen; "out," fourteen; "to," seventeen; "at" and "of," twenty each; "for," twenty-one; "in," twenty; "on," twenty-three; and "up," twenty-four. The extension of the "primary sense" of prepositions has produced a multiplicity of meanings that have been used profusely, as indicated, in primary reading. Similar findings are reported by Dewey¹⁷ and Uhl.¹⁸

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17. Dewey, Joseph C., A Case Study of Reading Comprehension Difficulties in American History. Abstract of Doctor's Dissertation, College of Education, State University of Iowa, Iowa City, Iowa, 1934.
18. Uhl, Willis L., "The Materials of Reading." Thirty-sixth Yearbook of the National Society for the Study of Education, Part I, 1937, Chapter VII.

Pressey,¹⁹ in a study of vocabularies of widely used histories, finds 542 technical words considered the "essential" vocabulary of the subject, and 503 "accessory" vocabulary, in all, 1045 words which are technical or unusual and which would not frequently be met, if at all, outside textbooks. The importance of knowing these words is stressed by Pressey, who says: "The failure to know this or that word is not an isolated or unimportant condition, but is primarily evidence of failure to comprehend the idea represented by the word."

In this connection Uhl²⁰ writes: "One of the surest ways by which the technical vocabulary of a given subject can be controlled and brought clearly to the reader's attention is to make sure that the words used in the books on that subject do not get out of hand. If vocabularies are selected for power, this can not take place. The words that children learn will be usable in many different connections. Thus the books in science, geography, history, reading and health will support one another."

Uhl believes that suitable books for the middle grades should be written in words that are known to be in the vocabulary of the children of the grades in which they are used. Our vocabulary specialists, he finds, have been forgetful of the fact that, truly considered, a

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19. Pressey, L. C., "The Determination of the Technical Vocabularies of School Subjects." School and Society, Volume 20, 1914, pp. 91-96.
20. Uhl, Willis L., "The Materials of Reading." Thirty-sixth Yearbook of the National Society for the Study of Education, Part I, 1937, pp. 222-227.

word is not a form but a meaning. "Whether or not the word 'blaze' may be used in a fourth-grade book depends on the meaning you attach to it. If the 'blaze' of a fire is meant, you are safe. If the 'blaze' on a tree made with a hatchet to indicate the trail is meant, you will either have to teach the word or use a substitute. A simple word like 'get' may have a dozen or more meanings, not just one. Or it may have degrees or levels of meaning. The word 'bank' means 'a building,' 'a place to deposit money,' 'a place to borrow money,' 'an organization that pays interest,' 'a place to keep jewelry,' 'a place through which to pay bills,' and 'a medium of financial exchange'."

In Miss Lenna E. Smock's²¹ study she attempts to determine the relative difficulty of the reading content of intermediate grade history textbooks on the basis of sentence difficulty. She assumes that the length of a sentence either hinders or aids comprehension.

To determine whether this be true, a history reading test was made in two forms. Five paragraphs of reading matter were selected, one from each of the five sixth-grade textbooks considered in the study. The length of the sentences ranged from 10 to 37 words with an average

21. Smock, Lenna E., A Study of Intermediate Grade History Textbooks Commonly Used in the State of Indiana with Special Reference to the Relative Difficulties of the Vocabulary. Master's Thesis, University of Indiana, Bloomington, Indiana, 1929.

length of 24.4 words. The paragraphs as originally taken from the books were arranged in Form I of the test. Four questions were given after each paragraph to test the comprehension. They were to be answered with one word.

The two forms, (original and rewritten sentences), were given to 104 fifth grade children of the public schools of Bloomington, Indiana. It was so arranged that every other pupil, 52 in all, took Form I and the other 52 took Form II. All the children were given time to complete the text.

The Sangren-Woody Reading Test was given to these same children. It makes a comparison of the child's achievement in various types of silent reading activity. The coefficients of reliability are somewhat higher for this test than those generally reported for standardized educational tests:

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Form I	.82
Form II	.75
Sangren-Woody Test	.95

The Median and Mean Scores made by each group on the History Reading Test and on the Sangren-Woody Reading Test are given below:

	<u>History-Reading</u>		<u>Sangren-Woody</u>			
	Time		Score		Score	
	Median	Mean	Median	Mean	Median	Mean
Form I	16.5	11.3	14.1	13.7	62.8	63.8
Form II	12.2	12.8	15.1	14.6	59.1	62.7

The two groups of fifth grade children to whom the History Reading Test was given made about equal achievement scores in various types of silent reading activities. The group that took Form I of the test made an average score of 63.8 for the Sangren-Woody Test, while the group that took Form II had an average score of 62.7 for the same test. Miss Smock concludes: "The results of the testing to measure the effect of the length of sentence upon comprehension did not show any significant difference in favor of the shorter sentence We cannot, as yet, by any authority, say what the average length of the sentence of the reading matter of intermediate grade textbooks should be."

Gates, however,²² does find that sentence simplification is important, and Horn²³ states that to read effectively a child should:

1. "Be able to interpret the passage properly, phrasing accurately, recognizing periods and punctuation marks. He should have sufficient "eye-voice span" to permit expressive appreciative inflection.
2. "He should be able to comprehend the text, its vocabulary and sentence structure."

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22. Gates, Arthur I., The Improvement of Reading. A Program of Diagnostic and Remedial Methods. 1935, p.668.
23. Horn, Ernest, "The Objectives of Reading as a Guide to Remedial and Prophylactic Work." Yearbook No. 2, Department of Elementary School Principals, National Educational Association, 1923, p. 204.

While Ayer²⁴ lists among the difficulties in comprehension of history, "long involved sentences," as an example she gives: "In the year that Louis XIV was crowned there was born at Rouen, an old town to the northwest of Paris, a boy who was to place the French flag in the Mississippi Valley. The name of this child was Robert Chevalier Sieur de la Salle." She says, however, that such sentences were common to only a few of the fifth grade histories examined.

B. Studies Which Show the Effect of
Vocabulary upon Comprehension

Johnson,²⁵ in his study of the polysyllabic words in standard reading tests makes the following conclusions:

1. "The results of this experiment showed that most of the pupils made high scores in the short-word test while many of those taking the long-word test made low scores. The wide difference in scores between these two equated groups indicates that the monosyllabic word test was strikingly less difficult than the polysyllabic word test.
2. "The percentage of polysyllabic words in the first five successive groups of 500 words in the Thorndike list increases with each group, indicating that as the words decrease in frequency of use, they increase in length.

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24. Ayer, Adelaide M., Some Difficulties in Elementary History. Teachers College Contributions to Education, No. 212. New York, Teachers College, Columbia University, 1926, p. 10.
25. Johnson, G. R., "An Objective Method of Determining Reading Difficulty." Journal of Educational Research, Volume 21, 1930, pp. 284-5.

3. "The vocabulary of certain standard reading tests,²⁶ the general difficulty of which has already been experimentally determined, showed an increase in polysyllabic words from grade to grade.
4. "Books expressly written for consecutive grades, such as a series of readers or language books, showed an increase in polysyllabic words from grade to grade.
5. "The use of this measure gives results corresponding to those found when the per cent of technical words is computed."

The count of technical words, based on the Pressey Technical Vocabulary Lists, gives the same relative rating to books as does the count of polysyllabic words. This may be shown by a study of four history books, the results of which are given below:

<u>Text History</u>	<u>Per Cent Polysyllabic</u>	<u>Per Cent Technical</u>
A	34.5	12.2
B	34.5	7.7
C	32.8	7.5
D	31.8	6.0

The method employed in Cutright's²⁷ study is similar to that employed by Ayer.²⁸ The technique involves the development of objective tests. One test, Test A, was

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26. Gray's Silent Reading Test, Gray's Oral Reading Test, Whipple's High School and College Test, Thorndike-McCall Reading Tests and Stanford Reading Tests.
 27. Cutright, Prudence, Halvorson, George, and Brueckner, J. L., "A Study of One Factor in the Grade Placement of Reading Materials." Elementary School Journal, Volume 29, 1928, pp. 284-95.
 28. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212. New York, Teachers College, Columbia University, 1926, pp. 16-30.

designed to determine the vocabulary difficulties encountered in Heidi; a second test, Test B, was designed to measure the extent to which pupils understood sections of the book.

The tests showed that such words as "climax," "primitive," and "passionately" were beyond the comprehension of all the 230 fourth-grade pupils who took the test, and such words as "summoned," "assure," "expectations," and "pursued" were understood by fewer than 26 per cent of the pupils, irrespective of grade.

85 per cent, in Test B requires eighth-grade reading ability
 75 per cent, seventh-grade reading ability
 70 per cent, sixth-grade reading ability
 65 per cent, fifth-grade reading ability
 50 per cent, fourth-grade reading ability

Ayer²⁹ states that school practice seldom considers a score much below 75 per cent of the possible number of correct responses to be satisfactory. In her tests, ("A Determination of the Extent of Reading Difficulties in Fifth Grade Histories"), a child's G reading score on the Thorndike-McCall Reading Scale, which corresponds to 75 per cent of answers correct on the original paragraphs is for the eighth month of the tenth grade.

It required reading ability equal to the last half of the tenth grade as represented by the Thorndike-McCall Reading Scale to get 75 per cent of the answers correct on the original paragraphs of Ayer's history test.

29. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212, New York, Teachers College, Columbia University, 1926, pp. 32-33.

It was found that a G score of 7.7 or reading ability equal to the seventh month of the seventh grade as represented by the Thorndike-McCall Reading Scale was necessary to get 75 per cent of the simplified answers correct.

It was found that to answer correctly on the original fifth-grade history paragraphs, in the original form, ability as following was necessary:

<u>Grade Ability</u>	<u>Per Cent of Correct Answers</u>
6.5	25
7.5	50
10.8	75

Ayer also found that when she had simplified the paragraphs, it required reading ability about two grades lower than that required to answer the same questions on the original paragraphs.

Mary C. Burch,³⁰ believing that the satisfaction which a book brings to its reader is of primary importance in the assignment of reading materials, asks the question: "What are those factors involved in reading a book which determine the satisfyingness of the act?" She answers the question by saying that the difficulty encountered in comprehending the matter, or the amount of the matter which is understood is a very important determiner of satisfaction.

30. Burch, Mary C., "Determination of a Content in Literature of a Suitable Difficulty for Junior and Senior High School Students." Genetic Psychology Monographs, Volume 4, Nos. 2 and 3, 1928, pp. 260-1, 288.

A book may be so hard that any attempt to read it brings only annoyance, or, on the other hand, so easy that it fails to stimulate that mental activity which produces satisfaction. There is a range, she states, in difficulty of reading material within which one reads with satisfaction, and the chances are small that one would go above or below this range with resulting pleasure. This range she defines as between 59.40 per cent and 89.85 per cent, with a median of 75.25. The following facts were also revealed by her test scores:

1. The means of contiguous grades are close together.
2. The range of ability in each grade is great.
3. The amount of overlapping of each grade on the other is large, in some cases all but complete.
4. Much of the present course of study in high schools is suited to the ability of about 25 per cent of the members of each class.

An interesting check on Burch's study is a thesis by T. W. Irion,³¹ Comprehension Difficulties of Ninth Grade Students in the Study of Literature. Irion tested the comprehension ability of ninth-grade students by means of four long selections from literature. The reading comprehension of these students for these four selections ranges from 34.4 per cent to 52.7.

31. Irion, T. W., Comprehension Difficulties of Ninth Grade Students in the Study of Literature. Teachers College Contributions to Education, No. 189. New York, Teachers College, Columbia University, 1926.

From his study on literature comprehension he draws the following conclusions, (among others):

1. "Literary comprehension of ninth-grade pupils can be fairly accurately measured.
2. "Comprehension varies with literary types--poetry types being most difficult.
3. "Word knowledge is a very significant item in reading comprehension.
4. "Literary comprehensions are a better index than are feeling reactions."

Mathews,³² in his study to determine the degree of comprehension at various age and grade levels for representative sampling of materials of a certain course of study, found that the comprehension of fourth-grade pupils on these reading materials, (episodes, descriptions, expositions, newspaper articles), ranges from about 8 to 45 per cent. On the average, they made a score of approximately 25 per cent on the twenty-five samples of these materials. On the other types of materials their degree of comprehension is less, being 10 per cent on graphs, 11 per cent on maps, 14 per cent on time lines and 16 per cent on pictograms.

The median comprehension of the twelfth grade pupils on these reading materials is about 85 per cent. Their

32. Mathews, C. O., The Grade Placement of Curriculum Materials in the Social Studies. Teachers College Contributions to Education, No. 241. New York, Teachers College, Columbia University, 1926, pp.34-5.

median comprehension scores on the other types of materials are as follows:

Maps - - - - -	74 per cent
Pictograms - - - - -	74 per cent
Time lines - - - - -	67 per cent
Graphs - - - - -	65 per cent

The average degree of comprehension for the reading materials is higher, grade for grade and age for age, than it is for any of the other types of material. The lowest average degree of comprehension is on graphs, (bar, circular, and line graphs combined), with maps lying between these two types. If these three sets of measures were plotted on the same ordinates, the three lines would not cross at any point.

This study, however, presents no evidence as to the factors which make materials difficult.

Dewey,³³ in attempting to answer the question: "Why do children at an eight-grade level comprehend as they do?", made reading selections from eighteen textbooks in American History in current use in the public schools. He used the following criteria in selecting the materials:

1. Paragraphs or other units that contain meanings or concepts that require careful, inferential thinking
2. Selections that discuss topics in political, economic and social history

33. Dewey, Joseph C., A Case Study of Reading Comprehension Difficulties in American History. Abstract of Doctor's Dissertation. Graduate College of the State University of Iowa, Iowa City, Iowa, 1931, p. 27.

3. Selections that lend themselves to several methods of testing
4. Selections that are short enough to permit exhaustive testing and long enough to permit a reasonable continuity of discussion

Two types of research techniques were used:

1. Pencil and paper tests and
2. Oral interviews

Each pupil of the latter group was given written tests and oral interviews on two different reading selections. The individual interviews were recorded by the Iowa Oral Language Recording Machine in order to secure a complete and accurate record of everything said by the investigator and by the children. In place of questions, he used a series of pictures as a measure of comprehension.

He found that:

1. "Eighth-grade children are not always consistent in responding to different types of tests or identical or similar ideas which are being tested.
2. "Children sometimes chose the correct picture in a picture-choice test, but demonstrated in the oral interview that they had inadequate or erroneous concepts of what the picture represented."

In this, Dewey concludes that the correct choice of pictures pertaining to certain types of context gives very little assurance of adequate understanding of that context.

3. "On the whole the pupils made a larger percentage of correct responses on the oral interview than on the written tests.

4. "The fact that the words in which any given meaning is expressed are found in a well-known vocabulary list is no guarantee that the meaning will be gained by children.
5. "Too much confidence should not be placed in verbal responses as evidence of understanding or in verbal presentation as an adequate method of teaching.
6. "The high percentage of correct responses on factual test items as compared with the small number of correct answers on inference test items is open to two interpretations.
 - a. "It may be that these responses to the factual test items, although correct, are no indication of proper understanding of the facts, and that a part of the inability to make inferences is due to the inadequate understanding of the facts upon which the inferences are based.
 - b. "It may be that the ability to make inferences is itself so poorly developed in eighth-grade children that, even though understanding, inferences are not easily made."

A critical study of the detailed answers on the written tests and even more particularly in the oral interviews leads Dewey to believe that both of these limitations operated.

7. "Children often are unable to locate in the reading content the exact sentence upon which their test responses are based."

This may be explained in some cases by the fact that the responses are based on knowledge gained before reading the content and partly upon inability of children to understand

the test questions in the light of the context. Another possible reason may be the unreliability of the investigator's judgment in deciding what sentences were to be considered as satisfactory responses, relative to the proof for any given response.

8. "Children in the eighth grade do not seem to possess sufficient backgrounds in the fields of history, civics, economics or geography, or even in general experience to understand and interpret in this investigation."

Or it may be, as suggested by Ayer, that children simply cannot interpret abstract subjects such as: "tariff," "finance," "political parties," "elections," "banks," and "slavery controversies."

Karl F. Nolte³⁴ also uses such devices as pictures, graphs, maps and the personal interview to determine children's vocabulary difficulties and the concepts they obtain from their reading at a sixth grade level.

In the pictorial tests, pupils were asked to indicate those pictures which best represented a particular word, group of words, sentence or thought in the reading selection. One or more pictures placed in each group was illustrative of the correct concept, whereas the others were either wrong or required discrimination on the part of

34. Nolte, Karl F., "Simplification of Vocabulary and Comprehension in Reading." Elementary English Review, Volume 14, No. 4, 1937, pp. 119-124.

pupils. The maps were used principally to indicate the location of places and areas referred to in the reading selections. A bar graph was also used as an aid in determining the extent to which pupils understood the description and the comparative size of areas referred to in the article.

Immediately following the pictorial and map tests, pupils were interviewed in order to secure additional information as to their comprehension of the materials just read. By this method, concepts and vocabulary difficulties were disclosed which could not be obtained through an objective test.

The purpose of the reading comprehension tests was to determine the difference between pupils' ability to read simplified material and to read material in its original form.

Five different comparisons were made on each of the three reading selections. Three of these were for the purpose of comparing results of the original material with those of the material rewritten according to Thorndike³⁵ and Ogden³⁶ vocabularies respectively, and for determining the advantage, if any, of one simplified form over the other.

35. Thorndike, E. L., A Teacher's Word Book of the Twenty Thousand Words Found Most Frequently and Widely in General Reading for Children and Young People. 1932.

36. Ogden, C. K., The System of Basic English. 1934.

The other two comparisons were to determine whether differences might result from using simplified questions.

The following findings were revealed through the study:

1. "Taken in their entirety there were no statistically significant differences between comprehension of selections read in the original form and those read with reduced vocabularies.
2. "Significant and meaningful differences were found on a few single test items which indicated wherein a number of vocabulary changes either facilitated or hindered pupil's comprehension of material read.
3. "In so far as results of a few single test items disclosed, there were more significant differences found in favor of the Ogden Simplification than the Thorndike. On the test as a whole, there were no significant differences in favor of either. However, the differences that did exist were greater in favor of the Ogden vocabulary, but not being significant, they were no doubt due to chance.
4. "The Ogden vocabulary, with its limited scope and its extreme limitation of verbs, reveals instances wherein substitutions necessitated a divergence from standard English usage, making the language cumbersome at times.
5. "There were instances wherein other elements were made more difficult by necessarily replacing a single word with a phrase or a group of words.
6. "Staying within the limits of Thorndike's first 2500 words (recommended as being suitable for the fourth grade) did not, in the main, facilitate understanding at the sixth-grade level.

7. "Pictorial tests and personal interviews revealed numerous vocabulary difficulties and erroneous concepts which were most frequently among pupils in the lower percentiles.
8. "Pictorial tests and personal interviews disclosed confusions that were caused by certain words and phrases having several possible connotations."

Results from this investigation indicate that, keeping other elements constant, the simplification of vocabulary does not materially facilitate pupils' understanding of material read. Only in a limited number of instances did the substitution of a known word for an unknown word aid pupils' comprehension. On the other hand, there were times when other structural elements were made more difficult.

The other factors that retard comprehension are time and place. An inadequate sense of time, as pointed out by Wesley³⁷ and Dewey,³⁸ is a factor that operates more in the social studies than in other subjects. The pupil may have little realization of even short periods of time, and years may be for him as mere astronomical vagaries. Until a rather definite time sense has developed, the pupil cannot appreciate cause and effect or sequential relationships. The process of growth in developing a time sense, however, is fairly well understood. It seems to grow with age as

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37. Wesley, Edgar Bruce, "Diagnosis in the Social Studies." Thirty-fourth Yearbook, National Society for the Study of Education, Educational Diagnosis. 1921, pp.127-44
 38. Dewey, Joseph C., A Case Study of Reading Comprehension Difficulties in American History. Abstract of Doctor's Dissertation. Graduate College of the State University of Iowa, Iowa City, Iowa, 1931, p. 43.

shown by Mary Sturt³⁹ and Mary C. Kelty.⁴⁰

Equal in importance to the time sense is that of place, which involves directions, areas and all kinds of geographic measurements. Social actualities occur at some time and in some place. The two factors seem to be not only aids in understanding and remembering actualities but also integral parts of them. This probably means in practice that the pupils must know some geography in order to understand social actualities, and without the necessary skills in reading maps, tables and charts they cannot acquire the necessary geographic knowledge. Children are apparently satisfied with the crudest notions of direction, space, and measurements. As long as they have a vague sense of place they are likely to have only a vague realization of what occurred in a designated place.

C. The Rate and Depth of Comprehension of Sentences.

It is customary to distinguish two features of comprehension during reading, as pointed out by Gates:⁴¹

1. The power or depth of comprehension and
2. Rate of speed of comprehension

39. Stuart, Mary, The Psychology of Time. London, 1925

40. Kelty, Mary C., "Time Expressions Comprehended by Children of the Elementary School" Elementary School Journal, Volume 25, pp. 522-528.

41. Gates, Arthur I., The Psychology of Reading and Spelling with Special Reference to Disability. Teachers College Contributions to Education, No. 129. New York, Teachers College, Columbia University, 1922, p. 53.

That this distinction is valid has been demonstrated before,⁴² although tests made on the two abilities show, in general, high correlations. In particular cases, however, wide differences, which are of utmost importance for diagnostic work, have been found.

In testing for rate and comprehension, Gates used the Thorndike-McCall Reading Scale Alpha 2 and the Thorndike-McCall Reading Scale, which give the most valid measure of power or depth of comprehension, and the Burgess Picture Supplement Test, the Courtis Test, or one of several other tests for "rate of comprehension." The mean correlation between the composite of speed tests and the composite of comprehension tests is high, 0.84 ± 0.08 . This figure, Gates says, probably does not represent the real association of rate and depth of comprehension because it was found that most of the tests which proposedly were measures of depth of comprehension were really measures of rate. The mean correlation of Thorndike-McCall with other tests is 0.46 ± 0.18 as compared with the mean r of 0.66 ± 0.12 between the Burgess and other tests. The mean of the grade correlation between Burgess and Thorndike-McCall is approximately 0.5, which represents, in Gate's opinion, approximately the actual association of rate and depth of comprehension.

42. Gates, Arthur I., "An Experimental and Statistical Study of Reading Tests." Journal of Educational Psychology. (October, November, December, 1921).

Gates states further that a rate of reading (grade III) as low as one word per second does not seriously handicap the subject for this test, when slowness of reading is the main difficulty. For example, one pupil in grade III who could scarcely read one word per second, obtained a score equal to the norm for grade XI, which shows that mere slowness of reading need not seriously influence achievement in the test.

In regard to speed of reading Gray⁴³ points out that records of progress show that speed continues to increase steadily during the middle grades. Because of the great importance attached to speed of reading, pupils have often been urged to read very rapidly without due consideration to comprehension. The fact should be remembered that pupils differ radically in their capacity to read rapidly; also, that speed is influenced by the reader's purpose, his interest in the content, the difficulty of the material, his control over the mechanics of reading, and his capacity to interpret meanings readily. Speed in silent reading has somewhat the same position as word recognition in the realization of meaning. It has no value by itself. It has value only when it is closely tied to comprehensions.

43. Gray, William S., "The Nature and Organization of Basic Instruction in Reading." Thirty-sixth Yearbook of the National Society for the Study of Education, Part I. 1937, Chapter IV.

D. Lack of Comprehension Leads to Verbalism and Over-potency.

"Progress in the social studies is dependent upon an adequate vocabulary," says Edgar Bruce Wesley.⁴⁴ Next to the lack of experience, perhaps the most fundamental difficulty in the field is that associated with word difficulty. In fact, experiences themselves, he points out, lose much of their value and significance when they are "unticketed and unnamed." Conversation and writing would be impossible without the system of identification tags called words. "Experience furnishes the basis and the purposes of thinking, writing and talking. The inadequate vocabulary may be the result of the lack of experience. In either case an inadequate understanding leads to the use of empty words, which are usually called 'verbalisms'."

That the presence of verbalisms indicates unsatisfactory learning is also pointed out by Ayer⁴⁵ and Dewey.⁴⁶ When children do not understand the assignment or recitation they resort either to omissions or to repetitions verbatim of the words of the author rather than to chance incorrect responses. Continued repetition confirms the error and increases the difficulty of correction.

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44. Wesley, Edgar B., "Diagnosis in the Social Studies." Thirty-fourth Yearbook of the National Society for the Study of Education, Educational Diagnosis, 1935, pp. 318-319.
45. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212, New York, Teachers College, Columbia University, 1926, pp. 48-49.
46. Dewey, Joseph C., A Case Study of Reading Comprehension Difficulties in American History. Abstract of Doctor's Dissertation. Graduate College of the State University of Iowa, Iowa City, Iowa, 1931, p. 48.

The detection of verbalism requires alertness and skill, for the pupil develops considerable art in vain repetitions. Wesley⁴⁷ sights the following verbalism in the closing words of the salute to the flag by a six-year-old boy.

Wesley, noticing the closing words sounded inexact, asked the boy to repeat the closing phrase very carefully. What the child actually said was, "and just as far off," instead of the phrase, "and justice for all." This amusing error is as meaningful to the boy as "justice for all." Oft-repeated verbalisms come to have the sound of reality, and every teacher realizes that they have the vitality of error.

There are also a large number of children who bluff at difficult meanings. Their favorite method of guessing at what they do not understand is apparently to get a cue from the general atmosphere of the paragraph and to respond in stereotyped patten such as: "He was a very nice man," "I think the people were kind," "He was brave and helped his country," or "They were mean to people."

Over-potency of element as a common cause of error is evidenced from the responses to test material. It is possible that most children do not select, weigh, compare and organize the elements of a paragraph in determining its meaning, but instead, they see only high spots, catch familiar and conspicuous elements here and there, and jump to conclusions.

47. Wesley, Edgar B., "Diagnosis in the Social Studies." Thirty-fourth Yearbook of the National Society for the Study of Education, Educational Diagnosis, 1935, p. 319.

Hence the explanation for the frequent illustrations of over-potency of elements which lead children into wild, absurd and ludicrous statements. The more difficult the subject matter, the more frequent is this tendency to over-potency as:

Original Form

Here he remained for four years during the stormy debate when the fate of the Union hung in the balance.

Children's Responses

He stayed out in the storm for four years. It was stormy where he was.

Thorndike's analysis of the reading involved in reading a paragraph summarizes the above difficulties in comprehension when he says: "Understanding a paragraph is like solving a problem in mathematics. It consists in selecting the right elements of the situation and putting them together in the right relation and also with the right amount of weight or influence or force for each. The mind is assailed, as it were, by every word in the paragraph. It must select, repress, soften, emphasize, correlate and organize all under the influence of the right mental set or purpose or demand."

Again the same author says, in referring to paragraphs in history, civics and geography textbooks: "It appears likely, therefore, that many children fail in certain features of these subjects not because they have understood and remembered the facts and principles but have been unable to organize and use them; not because they have understood them but have been unable to remember them; but because they never understood them...It is not a small or unworthy task to learn 'what the book says'."

SUMMARY OF THE LITERATURE OF THE FIELD

It is apparent from the foregoing investigations that what a child learns from the printed page is not wholly dependent upon vocabulary-difficulty and sentence-length and structure. Eye-voice-span, intelligence, perception, nature of the materials, and emotional attitudes of the learner undoubtedly play a strong role in the learning process. But that vocabulary-sentence-burden when simplified raises the comprehension level two grades, and materials of instruction show a range of less than 25 to 50 per cent of the context in the grade in which they appear should cause weighty consideration to the curriculum maker, the textbook writer, and the teacher.

Among the studies which show the effect of vocabulary upon comprehension, are those of Johnson and Cutright. Johnson, in his study of the polysyllabic words in standard reading tests found that most of the pupils made high scores in the short-word tests while many of those taking the long-word test made low scores. From this he concluded that the wide difference in scores between two equated groups indicated that the monosyllabic word test was strikingly less difficult than the polysyllabic word test.

Cutright, in her tests designed to determine the vocabulary difficulties encountered in Heidi, found that such

words as "climax," "primitive," and "passionately" were beyond the comprehension of all the 230 fourth-grade pupils who took the test. Applying the reading grades as determined by the Gates test, it required seventh-grade reading ability to obtain a comprehension score of 75 per cent, while the fourth-grade children, to whom the book Heidi is assigned, understood only 50 per cent of what they read.

Ayer found that to answer correctly on original fifth-grade history paragraphs, it required ability equal to the 6.5 grade to earn a score of 25 per cent accuracy. She also found that when she had simplified the paragraphs, it required reading ability about two grades lower than that required to answer the same questions on the original paragraph.

Subject matter that is too difficult for the learner, that deals with abstractions, generalizations and summary notions brings annoyance to the learner. Such stimuli weaken the connections of the learning process and lead to failure. They retard the mental growth of the individual and often result in serious cases of behavior maladjustment.

If it is the business of the school to select the environment that will stimulate right attitudes, it would seem that the curriculum which determines what shall be taught in the elementary school must take cognizance of

not only the phases of reading, history, and geography which are within the child's comprehension, but also of subject matter that is meaningful, significant and satisfying to boys and girls to the degree that the study will lead into new fields of investigations. This is but to ask the curriculum, the textbook, and the teaching to be in harmony with the best educational theory.

EXPERIMENTAL AND ANALYTICAL PROCEDURES

CHAPTER III

EXPERIMENTAL AND ANALYTICAL PROCEDURES

Because of the awareness of the important part that supplementary books have in the school life of her pupils, the writer undertook during the year 1936-1937 certain investigations to determine how effectively sixth-A pupils of the Louisville Public Schools learned from five history books.

A. Selection of Materials

For the purpose of these investigations five supplementary history books in general use in the sixth-A grade were selected. These five books were chosen because the author desired to know the amount of history her pupils learned from these particular supplementary books since they were the ones assigned to the grade she taught.

The books examined were:

- I. Europe the Mother of America, by Charles F. Horne and Olive Bucks. New York, Charles E. Merrill Company, 1930.
- II. Our Nation's Heritage, by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.
- III. The Old World Beginnings of America, by Mary C. Kelty. New York, Ginn and Company, 1932.
- IV. The American People and Their Old World Ancestors, by Grace Vollintine. New York, Ginn and Company, 1930.

V. The Elementary World History, by
Charles A. Beard and William C. Bagley.
New York, The Macmillan Company, 1932.

The author took from each of these books seventeen paragraphs which, in the experience of six teachers, were representative of the books as wholes. These teachers were: two sixth grade teachers, one fifth grade teacher, and one teacher of an ungraded class from California School, and two sixth grade teachers from Strother School.

Paragraphs were selected which dealt with the same topic in each of the books as shown in Table I.¹

TABLE I

Paragraph	Topic
1.	Roman roads
2.	Teutons
3.	Charlemagne
4.	Angles and Saxons
5.	Vikings in Europe
6.	Northmen on the mainland of America
7.	King Alfred
8.	Attempts to drive the Mohammedans out of the Holy Land
9.	Trade between Europe and the East
10.	Knowledge and products gained from the East
11.	Prince Henry the Navigator
12.	Spanish Missions in America
13.	The cultivation of tobacco in Virginia
14.	Meaning of the feudal system
15.	Invention of the printing press
16.	Defeat of the Invincible Armada
17.	Cortes' conquest of Mexico

1. The Elementary World History, by Beard and Bagley contains no discussion on tobacco so a paragraph on trade in sugar, coffee, and spices was substituted.

The above seventeen topics were selected because, in the opinion of the six teachers who examined the books, they met the following criteria:

1. Represented a wide range of subjects
2. Were sufficiently independent of the context preceding and following that questions upon them could be answered without further knowledge of the subject matter of the book
3. Appeared to be representative in difficulty of the book from which they were taken.
4. Contained four major ideas about which objective tests could be built

B. Vocabulary Analysis

These selections were analyzed first for the vocabulary in terms of frequency of usage according to Thorndike's Classification.²

According to Thorndike's method of classifying words, the more common a word is in general use the lower that word lies on his scale of the 10,000 most common words. That is, his scale begins with the 500 most frequently used words and proceeds by steps of 500 up to 6047, where he begins to classify the words by steps of approximately 1000, up to 10,000. This study has combined the steps of 500 in the lower ranks and classified all words by his

2. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p. iii.

milliclassification as shown in Table XLIII, page 131.

Every word from the seventeen selections of each book was looked up on the Thorndike Scale and placed according to its position on the scale. In the initial classification the words for each paragraph were kept separate as they were to be used later in the comparison of paragraphs. (Tables XXXVIII, XXXIX, XL, XLI, and XLII pages 126 to 130). The sum of all words lying in each classification of the different books was then calculated. From the sums of these classification-columns a grand total of all words in the seventeen paragraphs was made. This total was used to find the per cent of words lying in the respective thousandth ranks; that is, the per cent of words lying in the first 1000, the second 1000, etc., to 10,000. All words beyond 10,000 were looked up in Thorndike's Book of Twenty Thousand Words³ and grouped into a classification designated as "Beyond 10,000." Five words from the five books did not occur on either the 10,000 or the 20,000 list. Since this was approximately one word in 1500 their value was probably negligible, but they were listed with the words "Beyond 10,000."

3. Thorndike, E. L., A Teacher's Word Book of Twenty Thousand Words Found Most Frequently and Widely in General Reading for Children and Young People. 1932.

As one phase of the study was to ascertain how effectively children learn from a book whose vocabulary falls within a particular classification, all words beyond 6047 were counted for the selections from each book and the per cent of the whole number of words calculated.

Gates⁴ used only the first 2500 words in the Thorndike list as one basis for the construction of a reading vocabulary list for the primary grades, thus indicating that he considers that number to be the upper vocabulary limit of the three grades. Thorndike⁵ assigns credit numbers to each of the 10,000. The higher the credit or index value of a word, the more common is that word in general use. Certainly Gates accepted the first 2500 as the easiest of the 10,000 and it may be assumed from Thorndike's Scale that the more commonly a word is used, the easier is the word. Hence, the higher (toward 10,000) the word on the Thorndike Scale, the more difficult is the vocabulary of the book from which the samples are taken.

From Gates⁶ study it may be arbitrarily assumed that by the time children reach the upper sixth grade

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4. Gates, Arthur I., "The Construction of a Reading Vocabulary for the Primary Grades." Teachers College Record, Volume 27, 1926.
 5. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p.iii.
 6. Gates, Arthur I., "The Construction of a Reading Vocabulary for the Primary Grades." Teachers College Record, Volume 27, 1926.

their comprehension of words is in excess of 2500. Neither Gates nor Thorndike gives the limit or range of vocabulary for the upper sixth grade. Terman,⁷ however, gives an approximation of 6000 as the vocabulary of a normal twelve-year-old child. The reading norms for this study were taken from the Metropolitan Tests⁸ since that battery of tests was used to determine the reading ages and grades for the sixth-A pupils used in this study.

At the time these tests were administered, all children used in this experiment had been doing sixth-A (upper sixth grade) work for three months. Louisville has a ten-month term. The grade level for these subjects therefore was 6.8 when the tests were administered. The age for children in grade 6.8 is given as 12-5 by the norms on the Metropolitan Achievement Tests. The milli-classification boundary for the six-thousandth vocabulary classification on the Thorndike Scale is 6047, so 6047 was used as the upper limit of the number of words fairly comprehensible to pupils in grade 6.8.

Since the first 6047 words were considered reasonably well known by these pupils, the rest of the words of this list may be considered as difficult for them. Thus all

7. Terman, L. M., The Measurement of Intelligence, 1926. p. 226.

8. Metropolitan Achievement Tests. Intermediate Battery-Partial: Form A, For Grades 4, 5 and 6. Edited by Jacob S. Orleans, 1932.

words beyond 6047 were tabulated and their per cent estimated on the seventeen representative selections from the five history books.

C. Sentence and Phrase Analysis

The studies of Smock⁹ and Ayer¹⁰ given under "Literature," Chapter II, pages 21 and 22, consider sentence-length as a factor in the degree of comprehension with which a child reads history. Smock tests her subjects on original sentences from fourth, fifth and sixth grade histories, and then for shortened sentences; Ayer uses tests ("A Determination of the Extent of Reading Difficulties in Fifth Grade Histories") for long involved sentences and then for simplified sentences. Nice's¹¹ case studies of sixteen children from one year through the tenth year show that children of ten years use an average of 8.5 words to the sentence. An average of 144 adult sentences showed this average of 8 words.

This study makes no tests on original nor simplified sentences, but analyzes the samplings from the five

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9. Smock, Lenna S., A Study of Intermediate Textbooks Commonly Used in the State of Indiana with Special Reference to the Relative Difficulty of the Vocabulary and Length of Sentence. Master's Thesis, University of Indiana, Bloomington, Indiana, 1929.
 10. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212. Teachers College, Columbia University, New York, 1926, p. 10.
 11. Nice, Margaret M., "Length of Sentences as a Criterion of a Child's Progress in Speech." Journal of Educational Psychology, Volume 16, 1925, p. 370.

history books as to number of phrases and sentences to the paragraph and for the total seventeen paragraphs.

1. Sentences and Phrases to the Paragraph

The number of sentences and the number of phrases was tabulated for each of the selections separately so that paragraphs could be compared and statistical procedures computed for the means and variabilities. (Tables XLVI, XLVII, XLVIII, XLIX, L), pages 139 to 143.

From the number of sentences to the paragraph, means and standard deviations were computed for the seventeen paragraphs of the book. (Table LVI, page 153).

The means and standard deviations were then compared that a determination might be made of the significance of any differences between them. (Table LVII, page 154).

The same procedure was followed for the number of phrases to the paragraph and to the book. (Tables LXI, and LXII, pages 159 to 160).

2. Sentence and Phrase-length

As Ayer¹² had found long involved sentences a handicap to learning by as much as two years, the author analyzed the phrase-and sentence-length of the selections by counting the number of words to the sentence. To insure a uniformity of count throughout the books, every letter in each word of the sentence was counted and the

12. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212. Teachers College, Columbia University, New York, 1926, pp. 10, 16.

sum divided by five. Thus the word count for all selections is a unit word of five letters.

The number of words to the sentence was tabulated for all seventeen paragraphs taken from each book.

The sum of the words, (five letters to the word), was then divided by the number of sentences to the paragraph to get the average number of words to the sentence. Statistical calculations were made for the means and variabilities for each of the five books. (Tables LI, LII, LIII, pages 146 to 148).

The five books were then compared for significance of differences between means and measures of variability in number of words to the sentence. (Table LV, page 152).

D. Analysis of Test Scores

Another phase of the study was to determine the degree of accuracy with which the 172 sixth-A pupils read the seventeen selections from each history book, and answered the questions of comprehension on them. Four major ideas on which questions could be given¹³ were taken from each of the paragraphs. The four test questions were given

13. The third paragraph of The Elementary World History by Beard and Bagley has six major ideas, and the eighth paragraph of The Old World Beginnings of America, by Kelty contains seven major ideas, so six questions were made on the former and seven on the latter.

in the multiple choice form, which required the pupil to mark one word or one phrase. (Appendix B)

The selections and their accompanying questions were given to one group of pupils in each of five different schools. All tests were administered by the home-room sixth-A teacher under the direction of the principal.

The instructions given below were uniform for all groups:

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as:
"Louisville is a (a) house
(b) ~~city~~ (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY.
 4. Put your name at the bottom of each page right now -- before you start to work.

When every pupil understood what he was expected to do, the class was told to begin and the teacher noted the time on the blackboard. The pupils were allowed all the time they wished in which to study the selections and answer the questions, both the selections and the questions being available throughout the entire period. As each pupil finished the test form, he raised his hand and the teacher wrote under the caption "Time," at the head of the test, the number of minutes spent in completing the test.

To cancel any practice effects the selections from Book I were given to the sixth-A group in School A;

Book II to School B; Book III to School C; Book IV to School D; and Book V to School E.¹⁴

The tests for the five groups of pupils were scored when every child had finished, giving a credit mark of one for every correct response. The scores for every child were then tabulated. (Tables I, II, III, IV, and V, Appendix A). Score throughout the study means point-score or number of correct responses.

E. Equation of Groups

In order to determine which book was read with the greatest degree of accuracy, it was necessary to equate the groups. In dealing with these groups the results of the study are concerned with the means of the groups, not with individual children.

The groups were made up of 172 sixth-A pupils from five different schools. The author wished to pair them on the traits of Chronological Age, Mental Age and Reading Age.

To equate the five groups on the three variables, i.e., Chronological Age, Mental Age, and Reading Age, pairing every child selected for the initial group with another child on the same variables for each of the groups from the other four schools, reduced the population

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14. Book I Albert S. Brandeis School
 Book II California School
 Book III Gavin H. Cochran School
 Book IV John C. Strother School
 Book V Parkland Elementary School

of the groups to such small numbers that group comparisons were not reasonably reliable.

The writer then equated the groups so that they would have approximately equivalent means and variabilities. This basis of equating the groups also reduced the numbers too greatly for adequate accuracy.

Since the groups could not be equated on the three variable basis, and as it was necessary to retain both the Chronological and Reading Age for later comparison for age and grade norms, McCall's¹⁵ one variable method was used. (Tables II, III, IV, Appendix A, and Tables VI to XX, Appendix A).

