

FORMAL ENGLISH GRAMMAR
AND
THE PRACTICAL MASTERY OF ENGLISH

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TABLE OF CONTENTS.

CHAPTER I. THE PROBLEM AND ITS GENERAL SETTING.

1. The Problem	1
2. General Plan of the Thesis	1
3. Opinions Regarding the Values of Grammar	2
4. Criticisms of the Results of Grammar Teaching	18
5. Recent Attempts to Improve Grammar Instruction	22
6. Summary of the Chapter.	23

CHAPTER II. REVIEW AND SUMMARY OF PREVIOUS INVESTIGATIONS	25
1. General Plan of the Chapter	25
2. Review of Previous Investigations	25
a. Meek Rice	26
b. Hoyt	30
c. Rapeer	32
d. Meek	33
e. Hooper	34
f. Briggs	44
g. Committee on Grammatical Nomenclature	44
xxxxxxxxxxxxxxxx	
xx h. Committee of the National Council of Teachers of English	45
i. Committee on Economy of Time	49
j. Charters and Miller	52
k. Earhart and Small	55
l. Brown and Minnick	58
m. Betz and Marshall	58a
n. Charters	58b
3. Standardized Tests and Scales for Grammar	58
a. Starch	58
b. Buckingham	59
4. Analytical Summary of Previous Investigations	60
5. Problems Resulting from Previous Investigations.	66

CHAPTER III. THE RELATION OF FORMAL ENGLISH

GRAMMAR TO COMPOSITION	67
1. General Plan of the Chapter	67
2. History and Character of State High School Board Examinations in Minnesota	68
2. History and Character of State High School Board Examinations in Minnesota	68
3. Methods of Conducting Teachers' State Examinations in Minnesota	72
4. Correlations Based on Marks from Teachers' State Examinations	76
5. Correlations Based on Marks from State High School Board Examinations	130
6. Correlations Based on Pupils' Final Marks in Two Minnesota Cities	138
7. Correlations Reported by Other Investigators	139
8. Summary of the Chapter	139a
9. Conclusion	142a

CHAPTER IV. THE RELATION OF GRAMMAR TO THE
UNDERSTANDING OF SENTENCES

143.

1. The Application of Standardized Tests
and Scales 143
2. Correlations of Grammar and Understanding
of Sentences, Based on Returns from Five
Minnesota Cities 144
3. Correlations of Grammar and Understanding
of Sentences, Based on Returns from
Seventeen Schools in One School System 152
4. Summary of the Chapter 170

CHAPTER V. INTERPRETATIONS AND SUMMARY.	172
1. The Significance of Correlations	172
2. The General Tendency to Excel in All Subjects or to Be Deficient in All	175
3. Correlation Between Age and the Mastery of Grammar or the Understanding of Sentences	180
4. General Summary	183 192
5. General Conclusion	187 200

TABLES

		Page
Table I	Language Errors of Elementary School Children in Boise, Idaho	32
Table II	The Relation of the Study of Latin to the Student's Knowledge of English Grammar	33
Table III	Gains in Various Tests by Groups after Three Months of Instruction in Grammar or in Language and Composition	39
Table IV	Gains in Ability to Correct Language Errors	40a
Table IV, 1	Language Errors of Elementary School Children in Kansas City Schools	53
Table V	Percentage of Pupils Ranking Grammar as their First, Second, Third, or Last Choice among School Subjects	56
Table VI	Rank Given to Grammar as a School Subject by Pupils in Three Cities.	57
Table VII	Summary of Previous Investigations Relating to Formal English Grammar	60
Table VIII	Character of State High School Board Examination in English Grammar.	71
Table IX	Character of Teachers' State Examination in English Grammar.	74
Table X	Character of Teachers' State Examination in English Composition	75
Table XI	Average and Median Age of Candidates Taking Teachers' State Examinations. Quartile or Probable Error	77
Table XII	Teachers' State Examination, 1911. Correlation Table for Grammar and Composition.	80
Table XIII	Teachers' State Examination, 1911. Correlation Table for Arithmetic and Composition.	81
Table XIV	Teachers' State Examination, 1911. Correlation Table for History and Composition.	82
Table XV	Teachers' State Examination, 1911. Correlation Table for Geography and Composition.	83
Table XVI	Teachers' State Examination, 1912. Correlation Table for Grammar and Composition.	84
Table XVII	Teachers' State Examination, 1912. Correlation Table for Arithmetic and Composition	85