However, instead of pairing the groups from the five different schools for a single variable, groups were paired first on Chronological Age, holding sex constant; that is, for every boy used to make up the group for School A there was a matching boy in the groups of Schools, B, C, D and E.

A second group was then made up on the variable of Mental Age, holding sex constant. In equating this group every boy was matched with a like boy in each of the other four school groups.

For a third group the subjects from the five schools were matched in the same manner on Reading Age.

15. McCall, William C., How to Experiment in Education. 1930, pp. 46, 57-8.

When the pairing for the Chronological Age Group, Mental Age Group and Reading Age Group was complete, each group was made up of twenty-one matched subjects.

The method used in this study differs from the method of pairing subjects on three variables. When subjects are paired on three variables they are all the same children. In this experiment every child used in the Chronological Age Group is matched with a child of the same sex and age for each of the groups from the five schools. Every child in the Mental Age Group is matched with a like child in each of the other school groups. Like procedures are used in the Reading Age Group until twenty-one children from School A are paired with twenty-one like children in Schools B, C, D, and E. These subjects, however, are not always the same subjects.

The group of pupils making up the twenty-one pairings of the Chronological Age Group are not in all cases the same pupils used in equating the Mental Age Group and the Reading Age Group. Neither are the pupils used in the Mental Age Group nor those in the Reading Age Group in all cases found in the other groups.

This method, though it necessitates the handling of fifteen sets of subjects, - five sets to each of the three groupings, - shows the relationship between comprehension and the other variables, by comparing chronological age,

mental age, and reading age with the degree of accuracy with which the group read the selections and answered the questions on them.

The five pupil-groups composing the Chronological Age Group were arranged according to age. Immediately to the right of the age column were placed the scores of the pupils, and in a third column the time taken to complete the test. (Tables II, III, and IV, Appendix A).

Statistical analysis was then made for the five pupil-groups making up the Chronological Age Group, computing the means, standard deviations of the distributions, probable errors of the distributions, probable errors of the means and standard errors of the standard deviations. (Table LXXIV, page 188).

The means of the five groups were compared for differences between means, probable errors of the differences, and the differences divided by their probable errors, that a determination might be made for any significance that existed between groups. If a difference divided by its probable error was 3.00 or more, it was considered significant; if less, it was considered not significant.¹⁶ (Table LXXV, page 190).

16. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology, Volume 21, 1937, p. 5.

If this ratio, $(\text{Diff.}/\text{PE}_{\text{diff.}})$ resulted in a quotient anywhere approaching 3.00, or significance, the Age Group was changed until the difference in age was negligible.

Standard deviations and their probable errors were employed in comparing variabilities of the five Age Groups. If a difference between standard deviations was three or more times its probable error, the group, or groups, showing the significant difference was changed until all five groups showed approximately equivalent means and variabilities. (Table LXXV, page 190).

When the age groupings were satisfactory, the degree of comprehension with which the selections were read, was analyzed by the same measures of central tendency and dispersion as were the ages; no change, of course, being made in scores after they were once set up according to that particular pupil used in the final form of the Age Group. All differences of a significant value were marked "Yes." All those that were not significant were marked "No." (Tables LXXX, page 203 and LXXXI, page 204).

Like statistical procedures were employed for time taken to read the selections and answer the questions to determine the significance of differences in the time the groups spent in completing the History Comprehension Tests and also in the scores they made on the test. (Table LXXXIII, page 208).

The Mental Age Group and the Reading Age Group were set up and statistically analyzed for differences as was the Chronological Age Group. They were also analyzed for differences in degree of comprehension and time taken to complete the text. (Tables LXXXIV to XCI, pages 210 to 220).

F. Analysis of Data to Determine the Degree to Which the Samples Were Representative of the Book from Which They Were Taken.

The data as analyzed show the significance of differences between the representative samplings of the five history books in:

1. Vocabulary range:
 - a. Per cent of words beyond 6047 and
 - b. Per cent of words beyond 10,000
2. Number of words to the phrase and to the sentence (counting five letters to the word)
3. Number of phrases and number of sentences to the paragraphs and for the total sampling
4. Number of phrases to the sentence
5. Score or degree of comprehension with which the selections were read and the questions answered
6. Time taken to read the selections and answer the questions on the tests of comprehension

Before the books could be judged as suitable by the above criteria, it was necessary to make an analysis of the degree to which the seventeen paragraphs from each of the five history books were representative of the books from which they were taken.

Six teachers¹⁷ had assisted in the selection of the seventeen paragraphs which they deemed representative of the book. As a check on how well the teachers' selections were representative of a book as a whole, the author divided the seventeen paragraphs into random halves by placing every other paragraph into one of the two groups. By this procedure the odd paragraphs (1, 3, 5, 7, 9, 11, 13, 15, and 17) fell into one group and were marked Odd. The even paragraphs (2, 4, 6, 8, 10, 12, 14, and 16) fell into the second group and were marked Even. There were nine paragraphs in the odd half of the sampling and eight paragraphs in the even half. This, however, was of no consequence because the paragraphs were not matched paragraph for paragraph but were compared through their means and variabilities. The first paragraph in the odd-numbered half was not necessarily like the first paragraph in the even-numbered half, nor the second odd paragraph like the second even paragraph, but the odd-numbered paragraphs, considered as a whole, and the even-numbered paragraphs, considered as a whole, had means and variabilities that were significantly alike.

The two halves of each sampling were compared for the six variables given below:

1. Per cent of words lying beyond 6047
2. Number of sentences to the paragraph
3. Number of phrases to the paragraph

17. Louisville Elementary School Teachers, op. cit., Chapter III, p. 42.

4. Average sentence-length to the paragraph, counting five letters to the word
5. Average phrase-length to the paragraph, counting five letters to the word
6. Score on History Comprehension Test

If the six separate comparisons of the two random samplings (odd and even paragraphs) showed that they were alike when compared for each of the six variables, the two halves of the sampling from each book were certainly alike. If seventeen widely scattered paragraphs from a book about seventeen different topics proved to have means and dispersions that showed no significant differences, then they must be adequately representative of the book as a whole so far as vocabulary and sentence and phrase-structure are concerned.

1. Vocabulary Range

Statistical computations were first made for a comparison of the odd-numbered paragraphs and the even-numbered paragraphs for the number of words lying beyond 6047 on the Thorndike Scale.¹⁸ (Tables III to VII, pages 81 to 85). Computations were made for the mean, standard deviation of the distribution, probable error of the distribution, probable error of the mean, and standard error of the standard deviation for each half of the paragraphs.

18. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p.iii.

The odd-half and the even-half were then compared as to difference between means, probable error of the difference between means, difference between means divided by the probable error of the difference. If this quotient was 3.00, or greater, the difference was considered significant. (Tables III to VII, pages 81 to 85).

The standard deviation of the odd distribution was compared with the standard deviation of the even distributions. If the difference between the standard deviations was as great as 3.00 times its probable error, the difference was considered significant. (Tables III to VII, pages 81 to 85).

2. Sentence and Phrase Analysis

The same procedures were used for determining the representativeness of the samplings as shown by an analysis of the means and variables of:

- (a) Number of sentences to the paragraph
- (b) Number of phrases to the paragraph
- (c) Average sentence-length to the paragraph,
(five letters to the word)
- (d) Average phrase-length to the paragraph,
(five letters to the word)

(See Tables VIII to XVII, pages 87 to 97).

3. Degree of Accuracy with Which the Selections Were Read and the Questions on Them Answered

A comparison was made last for the scores, or number of correct responses to the questions on the tests of comprehension.

The study at this point is concerned only with the two halves of the selections from one of the books. The author here is considering only the correct responses of one group of pupils for each book: those, for instance, from School A, taking the test on Book I; those from School B, taking the test on Book II, etc.

All correct responses were tabulated for each paragraph. As each paragraph had a possible score of four¹⁹, the sum of all the correct responses to questions on each paragraph was used for the statistical calculations. These calculations were made for the means and variabilities of the scores by the same methods used in analyzing the other five variables. (Tables LXXX to XCI, pages 203 to 220).

G. Comparison of the Five History Books

When this method of two comparable halves showed the selections from each book to have approximately the same means and variabilities, procedures were set up to determine any differences that existed between books.

19. The third paragraph of The Elementary World History, by Beard and Bagley has six questions, and the eighth paragraph of The Old World Beginnings of America, by Kelty has seven questions. Percentages were used to equalize these. Thus a question in a paragraph of four questions was given a credit of 25%, while one of a possible six answers was given a credit of 16-2/3%. Four questions correct on a paragraph containing four possible correct answers was worth "4." Four correct responses out of a possible six was worth "3-2/3."

1. Comparison for Vocabulary

The five books were first compared for differences in vocabulary range for:

1. Per cent of words listed beyond 10,000 on the Thorndike Scale
2. Per cent of words listed beyond 6047

The percentage of words lying beyond 6047 and beyond 10,000 had been determined early in the study. For this comparison of the books, differences between the percentages were calculated. Thus, if the vocabulary of Book I showed that 1.7 per cent of its words lay beyond 10,000 and 3.6 per cent of its words beyond 6047, while Book II showed 2.1 per cent beyond 10,000 and 3.6 per cent beyond 6047, there was no difference between Book I and Book II on the range of the vocabulary beyond the 6047 boundary and only .4 per cent between the number of words lying beyond the 10,000. The two books would have the same rank on words beyond 6047, but Book II would lie higher on the scale for words beyond 10,000. In like manner, each book was compared with each of the other four books. (Table XLIII, page 131).

The five books were then ranked as to vocabulary range. Since in the opinion of the writer, the pupils tested know the words lying within the 6047 range with 97 per cent accuracy, the per cent of words below 6047 rather than the per cent above was used to rank the books.

Thus, if Book I had 3.6 per cent of its word above 6047, 96.4 per cent were below. ($100.0 - 3.6 = 96.4$)

Book IV with 95.4 per cent of its vocabulary below 6047 was considered to have more uncommon words than Book V with a percentage of 95.9. Ranked on a scale of 5, then, the book with most uncommon words was given a rank of 5, and the book having the least uncommon words, a rank of 1. (Table XLIV, page 134)

2. Comparison for Sentence-length

1. Average number of words to the sentence (counting five letters to the word) for the seventeen selections

2. Average number of sentences to the paragraph for the seventeen selections

Book I was compared with Books II, III, IV, and V for significance of differences by using the critical ratios for the difference between means, (difference between means divided by the probable error of the difference), and for the standard deviations, (difference between standard deviations divided by the probable error of the difference). Like methods were used to compare each book with the other four books. (Table LV, page 152). (Table LVII, page 154). The five books were ranked according to the mean number of words to the sentence, (Table LIV, page 150) and for the mean number of sentences to the paragraph (Table LVIII, page 155). The book showing the largest mean was ranked 5, and the book showing the

smallest mean, 1.

3. Comparison for Phrase-length

To determine further difference or likeness between the books, a comparison was made for phrase-length:

1. Average number of words to the phrase (counting five letters to the word) for the seventeen selections
2. Average number of phrases to the paragraph for the seventeen selections
3. Average number of phrases to the paragraph for the seventeen selections

The same procedures were used to compare the books for phrase-length as was used in making the sentence-length comparisons. Table LI, LII, LIII pages 146 to 148, and Tables LVII, LIX, LXII, pages 154, 156 and 160). For rank of books see Tables LXI, page 159, LXIII, page 161 and LXV, page 164).

4. Comparison for Degree of Comprehension with Which the Selections Were Read

As a last analysis for differences, the five books were compared for the degree of comprehension with which they were read and the time taken to read the selections.

To do this, the differences between the means and standard deviations were calculated for each of the three equated groups: Chronological Age Group, Mental Age Group, and Reading Age Group. Each of the twenty-one pupils used in each of the five school-groups making up the

Chronological Age Group had a score for the number of correct responses to the tests on one book; and similarly for each child making up the Mental Age Group, and the Reading Age Group.

The comparisons and significance of differences for all books are given in Tables LXXIX, LXXX and LXXXI, pages 198 to 204.

The time taken to read the selections from each book and answer the questions was compared by the same procedures used for the degree of comprehension. The length of time taken to complete the test, however, is used only in connection with the degree of comprehension. The pupils were permitted all the time they wished up to sixty minutes. Time is meaningful in connection with comprehension, but speed is not an indication of degree of comprehension as shown by Gates²⁰ and Gray.²¹ For that reason there is no separate comparison of books on the time or speed factor for degree of difference.

The same method was used for comparing the books on their degree of accuracy basis for the Mental Age Group and the Reading Age Group. Tables LXXXIV, LXXXV, pages 210 to 211 and Tables LXXXIX, and XC, pages 218 to 219.

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20. Gates, Arthur I., "An Experimental And Statistical Study of Reading." Journal of Educational Psychology, (October, November, December, 1921), pp. 48-54.
21. Gray, William S., "The Nature and Organization of Basic Instruction in Reading." Thirty-sixth Year Book of the National Society for the Study of Education, Part I, 1937, Chapter IV.

H. Reliabilities of the Tests of Comprehension

The reliabilities of the tests were calculated by the Spearman-Brown formula from product-moment correlation coefficients between scores on the odd- and even-numbered items:

$$r_{11} = \frac{r_{\frac{1}{2} I}^2}{1 - r_{\frac{1}{2} I}^2} \quad 22.$$

The reliability for each test and the statistical data from which the reliability was computed are given in Table II, page 66.

That these reliability coefficients are high enough to estimate individual scores with accuracy will be seen from item No. 12 in Table II.²³

One may therefore assume that these tests are reliable measures of history comprehension so far as the ability measured by the tests is concerned.

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22. Dunlap, J. W. and Kurtz, A. K., Handbook of Statistical Nomographs, Tables and Formulas. 1932. Formula No. 287, p. 127.
23. Garrett, Henry E., Statistics in Psychology and Education. 1932, p. 290.

TABLE II
MEANS, STANDARD DEVIATIONS AND RELIABILITIES OF THE TESTS

	History Comprehension Tests				
	Book I	Book II	Book III	Book IV	Book V
1. M_o	29.52	27.14	31.87	30.62	30.00
2. M_e	28.17	27.76	30.43	32.21	30.85
3. σ_o	3.64	3.73	4.83	4.32	3.64
4. σ_e	4.68	4.03	4.18	4.83	4.19
5. $M_o - M_e$	1.35	.62	1.44	1.59	.85
6. P.E. diff.	.656	.698	.672	.772	.639
7. Diff./P.E. diff.	2.056	.888	2.142	2.059	1.330
8. $\sigma_o - \sigma_e$	1.04	.300	.650	.511	.550
9. P.E. diff.	.412	.519	.470	.545	.446
10. Diff./P.E. diff.	2.515	.579	1.381	.947	1.232
11. $r_{\frac{11}{22}}$	.844	.846	.810	.889	.846
12. r_{II}	.910	.911	.890	.938	.908

Key to Table II,

1. Means for the odd half of the scores
2. Means for the even half of the scores
3. Standard deviations for the odd half of the scores
4. Standard deviations for the even half of the scores
5. Differences between the means for the odd and even halves
6. Probable errors of the differences between means
7. Differences between means divided by the probable error of the differences
8. Differences between standard deviations for the odd half of the scores and the even half of the scores
9. Probable errors of the differences between standard deviations
10. Differences between standard deviations divided by the probable error of the differences
11. Correlations between the two halves of the tests
12. Reliability coefficients of the tests

I. Suitability of the Books for the Groups That Use Them

The fourth purpose of the experiment, as stated in the problem, was: to determine the suitability of the five history books for the pupils who read them, as judged by an analysis of vocabulary and phrase-and sentence-length, and tests on degree of comprehension as related to age and grade norms.

Studies^{24 25 26} disagree as to the per cent of words a child may not understand and still read a selection with a fair degree of accuracy, but they are all agreed that to read with anywhere near complete comprehension a child must be able to recognize practically every word.

In this study the author has placed the number at 97 per cent. Three words out of a hundred does not seem great, but 41 words out of 1354, as in the case of Book I, may mean that 97 per cent is entirely too low. However, if 97 per cent of the words selected by the Thorndike Scale fell below the 6047 boundary, the book was classed as suitable for the sixth-A pupils who use it.

Since no tests were made in this study for simplified sentence- or phrase-length, it is assumed that if

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24. Burnside, Margaret, An Experiment to Determine Whether a Test May Be Devised to Find Out If a Piece of Literature is Placed Correctly in the Curriculum. Master's Thesis, Indiana University, Bloomington, Indiana, 1933.
 25. Stephens, Marion P., "Comprehension Tests in the Reading Program." American Childhood, Volume 20, 1936, pp. 46-7.
 26. Gates, Arthur I., "An Experimental and Statistical Study of Reading." Journal of Educational Psychology, (October, November, December, 1921), pp. 48-54.

sixth-A pupils read a history book, whose sentence and phrase length is known, with an acceptable degree of accuracy, that sentence- and phrase-length is satisfactory for that book.

Metropolitan Achievement Tests²⁷ were used to determine the reading ages for all children used in this study, and these were used to determine the suitability of these particular five supplementary history books. (It is to be remembered that School A was tested on Book I, School B on Book II, etc.).

The subjects from each school were grouped in reading-age-grade categories according to norms of the Metropolitan Achievement Tests. This means that all pupils who had a reading age of 9-0 (9-0 to 9-4) were placed in the grade-norm group 3.7, 3.7 being the grade-norm for pupils making a reading age of 9-0 years. All pupils scoring a reading age of 9-5 (9-5 to 9-9) years were placed in 4.1 etc.

Age-grade groups were made for ages ranging from 9-0 years, to 13-10 years in steps of five months, as: 9-0, 9-5, 9-10, 10-0. Since 75 per cent accuracy was taken as an acceptable degree of comprehension,²⁸ the number of pupils in each category and the number of correct responses on the tests of comprehension were expressed as per cents.

27. Metropolitan Achievement Tests, op. cit., Chapter III, p. 46.

28. History Comprehension Tests, op. cit., Chapter III, p. 69.

It is recognized by the author that the limited numbers of children used in the various age-grade groups are too small to warrant extensive generalizations. The author, however, was interested in ascertaining the degree of comprehension with which these pupils used history books in common use. Thus, measures were set up for the various age-grade levels.

All scores on the History Comprehension Tests were tabulated for each child in the specific groups. These scores were then averaged for the specific age and grade group and converted into per cents of accuracy. This means that all the scores were divided by the total possible scores for that group of children. A per cent of accuracy of 75 per cent means that children in that particular age and grade group answered correctly 75 per cent of all questions on which they were tested. Thus "per cent of accuracy" in relation to the book is taken to mean that children who read that specific book comprehend 75 per cent of what they read. The "per cent of accuracy" might, of course, be 25 per cent, 60 per cent, or any other per cent of the possible correct answers. (Tables LXVIII, page 172, LXIX, page 174, XCII, page 221, LXXI, page 178, and LXXII, page 180).

The average number of minutes spent in completing the History Comprehension Tests was averaged for all age-grade groups. A table was then set up as:

<u>Chron. Age</u>	<u>Reading Age</u>	<u>Degree-Accuracy</u>	<u>Time</u>
9-5	4.1	64%	32

The subjects used in the experiment had been in the sixth-A grade for three months. Therefore, the normal achievement for them in terms of Metropolitan Achievement Test norms

was:	<u>Age</u>	<u>Grade</u>
	12-5	6.8

Since an accuracy of 75 per cent is here considered an acceptable degree of comprehension²⁹ any book which the subjects in the reading age-group 12-5 read with 75 per cent accuracy was considered suitable for the sixth-A children using it.

The per cent of pupils lying in each Reading Age Group was calculated and tabulated with their per cent of accuracy, as:

<u>Reading Age</u>	<u>Per Cent of Pupils Tested</u>	<u>Per Cent of Accuracy on History Comprehension Test</u>
9-5	4.5%	64%
11-0	11.6%	88%

It is assumed by the author that a child who shows a Reading Age of 10-0 years on the Metropolitan Achievement Test can also read with as much understanding at all levels below 10-0. This same assumption is made for the author's History Comprehension Tests.

29. Ayer, Adelaide M., Some Difficulties in Elementary School History. Teachers College Contributions to Education, No. 212. Teachers College, Columbia University, New York, 1926, p. 32.
Burch, Mary C., "Determination of a Content in Literature of a Suitable Difficulty for Junior and Senior Students." Genetic Psychology Monographs, Volume 4, 1928, p. 288

The 11.6 per cent then means that there are 11.6 per cent of this group of pupils in the 11-0 reading age-group. There are five groups (11-0, 11-5, 11-10, 12-0, 12-5) between 11-0 reading level and the 12-5 reading level.

Each of these steps shows the per cent of pupils scoring that particular reading age. When the per cents for the five groups are added, the sum will be 55.8 per cent, or some other similar sum.

Interpreted, then, 55.8 per cent of the pupils in this particular group read the selections from one of the history books, and answered the questions on them with an accuracy of 88 per cent or better.

The same procedures were used for interpreting the per cent of understanding for the five books.

Since this study is primarily interested in the 12-5 Reading Age Group, the per cent of pupils lying in this group and all groups below was calculated. If 75 per cent of all pupils tested read a specific book with 75 per cent accuracy, the book was accepted as suitable for that particular age and grade group.

The number of minutes used by each group was averaged. No direct suitability was determined for a book by the length of time required to read the selections and answer the questions. The average class period, however, for the sixth-A grades is thirty minutes. An assignment, such as the above, would necessarily have to be covered in approximately thirty minutes to be suitable for these classes.

SUMMARY OF EXPERIMENTAL AND ANALYTICAL PROCEDURES

The experimental and analytical procedures are discussed under nine heads:

- I. Selection of Materials
- II. Vocabulary Analysis
- III. Sentence and Phrase Analysis
- IV. Analysis of Test Scores
- V. Equation of Groups
- VI. Analysis of Data to Determine the Degree to Which the Samples Were Representative of the Book from Which They Were Taken
- VII. Difference Between the Five History Books
- VIII. Suitability of the Books for the Group That Use Them
- IX. Reliability of Tests

I. Five supplementary history books in common use among the sixth-A classes of the Louisville Public Schools were selected for this study. These five history books were read by six elementary school teachers for representative samplings. Seventeen paragraphs dealing with seventeen different topics were chosen which, in the opinion of the six teachers, met the following criteria:

1. Represented a wide range of subjects
2. Were sufficiently independent of the context preceding and following that questions upon them could be answered without further knowledge of the subject matter of the book

3. Appeared to be representative in difficulty of the book from which they were taken
4. Contained four major ideas about which objective tests could be built

Four major ideas were taken from each paragraph, each idea being tested with a multiple choice question. These tests of comprehension were given to five different groups of sixth grade pupils, (one test to each group). When the pupils had finished answering the test questions, the tests were collected and scored, each being marked for the number of minutes spent in finishing it and the number of correct responses.

II. All words from the seventeen selections from each book were tabulated as to frequency of usage according to Thorndike's Classification³⁰ for:

1. Milliclassification of words from 1000 to 10,000
2. Number of words beyond 10,000
3. Number of words beyond 6047, - 6047 being taken as the number of words a normal twelve-year-old child should know³¹

III. Sentence- and phrase-analysis was made for each paragraph in the samplings from the five books for:

1. Number of phrases
2. Number of sentences
3. Number of phrases to the sentence

30. Thorndike, E. L., op. cit., Chapter II, p. 2.

31. Terman, Louis M., op. cit., Chapter II, p. 4.

4. Word length of phrases, counting five letters to the word
5. Word length of sentences, counting five letters to the word

Statistical analysis was made for each of the above for:

- a. Mean
- b. Standard deviation of the distribution
- c. Probable error of the distribution
- d. Probable error of the mean
- e. Standard error of the mean

Using the seventeen paragraphs from each book as composite samplings the books were compared on the measures given in III above by computing the:

- a. Difference between means
- b. Probable error of the difference between means
- c. Critical ratios

The books were then compared for variabilities of these same measures (III above) by computing the:

- a. Difference between standard deviations
- b. Standard error of the difference
- c. Probable error of the difference between standard deviations

If a difference divided by its probable error is 3.00 or more, it is considered significant; if less, it is considered not significant. If a difference is significant it is marked "Yes;" if not significant, "No."³²

The tests of comprehension were scored by giving a credit mark of one for every correct response.

32. Link, H. C., op. cit., Chapter III, p. 8

The scores were used in two ways:

1. Raw scores, which were used in making the statistical comparisons of the difference between means and standard deviations
2. Per cents of accuracy, (the number of correct responses divided by the possible correct responses), where it was necessary to have a common unit for determining the per cent of accuracy with which an age-grade group understood the tests of comprehension.

V. Five groups of twenty-one pupils each were paired on three bases:

1. Pupils of the same sex and chronological age
2. Pupils of the same sex and mental age
3. Pupils of the same sex and reading age

This method of equating three groups of pupils on a one-trait basis was used because of reasons given in chapter III (p.51,ff).

VI. Two methods were used to determine whether the paragraphs selected were representative of the book from which they were taken:

1. Teacher Judgment

Six teachers selected seventeen paragraphs which in their opinion were representative of the book from which they were taken

2. Statistical Measures

The odd-numbered paragraphs were compared with the even-numbered paragraphs for:

- a. Score on History Comprehension Tests
- b. Number of sentences to the paragraph
- c. Number of phrases to the paragraph
- d. Average sentence-length, counting five letters to the word
- e. Average phrase-length, counting five letters to the word
- f. Number of words beyond the 6047 on the Thorndike Scale

VII. The five supplementary history books were compared on the measures listed in VI, 2 above for each of the ten comparisons: Book I with Books II, III, IV, and V; Book II with Books I, III, IV, and V, etc.

The books were then ranked with respect to:

1. Vocabulary range
2. Sentence- and phrase-length (words)
3. Average number of phrases to the sentence
4. Average number of sentences to the paragraph
5. Average number of phrases to the paragraph

VIII. Three measures were used to determine the suitability of the books for the groups that use them:

1. Vocabulary range, or 97 per cent of the words from the selections lying below 6047 on the Thorndike Frequency of Usage Scale³³
2. Sentence- and Phrase-length

No tests were made for sentence- and phrase-length. The selections were analyzed for their sentence- and phrase-length to determine any relation between long sentences

33. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p. iii.

and phrases, and comprehension on samples containing such.

3. Scores on the Tests of Comprehension

75 per cent accuracy was considered suitable comprehension.³⁴ The pupils used in the study had been in the sixth-A, or upper sixth grade, for three months. This gave them a grade norm of 6.8. Children showing a reading age of 12 years and 5 months on the Metropolitan Achievement Tests³⁵ had a grade norm of 6.8. If the group of children read a book with 75 per cent accuracy, it was considered suitable for them. Or, since the study was made to determine the suitability of the books for these specific sixth-A groups, if 75 per cent of these pupils read a book with a comprehension of 75 per cent accuracy it was considered of suitable difficulty for them.

IX. The reliabilities of the tests were calculated by the SpearmanBrown formula from product moment correlation coefficients between scores of the odd- and even-numbered items. These reliabilities were high enough to estimate individual scores with accuracy.

34. Ayer, Adelaide M., and Burch, Mary C., op. cit., Chapter III, p. 70.

35. Metropolitan Achievement Tests, op. cit., Chapter III, p. 46.

**STATISTICAL ANALYSIS OF REPRESENTATIVENESS OF
SELECTIONS FROM FIVE SUPPLEMENTARY HISTORY BOOKS**

CHAPTER IV

STATISTICAL ANALYSIS OF REPRESENTATIVENESS OF
SELECTIONS FROM FIVE SUPPLEMENTARY HISTORY BOOKS

The validity of the findings in this study rests upon the assumption that the samplings used for analysis and tests of comprehension are truly representative of the books examined.¹

From each of the five history books, six teachers² chose seventeen paragraphs which, in their opinion, were representative of the book from which they were taken. As a check upon the soundness of the teachers' judgment as to "representativeness" the odd-numbered paragraphs, (1,3,5,7,9,11,13,15,17), were compared with the even-numbered paragraphs, (2,4,6,8,10,12,14,16), N, or number of cases, being 9.00 in the odd half and 8.00 in the even half.

This comparison of the two halves was made for:

1. Number of words lying beyond the 6047 rank on the Thorndike Scale³
2. Number of words to the sentence (five letters to the word)
3. Number of words to the phrase (five letters to the word)
4. Number of sentences to the paragraph
5. Number of phrases to the paragraph

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1. Representativeness of Samplings, op. cit., Chapter III, pp. 57-58.
 2. Selection of Samplings, op. cit., Chapter III, pp.42-43.
 3. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p. iii.

6. Degree of accuracy with which the selections were read and the questions answered

Statistical analysis of the even paragraphs and the odd paragraphs are given in the tables that follow, pages 84 to 118.

In the upper half of the tables, under the captions "Odd" and "Even," are given the:

1. Mean
2. Standard deviation of the distribution
3. Probable error of the distribution
4. Probable error of the mean
5. Standard error of the standard deviation

In the lower half of the table are given the comparison of the Odd and Even halves for:

1. Differences between means
2. Probable error of the difference between means
3. Difference between means divided by their probable error
4. Difference between standard deviations and the probable error of the standard error of the difference between standard deviations
5. Standard error of the difference between standard deviations

1. Comparison for the Number of Words Lying Beyond 6047

Table III, page 81, shows the comparison of the

odd-numbered paragraphs with the even-numbered paragraphs of Book I for the number of words beyond the 6047 rank.

The odd-numbered paragraphs have a mean of 2.78 words beyond 6047. The even-numbered paragraphs have a mean of 3.00 words.

The difference between M_1 and M_2 is .22. The probable error of the difference between M_1 and M_2 is .824. The difference between means divided by their probable error is .267, which is not a significant difference.⁴

The standard deviations are 2.19 and 2.18 respectively. The difference between σ_1 and σ_2 is .01. The standard error of the difference between σ_1 and σ_2 is .757. The probable error of .757 is .510. The difference between the two standard deviations, then, is $.01 \pm .510$, which is not a significant difference.

The two halves of the selections from Book I show no significant difference when compared for the number of words beyond the 6047 range.

4. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology, Volume 21, 1937, p. 5.

TABLE III

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS BEYOND 6047

BOOK I

Europe the Mother of America - Horne and Bucks

Odd		Even	
Mean	2.78	Mean	3.00
σ	2.19	σ	2.18
P.E.	1.477	P.E.	1.470
P.E.M	.522	P.E.M	.555
σ_{σ}	.516	σ_{σ}	.545
$M_1 - M_2$		.22	
P.E. ($M_1 - M_2$)		.824	
Diff. / P.E. diff.		.267	
$\sigma_1 - \sigma_2$		.01 $\pm$.510	
$\sigma (\sigma_1 - \sigma_2)$		.757	

The difference between $Mean_1$ and $Mean_2$ is .22. The probable error of the difference between means is .824. The difference between means divided by their probable error is .267, which is not a significant difference.

The difference between standard deviations is .01. The probable error of the difference between standard deviations is $\pm$.510 which is not significant.

TABLE IV
ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS BEYOND 6047

BOOK II			
<u>Our Nation's Heritage</u> - Halleck and Frantz			
Odd		Even	
Mean	3.33	Mean	3.50
σ	1.76	σ	2.69
P.E.	1.187	P.E.	1.814
P.E. $\cdot$ M	.419	P.E. $\cdot$ M	.685
$\frac{\sigma}{\sigma}$	.414	$\frac{\sigma}{\sigma}$	.672
$M_1 - M_2$		.17	
P.E. ($M_1 - M_2$)		.802	
Diff./P.E. diff.		.211	
$\sigma_1 - \sigma_2$		$.93 \pm .531$	
$\sigma(\sigma_1 - \sigma_2)$		.788	

Table IV gives the statistical analysis of Book II when the two halves are compared for the number of words beyond 6047.

The difference between means is .17. This difference divided by the probable error of the difference between means is .211 and not a significant difference.

The difference between standard deviations is .93 with a probable error of $\pm .531$, which is not significant.

TABLE V
ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS BEYOND 6047

BOOK III			
<u>The Old World Beginnings of America</u> - Kelty			
	Odd		Even
Mean	2.78	Mean	3.25
σ	2.24	σ	1.89
P.E.	1.511	P.E.	1.275
P.E. _M	.534	P.E. _M	.482
σ_{σ}	.528	σ_{σ}	.472
	$M_1 - M_2$		.47
	P.E. ($M_1 - M_2$)		.718
	Diff./P.E. diff.		.654
	$\sigma_1 - \sigma_2$		$.35 \pm .477$
	$\sigma (\sigma_1 - \sigma_2)$		.708

Table V gives the statistical analysis of Book III. The difference between means is .47. The probable error of the difference between means is .718. .47 divided by .718 gives .654. The difference between means is not significant.

The difference between standard deviations is .35 with a probable error of $\pm .477$. The difference between the variabilities is not significant.

TABLE VI

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS BEYOND 6047

BOOK IV			
<u>The American People and Their Old World Ancestors-Vollintine</u>			
	Odd		Even
Mean	5.11	Mean	5.00
σ	2.23	σ	2.90
P.E.	1.504	P.E.	1.956
P.E. _M	.531	P.E. _M	.720
σ_{σ}	.525	σ_{σ}	.725
	$M_1 - M_2$		.11
	P.E. ($M_1 - M_2$)		.836
	Diff./P.E. diff		.131
	$\sigma_1 - \sigma_2$		.67 $\pm$.603
	$\sigma (\sigma_1 - \sigma_2)$		.895

Table VI gives the statistical analysis of Book IV. The difference between means is .11. This difference divided by the probable error of the difference between means is .131 and not significant.

The difference between standard deviations is .67 with a probable error of $\pm$.603 and is not significant.

TABLE VII
ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS BEYOND 6047

BOOK V			
<u>Elementary World History - Beard and Bagley</u>			
	Odd		Even
Mean	4.34	Mean	5.25
σ	2.53	σ	3.99
P.E.	1.706	P.E.	2.691
P.E.-M	.603	P.E.-M	1.01
σ	.572	σ	.997
	$M_1 - M_2$		.91
	P.E. ($M_1 - M_2$)		1.176
	Diff./P.E. diff.		.733
	$\sigma_1 - \sigma_2$		$1.46 \pm .76$
	$\sigma(\sigma_1 - \sigma_2)$		1.149

Table VII gives the statistical analysis of the two halves of the selections from Book V. The difference between the means is .91, but when analyzed, is not significant. The difference between standard deviations is 1.46 with a probable error of $\pm .76$. This is not a significant difference since the difference is not more than three times its probable error.

2. Comparison for the Number of Words to the Sentence

Comparison of the odd selections with the even selections for the number of words to the sentence, (five letters to the word), was used as a second means for determining whether the samplings were representative of the book from which they were chosen.

Statistical analysis was made for each of the books by the same procedures used for the number of words beyond 6047. These analyses for the number of words to the sentence are given in Tables VIII, XIX, X, XI, and XII, pages 87 to 91.

The tables give the statistical data for the two halves and show the comparison of the two halves for significant differences between the means and variabilities.

The discussion below the table for each book compares the means and standard deviations and states whether the differences are significant.

If a difference divided by its probable error is 3.00 or more, it is considered significant; if less, it is considered not significant.

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5. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology, Volume 21, 1937, p.5.

TABLE VIII

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE SENTENCE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK I			
<u>Europe the Mother of America</u> - Horne and Bucks			
	Odd		Even
Mean	14.12	Mean	14.25
σ	2.47	σ	2.91
P.E.	1.666	P.E.	1.956
P.E. _M	.744	P.E. _M	.874
σ_{σ}	1.00	σ_{σ}	1.10
	$M_1 - M_2$		.13
	P.E. ($M_1 - M_2$)		1.14
	Diff./P.E. diff.		.144
	$\sigma_1 - \sigma_2$		.44 $\pm$.567
	$\sigma (\sigma_1 - \sigma_2)$		.842

The difference between means is .13. The probable error of the difference between means is 1.14. The difference divided by the probable error of the difference is .144. Since this quotient is less than 3.00, it is not significant. The probable error of the standard error of the difference between standard deviations is $\pm .567$. This also is not significant since a difference must be three times its probable error.

TABLE IX

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE SENTENCE (COUNTING FIVE
LETTERS TO THE WORD

BOOK II			
<u>Our Nation's Heritage</u> - Halleck and Frantz			
Odd		Even	
Mean	14.50	Mean	14.50
σ	1.32	σ	2.23
P.E.	.890	P.E.	1.504
P.E. _M	.398	P.E. _M	.672
σ_{σ}	.53	σ_{σ}	.910
$M_1 - M_2$	0.00		
P.E.($M_1 - M_2$)	.771		
Diff./P.E.diff.	0		
$\sigma_1 - \sigma_2$	.91 $\pm$.735		
$\sigma(\sigma_1 - \sigma_2)$	1.09		

The difference between means is 0.00. The difference divided by probable error of the difference is necessarily 0.00 so there can be no significant difference.

The difference between standard deviations is .91 with a probable error of $\pm .735$, which is not significant.

TABLE X

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE SENTENCE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK III			
<u>The Old World Beginnings of America - Kelty</u>			
Odd		Even	
Mean	17.37	Mean	16.37
σ	2.69	σ	2.87
P.E.	1.84	P.E.	1.936
P.E. _M	.811	P.E. _M	.865
σ_{σ}	1.09	σ_{σ}	1.17
$M_1 - M_2$	1.00		
P.E. ($M_1 - M_2$)	1.18		
Diff. / P.E. diff.	.845		
$\sigma_1 - \sigma_2$	.18 $\pm$ 1.052		
$\sigma(\sigma_1 - \sigma_2)$	1.56		

The difference between means is 1.00. The difference divided by the probable error of the difference between means is .845. This is not a significant difference.

The difference between standard deviations is .18. The probable error of the standard error of the difference between standard deviations is ± 1.052 , which is not significant.

TABLE XI

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE SENTENCE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK IV			
<u>The American People and Their Old World Ancestors-Vollintine</u>			
	Odd		Even
Mean	11.50	Mean	12.00
σ	3.35	σ	2.96
P.E.	2.260	P.E.	1.996
P.E.M	1.01	P.E.M	.892
$\frac{\sigma}{\sigma}$	1.37	$\frac{\sigma}{\sigma}$	1.21
	$M_1 - M_2$		.5
	P.E.($M_1 - M_2$)		1.34
	Diff./P.E. diff.		.373
	$\sigma_1 - \sigma_2$		.39 $\pm$ 1.29
	$\sigma (\sigma_1 - \sigma_2)$		1.82

The difference between means is .5. The difference divided by the probable error of the difference between means is .373, which being less than 3.00 is not significant.

The difference between standard deviations is .39. The probable error of the standard error of the difference between standard deviations is $\pm$ 1.29, which is not significant.

TABLE XII

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE SENTENCE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK V			
<u>Elementary World History</u> - Beard and Bagley			
	Odd		Even
Mean	16.62	Mean	16.25
σ	1.65	σ	2.29
P.E.	1.113	P.E.	1.545
P.E. _M	.497	P.E. _M	.690
σ_{σ}	.702	σ_{σ}	.935
	$M_1 - M_2$		.37
	P.E. ($M_1 - M_2$)		.850
	Diff./P.E. diff.		.434
	$\sigma_1 - \sigma_2$		.64 $\pm$.782
	$\sigma (\sigma_1 - \sigma_2)$		1.16

The difference between means is .37. The difference divided by the probable error of the difference between means is .434, which shows the difference between means to be not significant.

The difference between standard deviations is .64. The probable error of the standard error of the difference between standard deviations is $\pm$.782, which shows the difference between standard deviations to be not significant.

3. Comparison for the Number of Words to the Phrase

As a third means of determining whether the selections were representative of the book from which they were taken, the odd-numbered paragraphs were compared with the even-numbered paragraphs for differences between their means and variabilities.

The first half of Tables XIII, XIV, XV, XVI, and XVII, pages 93 to 97, gives the statistical analyses for the two halves of the selections. The second, or lower half, gives the comparison of the two halves for any significant difference between the means and standard deviations.

Table XIII for example, shows the mean of the odd-half of the selections from Book I to be 6.37, and the mean of the even-half of the selections to be 6.50. The difference between the means (M_1 and M_2) is .125. The probable error of the difference between means is .485. The difference between means divided by their probable error is .258. This is not a significant difference since it is less than 3.00.⁶

The standard deviation of the odd-half is .91, and of the even-half, 1.32. The difference between the two standard deviations is .41. The standard error of the difference between standard deviations is .646 and its probable error is .435. This is not a significant difference since a difference must be at least three times its P.E.

6. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology, Volume 21, 1937, p.5

TABLE XIII

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE PHRASE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK I			
<u>Europe the Mother of America</u> - Horne and Bucks			
	Odd		Even
Mean	6.37	Mean	6.50
σ	.91	σ	1.32
P.E.	.613	P.E.	.890
P.E.M	.274	P.E.M	.398
σ	.37	σ	.53
	$M_1 - M_2$		.125
	P.E. ($M_1 - M_2$)		.485
	Diff. / P.E. diff.		.258
	$\sigma_1 - \sigma_2$		.41 $\pm$.435
	$\sigma (\sigma_1 - \sigma_2)$		.646

The two halves of the paragraphs from Book I show no significant difference between their means or their standard deviations when compared for the number of words to the phrase. (Discussion on page 98).

TABLE XIV

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE PHRASE (COUNTING FIVE
LETTERS TO THE WORD

BOOK II

Our Nation's Heritage - Halleck and Frantz

Odd		Even	
Mean	6.37	Mean	6.25
σ	1.23	σ	.968
P.E.	.830	P.E.	.6529
P.E. _M	.370	P.E. _M	.292
σ_{σ}	.502	σ_{σ}	.395
$M_1 - M_2$	.12		
P.E. ($M_1 - M_2$)	.493		
Diff. / P.E. diff.	.243		
$\sigma_1 - \sigma_2$	.262 $\pm$.563		
$\sigma(\sigma_1 - \sigma_2)$	.836		

The difference between the means is .12. The difference divided by the probable error of the difference between means is .243, which is not significant.

The difference between the standard deviation is .262. The probable error of the standard error of the difference between standard deviations is $\pm$.563, which is not significant.

TABLE XV

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE PHRASE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK III			
<u>The Old World Beginnings of America</u> - Kelty			
Odd		Even	
Mean	5.25	Mean	5.25
σ	.661	σ	.661
P.E.	.4458	P.E.	.4458
P.E. _M	.199	P.E. _M	.199
σ_{σ}	.269	σ_{σ}	.269
$M_1 - M_2$		0.00	
P.E.($M_1 - M_2$)		.263	
Diff./P.E.diff.		0.00	
$\sigma_1 - \sigma_2$		$0 \pm .256$	
$\sigma(\sigma_1 - \sigma_2)$		.380	

The difference between means is 0.00. The difference divided by the probable error of the difference is therefore 0.00 and not significant.

The difference between the standard deviations is 0.00, which, of course, is not significant.

TABLE XVI

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE PHRASE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK IV

The American People and Their Old World Ancestors-Vollintine

Odd		Even	
Mean	7.56	Mean	7.00
σ	.829	σ	.866
P.E.	.552	P.E.	.584
P.E. _M	.246	P.E. _M	.261
σ	.338	σ	.368
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$M_1 - M_2$	.56		
P.E. ($M_1 - M_2$)	.358		
Diff. / P.E. diff.	.156		
$\sigma_1 - \sigma_2$	.047 $\pm$.336		
$\sigma(\sigma_1 - \sigma_2)$	.499		

The difference between means is .56. The difference divided by the probable error of the difference is .156, which is not significant.

The difference between standard deviations is .047. The probable error of the standard error of the difference between standard deviations is .336. A difference between standard deviations of .047 $\pm$.336 is not a significant difference.

TABLE XVII

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
AS TO NUMBER OF WORDS TO THE PHRASE (COUNTING FIVE
LETTERS TO THE WORD)

BOOK V			
<u>Elementary World History</u> - Beard and Bagley			
	Odd		Even
Mean	7.00	Mean	7.00
σ	1.11	σ	1.00
P.E.	.749	P.E.	.674
P.E. _M	.335	P.E. _M	.301
σ	.453	σ	.408
	$M_1 - M_2$		0
	P.E. ($M_1 - M_2$)		.450
	Diff. / P.E. diff.		0
	$\sigma_1 - \sigma_2$		.11 $\pm$.276
	$\sigma(\sigma_1 - \sigma_2)$		.410

The difference between means is 0.00. The difference divided by the probable error of the difference is necessarily 0.00 and not significant.

The difference between the standard deviations is .11. The probable error of the standard error of the difference between standard deviations is .276. A difference of .11 $\pm$.276 is not significant.

4. Comparison for the Number of Sentences to the Paragraph

As a fourth measure of representativeness, the odd and even selections were compared for the number of sentences to the paragraph.

Tables XVIII to XXII, pages 99 to 103, give the statistical data for the two halves and show the comparison of the two halves for significant differences between the means and variabilities.

The discussion below the table for each book compares the means and standard deviations and states whether the differences are significant or not significant.

If a difference divided by its probable error is 3.00 or more, it is considered significant; if less, it is considered not significant.

Table XXI shows the statistical analysis for Book IV. In comparing the two halves of the book for a difference between means, the table shows no significance. When the standard deviations of the two halves are compared the difference is $.081 \pm .393$, which is not a significant difference.

TABLE XVIII

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF SENTENCES

BOOK I			
<u>Europe the Mother of America</u> - Horne and Bucks			
Odd		Even	
Mean	5.0	Mean	5.4
σ	1.69	σ	1.25
P.E.	1.140	P.E.	.843
P.E. _M	.509	P.E. _M	.377
σ	.690	σ	.510
$M_1 - M_2$	.4		
P.E. ($M_1 - M_2$)	.633		
Diff./P.E. diff.	.631		
$\sigma_1 - \sigma_2$	.44 $\pm$.578		
$\sigma(\sigma_1 - \sigma_2)$	.858		

The difference between M_1 and M_2 , the means of the odd and even halves, is 0.4. The probable error of the difference between means is .633. The difference between means divided by its probable error is .631. To be significant this quotient should be at least 3.0

The difference between σ_1 and σ_2 , the standard deviations of the halves is .44 with a probable error of $\pm$.578. Since this difference is less than three times as large as its probable error (.578) it is not significant.

TABLE XIX

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF SENTENCES

BOOK II

Our Nation's Heritage - Halleck and Frantz

Odd		Even	
Mean	5.7	Mean	5.5
σ	1.96	σ	1.34
P.E.	1.322	P.E.	.904
P.E. _M	.591	P.E. _M	.408
σ_{σ}	.800	σ_{σ}	.547
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$M_1 - M_2$	.20		
P.E. ($M_1 - M_2$)	.714		
Diff./P.E. diff.	.280		
$\sigma_1 - \sigma_2$	.62 $\pm$.653		
$\sigma(\sigma_1 - \sigma_2)$	.969		

The difference between means is .20. This difference divided by the probable error of the difference between means is .280, which is not significant.

The difference between standard deviations is .62. The probable error of the standard error of the difference between standard deviations is $\pm$.653, which is not significant.

TABLE XX

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF SENTENCES

BOOK III			
<u>The Old World Beginnings of America - Kelty</u>			
Odd		Even	
Mean	4.52	Mean	4.87
σ	1.11	σ	1.36
P.E.	.749	P.E.	.917
P.E. _M	.335	P.E. _M	.410
σ_{σ}	.453	σ_{σ}	.555
$M_1 - M_2$		.25	
P.E. ($M_1 - M_2$)		.529	
Diff. / P.E. diff.		.472	
$\sigma_1 - \sigma_2$		$.25 \pm .482$	
$\sigma(\sigma_1 - \sigma_2)$		.716	

The difference between the means is .25. This difference divided by the probable error of the difference between means is .472, which is not significant.

The difference between the standard deviations is .25 with a probable error of $\pm .482$, which is not significant.

TABLE XXI

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF SENTENCES

BOOK IV			
<u>The American People and Their Old World Ancestors-Vollintine</u>			
	Odd		Even
Mean	5.25	Mean	4.87
σ	.969	σ	1.05
P.E.	.653	P.E.	.708
P.E. _M	.292	P.E. _M	.312
σ	.396	σ	.428
	$M_1 - M_2$		.38
	P.E. ($M_1 - M_2$)		1.29
	Diff. / P.E. diff.		.29
	$\sigma_1 - \sigma_2$		$.081 \pm .393$
	$\sigma(\sigma_1 - \sigma_2)$		.583

The difference between means is .38. This difference divided by the probable error of the difference between means is .29, which is not significant.

The difference between standard deviations is .081. The probable error of the standard error of the difference between standard deviations is .393. The difference of $.081 \pm .393$ is not a significant difference.

TABLE XXII

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF SENTENCES

BOOK V			
<u>Elementary World History</u> - Beard and Bagley			
Odd		Even	
Mean	5.0	Mean	5.25
σ	1.50	σ	1.28
P.E.	1.012	P.E.	.863
P.E. $\cdot$ M	.452	P.E. $\cdot$ M	.385
σ	.612	σ	.530
<hr/>			
$M_1 - M_2$		.25	
P.E. ($M_1 - M_2$)		.593	
Diff. / P.E. diff.		.421	
$\sigma_1 - \sigma_2$		.22 $\pm$.545	
$\sigma (\sigma_1 - \sigma_2)$		.809	

The difference between the means is .25. This difference divided by its probable error is .421, which is not significant.

The difference between standard deviations is .22. The probable error of the standard error of the difference between standard deviations is .545, which is not significant.

5. Comparison for the Number of Phrases to the Paragraph

As a fifth means of determining the degree to which the seventeen selections were representative of their respective books, the two halves of the selections were compared on number of phrases to the paragraph.

Tables XXIII, XXIV, XXV, XXVI, and XXVII, pages 106 to 110, give the statistical data for the two halves and show the comparison of the two halves for significant differences between the means and variabilities.

The discussion below the table for each book compares the means and standard deviations, and states whether the differences are significant or not significant.

Table XXIII for example, shows that the mean of odd paragraphs is 11.00. The mean for the even paragraphs is 11.50. The difference between the means is .50. The probable error of the difference between means is 1.44. The difference divided by its probable error is .34, which is not significant.

The standard deviation of the odd paragraphs is 3.60. The standard deviation of the even paragraphs is 3.12. The difference between the standard deviations is .48 with a probable error of ± 1.30 , which is not significant.

TABLE XXIII

ONE HALF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF PHRASES

BOOK I

Europe the Mother of America - Horne and Bucks

Odd		Even	
Mean	11.0	Mean	11.50
σ	3.60	σ	3.12
P.E.	2.428	P.E.	2.104
P.E. _M	1.08	P.E. _M	.95
σ_{σ}	1.46	σ_{σ}	1.27
$M_1 - M_2$		.50	
P.E. ($M_1 - M_2$)		1.44	
Diff. / P.E. diff.		.34	
$\sigma_1 - \sigma_2$		$.48 \pm 1.30$	
$\sigma(\sigma_1 - \sigma_2)$		1.92	

The difference between the means is .50. This difference divided by its probable error is .34 and not significant.

The difference between the standard deviations is .48 with a probable error of ± 1.30 and is not significant.

TABLE XXIV

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF PHRASES

BOOK II

Our Nation's Heritage - Halleck and Frantz

Odd		Even	
Mean	13.6	Mean	13.5
σ	5.10	σ	3.95
P.E.	3.440	P.E.	2.664
P.E. _M	1.54	P.E. _M	1.19
σ	2.08	σ	1.62
$M_1 - M_2$	.10		
P.E.($M_1 - M_2$)	1.94		
Diff./P.E.diff.	.051		
$\sigma_1 - \sigma_2$	1.51 ± 1.774		
$\sigma(\sigma_1 - \sigma_2)$	2.63		

The difference between means is .10. This difference divided by its probable error is .051 and is not significant.

The difference between standard deviations is 1.51 with a probable error of ± 1.774 and is not significant.

TABLE XXV

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF PHRASES

BOOK III

The Old World Beginnings of America - Kelty

Odd		Even	
Mean	13.5	Mean	12.2
σ	3.35	σ	4.01
P.E.	2.260	P.E.	2.705
P.E. _M	1.01	P.E. _M	1.21
σ_{σ}	1.32	σ_{σ}	1.62
$M_1 - M_2$	1.3		
P.E. ($M_1 - M_2$)	1.57		
Diff. / P.E. diff.	.82		
$\sigma_1 - \sigma_2$	.66 $\pm$ 1.457		
$\sigma(\sigma_1 - \sigma_2)$	2.16		

The difference between means is 1.3. This difference divided by its probable error is .82 and is not significant.

The difference between standard deviations is .66 with a probable error of ± 1.457 and is not significant.

TABLE XXVI

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF PHRASES

BOOK IV			
<u>The American People and Their Old World Ancestors-Vollintine</u>			
	Odd		Even
Mean	15.2	Mean	13.6
σ	3.61	σ	4.05
P.3.	2.435	P.E.	2.732
P.E.-M	1.08	P.E.-M	1.26
σ	1.47	σ	1.69
	$M_1 - M_2$		1.60
	P.E. ($M_1 - M_2$)		1.65
	Diff. / P.E. diff.		.95
	$\sigma_1 - \sigma_2$		.44 $\pm$ 1.794
	$\sigma(\sigma_1 - \sigma_2)$		2.66

The difference between means is 1.60. This difference divided by its probable error is .95 and is not significant.

The difference between standard deviations is .44 with a probable error of ± 1.794 and is not significant.

TABLE XXVII

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR NUMBER OF PHRASES

BOOK V

Elementary World History - Beard and Bagley

Odd		Even	
Mean	12.1	Mean	12.6
σ	4.14	σ	2.66
P.E.	2.792	P.E.	1.794
P.E. _M	1.20	P.E. _M	.76
$\frac{\sigma}{\sigma}$	1.69	$\frac{\sigma}{\sigma}$	1.08
$M_1 - M_2$	.50		
P.E. ($M_1 - M_2$)	1.42		
Diff./P.E. diff.	.35		
$\sigma_1 - \sigma_2$	1.48 $\pm$ 1.349		
$\sigma(\sigma_1 - \sigma_2)$	2.00		

The difference between means is .50. This difference divided by its probable error is .35 and is not significant.

The difference between standard deviations is 1.48 with a probable error of $\pm$ 1.349 and is not significant.

6. Comparison for the Degree of Comprehension with Which the Selections Were Read and the Questions Answered.

As a sixth and last means for determining the degree to which the selections were representative of the book from which they were taken, the odd-numbered paragraphs were compared with the even-numbered paragraphs for the degree of comprehension with which the pupils read the selections and answered the test questions on them.

A point of 1.00 was given for each correct response on the test questions of comprehension. (Appendix B) The number of correct responses was counted for each paragraph. The sums of the correct responses for the odd paragraphs was compared with the sums of the correct responses for the even paragraphs.

The statistical data for the correct responses for the two halves of the selections is given in Tables XXVIII, XXIX, XXX, XXXI, and XXXII, pages 111 to 115, which show the comparison of the two halves for significant differences between the means and variabilities.

The discussion below the table for each book compares the means and standard deviations, and states whether the differences are significant or not.

TABLE XXVIII
ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR SCORES

BOOK I			
<u>Europe the Mother of America</u> - Horne and Bucks			
Odd		Even	
Mean	127.50	Mean	127.00
σ	9.54	σ	8.21
P.E.	6.435	P.E.	5.538
P.E.-M	2.87	P.E.-M	2.47
σ	3.85	σ	3.35
$M_1 - M_2$		.50	
P.E. ($M_1 - M_2$)		3.78	
Diff. / P.E. diff.		.132	
$\sigma_1 - \sigma_2$		1.33 ± 3.440	
$\sigma(\sigma_1 - \sigma_2)$		5.10	

The difference between means is .50. This difference divided by its probable error is .132 and is not significant.

The difference between standard deviations is 1.33 with a probable error of ± 3.440 and is not significant.

TABLE XXIX
ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR SCORES

BOOK II			
<u>Our Nation's Heritage</u> - Halleck and Prantz			
	Odd		Even
Mean	96.38	Mean	96.78
σ	1.01	σ	1.04
P.E.	.681	P.E.	.701
P.E. _M	.304	P.E. _M	.313
σ _{σ}	.412	σ _{σ}	.424
	$M_1 - M_2$		.40
	P.E. ($M_1 - M_2$)		.427
	Diff. / P.E. diff.		.937
	$\sigma_1 - \sigma_2$		.020 $\pm$.398
	$\sigma(\sigma_1 - \sigma_2)$		.591

The difference between means is .40. This difference divided by its probable error is .937 and is not significant.

The difference between standard deviations is .020 with a probable error of $\pm .398$, which is a significant difference in dispersion.

TABLE XXX
ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR SCORES

BOOK III			
<u>The Old World Beginnings of America - Kelty</u>			
Odd		Even	
Mean	144.62	Mean	144.50
σ	6.56	σ	5.57
P.E.	4.425	P.E.	3.757
P.E.-M	1.97	P.E.-M	1.68
σ	2.67	σ	2.27
$M_1 - M_2$		.12	
P.E. ($M_1 - M_2$)		2.58	
Diff./P.E. diff.		.046	
$\sigma_1 - \sigma_2$		.99 $\pm$ 2.361	
$\sigma(\sigma_1 - \sigma_2)$		3.50	

The difference between means is .12. This difference divided by its probable error is .046 and is not significant.

The difference between standard deviations is .99 with a probable error of $\pm$ 2.361 which is not a significant difference.

TABLE XXXI

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR SCORES

BOOK IV			
<u>The American People and Their Old World Ancestors-Vollintine</u>			
Odd		Even	
Mean	106.62	Mean	106.75
σ	8.74	σ	8.45
P.E.	5.895	P.E.	5.699
P.E. _M	2.63	P.E. _M	2.54
σ	3.56	σ	3.45
$M_1 - M_2$		.13	
P.E. ($M_1 - M_2$)		3.65	
Diff./P.E. diff.		.035	
$\sigma_1 - \sigma_2$		$.29 \pm 3.197$	
$\sigma(\sigma_1 - \sigma_2)$		4.740	

The difference between means is .13. This difference divided by its probable error is .035 and is not significant.

The difference between standard deviations is .29 with a probable error of ± 3.197 which is not significant.

TABLE XXXII

ONE HALF OF THE PARAGRAPHS COMPARED WITH THE OTHER HALF
FOR SCORES

BOOK V

Elementary World History - Beard and Bagley

Odd		Even	
Mean	121.87	Mean	121.75
σ	8.69	σ	8.42
P.E.	5.861	P.E.	5.679
P.E. _M	2.61	P.E. _M	2.53
σ_{σ}	3.54	σ_{σ}	3.43
$M_1 - M_2$	.12		
P.E. ($M_1 - M_2$)	3.63		
Diff. / P.E. diff.	.330		
$\sigma_1 - \sigma_2$	.27 $\pm$ 3.318		
$\sigma(\sigma_1 - \sigma_2)$	4.92		

The difference between means is .12. This difference divided by its probable error is .330 and is not significant.

The difference between the standard deviations is .27 with a probable error of $\pm$ 3.318 which is not significant.

Tables XXXIII, XXXIV, XXXV, XXXVI, and XXXVII, pages 117 to 121, give the summary of the comparisons of the two halves of the selections for each book for:

1. Number of sentences to the paragraph
2. Number of phrases to the paragraph
3. Number of words to the sentence
4. Number of words to the phrase
5. Score on tests of comprehension
6. Words beyond 6047

The statistical analysis for each of the above six variables includes:

- a. Difference between means
- b. Probable error of the difference between means
- c. Difference between means divided by their probable error
- d. Difference between standard deviations
- e. Standard errors of the difference between standard deviations
- f. Probable error of the standard error of the difference between standard deviations

The discussion below the table of summaries for each book gives the comparison of the means and standard deviations. It also states whether the differences between the means and dispersions of the six pairs of variables are significant.

TABLE XXXIII

SUMMARY OF THE ODD PARAGRAPHS COMPARED WITH THE EVEN PARAGRAPHS TO DETERMINE WHETHER THE TWO HALVES ARE REPRESENTATIVE OF BOOK I*

	Difference Between Diff./P.E. Means		Difference Between Diff./P.E. diff. S. D.'s	
Number of Sentences	$.4 \pm .633$	.631	$.44 \pm .578$	.761
Number of Phrases	$.5 \pm 1.44$	.340	$.48 \pm 1.30$	.369
Number of Words to Sentence	$.13 \pm 1.14$	1.440	$.44 \pm .567$	.777
Number of Words to Phrase	$.12 \pm .485$	.258	$.41 \pm .435$	.943
Score on Test	$.50 \pm 3.78$	.132	1.33 ± 3.44	.387
Words Beyond 6047	$.22 \pm .824$	.267	$.01 \pm .510$	.020

* Europe the Mother of America, by Charles F. Horne and Olive Bucks. New York, American Book Company, 1931.

The difference between the means together with their probable errors are given in the first column. The differences divided by their probable errors are given in the second column. If a critical ratio is less than 3.00, the difference is not significant.

The differences between the standard deviations together with their probable errors are given in the third column; the differences between standard deviations divided by their probable errors in the fourth column. If a difference is less than three times its probable error it is not significant. None of the differences for Book I are significant.

TABLE XXXIV

SUMMARY OF THE ODD PARAGRAPHS COMPARED WITH THE EVEN PARAGRAPHS TO DETERMINE WHETHER THE TWO HALVES ARE REPRESENTATIVE OF BOOK II*

	Difference Between Diff./P.E. Means			Difference Between Diff./P.E. diff. S. D.'s		
Number of Sentences	.20 ±	.714	.280	.62 ±	.653	.949
Number of Phrases	.10 ±	1.940	.051	1.15 ±	1.774	.648
Number of Words to Sentence	0.0 ±	.771	0.00	.91 ±	.735	1.238
Number of Words to Phrase	.12 ±	.493	.243	.26 ±	.563	.462
Score on Test	.40 ±	.427	.937	.02 ±	.398	.050
Words Beyond 6047	.17 ±	.802	.211	.93 ±	.531	1.750

* Our Nation's Heritage, by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.

The differences between means divided by their probable errors are given under the caption "Difference divided by P.E. difference." Since these differences are less than 3.00 for all of the six variables, there are no significant differences.

The difference between standard deviations together with their probable errors are given under the caption "Difference between Standard Deviations." Since these differences are less than three times their probable errors they are not significant.

TABLE XXXV

SUMMARY OF THE ODD PARAGRAPHS COMPARED WITH THE EVEN PARAGRAPHS TO DETERMINE WHETHER THE TWO HALVES ARE REPRESENTATIVE OF BOOK III*

	Difference Between Diff./P.E. Means			Difference Between Diff./P.E. diff. S. D.'s		
Number of Sentences	.25 ±	.529	.472	.25 ±	.482	.520
Number of Phrases	1.30 ±	1.571	.820	.66 ±	1.457	.453
Number of Words to Sentence	1.00 ±	1.180	.845	.18 ±	1.052	.171
Number of Words to Phrase	0.0 ±	.263	0.00	0.0 ±	.256	0.0
Score on Test	.12 ±	2.58	.046	.99 ±	2.361	.418
Words Beyond 6047	.47 ±	.718	.654	.35 ±	.477	.735

* The Old World Beginnings of America by Mary C. Kelty. New York, Ginn and Company, 1932.

The differences between means divided by their probable errors are given under the caption "Difference divided by P.E. difference." Since these differences are less than 3.00 for all of the six variables, they are not significant.

The differences between standard deviations together with their probable errors are given under the caption "Difference between Standard Deviations." Since these differences are less than three times their probable errors they are not significant.

TABLE XXXVI

SUMMARY OF THE ODD PARAGRAPHS COMPARED WITH THE EVEN PARAGRAPHS TO DETERMINE WHETHER THE TWO HALVES ARE REPRESENTATIVE OF BOOK IV*

	Difference Between Diff. Means		Difference Between Diff. S. D.'s		Diff. /P.E. diff.	
Number of Sentences	.38 ±	1.290	.290	.081 ±	.393	.229
Number of Phrases	1.60 ±	1.650	.950	.44 ±	1.794	2.470
Number of Words to Sentence	.50 ±	1.340	.373	.39 ±	1.290	.311
Number of Words to Phrase	.56 ±	.358	.156	.047 ±	.336	.159
Score on Test	.13 ±	3.650	.035	.29 ±	3.197	.098
Words Beyond 6047	.11 ±	.836	.131	.67 ±	.603	1.108

* The American People and Their Old World Ancestors by Grace Vollintine. New York, Ginn and Company, 1930.

The differences between means divided by their probable errors are given under the caption "Difference divided by P.E." Since these differences are less than 3.00 for all of the six variables, they are not significant.

The differences between standard deviations together with their probable errors are given under the caption "Difference between Standard Deviations." Since these differences are less than three times their probable errors they are not significant.

TABLE XXXVII

SUMMARY OF THE ODD PARAGRAPHS COMPARED WITH THE EVEN PARAGRAPHS TO DETERMINE WHETHER THE TWO HALVES ARE REPRESENTATIVE OF BOOK V*

	Difference Between Diff. Means			Difference Between Diff. S. D.'s		
	/P.E. diff.			/P.E. diff.		
Number of Sentences	.25 ±	.593	.421	.22 ±	.545	.404
Number of Phrases	.50 ±	1.420	.350	1.48 ±	1.349	1.099
Number of Words to Sentence	.37 ±	.850	.434	.64 ±	.782	1.818
Number of Words to Phrase	0.0 ±	.450	0.0	.11 ±	.76	.145
Score on Test	.12 ±	3.630	.330	.27 ±	3.318	.081
Words Beyond 6047	.91 ±	1.176	.733	1.46 ±	.76	1.920

* The Elementary World History by Charles A. Beard and William C. Bagley. New York, The Macmillan Company, 1932.

The differences between means divided by their probable errors are given under the caption "Difference divided by P.E. difference." Since these differences are less than 3.00 for all of the six variables, they are not significant.

The differences between standard deviations and their probable errors are given under the caption "Difference between Standard Deviations." Since these differences are less than three times their probable errors they are not significant.

SUMMARY FOR THE ANALYSIS OF THE DATA TO DETERMINE THE DEGREE TO WHICH THE SAMPLINGS ARE REPRESENTATIVE OF THE BOOK FROM WHICH THEY ARE TAKEN

In order to determine the degree to which the seventeen selections from each book were in keeping with the joint opinion of the six teachers who selected them, statistical measures of comparison were used.

The odd-numbered paragraphs were compared with the even-numbered paragraphs.

Comparison of the two halves of the selections were made for:

1. Number of words lying beyond 6047
2. Number of words to the sentence
(five letters to the word)
3. Number of words to the phrase
(five letters to the word)
4. Number of sentences to the paragraph
5. Number of phrases to the paragraph
6. Degree of accuracy with which the selections were read and the questions answered

Each book was compared for significant differences between its means and standard deviations for the six variables given above.

The statistical comparisons showed no significant differences between means nor standard deviations for any of the five history books, from which we may conclude that the samplings chosen by the six judges are truly representative of the books as wholes.

**ANALYSIS OF THE FIVE SUPPLEMENTARY
HISTORY BOOKS FOR VOCABULARY AND
SENTENCE - AND PHRASE-LENGTH**

CHAPTER V

ANALYSIS OF THE FIVE SUPPLEMENTARY HISTORY
BOOKS FOR VOCABULARY AND SENTENCE - AND
PHRASE-LENGTHA. Vocabulary Analysis

The vocabulary analysis is made for the five history books by paragraphs for each milliclassification of Thorndike's Scale¹ and for the number of words lying beyond 10,000.

Table XXXVIII, (page 126), shows the word count and classification of words from Book I, Europe the Mother of America, by Horne and Bucks. The paragraphs are numbered at the extreme left in vertical order. To the right are the scale positions for all words occurring in the paragraph. At the foot of the table are shown the total number of words for the seventeen paragraphs and the per cent for the totals.

In tabulating the words, every word was counted, no separate categories being made for different or recurring words. Table XXXVIII, (page 126), means, then, that there are 1356 running words in the seventeen paragraphs taken from Book I. 1075 of the words, or 79.4 per cent of the 1356, lie in the first rank or below 1000; 117 words, or 8.6 per cent, lie between 1001 and 2000; and 23, or 1.7 per cent of the words, lie beyond 10,000.

1. Thorndike, E. L., The Teachers Word Book of Ten Thousand Words. 1923, p.iii.

Of 74 words in Paragraph No. 1:

59	lie	between	1	and	1000
6	"	"	1001	and	2000
4	"	"	2001	and	3000
3	"	"	3001	and	4000
1	"	"	4001	and	5144
1	"	"	6048	and	6618

Paragraph No. 1, then, has no words beyond 10,000 and only one word beyond 6047, that in the next rank of 6048-6618. 69 of the words lie below 3000. Since Gates² uses the first 2500 words on the Thorndike Scale as a range for primary grades, the words in Paragraph No. 1 appear to be words in very common use.

Paragraph No. 12 has 65 of its 78 words lying below 1000, but also shows one word beyond 10,000 and one word beyond 6047. These two words mean that 2.5 per cent of the words in Paragraph No. 12 lie beyond the range of words commonly used by twelve-year-old children,³ and, if they are key words, they may affect the pupils' understanding of that paragraph. The words are "monasteries," and "patios," "patio" being defined as "a court."

Paragraph No. 7 has 33 words, or 70.1 per cent of its vocabulary, below 1000, and 4 words, or 8.6 per cent of its vocabulary, beyond 6047.

Paragraph No. 17 shows five words beyond 6047, which means that 8.9 per cent of its vocabulary is not frequently

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2. Gates, Arthur I, "The Construction of a Reading Vocabulary for the Primary Grades." Teachers College Record, Volume 27, 1926, p. 4.
 3. Terman, L. M., The Measurement of Intelligence. 1926, p. 226.

used by twelve-year-old children.

The range of words in other paragraphs is given under their rank-heading.

Table XXXIX, (page 127), shows the word count by ranks from Book II. There are 173 more words in the sampling from Book II with the range of vocabulary lying somewhat higher than Book I.

Table XL, (page 128), shows Book III to have a low range of vocabulary. Paragraphs Nos. 5 and 6, however, contain words beyond the 10,000 rank. Paragraph No. 5 is a discussion of the "Vikings in Europe," and Paragraph No. 6 is about the "Northmen on the Mainland of America." These paragraphs show uncommon words for all the samples with Book III piling up five words for Paragraph No. 5 and eight words for Paragraph No. 6.

Table XLI, (Page 129), shows the word count for Book IV and Table XLII, (page 130), for Book V. The word range of Book IV shows 78.8 per cent of the words below the first 1000, but, as seen under Rank 13, a large number of words are clearly unusual to twelve-year-old children. In Table XLII, Book V has 9 words beyond 10,000 in the second paragraph. This topic, "Teutons," was discussed in Books II and III with one uncommon word; in Book IV with two uncommon words; and in Book I with none. The general range of vocabulary for Book V, however, is similar to that of Book II.

TABLE XXXVIII

VOCABULARY ANALYSIS BY PARAGRAPHS FOR BOOK I, EUROPE THE MOTHER OF AMERICA, BY HORNE - BUCKS

Paragraphs	Word Count													*
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	59	6	4	3	1	0	0	1	0	0	0	0	0	*Key: 1. 1-1000 2. 1001-2000 3. 2001-3000 4. 3001-4000 5. 4001-5144 6. 5145-5544 7. 5545-6047 8. 6048-6618 9. 6619-7262 10. 7263-8145 11. 8146-9190 12. 9191-10000 13. Beyond 10,000
2	68	10	2	3	0	0	0	0	0	0	0	0	1	
3	60	3	0	1	1	0	1	0	0	0	0	1	1	
4	55	9	3	2	1	0	1	0	1	0	0	1	3	
5	43	6	1	1	0	0	1	0	0	0	0	0	1	
6	72	8	2	3	0	0	0	1	1	0	0	0	6	
7	33	6	2	0	0	2	0	0	2	2	0	0	0	
8	80	5	3	2	1	0	0	0	0	1	0	0	1	
9	37	8	5	0	0	0	0	0	0	1	0	0	0	
10	81	5	3	4	2	0	1	0	0	1	0	0	0	
11	40	5	4	0	0	1	0	1	0	0	0	0	0	
12	65	3	4	2	2	0	0	0	0	0	0	1	1	
13	45	4	4	1	2	0	0	0	1	0	1	0	1	
14	107	12	4	0	0	2	3	0	3	0	0	0	4	
15	58	11	4	1	0	0	2	0	0	1	2	0	2	
16	81	7	6	1	0	1	0	0	1	0	0	0	0	
17	91	9	6	6	2	0	0	0	1	2	0	0	2	
Total	1075	117	57	30	12	6	9	3	10	8	3	3	23	= 1356
Per Cent	79.4	8.6	4.2	2.2	.9	.5	.6	.2	.7	.6	.2	.2	1.7	

TABLE XXXIX

VOCABULARY ANALYSIS BY PARAGRAPHS FOR BOOK II, OUR NATION'S HERITAGE, BY HALLECK - FRANTZ

Paragraphs	Word Count													*
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	127	20	7	3	3	3	1	0	0	0	0	0	2	*Key:
2	51	9	4	0	1	0	1	0	0	0	0	0	1	1. 1-1000
3	72	6	5	2	0	0	0	0	0	0	0	0	2	2. 1001-2000
4	31	5	2	2	0	0	1	0	0	0	0	0	1	3. 2001-3000
5	80	10	3	1	4	1	0	1	0	1	1	0	4	4. 3001-4000
6	58	4	3	3	1	0	0	0	2	0	0	1	5	5. 4001-5144
7	40	5	1	3	0	2	1	0	0	2	0	0	0	6. 5145-5544
8	77	16	15	0	1	0	0	0	0	3	0	1	4	7. 5545-6047
9	29	4	3	3	3	1	1	0	0	2	0	0	2	8. 6048-6618
10	56	3	6	7	3	0	0	0	0	1	0	0	1	9. 6619-7262
11	73	7	9	3	1	1	0	1	2	0	0	0	2	10. 7263-8145
12	69	4	6	1	3	1	0	0	0	0	0	0	0	11. 8146-9190
13	69	3	5	1	1	1	0	1	0	0	0	0	1	12. 9191-10000
14	103	12	3	3	3	0	6	0	1	0	1	0	0	13. Beyond 10,000
15	67	12	2	1	2	0	0	0	1	0	0	0	0	
16	67	8	4	1	2	0	1	0	0	1	0	0	2	
17	92	9	5	2	2	0	1	0	0	1	0	0	3	
Total	1161	137	83	36	30	10	12	3	6	11	2	2	31	= 1529
Per Cent	76.0	9.0	5.5	2.4	2.0	.7	.8	.2	.4	.7	.1	.1	2.1	

TABLE XL

VOCABULARY ANALYSIS BY PARAGRAPHS FOR BOOK III, THE OLD WORLD BEGINNINGS OF AMERICA, BY KELTY

Paragraphs	Word Count													*
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	62	3	2	1	0	0	0	0	1	0	0	0	0	*Key: 1. 1-1000 2. 1001-2000 3. 2001-3000 4. 3001-4000 5. 4001-5144 6. 5145-5544 7. 5545-6047 8. 6048-6618 9. 6619-7262 10. 7263-8145 11. 8146-9190 12. 9191-10000 13. Beyond 10,000
2	30	11	2	0	0	0	0	1	0	0	0	0	1	
3	81	6	3	4	0	0	0	1	0	0	0	0	0	
4	52	6	1	2	0	0	0	1	1	1	0	0	3	
5	52	6	1	0	0	1	0	0	2	1	0	0	4	
6	54	3	0	0	0	0	0	0	0	0	0	2	4	
7	69	2	4	0	0	1	0	0	1	1	0	0	0	
8	139	10	0	2	0	0	0	1	0	3	1	0	0	
9	89	11	1	1	2	0	1	0	0	1	0	0	2	
10	123	8	8	4	2	0	0	1	0	0	0	2	0	
11	81	6	0	0	2	0	0	0	0	0	0	0	0	
12	57	1	3	0	1	0	0	0	0	0	0	0	0	
13	77	4	4	1	1	0	0	0	3	0	0	0	0	
14	81	2	2	2	0	0	4	1	0	0	0	0	3	
15	79	6	1	2	0	0	1	0	0	0	0	0	1	
16	78	6	4	1	0	0	0	1	0	0	1	0	2	
17	89	1	2	2	0	1	0	0	0	1	0	0	2	
Total	1293	92	38	22	8	3	6	7	8	7	2	4	22	= 1512
Per Cent	85.5	6.7	2.5	1.4	.5	.1	.3	.4	.5	.4	.1	.2	1.4	

TABLE XLI

VOCABULARY ANALYSIS BY PARAGRAPHS FOR BOOK IV, THE AMERICAN PEOPLE AND THEIR OLD WORLD ANCESTORS
BY VOLLINTINE

Paragraphs	Word Count													*
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	100	15	2	3	3	0	0	0	0	1	0	0	0	*Key: 1.1-1000 2.1001-2000 3.2001-3000 4.3001-4000 5.4001-5144 6.5145-5544 7.5545-6047 8.6048-6618 9.6619-7262 10.7263-8145 11.8146-9190 12.9191-10000 13.Beyond 10,000
2	88	7	4	0	3	1	0	2	0	0	0	1	2	
3	89	8	3	1	1	0	3	0	1	0	0	0	4	
4.	82	9	3	1	1	0	0	1	4	1	1	0	2	
5	84	6	1	1	1	0	0	0	1	1	0	0	5	
6	80	8	0	3	2	0	0	2	1	1	0	0	8	
7	105	7	5	2	2	2	3	0	1	0	0	0	4	
8	71	6	8	0	1	1	0	0	0	2	0	0	2	
9	60	13	6	1	0	0	1	0	0	3	0	0	1	
10	84	10	7	0	0	0	0	0	2	0	0	0	0	
11	67	9	5	2	1	2	0	0	0	1	0	0	2	
12	66	7	4	0	2	0	0	0	0	0	1	0	2	
13	101	11	5	3	1	1	0	1	0	0	0	0	4	
14	123	10	6	1	2	1	1	1	0	0	1	0	1	
15	85	11	9	3	2	2	0	1	0	1	0	1	4	
16	66	8	8	2	0	0	2	1	1	1	0	0	3	
17	83	7	8	4	1	1	1	1	2	0	1	0	1	
Total	1434	152	84	27	23	11	11	10	13	12	4	2	45	= 1821
Per Cent	78.8	8.3	4.6	1.4	1.2	0.6	0.6	0.5	0.7	0.6	0.2	0.1	2.4	

TABLE XLII

VOCABULARY ANALYSIS BY PARAGRAPHS FOR BOOK V, ELEMENTARY WORLD HISTORY, BY BEARD - BAGLEY

Paragraphs	Word Count													*
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	131	25	8	3	0	0	0	0	0	0	0	0	1	*Key: 1.1-1000 2.1001-2000 3.2001-3000 4.3001-4000 5.4001-5144 6.5145-5544 7.5545-6047 8.6048-6618 9.6619-7262 10.7263-8145 11.8146-9190 12.9191-10000 13.Beyond 10,000
2	59	10	6	5	2	1	1	1	1	0	2	0	9	
3	117	13	6	3	1	0	0	0	1	0	0	0	5	
4	86	11	6	4	0	1	0	0	2	0	0	0	1	
5	71	6	3	5	3	0	1	0	1	1	0	1	3	
6	67	8	1	2	2	1	2	1	1	1	0	0	3	
7	165	16	6	6	1	0	0	0	4	0	1	1	1	
8	102	7	4	5	3	0	1	1	2	1	1	0	5	
9	56	12	5	0	1	0	2	0	1	3	0	0	0	
10	85	9	8	0	0	0	0	0	1	0	0	0	1	
11	75	9	6	4	3	1	0	1	2	0	0	1	1	
12	54	9	5	5	1	2	0	1	0	0	0	1	0	
13	48	8	5	0	0	0	0	0	0	0	0	0	0	
14	90	7	2	4	1	0	0	0	0	1	0	0	0	
15	65	6	4	2	1	0	0	0	0	0	0	0	2	
16	46	4	4	2	2	0	0	1	1	0	1	0	2	
17	54	7	3	5	0	0	3	0	0	2	0	0	2	
Total	1371	167	82	55	21	6	10	6	17	9	5	4	36	= 1789
Per Cent	76.5	9.3	4.5	3.7	1.1	.3	.5	.3	.9	.5	.2	.2	2.0	

TABLE XLIII

VOCABULARY ANALYSIS OF REPRESENTATIVE SELECTIONS FROM FIVE SIXTH GRADE HISTORY BOOKS USED FOR HISTORY COMPREHENSION TESTS

(Thorndike's Classification, Frequency of Usage)

Frequency of Usage	Selection*									
	Book I		Book II		Book III		Book IV		Book V	
	Words	Per Cent	Words	Per Cent	Words	Per Cent	Words	Per Cent	Words	Per Cent
1-1000	1075	79.4	1161	76.0	1293	85.5	1434	78.7	1371	76.5
1001-2000	117	8.6	137	9.0	92	6.7	152	8.3	167	9.3
2001-3000	57	4.2	83	5.5	38	2.5	84	4.6	82	4.5
3001-4000	30	2.2	36	2.4	22	1.4	27	1.4	55	3.7
4001-5144	12	0.9	30	2.0	8	0.5	23	1.2	21	1.1
5145-5544	6	0.5	10	0.7	3	0.1	11	0.6	6	0.3
5545-6047	9	0.6	12	0.8	6	0.3	11	0.6	10	0.5
6048-6618	3	0.2	3	0.2	7	0.4	10	0.5	6	0.3
6619-7262	10	0.7	6	0.4	8	0.5	13	0.8	17	0.9
7263-8145	8	0.6	11	0.7	7	0.4	12	0.6	9	0.5
8146-9190	3	0.2	2	0.1	2	0.1	4	0.2	3	0.2
9191-10,000	3	0.2	2	0.1	4	0.2	2	0.1	4	0.2
Beyond 10,000	23	1.7	31	2.1	22	1.4	45	2.4	36	2.0
Total Words	1356	100%	1529	100%	1512	100%	1821	100%	1789	100%
Number beyond 6047 -50			55		50		86		77	
Per Cent beyond 6047 -3.6%			3.6%		3.0%		4.6%		4.1%	

* Selection: Seventeen selections from each of Books I, II, III, IV and V were used for the History Comprehension Tests.