Table LVI	Correlations Based on Pupils' Final Marks in Two Minnesota Cities	138a
Table LVII	Correlations in Terms of Tertile Retention Between English Seventh and Other School Subjects. From Clement.	139
Table LVIII	Relationship Between Grammar and Other Subjects as Shown by Comparison of Median and Tertile Retentions.	141
Table LIX	Relationship of Grammar to Other Subjects as Shown by Per Cent of Retention in the Same Groups, i. e.; 75 plus, 65 plus, and Failed	142
Table LX	Average of Correlations Between Grammar and Composition with Other Subjects in Two Minnesota Cities.	142
Table LXI	Percentage of Pupils Who Answered Each Question in Grammar Correctly	146
Table LXII	Correlation Table for Grammar and the Understanding of Sentences. Based on Returns from Five Minnesota Cities.	148
Table LXIII	Correlations of Grammar and Understanding of Sentences. Based on Returns from Five Minnesota Cities.	149
Table LXIV	Average Grade in Grammar for Corresponding to Each Step on the Scale for Understanding of Sentences	149
Table LXV	Correlations of Composition with Grammar, History and Arithmetic in Teachers' State Examinations for 1911 - 1916. Amount of Correlation in Per Cent of Tertile Retention.	150
Table LXVI	Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 75 Girls.	151
Table LXVII	Percentage of Pupils Who Answered Each Question in the Grammar Test Correctly.	154a
Table LXVIII	Correlation Table for Grammar and Understanding of Sentences. Based on Returns from Nine Schools Which Ranked Low in Grammar.	156
Table LXIX	Correlation Table for Grammar and Understanding of Sentences. Based on Returns from Eight Schools Which Ranked High in Grammar.	157
Table LXX	Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 235 Boys.	163

Table LXXI	Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 265 Girls.	164
Table LXXII	Summary of Correlations Between Grammar and the Understanding of Sentences.	170
Table LXXIII	Teachers' State Examination, 1914. Sample Part of Table, Showing Rank of Each Examinee as High or Low with Reference to the Median in Each Subject.	176
Table LXXIV	Distribution of Ranks in Each of Five Subjects Based on the Teachers' Examinations, 1914 - 1915.	177
Table LXXV	Distribution of Ranks in Each of Five Subjects XXXX As It Would Be According to Chance	177
Table LXXVI	Comparison of Actual Distribution With Chance Distribution.	178
Table LXXVII	Correlation Table for Age and Attainment in Grammar.	181
Table LXXVIII	Correlation Table for Age and Understanding of Sentences.	182
Table LXXIX	Correlation Table for Age and Number of High Ranks in Five Subjects Based on Teachers' State Examination, 1914.	188

FIGURES.

Fig. 1	Correlations of Grammar with Composition, History, Arithmetic and Geography in Teachers' State Examinations 1911 - 1916. The Amount of Correlation Indicated by the Size of the Sectors Marked ++ and --.	124
Fig. 2	Correlations of Composition with Grammar, History, Arithmetic and Geography in Teachers' State Examinations 1911 - 1916. The Amount of Correlation Indicated by the Size of the Sectors Marked ++ and --.	125
Fig. 3	Average Per Cent of Tertile Distribution of Marks in Grammar and Composition in Teachers' State Examinations for 1911 - 1916.	127
Fig. 4	Average Per Cent of Tertile Distribution of Marks in Arithmetic and Composition in Teachers' State Examinations for 1911 - 1916.	128
Fig. 5	Average Per Cent of Tertile Distribution of Marks in History and Composition in Teachers' State Examinations for 1911 - 1916.	129
Fig. 6	Distribution of Grades in Grammar and Composition in the State High School Board Examination for 1914.	132
Fig. 7	Distribution of Grades in Grammar and History in the State High School Board Examination for 1914.	133
Fig. 8	Distribution of Grades in Grammar and Composition in the State High School Board Examination for 1915.	134
Fig. 9	Distribution of Grades in Grammar and History in the State High School Board Examination for 1915.	135
Fig. 10	Distribution of Grades in History and Composition in the State High School Board Examination for 1915.	136
Fig. 11	Median Scores of Eighth Grade Pupils in Seventeen City Schools for Grammar and Understanding of Sentences.	155
Fig. 12	Median Score in Grammar for Every Half-Step on the Scale for Understanding of Sentences. Curve Marked 240 Shows Medians for Eight Schools Ranking High in Grammar. Curve Marked 260 Shows Medians for Nine Schools Ranking Low in Grammar.	161
Fig. 13	Relative Scores of Boys and Girls in the Understanding of Sentences.	166
Fig. 14	Relative Scores of Boys and Girls in the Grammar Test.	167
Fig. 15	Relative Scores of Boys and Girls in the Grammar Test for Every Half-Step on the Sentence Scale.	169
Fig. 16	Relationship Between Age and Attainment in Grammar Shown by Curve of Medians. Numbers on the Curve	