Table XLIII, (page 131), is a summary of the vocabulary analyses for the five books. Given in the vertical columns are the totals for each category, showing the number of words and the per cents for each. At the foot of this table, in the first horizontal line, are shown the number and per cent of all words from each book which lie beyond the 10,000 rank.

Tabulating all of the words from the seventeen paragraphs as a representative sample of Book I, Table XLIII shows in vertical order that 79.4 per cent of the words are between 1 and 1000; 8.6 per cent between 1001 and 2000, etc.

Table XLIII, read in horizontal order, also shows the per cent of words from each book lying in a given rank, as: Book I has 79.4 per cent of its words in rank 1 -1000; Book II, 76.0; Book III, 85.5; Book IV, 78.7; and Book V, 76.5.

Book III shows the highest per cent of words in the first rank and Book II the lowest. When compared for words beyond 10,000, Book II has a higher rank by .7 per cent. Book IV shows the highest per cent of words beyond 10,000, with Book II next in order.

Words lying beyond 6047, however, are of greater significance, since they lie beyond the range of sixth-A pupils as interpreted by this study. (See Chapter III, p. 46). Book IV shows 4.5 per cent of its words to be beyond 6047. Book V ranks next with 4.1 per cent of its

words beyond this range. Book III ranks lowest with 3.0 per cent.

This study considered answering with 97 per cent accuracy as essential to satisfactory comprehension of the reading samples given on the five history books.⁴ The per cents given in Table XLIII are for the words above 6047. The writer wished to determine the per cent of words below 6047. The per cent of words lying above 6047 was, therefore, subtracted from 100 per cent. Thus Book I has 3.6 per cent of its words lying above 6047 and 96.4 per cent of its words lying below 6047.

Analysis was made of the significance of the per cent of words falling beyond a frequency of 6047 for each of the five books. In doing this the probable errors of the per cents were calculated by means of the formula:

$$P.E.B\% = .6745 \sqrt{\frac{pq}{N}}$$

where P refers to the per cent in one category, q to the per cent in the other category and N to the number of cases.⁵ If a per cent is 3.00 or more times its probable error greater than zero it is considered significant; if less, not significant. These data are given in Table XLIV, page 134.

It will be noted that all these per cents are significantly greater than zero. From a purely statistical point of view we may say then that none of the books examined

4. Author's arbitrary vocabulary standard, op. cit., Chapter III, p. 67.

5. Dunlap, J. W., and Kurtz, A., Handbook of Statistical Nomographs, Tables, and Formulas, 1932, Formula No. 48, p. 24

restrict their vocabularies sufficiently for the standards set down in the literature (Chapter II) or in this study.

TABLE XLIV
DIFFERENCES BETWEEN THE FIVE HISTORY BOOKS
FOR THE PER CENT OF WORDS BEYOND 6047

	BOOK I	BOOK II	BOOK III	BOOK IV	BOOK V
Number of Words Beyond 6047	50	55	50	86	77
Per Cent of Words Beyond 6047	3.6	3.6	3.0	4.6	4.1
Probable Error of the Per Cent of Words Beyond 6047	.0004	.0032	.0030	.0033	.0033
$\frac{\%}{\text{P.E.}\%}$	10.6	11.3	10.0	13.9	12.4
Significant	Yes	Yes	Yes	Yes	Yes
Rank	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1	5	4

Statistical analysis of the differences between per cents reveals that Book IV has a significantly larger per cent of words beyond a frequency value of 6047 than does Book III and that none of the other differences are significant. Therefore, while we might rank the books relative to restriction of vocabulary for sixth-A grade requirements we would be justified only in saying that Book III meets these requirements more adequately than does Book IV. From Table XLIV it will be noted that none of them are satisfactory. The findings of this analysis simply are that all the books are unsatisfactory in this respect and that Book IV is more unsatisfactory than is Book III.

Table XLV, page 136, gives the calculations for this last analysis. A - B refers to successive differences between per cents of words falling beyond a frequency value of 6047. "D" is the difference. P.E._{diff.} is the probable error of the difference calculated by the accepted formula:

$$P.E._{A-B} = \sqrt{P.E._A^2 + P.E._B^2}$$

where the measures are uncorrelated.⁶

6. Dunlap, J. W., and Kurtz, A. K., Handbook of Statistical Nomographs, Tables and Formulas. 1932, Formula No. 157 A, p. 16.

TABLE XLV

STATISTICAL ANALYSIS OF THE PER CENT OF WORDS BEYOND A
FREQUENCY VALUE OF 6047 FOR FIVE SUPPLEMENTARY HISTORY BOOKS

A - B	D	P.E. _{diff.}	D/P.E. _{diff.}	Significant
.036 - .036	0.00	.0047	0.00	No
.036 - .030	.006	.0045	1.33	No
.036 - .046	.010	.0048	2.08	No
.036 - .041	.005	.0048	1.04	No
.036 - .030	.006	.0044	1.31	No
.036 - .046	.010	.0046	2.18	No
.036 - .041	.005	.0046	1.04	No
.030 - .046	.016	.0045	3.56	Yes
.030 - .041	.010	.0045	2.44	No
.046 - .041	.005	.0047	1.06	No

Table XLV gives the differences between the books for per cent of words beyond a frequency value of 6047. It reveals that Book IV has a significantly larger per cent of words beyond 6047 than does Book III and that none of the other differences are significant.

B. Sentence and Phrase Analysis

Sentences were analyzed on four bases:

1. Number of sentences to the paragraph
2. Number of sentences to the book as represented by the total of the seventeen selections
3. Average number of words to the sentence, counting five letters to the word
4. Average number of words to the book as represented by the total of the seventeen selections

Phrases were analyzed for the same four bases with an additional fifth, the number of phrases to the sentence.

Table XLVI, (page 139), gives the sentence and phrase analyses of the selections from Book I. The table shows the:

1. Number of words, (five letters to the word), to the paragraph and for the total selections
2. Number of phrases to the paragraph and for the total selections
3. Number of sentences to the paragraph and for the total selections

At the foot of Table XLVI is shown the mean and its probable error for:

1. Mean sentence-length
2. Mean phrase-length
3. Mean phrases to the sentence

Paragraph No. 1 in Table XLVI contains 72 words, counting five letters as one word. Paragraph No. 2 contains 75 unit words; Paragraph No. 3, 69, etc.

To obtain this unit word all of the letters in a paragraph were counted and the sum divided by five.

There are 12 phrases in the first paragraph and 5 sentences. The phrase-length of this paragraph is, then, 6 words, and the sentence-length, 14.5 words.

The fourteenth paragraph contains 121 words, 23 phrases and 9 sentences, hence its phrase-length is 6.2 words and its sentence-length 13.4. This means that Paragraph No. 14 is a longer paragraph than Paragraph No.1, but there is little difference in the length of the phrase or the sentence.

Paragraph No. 17 is again a long paragraph, its phrase-length of 6.7 words appearing much like that of the other two paragraphs, but its sentence-length of 15.1 words possibly making a significant difference. This paragraph also has 5 words lying beyond the 6047 range.

The number of words to the phrase and the number of words to the sentence for all of the paragraphs were computed as shown above. From these were calculated the means and their probable errors, as will be further discussed under Table LI, (page 146).

Tables XLVII, XLVIII, XLIX, and L give the number of words, number of phrases and number of sentences for Books II, III, IV and V.

The sentence-lengths of Books II and III appear somewhat alike with means of 15.29 and 15.64, but Book IV shows a mean sentence-length of 19.71. The significance of differences between these means is discussed in part C of this chapter.

TABLE XLVI

SENTENCE AND PHRASE ANALYSIS OF SELECTIONS COMPRISING
TEST MATERIAL FROM BOOK I*

Paragraph Number	Number of Words to the Paragraph	Number of Phrases to the Paragraph	Number of Sentences to the Paragraph
1	72	12	5
2	75	11	4
3	69	11	4
4	68	11	5
5	51	8	4
6	89	13	7
7	43	9	4
8	75	12	6
9	47	7	4
10	87	18	7
11	42	8	3
12	72	8	5
13	53	7	4
14	121	23	9
15	69	12	5
16	77	15	4
17	121	18	8
Total:	1231	203	88

Mean sentence length:
(5 letters to the word)

$$14.00 \pm 1.081$$

Mean phrase length:
(5 letters to the word)

$$8.11 \pm .221$$

Mean phrases to the sentence:

$$2.29 \pm .030$$

* Refers to Europe the Mother of America by Charles F. Horne and Olive Bucks. New York, Charles E. Merrill Company, 1930.

TABLE XLVII

SENTENCE AND PHRASE ANALYSIS OF SELECTIONS COMPRISING
TEST MATERIAL FROM BOOK II*

Paragraph Number	Number of Words to the Paragraph	Number of Phrases to the Paragraph	Number of Sentences to the Paragraph
1	148	27	9
2	61	12	5
3	80	14	7
4	44	7	3
5	98	20	7
6	114	19	8
7	53	9	4
8	105	20	6
9	48	5	3
10	85	11	6
11	87	14	4
12	83	12	5
13	87	12	5
14	107	16	6
15	92	13	7
16	87	13	5
17	120	22	8
Total:	1499	246	98

Mean sentence length:
(5 letters to the word)

$15.29 \pm .413$

Mean phrase length:
(5 letters to the word)

$6.11 \pm .170$

Mean phrases to the sentence:

$2.48 \pm .037$

* Refers to Our Nation's Heritage by Reuben Post Halleck
and Juliette Frantz, New York, American Book Company, 1931.

TABLE XLVIII
SENTENCE AND PHRASE ANALYSIS OF SELECTIONS COMPRISING
TEST MATERIAL FROM BOOK III*

Paragraph Number	Number of Words to the Paragraph	Number of Phrases to the Paragraph	Number of Sentences to the Paragraph
1	61	11	5
2	39	7	5
3	89	15	4
4	61	9	3
5	67	12	4
6	55	8	4
7	66	12	3
8	128	19	7
9	94	14	6
10	128	20	11
11	78	14	5
12	45	7	3
13	78	16	4
14	81	15	5
15	75	14	5
16	83	13	6
17	82	13	7
Total:	1310	219	89

Mean sentence length:
(5 letters to the word)

$$15.64 \pm .632$$

Mean phrase length:
(5 letters to the word)

$$5.89 \pm .042$$

Mean phrases to the sentence:

$$2.71 \pm .043$$

* Refers to The Old World Beginnings of America by
Mary C. Kelty. New York, Ginn and Company, 1932.

TABLE XLIX

SENTENCE AND PHRASE ANALYSIS OF SELECTIONS COMPRISING
TEST MATERIAL FROM BOOK IV*

Paragraph Number	Number of Words to the Paragraph	Number of Phrases to the Paragraph	Number of Sentences to the Paragraph
1	119	21	6
2	86	10	5
3	103	16	6
4	100	16	6
5	92	12	5
6	90	11	4
7	122	20	8
8	92	13	4
9	86	12	5
10	105	14	5
11	80	11	3
12	85	10	3
13	117	17	6
14	132	23	6
15	108	13	5
16	91	12	6
17	107	15	6
Total:	1715	246	89

Mean sentence length:
(5 letters to the word)

$$19.71 \pm .555$$

Mean phrase length:
(5 letters to the word)

$$7.11 \pm .224$$

Mean phrases to the sentence:

$$3.23 \pm .034$$

* Refers to The American People and Their Old World Ancestors by Grace Vollintine. New York, Ginn and Company, 1930.

TABLE L

SENTENCE AND PHRASE ANALYSIS OF SELECTIONS COMPRISING
TEST MATERIAL FROM BOOK V*

Paragraph Number	Number of Words to the Paragraph	Number of Phrases to the Paragraph	Number of Sentences to the Paragraph
1	135	19	7
2	92	12	5
3	127	19	7
4	109	14	7
5	92	11	6
6	69	12	4
7	178	32	10
8	121	17	6
9	71	8	4
10	113	15	6
11	89	11	5
12	73	10	3
13	54	8	3
14	74	13	5
15	63	11	5
16	53	8	4
17	43	10	3
Total:	1556	230	90

Mean sentence length:
(5 letters to the word)

$$17.23 \pm .455$$

Mean phrase length:
(5 letters to the word)

$$6.89 \pm .216$$

Mean phrases to the sentence:

$$2.53 \pm .084$$

* Refers to The Elementary World History by Charles A. Beard and William C. Bagley. New York, The Macmillan Company, 1932.

Table LI, (page 146), gives the statistical analysis of the data in Tables XLVI and XLVII, (pages 139-140) for Books I and II.

Analysis is given for:

1. Sentence-length in words
2. Phrase-length in words
3. Number of phrases to the sentence

For each of the above Table LI gives the:

1. Mean
2. Standard deviation of the distribution
3. Probable error of the distribution
4. Probable error of the mean
5. Standard error of the mean
6. Standard error of the standard deviation

The means were first calculated for the sentence-length of each book from the guessed average by the formula:

$$M = G.A. \pm c^7$$

The standard deviations were then computed by the formula:

$$\sigma = \sqrt{\frac{\sum (x^2)}{N} - \frac{(\sum x)^2}{N^2}}^8$$

The probable errors of the distribution were taken from Dunlap's and Kurtz' table: "Converting Standard Errors to Probable Errors."⁹

7. Barrett, Henry E., Statistics in Psychology and Education. 1932, p. 29.
8. Dunlap, J. W., and Kurtz, A. K., Handbook of Statistical Nomographs, Tables and Formulas. 1932, Formula No. 37-A, p. 14.
9. Ibid., Table 90, p. 90.

The probable error of the mean was calculated from the formula:

$$P.E._M = \frac{P.E.}{\sqrt{N}} \quad 10$$

the standard deviation of the mean, from the formula:

$$\sigma_M = \frac{\sigma}{\sqrt{N}} \quad 11$$

the standard errors of the standard deviations were calculated from the formula:

$$\sigma_{\sigma} = \frac{\sigma}{\sqrt{2N}} \quad 12$$

The same procedures were used to analyze the phrase-length and the number of phrases to the sentence.

Table LII, (page 147), shows the analysis of the data in Tables XLVIII and XLIX for Book III and Book IV.

Table LIII, (page 148), shows the analysis of data in Table L for Book V.

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10. Dunlap, J. W., and Kurtz, A. K., Handbook of Statistical Nomographs, Tables and Formulas. 1932, Formula No. 5 B, p. 6.
 11. Ibid., Formula No. 5, p. 4.
 12. Ibid., Formula No. 41, p. 18.

TABLE LI

STATISTICAL ANALYSIS OF THE SENTENCE LENGTH (WORDS), PHRASE LENGTH (WORDS), AND THE NUMBER OF PHRASES TO THE SENTENCE OF THE SEVENTEEN SELECTIONS FROM THE FIVE SIXTH GRADE HISTORY BOOKS

BOOK I*			
Sentence Length (Words)	Phrase Length (Words)	Number of Phrases to the Sentence	
Mean	14.00	6.11	2.29
Standard Deviation	6.41	1.31	.132
Probable Error	4.323	.884	.132
Probable Error of Mean	1.081	.221	.030
Standard Deviation of Mean	1.601	.327	.044
S.D. of Standard Deviation	1.090	.225	.033
BOOK II*			
Sentence Length (Words)	Phrase Length (Words)	Number of Phrases to the Sentence	
Mean	15.29	6.11	2.48
Standard Deviation	2.48	1.019	.222
Probable Error	1.652	.681	.149
Probable Error of Mean	.413	.170	.037
Standard Deviation of Mean	.612	.252	.054
S.D. of Standard Deviation	.433	1.75	.041

* Refers to: Book I Europe the Mother of America by Charles F. Horne and Olive Bucks.
New York, Charles E. Merrill Company, 1930.
Book II Our Nation's Heritage by Reuben Post Halleck and Juliette Frantz.
New York, American Book Company, 1931.

TABLE LII

STATISTICAL ANALYSIS OF THE SENTENCE LENGTH (WORDS), PHRASE LENGTH (WORDS), AND THE NUMBER OF PHRASES TO THE SENTENCE OF THE SEVENTEEN SELECTIONS FROM THE FIVE SIXTH GRADE HISTORY BOOKS

BOOK III*			
Sentence Length (Words)	Phrase Length (Words)	Number of Phrases to the Sentence	
Mean	15.64	5.89	2.71
Standard Deviation	3.75	.261	.257
Probable Error	2.529	.177	.173
Probable Error of Mean	.632	.042	.043
Standard Deviation of Mean	.937	.062	.063
S.D. of Standard Deviation	.643	.447	.044

BOOK IV*			
Sentence Length (Words)	Phrase Length (Words)	Number of Phrases to the Sentence	
Mean	19.71	7.11	3.23
Standard Deviation	3.29	1.33	.204
Probable Error	2.219	.897	.137
Probable Error of Mean	.555	.224	.034
Standard Deviation of Mean	.822	.332	.050
S.D. of Standard Deviation	.547	.228	.035

* Refers to: Book III The Old World Beginnings of America by Mary C. Kelty. New York, Ginn and Company, 1932.
 Book IV The American People and Their Old World Ancestors by Grace Vollintine. New York, Ginn and Company, 1930.

TABLE LIII

STATISTICAL ANALYSIS OF THE SENTENCE LENGTH (WORDS), PHRASE LENGTH (WORDS), AND THE NUMBER OF PHRASES TO THE SENTENCE OF THE SEVENTEEN SELECTIONS FROM THE FIVE SIXTH GRADE HISTORY BOOKS

BOOK V*			
	Sentence Length (Words)	Phrase Length (Words)	Number of Phrases to the Sentence
Mean	17.23	6.89	2.53
Standard Deviation	2.71	1.18	.50
Probable Error	1.820	.853	.337
Probable Error of Mean	.455	.216	.084
Standard Deviation of Mean	.674	.320	.124
S.D. of Standard Deviation	.464	.202	.085

* Refers to: Book V The Elementary World History by Charles A. Beard and William C. Bagley.
New York, The Macmillan Company, 1932.

C. Comparison of the Five Books for Sentence-Length

Table LV, (page 152), compares the five books for sentence-length. The data for these comparisons have been given previously in Tables XLVI to LIII. These data are brought together in Table LV.

In this table $M_1 - M_2$ is the difference between the mean sentence-length of Book I and Book II; $M_1 - M_3$ is the difference between Book I and Book III, etc. The difference between $M_1 - M_2$ is 1.29; the difference between 15.29 and 14.00. (Table LI)

P.E. diff. is the probable error of the difference between means, in this case, $M_1 - M_2$. It was calculated from the formula:

$$P.E. - M_1 - M_2 = \sqrt{P.E.^2_{M_1} + P.E.^2_{M_2}} \quad 13$$

where P.E. refers to probable error of the mean and $M_1 - M_2$ to successive means.

Diff./P.E. diff. is the difference between means divided by its probable error. In this case: $1.29/1.15 = 1.12$. If a difference divided by its probable error is 3.0 or more, it is considered significant. These are indicated by "Yes" or "No."¹⁴

13. Dunlap, J. W., and Kurtz, A. K., Handbook of Statistical Nomographs, Tables and Formulas. 1932, Formula No. 157 A, p. 16.
14. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology. Volume 21, 1937, p. 5.

Compared on their sentence-length, then, there is a significant difference between Book I and Book IV, Book III and Book IV, and Book V and Book IV.

The most significant difference between books is between Book II and Book IV, while the least significant difference is between Book II and Book III, thus indicating that Books II and IV are different to a marked degree and Books II and III are much alike.

When ranked as to mean sentence-length the books show the following order:

TABLE LIV

BOOKS RANKED AS TO SENTENCE-LENGTH (WORDS)
(No. 5, greatest mean length; No. 1, least mean length)

Books	Author	Rank
IV	Vollintine	5
V	Beard and Bagley	4
III	Kelty	3
II	Halleck and Frantz	2
I	Horne and Bucks	1

When the books were compared for any differences in their standard deviations, a significant difference appeared between Books I and II, Books I and III, Books I and IV, and Books I and V.

KEY TO THE FOLLOWING TABLES LV, LVII, LIX, LXII, LXIV

$M_A - M_B$

Comparison between the various Means for the seventeen selections from Book I and Book II, etc., such as Sentence Length, Number of Phrases and Words to Phrase.

Diff.

Difference between Means

$P.E. \text{ diff. } M$

Probable Error of difference between Means

$\text{Diff.} / P.E. \text{ diff. } M$

Difference between Means divided by their Probable Errors

$\sigma_A - \sigma_B$

Differences between the Standard Deviations of the seventeen selections from Book I, Book II, etc.

Diff.

Difference between Standard Deviations

$P.E. \text{ diff. } \sigma$

Probable Error of difference between Standard Deviations

$\text{Diff.} / P.E. \text{ diff. } \sigma$

Difference between Standard Deviations divided by their Probable Errors.

Significant?

If a difference divided by its probable error is 3.0 or more, it is considered significant; if less, it is considered not significant. These are indicated by "Yes" or "No." (Link, H.C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology, Volume 21, 1937, p. 5.

TABLE LV

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR SENTENCE LENGTH* OF THE SELECTIONS FROM THE FIVE HISTORY BOOKS

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
M_A-M_B	Diff. P.E.	diff. $\bar{M}$	Diff./P.E. diff. $\bar{M}$	Signif.?	$\sigma_A-\sigma_B$	Diff. P.E. diff. σ	Diff./P.E. diff. σ	Signif.?	
M_1-M_2	1.29	1.15	1.12	No	$\sigma_1-\sigma_2$	3.96	.300	13.20	Yes
M_1-M_3	1.64	1.25	1.31	No	$\sigma_1-\sigma_3$	2.66	.439	6.04	Yes
M_1-M_4	5.71	1.19	4.79	Yes	$\sigma_1-\sigma_4$	3.13	.376	8.32	Yes
M_1-M_5	3.23	1.16	2.69	No	$\sigma_1-\sigma_5$	3.70	.319	11.28	Yes
M_2-M_3	.33	.75	.46	No	$\sigma_2-\sigma_3$	1.30	.524	2.48	No
M_2-M_4	4.42	.69	6.40	Yes	$\sigma_2-\sigma_4$	.84	.470	.17	No
M_2-M_5	1.94	.93	2.08	No	$\sigma_2-\sigma_5$	.26	.428	.06	No
M_3-M_4	4.07	.84	4.84	Yes	$\sigma_3-\sigma_4$	.46	.563	.06	No
M_3-M_5	1.59	.77	2.06	No	$\sigma_3-\sigma_5$	.04	.534	.07	No
M_4-M_5	2.48	.72	3.44	Yes	$\sigma_4-\sigma_5$	.58	.482	1.20	No

* Sentence Length - the number of words to a sentence counting five letters to the word.

**F. Comparison of the Five Books for
Number of Sentences to the Paragraph**

The books were compared for the number of sentences to the paragraph by the same process as used for sentence-length.

Table LVI gives the following data for each of the five books:

1. Mean
2. Standard deviation
3. Probable error
4. Probable error of mean
5. Standard error of the standard deviation

As the means appear in Table LVI they seem much alike with Book II showing the largest number of sentences to the paragraph and Book III the smallest number.

TABLE LVI

STATISTICAL ANALYSIS OF THE NUMBER OF SENTENCES TO THE PARAGRAPH OF THE SEVENTEEN SELECTIONS FROM THE FIVE SIXTH GRADE HISTORY BOOKS

Sentences Per Paragraph	Book I	Book II	Book III	Book IV	Book V
Mean	5.23	5.77	5.11	5.23	5.29
Standard Deviation	1.55	1.66	2.56	1.21	1.77
Probable Error	1.045	1.120	1.720	.816	1.194
Probable Error of Mean	.261	.280	.430	.204	.298
Standard Error of Standard Deviation	.265	.284	.437	.207	.303

TABLE LVII

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE NUMBER OF SENTENCES TO THE PARAGRAPH OF THE SEVENTEEN SELECTIONS FROM THE FIVE HISTORY BOOKS

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	Diff./P.E.	Signf.?		$\sigma_A - \sigma_B$	Diff. P.E.	Diff./P.E.	Signf.?	
	diff. M	diff. M				diff. σ	Diff. σ		
$M_1 - M_2$	.54	.772	.69	No	$\sigma_1 - \sigma_2$	.021	.596	.03	No
$M_1 - M_3$	.12	.938	.14	No	$\sigma_1 - \sigma_3$	.173	.344	.50	No
$M_1 - M_4$	0.0	.748	.0	No	$\sigma_1 - \sigma_4$	.058	.225	.25	No
$M_1 - M_5$	.06	.772	.07	No	$\sigma_1 - \sigma_5$	.038	.273	.13	No
$M_2 - M_3$	.66	.513	1.28	No	$\sigma_2 - \sigma_3$	.143	.350	.40	No
$M_2 - M_4$	.54	.346	1.56	No	$\sigma_2 - \sigma_4$	.077	.236	.32	No
$M_2 - M_5$	.48	.407	1.17	No	$\sigma_2 - \sigma_5$	.019	.279	.06	No
$M_3 - M_4$	.12	.475	.25	No	$\sigma_3 - \sigma_4$	.230	.246	.93	No
$M_3 - M_5$	.18	.522	.34	No	$\sigma_3 - \sigma_5$	.066	.357	.18	No
$M_4 - M_5$	.06	.360	.16	No	$\sigma_4 - \sigma_5$	.096	.246	.39	No

To determine whether the differences are significant, the data from Table LVI is compiled in Table LVII, (page 154), where each of the five books is compared with each of the other books for any difference between means and standard deviations.

There are no significant differences between any of the books when compared for the number of sentences to the paragraph. Books I and IV are most alike, while Books II and IV show the highest ratio of difference.

When ranked for sentences to the paragraph, the books appear in the following order:

TABLE LVIII

BOOKS RANKED AS TO NUMBER OF SENTENCES TO THE PARAGRAPH

Book	Author	Rank
II	Halleck and Frantz	5
V	Beard and Bagley	4
IV	Vollintine	$2\frac{1}{2}$
I	Horne and Bucks	$2\frac{1}{2}$
III	Kelty	1

D. Comparison of the Five Books
for Phrase-Length

The first column of Tables XLVI to L, (pages 139 to 143), gives the tabulation of the number of words, (five letters to the word), for each paragraph from the five history books.

The second column gives the number of phrases to the paragraph. Thus the first paragraph of Book V, (page 143), has 135 words and 19 phrases. The average phrase-length, then, of Paragraph No. 1 is $(135 \div 19)$ 7.1 words.

TABLE LIX

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE NUMBER OF WORDS TO THE PHRASE OF THE SELECTIONS FROM THE FIVE HISTORY BOOKS

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	Diff./P.E.	Signf.?		$\sigma_A - \sigma_B$	Diff. P.E.	Diff./P.E.	Signf.?	
	diff. $\bar{M}$	diff. $\bar{M}$				diff. σ	Diff. σ		
$M_1 - M_2$	0.0	.27	.0	No	$\sigma_1 - \sigma_2$	.31	.192	1.61	No
$M_1 - M_3$	.22	.23	.95	No	$\sigma_1 - \sigma_3$	1.05	.337	3.11	Yes
$M_1 - M_4$	1.00	.31	3.21	Yes	$\sigma_1 - \sigma_4$	.02	.150	.13	No
$M_1 - M_5$	.78	.31	2.51	No	$\sigma_1 - \sigma_5$	.13	.203	.64	No
$M_2 - M_3$	.22	.18	1.22	No	$\sigma_2 - \sigma_3$	.75	.323	2.32	No
$M_2 - M_4$	1.00	.28	3.57	Yes	$\sigma_2 - \sigma_4$	.32	.168	1.90	No
$M_2 - M_5$	.78	.27	2.14	No	$\sigma_2 - \sigma_5$	.17	.201	.84	No
$M_3 - M_4$	1.22	.26	4.69	Yes	$\sigma_3 - \sigma_4$	1.07	.337	3.11	Yes
$M_3 - M_5$	1.00	.22	4.54	Yes	$\sigma_3 - \sigma_5$	.92	.330	2.78	No
$M_4 - M_5$	.22	.31	.70	No	$\sigma_4 - \sigma_5$	.15	.205	.74	No

Under the second caption at the foot of the tables, (XLVI to L), are given the mean phrase-lengths and their probable errors for the five books.

Tables LI to LIII, (pages 146-148) give the statistical analysis for the:

1. Mean
2. Standard deviation of the distribution
3. Probable error of the distribution
4. Probable error of the mean
5. Standard error of the mean
6. Standard error of the standard deviation

These data are brought together in Table LIX, (page 156), for comparison of the means and standard deviations of the five books.

Table LIX shows that significant differences are found between Book I and Book IV, Book II and Book IV, Book III and Book IV, and Book III and Book V.

Book IV, with a mean phrase-length of 7.11 words, appears as most unlike the other books. Book I and Book II appear to be much alike, as do Books I and III. The difference between Book II and Book III, though not significant, is 1.22 and somewhat larger than the other differences of 0.0 and .95, which means that the phrase-length of Book III is slightly more like that of Book I than that of Book II.

The phrase-length of Book V is more like that of Book IV than it is like any of the other books, differing most from Book III.

This is just the reverse of what was found when the books were compared for sentence-length. Book V is more like Book III on sentence-length than it is like Book IV. (Table LV, p. 152).

When compared for variability, the phrase-length of Book V is slightly nearer to Book IV than Book III, though neither of the differences is significant. There is a significant difference, however, between Books I and III, and Books III and IV for phrase-length.

When ranked for phrase-length the books appear in the following order:

TABLE LX
BOOKS RANKED AS TO PHRASE-LENGTH (WORDS)

Book	Author	Rank
IV	Vollintine	5
V	Beard and Bagley	4
I	Horne and Bucks	2 $\frac{1}{2}$
II	Halleck and Frantz	2 $\frac{1}{2}$
III	Kelty	1

E. Comparison of the Five Books for the
Number of Phrases to the Paragraph

The number of phrases counted for each paragraph for the five books is tabulated in Tables XLVI to L, (pages 139 to 143). The statistical analysis is given in Table LXI, (page 159).

These data are brought together in Table LXII, (page 160), where a comparison is made for the means and standard deviations of the five books for any significant difference in the number of phrases to the paragraph.

TABLE LXI

STATISTICAL ANALYSIS OF THE NUMBER OF PHRASES TO THE PARAGRAPH OF THE SEVENTEEN SELECTIONS FROM THE FIVE SIXTH GRADE HISTORY BOOKS

Phrases to Paragraph	Book I	Book II	Book III	Book IV	Book V
Mean	11.95	14.76	12.89	14.48	13.89
Standard Deviation	4.27	5.41	3.62	3.79	5.72
Probable Error	2.880	3.642	2.442	2.556	3.865
Probable Error of Mean	.720	.910	.610	.639	.966
Standard Error of Standard Deviation	.735	.927	.620	.649	.981

TABLE LXII

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE NUMBER OF PHRASES TO THE PARAGRAPH OF THE SEVENTEEN SELECTIONS FROM THE FIVE HISTORY BOOKS

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	diff. M	Diff./P.E. diff. M	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. σ	Diff./P.E. diff. σ	Signf.?
$M_1 - M_2$	2.81	.366	.75	No	$\sigma_1 - \sigma_2$	1.14	.796	1.44	No
$M_1 - M_3$	.94	.298	3.15	Yes	$\sigma_1 - \sigma_3$	.65	.611	1.06	No
$M_1 - M_4$	2.53	.962	2.62	No	$\sigma_1 - \sigma_4$	.48	.661	.72	No
$M_1 - M_5$	1.94	.727	2.67	No	$\sigma_1 - \sigma_5$	1.45	.823	1.76	No
$M_2 - M_3$	1.87	.346	5.44	Yes	$\sigma_2 - \sigma_3$	.79	.755	1.04	No
$M_2 - M_4$	.28	.352	.79	No	$\sigma_2 - \sigma_4$	1.62	.762	2.12	No
$M_2 - M_5$	.87	.426	2.04	No	$\sigma_2 - \sigma_5$	.31	1.025	.30	No
$M_3 - M_4$	1.59	.883	1.80	No	$\sigma_3 - \sigma_4$	.17	.605	.28	No
$M_3 - M_5$	1.00	.369	2.70	No	$\sigma_3 - \sigma_5$	2.10	.782	2.67	No
$M_4 - M_5$	.59	.374	1.60	No	$\sigma_4 - \sigma_5$	1.93	.789	2.44	No

If a difference divided by its probable error is 3.00 or more, it is considered significant; if less, it is considered not significant.¹⁵ If this difference was significant, it was marked "Yes;" if not significant, "No."

Observation of Table LXII shows a difference of 2.81 between M_1 and M_2 , which, divided by its probable error gives .76, which is not significant. There is a difference of 1.87 between M_2 and M_3 , critical ratio, 5.44, which is of course significant.

Significant differences were found between Books I and III, and II and III.

There are no significant differences between the standard deviations on the number of phrases to the paragraph.

In number of phrases to the paragraph, the five books rank as follows:

TABLE LXIII
BOOKS RANKED FOR NUMBER OF PHRASES TO THE PARAGRAPH

Book	Author	Rank
II	Halleck and Frantz	5
IV	Vollintine	4
V	Beard and Bagley	3
III	Kelty	2
I	Horne and Bucks	1

Book I shows the greatest difference when compared with the other four books for the number of phrases to the paragraph. Book V shows the least difference. Significant differences are found between the means of Books I and

15. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology. Volume 21, 1937, p.5

III, and Books II and III. No significant differences are found between the standard deviations of any of the books.

G. Comparison of the Five Books for the Number of Phrases to the Sentence

Tables XLVI to L, (pages 139-43), show the tabulation of the number of sentences and the number of phrases for each of the seventeen selections from the five books. Table XLVI, (page 139), shows the tabulations from Book I.

Paragraph No. 1 contains 12 phrases and 5 sentences. There are, then, an average of 2.5 ($12 \div 5$) phrases to the sentence.

Paragraph No. 2 contains 11 phrases and 4 sentences, with an average of 2.7 ($11 \div 4$) phrases to the sentence. The same may be found for all sentences in the seventeen paragraphs.

The mean number of phrases to the sentence and their probable errors are given for each of the books at the foot of the table. Book I, for example, has a mean of 2.29 phrases to the sentence, with a probable error of $\pm .030$.

The statistical analysis for the number of phrases to the sentence is given in Tables LI to LIII, (pages 146-148). The comparison of the five books for significant differences between means and standard deviations is given in Table LXIV, (page 163).

Here some of the differences between means show a very marked significance. Book II and Book IV show the greatest difference of 15.00.

TABLE LXIV

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR NUMBER OF PHRASES TO THE SENTENCE OF THE SELECTIONS FROM THE FIVE HISTORY BOOKS

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	diff. M	Diff. / P.E.	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. σ	Diff. / P.E.	Signf.?
			diff. M					diff. σ	
$M_1 - M_2$	.19	.101	1.88	No	$\sigma_1 - \sigma_2$	.040	.010	4.00	Yes
$M_1 - M_3$	.42	.104	4.03	Yes	$\sigma_1 - \sigma_3$	.075	.036	2.08	No
$M_1 - M_4$	.94	.100	9.40	Yes	$\sigma_1 - \sigma_4$	.022	.032	.68	No
$M_1 - M_5$	.24	.126	2.69	No	$\sigma_1 - \sigma_5$	.318	.061	5.21	Yes
$M_2 - M_3$	.23	.057	4.01	Yes	$\sigma_2 - \sigma_3$	.035	.039	.89	No
$M_2 - M_4$	.75	.050	15.00	Yes	$\sigma_2 - \sigma_4$	.018	.036	.50	No
$M_2 - M_5$	.05	.092	.54	No	$\sigma_2 - \sigma_5$	.278	.063	4.40	Yes
$M_3 - M_4$	.52	.055	9.45	Yes	$\sigma_3 - \sigma_4$	.053	.037	1.40	No
$M_3 - M_5$	.18	.094	1.91	No	$\sigma_3 - \sigma_5$	.243	.064	3.79	Yes
$M_4 - M_5$	.70	.090	7.77	Yes	$\sigma_4 - \sigma_5$	.296	.061	4.85	Yes

Significant differences are shown between Books IV and I, IV and II, IV and III, IV and V, III and I, and III and II. Books I and II appear much alike, as do Books II and V.

In the comparison of the five books for the number of phrases to the sentence, Books V and IV are found to be quite different, but the difference between Book III and Book V is not significant. Book V is, then, more like Book III in number of phrases to the sentence than it is like Book IV.

Differences are significant between the standard deviations for Books I and II, Books I and V, Books II and V, Books III and V, and Books IV and V.

Ranked as to the average number of phrases to the sentence, the books appear as follows:

TABLE LXV

BOOKS RANKED FOR THE AVERAGE NUMBER OF PHRASES TO THE SENTENCE

Book	Author	Rank
IV	Vollintine	5
III	Kelty	4
V	Beard and Bagley	3
II	Halleck and Frantz	2
I	Horne and Bucks	1

A summary of the six rankings of the five history books is given in Table LXVI, (page 165). In order to have one composite measure on which to judge the rank order of the difference between the books, the six ratings were averaged for each book. These averages appear at the foot of Table LXVI.

TABLE LXVI

BOOKS RANKED AS TO VOCABULARY, SENTENCE-LENGTH, (WORDS), PHRASE-LENGTH, (WORDS), PHRASES TO THE SENTENCE, NUMBER OF SENTENCES TO PARAGRAPH, AND NUMBER OF PHRASES TO PARAGRAPH

	Book I	Book II	Book III	Book IV	Book V
Vocabulary	2	4	1	5	3
Sentence Length in Words	1	2	3	5	4
Phrase Length in Words	2½	2½	1	5	4
Phrases to Sentence	1	2	4	5	3
Sentences to Paragraph	2½	5	1	2½	4
Phrases to Paragraph	1	5	2	4	3
Average Rank	1.66	3.41	2.00	4.25	3.50

Using the average rankings of the books as a scale,
they appear in the following order:

TABLE LXVII

BOOKS RANKED AS TO THE AVERAGE RATINGS ON VOCABULARY, SENTENCE-LENGTH, (WORDS), PHRASE-LENGTH, (WORDS), PHRASES TO THE SENTENCE, SENTENCES TO THE PARAGRAPH, AND NUMBER OF PHRASES TO THE PARAGRAPH

Book	Author	Rank
IV	Vollintine	5
V	Beard and Bagley	4
II	Halleck and Frantz	3
III	Kelty	2
I	Horne and Bucks	1

SUMMARY OF VOCABULARY ANALYSES OF THE FIVE HISTORY BOOKS

The five books were analyzed and judged by a criteria of:

1. Vocabulary lying within the 6047 range on the Thorndike Scale¹⁵
2. Sentence-length in words
3. Number of sentences to the paragraph
4. Phrase-length in words
5. Number of phrases to the paragraph
6. Number of phrases to the sentence

Each of the five books was compared with each of the other four books by the above criteria for any likeness or difference that existed between them.

1. For vocabulary range per cents were used for comparing the books. For all other measures, statistical analysis was used to determine the difference or likeness between books by comparing the means and standard deviations of the books for the above six measures. That is, the mean and standard deviation of Book I was compared with the mean and standard deviation of Books II, III, IV and V, for vocabulary beyond 6047, etc.

When compared for the per cent of words lying within the accepted range of 6047,¹⁶ Book III was the only book of the five which showed 97 per cent¹⁷ of its vocabulary to be within 6047. Books I and II ranked the same with 96.5 per cent

15. Thorndike, E. L., The Teachers Wordbook of Ten Thousand Words. 1923, p. iii.

16. Vocabulary Range based on Thorndike, Terman, and Metropolitan Achievement Tests, op. cit., Chapter III, p. 46.

17. Author's arbitrary vocabulary standard, op.cit., Chapter III, p. 67.

of their vocabulary below 6047. Book II, however, had 2.1 per cent of the remaining 3.5 per cent beyond 10,000, while Book I had only 1.7 per cent beyond 10,000. All the books had a significant per cent of words beyond the 6047 frequency, however.

Book III, may be said to contain the smallest number of uncommon words and Book IV the largest number of them.

2. Compared for sentence-length, the most significant difference was found between Books II and IV. The least difference was between Books II and III. As determined by the difference between means, Books II and IV were different to a marked degree, and Books II and III were much alike.

3. When compared for the number of phrases to the paragraph, Book II ranked high, and Book I low. Statistical comparison of the means showed significant differences between Books I and III and Books II and III.

4. No significant difference was found between any of the books when compared for the number of sentences to the paragraph. The greatest difference, though small, was again between Books II and IV. When ranked for number of sentences to the paragraph, Book III was low and Book II high.

5. There are marked differences between the books when compared for the number of words to the sentence. Significant differences were found between Books I and IV, Books II and IV, Books III and IV, and Books IV and V. Book IV here was most

unlike the other books, the greatest difference being between it and Book II, Books I and II, and Books II and III show the least difference when compared for the number of words to the sentence.