Table XVIII	Teachers' State Examination, 1912. Correlation Table for History and Composition.	86
Table XIX	Teachers' State Examination, 1912. Correlation Table for Geography and Composition.	87
Table XX	Teachers' State Examination, 1913. Correlation Table for Grammar and Composition.	88
Table XXI	Teachers' State Examination, 1913. Correlation Table for Arithmetic and Composition.	89
Table XXII	Teachers' State Examination, 1913. Correlation Table for History and Composition.	90
Table XXIII	Teachers' State Examination, 1913. Correlation Table for Geography and Composition.	91
Table XXIV	Teachers' State Examination, 1914. Correlation Table for Grammar and Composition.	92
Table XXV	Teachers' State Examination, 1914. Correlation Table for Arithmetic and Composition.	93
Table XXVI	Teachers' State Examination, 1914. Correlation Table for History and Composition.	94
Table XXVII	Teachers' State Examination, 1914. Correlation Table for Geography and Composition.	95
Table XXVIII	Teachers' State Examination, 1915. Correlation Table for Grammar and Composition.	96
Table XXIX	Teachers' State Examination, 1915. Correlation Table for Arithmetic and Composition.	97
Table XXX	Teachers' State Examination, 1915. Correlation Table for History and Composition.	98
Table XXXI	Teachers' State Examination, 1915. Correlation Table for Geography and Composition.	99
Table XXXII	Teachers' State Examination, 1916. Correlation Table for Grammar and Composition.	100
Table XXXIII	Teachers' State Examination, 1916. Correlation Table for Arithmetic and Composition.	101
Table XXXIV	Teachers' State Examination, 1916. Correlation Table for History and Composition.	102
Table XXXV	Teachers' State Examination, 1916. Correlation Table for Geography and Composition.	103
Table XXXVI	Teachers' State Examination, 1911. Correlation Table for Arithmetic and Grammar.	104

Table XXXVII	Teachers' State Examination, 1911. Correlation Table for History and Grammar.	105
Table XXXVIII	Teachers' State Examination, 1911. Correlation Table for Geography and Grammar.	106
Table XXXIX	Teachers' State Examination, 1912. Correlation Table for Arithmetic and Grammar.	107
Table XL	Teachers' State Examination, 1912. Correlation Table for History and Grammar.	108
Table XLI	Teachers' State Examination, 1912. Correlation Table for Geography and Grammar.	109
Table XLII	Teachers' State Examination, 1913. Correlation Table for Arithmetic and Grammar.	110
Table XLIII	Teachers' State Examination, 1913. Correlation Table for History and Grammar.	111
Table XLIV	Teachers' State Examination, 1913. Correlation Table for Geography and Grammar.	112
Table XLV	Teachers' State Examination, 1914. Correlation Table for Arithmetic and Grammar.	113
Table XLVI	Teachers' State Examination, 1914. Correlation Table for History and Grammar.	114
Table XLVII	Teachers' State Examination, 1914. Correlation Table for Geography and Grammar.	115
Table XLVIII	Teachers' State Examination, 1915. Correlation Table for Arithmetic and Grammar.	116.
Table XLIX	Teachers' State Examination, 1915. Correlation Table for History and Grammar.	117.
Table L	Teachers' State Examination, 1915. Correlation Table for Geography and Grammar.	118
Table LI	Teachers' State Examination, 1916. Correlation Table for Arithmetic and Grammar.	119
Table LII	Teachers' State Examination, 1916. Correlation Table for History and Grammar.	120
Table LIII	Teachers' State Examination, 1916. Correlation Table for Geography and Grammar.	121
Table LIV	Summary Table of Correlations in Per Cent of Median Retention and Pearson Coefficients.	122
Table LV	Correlations of Composition with Grammar, History and Arithmetic in Teachers' State Examinations for 1911 - 1916. Amount of Correlation in Per Cent of Tertile Retention.	126

Figure 16 (con. Indicate the Cases

Figure 17 Relationship between Age and the Understanding of Sentences Shown by Curve of Medians. Numbers on the Curve Indicate the Cases.

Figure 18 Same as Figure 17 but Based on Averages in Place of Medians

Figure 19 Relationship Between Age and Number of Marks above Median Obtained in Five Subjects Based on the Teachers' State Examination, 1914.

CHAPTER I.

THE PROBLEM AND ITS GENERAL SETTING.

1. THE PROBLEM.

What degree of relationship, if any, is there between the knowledge of formal English grammar and the practical mastery of English as shown by the ability to understand the meaning of sentences or the ability to express thoughts in various forms of composition? This is the problem with which this thesis is concerned.

2. General Plan of the Thesis.

The general setting and significance of this problem will be indicated in the present chapter by giving a brief sketch of the ~~diversity~~ ~~of~~ claims which have been made for the study of formal grammar during the last twenty-five years.* Chapter two will give the specific setting of the problem by relating it to other investigations of a statistical or experimental nature dealing with formal grammar. The succeeding chapters will present the results of various investigations by the writer.

*For general historical surveys of English grammar the reader is referred to the following:
Encyclopedia of Education. Article on Grammar by Foster Watson.
Barbour, F. A., The Teaching of English Grammar. 1901.
Carpenter, Baker and Scott, The Teaching of English. 1903.
Hoyt, Franklin S., The Place of Grammar in the Elementary Curriculum. Teachers College Record, VII, No. 5, Nov. 1906.
Briggs, Thomas H., Formal English Grammar as a Discipline. Teachers College Record, XIV, No. 4, Sept., 1913.

The situation with respect to the place of formal grammar in the schools of this country about twenty-five years ago is quite clearly indicated by the reports of two important committees ⁽¹⁾ of the National Education Association. Their statements, ^{together with a number of others,} which are quoted somewhat fully, in order to show the ~~full~~ connection of the expressions specifically relevant to our problem, show that the aim of grammar at that time was by no means a unified one. On the one hand are assertions ~~that~~ that the study of grammar will promote the mastery of English both as to comprehension and composition. On the other hand it is claimed that technical grammar can not "educate the child in the use of a higher and better English style".

The report of the Committee of Ten contained the following statements: Not earlier than the thirteenth year of the pupil's age the study of formal grammar, with drill in fundamental analysis, may be taken up. It should not be pursued as a separate study longer than is necessary to familiarize the pupil with the main principles. Probably a single year (not more than three hours a week) will be sufficient. Subsequently, although grammatical analysis (as an instrument of interpretation and criticism) may properly accompany reading and the study ~~of~~

* Italics are used to indicate the expressions particularly relevant to our problem. This practice will be followed throughout the book.

(1) Report of the Committee on Secondary School Studies. National Education Association. 1892.

Report of the Committee of Fifteen on Elementary Education. National Education Association. 1895.

of composition, it should not be regarded as a separate subject in the curriculum.

With regard to the study of formal grammar the Conference wishes to lay stress on three points: (1) a student may be taught to ~~see~~ speak and write good English without receiving any special instruction in formal grammar; (2) the study of formal grammar is valuable as training in thought, but has only an indirect bearing on the art of writing and speaking; and (3) the teaching of formal grammar should be, as far as possible, incidental and should be brought into close connection with the pupil's work in reading and composition. These principles explain the considerable reduction recommended by the Conference in the amount of time allowed to this study."(2)

Two years later the Committee of Fifteen made a somewhat similar statement regarding the futility of the study of grammar for the purpose of acquiring mastery of English. They said: "A third phase of language study in the elementary school is formal grammar. The works of literary art in readers,, reinforced as they ought to be by supplementary reading at home of the whole works from which the selections for the school readers are made, will educate the child in the use of a higher and better English style. Technical grammar never can do this. Only familiarity with fine English works will insure one a good and correct style. But grammar is the science of language, and, as the first of the seven liberal arts, it has long held sway in school as the disciplinary study par excellence. A survey of its educational value, subjective and objective, usually produces the conviction that it is to retain the first place in the future. Its chief objective advantage is that it shows the structure of language, and the logical

(2) Report of the Committee on Secondary School Studies. Washington. Government Printing Office. 1893. p 88.