Significant differences were found between the standard deviations for: Books I and II, Books I and III, Books I and IV, and Books I and V.

6. Ranked for the number of phrases to the sentence, Book IV was high and Book I low.

Books IV and V show a marked difference, but the difference between Books II and V in this comparison is not significant. Books I and II appear much alike, as do Books II and V. Significant differences are found between Books I and II, I and IV, III and IV, II and V, III and I, and II and III.

Book IV is most consistently unlike the other four books. It has the highest vocabulary, the longest sentences, the longest phrases, and the most phrases to the sentence. In number of sentences to the paragraph it ranks with Book I. Book IV, however, has an average of 19.71 words to the sentence, while Book I has only 14.00 words. In phrases to the paragraph, Book IV ranks fourth with an average of 14.48 phrases to the paragraph with a mean word-length of 7.11.

Book V is more like Book IV than the other books, while Book II is nearest like Book V. Book I and Book III are much alike. Book III has longer sentences than Book I and more phrases to the sentence. These phrases, however, are short, with an average of 5.89 words to the phrase.

H. Further Analysis of the Five History Books with Respect to the Suitability for Sixth-A Grade Pupils

1. Vocabulary Range

An inspection of Table XLIII, page 131, shows that Book III is the only one of the five books with 97 per cent (100.0% - 3.0%) of its vocabulary within a frequency range of 6047 -- the limit arbitrarily established by the author as desirable for sixth-A grade children. (See page 67).

Book IV, with 95.4 per cent (100.0% - 4.6%) of its vocabulary within the prescribed range, appears to have the most difficult vocabulary, though as shown in Table XLV page 136, only one of the differences between the per cent of words beyond 6047 is statistically reliable. It will be remembered that all five of the books have a significant per cent of words beyond the 6047 frequency level.

2. Degree of Comprehension with which Sixth-A Pupils Read the Five Books

The reading age of all pupils used in this study was determined from their test performances on the Metropolitan Achievement Tests¹⁶ and these were compared with the degree of accuracy with which they answered the questions on the tests of comprehension.

16. Metropolitan Achievement Tests, Intermediate Battery-Partial: Form A. For Grades 4, 5, and 6. Edited by Jacob S. Orleans - 1932.

The individual scores of the children in the groups were equated for chronological age, mental age, and reading age, and were used to set up age and grade categories, (no child being used more than once). Table I to V, Appendix A.

The pupils from School A, who were tested on Book I were grouped in age and grade categories according to the age and grade norms on the Metropolitan Achievement Tests.

These are shown in Table LXVIII, page 182. All children having a reading age of 9 years and 5 months were placed in the grade-norm group of 4.1, 4.1 being the grade-norm for pupils making a reading age of 9-5 years. All pupils scoring a reading age of 9-10 years were placed in the 4.4 grade-norm category, etc.

The number of children reading in each group was tabulated and converted into the per cent of the total number of children taking the test. Thus 8.1 per cent of the pupils in Group I were reading at a 4.1 grade level as determined by the Metropolitan Achievement Test, 13.5 per cent were reading at a 6.8 level, and 8.1 per cent were reading at a level above 6.8 level (Table LXVII).

The number of correct responses to the tests of comprehension was tabulated for each age and grade step. Correct responses, or scores, were converted into per cents by dividing the number of correct responses in each step by the total possible scores. These are called per cents of accuracy.

The pupils in step 9-5, for example, answered the tests of comprehension on Book I with 64 per cent accuracy. The pupils in step 12-5 answered with 92 per cent accuracy.

The number of minutes used by each child to complete the tests was tabulated for each step and these were averaged.

13.5 per cent of the pupils of Group I were reading at a grade 6.8 level. They read the seventeen selections from Book I, and answered the questions on them in an average of 25 minutes.

Since the pupils used in this study had been in the sixth grade eight months, 6.8 was used as their grade level and 12-5 years as their reading age. (Chapter III, p.70). A book was considered as suitable for them if they could read it with 75 per cent accuracy. These children (6.8 grade, 12-5 years) read Book I for example with 92 per cent accuracy. 78.4 per cent of the group (steps 10-0 to 12-5) read it with a degree of accuracy above 75 per cent.

It will be seen that there is a gradual though irregular increase in the amount the pupils comprehended with a corresponding increase in reading age. The amount of time taken to finish the tests decreases as the reading ability increases. (See Table LXVII, page 172).

By the above criteria, Book I, Europe the Mother of America, by Horne and Bucks may be accepted as suitable for Group I since the five groups are comparable in

terms of chronological age, mental age, and reading age.

Book I may be said to be reasonably suitable in comprehensibility for the groups from each of the five schools.

TABLE LXVIII

AGE AND GRADE NORMS FROM THE METROPOLITAN ACHIEVEMENT TESTS,
AVERAGE NUMBER OF PUPILS IN EACH AGE AND GRADE CATEGORY,
AVERAGE SCORE, PER CENT OF ACCURACY, AND TIME TO COMPLETE
HISTORY COMPREHENSION TESTS

Group I					
Age	Grade	Per Cent of Pupils	Average Score	Per Cent of Accuracy	Time
9-0	0.0	0.0	0.0	0.0	0.0
9-5	4.1	8.1	44	64	32
9-10	4.4	5.4	47	69	41
10-0	4.6	10.8	54	79	40
10-5	4.10	10.8	54	79	40
10-10	5.3	16.3	57	83	28
11-0	5.5	8.1	60	88	25
11-5	5.9	5.4	62	91	35
11-10	6.3	8.1	61	89	29
12-0	6.4	5.4	63	92	27
12-5	6.8	13.5	63	92	25
12-10	7.3	8.1	62	91	25
13-0	7.5	0.0	0.0	0.0	0.0
13-5	7.9	0.0	0.0	0.0	0.0
13-10	8.4	0.0	0.0	0.0	0.0

Table LXIX, page 174, gives the data for Group II, or the pupils tested on Book II.

These pupils were in Chronological-Age Group II, Mental Age Group II, and Reading Age Group II.

They were grouped in age and grade categories by the same procedures used for the children in Group I.

Inspection of Table LXIX shows that the reading age range for this group is from 9-5 to 13-5 years. 3.5 per cent of this group are at a grade level of 6.8, and 12-5 reading age. These pupils answered the questions on Book II with 94 per cent accuracy in an average time of 30 minutes.

82.7 per cent of the group, not including those pupils beyond 12-5, answered the questions with an accuracy of 75 per cent or better. 72.4 per cent of the pupils were beyond 75 per cent accuracy.

It will be seen that comprehension increased with reading ability and that the amount of time required, decreased. Both of these however, are irregular, and at the 13-0 level fell below that of children with a reading age of two months less. Since the pupils at the 12-5 reading age level read Book II with 94 per cent accuracy, and 82.7 per cent of the group below the 12-10 level, read it with an accuracy of 75 per cent or better, the book, Our Nation's Heritage, by Halleck and Frantz may be accepted as suitable for these groups.

TABLE LXIX

AGE AND GRADE NORMS FROM THE METROPOLITAN ACHIEVEMENT TESTS, AVERAGE NUMBER OF PUPILS IN EACH AGE AND GRADE CATEGORY, AVERAGE SCORE, PER CENT OF ACCURACY, AND TIME TO COMPLETE HISTORY COMPREHENSION TESTS

Group II					
Age	Grade	Per Cent of Pupils	Average Score	Per Cent of Accuracy	Time
9-0	3.7	0.0	0.0	0.0	0.0
9-5	4.1	0.0	0.0	0.0	0.0
9-10	4.4	6.9	41	60	45
10-0	4.6	10.3	51	75	49
10-5	4.10	13.7	52	76	43
10-10	5.3	10-3	58	85	38
11-0	5.5	13.7	55	80	26
11-5	5.9	17.4	57	83	36
11-10	6.3	6.9	59	86	31
12-0	6.4	6.9	64	94	30
12-5	6.8	3.5	64	94	30
12-10	7.3	6.9	66	97	31
13-0	7.5	3.5	62	91	33
13-5	7.9	0.0	0.0	0.0	0.0
13-10	8.4	0.0	0.0	0.0	0.0

Table LXX, page 176, gives the data for Group III, or the pupils tested on Book III.

Age level 12-5 shows that 14.7 per cent of the group were at a 6.8 grade level.

Of the pupils in Group III, 7.4 per cent had a reading ability of 10-0 years. They scored 71 per cent accuracy.

There is a large increase, however, in the degree of accuracy from the 10-0 to the 10-5 step. There is a continuous increase in per cent of accuracy with an increase in reading ability. The scores, however, are bunched, with a large increase at the 10-5 and 13-0 levels.

Since 75.6 per cent of the group answered the questions with an accuracy of 75 per cent or better, Book III, Our Old World Beginnings, by Kelty, may be considered acceptable for the groups who use it.

TABLE LXX

AGE AND GRADE NORMS FROM THE METROPOLITAN ACHIEVEMENT TESTS, AVERAGE NUMBER OF PUPILS IN EACH AGE AND GRADE CATEGORY, AVERAGE SCORE, PER CENT OF ACCURACY, AND TIME TO COMPLETE HISTORY COMPREHENSION TESTS

Group III					
Age	Grade	Per Cent of Pupils	Average Score	Per Cent of Accuracy	Time
9-0	3.7	0.0	0.0	0.0	0.0
9-5	4.1	4.9	39	54	43
9-10	4.4	2.4	51	61	36
10-0	4.6	7.4	58	71	40
10-5	4.10	7.4	62	87	36
10-10	5.3	9.7	63	88	36
11-0	5.5	12.2	64	90	35
11-5	5.9	9.7	64	90	29
11-10	6.3	9.7	65	91	32
12-0	6.4	12.2	65	91	29
12-5	6.8	14.7	66	93	24
12-10	7.3	4.9	65	91	26
13-0	7.5	2.4	67	95	30
13-5	7.9	2.4	67	95	38
13-10	8.4	0.0	0.0	0.0	0.0

Table LXXI, page 178, gives the data for Group IV, tested on Book IV.

15.7 per cent of the children in this group had a reading age of 12.5 years. They read the selections with an accuracy of 88 per cent in 46 minutes.

The scores in Group IV are somewhat lower than those of Groups I, II, and III, and the time much longer. There is an increase in the per cent of accuracy with reading age. But there is little change between the scores from the 10-5 age level to the 12-5 level.

The noticeable increase in the time used by the pupils may mean that the reading was difficult and the children spent a longer time on trying to comprehend its meaning. Or it may mean that these children were slower workers.

With 93.9 per cent of the group scoring a 10-0 reading age level on the Metropolitan Achievement Tests, which are time tests, this is probably not the cause. They do not appear to be slow workers.

Of these children 84.5 per cent with a reading level below 12-10, answered the questions with a degree of accuracy beyond 75 per cent. From this criterion, Book IV, The American People and Their Old World Ancestors, by Vollintine is suitable for the groups that read it. But the time expended by these children may mean that the book is too difficult. The average class period for the upper sixth grade is 30 minutes. 46 minutes to read and answer questions on seventeen paragraphs may mean too great an expenditure of time for the results obtained.

TABLE LXXI

AGE AND GRADE NORMS FROM THE METROPOLITAN ACHIEVEMENT TESTS, AVERAGE NUMBER OF PUPILS IN EACH AGE AND GRADE CATEGORY, AVERAGE SCORE, PER CENT OF ACCURACY, AND TIME TO COMPLETE HISTORY COMPREHENSION TESTS

Group IV					
Age	Grade	Per Cent of Pupils	Average Score	Per Cent of Accuracy	Time
9-0	3.7	0.0	0.0	0.0	0.0
9-5	4.1	0.0	0.0	0.0	0.0
9-10	4.4	6.3	43	63	62
10-0	4.6	3.1	54	79	47
10-5	4.10	12.5	58	85	38
10-10	5.3	9.4	60	85	54
11-0	5.5	12.5	58	85	41
11-5	5.9	12.5	57	83	43
11-10	6.3	9.4	58	85	49
12-0	6.4	9.4	57	86	31
12-5	6.8	15.7	60	88	46
12-10	7.3	3.1	64	94	26
13-0	7.5	0.0	0.0	0.0	0.0
13-5	7.9	6.3	67	98	31
13-10	8.4	0.0	0.0	0.0	0.0

Table LXXII, page 180, gives the data for Group V, the children tested on Book V.

6.8 per cent of these children have a reading age of 12-5 years. They read the selections from Book V with 95 per cent accuracy in 16 minutes.

14.3 per cent of the group were at a 12-0 age level. They scored 91 per cent accuracy in 20 minutes. 85.8 per cent of the group answered the questions with an accuracy of 75 per cent or better.

There is a gradual though irregular increase in the number of correct responses with an increase with reading age, and a decrease in the number of minutes used to complete the tests.

The difference between the length of time used by Groups IV and V to complete the tests of comprehension is very marked.

The children of Group IV scored 79 per cent accuracy in 47 minutes at an age level of 10-0 years. The children of Group V scored 88 per cent accuracy in 25 minutes at the same age level.

Group IV scored 88 per cent accuracy in 46 minutes at an age level of 12-5 years. Group V scored 95 per cent accuracy in 16 minutes at the 12-5 level. Thus Book V appears much easier to understand than Book IV.

Since the pupils at the age level of 12-5 years read Book V with 95 per cent accuracy, and since 85.8 per cent of the group scored 75 per cent or better, The Elementary World History, by Beard and Bagley is considered suitable for the groups that use it.

TABLE LXXII

AGE AND GRADE NORMS FROM THE METROPOLITAN ACHIEVEMENT TESTS, AVERAGE NUMBER OF PUPILS IN EACH AGE AND GRADE CATEGORY, AVERAGE SCORE, PER CENT OF ACCURACY, AND TIME TO COMPLETE HISTORY COMPREHENSION TESTS

Group V					
Age	Grade	Per Cent of Pupils	Average Score	Per Cent of Accuracy	Time
9-0	3.7	0.0	0.0	0.0	0.0
9-5	4.1	5.7	50	71	36
9-10	4.4	8.6	53	75	38
10-0	4.6	11.4	62	88	25
10-5	4.10	8.6	62	88	26
10-10	5.3	5.7	60	85	22
11-0	5.5	8.6	66	94	23
11-5	5.9	8.6	65	92	23
11-10	6.3	11.4	66	94	26
12-0	6.4	14.3	64	91	20
12-5	6.8	8.6	67	95	16
12-10	7.3	5.7	66	94	14
13-0	7.5	0.0	0.0	0.0	0.0
13-5	7.9	2.8	66	94	15
13-10	8.4	0.0	0.0	0.0	0.0

Table LXXIII brings the data from the five groups together in summary, (page 182).

It gives the following for each age and grade step for the five groups.

1. Reading age
2. Grade norm
3. Per cent of accuracy
4. Average time

The dotted line below the age level 12-5 is the normal position for the average of children who are in the eighth month of the sixth grade. It shows that the five books were read and the questions answered with the following degree of accuracy. Group averages are given at the bottom of the table.

TABLE LXXIII

READING AGE, PER CENT OF ACCURACY ON HISTORY ACHIEVEMENT TEST, AVERAGE TIME IN COMPLETION OF TEST AND AGE - GRADE NORM OF METROPOLITAN ACHIEVEMENT TEST*

Reading Age	Grade Norm	Book I		Book II		Book III		Book IV		Book V	
		Percent	Time	Percent	Time	Percent	Time	Percent	Time	Percent	Time
9-0	3.7	0	0	0	0	0	0	0	0	0	0
9-5	4.1	64%	32	0%	0	54%	43	0%	0	71%	36
9-10	4.4	69	41	60	45	61	36	63	62	75	38
10-0	4.6	79	40	75	49	71	40	79	47	88	25
10-5	4.10	79	40	76	43	87	36	85	38	88	26
10-10	5.3	83	28	85	38	88	36	85	54	85	22
11-0	5.5	88	25	80	26	90	35	85	41	94	23
11-5	5.9	91	35	83	36	90	29	83	43	92	23
11-10	6.3	89	29	86	31	91	32	85	49	94	26
12-0	6.4	92	27	94	30	91	29	86	31	91	20
12-5	6.8	92	25	94	30	93	24	88	46	95	16
12-10	7.3	91	25	97	31	91	26	94	26	94	14
13-0	7.5	0	0	91	33	95	30	0	0	0	0
13-5	7.9	0	0	0	0	95	38	98	31	94	15
13-10	8.4	0	0	0	0	0	0	0	0	0	0
Group Average		92	25	94	30	93	24	88	46	95	16

**

* Metropolitan Achievement Tests, Intermediate Battery - Partial: Form A, For Grades 4, 5, and 6. World Book Company, Yonkers-on-Hudson, New York, 1932.

** Metropolitan Achievement Tests Age-Grade Norm for Upper Sixth Grade.

Since 75 per cent is considered a satisfactory degree of accuracy, the five history books appear to be well within the understanding of the groups who read them.

SUMMARY FOR THE SUITABILITY OF THE FIVE HISTORY BOOKS
FOR THE GROUPS THAT USE THEM

The five books were judged as suitable for the children using them if:

1. 97 per cent of the vocabulary was within the 6047 range on the Thorndike Frequency of Usage Scale
2. The selections were read with a degree of comprehension of not less than 75 per cent

Book III was the only one of the five books having 97 per cent of its vocabulary within the 6047 range. A comparison of the five books for the per cent of words beyond 6047, shows a significant difference between Books III and IV.

All of the books were read with a degree of accuracy above 75 per cent by pupils who scored a reading age of 12-5 on the Metropolitan Achievement Tests. Book V being the easiest and Book IV the most difficult. In degree of comprehension with which the books are read by pupils typical of this grade level they rank, then as follows: Book V, easiest, Book II, next easiest; then Book III, Book I, next, and Book IV, most difficult.

THE DEGREE OF COMPREHENSION WITH WHICH
THE FIVE SUPPLEMENTARY HISTORY BOOKS
WERE READ BY SIXTH-A CHILDREN

CHAPTER VI

THE DEGREE OF COMPREHENSION WITH WHICH THE FIVE SUPPLEMENTARY HISTORY BOOKS WERE READ BY SIXTH-A CHILDREN

A. Equating the Groups

The pupils used in this study are equated on three bases as described in Chapter III.

1. Chronological Age
2. Mental Age
3. Reading Age

The basic data for all pupils in the five groups equated on chronological age are given in Tables I, II, III, IV, and V, Appendix A.

Table I gives the basic data for Group I. Group I consists of all sixth-A pupils from School A who read the selections and answered the questions on Book I, Europe, the Mother of America, by Horne and Bucks.

The following data are given for all pupils:

1. Sex
2. Chronological Age
3. Mental Age
4. Intelligent Quotient
5. Reading Age
6. Score or degree of accuracy with which the selections were read and the questions answered
7. Time taken to read the selections and answer the questions

The twenty-one pupils whose C.A. is not preceded by a star are the children used to make up the Chronological Age Groups. Those pupils under M.A. not preceded by two stars comprise the Mental Age Groups. Those pupils under R.A. not preceded by three stars comprise the Reading Age Groups.

Table II gives the data for all sixth-A pupils from School B who read the selections and answered the questions on Book II, Our Nation's Heritage, by Halleck and Frantz.

Table III gives the data for all sixth-A pupils from School C who read the selections and took the tests on Book III, The Old World Beginnings, by Kelty.

Table IV gives the data for all sixth-A children who read the samplings and took the tests of comprehension on Book IV, The American People and Their Old World Ancestors, by Vollintine.

Table V gives the data for all sixth-A children who read the selections and answered the questions on the tests of comprehension on Book V, The Elementary World History, by Beard and Bagley.

1. Equation of Groups on Chronological Age

Twenty-one pupils from each of the five groups (one group from each school) were paired on sex and chronological age.

The first pupil in Group I is a girl eleven years and six months old. She is paired with a pupil in each of the

other four groups of the same sex and age. The second pupil, who is also a girl, is eleven years and five months old. The second pupil in Group IV is eleven years and four months old. The second pupil is, then, paired with four identical girls, and a fifth of as near identical age as it was possible to get it. All other pupils are paired in the same manner. (Tables I, II, III, IV, and V, Appendix A).

Since the writer is here concerned with the means of the groups and not with individual children, it is not required that all the subjects participating be identical. It means that all the groups participating be equivalent. To be equivalent the various groups must have like means and like variabilities among the subjects constituting each group.¹

The statistical data for the five groups equated on chronological age are given in Table LXXIV, page 188. The data for the five groups are:

1. Means
2. Standard deviations of the distributions
3. Probable errors of the distributions

1. McCall, William A, How to Experiment in Education. 1930, pp. 40-41.

4. Probable errors of the means
5. Standard errors of the means
6. Standard errors of the standard deviations

The first horizontal column in Table LXXIV shows the means of the five groups to be identical. The second column shows the standard deviations. There is a slight variation in the standard deviations of the five groups. Table LXXV, page 190, gives a comparison of the means and standard deviations to determine whether these differences are significant or not significant.

Table LXXV shows the means of the five groups to be identical. The differences between standard deviations must be at least three times their probable errors to be significant.² Since all are less than 3.00, the differences are not significant.

The five groups equated on sex and chronological age are, then, equivalent groups.

2. Link, H. C., "How Many Interviews Are Necessary for Results of a Certain Accuracy." Journal of Applied Psychology. Volume, 21, 1937, p. 5.

TABLE LXXIV
DATA OF THE FIVE GROUPS EQUATED FOR CHRONOLOGICAL AGE

Chronological Age					
	Group I	Group II	Group III	Group IV	Group V
Mean	12.00	12.00	12.00	12.00	12.00
Standard Deviation	7.20	8.05	7.44	7.00	7.25
Probable Error	4.856	5.429	5.011	4.721	4.792
Probable Error of Mean	1.080	1.212	1.124	1.055	1.070
Standard Error of Mean	1.601	1.779	1.809	1.705	1.586
Standard Error of the Standard Deviation	1.111	1.244	1.142	1.086	1.111

Table LXXIV gives the data of the five groups equated on sex and chronological age. The first horizontal column gives the means of the five groups. The second horizontal column gives the standard deviations of the distributions of the five groups; the third the probable errors, etc.

The means of the five groups are identical. The slight variation between the standard deviations are not significant. (Table LXXV, p. 190).

KEY TO THE FOLLOWING TABLES LXXV, LXXVII, LXXIX

$M_A - M_B$

Differences between the Means of Groups I and II, I and III, I and IV, etc.

Diff.

Difference between Means

P.E. diff. M

Probable Error of difference between Means

Diff. / P.E. diff. M

Difference between Means divided by their Probable Errors

$\sigma_A - \sigma_B$

Differences between the Standard Deviations of Groups I and II, I and III, I and IV, etc.

Diff.

Difference between Standard Deviations

P.E. diff. σ

Probable Error of difference between Standard Deviations

Diff. / P.E. diff. σ

Difference between Standard Deviations divided by their Probable Errors.

Significant?

If a difference divided by its probable error is 3.0 or more, it is considered significant; if less, it is considered not significant. These are indicated by "Yes" or "No." (Link, H.C., "How Many Interviews Are Necessary for Results of a Certain Accuracy," Journal of Applied Psychology, Volume 21, 1937, p.5.)

TABLE LXXV

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE FIVE GROUPS EQUATED ON CHRONOLOGICAL AGE

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS						
$M_A - M_B$	Diff.	P.E.	diff. $\cdot M$	Diff./P.E. diff. $\cdot M$	Signf.?	$\sigma_A - \sigma_B$	Diff.	P.E.	diff. $\cdot \sigma$	Diff./P.E. diff. $\cdot \sigma$	Signf.?
$M_1 - M_2$	.0	1.62		.0	No	$\sigma_1 - \sigma_2$	.85	1.12		.75	No
$M_1 - M_3$	.0	1.55		.0	No	$\sigma_1 - \sigma_3$	.24	1.07		.22	No
$M_1 - M_4$	.0	1.50		.0	No	$\sigma_1 - \sigma_4$	.20	1.03		.19	No
$M_1 - M_5$	.0	1.67		.0	No	$\sigma_1 - \sigma_5$	.05	1.05		.04	No
$M_2 - M_3$	.0	1.64		.0	No	$\sigma_2 - \sigma_3$	.61	1.12		.54	No
$M_2 - M_4$	.0	1.60		.0	No	$\sigma_2 - \sigma_4$	1.05	1.10		.95	No
$M_2 - M_5$	.0	1.61		.0	No	$\sigma_2 - \sigma_5$	.80	1.12		.71	No
$M_3 - M_4$	.0	1.52		.0	No	$\sigma_3 - \sigma_4$	.44	1.05		.41	No
$M_3 - M_5$	.0	1.54		.0	No	$\sigma_3 - \sigma_5$	.19	1.07		.17	No
$M_4 - M_5$	.0	1.50		.0	No	$\sigma_4 - \sigma_5$	.25	1.03		.24	No

Table LXXV shows the five groups equated on Chronological Age to be equivalent groups, since the differences between the means are 0.00 and the differences between the standard deviations not significant.

2. Equation of Groups on Mental Age

Twenty-one pupils from each of five groups (one group from each school) were paired on sex and mental age.³ The mental ages used in making the pairings were taken from the children's performance on the Otis Self-Administering Test of Mental Ability,⁴ which had been given to all sixth-A pupils.

All mental ages were converted into quotients by dividing the mental age in months by the chronological age in months.⁵

Each boy and girl was paired with four other pupils of the same sex and as nearly identical mental age as could be procured from the 172 pupils used in selecting the five equated groups. (Tables I, II, III, IV, and V, Appendix A).

Statistical computations were used for determining the equivalency of the groups. The statistical data for the five equivalent groups making up the Mental Age Groups are given in Table LXXVI, page 193.

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3. The computation of mental age is explained in Terman's, The Measurement of Intelligence, 1926, pp. 137 ff.
 4. Otis Self-Administering Tests of Mental Ability, by Arthur S. Otis, 1928.
 5. McCall, William A., How to Experiment in Education. 1930, pp. 59-60.

The means and standard deviation of these groups are:

	Means	Standard Deviations
Group I	93.50	12.95
Group II	93.50	12.90
Group III	93.60	13.22
Group IV	93.00	10.81
Group V	93.60	15.61

Comparisons of these means and variabilities for significance of differences are given in Table LXXVII, page 194.

The fourth column of Table LXXVII shows the differences between the means divided by their probable errors. Since all are less than 3.00, there are no significant differences between means.

The differences between standard deviations, given in the seventh column, show them to be less than three times their probable errors. Therefore the differences are not significant.

The five groups equated on mental age may then be said to be equivalent groups.

TABLE LXXVI

DATA OF THE FIVE GROUPS EQUATED FOR MENTAL AGE

	Mental Age				
	Group I	Group II	Group III	Group IV	Group V
Mean	93.50	93.50	93.60	93.00	93.50
Standard Deviation	12.95	12.90	13.22	10.81	15.61
Probable Error	8.733	8.700	8.900	7.291	10.222
Probable Error of Mean	1.954	1.904	1.992	1.638	2.281
Standard Errors of Mean	2.876	2.876	2.950	2.417	3.380
Standard Errors of the Standard Deviation	1.999	1.999	2.042	1.766	2.400

Table LXXVI gives the data for the groups equated on sex and mental age. The first horizontal column gives the means of the five groups. The second horizontal column gives the standard deviations of the groups; the third column the probable errors, etc.

A comparison of the means and standard deviations for significance of differences is given in Table LXXVII, page 194.

TABLE LXXVII

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE FIVE GROUPS EQUATED ON MENTAL AGE

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	diff. $\bar{M}$	Diff./P.E.	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. $\bar{\sigma}$	Diff./P.E.	Signf.?
$M_1 - M_2$	.0	2.75	.0	No	$\sigma_1 - \sigma_2$	.05	1.89	.02	No
$M_1 - M_3$	.1	2.78	.03	No	$\sigma_1 - \sigma_3$	.27	1.91	.14	No
$M_1 - M_4$	.2	2.54	.79	No	$\sigma_1 - \sigma_4$	2.14	1.78	1.20	No
$M_1 - M_5$	.1	3.00	.03	No	$\sigma_1 - \sigma_5$	2.66	2.09	1.27	No
$M_2 - M_3$	.1	2.76	.03	No	$\sigma_2 - \sigma_3$	.32	1.91	.16	No
$M_2 - M_4$	.2	2.90	.06	No	$\sigma_2 - \sigma_4$	2.09	1.78	1.17	No
$M_2 - M_5$	.1	2.99	.03	No	$\sigma_2 - \sigma_5$	2.71	2.09	1.29	No
$M_3 - M_4$	.3	2.57	.11	No	$\sigma_3 - \sigma_4$	2.41	1.81	1.33	No
$M_3 - M_5$	.0	3.02	.0	No	$\sigma_3 - \sigma_5$	2.39	2.11	1.13	No
$M_4 - M_5$	.3	2.80	.10	No	$\sigma_4 - \sigma_5$	4.40	2.00	2.20	No

Table LXXVII shows the five groups equated on Mental Age to be equivalent groups, since the differences between the means and standard deviations are not significant.

3. Equation of Groups on Reading Age

Twenty-one pupils from each of the five groups (one group from each school) were paired on sex and reading age. The reading ages were taken from test performance on the Metropolitan Achievement Tests.⁶

All reading ages were converted into quotients by dividing the reading age in months by the chronological age in months,⁷ the chronological age being the natal age at the time the tests were given. (Tables I, II, III, IV, and V, Appendix A).

The data for the five groups are given in Table LXXVIII, page 197.

The means and standard deviations of the groups are:

	Means	Standard Deviations
Group I	91.50	9.65
Group II	91.40	7.69
Group III	91.90	9.60
Group IV	91.50	6.74
Group V	91.40	9.48

6. Metropolitan Achievement Tests, Intermediate Battery-Partial: Form A. For Grades 4, 5, and 6. Edited by Jacob S. Orleans. 1932.
7. McCall, William A., How to Experiment in Education. 1930, pp. 59-60.

The comparisons of these means and standard deviations for significance of differences are given in Table LXXIX, page 198.

None of the differences divided by their probable errors are significant.

The differences between standard deviations divided by probable errors show the difference between the variabilities to be not significant.

The five groups equated on sex and reading age are equivalent since they have equivalent means and variabilities.⁸

8. McCall, William A., How to Experiment in Education. 1930, pp. 40-41.

TABLE LXXVIII
DATA OF THE FIVE GROUPS EQUATED FOR READING AGE

	Reading Age				
	Group I	Group II	Group III	Group IV	Group V
Mean	91.50	91.40	91.90	91.50	91.40
Standard Deviation	9.65	7.69	9.60	6.74	9.48
Probable Error	6.500	5.186	6.474	4.546	6.394
Probable Error of Mean	1.452	1.211	1.444	1.011	1.425
Standard Error of Mean	2.150	1.794	2.135	1.497	2.105
Standard Error of the Standard Deviation	1.484	1.188	1.481	1.044	1.462

Table LXXVIII gives the data for the groups equated on sex and reading age. The first horizontal column gives the means of the five groups. The second horizontal column gives the standard deviations of the groups; the third column the probable errors, etc.

A comparison of the means and variabilities for significant differences is given in Table LXXIX, page 198.

TABLE LXXIX

STATISTICAL ANALYSIS OF THE DIFFERENCE BETWEEN MEANS AND STANDARD DEVIATIONS FOR THE FIVE GROUPS EQUATED ON READING AGE

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff.	P.E.	Diff./P.E.	Signf.?	$\sigma_A - \sigma_B$	Diff.	P.E.	Diff./P.E.	Signf.?
	diff. $\bar{M}$		diff. $\bar{M}$			diff. $\bar{\sigma}$		diff. $\bar{\sigma}$	
$M_1 - M_2$	.1	1.38	.05	No	$\sigma_1 - \sigma_2$	1.96	1.26	1.55	No
$M_1 - M_3$	.4	2.04	.19	No	$\sigma_1 - \sigma_3$	.05	1.41	.03	No
$M_1 - M_4$	.0	1.76	0.0	No	$\sigma_1 - \sigma_4$	2.81	1.21	2.32	No
$M_1 - M_5$	.1	2.02	.04	No	$\sigma_1 - \sigma_5$	.17	1.39	.12	No
$M_2 - M_3$	.5	1.88	.26	No	$\sigma_2 - \sigma_3$	1.91	1.27	1.50	No
$M_2 - M_4$	.1	1.57	.63	No	$\sigma_2 - \sigma_4$	.95	1.25	.76	No
$M_2 - M_5$	.0	1.88	0.0	No	$\sigma_2 - \sigma_5$	1.79	1.26	1.39	No
$M_3 - M_4$	.4	1.75	.22	No	$\sigma_3 - \sigma_4$	1.86	1.21	1.53	No
$M_3 - M_5$	.5	2.02	.24	No	$\sigma_3 - \sigma_5$	.12	1.39	.08	No
$M_4 - M_5$	.1	1.74	.57	No	$\sigma_4 - \sigma_5$	1.74	1.20	1.45	No

Table LXXIX shows the five groups equated on Reading Age to be equivalent groups, since the differences between the means and standard deviations are not significant.

SUMMARY FOR EQUATION OF GROUPS

In selecting equivalent groups, data were secured from 172 sixth-A children in five elementary schools. From these, five groups of twenty-one children each were secured, each child in each group being paired with a child in each of the other four groups on the basis of sex and chronological age. This was called the first, or Chronological Age Group.

For a second group, twenty-one children from each of the five schools were paired on the basis of sex and mental age as measured by the Otis Self-Administering Tests of Mental Ability.⁹ This group was called the second, or Mental Age Group.

A third group was secured by selecting twenty-one children from each of the five schools and pairing each child in each group with a child in each of the other four groups on the basis of sex and test performance in reading as measured by the Metropolitan Achievement Tests.¹⁰

Data for each of the five equivalent groups making up the Chronological Age Group, the Mental Age Group, and the Reading Age Group, are given in Tables LXXIV, LXXVI, and LXXVIII, pages 188, 193, 197.

That these groups are well equated will be seen from inspection of Tables LXXV, LXXVIII, and LXXIX, pages 190, 194, 198. Here are given the differences between means and variabilities for the various groups together with the probable errors of these differences and the resultant quotients.

9. Otis Self-Administering Tests of Mental Ability, by Arthur S. Otis. 1928.

10. Metropolitan Achievement Tests, Intermediate Battery-Partial: Form A. For Grades 4, 5, and 6. Edited by Jacob S. Orleans. 1932.

B. Testing for Comprehension

The degree of accuracy with which the selections from each of the five books were read was determined as outlined in Chapter III by the tests given in Appendix B for:

I. The groups equated on Chronological Age

II. The groups equated on Mental Age

III. The groups equated on Reading Age

I. Degree of Comprehension with the Groups Equated for Chronological Age

The basic data for all pupils used in the five groups equated on chronological age are given in Tables I, II, III, IV, and V, Appendix A.

Group I is the group of sixth-A pupils from School A, who read the selections and answered the questions of comprehension on Book I, Europe the Mother of America, by Horne and Bucks.

Group II is the group from School B, tested on Book II, Our Nation's Heritage, by Halleck and Frantz.

In like manner III, IV, and V are the groups from Schools C, D, and E, tested on Books III, IV, and V, which are The Old World Beginnings of America, by Kelty; The American People and Their Old World Ancestors, by Vollintine, and The Elementary World History, by Beard and Bagley.

The pupils making up the Chronological Age Group

are the first twenty-one pupils under C.A. (Chronological Age). These pupils' chronological ages are not preceded by a star. They may be found in the second column of Tables I to V, Appendix A, which give the data for the five groups.

The scores, or number of correct responses are given in the sixth column of these tables under Score. The number of minutes required to read the samplings and answer the questions on the tests of comprehension is given in the seventh column under Time.

A summary of the initial data for each of the groups is given in Table VI, VII, VIII, IX, and X, Appendix A, which gives the following data for Age, Score, and Time.

1. Mean of distribution
2. Range
3. Standard deviation of the distribution
4. Standard error of the mean
5. Probable error of the mean
6. Standard error of the standard deviation

All of these data are brought together in Table LXXX, page 203. From an inspection of Table LXXX, it will be seen that pupils equated on a basis of sex and chronological age made mean scores of: Book I, 57.41; Book II, 56.54; Book III, 62.72; Book IV, 55.67; Book V, 61.0.

From the mean responses it appears that Book III with a mean of 62.72 correct answers is easiest to read

and understand. Book IV with a mean score of 55.67 appears hardest.

Data for evaluating the difference between means and standard deviations are also given in Table LXXX, page 203, for the:

1. Standard deviations
2. Probable errors
3. Probable errors of the means
4. Standard errors of the means
5. Standard errors of the standard deviations

Table LXXXI, page 204, compares the means and standard deviations. An inspection of this table shows that there are significant differences between the means for Books II and III, Books II and V, and Books III and IV.

Significant differences are found between the standard deviations for Books II and IV, and Books II and V.

The mean comprehension with which Book II is read is significantly different from that of Books III and V, and the comprehension with which Book III is read is significantly different from that of Book IV.

TABLE LXXX

DATA FOR THE NUMBER OF CORRECT RESPONSES TO COMPREHENSION QUESTIONS ON THE FIVE BOOKS WHEN THE PUPILS ARE EQUATED FOR CHRONOLOGICAL AGE.

Comprehension Scores					
	Book I	Book II	Book III	Book IV	Book V
Mean	57.41	56.54	62.72	55.67	61.00
Standard Deviation	9.51	4.98	7.11	9.17	8.54
Probable Error	6.410	3.355	4.766	6.188	5.766
Probable Error of Mean	1.433	.745	1.061	1.382	1.283
Standard Error of Mean	2.120	1.090	1.572	2.046	1.898
Standard Error of the Standard Deviation	1.466	.761	1.090	1.411	1.311

Table LXXX shows that when the pupils were equated on the basis of chronological age, the questions on Book III were answered with the highest number of correct responses, and Book IV the lowest. Book V, with a mean response of 61.00, ranks in second place. Book I ranks in third place, and Book II in fourth place.

The data from this table are used in Table LXXXI where the means and dispersions are compared for significance of differences.

TABLE LXXXI

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS FOR COMPREHENSION SCORES WITH CHRONOLOGICAL AGE CONSTANT

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	Diff. / P.E.	Signf.?		$\sigma_A - \sigma_B$	Diff. P.E.	Diff. / P.E.	Signf.?	
	diff. M	diff. M				diff. σ	diff. σ		
$M_1 - M_2$	.9	1.61	.55	No	$\sigma_1 - \sigma_2$	4.53	1.10	4.09	Yes
$M_1 - M_3$	5.3	1.78	2.97	No	$\sigma_1 - \sigma_3$	2.40	1.22	1.96	No
$M_1 - M_4$	1.8	1.98	.90	No	$\sigma_1 - \sigma_4$	.34	1.36	.25	No
$M_1 - M_5$	3.6	1.91	1.88	No	$\sigma_1 - \sigma_5$	.97	1.32	.74	No
$M_2 - M_3$	6.2	1.29	4.80	Yes	$\sigma_2 - \sigma_3$	2.13	0.89	2.39	No
$M_2 - M_4$	.9	1.56	.57	No	$\sigma_2 - \sigma_4$	4.19	1.07	3.91	Yes
$M_2 - M_5$	4.5	1.47	3.06	Yes	$\sigma_2 - \sigma_5$	3.56	1.01	3.52	Yes
$M_3 - M_4$	7.1	1.74	4.08	Yes	$\sigma_3 - \sigma_4$	2.06	1.20	1.71	No
$M_3 - M_5$	1.7	1.66	1.02	No	$\sigma_3 - \sigma_5$	1.43	1.14	1.25	No
$M_4 - M_5$	5.4	1.88	2.87	No	$\sigma_4 - \sigma_5$	.63	1.29	.48	No

Table LXXXI shows significant differences between the means for Books II and III, Books II and V, and Books III and IV.

Significant differences are shown between the standard deviations for Books II and IV, and Books II and V.

Time Required to Read the Selections and Answer
the Questions when the Groups Were Equated on
Chronological Age

The mean time taken by each group to read the selections and answer the questions on them is given in Tables VI to X, Appendix A.

The mean time taken by each group is as follows:

	<u>Minutes</u>
Group I tested on Book I	30.23
Group II tested on Book II	34.23
Group III tested on Book III	30.33
Group IV tested on Book IV	39.52
Group V tested on Book V	25.10

A comparison of means and dispersions for significant differences is given in Table LXXXIII, page 207.

An inspection of this table shows significant differences between those groups tested on Books I and IV, Books II and V, Books III and IV, and Books IV and V.

Significant differences between standard deviations are shown for Books II and IV, and Books III and IV.

When the time is compared with the number of correct responses, the following comparisons are shown.

TABLE LXXXII

MEAN NUMBER OF CORRECT RESPONSES AND MEAN NUMBER OF MINUTES REQUIRED TO FINISH THE TESTS WHEN THE GROUPS WERE EQUATED ON CHRONOLOGICAL AGE

	Mean Score	Mean Time
Group I	57.41	30.23
Group II	56.54	34.23
Group III	62.72	30.33
Group IV	55.07	39.52
Group V	61.00	25.10

Group III, tested on Book III, completed the test with the highest score of 62.72 in 30.33 minutes. Group V, tested on Book V, completed the test in 25.10 minutes with a score of 61.00. While Group IV, tested on Book IV, made the lowest score of 55.07 and took the longest time, 39.52 minutes.

From this analysis it will be seen that the books read with the greatest accuracy are also read most rapidly, and vice versa.

TABLE LXXXIII

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS FOR TIME SCORES
WITH CHRONOLOGICAL AGE CONSTANT

COMPARISON OF AVERAGES

COMPARISON OF STANDARD DEVIATIONS

$M_A - M_B$	Diff. P.E.	diff. $\bar{M}$	Diff./P.E.	diff. $\bar{M}$	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. σ	Diff./P.E.	diff. σ	Signf.?
$M_1 - M_2$	4.00	1.94	2.06	No		$\sigma_1 - \sigma_2$	.93	1.32	.70	No	
$M_1 - M_3$	.10	1.92	.052	No		$\sigma_1 - \sigma_3$	1.09	1.31	.83	No	
$M_1 - M_4$	9.29	2.64	3.51	Yes		$\sigma_1 - \sigma_4$	4.46	1.75	2.54	No	
$M_1 - M_5$	5.13	2.05	2.50	No		$\sigma_1 - \sigma_5$	.13	1.40	.09	No	
$M_2 - M_3$	3.90	1.82	2.14	No		$\sigma_2 - \sigma_3$	.16	1.25	1.28	No	
$M_2 - M_4$	5.29	2.51	2.05	No		$\sigma_2 - \sigma_4$	5.39	1.70	3.17	Yes	
$M_2 - M_5$	9.13	1.95	4.68	Yes		$\sigma_2 - \sigma_5$	1.06	1.34	.79	No	
$M_3 - M_4$	9.19	2.56	3.58	Yes		$\sigma_3 - \sigma_4$	5.55	1.70	3.26	Yes	
$M_3 - M_5$	5.23	1.94	2.68	No		$\sigma_3 - \sigma_5$	1.22	1.34	.91	No	
$M_4 - M_5$	14.42	2.65	5.44	Yes		$\sigma_4 - \sigma_5$	4.34	1.76	2.46	No	

In mean time to read there are significant differences between Books I and IV, Books II and IV, Books III and IV, and Books IV and V.

Significant differences between standard deviations are shown for Books II and IV, and Books III and IV.

II. Degree of Comprehension with the Groups Equated for Mental Age

The original data for the five groups equated on Mental Age are given in Tables I, II, III, IV, and V, Appendix A.

Twenty-one pupils from each of the five groups were used to make up the five groups equated on sex and mental age. They are the pupils whose M.A. (Mental Age) appears in the third column of the above tables not preceded by two stars.

The number of correct responses and the number of minutes taken to read the samples and answer the questions are given opposite the pupils' numbers in columns six and seven, under Score and Time.

Tables XI, XII, XIII, XIV, and XV, Appendix A, give the statistical data for the five groups for:

1. Mean
2. Standard deviation of the distribution
3. Probable error of the distribution
4. Probable error of the mean
5. Standard error of the mean
6. Standard error of the standard deviation

Data for this phase of the investigation are presented in Table LXXXIV, p. 210.

Book I refers to the data for Group I on the questions on Book I. The same interpretation applies to Books II, III, IV, and V.

Statistical analyses are given in Table LXXXIV for the correct responses to the questions on each of the five books in terms of:

1. Means
2. Standard deviations of the distributions
3. Probable errors of the distributions
4. Probable errors of the means
5. Standard errors of the means
6. Standard errors of the standard deviations

A comparison of the mean correct responses and standard deviations for the five books are:

	Mean	Standard Deviation
Book I	56.60	7.94
Book II	56.00	7.60
Book III	59.60	9.67
Book IV	53.70	13.09
Book V	60.60	8.39

As judged by their means Book V is slightly easier than Book III, while Book IV again appears hardest.

The significance of these mean differences is shown in Table LXXXV, page 211.

Significant differences were found between the means of Books II and V, and Books IV and V and between the standard deviations of Books IV and V.

TABLE LXXXIV

STATISTICAL DATA FOR THE NUMBER OF CORRECT RESPONSES TO THE COMPREHENSION QUESTIONS ON THE FIVE BOOKS WHEN THE PUPILS ARE EQUATED FOR MENTAL AGE

Comprehension Scores					
	Book I	Book II	Book III	Book IV	Book V
Mean	56.60	56.00	59.60	53.70	60.60
Standard Deviation	7.94	7.60	9.67	13.09	8.36
Probable Error	5.353	5.121	6.521	9.388	5.633
Probable Error of Mean	1.100	1.144	1.454	2.071	1.252
Standard Error of Mean	1.631	1.690	2.150	3.069	1.853
Standard Error of the Standard Deviation	1.222	1.171	1.491	2.050	1.291

When the five groups were equated on the basis of mental age, Book V was read with somewhat greater comprehension than Book III. Book IV was the hardest. Books I and II were very much alike.

The significance of the differences between means and standard deviations is given in Table LXXXV.

TABLE LXXXV

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS OF SCORES IN
COMPREHENSION WITH MENTAL AGE CONSTANT

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	diff. $\bar{M}$	Diff./P.E.	Signif.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. σ	Diff./P.E.	Signif.?
$M_1 - M_2$	.6	1.57	.38	No	$\sigma_1 - \sigma_2$	.34	1.14	.29	No
$M_1 - M_3$	3.0	1.81	1.65	No	$\sigma_1 - \sigma_3$	1.73	1.29	1.34	No
$M_1 - M_4$	2.9	2.36	1.65	No	$\sigma_1 - \sigma_4$	5.15	1.76	2.92	No
$M_1 - M_5$	4.2	1.46	2.87	No	$\sigma_1 - \sigma_5$	1.54	1.05	1.46	No
$M_2 - M_3$	3.6	1.84	1.95	No	$\sigma_2 - \sigma_3$	2.07	1.27	1.62	No
$M_2 - M_4$	2.3	2.75	.83	No	$\sigma_2 - \sigma_4$	5.49	2.28	2.40	No
$M_2 - M_5$	4.8	1.48	3.24	Yes	$\sigma_2 - \sigma_5$	1.20	1.02	1.17	No
$M_3 - M_4$	5.9	2.52	2.34	No	$\sigma_3 - \sigma_4$	3.42	1.70	2.01	No
$M_3 - M_5$	1.2	1.73	.69	No	$\sigma_3 - \sigma_5$	3.27	1.20	2.72	No
$M_4 - M_5$	7.1	2.28	3.11	Yes	$\sigma_4 - \sigma_5$	6.69	1.53	4.37	Yes

Table LXXXV shows significant differences between the means for Books II and V, and Books IV and V, Books I and II appear much alike.

The standard deviations of Books IV and Book V are significantly different.

1. Time Required to Read the Selections and Answer the Questions When the Groups Were Equated on Mental Age

The mean number of minutes taken by each group to read the selections and answer the tests of comprehension on them is given in Tables XI to XV, Appendix A.

The time taken by each group to complete the tests is as follows:

		<u>Minutes</u>
Group I	tested on Book I	33.04
Group II	tested on Book II	35.90
Group III	tested on Book III	32.66
Group IV	tested on Book IV	42.00
Group V	tested on Book V	28.15

A comparison of means and dispersions for significant differences is given in Table LXXXVII, page 214.

Significant differences are shown between the groups tested on Books I and IV, Books II and V, Books III and IV, and Books IV and V.

Differences between dispersions are shown for those groups tested on Books I and IV, Books II and IV, Books III and IV, and Books IV and V.

When the mean number of correct responses is compared with the mean number of minutes taken to complete the tests there appears to be little consistency.

TABLE LXXXVI

MEAN NUMBER OF CORRECT RESPONSES AND MEAN NUMBER OF MINUTES
REQUIRED TO FINISH THE TESTS WHEN THE GROUPS WERE EQUATED
ON MENTAL AGE

	Mean Score	Mean Time
Group I	56.60	33.04
Group II	56.00	35.90
Group III	59.60	32.66
Group IV	53.70	42.00
Group V	60.80	28.15

Group V, tested on Book V, made the highest mean score of 60.80 in the shortest mean time of 28.15 minutes. Group III dropped to second place with a mean score of 59.60 in 32.66 minutes. Group IV continued to have the lowest mean score of 53.70 in the longest mean time of 42.00 minutes. Book II continued in fourth place.

TABLE LXXXVII

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS FOR TIME TO COMPLETE THE TESTS WITH MENTAL AGE CONSTANT

COMPARISON OF AVERAGES				COMPARISON OF STANDARD DEVIATIONS					
$M_A - M_B$	Diff. P.E.	Diff./P.E.	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	Diff./P.E.	Signf.?		
	diff. M	diff. M			diff. σ	diff. σ			
$M_1 - M_2$	2.86	1.76	1.62	No	$\sigma_1 - \sigma_2$	.75	1.21	.61	No
$M_1 - M_3$	.38	1.71	.22	No	$\sigma_1 - \sigma_3$	.28	1.18	.23	No
$M_1 - M_4$	9.53	2.41	3.95	Yes	$\sigma_1 - \sigma_4$	6.61	1.72	3.26	Yes
$M_1 - M_5$	4.89	1.80	2.71	No	$\sigma_1 - \sigma_5$	1.11	1.24	.87	No
$M_2 - M_3$	3.24	1.78	1.82	No	$\sigma_2 - \sigma_3$	.47	1.23	.38	No
$M_2 - M_4$	6.67	2.54	2.62	No	$\sigma_2 - \sigma_4$	5.86	1.75	3.34	Yes
$M_2 - M_5$	7.75	1.88	4.12	Yes	$\sigma_2 - \sigma_5$	.36	1.29	.27	No
$M_3 - M_4$	9.91	2.51	3.94	Yes	$\sigma_3 - \sigma_4$	6.33	1.73	3.28	Yes
$M_3 - M_5$	4.51	1.83	2.46	No	$\sigma_3 - \sigma_5$	.83	1.26	.65	No
$M_4 - M_5$	14.42	2.53	5.69	Yes	$\sigma_4 - \sigma_5$	5.50	1.77	3.10	Yes

Table LXXXVII shows significant differences between the means for Books I and IV, Books II and V, Books III and IV, and Books IV and V.

Significant differences were found between the standard deviations for Books I and IV, Books II and IV, Books III and IV, and Books IV and V.

III. Degree of Comprehension When the Groups Were Equated on Reading Age

Under R.A. (Reading Age) in the fifth columns of Tables I, II, III, IV, and V, Appendix A are given the reading ages of the twenty-one children from each group making up the groups equated on Reading Age.

The reading ages used for these equivalent groups are those not preceded by three stars.

In the two columns immediately to the right of R.A. are the numbers of correct responses and time used to complete the tests.

Tables XVI, XVII, XVIII, XIX, and XX, Appendix A, give the data for each of the groups for the Mental Age, Score and Time.

These data are summarized in Table LXXXVIII, page 217, where the responses of each group are shown under each Book. A mean of 58.20, under Book I, means that Group I answered the questions on the selections from Book I with an average of 58.20 correct responses.

Following are the means for the five books: Book I, 58.20; Book II, 56.0; Book III, 60.50; Book IV, 56.60; Book V, 60.60.

The number of correct responses for Book V is .10 greater than for Book III. Books II and IV differ by .60, and Books III and IV differ by 3.90 correct responses.

An inspection of Table XC, page 219, however, shows that none of the differences between the means are significant.

Standard deviations of scores for the five books are as follows: Book I, 8.08. Book II, 7.75; Book III, 9.00; Book IV, 8.02; Book V, 8.38.

Comparison of the standard deviations is given in Table XC. None of the differences between standard deviations are significant.

When the groups are equated for sex and reading age as shown by performance on the Metropolitan Achievement Tests slight differences appear in the degree of accuracy with which the books are read. Book II appears to be slightly the hardest, and Book V very slightly the easiest. These differences, however, are not statistically significant. (Table XC, page 219).

1. Time Required to Read the Selections and Answer the Questions When the Groups Were Equated on Reading Age

The mean number of minutes taken by each group to read the selections and answer the comprehension questions on them is given in Tables XVI to XX, Appendix A.

The mean number of minutes required by each group to complete the tests is given below:

		<u>Minutes</u>
Group I	tested on Book I	31.85
Group II	tested on Book II	34.00
Group III	tested on Book III	35.00
Group IV	tested on Book IV	42.14
Group V	tested on Book V	25.67

Analysis of differences between means and standard deviations is given in Table XCI, page 220.

Differences between the means for the groups tested on Books I and IV, Books II and V, Books III and V, and Books IV and V are significant.

No significant differences were found between the measures of dispersions for these groups.

The mean number of correct responses and the mean number of minutes required to complete the tests are given in Table LXXXVIII.

TABLE LXXXVIII

MEAN NUMBER OF CORRECT RESPONSES AND MEAN NUMBER OF MINUTES REQUIRED TO FINISH THE TESTS WHEN THE GROUPS WERE EQUATED ON MENTAL AGE

	<u>Mean Score</u>	<u>Mean Time</u>
Group I	58.20	31.85
Group II	56.00	34.00
Group III	60.50	35.00
Group IV	56.60	42.00
Group V	60.60	25.67

TABLE LXXXIX

STATISTICAL DATA FOR THE NUMBER OF CORRECT RESPONSES TO THE COMPREHENSION QUESTIONS ON THE FIVE BOOKS WHEN THE PUPILS ARE EQUATED FOR READING AGE

Comprehension Scores					
	Book I	Book II	Book III	Book IV	Book V
Mean	58.20	56.00	60.50	56.60	60.60
Standard Deviation	8.08	7.75	9.00	8.02	8.36
Probable Error	5.455	5.222	6.072	5.400	5.633
Probable Error of Mean	1.211	1.161	1.356	1.200	1.252
Standard Error of Mean	1.266	1.720	2.002	1.779	1.853
Standard Error of the Standard Deviation	1.794	1.191	1.380	1.235	1.291

When the five groups were equated on the basis of reading age, Book V was the easiest. Book V, however, is only .10 response higher than Book III. Book IV showed the lowest number of correct responses. Book I ranked third and Book II fourth.

Significance of differences between means and standard deviations is analyzed in Table XC.

TABLE XC

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS OF SCORES IN COMPREHENSION WITH READING AGE CONSTANT

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff.	P.E. diff. M	Diff. / P.E. diff. M	Signf.?	$\sigma_A - \sigma_B$	Diff.	P.E. diff. σ	Diff. / P.E. diff. σ	Signf.?
$M_1 - M_2$	2.2	1.67	1.73	No	$\sigma_1 - \sigma_2$	.33	1.16	.29	No
$M_1 - M_3$	2.3	1.81	1.27	No	$\sigma_1 - \sigma_3$	.92	1.25	.73	No
$M_1 - M_4$	1.6	1.70	.94	No	$\sigma_1 - \sigma_4$	.06	1.18	.05	No
$M_1 - M_5$	2.4	1.74	1.37	No	$\sigma_1 - \sigma_5$	.28	1.21	.21	No
$M_2 - M_3$	4.5	1.78	2.52	No	$\sigma_2 - \sigma_3$	1.25	1.22	1.02	No
$M_2 - M_4$	.6	1.66	.36	No	$\sigma_2 - \sigma_4$	.27	1.15	.23	No
$M_2 - M_5$	4.6	1.70	2.70	No	$\sigma_2 - \sigma_5$	.61	1.18	.54	No
$M_3 - M_4$	3.9	1.80	2.16	No	$\sigma_3 - \sigma_4$	.98	1.24	.79	No
$M_3 - M_5$	.1	1.83	.05	No	$\sigma_3 - \sigma_5$	.64	1.26	.50	No
$M_4 - M_5$	4.0	1.73	2.31	No	$\sigma_4 - \sigma_5$	.34	1.20	.28	No

Table XC shows that there are no significant differences between the means nor the standard deviations when the groups are equated on reading age.

TABLE XCI

STATISTICAL ANALYSIS OF THE DIFFERENCES BETWEEN MEANS AND STANDARD DEVIATIONS FOR TIME TO COMPLETE THE TESTS WITH READING AGE CONSTANT

COMPARISON OF AVERAGES					COMPARISON OF STANDARD DEVIATIONS				
$M_A - M_B$	Diff. P.E.	diff. M	Diff. / P.E. diff. M	Signf.?	$\sigma_A - \sigma_B$	Diff. P.E.	diff. σ	Diff. / P.E. diff. σ	Signf.?
$M_1 - M_2$	2.15	2.06	1.04	No	$\sigma_1 - \sigma_2$	.68	1.43	.47	No
$M_1 - M_3$	3.15	2.14	1.47	No	$\sigma_1 - \sigma_3$	.06	1.47	.04	No
$M_1 - M_4$	10.29	2.55	4.03	Yes	$\sigma_1 - \sigma_4$	3.00	1.70	1.76	No
$M_1 - M_5$	6.18	1.97	3.13	No	$\sigma_1 - \sigma_5$	1.52	1.36	1.11	No
$M_2 - M_3$	1.00	2.07	.48	No	$\sigma_2 - \sigma_3$	.74	1.43	.51	No
$M_2 - M_4$	8.14	2.49	3.26	No	$\sigma_2 - \sigma_4$	3.68	1.67	2.20	No
$M_2 - M_5$	8.33	1.90	4.38	Yes	$\sigma_2 - \sigma_5$	.84	1.32	.63	No
$M_3 - M_4$	7.14	2.56	2.78	No	$\sigma_3 - \sigma_4$	2.94	1.71	1.71	No
$M_3 - M_5$	9.33	1.98	4.71	Yes	$\sigma_3 - \sigma_5$	1.58	1.36	1.16	No
$M_4 - M_5$	16.47	2.44	6.75	Yes	$\sigma_4 - \sigma_5$	4.52	1.61	2.80	No

Table XCI shows significant differences between the means for Book I and Book IV, Book II and Book V, Book III and Book V, and Book IV and Book V.

There are no significant differences between any of the standard deviations.

Group V, reading Book V, had the highest score (80.60) in the shortest time (25.67 minutes). The group reading Book III was second in comprehensibility but required more time than the group reading Book I or Book II. The group reading Book IV required the longest time but their mean score was slightly higher than those reading Book II. This difference in score is not significant. (Table LXXXIX, page 218).

Rankings of the books on the degree of comprehension with which they were read by the groups equated on the three variables are given in Table XCII:

TABLE XCII

BOOKS RANKED AS TO MEAN PERFORMANCE ON THE COMPREHENSION TESTS WHEN THE GROUPS WERE EQUATED FOR CHRONOLOGICAL AGE, MENTAL AGE, AND READING AGE

	Book I	Book II	Book III	Book IV	Book V
Chronological Age	3	4	1	5	2
Mental Age	3	4	2	5	1
Reading Age	3	5	2	4	1
Average	3	4 1/3	1 2/3	4 2/3	1 1/3

Book I is third in comprehension by the pupils equated for each of the three variables. Book II is fourth for chronological age and mental age-groups, but fifth for the reading age groups. Book IV is most difficult for the groups when equated for chronological age and mental age, but falls to fourth place for reading age group. Book V shows a slightly higher rank than Book III. In averaged order of comprehensibility, from a easiest to most difficult, they are:

Book V, Book III, Book I, Book II and Book IV. There are no significant differences, however, between Book V and III as shown by the statistical analysis of the means when equated for chronological age, mental age, or reading age.

Table XCIII below gives a comparison of the means of the books when the groups were equated for the three bases and shows where significant differences occurred as measured by statistical analysis.

TABLE XCIII

SIGNIFICANT DIFFERENCES IN COMPREHENSION OF THE BOOKS WHEN THE GROUPS WERE EQUATED FOR CHRONOLOGICAL AGE, MENTAL AGE, AND READING AGE

<u>Chronological Age</u>	<u>Mental Age</u>	<u>Reading Age</u>
Books II and III		No significant difference
Books II and V	II and V	
Books III and IV	IV and V	

The location of significant differences between means for the six analyses made of the five books are given below. The numbers of the books are given opposite the analyses as, I & II for Books I and II, etc.:

	<u>Books</u>
1. Per cent of words beyond 6047	III and IV
2. Words to the sentence	I & IV, II & IV, III & IV, IV & V
3. Sentences to the paragraph	None
4. Words to the phrase	I & IV, II & IV, III & IV, III & V
5. Phrases to the paragraph	I & III, II & III
6. Phrases to the sentence	II & III, II & IV, III & IV, IV & V, I & III, I & IV.

Book I is not significantly different from the other books in the degree of accuracy with which the pupils comprehended it. It is, however, significantly different from Book IV when analyzed for: Number of words to the sentence; Number of words to the phrase; and Number of phrases to the sentence.

Book II is significantly different from Book III in the degree of accuracy of comprehension when the groups are equated for chronological age. It is also significantly different from Book V when the groups are equated for mental age.

Book II is significantly different from Book IV on number of words to the sentence and number of words to the phrase. It is significantly different from Book III on the number of phrases to the paragraph and number of phrases to the sentence.

Book III, is significantly different from Book II on comprehension when the groups are equated for chronological age; also from Book IV on number of words to the sentence, and number of words to the phrase. It is significantly different from Book V on number of words to the phrase.

Book IV which is significantly different from Book III on comprehension when the groups are equated for chronological age, differs significantly from Book V when the groups are equated for mental age. Book IV is also

significantly different from Books I, II, III, and V on the number of words to the sentence. It is significantly different from Books I, II, and III on the number of words to the phrase, and Books I, II, III and V, on the number of phrases to the sentence.

Book V which is significantly different from Book IV when the groups are equated for mental age, is significantly different from Book IV when analyzed for number of words to the sentence; from Book III for the number of words to the phrase; and from Book IV for the number of phrases to the sentence.

SUMMARY OF ANALYSIS OF DEGREE OF COMPREHENSION
WITH WHICH THE SELECTIONS WERE READ

1. Analysis of the data show that there is no significant difference with which the pupils comprehended the books, as represented by their samplings, when the groups are equated on the basis of sex and reading age.

2. There is a significant difference between the comprehension scores on Books II and III, Books II and V, and Books III and IV when the groups are equated for chronological age.

3. There is a significant difference between the comprehension scores on Books II and V, and Books IV and V when the groups are equated for mental age.

4. Significant differences between comprehension scores of groups equated for chronological age were found between books which differed significantly in:

1. Number of words to the sentence
2. Number of words to the phrase
3. Number of phrases to the sentence

5. Significant differences between comprehension scores of groups equated for mental age were found between books which differed significantly in:

1. Number of words to the sentence
2. Number of phrases to the sentence
3. Long involved sentences, with a large number of phrases to the sentence, and to the paragraph, appear to bear some relationship to the amount a child learns from a book.

The number of sentences to the paragraph, however, is not statistically significant.

7. The number of words to the sentence appears to have some bearing on the amount a child comprehends from a book, significant differences being found between the comprehension of Books III and IV and Books V and IV.

8. The number of words to the phrase has a slight relation to the number of correct responses made by the children; significant differences being found between Books III and IV.

9. For the number of phrases to the sentence, significant differences were found in the amount comprehended from Books III and IV and Books V and IV.

10. Book IV which has the hardest vocabulary, the longest sentences, the longest phrases, and the greatest number of phrases to the sentence, is read with the lowest degree of comprehension by the groups equated for chronological age and mental age, and is only 0.60 points higher than Book II when the groups are equated for reading age.

11. Book III, which appears easiest when ranked for vocabulary, phrase-length and number of sentences to the paragraph, ranked highest on the number of correct responses by the groups equated on chronological age, and next to highest by the groups equated on mental age and reading age. There are no significant differences, however, between the number of correct answers made on Book III and Book V.

12. Book V, which was slightly the easiest for the groups equated on mental age and reading age, is third or fourth in ease of vocabulary, phrase-and sentence-length and number of phrases to the sentence and to the paragraph.

13. Book I, which is the easiest in terms of sentence-length, phrases to the sentence, and phrases to the paragraph, is third in ease of comprehension for the groups equated on chronological age, mental age and reading age.

14. The five books are much alike. Factors other than vocabulary, phrase-and sentence-length, and length of paragraph, appear responsible for small differences in the degree of comprehension with which the equated groups read the representative selections from them.

GENERAL SUMMARY

CHAPTER VII

GENERAL SUMMARY

This study is an attempt to determine in terms of comprehensibility the requirement for a history text at the sixth-A level as outlined in educational and psychological literature and to ascertain how well five supplementary history books assigned to that grade in the Louisville Public Schools meet these requirements.

The investigations, as given under "Literature" in Chapter II, find that satisfactory comprehension of a textbook is dependent upon:

1. The vocabulary in which the book is written
2. The length of sentence and clearness of its structure
3. The nature of materials used
4. The purpose of the reader
5. The method of attacking the problem

Most writers are in agreement that vocabulary is a very strong factor in determining the amount a child learns from a textbook, and that a book must be made up of words that are known to be in the vocabulary of the pupils using the book.

The fact is pointed out, moreover, that words have many shades of meaning and it is a great error to assume that the meaning of a word understood in one situation is understood in another.

Dewey finds that merely the fact that a word occurs in a well-known vocabulary list is no guarantee that its meaning will be known by children. The investigations made by Nolte showed no significant difference between comprehension of selections read in the original form and those with simplified vocabularies.

This is contrary to the findings of Pressey, Johnson, Cutright, Ayer, and Wesley, whose investigations showed that comprehension depends to a marked extent upon vocabulary range, technical meaning of words, and frequency of usage.

These writers are not agreed as to the number of unknown words a child may encounter and still read with understanding, their opinions ranging from one word to 50 per cent, nor are they in full agreement with Uhl, Horn, and Gates; but all agree that if these unfamiliar words are key words, their number must be very small or an adequate interpretation of the selection is impossible.

That comprehension is influenced by sentence-length and sentence-structure is pointed out by Gates, Ayer, Burch, Gray and Horn. Ayer found that long-involved sentences retarded comprehension and that simplification of sentence-structure raised the degree of comprehension two grades. Horn and Gray found that sentence-structure influenced comprehension to a great extent, while Burch found that both length of sentence and length of paragraph influenced the amount of a child's comprehension. Smock, however, found

no significant difference in comprehension when pupils were tested on original and shortened sentences.

Abstract topics such as "finance," "political parties," and "tariff" are difficult to comprehend regardless of sentence-structure, as are materials dealing with time, place, maps, and graphs.

That the degree of comprehension on these and other materials as well as speed of comprehension is influenced by the interest and purpose of the reader was found by investigations of Gray and Gates.

The degree of comprehension is further dependent upon the method employed by the pupil. Some read a selection and attempt to get the thought as a whole. Many, however, as found by Dewey, Ayer, and Wesley, make no attempt to get the meaning as a whole, but attempt to find exact words or sentences containing the answer to the question sought, and failing in this, resort to verbalism. Such pupils comprehend very little of what they read as shown by Nolte's interviews and picture tests.

The degree of comprehension, however, is a problem of grave concern to investigators who find that children respond to test materials taken from their textbooks with a comprehension of only 25 to 50 per cent of the content, and in some cases this drops as low as 8 per cent.

Ayer states that the commonly accepted degree of comprehension must not be below 75 per cent accuracy, while

Burch finds that to justify the expenditure of time upon materials, the degree of accuracy must be 75.25 per cent or midway between 59.40 and 89.85 per cent.

From these investigations the writer accepted vocabulary and sentence-length-and-structure as important factors in determining the satisfactoriness of history supplementary books. The findings of Burch and Ayer were accepted, setting an acceptable degree of comprehension at 75 per cent accuracy.

There is no clearly established boundary for vocabulary, but since it is generally agreed that the vocabulary in which materials of instruction are written must lie within the understanding and common usage of the pupils, the writer has used the average number of words known by children of a given age, as determined by Terman, and placed this on the Thorndike Frequency of Usage Scale at 6047, with an arbitrary degree of comprehension of 97 per cent as a standard.

From each of five supplementary history books assigned to the sixth-A Grade, the writer and five other teachers selected seventeen paragraphs as being representative of the books as wholes. These were analyzed for vocabulary range according to Thorndike's Frequency of Usage Scale, and sentence- and phrase-length, and checked on representativeness by comparing the odd-numbered paragraphs and the even-numbered paragraphs.

If 97 per cent of the vocabulary of a book was within the 6047 level on the Thorndike Scale, the book was considered as suitable for the sixth-A grade in so far as its vocabulary was concerned.

Tests of comprehension were made for each of the books. These were used to determine how accurately five equated groups of sixth-A pupils read the representative samplings. The groups were equated in three ways: with sex and chronological age held constant, with sex and mental age constant, and with sex and reading age constant.

The average reading age of children in this grade was 12 years and 5 months on the Metropolitan Achievement Tests. If pupils of this reading (12-5) age comprehended 75 per cent or more of the test materials of a book, the book was considered of suitable comprehensibility for that reading-age level.

It was found that Book III was the only one of the five with 97 per cent of its vocabulary within the 6047 range. All five books had a significant per cent of words beyond the 6047 level. Only one difference of statistical significance was found between the books, however, that between Books III and IV.

All of the books were read with a degree of accuracy above 75 per cent by pupils who scored a reading age of 12-5 on the Metropolitan Achievement Tests. In averaged order of comprehensibility, from easiest to most difficult,

the books are: Book V, Book III, Book I, Book II, and Book IV.

When chronological age was held constant significant differences in degree of comprehension were found between books that differed significantly in: 1. Per cent of words beyond the 6047 level (III and IV); 2. Mean phrase- and sentence-length (III and IV); 3. Number of phrases to the sentence (III and IV, and II and III); 4. Number of phrases to the paragraph (II and III).

No significant differences were found in degree of comprehension with which the five books were read when the groups were equated on reading age.

When the groups were equated for mental age significant differences in degree of comprehension were found only between books that differed significantly in: 1. Words to the sentence and phrases to the sentence (IV and V).

Book IV, which has the hardest vocabulary, the longest sentences, the longest phrases, and the greatest number of phrases to the sentence, was read with the lowest degree of comprehension with chronological age constant and with mental age constant, and was only 0.60 points higher than Book II with reading age constant.

As far as this study is concerned there are very definite standards set down in the educational and psychological literature for history books at the sixth-A grade level, assuming that unanimity of opinion as a satisfactory

criterion for the determination of a standard. Analysis of the five history books assigned to this level in the Louisville Public Schools reveals an unusual degree of conformity to these standards, all of the books being well within the range of comprehensibility usually considered essential. It will be noted, however, that some of the books are markedly superior to others in certain features and that, in terms of the accepted standards, some of the books show distinct weaknesses. While the authors of these books have considered educational requirements remarkably well it is evident that they could do even better than they have by more careful regard to vocabulary, particularly to multiple usage of vocabulary terms, and to sentence, phrase, and paragraph construction. That more rigid requirements are to be expected in the future by those responsible for textbook selections at this grade level is a reasonable expectation in view of the positiveness with which these requirements are set down in the literature.

APPENDIX A

TABLE I

BASIC DATA FOR ALL PUPILS USED IN THE EXPERIMENT, SHOWING CHRONOLOGICAL AGE, MENTAL AGE, QUOTIENTS ON METROPOLITAN ACHIEVEMENT TEST, SCORE ON HISTORY COMPREHENSION TEST, AND TIME TO COMPLETE HISTORY COMPLETION TEST.

GROUP I ¹							
	Sex	C.A.	M.A.	I.Q.	R.A.	Score	Time
1.	G	11-6	118	114	98	65	40
2.	G	11-5	**111	109	108	63	24
3.	G	11-10	112	110	98	59	31
4.	B	12-8	89	91	*** 88	59	23
5.	G	11-4	**128	120	***112	62	25
6.	G	11-3	100	100	90	52	37
7.	B	12-6	74	77	*** 74	31	28
8.	B	12-6	93	94	*** 74	62	25
9.	G	11-5	85	87	88	63	29
10.	G	12-6	** 74	72	80	49	33
11.	G	11-9	**104	104	91	57	34
12.	G	12-2	81	83	84	49	31
13.	G	11-10	102	101	94	66	22
14.	B	12-1	**122	116	91	60	25
15.	G	11-5	**129	121	103	67	22
16.	B	13-1	81	84	*** 75	54	30
17.	G	13-7	111	104	91	66	18
18.	B	11-6	**129	121	109	66	25
19.	B	12-1	**108	107	88	63	23
20.	B	12-1	** 73	75	79	35	54
21.	B	11-11	65	76	72	57	56
22.	G	*12-4	106	106	*** 89	57	31
23.	B	*11-8	110	108	98	63	26
24.	G	*12-0	95	96	*** 87	51	50
25.	B	*11-10	85	87	82	53	39
26.	B	*12-6	97	98	*** 94	62	37
27.	B	*11-8	89	91	86	46	32
28.	G	*11-7	**124	119	106	65	23
29.	G	*11-10	92	93	*** 90	52	28
30.	G	*12-2	89	91	*** 86	60	43
31.	G	*11-7	91	93	*** 86	62	50
32.	B	*11-8	** 89	90	86	58	53
33.	B	*11-6	**123	117	***100	63	26
34.	B	*11-1	**125	110	***111	60	23
35.	G	*12-2	**112	120	*** 99	62	25
36.	G	*11-8	**105	104	*** 91	56	38

* Pupils not used in the groups equated for chronological age.

** Pupils not used in the groups equated for mental age.

*** Pupils not used in the groups equated for reading age.

1. Group I refers to group of pupils tested on Europe the Mother of America by Charles F. Horne and Olive Bucks. New York, Charles E. Merrill Company, 1930.

2. Key to TABLE

Sex, G girl; B boy

C.A., Chronological Age

M.A., Mental Age Quotient

I.Q., Intelligence Quotient

R.A., Reading Age Quotient

Score, Number of right answers on History Comprehension Test

Time, Time in minutes to complete the History Comprehension Test

TABLE II

GROUP II ¹							
	Sex	C.A.	M.A.	I.Q.	R.A.	Score	Time
1.	G	11-6	107	106	103	88	37
2.	G	11-5	108	107	97	61	31
3.	G	11-10	** 87	87	81	54	42
4.	B	12-9	90	92	*** 81	51	45
5.	G	11-4	114	111	100	53	35
6.	G	11-2	94	95	101	51	31
7.	B	12-9	85	87	86	58	42
8.	B	12-10	90	92	86	56	24
9.	G	11-5	93	94	91	51	30
10.	G	12-8	90	92	90	61	35
11.	G	11-9	112	110	101	62	27
12.	G	12-1	101	101	97	66	30
13.	G	11-7	77	80	89	46	60
14.	B	11-9	99	100	*** 90	57	37
15.	G	12-2	79	77	88	59	30
16.	B	13-2	92	94	86	59	40
17.	G	13-2	80	82	*** 77	53	34
18.	B	11-2	112	110	90	63	20
19.	B	11-5	** 93	94	97	49	24
20.	B	12-9	84	87	*** 89	60	39
21.	B	12-7	** 96	97	101	59	26
22.	G	*13-7	84	87	88	63	35
23.	G	*11-10	99	99	91	55	49
24.	B	*13-8	63	66	71	30	43
25.	B	*13-11	101	102	87	64	23
26.	G	*13-2	** 90	89	*** 80	49	27
27.	G	*11-4	** 87	89	92	55	39
28.	G	*11-8	***121	108	***107	61	35
29.	G	*12-2	** 81	82	*** 80	38	50

1. Group II refers to group of pupils tested on Our Nation's Heritage by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.

TABLE III

GROUP III ¹							
Sex	C.A.	H.A.	I.Q.	R.A.	Score	Time	
1.	G	11-6	83	85	86	57	29
2.	G	11-5	**129	121	94	65	34
3.	G	11-9	**119	114	***107	66	21
4.	B	12-11	64	68	*** 77	63	50
5.	G	11-4	116	112	100	65	35
6.	G	11-2	**122	117	101	69	32
7.	B	12-7	** 83	94	86	63	36
8.	B	11-5	84	86	*** 84	54	38
9.	G	12-7	**126	119	***108	69	27
10.	G	11-9	**121	116	110	68	22
11.	G	12-2	**117	113	***106	63	29
12.	G	11-6	**133	123	***107	63	23
13.	G	11-8	106	105	98	58	22
14.	B	12-2	**135	124	***110	66	29
15.	G	11-6	**153	136	***109	68	28
16.	B	13-3	** 69	72	71	36	29
17.	G	13-9	82	85	76	66	35
18.	B	11-1	**162	140	***113	67	21
19.	B	12-3	116	112	***119	69	21
20.	B	12-5	97	97	95	63	24
21.	B	12-3	76	79	81	61	53
22.	B	*12-0	111	109	101	61	38
23.	G	*11-3	110	108	***117	68	19
24.	B	*14-4	89	99	84	62	31
25.	G	*11-4	93	94	94	63	33
26.	B	*12-1	80	81	*** 77	32	36
27.	B	*12-6	99	100	94	66	32
28.	B	*12-1	92	93	85	55	29
29.	G	*12-2	104	117	100	63	28
30.	G	*11-8	89	100	91	62	31
31.	B	*11-8	100	100	**102	65	31
32.	B	*11-10	80	98	*** 96	32	30
33.	G	*11-6	105	103	*** 91	65	42
34.	G	*11-6	**116	112	102	62	40
35.	G	*11-7	** 73	78	82	34	30
36.	B	*11-3	**122	117	100	69	31
37.	B	*11-3	**160	138	***119	68	19
38.	G	*11-9	**125	119	***107	68	26
39.	B	*11-10	**108	106	*** 97	62	28
40.	B	*11-6	**113	111	***105	67	22
41.	B	*11-5	**127	118	***118	67	20

1. Group III refers to group of pupils tested on The Old World Beginnings of America by Mary G. Kelly. New York, Ginn and Company, 1932.

TABLE IV

GROUP IV ¹							
	Sex	C.A.	M.A.	I.Q.	H.A.	Score	Time
1.	G	11-5	** 96	96	*** 94	51	52
2.	G	11-4	88	89	87	54	32
3.	G	11-10	109	108	93	62	46
4.	B	12-7	**107	106	93	53	44
5.	G	11-3	100	100	94	61	50
6.	G	11-7	**147	132	***120	69	31
7.	B	12-5	92	93	*** 97	31	15
8.	B	12-1	**104	103	***105	62	27
9.	G	11-6	94	94	99	61	27
10.	G	12-2	98	98	84	58	58
11.	G	11-9	** 95	96	*** 94	46	54
12.	G	12-3	80	82	84	50	48
13.	G	11-7	84	86	87	29	27
14.	B	11-9	85	87	87	61	60
15.	G	12-1	**102	102	90	57	44
16.	B	12-0	94	95	99	54	30
17.	G	13-8	78	81	*** 73	54	62
18.	B	13-1	87	88	93	60	27
19.	B	12-7	** 95	96	99	57	35
20.	B	11-6	**119	114	94	64	48
21.	B	11-7	**102	102	102	55	28
22.	B	*11-4	110	108	*** 98	60	43
23.	G	*12-3	104	103	89	65	63
24.	G	*11-4	116	113	89	60	46
25.	B	*11-5	99	99	*** 96	59	47
26.	G	*11-4	104	94	*** 93	65	60
27.	G	*11-5	96	96	94	61	62
28.	B	*11-8	84	96	*** 95	29	35
29.	B	*12-1	80	82	85	42	32
30.	B	*11-10	80	93	*** 97	50	47
31.	B	*11-6	**119	114	99	60	39
32.	B	*13-8	** 78	81	73	54	62

1. Group IV refers to group of pupils tested on The American People and Their Old World Ancestors by Grace Vollentine. New York, Ginn and Company, 1930.

TABLE V

GROUP V ¹						
	Sex	C.A.	M.A.	I.Q.	R.A.	Score Time
1.	G	11-6	98	98	87	68 27
2.	G	11-5	81	84	84	57 26
3.	G	11-10	108	106	85	65 24
4.	B	12-8	** 78	76	78	54 26
5.	G	11-3	** 74	78	88	37 35
6.	G	11-6	**116	112	***103	66 22
7.	B	12-5	85	86	*** 79	42 18
8.	B	12-5	**145	130	103	69 16
9.	G	11-6	**118	114	106	62 20
10.	G	12-2	**148	132	101	68 15
11.	G	11-9	**153	136	109	65 16
12.	G	12-0	** 76	78	81	51 47
13.	G	11-7	113	111	84	67 22
14.	B	11-9	**123	117	***109	66 19
15.	G	12-4	105	106	87	65 22
16.	B	11-6	82	84	*** 81	63 47
17.	G	13-4	78	80	73	49 42
18.	B	13-2	99	101	*** 80	62 31
19.	B	13-1	95	97	*** 99	63 20
20.	B	11-8	**133	123	***107	66 17
21.	B	11-8	**152	136	***119	66 15
22.	G	*11-8	81	83	*** 82	56 31
23.	G	*10-2	112	109	98	62 29
24.	G	*11-6	116	112	103	66 22
25.	G	*11-5	88	97	88	55 22
26.	B	*15-0	85	93	*** 89	65 18
27.	B	*11-6	96	88	84	55 22
28.	G	*11-8	116	113	96	60 23
29.	G	*12-6	82	81	79	63 35
30.	B	*11-4	101	101	*** 94	67 30
31.	B	*14-1	68	71	*** 68	61 41
32.	B	*11-11	**109	109	87	60 35
33.	B	*11-10	**126	119	87	66 18
34.	G	*11-7	**132	123	100	67 18
35.	G	*11-8	**139	127	95	68 22

1. Group V refers to group of pupils tested on The Elementary World History by William C. Bagley. New York, The Macmillan Company, 1932.