4

forms (3) of subject, predicate, and modifier, thus revealing the essential nature of thought itself, the most important of all objects because it is self-object. On the subjective or psychological side, grammar demonstrates its title to the first place by its use as a discipline in subtle analysis, in logical division and classification, in the art of questioning, and in the mental accomplishment of making exact definitions. Nor is this empty, formal discipline, for its subject matter, language, is a product of the reason of a people not as individuals but as a social whole, and the vocabulary holds in its store of words the generalized experience of that people, including sensuous observation and reflection, feeling and emotion, instinct and volition." (4)

Only four years before the Committee of Fifteen made the statements just quoted the following had appeared in the preface of a popular text-book in grammar. Speaking of the ~~xxxxxxx~~ values of the study of grammar the author says: "Its practical ~~xxxx~~ uses, as distinguished from pure intellectual gymnastics, are to give the student practice in comprehending thought when expressed in language, and to enable him to express correctly and clearly his own experiences and thoughts." (5)

III

(3) See chapter ~~three~~ for an illustration of the dominance of the logical aim. Grammar in Minnesota conformed to this aim for more than twenty years.

(4) Report of the Committee of Fifteen on Elementary Education. American Book Co. 1895. p 48.

(5) Maxwell, Wm.H., Advanced Lessons in English Grammar. American Book Co. 1891. Preface.

3

Note also the following from a grammar published in 1895: "Grammar is eminently a means of mental training; and while it will train the student in subtle and acute reasoning, it will at the same time, if rightly presented, lay the foundation of a keen observation and correct literary taste." (6)

Carpenter expresses ~~the same~~ a similar idea in this manner: "But it will readily be seen that the study of grammar is of great value, especially to the young, in that it enables anyone who gives his mind to it to gain a systematic idea of his mother tongue, and thus to speak it in accordance with the essential principles of the language". (7)

(6) Baskervill, W.M., and Sewell J.W., An English Grammar. American Book Co. 1895. p 11.

(7) Carpenter, G.R., Principles of English Grammar. The MacMillan Co. 1898. p 5.

The situation evidently amounted to more than a difference of opinion. Gen. S.C. Armstrong is quoted by Barbour ~~xi~~ (8) as stating in 1891 that the state of Connecticut had dropped all technical grammar from its ~~an~~ curriculum both in model and normal schools, ~~Maxxise~~ and that the Board of Education of Connecticut had omitted grammar from the state examinations giving as their reasons for so doing the following: "1. The study of grammar does not help us either to speak or write our language. ~~2.~~ 2. As a study technical grammar is hateful to any child, (9) and belongs to ~~axxixentary~~ our advanced course, if anywhere. Its use in an elementary school is contrary to all approved pedagogical theories. 3. There is not time for such work and for other subjects that belong to our civilization. 4. We are convinced that the discipline said to be derived from the study of grammar can be secured by the study of other subjects."

(8) Barbour, F.A., The Teaching of English Grammar. Ginn and Co. 1901. p 20. Barbour bases his statements on the Educational Journal of Virginia, March, 1891.

(9) Compare this statement with the investigation by Brown and Minnick. Summarized in chapter two.

A few selections will show ~~the~~ ^{that} ~~praxakikngn~~ that, ~~apuhhnamzshantmthaxvritasxofngammarm~~ if any change had ~~taken~~ ^{took} place during the next few years, it was probably in the direction of less emphasis on grammar as an aid toward better comprehension or expression of English. Chubb characterizes the situation in 1902 by saying that "We have finally abandoned the old view, which regarded grammar as ~~the~~ the art of speaking and writing, in favor of the view that grammar is the science underlying that art,-- a knowledge of which aids the art, and is involved in the conscious elaboration of its principles and technique..... We have come to recognize the necessity of following a different method, for insuring a conscious mastery of our native tongue, from that employed in mastering a foreign tongue."(9)

F.T.Baker, ~~knxthaxgaintxforxkowngxaxax~~ expressed similar views in 1903. He states that there has been a reaction against the study of English grammar and among the reasons ~~which he assigns~~ for this movement ~~he~~ he mentions the following: "The claim commonly made for the study, that it led to the correct use of English, was entirely contradicted by facts, since many good students of grammar used bad English, and many who knew no grammar used good English."(10)

He goes on to say that all the objections have been ~~amshshadm~~ fully sustained. He finds, however, that despite this fact grammar holds its place in the

(10) Carpenter, Baker and Scott, The Teaching of English in the Elementary and Secondary School. Longmans, Green and Co. 1903. p 145.

8

schools and that it is defended both by the teachers and the educational theorist. He believes that the teacher's faith in ~~grammar~~ grammar is "lies in his actual knowledge" of ~~its~~ its value as "a general means of training in clear thinking" and "as an assistance in understanding language and in clear expression"; also that it is "a means of correction of some of the gross errors of speech." (11)

Another of the authors of the same book says that "as a rule, however, we have come to depend, for the purpose of teaching 'correctness', largely on the now greatly increased instruction in composition and literature, and to look upon grammar as a means both for giving the young some knowledge of the facts of language and for training them in the analysis and structure of sentences". (12)

(11) Carpenter, Baker and Scott, The Teaching of English. p 145.