TABLE VI

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS EQUATED AS TO AGE, SHOWING THE COMPREHENSION SCORES AND TIME OF COMPLETING TEST.

GROUP I ¹			
	Age	Score	Time
Mean of Distribution	12-0	57.41	30.23
Range	11-3 to 13-7	31 to 67	18 to 56
Standard Deviation	7.20	9.51	9.60
Standard Error of Mean	1.60	2.12	2.13
Probable Error of Mean	1.08	1.43	1.44
Standard Error of the Standard Deviation	1.11	1.46	1.45

1. Group I refers to group of pupils tested on Europe the Mother of America by Charles F. Horne and Olive Bucks. New York, Charles E. Merrill Company, 1930.

TABLE VII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS EQUATED AS TO AGE, SHOWING THE COMPREHENSION SCORES AND TIME OF COMPLETING TEST.

GROUP II ¹			
	Age	Score	Time
Mean of Distribution	12-0	56.54	34.23
Range	11-2 to 13-2	46 to 66	20 to 60
Standard Deviation	8.05	4.98	8.67
Standard Error of Mean	1.77	1.09	1.92
Probable Error of Mean	1.21	.74	1.30
Standard Error of the Standard Deviation	1.24	.76	1.33

1. Group II refers to group of pupils tested on Our Nation's Heritage by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.

TABLE VIII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS EQUATED AS TO AGE, SHOWING THE COMPREHENSION SCORES AND TIME OF COMPLETING TEST.

GROUP III ¹			
	Age	Score	Time
Mean of Distribution	12-0	62.72	30.33
Range	11-1 to 13-9	36 to 69	21 to 52
Standard Deviation	7.44	7.11	8.51
Standard Error of Mean	1.80	1.57	1.89
Probable Error of Mean	1.12	1.06	1.28
Standard Error of the Standard Deviation	1.14	1.09	1.31

1. Group III refers to the group of pupils tested on The Old World Beginnings by Mary G. Kelly. New York, Ginn and Company, 1932.

TABLE IX

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS EQUATED AS TO AGE, SHOWING THE COMPREHENSION SCORES AND TIME OF COMPLETING TEST.

GROUP IV ¹			
	Age	Score	Time
Mean of Distribution	12-0	55.07	39.52
Range	11-3 to 13-9	29 to 69	15 to 52
Standard Deviation	7.00	9.17	14.06
Standard Error of Mean	1.70	2.04	3.29
Probable Error of Mean	1.05	1.38	2.22
Standard Error of the Standard Deviation	1.08	1.41	2.16

1. Group IV refers to the group of pupils tested on The American People and Their Old World Ancestors by Grace Vollintine. New York, Ginn and Company, 1930.

TABLE X

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS EQUATED AS TO AGE, SHOWING THE COMPREHENSION SCORES AND TIME OF COMPLETING TEST.

GROUP V ¹			
	Age	Score	Time
Mean of Distribution	12.0	61.00	25.10
Range	11-3 to 13-4	37 to 68	15 to 47
Standard Deviation	7.25	8.54	9.73
Standard Error of Mean	1.58	1.89	2.16
Probable Error of Mean	1.07	1.28	1.46
Standard Error of the Standard Deviation	1.11	1.31	1.50

1. Group V refers to the group of pupils tested on the Elementary World History by Charles A. Beard and William G. Bagley. New York, The Macmillan Company, 1932.

TABLE XI

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO MENTAL AGE, SHOWING THE COMPREHENSION SCORES
AND TIME OF COMPLETING TEST.

GROUP I ¹			
	Age	Score	Time
Mean	93.50	56.60	33.04
Standard Deviation	12.95	7.94	7.93
Probable Error	8.733	5/353	5.343
Probable Error of Mean	1.954	1.100	1.197
Standard Error of Mean	2.676	1.631	1.764
Standard Error of the Standard Deviation	1.999	1.222	1.222

1. Group I refers to group of pupils tested on Europe the
Mother of America, by Charles F. Horne and Olive Bucks.
New York, Charles E. Merrill Company, 1930.

TABLE XII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO MENTAL AGE, SHOWING THE COMPREHENSION SCORES
AND TIME OF COMPLETING TEST.

GROUP II ¹			
	Age	Score	Time
Mean	93.50	56.00	35.90
Standard Deviation	12.90	7.60	8.68
Probable Error	8.700	5.121	5.855
Probable Error of Mean	1.944	1.144	1.300
Standard Error of Mean	2.875	1.690	1.927
Standard Error of the Standard Deviation	1.999	1.171	1.333

1. Group II refers to group of pupils tested on Our Nation's Heritage, by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.

TABLE XIII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO MENTAL AGE, SHOWING THE COMPREHENSION SCORES
AND TIME OF COMPLETING TEST.

GROUP III ¹			
	Age	Score	Time
Mean	93.60	59.60	32.66
Standard Deviation	13.22	9.67	8.21
Probable Error	8.900	6.521	5.535
Probable Error of Mean	1.992	1.454	1.233
Standard Error of Mean	2.950	2.150	1.824
Standard Error of the Standard Deviation	2.042	1.491	1.267

1. Group III refers to group of pupils tested on The Old World Beginnings of America, by Mary C. Kalty. New York, Ginn and Company, 1932.

TABLE XIV

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO MENTAL AGE, SHOWING THE COMPREHENSION SCORES
AND TIME OF COMPLETING TEST.

GROUP IV ¹			
	Age	Score	Time
Mean	93.00	53.70	42.57
Standard Deviation	10.81	13.09	14.54
Probable Error	7.291	9.388	9.800
Probable Error of Mean	1.638	3.071	2.196
Standard Error of Mean	2.417	3.069	3.247
Standard Error of the Standard Deviation	1.766	2.050	2.244

1. Group IV refers to group of pupils tested on The American People and Their Old World Ancestors, by Grace Vollintine. New York, Ginn and Company, 1930.

TABLE XV

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO MENTAL AGE, SHOWING THE COMPREHENSION SCORES
AND TIME OF COMPLETING TEST.

GROUP V ¹			
	Age	Score	Time
Mean	93.60	50.80	28.15
Standard Deviation	15.61	6.40	9.04
Probable Error	10.222	4.311	6.090
Probable Error of Mean	2.281	.956	1.352
Standard Error of Mean	3.380	1.423	2.014
Standard Error of the Standard Deviation	2.400	.981	1.399

1. Group V refers to group of pupils tested on The Elementary World History, by Charles A. Beard and William C. Bagley. New York, The Macmillan Company, 1932.

TABLE XVI

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO READING AGE, SHOWING THE COMPREHENSION
SCORES AND TIME OF COMPLETING TEST.

GROUP I ¹			
	Age	Score	Time
Mean	91.50	58.20	31.85
Standard Deviation	9.65	8.08	10.07
Probable Error	6.500	5.455	6.797
Probable Error of Mean	1.452	1.211	1.511
Standard Error of Mean	2.150	1.266	2.239
Standard Error of the Standard Deviation	1.484	1.794	1.555

1. Group I refers to group of pupils tested on Europe the
Mother of America, by Charles F. Horne and Olive Bucks.
New York, Charles E. Merrill Company, 1930.

TABLE XVII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO READING AGE, SHOWING THE COMPREHENSION
SCORES AND TIME OF COMPLETING TEST.

GROUP II ¹			
	Age	Score	Time
Mean	91.40	56.00	34.00
Standard Deviation	7.69	7.75	9.39
Probable Error	5.186	5.222	6.333
Probable Error of Mean	1.211	1.161	1.411
Standard Error of Mean	1.794	1.720	2.090
Standard Error of the Standard Deviation	1.188	1.191	1.465

1. Group II refers to group of pupils tested on Our Nation's Heritage, by Reuben Post Halleck and Juliette Frantz. New York, American Book Company, 1931.

TABLE XVIII

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO READING AGE, SHOWING THE COMPREHENSION
SCORES AND TIME OF COMPLETING TEST.

GROUP III ¹			
	Age	Score	Time
Mean	91.90	60.50	35.00
Standard Deviation	9.60	9.00	10.13
Probable Error	6.474	6.072	6.832
Probable Error of Mean	1.444	1.356	1.524
Standard Error of Mean	2.135	2.002	2.254
Standard Error of the Standard Deviation	1.481	1.380	1.568

1. Group III refers to group of pupils tested on The Old World Beginnings of America, by Mary C. Kelly. New York, Ginn and Company, 1932.

TABLE XIX

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO READING AGE, SHOWING THE COMPREHENSION
SCORES AND TIME OF COMPLETING TEST.

GROUP IV ¹			
	Age	Score	Time
Mean	91.50	56.60	42.14
Standard Deviation	6.74	8.02	13.07
Probable Error	4.546	5.400	9.241
Probable Error of Mean	1.011	1.200	2.062
Standard Error of Mean	1.497	1.779	3.054
Standard Error of the Standard Deviation	1.044	1.235	2.014

1. Group IV refers to group of pupils tested on The American People and Their Old World Ancestors, by Grace Vollintine. New York, Ginn and Company, 1930.

TABLE XX

SUMMARY OF INITIAL DATA FOR THE FIVE EXPERIMENTAL GROUPS
EQUATED AS TO READING AGE, SHOWING THE COMPREHENSION
SCORES AND TIME OF COMPLETING TEST.

GROUP V ¹			
	Age	Score	Time
Mean	91.40	60.60	25.67
Standard Deviation	9.48	8.36	8.55
Probable Error	6.394	5.633	5.764
Probable Error of Mean	1.425	1.252	1.282
Standard Error of Mean	2.105	1.853	1.898
Standard Error of the Standard Deviation	1.462	1.291	1.311

1. Group V refers to group of pupils tested on The Elementary World History, by Charles A. Beard and William C. Bagley. New York, The Macmillan Company, 1932.

APPENDIX B

-1-

EUROPE THE MOTHER OF AMERICA - HORNE AND BUCKS

Name _____ School _____ Grade _____

Date _____ Time _____

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as: "Louisville is a (a) house (b) city (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY.
 4. Put your name at the bottom of each page right now---before you start to work.

I

Even the great Roman roads of stone, which had led all over western Europe, could no longer be used for travel. They were disappearing through neglect. Their very stones were carried off to build rude walls of defense. Wolves came down from the mountains and roamed over the country. There was no peace anywhere--except where some strong tribe had settled down, and defended for itself the city or farmland which it had seized.

- _____ 1. The stone roads of Rome were (a) neglected (b) well cared for (c) rebuilt.
- _____ 2. The stones from the roads were used to (a) build houses (b) rebuild the roads (c) build walls.
- _____ 3. The country was roamed over by (a) bandits (b) wolves (c) soldiers.
- _____ 4. There was peace only for the (a) priests (b) common people (c) strong tribes.

II

Chief of these peoples were the German tribes or Teutons (tu'tons), as the Romans called them, who lived in the forests of Northern Europe. These Teutons were the ancestors of the German and English people of today. They were also the ancestors of many of the people of

France and Italy, because after they had gradually conquered those countries, they married the natives or brought their own families to live in those lands. As almost all the American colonists came from western Europe, the Teutons were our ancestors also.

- _____ 1. The Romans called the German tribes (a) Europeans (b) Americans (c) Teutons.
- _____ 2. The Teutons of Europe lived in the (a) north (b) south (c) east.
- _____ 3. The Teutons of Europe were ancestors of the (a) Spanish (b) French (c) Germans.
- _____ 4. Almost all the American colonists were related to the (a) Teutons (b) French (c) Spanish.

III

Charlemagne believed that people should have schools. Besides those which had grown up in the monasteries, he started some himself. The main school was in Charlemagne's own palace, and he commanded that the children of his own chief followers should study there. Other children were also admitted if the teacher thought the child bright enough to make educating him worth while.

- _____ 1. Charlemagne wanted the people to have (a) schools (b) no schools (c) many parks.
- _____ 2. The children of Charlemagne's followers went to school because (a) they had to (b) they wanted to (c) there was nothing else to do.
- _____ 3. Some children went to Charlemagne's school because (a) the teachers liked them (b) they liked the teachers (c) the teachers thought they were bright.
- _____ 4. Charlemagne had the main school in his (a) church (b) palace (c) courtyard.

IV

England, at first known as Britain, had been ruled like most of Europe by the Romans. When the Roman Empire was ruined, some Teuton tribes called Angles and Saxons conquered Britain and gave their own name to it--Angle-Land. They did not draw together under a single great leader, as did the Franks under Charlemagne. They did, however, form

a group of little kingdoms and enjoyed some peaceful years. Their monks became noted for their scholarship.

- _____ 1. England was first called (a) Rome (b) Britain (c) Angle-Land.
 - _____ 2. After the fall of Rome, England belonged to the (a) Franks (b) French and English (c) Angles and Saxons.
 - _____ 3. The Anglo-Saxons (a) united with France (b) had one leader (c) formed a group of little kingdoms.
 - _____ 4. The Anglo-Saxons had peace for (a) some time (b) a long time (c) not at all.
-

V

Every year the Vikings sailed south with ever larger fleets of their swift ships. After a while they built strong camps on the French and English coasts and stayed in these camps all winter. Thus they could begin their robberies earlier the next spring. The coast cities became too exhausted, too ruined, to make any defense.

- _____ 1. The Vikings sailed (a) north (b) south (c) southeast.
 - _____ 2. The Vikings stayed in their camps all (a) year (b) winter (c) all spring.
 - _____ 3. The coast cities did not fight the Vikings because (a) they were too weak (b) they had no ships (c) they were afraid.
 - _____ 4. The Viking ships were (a) slow (b) clumsy (c) swift.
-

VI

Always, as Lief and his followers advanced, the shores became more warm and sunny and green with woodlands. They found it different indeed from the dark, foggy land they had first discovered. At length one of them, wandering inland, found great quantities of wild grapes. They then declared the new country was well worth settling in, and they called it Vineland or Vinland. As the saga gives no exact location, we are not sure just where Vinland was. Perhaps it lay on the shores of Nova Scotia in Canada. Perhaps the explorers had reached as far south as New England.

- _____ 1. The land that Lief found first was (a) sunny
(b) foggy (c) hilly.
 - _____ 2. Vinland was on the shores of (a) Virginia
(b) Maine (c) Nova Scotia.
 - _____ 3. Vinland gets its name from its (a) woodlands
(b) grapes (c) sunny skies.
 - _____ 4. Lief's followers found (a) grapes (b) apples
(c) corn.
-

VII

For many years Alfred fought the Danes. He built himself new ships, swifter and stronger than those of the Danes. These pursued and captured many Danish ships before the raiders could do much harm. This fleet of Alfred's was the beginning of the now famous English navy.

- _____ 1. Alfred fought the (a) English (b) Danes (c) French.
 - _____ 2. Alfred's ships won out because they were (a) big
(b) many (c) swift and strong.
 - _____ 3. Alfred's fleet was the beginning of (a) the English
Navy (b) the French Navy (c) the Armada.
 - _____ 4. Alfred's ships chased and caught (a) many of
(b) a few of (c) all of the enemy ships.
-

VIII

The more ignorant people of Europe did not realize the difficulty at all. Thousands flung themselves into the Crusade as though it had been no more serious than their usual fighting. They did not know that they were attempting a long journey. They did not see that this journey would be far more terrible than any battle with the Turks which might come at the end of it. When only a few pilgrims had been traveling to Jerusalem, they could gather food upon the way. But there was no food ready for a great army.

- _____ 1. The ignorant people thought the Crusades would be
(a) hard (b) easy (c) about like an ordinary fight.
- _____ 2. (a) thousands (b) hundreds (c) millions of people
went on the Crusades.
- _____ 3. The Crusaders went to fight the (a) Germans
(b) Turks (c) Jews.

- _____ 4. The food on the way was enough for (a) many
(b) few (c) none.
-

IX

After the Crusades there continued to be an active trade with Asia. The East was glad to get grain, oil, metals, wool cloth, leather, and furs from the West. These products were carried to Eastern ports by Italian merchants. Then the boats were loaded with Eastern goods and returned to Italy.

- _____ 1. The ships to the East carried (a) wool (b) wool cloth (c) coffee.
- _____ 2. The merchants that took goods to the East were from (a) Italy (b) Asia (c) India.
- _____ 3. Trade with Asia came (a) during (b) before (c) after the Crusades.
- _____ 4. The boats that carried Eastern goods to the West were from (a) Italy (b) Asia (c) India.
-

X

Now men learned about other places and different ways of living. The civilization of the East was in many ways better than that of Europe. The homes of the Eastern people were not only finer ones, but they showed much more artistic beauty than those of Europe. Beautiful rugs on the floors and fine tapestry on the walls made the homes of Eastern people a delight to visit. Their clothing and jewels were richer than those of Europeans. Inventions made life easier for them. Windmills, first seen in the East, were now copied for use in Holland and other lands.

- _____ 1. The civilization of the East was (a) better (b) worse (c) about the same as that of Europe.
- _____ 2. Life for the Eastern people was made easy by (a) baths (b) jewels (c) inventions.
- _____ 3. Windmills were first seen in (a) the East (b) Italy (c) Holland.
- _____ 4. The people of the East wore (a) ragged (b) fine (c) ugly clothing.

XI

There now arose a man of such power and such wisdom that he made these new instruments do a great work for mankind. This famous leader belonged not to the Italian merchant cities, but to Portugal. He was of the royal family there. He is known as Prince Henry the Navigator.

- _____ 1. Prince Henry made new (a) sea routes (b) instruments (c) furniture.
 - _____ 2. Prince Henry lived in (a) Portugal (b) France (c) Italy.
 - _____ 3. Prince Henry was a (a) teacher (b) soldier (c) navigator.
 - _____ 4. Prince Henry was a great help because he was (a) rich (b) royal prince (c) a wise man.
-

XII

Each village had a school in which the priests taught the Indian children as much as was possible of European ideas and ways of living. Indian girls were taught in these schools with the boys. The missions were to the Indians what the monasteries were to Europeans in the Dark Ages. The priests and monks were doctors and nurses, farmers and gardeners. Traces of their carefully tended gardens still linger in the courts, or patios, of some of the old missions.

- _____ 1. The priests taught the Indian children to (a) make lace (b) make bows and arrows (c) live like Europeans.
- _____ 2. Indian girls and boys (a) went to the same schools (b) went to different schools (c) did not go to school.
- _____ 3. The missions were like (a) factories (b) stores (c) monasteries.
- _____ 4. The priests and monks did the work of (a) servants (b) doctors (c) soldiers.

XIII

The chief products brought home from Roanoke had been tobacco and potatoes. We have seen how the Spaniards had learned from the Indians to use tobacco. Now Raleigh set the fashion of it in England. He frequently smoked a pipe at court, and there is a legend that Elizabeth would sit beside him admiringly, sniffing at the smoke.

- _____ 1. Tobacco was brought from (a) Rome (b) Roanoke (c) Spain.
 - _____ 2. The fashion of smoking in England was set by (a) Raleigh (b) Elizabeth (c) Roanoke.
 - _____ 3. Queen Elizabeth (a) smoked a pipe (b) used snuff (c) liked to smell tobacco smoke.
 - _____ 4. Tobacco was used first by the (a) Indians (b) Spanish (c) English.
-

XIV

The system of feudalism was based upon the idea that all land belonged to the king. The word "feud" or "fief" meant an estate or large farm. The estate of each noble came to him as a sort of gift from the king or a noble of high rank. Each one who received a gift of land owed "feudal" service to the giver, and was called his "vassal." He in turn might grant parts of his piece of land to vassals. Each vassal took an oath of homage to his lord. He agreed to fight for him and to pay him certain service or dues in money. The actual work on the farms was done by the lowest class of peasants, called "serfs." They were almost like slaves for they could be sold with the land. They worked a part of each week on their lord's land in return for the privilege of farming a little strip for themselves.

- _____ 1. A fief was a large (a) town (b) man (c) farm.
- _____ 2. The person who received a gift of land was called a (a) vassal (b) fief (c) lord.
- _____ 3. The work on the farms was done by the (a) lords (b) serfs (c) vassals.
- _____ 4. (a) serfs (b) vassals (c) fiefs could be sold with the land.

XV

Now there sprang up in Germany the idea of printing by movable letters which we call type. In this way one page of a book could be quickly set up and printed from a set of type; and later the same type could be used for setting up another page. The old way of making books, as you will remember, was by writing them out by hand, as the monks did in monasteries. By this new way of printing from a set of type, books could be made many times more quickly, and they rapidly became much cheaper.

- _____ 1. Printing with movable type began in (a) France
(b) Italy (c) Germany.
 - _____ 2. Monks wrote books (a) on stone tablets (b) by
hand (c) on printing presses.
 - _____ 3. With movable letters they could (a) print a whole
page at one time (b) print pictures (c) move the
letters on the page.
 - _____ 4. Movable type made books (a) more expensive (b)
cheaper (c) scarcer.
-

XVI

It was in the year 1588 that the Invincible Armada finally set forth to conquer England. A hundred and thirty Spanish warships sailed with stately slowness up the English Channel. They advanced in a great crescent, defying English attack. On the coast of what is now Belgium but was then a province of Spain, the Spanish army awaited their ships. These were to carry the fierce Spanish warriors across the narrow arm of the sea which alone kept them out of England.

- _____ 1. The Armada tried to beat the (a) English
(b) Spanish (c) French.
- _____ 2. The Armada was made up of (a) ships (b) soldiers
(c) airplanes.
- _____ 3. The Armada belonged to (a) England (b) Italy
(c) Spain.
- _____ 4. The Armada carried (a) soldiers (b) oil and coal
(c) silk.

XVII

Almost at once Cortes contrived to make a prisoner of the Aztec emperor. The bold Spaniard then gave commands and ruled in the emperor's name. When the Aztecs realized what had happened, they fought desperately to free their leader and drive out the Spaniards. One fierce battle followed another, for the Aztecs were brave warriors. They fought with bone-tipped arrows, bronze javelins and tomahawks of stone. Even the iron weapons and the cannon of the Spaniards could not turn them back. The Aztecs thought that the horses and armor of the Spaniards were part of them. The invaders seemed to them like four-legged monsters with skins of iron. When they learned that the horse was separate and not a part of the warrior, they attacked each horse from beneath.

- _____ 1. Cortes made the Aztec Emperor a (a) knight
(b) prisoner (c) priest.
- _____ 2. The Aztec warriors were (a) weak (b) brave
(c) cowards.
- _____ 3. The Aztecs fought to (a) kill the Spaniards
(b) capture the Spaniards (c) free their leader.
- _____ 4. The Spaniards fought with weapons of (a) iron
(b) wood (c) steel.

-1-

OUR NATION'S HERITAGE - HALLECK AND FRANTZ

Name _____ School _____ Grade _____

Date _____ Time _____

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as: "Louisville is a (a) house (b) city (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY.
 4. Put your name at the bottom of each page right now--before you start to work.

I

Among the remarkable things in the Roman Empire were the roads on which armies, traders, and travelers could move quickly from one place to another. Rome taught the importance of good roads in the development of a country. From Rome as a center, perfect roads, hard, wide and smooth as city streets, radiated to all parts of the empire. The Roman roads have given us one of our proverbs: "All roads lead to Rome." Important roads went directly in straight lines from place to place. In planning them, the Romans were not blocked by mountains, rivers or swamps in the way. Mountains were tunneled, and rivers and marshes were spanned by bridges. We say today: "Run a Roman road through it," an expression which means "go right ahead and allow nothing to block the way." When we ride today over parts of the old Roman roads in Italy, France, and England, we cannot deny that the Romans were the great road builders of the world.

- _____ 1. The roads of Rome were (a) rough (b) rutty (c) smooth.
- _____ 2. Rome showed that (a) roads (b) schools (c) baths were most important in building a country.
- _____ 3. On the Roman roads one could travel (a) slowly (b) rapidly (c) only short distances.
- _____ 4. The main roads of Rome went (a) straight (b) along the rivers (c) over the mountains.

II

To the small, dark Romans, the tall, fair Germans and other Teutons seemed like giants. Their bodies were powerful and well developed. Their eyes were blue or gray, and their long hair, golden or red. This light hair was a source of wonder to the Romans, who made wigs of the hair taken from German prisoners. Many a Roman lady proudly wore the hair of one of her barbarian neighbors.

- _____ 1. The Romans thought the Germans were like
(a) dwarfs (b) giants (c) fairies.
 - _____ 2. The Romans used the hair of the German prisoners
to make (a) brushes (b) wigs (c) cloth.
 - _____ 3. The eyes of the Teutons were (a) black (b) brown
(c) blue.
 - _____ 4. The Germans were (a) weak (b) strong (c) sick.
-

III

In 800 A.D. learning was at a very low stage in the Frankish kingdom. Even the great emperor himself could not read. He tried to learn how to write, and used to keep tablets under his pillow so that in his leisure hours he might practice forming the letters. But he was never able to write any more than his name. Charlemagne found that some of the priests could not read. They simply learned the church service by heart from others. Many of the best men in the Frankish kingdom had little education.

- _____ 1. Charlemagne (a) was educated (b) could not read
(c) was a great writer.
- _____ 2. Charlemagne was (a) English (b) Spanish (c) a
Frank.
- _____ 3. Some of the priests (a) betrayed Charlemagne
(b) could not read (c) were excellent scholars.
- _____ 4. Charlemagne kept tablets under his pillow so
that (a) he could practice writing (b) he would
not lose them (c) the priests would like him.

IV

The newcomers practically destroyed Roman civilization in the island. Many valuable things disappeared from use. For instance, coal had been used in Britain by the Romans, but was not known by the early English nor used again until the twelfth or thirteenth century.

- _____ 1. Roman civilization was almost destroyed in Britain by (a) the plague (b) wars (c) volcanoes.
 - _____ 2. The Anglo-Saxons did not know about (a) gold (b) ore (c) coal.
 - _____ 3. The English began using coal in the (a) twelfth (b) twentieth (c) fifth century.
 - _____ 4. The newcomers to Britain (a) brought gold (b) protected the poor people (c) stole the treasures.
-

V

Across the North Sea, in what is now Norway, Sweden and Denmark, lived the Danes. They were also called Northmen, Norsemen, Normans or Vikings and were the fiercest of the Teutons. They had taken no part in the early invasions of the Roman Empire by their kinsmen. By the ninth century they were roaming the sea as heathen pirates. Wherever a river mouth invited them, they entered, robbed the towns, and then sailed away. Gradually the Northmen made settlements along the coast of Europe. The most famous, which included the region about the mouth of the Seine River in France, still bears their name, Normandy.

- _____ 1. The Danes were (a) Norsemen (b) Germans (c) Romans.
- _____ 2. The Vikings were the (a) calmest (b) fiercest (c) weakest of the Teutons.
- _____ 3. The Northmen settled on the coast of (a) Africa (b) Asia (c) Europe.
- _____ 4. At the mouths of the rivers the Norsemen (a) built homes (b) robbed the towns (c) burnt the towns.

VI

The Northmen settled Iceland and founded colonies in Greenland which lasted several hundred years. One band, under the leadership of Lief Ericsson, even visited the mainland of America, about the year 1000. The Northmen explored the coast of Labrador, Newfoundland and Nova Scotia, and made a settlement in what they called Vinland. They traded red cloth for the furs of the Indians. Then the white men and the Indians quarreled, and many Northmen were killed. The survivors left the Vinland Settlement and went back to Greenland. Nothing remains to mark the site of the Vinland Settlement. Those in Europe who heard of the Northmen's story did not dream that they were hearing about a new continent.

- _____ 1. The Northmen traded (a) furs (b) jewelry (c) cloth.
 - _____ 2. Many Northmen were killed when they quarreled with the (a) Spanish (b) Indians (c) English.
 - _____ 3. The colonies of the Northmen in Iceland lasted (a) several months (b) a few years (c) several hundred years.
 - _____ 4. The Indians traded (a) furs (b) jewelry (c) red cloth.
-

VII

The first years of Alfred's reign were marked by fierce and continuous struggles with the Danes. Alfred knew that until the Danes were conquered, England could enjoy no peace or progress. He ordered his men to build ships larger than those of their enemies. Alfred has sometimes been called "the founder of the English navy."

- _____ 1. To have peace the English had to conquer the (a) Romans (b) Danes (c) Germans.
- _____ 2. Alfred founded the (a) English Navy (b) English Army (c) English Parliament.
- _____ 3. The first years of Alfred's reign were (a) easy (b) hard (c) useless.
- _____ 4. Alfred had his men build (a) many canoes (b) large ships (c) small ships.

VIII

Men of all classes from Christian Europe joined armies that fought not only the Turks but also other Mohammedans in western Asia at various times (beginning 1096) for nearly two hundred years. These attempts to drive the Mohammedans out of the Holy Land were called the Crusades, from the Latin word meaning "cross." The church showed its great influence in starting the Crusades. The Crusaders, to show their respect for the cross on which Christ died, wore a cross of red cloth. They captured Jerusalem (1099) and held it for nearly a hundred years. The Crusaders failed in their real purpose, for the Mohammedans took Jerusalem from them (1187) and kept it for more than seven hundred years. The Christians then re-captured it (1917) in the World War.

- _____ 1. The Crusaders tried to drive the (a) Mohammedans (b) Jews (c) Spanish out of the Holy Land.
- _____ 2. The Crusaders wore crosses of (a) gold (b) silver (c) cloth.
- _____ 3. The Christians captured the Holy Land (a) once (b) twice (c) three times.
- _____ 4. The Mohammedans took the Holy Land from the Christians (a) once (b) twice (c) three times.

IX

During the Crusades many Europeans settled in Syria, north of the Holy Land and engaged in trade. They sent ships to Europe loaded with carpets, rugs, silks, fine cloth, pepper, ginger, cloves, nutmegs, sugar, citron, figs, melons, steel mirrors, glass, and vases. Thus trade grew between the East and Europe.

- _____ 1. Many Europeans settled in (a) the Holy Land (b) Syria (c) the East.
- _____ 2. Trade between Europe and the East was caused by (a) the World War (b) the Crusades (c) the Revolution.
- _____ 3. Ships to Europe carried (a) spices (b) gold (c) guns.
- _____ 4. The Crusades caused many Europeans to become (a) fishermen (b) traders (c) manufacturers.

X

Europeans learned also to replace the filthy rushes on their floors with eastern rugs and carpets. They bought soft cloth made of camel's hair in place of coarse European woollens which scratched almost like briars. Pretty yellow, red, and blue dyes were brought from the East. People became interested in making their dress and homes more pleasing. Europeans also began to take more care in the preparation of their meals. Their food could be seasoned with eastern pepper, ginger, and nutmegs.

- _____ 1. European floors were covered with (a) linoleum (b) rugs (c) rushes.
 - _____ 2. European cloth was made of (a) silk (b) wool (c) camel's hair.
 - _____ 3. The dyes from the East were (a) blue (b) purple (c) green.
 - _____ 4. In the East the Europeans learned about (a) war (b) reading (c) good homes.
-

XI

Prince Henry of Portugal (1394-1460), known as the Navigator, was one of the great explorers to use the mariner's compass on long voyages. He was the son of an English mother and a Portuguese father. He had two very strong wishes: (1) to take the gospel of Christ to the heathen, (2) to explore the coast of Africa and, if possible, to find a sea route to India. If successful in this aim, he hoped to load his vessels with spices and other products of the East, and thus solve the problem of finding a better way of bringing such things to Europe.

- _____ 1. Prince Henry was (a) king (b) crusader (c) navigator.
- _____ 2. Prince Henry wanted to (a) discover a new world (b) find a new sea route to India (c) capture the Holy Land.
- _____ 3. Prince Henry wanted to become a (a) great ruler (b) great trader (c) solve a big problem.
- _____ 4. Prince Henry lived in (a) Portugal (b) England (c) Africa.

XII

The Spanish priests brought the Indians to live in villages around a religious mission house as a center. The old mission buildings are still to be seen in many places. The missions were schools as much as churches. The priests taught Indian children and their parents how to live in a civilized way. The Indians learned how to raise food and to make what things they needed. They were taught farming, carpentering, cooking, weaving, dyeing, and how to make clothes, leather, saddles, bridles, and shoes.

- _____ 1. The priests taught the Indians (a) Latin
(b) farming (c) how to fight.
 - _____ 2. The old missions have (a) been burned down (b) been
carried away (c) are still standing.
 - _____ 3. The Indians lived in (a) missions (b) villages
(c) on small farms.
 - _____ 4. The missions were (a) just schools (b) just
churches (c) both schools and churches.
-

XIII

Corn and tobacco, both found only in the New World, would have a prominent place in a pageant showing the settlement of Virginia. John Rolfe tried raising tobacco in his garden before he made his visit to London with Pocahontas. When he came back after a two years' absence he found only five or six houses in Jamestown. Its streets were planted with tobacco. Its people had spread out in the country to raise tobacco. So it happened that Virginia became a colony of tobacco plantations and not of towns.

- _____ 1. Virginia (a) built towns (b) manufactured
(c) raised tobacco.
- _____ 2. Tobacco was planted by (a) Pocahontas (b) John
Rolfe (c) John Smith.
- _____ 3. Corn and tobacco were found in (a) Spain (b) the
New World (c) England.
- _____ 4. Jamestown was a (a) large city (b) small town
(c) manufacturing center.

XIV

The feudal system was a kind of government based on the holding of land. The agreement between each lord and his vassal called for duties both ways. The vassal had to fight in his lord's army, and the lord had to protect his vassal. When necessary, the lord gathered an army to fight off invading enemies. He also acted as governor and judge to keep order among his vassals, conduct trials, and settle disputes. A vassal was subject to call to sit in his lord's court and to advise his lord. All vassals were required to pay money to their lord on special occasions, such as for a ransom (price for setting a prisoner free) if the lord should be captured by an enemy, or for a dowry (large wedding gift) when the lord's daughter was married.

- _____ 1. The feudal system was about (a) the king
(b) the soldiers (c) the land.
 - _____ 2. The lord was protected by (a) his armies
(b) his vassals (c) his serfs.
 - _____ 3. The vassal (a) advised the lord (b) fought the
lord (c) was a slave.
 - _____ 4. The lord and his vassals (a) helped each other
(b) fought each other (c) both worked for the church.
-

XV

In the twelfth century paper was introduced into western Europe by the Moors in Spain. A material cheaper than parchment was thus secured. Then in the fifteenth century the printing press was invented. Instead of writing one copy of a page at a time, the printer could strike off five hundred copies of each page if he wished, when once his type was set. William Caxton set up the first printing press in England. From his time on, books began to grow more and more plentiful and much cheaper. The art of reading became common.

- _____ 1. The first printing press in England was set up by
(a) Fulton (b) Caxton (c) Whitney.
- _____ 2. The printing press made books (a) more expensive
(b) smaller (c) cheaper.
- _____ 3. Paper was first used in (a) Germany (b) Spain
(c) England.
- _____ 4. Paper was used instead of (a) printing (b) writing
by hand (c) parchment.

XVI

A battle that changed the history of the world was fought (1588) in the last half of Elizabeth's reign. Phillip sent against England a fleet which the Spaniards called the "Invincible Armada" because they were sure it could not be defeated. There were about one hundred and thirty-two vessels in this fleet as it entered the English Channel. Twenty-one thousand soldiers were on board, and more were to be added from the Spanish army in the Netherlands. The combined force was to be landed in England to conquer it and annex it to Spain.

- _____ 1. The Armada was a (a) building (b) army (c) fleet.
 - _____ 2. The ruler of England was (a) Phillip (b) Alfred (c) Elizabeth.
 - _____ 3. The Armada carried (a) soldiers (b) silk (c) gold.
 - _____ 4. The Armada went to beat (a) Spain (b) England (c) Portugal.
-

XVII

While Cortes was at the coast, Montezuma, emperor of the Aztecs, was greatly troubled by the news brought him. The white strangers had death-dealing firearms and rode horses--an animal unknown in America. Montezuma sent Cortes many presents, among them two large wheels, one of gold and the other of silver, and a peck of gold dust. These presents made Cortes wealthy and roused his desire for more. They were sent as a bribe to cause Cortes to leave Mexico, but they had the opposite effect. Cortes made up his mind to visit Montezuma and get the rest of the Aztec treasures. He boldly marched into the Aztec capital and even took Montezuma prisoner. After several months, however, the Aztecs began to fight under a new emperor.

- _____ 1. Cortes was (a) weak (b) determined (c) cowardly.
- _____ 2. The emperor of the Aztecs was (a) Magellan (b) Cortes (c) Montezuma.
- _____ 3. Presents were used as (a) bribes (b) rewards (c) tokens.
- _____ 4. The Aztecs (a) were conquered (b) beat the Spanish (c) became a province of England.

-1-

THE OLD-WORLD BEGINNINGS OF AMERICA - KELTY

Name _____ School _____ Grade _____

Date _____ Time _____

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as: "Louisville is a (a) house (b) city (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY
 4. Put your name at the bottom of each page right now--before you start to work.

I

Goods was carried overland also. Paved roads, so well made that some of them are in use today, led out to the farthest parts of the Empire. There were so many of them that people said, "All roads lead to Rome." Along the sides of the roads were stations where fresh horses were kept. By changing horses often a messenger could travel over these highways a hundred miles in a day.

- _____ 1. Roman roads were (a) poor (b) short (c) good.
- _____ 2. Roman goods could be sent (a) long distances (b) short distances (c) only to Rome.
- _____ 3. There were stations at the sides of the road for (a) lunch (b) horses (c) soldiers.
- _____ 4. Messengers traveled fast because they (a) always went to Rome (b) changed horses (c) had to go so far.

II

One of these groups of people was called the Teutons or Germans. They were fierce fighters, and were so huge that they looked like giants compared with the Romans. They wore clothing made from furs or rough wool. They lived in huts made of twigs.

- _____ 1. The Germans were (a) very small (b) very large (c) about average.
- _____ 2. The Germans fought (a) well (b) poorly (c) not at all.

- _____ 3. The Germans lived in (a) fine homes (b) city homes (c) poor homes.
- _____ 4. The clothing of the Germans was (a) warm (b) strong (c) flimsy.
-

III

Charlemagne himself was not very well educated, but he valued learning very highly. He knew some Latin and a little Greek, and he liked to make up poetry and riddles. Throughout his life he studied hard, and he even had stories about the great deeds of the Franks told to him while he was at meals. But, to his sorrow, he never was able to learn to write, although he carried tablets about to practice on, and even kept them under his pillow at night so that he might practice as soon as he woke in the morning. He had begun too late.

- _____ 1. Charlemagne did not learn to write because he (a) did not try (b) was too old to learn (c) put his tablet under his pillow.
- _____ 2. Charlemagne thought that people should be (a) educated (b) rich (c) neither.
- _____ 3. Charlemagne liked to hear stories about (a) cruel deeds (b) robbers (c) brave men.
- _____ 4. Charlemagne liked to make up (a) legends (b) problems (c) poems.
-

IV

The Anglo-Saxons were heathen; they worshiped the two gods Woden and Thor (after whom our days of the week Wednesday and Thursday are named). Like the other barbarians, they preferred to live in the open country, so they burned what was left of the Roman towns. Thus they destroyed what little remained of the Roman civilization; in time even the use of coal was forgotten in Britain.

- _____ 1. We use the names of Anglo-Saxon gods for some of the names of our (a) days (b) months (c) seasons.
- _____ 2. The Anglo-Saxons were (a) civilized (b) uncivilized (c) Christians.
- _____ 3. The Anglo-Saxons lived (a) in towns (b) in cities (c) in the country.
- _____ 4. The Anglo-Saxons made Britain (a) a better place to live in (b) a poorer place to live in (c) kept it as it was.

V

Then the Danes began to bring to these camps their women and their children and their cattle. They left their homeland forever and settled down in land they seized from the Anglo-Saxons. History seemed to be repeating itself. What had happened centuries ago when the Anglo-Saxons drove the Britons out of the land was happening again. But this time the Northmen, in their turn, were driving away the Anglo-Saxons.

- _____ 1. The Danes brought their children with them because (a) they were afraid of the Anglo-Saxons (b) there were no children in Britain (c) they were making homes in a new place.
 - _____ 2. The Danes got their land from the Anglo-Saxons by (a) buying it (b) renting it (c) stealing it.
 - _____ 3. When the Danes settled in Britain they took their (a) sheep (b) mules (c) cattle with them.
 - _____ 4. The Northmen drove the Anglo-Saxons out (a) just as the Danes had driven away the Northmen (b) just as the Angles had driven away the Saxons (c) just as the Anglo-Saxons had driven away the Britons.
-

VI

Lief discovered Vinland about the year 1000. We now think that he had found part of America. His men spent a very pleasant winter in Vinland and then sailed home to Greenland, taking with them a number of logs, for the trees in Greenland and Iceland were small. They also took some of the wild wheat that they had found and some of the grapes.

- _____ 1. Vinland is a part of (a) North America (b) Europe (c) Asia.
- _____ 2. Lief's home was in (a) Iceland (b) Vinland (c) Greenland.
- _____ 3. Lief took home logs with him because (a) there were no big trees in Greenland and Iceland (b) trees would not grow in Greenland and Iceland (c) all of the trees in Greenland and Iceland had been cut down.
- _____ 4. Lief took home some (a) tobacco (b) corn (c) grapes.

VII

Alfred also defeated them in a great sea fight north of the Thames River, for he had been wise enough to build some ships as well as to gather an army. He had learned that the Danes always ran back to their ships when they were defeated and then soon appeared again in another section of the country to make another attack. The ships which he built were very long and strong; they easily defeated the Danish ships.

- _____ 1. Alfred defeated the Danes with his (a) guns
(b) ships (c) airplanes.
- _____ 2. Alfred's ships were (a) poorly built (b) well
built (c) slow.
- _____ 3. When the Danes were defeated (a) they went home
(b) they disappeared forever (c) they came back.
- _____ 4. When Alfred fought the Danes on the sea he found
them (a) hard to defeat (b) easy to defeat
(c) impossible to defeat.

VIII

Late in the spring the main army was ready. There were so many soldiers that they could not all go at once, but were divided into five sections. All the long journey had to be made overland, since not enough ships could be found to carry the people. The Crusaders climbed slowly over the rocky peaks of the mountains in winter; they journeyed for days at a time in cold rain in spring; they passed over burning waste land in summer. Men, women and horses died for want of water in the heat of the July sun because they did not know how to carry water in skins as the natives did. They sometimes had to use sheep and goats to carry their baggage. The Turks followed at a distance, shooting their arrows at the sick, the weak, or any that could not keep up with the army. Those were terrible days for the Crusaders!

- _____ 1. In the spring (a) most of the army was ready
(b) none of the army was ready (c) all of the army
was ready.
- _____ 2. The whole army (a) went one at a time (b) went in
parts (c) went all at a time.
- _____ 3. The Crusaders walked because (a) they liked to walk
(b) it was summer (c) there was no other way to get
there.

- _____ 4. The Crusaders found the journey very (a) hard
(b) easy (c) restful.
- _____ 5. Many people died because they did not know how
to (a) milk the goats (b) carry water in skins
(c) ride on their horses.
- _____ 6. The Turks shot arrows at the Crusaders from
(a) the front (b) behind (c) in regular battle
line.
- _____ 7. More of the Crusaders died in (a) the winter
(b) summer (c) the fall.

IX

The traders of Venice had built many ships to help carry the Crusaders to the Holy Land, so they could very well spare a few for the Eastern trade. They began to make regular trips each year, taking with them slaves, wool, iron and leather. In every Christian city of the Holy Land they had a market in which they sold their goods. They bought from the natives or from camel trains out of the Far East the goods for which they had come. In this way a great trade grew up between the East and the West. It was the stories of these traders that had made Marco Polo's father wish to go to China.

- _____ 1. The ships from Venice were first built to carry
(a) silk (b) Crusaders (c) cotton.
- _____ 2. When the ships from Venice began to make regular
trips, they carried (a) only soldiers (b) only
slaves (c) many different things.
- _____ 3. The traders of Venice had (a) many markets (b) few
markets (c) no markets.
- _____ 4. Marco Polo's father wanted to go to China because
(a) he wanted to go on a Crusade (b) he liked the
Chinese (c) he had heard stories of the East.

X

When the war was over, the natives and the Christians became friendly. The people from the West found out that those of the East knew many things which they themselves did not know. They learned how to raise lemons, oranges, plums, watermelons, rice, and, best of all, sugar cane.

They learned to use ginger and such spices as pepper and cloves. They learned that they could color their clothing by the use of dyes, that silk was much more beautiful than wool, and that glass could be used for dishes. They found that carpets added to the comfort of a room and that mattresses made beds softer. They learned the use of soap and began to bathe more often. The men began to shave. They used windmills to pump water. They had never known any of these things at home, for life in the West was very simple.

- _____ 1. The people of the West found that the people of the East (a) knew more than they did (b) knew nothing at all (c) knew only about stars.
 - _____ 2. The people of the West found that the people of the East were (a) clean (b) dirty (c) filthy.
 - _____ 3. After the war was over the natives and Christians (a) got along well together (b) hated each other (c) fought each other.
 - _____ 4. The people of the East taught the people of the West (a) to sleep in beds (b) to build ships (c) to live more comfortably.
-

XI

In that land lived John, called the "King of Good Memory," with his five strong sons. Four of the boys were interested in games, in court life, and in war, as were most youths of their age. One, however, was very different. Prince Henry was thoughtful and grave, spending most of his time in study. Many fine offers to take charge of armies were made him, but he refused them all. When he became a man he left his father's court and built, far out by the sea, a tower in which to study the stars.

- _____ 1. Prince Henry and his brothers liked (a) the same things (b) different things (c) everything.
- _____ 2. Prince Henry was (a) noisy (b) gay (c) quiet.
- _____ 3. Some people thought Prince Henry would make (a) a timid soldier (b) a cruel soldier (c) a brave soldier.
- _____ 4. Prince Henry left his father's court to (a) lead his armies (b) have a better place to study (c) go to the Holy Land.

XII

The priests tried very hard to make Christians of the Indians. Since most of the Indians lived out in the country, the priests moved out into the country too. They learned the Indian languages and built missions in the wilderness in order to teach the white men's ways of living.

- _____ 1. The priests tried to teach the Indians about
(a) Washington (b) Lincoln (c) Christ.
- _____ 2. The Indians lived in (a) towns (b) cities
(c) the country.
- _____ 3. The priests found teaching the Indians
(a) easy (b) hard (c) impossible.
- _____ 4. The priests built missions so as to have a better
place (a) to make the Indians work (b) to live
in comfort (c) to teach the Indians.

XIII

The men who had lived in Virginia took home with them a full account of the new land and carried some of its plants to Raleigh--among them potatoes and tobacco. Raleigh planted the potatoes on his broad lands and taught the courtiers to smoke tobacco. The story is told that one day his servant came into the room and saw great clouds of smoke rising from his master's head. He rushed out, seized a pail of water, and dashed it into Raleigh's face, fearing that his master was on fire.

- _____ 1. Men who lived in Virginia took home (a) plants
(b) animals (c) oil.
- _____ 2. Raleigh taught smoking to (a) women (b) the slaves
(c) people of the court.
- _____ 3. Raleigh's servant thought his master was (a) sleeping
(b) dying (c) burning.
- _____ 4. Raleigh's farm was (a) small (b) large (c) about
average.

XIV

The granting of a fief from an overlord to an underlord (or vassal, as he was called) was a very solemn ceremony. The overlord sat on a high place, surrounded by his followers. The vassal approached, fell upon his knees, put his hands between those of his lord, and promised to serve him faithfully and well. Then the overlord gave the vassal a fief to hold for life or during good behavior. When this vassal died his son had to go through the same ceremony if he wanted to live on the same land that his father had held.

- _____ 1. The overlord sat (a) on the seat with his men
(b) on a seat above his men (c) at a table with his men.
 - _____ 2. The overlord gave a fief to a (a) monk (b) serf
(c) vassal.
 - _____ 3. The vassal had to (a) be very old (b) be faithful
to his overlord (c) give his lands to his son.
 - _____ 4. If a vassal's son wanted his father's lands he
had (a) to make a promise to the overlord
(b) build a church (c) raise sheep on the lands.
-

XV

At last a man named John Gutenberg showed the world a much shorter and easier way of printing. He made little letters of lead, dozens of a's, dozens of b's, and so on--some capital lettees and some small. Those letters stood on a great table, in rows of wooden boxes. A workman took up the letters making different words, placed them in a little metal groove, and fastened them in. Then he put some thick black ink on them, pressed a piece of white paper upon them and took off the paper.

- _____ 1. John Gutenberg showed people how to make books
(a) in a better way (b) in a longer way (c) in a harder way.
- _____ 2. John Gutenberg's letters were (a) all cut into
a block of wood (b) all cut out separately (c) set
with a linotype.
- _____ 3. Gutenberg made his letters of (a) wax (b) lead
(c) steel.
- _____ 4. Gutenberg's printing press made it (a) harder to
learn to read (b) easier to learn to read (c) harder
to get new books.

XVI

The king of Spain kept up his preparations with stubborn determination. In the spring of 1588 the Armada was ready. It consisted of one hundred and thirty-two great ships, carrying three thousand guns and thirty thousand men. But there were too many soldiers and not enough sailors on board, and there were few skilled gunners.

Many of the ships were not warships, but only freight vessels pressed into service to carry the army. And the officer in charge was a soldier who knew very little about the sailing of ships.

- _____ 1. The Armada was (a) a fleet of ships (b) a troop of soldiers (c) a battery of guns.
 - _____ 2. The Armada carried (a) only sailors (b) only soldiers (c) sailors and soldiers.
 - _____ 3. The Armada's commander (a) did not know enough about ships (b) was too old (c) did not like ships.
 - _____ 4. Many of the ships were (a) too old (b) too big (c) not built for warships.
-

XVII

After some weeks they reached the top of a great range of mountains and, looking down, saw a lake with an island in the center. On the island was the great city of Mexico, joined to the mainland by five long bridges. The houses were of red stone covered with a white coating which shone like silver in the sun. Their low, flat roofs had been made into flower gardens. It was a city of wonders. How eagerly the Spaniards looked at it! They thought that at last they had arrived at one of Marco Polo's cities of gold.

- _____ 1. The island was joined to the mainland by (a) canoes (b) houses (c) bridges.
- _____ 2. Mexico City was (a) large city (b) small city (c) little town.
- _____ 3. The houses were (a) dull and dark (b) damp and ugly (c) bright and beautiful.
- _____ 4. When the Spaniards saw the city of Mexico they were (a) surprised (b) disappointed (c) angry.

-1-

THE AMERICAN PEOPLE AND THEIR OLD WORLD ANCESTORS - VOLLINTINE

Name _____ School _____ Grade _____

Date _____ Time _____

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as: "Louisville is a (a) house (b) city (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY
 4. Put your name at the bottom of each page right now--before you start to work.

I

Of far greater value to Rome than her beautiful buildings were her paved roads, for they led everywhere and connected the scattered parts of the Empire as the railroads of our nation bind our States together. One of the first things that the Romans did after conquering a country was to connect it with their city by means of a wide road. These roads were so well built that in some countries of western Europe they are in use today. They were laid out in straight lines, --over hills, through mountains, and across marshes and rivers. The builders first cleared the roadway and packed the ground hard. Then they either strewed sand or gravel over the bed thus made or paved it with solid stones.

- _____ 1. Rome was helped most by her (a) ships (b) highways (c) buildings.
- _____ 2. The roads of Rome were (a) curved (b) straight (c) crooked.
- _____ 3. The Roman roads lasted (a) a short time (b) a long time (c) about five years.
- _____ 4. The Roman roads were (a) paved (b) tarred (c) oiled.

II

The winds of winter were raw and cold, so the Teutons wore clothing made from the skins of animals. A few of the tribes knew how to tan animal skins and

make them into leather. Those tribes wore leather garments and sandals. Some of the women wore robes of wool or linen, for they had learned to make coarse cloth. Because they lived much out of doors in a harsh climate, their bodies were so toughened and weather-beaten that they were able to withstand great hardship and exposure.

- _____ 1. The Teutons wore skins of animals (a) to keep them warm (b) because the women could not sew (c) because there were no sheep.
- _____ 2. The Teutons often lived (a) in tents (b) in castles (c) out of doors.
- _____ 3. The skins of the Teutons were (a) soft (b) black (c) tough.
- _____ 4. The Teutons should have made good (a) soldiers (b) salesmen (c) clerks.

III

Perhaps the most important thing that Charlemagne did for his people was to try to educate them. That was not an easy task in his day, for books were rare. They were costly too, for they had to be made of parchment, because no papyrus could be obtained from Egypt and paper was not then known in Europe. In spite of scarcity of books Charlemagne had educated himself. He had called wise men to his palace and had eagerly learned from them. They read to him from the few papyrus rolls that still survived, --priceless now because they contained all that was left of the knowledge of history, geography and numbers.

- _____ 1. Books were scarce because (a) there was no paper (b) the wise men could not read (c) nobody wanted books.
- _____ 2. Charlemagne thought the people should be (a) punished (b) educated (c) entertained.
- _____ 3. Charlemagne learned from (a) educated men (b) his children (c) Arabians.
- _____ 4. Papyrus rolls were (a) cheap (b) worthless (c) of great value.
- _____ 5. In Charlemagne's time (a) it was easy to get an education (b) it was hard to get an education (c) anyone could get an education if he wanted it.

IV

The fair-haired Anglo-Saxon invaders had seen little or nothing but their wild German shore until they landed in Romanized Britain. Therefore the towns and the fields of that island seemed to them intended only for plunder. They raided settlements, robbed and burned churches, and destroyed gardens and orchards. After that, for a time, Britain had no towns, --only heaps of cinders and stones where cities had once been. The Anglo-Saxons made no new towns, for they hated to live crowded together and shut in by walls. They settled far apart, each upon land received as his share of the stolen country.

- _____ 1. The country from which the Anglo-Saxons came was (a) warm and sunny (b) hot and rainy (c) wild and barren.
 - _____ 2. The Anglo-Saxons thought towns were made to (a) live in (b) heap up cinders (c) rob.
 - _____ 3. The Anglo-Saxons (a) made towns in Britain (b) destroyed what was in Britain (c) made Britain a beautiful place.
 - _____ 4. The Anglo-Saxons lived (a) in towns (b) close together (c) far apart.
-

V

During their raids the Vikings left their wives and children at home in the Northland. But at last the women too wanted to see the rich country from which came so much plunder. So women and children went with the ships; and when they landed on some fruitful shore, the Vikings fought for land on which a new home might be built. Finally the French thought it better to give the Northmen land than to fight them (A.D. 911). So they bought peace for themselves by giving a wide district in western France that is known today as Northman's Land, or Normandy.

- _____ 1. The women wanted to come to the new country because (a) they were tired of staying at home (b) the new country had nice things in it (c) they wanted a sea trip.
- _____ 2. The women and children landed in a place where (a) there was little to eat (b) there was plenty to live on (c) nothing to live on.

_____ 3. The French gave the Vikings some land because they (a) liked them (b) wanted to have peace (c) wanted to fight them.

_____ 4. Normandy is in (a) England (b) Belgium (c) France.

VI

The old Icelandic legends say that in the year 1000 or thereabouts Leif Ericson explored the eastern coast of America, which had been sighted several years before by the captain of a storm-driven viking ship. Leif found the shores of Newfoundland and Nova Scotia, and then, moving southward, landed on an inviting coast overgrown with trees and draped with vines of the wild grape. Leif gave the name "Wineland," or "Vinland," to the region, now thought to have been part of Massachusetts or Rhode Island. He settled there and spent the winter.

_____ 1. A viking ship came near America because (a) the men were looking for America (b) the ship was driven out of its course by a storm (c) the men were looking for Leif.

_____ 2. Leif found the shores of (a) Florida (b) Mexico (c) Newfoundland.

_____ 3. Leif called the country Vinland because there were so many (a) trees (b) apples (c) grapes.

_____ 4. Vinland is thought to be a part of (a) Kentucky or Virginia (b) Greenland or Iceland (c) Massachusetts or Rhode Island.

VII

So Alfred decided that he must meet them before they reached his shores, and defeat them upon the sea. He therefore started to build a fleet, and soon had a navy of more than a hundred warships. These ships were like the viking ships, but longer and broader. They were swift enough to overtake any enemy, because each carried a huge sail and there was space for sixty or more rowers. In spite of their great size these vessels were light, and they rode high in the water. Therefore they were able to keep afloat in shallow water, and they ran aground many an enemy ship. With this navy Alfred was able to win many victories over Danes, Northmen, and pirates. These staunch little ships were the beginning of England's mighty navy.

- _____ 1. Alfred started the English (a) navy (b) banks
(c) factories.
 - _____ 2. Alfred's ships could fight well because (a) there
were a hundred of them (b) they were big and clumsy
(c) they were swift and could sail in shallow water.
 - _____ 3. Alfred won battles over the (a) Danes (b) Italians
(c) English.
 - _____ 4. Alfred's ships were run by (a) steam (b) sails
(c) sails and oars.
-

VIII

All who heard the Pope's appeal spread the word, and in the spring of 1096 a great army--perhaps three hundred thousand people--collected along the Rhine, intent upon capturing the Holy City, two thousand miles away. Each Crusader wore upon his breast a red cross as a sign that he had enlisted in a holy war; returning Crusaders were to wear the cross upon their backs. So great an army could not move at once across central Europe. The multitude was therefore separated into five divisions, traveling by different routes and under different leaders.

- _____ 1. Many people gathered along the Rhine because
(a) they heard that the Pope wanted them to go
to the Holy City (b) the army could not cross
the river (c) they did not want to leave their
homes.
 - _____ 2. The Holy City was (a) on the Rhine River
(b) far away (c) just a few miles from the Rhine
River.
 - _____ 3. Each Crusader wore a (a) circle (b) star
(c) cross.
 - _____ 4. The army was divided because (a) the people
could not get across the river (b) there were
so many people (c) the people could fight better.
-

IX

The Italian merchants became firmly established in Eastern ports during the Crusades. They had furnished ships for transporting Crusaders, had aided in capturing

towns, and had furnished supplies to the conquerors. In whatever way an Italian city gave help, it always had to be well paid. It usually demanded a place in the conquered city, preferably on a water front, where its markets and docks would make a center for its commerce. In this way Genoa, Venice, Amalfi, and other Italian cities won trading quarters in Eastern ports.

- _____ 1. The Italian merchants went to the East during
(a) the Crusades (b) Spanish war (c) Revolutionary war.
- _____ 2. Trade from the Crusades helped (a) Paris
(b) Venice (c) London.
- _____ 3. The Italian merchants were (a) generous
(b) greedy (c) kindly.
- _____ 4. The Italian merchants always wanted a place
(a) in the army (b) on the pilgrimages (c) where they could buy and sell.

X

Thousands of French, Germans, and English had traveled to the East by land and sea. Many of them were nobles; most of them were common people, some of whom had known nothing of the world beyond the estate upon which they were born. They had looked with wonder upon Constantinople, -- its public squares, its fountains and palaces. In other Eastern cities they had seen the homes of rulers and of wealthy merchants hung with tapestries, carpeted with rugs of velvet, and furnished in luxury. They saw for the first time how the East lived, and it made them want better things for themselves and more comfortable ways of living.

- _____ 1. Most of the people on the Crusades were
(a) nobles (b) common people (c) slaves.
- _____ 2. The homes of the Eastern people were (a) beautiful
(b) dirty (c) cold.
- _____ 3. The people thought Constantinople (a) an ugly place
(b) an unhealthy place (c) a wonderful place.
- _____ 4. The homes of the Eastern people made the Western people want more (a) fountains to bathe in
(b) more warm weather (c) more comfortable homes for themselves.

XI

In the meantime there had grown to manhood in Lisbon the five sturdy sons of good King John. All of them were interested in knowing more of the geography of the world, and the fourth one, Henry, known as "the Navigator," spent his life in trying to find for Portugal that longed-for all-water route to India. Though he did not fully succeed, he accomplished so large a part of the great undertaking that he is known today as the hero of Portugal and the leader of modern discovery.

- _____ 1. Prince Henry liked (a) games (b) court life
(c) to know more about the world.
 - _____ 2. Prince Henry wanted to find out (a) how to get to America (b) how to lead an army (c) how to reach India by water.
 - _____ 3. Henry is (a) honored by Portugal (b) forgotten by Portugal (c) hated by Portugal.
 - _____ 4. Prince Henry (a) learned all about the way to India (b) learned the way to America (c) learned many things which helped others to find the way to India.
-

XII

From St. Augustine and San Gabriel the fathers pushed their way over the southern part of the continent. When they had gained the friendship of the Indians, they gathered them into villages called missions. Each Indian had his own farm near the village, and he worked for two hours a day on land belonging to the mission, the crops of which were used to support the church of the Christ. They also taught reading, writing, music, and such useful handicrafts as blacksmithing, carpentry, shoemaking and tailoring.

- _____ 1. The fathers tried to teach the Indians (a) more about geography (b) more about other Indians (c) how to have better homes and happier lives.
- _____ 2. The fathers made (a) enemies of the Indians (b) nobles of the Indians (c) friends of the Indians.
- _____ 3. The crops raised on the land belonging to the missions were used (a) to pay the Indians (b) to give to the Spaniards (c) to help the Church
- _____ 4. The fathers (a) built their missions in one place (b) stopped when they came to a river (c) kept going further and further across the country.

XIII

In 1612 one of the farmers, John Rolfe, planted a field of tobacco. He had seen the Indians cultivating that plant in small gardens, but he did not think the flavor of Virginia tobacco was as good as that of the West Indies, with which Spain had been supplying Europe. After two years of cultivation, however, Rolfe produced a crop that was considered excellent both as to size of leaf and as to flavor. A small quantity of this crop was sent to England, where it sold readily at a good price. The news of this success spread, and as soon after every farmer of Jamestown was planting tobacco on his patch of land within the stockade. Even the sides of the streets and the market place were green with the growing plants.

- _____ 1. John Rolfe thought the tobacco in the West Indies (a) was better than that in Virginia (b) not as good as that in Virginia (c) was better than that in Spain.
- _____ 2. Rolfe found out that (a) he could not raise tobacco in Virginia (b) it did not pay to raise it (c) he could raise very good tobacco in Virginia.
- _____ 3. Tobacco was raised because (a) the Indians taught the English (b) it was easy to raise (c) it paid well.
- _____ 4. Tobacco raising in Virginia grew (a) slowly (b) rapidly (c) not at all.

XIV

The men who owned land needed workers, and they needed warriors too, for no landowner was secure while he had a strong neighbor. In order to give landowners the workers they needed, and to give men who had no land protection and a means of support, feudalism gradually grew up. Under this plan a noble who owned a small amount of land but who had no workers or warriors joined his land to the large estate of some lord or king. The lord had to agree to allow the noble a certain amount of land, to protect him, and not to interfere with the control of the land. The nobles who accepted the lord's protection had to promise to be faithful to him, to fight for him, and to go at least once a year to the lord's court to help decide cases of law. The men who made terms with the lords were called vassals.

- _____ 1. Feudalism was a kind of government that (a) gave the people more education (b) protected the people (c) made all the nobles stop fighting.
 - _____ 2. Men who promised to fight for the lord were called (a) peasants (b) fiefs (c) vassals.
 - _____ 3. The nobles took a vow to be (a) faithful (b) pay taxes (c) build schools.
 - _____ 4. Vassals had to (a) attend court (b) go on journeys (c) punish the lords.
-

XV

The first printing was done from blocks of wood on which the words were cut by hand, but the labor and uncertainty of this woodblock printing led men in Holland and Germany to experiment with movable type. It is claimed that Laurens Coster of Holland made metal type as early as 1430. Soon after that John Gutenberg, who had been experimenting in the German town of Mainz, printed the Bible in Latin from movable type. The use of type greatly lessened the work of making books, for after the type had been set up, any number of copies could be quickly made. If the printers had set their type with care, the copies would be correct and would be exactly alike.

- _____ 1. The first printing was done on (a) lead plates (2) steel rollers (c) wooden blocks.
 - _____ 2. It is claimed that Laurens Coster made (a) wooden letters (b) metal letters (c) a typewriter.
 - _____ 3. John Gutenberg printed a (a) novel (b) history (c) Bible.
 - _____ 4. Movable type (a) made the work slow (b) made more mistakes (c) made printing easier.
-

XVI

Drake's raids did not greatly affect Phillip's plans. He collected in Holland and Belgium a large army, which he expected to send across the English Channel in barges. He also meant to send a great fleet of ships into the Channel to guard the passage while the troops were being transported. When his ships were assembled in the river Tagus they numbered one hundred and thirty-two. Sixty-five were galleons, the largest ships ever made. Phillip felt so sure that this navy could never be conquered that he called it the "Invincible Armada."

- _____ 1. The Invincible Armada was a (a) troop of soldiers (b) battery of guns (c) fleet of ships.
 - _____ 2. Phillip needed his ships to (a) protect his own ships (b) carry the Crusaders (c) ship goods to England.
 - _____ 3. The Armada had (a) 132 ships (b) 1000 ships (c) 67 ships.
 - _____ 4. Phillip was (a) afraid he would lose his ships (b) afraid of Drake (c) sure that his ships could not be beaten.
-

XVII

The Aztecs became builders in stone, and they erected many temples, palaces, and dwellings of hewn stone held in place with mortar. Their builders knew nothing of arches or domes, so the buildings were heavy and bulky in appearance. They were decorated everywhere with delicate carvings, for the Aztecs were famous as stone-cutters. For this work they used a knife or scraper made of a very hard volcanic stone which was abundant in Mexico. Some of the buildings were made of a kind of stone that could be highly polished. These shone so brightly in the sun that Spanish explorers who first caught sight of them believed that they were silver.

- _____ 1. The Aztecs built with (a) concrete (b) brick (c) stone.
- _____ 2. The Aztec buildings were (a) small (b) slender (c) large.
- _____ 3. The buildings looked like silver because (a) they were made of silver (b) carved with figures (c) were highly polished.
- _____ 4. The work of the Aztec stone-cutters would be called (a) very poor art (b) very good art (c) very clumsy art.

-1-

ELEMENTARY WORLD HISTORY - BEARD and BAGLEY

Name _____ School _____ Grade _____

Date _____ Time _____

- Directions:
1. Read each paragraph.
 2. Answer each question. Draw a line through the right answer as: "Louisville is a (a) house (b) city (c) dog."
 3. Work fast but ANSWER EACH QUESTION CAREFULLY
 4. Put your name at the bottom of each page right now--before you start to work.

I

In the course of time, the "august" emperor became the absolute master. The republic was changed into an empire ruled by one man whose word was law from one end of the empire to the other. The emperors, as they followed one another through the passing years, brought huge stores of treasures to the city of Rome. They built grand public buildings, huge triumphal arches, great highways, immense public baths, and vast theaters to furnish sport for the people of the city. They tried hard to keep the citizens at Rome contented. They gave food to the masses. They amused them with shows in the open-air theaters, where men called gladiators fought one another with swords or fought with lions and tigers - "every form of man or beast the broad empire of Rome could furnish." Never had the world beheld such splendid buildings, such wealth, such display of riches, such pomp and pride.

- _____ 1. The Roman emperors (a) built up the city (b) destroyed the buildings (c) killed the people.
 - _____ 2. The emperor of Rome was (a) a kind and just ruler (b) a beloved king (c) a man whose word was law.
 - _____ 3. Rome at the time was a city of (a) poverty (b) ruin (c) riches.
 - _____ 4. The emperors of Rome wanted to (a) kill all the tigers and lions (b) tear down the triumphal arches (c) keep the citizens happy.
-

II

Thousands of Germans, also organized as tribes - Goths, Franks, Angles, and Saxons - invaded Roman territory under powerful and daring chiefs. One of these bands, the West Goths, commanded by Alaric, even captured and looted the city of Rome itself in 410 A.D. Thus the very spot from which Roman armies had once gone forth to subdue the earth was itself in the hands of conquerors. "Nations innumerable and savage beyond measure," exclaimed the Christian monk, St. Jerome, "have invaded all Gaul. The whole region between the Alps and the Pyrenees, the ocean and the Rhine has been devastated . . . O wretched empire!"

- _____ 1. The Germans were divided into (a) armies (b) nations (c) tribes.
 - _____ 2. Rome was captured by (a) Luther (b) Phillip (c) Alaric.
 - _____ 3. The Germans were (a) peaceable (b) civilized (c) savage.
 - _____ 4. The Germans (a) built great cities (b) destroyed Rome (c) taught the people Christianity.
-

III

The most famous of the Carolingian kings was Charlemagne or Charles the Great, who reigned from 768 to 814. He widened his kingdom to include large portions of Germany and Italy as well as France. He was a fierce warrior when fighting his neighbors; at the same time he was a friend to peace in his own country. He sent missionaries to the heathen in the forests of eastern Germany, built magnificent palaces, and took pride in erecting beautiful churches. He gave money to found schools. He even tried to learn how to write after he became a man; he kept tablets at his side so that he could practice whenever he had a little time to spare. Unhappily he be-

gan too late in life and could not master the art. The monks at his court, however, could write, and they kept records of his brave deeds.

- _____ 1. King Charlemagne was (a) brave (b) cowardly (c) unjust.

- _____ 2. Charlemagne set up (a) theaters (b) libraries (c) schools.
 - _____ 3. Charlemagne kept tablets at his side so that (a) he could write down all the things he learned (b) so that he could find out things for the priests (c) so that he could learn to write.
 - _____ 4. Charlemagne wished the people of the country to be (a) Christians (b) Mohammedans (c) Unreligious.
 - _____ 5. Charlemagne did not learn to write because (a) the priests did not know how (b) there were no pens (c) he was too old to learn.
 - _____ 6. We know that Charlemagne was a brave man because (a) lots of people knew him (b) people were afraid of him (c) the monks wrote about him.
-

IV

Before many years had passed, the English, as we may now call the various tribes of Angles and Saxons who had come to aid the Britons, turned against their allies. They began a war to win Britain for themselves. For a century or more the terrible contest went on. Wealthy Romans fled with their gold and silver or buried the treasure in the earth. One after another, the old Roman towns fell into the hands of the invaders. Christian churches were burned. Even the priests were slain at the altars. By the year 557, all southern and eastern Britain had been seized by bands of English, each headed by its own war lord.

- _____ 1. The Anglo-Saxons (a) were always good friends to the Britons (b) became enemies of the Britons (c) went away and left the Britons in peace.
 - _____ 2. The Anglo-Saxons (a) burned the towns (b) built churches (c) established schools.
 - _____ 3. Many wealthy Romans (a) joined the Anglo-Saxons (b) captured Britain (c) left Britain.
 - _____ 4. The Anglo-Saxons wanted (a) to help the Romans (b) to give part of the land to the Romans (c) all of the land for themselves.
-

V

Yet the island was not to find peace. The victors turned against one another. For two and a half centuries English chieftains fought among themselves to gain the whole of Britain as a prize. At length, in 828, one of them, Egbert of Wessex, brought all the English under his banner. In the meantime, missionaries had been active and had converted the English to the Christian faith. Churches and monasteries had risen all over the land, and monks were busy with their quills writing down laws and chronicles or records of important happenings.

- _____ 1. The English chieftains were (a) ready to help each other (b) jealous of each other (c) helped everybody.
- _____ 2. The union of the English was helped by the work of the (a) chieftains (b) pirates (c) missionaries.
- _____ 3. The monks wrote with (a) lead pencils (b) styles (c) quill pens.
- _____ 4. The English were united under one leader (a) in a short time (b) in a long time (c) during the life of their oldest man.

VI

This new soldier of fortune was William, the Duke of Normandy, from northern France. He was the descendant of a Norse chieftain and pirate who had raided the coasts of France and then settled down there as a vassal, or underlord, of the French king. William himself was a born fighter of great strength and dreadful cruelty. "So fierce was he," wrote a chronicler of his time, "that none dared to resist his will." No one else was strong enough to bend his bow or wield his heavy battle-ax.

- _____ 1. William was (a) a Spaniard (b) a Frenchman (c) an Italian.
- _____ 2. William's great-grandfather had been a (a) monk (b) king (c) pirate.
- _____ 3. William was the sort of king who made every one (a) love him (b) fear him (c) want to give him weapons.
- _____ 4. William was very (a) weak (b) sick (c) strong.

VII

In the land that remained Alfred ruled with wisdom and justice. He won for himself a place in history as one of the noblest English kings. A brave warrior himself, he knew how to lead an army in defense of his country. He was a wise lawgiver. He collected the laws of England, taking, as he said, "those which seemed rightest to me." Deeply interested in education, he had a school at his court, and wished that every freeborn boy should "abide at his book until he can well understand English writings." Alfred also gave money and land to the church. He loved the English tongue and translated many Latin books into his native language. Not content with making mere translations, Alfred often added ideas of his own. He hated the cruelty and tyranny of Roman emperors and declared that all officers ought to rule wisely and fairly. One of his friends said of him that day and night Alfred labored to see that justice was done to his subjects, "for in the whole kingdom the poor had no helpers, or few, save the king himself." Alfred made the beginnings of English literature and set an example of a king who wished to be "a father to his people." He died in 901, one of the most beloved monarchs of all history.

- _____ 1. King Alfred ruled his people with (a) cruelty
(b) wisdom (c) selfishness.
- _____ 2. Alfred thought that all free-born boys should
(a) learn Latin (b) understand English writing
(c) study to be a priest.
- _____ 3. Alfred thought that Roman rulers ruled with
(a) fairness (b) wisdom (c) cruelty.
- _____ 4. Alfred was a friend to (a) all the people
(b) only the poor (c) only the wealthy.

VIII

In a strange way, the trade of Europe was increased by the rise of the Mohammedans whose armies tried to conquer Christendom. All the eastern and southern shores of the Mediterranean, including Palestine with the tomb of Christ, fell into their hands. To rescue the Holy Land from the Mohammedans, the Europeans of all nations began, in 1096, a series of wars known as the Crusades. These lasted for more than two hundred years. Kings, princes, knights, common soldiers, monks, peasants, artisans and

even children flocked to the armies that made the perilous journeys to distant Palestine. In those crusades, thousands of people perished by the wayside or were killed in battle. Other thousands lived to make their way home and tell stirring tales about their adventures and about the countries through which they had passed.

- _____ 1. The Crusades were wars (a) to get America
(b) to capture Drake (c) to take the Holy Land from the Mohammedans.
- _____ 2. The Mohammedan armies were (a) good fighters
(b) timid fighters (c) cowards.
- _____ 3. Many people died on the way to the Holy Land because of (a) the many hardships on the way
(b) they fought among themselves (c) they were knights.
- _____ 4. Of the people who went (a) all were killed
(b) many came back (c) very few came back.

IX

Moreover, travelers from western Europe had seen the great city of Constantinople, where some signs of Rome's former glory were still to be found. Adventurers then learned how to trade with the merchants of the East and heard from them tales of India and China. Especially did the Italians profit from the Crusades. The merchants of Genoa and Venice heaped up great supplies to the crusading armies, and founded colonies and trading centers on the eastern shores of the Mediterranean.

- _____ 1. Constantinople was a wonderful sight to the Crusaders because (a) it was in the East (b) many people lived there (c) some of the buildings put there by the Romans were still standing.
- _____ 2. In Constantinople the people heard stories of (a) China (b) Japan (c) Russia.
- _____ 3. The Italians found the Crusades (a) a great help to their trade (b) kept their ships from the East (c) ruined their trade.
- _____ 4. The merchants of Genoa became (a) very poor (b) very rich (c) very lazy.

X

In the end, the tomb of Christ was not won by the Christian crusaders. As often happens, the results were very different from what had been expected. Instead of hating the Mohammedans and all their ideas, the crusaders grew to like many things they saw in the East. Men from England, France, Germany and Spain got new wants and tastes when they saw the luxuries of the East. They became discontented with the rough life they had led. Henceforth they must have spices, silks, rugs, gold and silver ornaments, and precious stones from the East. Their neighbors caught the same spirit as they heard wondrous stories of far countries, rich in luxuries.

- _____ 1. The Crusaders (a) took the tomb of Christ away from the Mohammedans (b) had to let the Mohammedans keep it (c) shared the tomb of Christ with the Mohammedans.
- _____ 2. The people of the West grew (a) to like the people of the East (b) to hate them (c) to learn that they were all thieves.
- _____ 3. The Westerners learned that the Easterners had (a) only old and ugly things (b) things that no one would want (c) some very beautiful things.
- _____ 4. The Crusades made the people of the West (a) better satisfied with their western ways (b) glad that they did not have to live in the East (c) want the things they saw the people of the East using.

XI

The way for this great undertaking was made easier by the son of the Portuguese king, Prince Henry, famous in history as "the Navigator." Though brave in battle and skilled in directing armies, he was less interested in the arts of war than in the arts of peace. He refused to become a high officer in the army. He chose instead to live on the lonely cape of Sagros at the remotest point of Portugal looking out southwest over the sea. There he built a home and an observatory. There he brought together astronomers, geographers, and map makers. He sent fleet after fleet down the coast of Africa in search of the southern passage.

- _____ 1. Prince Henry was most interested in (a) leading armies (b) fighting battles (c) studying about geography and the stars.

- _____ 2. Prince Henry tried to find the way to (a) America
(b) Jerusalem (c) the Indies.
 - _____ 3. Prince Henry bought maps with (a) the king's
money (b) the people's money (c) his own money.
 - _____ 4. Prince Henry helped men who wanted to be
(a) navigators (b) army captains (c) school teachers.
-

XII

A third Spanish captain, De Soto, sought fame and wealth by making an expedition into Florida and the wilderness to the west. Instead of rich cities, however, he found a few native Indians living in wretched huts; instead of fortune, he met his death on the banks of the Mississippi River. Other explorers, working northward from Mexico, traveled over the lands now included in Texas, Arizona, and New Mexico and planted the Spanish flag in many a trading post and mission which they founded.

- _____ 1. De Soto wanted (a) to get rich (b) to teach the
Indians (c) to live with the Indians.
 - _____ 2. De Soto was (a) pleased with what he found
(b) disappointed (c) became wealthy.
 - _____ 3. Spanish explorers established (a) colonies
(b) trading posts (c) neither.
 - _____ 4. Some of the Spaniards were (a) slaves (b) missiona-
ries (c) tenants.
-

XIII

Commerce, while making these changes within the nations, also became a powerful cause of wars among them. The desire for new lands and new markets led to bitter jealousies. Princes had long fought over territory in Europe. Now whole nations were to wage wars for territory and trade in all parts of the world -- over profits from tea, sugar, coffee, and spices.

- _____ 1. Trade caused (a) people to love one another
(b) to fight one another (c) to give their lands
to each other.
- _____ 2. War was fought over (a) trade (b) the Indians
(c) schools.

- _____ 3. War has been caused by (a) new houses (b) new markets (c) new books.
- _____ 4. Traders who sold spices (a) lost money (b) made money (c) came out even.
-

XIV

The power of the king was also increased by the help he had from the nobles. They were few in number, and no common man could ever become a noble unless the king raised him to that rank and gave him a title. Much of the land of England was owned by these rich lords -- dukes, earls and barons. On their lands they lived like princes, although they could no longer defy the king as their ancestors had done. They were not independent; they were loyal subjects of the king. They held high offices under him and served him in many ways in war and peace.

- _____ 1. The nobles made the king (a) weaker (b) stronger (c) kinder.
- _____ 2. A common man became a noble (a) when the king died (b) when he became rich (c) when the king gave him a title.
- _____ 3. The land of England was owned by the (a) common people (b) nobles (c) king.
- _____ 4. The nobles (a) did as they pleased (b) obeyed the king (c) fought the king.
-

XV

The name of the person who really made the first printing press is not known. Gutenberg and Faust in Germany and Coster in Holland are among those to whom the credit has been given. As in the case of most inventions, the idea was in the air and many men were at work on it. We do know, however, that a Bible was printed at Mainz, in Germany, in 1456. That year may well be taken as opening the age of the printing press.

- _____ 1. The printing press was invented by (a) a man in Germany (b) a man in Holland (c) many men.
- _____ 2. One of the first books printed (a) a history book (b) an arithmetic book (c) the Bible.

- _____ 3. The first printing of the Bible is important because it tells us (a) about the Bible (b) when printing started in Germany (c) that Coster lived in Holland.
 - _____ 4. One of the first towns to use a printing press was (a) London (b) Paris (c) Mainz.
-

XVI

The king of Spain, greatly angered at Drake's exploits, made ready for war on England. In 1588 he sent a powerful fleet of warships, the Armada, to the English Channel to drive his English rivals from the sea. But instead of winning a great victory, the Spaniards suffered a terrible defeat. The Spanish navy was badly crippled and the English no longer feared it.

- _____ 1. Spain fought England because she (a) wanted England (b) did not like the things Drake was doing (c) wanted to trade with England.
 - _____ 2. The Armada was (a) an army (b) a fleet of ships (c) a knight.
 - _____ 3. Spain lost her ships (b) defeated England (c) won the war.
 - _____ 4. After 1588 England was (a) afraid of Spain (b) not afraid of Spain (c) an ally of Spain.
-

XVII

In exploring the mainland of America the lead was taken by soldiers bearing the banner of Spain and by missionaries bearing the cross of Christ. One of the great Spanish warriors, Ferdinand Cortez, in 1519 discovered Mexico -- a vast empire with fertile farms, prosperous cities and great stores of gold and silver. In a short time he conquered Mexico, seized the gold and silver of its rulers and made it a part of the Spanish Empire.

- _____ 1. Spain was helped in America by her (a) merchants (b) mechanics (c) missionaries.
- _____ 2. Mexico made Spain (a) richer (b) poorer (c) less powerful.
- _____ 3. When Cortez discovered Mexico he found (a) poverty (b) riches (c) monasteries.
- _____ 4. Cortez (a) took the gold away from the people of Mexico (b) gave the Mexicans money for their gold (c) taught the Mexicans how to spend their money.

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