(12) Ibid. p 193.

DeGarmo emphasized the logical aspects of grammar and claims that "for the most part, the language sense developed since infancy suffices for the grammatical side of both understanding and composition". Grammar, he thinks, is studied "mostly for mastery of the thought system involved". (13)

(14)
 Bagley goes still farther and asserts that "oral speech is ineffective when attention must be divided by the speaker between thought and form." He also finds that "written speech is uneconomical when the writer must make a similar transfer of attention". He states further that the practical value of the rules and principles of grammar are to be found mainly in the "imitation of habits", and that "efficiency of expression" would be "greatly curtailed" if by conscious application of rules or principles. He holds that "fluency and spontaneity" are more important than "correctness of form".

(13) DeGarmo, Charles, Principles of Secondary Education. The Studies. The MacMillan Co. 1907. p 112.

(14) Bagley, W. C., Educational Values. The MacMillan Co. 1911. pp 129-130.

however,

These expressions must not be taken as evidence ~~to~~ ^{that} that the other view of grammar had disappeared, for in one of the text-books of this time, a book⁽¹⁵⁾ which has ~~been~~ been reprinted many times, the authors state that the chief purpose of the book is "to awaken an interest in the correct use of the English of to-day", also that the aim is to give boys and girls "ability to express their own thoughts and to understand the thoughts of others". In the very next ~~paragraph~~ paragraph of the book is found this statement; "The fact is recognized that a knowledge of technical grammar exerts very little influence either on the daily speech or on the written compositions of children". To overcome this difficulty the authors suggest that constant ~~effort~~ effort be made to correct the errors of speech among young people and to teach them variety of expression as well as to make correct expression easy and natural. Imitation is suggested as the means to accomplish this.

(15) Emerson and Bender, Modern English, Book Two. The MacMillan Co. 1905. Preface.

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In 1910 Ruediger ^{wrote} ~~writes~~ ~~wrote~~ that, "The opinions regarding the educational values of grammar are unsettled, if not chaotic. Practically every value in the category has been assigned to it, with special emphasis on the formal values of discrimination and exact logical thinking". (16) In his discussion Ruediger holds that the value for logical thinking depends on the method of teaching, not on the content; consequently this value may or may not be obtained from the study of grammar. He believes that the subject has preparatory value and that through this it ~~helps~~ ministers "to the interpretation of language and to the correctness of expression." (17) Grammar "forms the common language between teacher and pupil" (18) in the correction of mistakes in speech and writing. It serves as a means of self-criticism for the pupil. It also has instrumental value in the learning of other languages.

(16) Ruediger, William Carl, The Principles of Education. Houghton Mifflin Co. 1910. p 189.

(17) Ibid.

(18) Ibid. p 189.

Some criticisms of the logical value of grammar *have* appeared. Baylor (20) and Rounds (21) called attention to the lack of agreement in the nomenclature used in grammar texts. Baylor states that in the examination of twenty-two texts sixteen different names were found *The use of* for "red" in the sentence "We painted the barn red" and concludes that "it is no wonder that even teachers lose sight of the essentials of a sentence in the controversies over what to call certain words relating to these ~~essentials~~ essentials". Shallies⁽²²⁾ calls attention to the waste and confusion resulting from lack of uniformity in nomenclature. He finds, ~~that~~ for example, that ~~the~~ clauses are classified as "dependent or independent", "principal or subordinate," "main or secondary" while foreign languages use only the terms "principal and subordinate". "Predicate nominative", "attribute complement", "predicate noun", "predicate adjective", or simply "attribute" are used where one term should be uniformly employed. ~~Sheffield (23) objects to some of~~

(20) Baylor, Adelaide Steele. Report. National Education Association. 1910. pp 430-436. April, '12
 (21) Rounds, C. R., "The Waste of Unlearning". Eng. Jour. I; 214.
 Rounds, C.R., Reform in Grammatical Nomenclature. School Rev. 19: 610-42. N. '11.
 (22) Shallies, Guy Wheeler, Waste in English Grammar. Educ. 31: 536. Apr. '11.
 (23) Sheffield, A.D., Grammar and Thinking. G.P. Putnam's Sons 1912. p

Sheffield (23) claims that grammar is logically confusing. A noun is defined in terms of meaning ~~xxxxxxx~~ while an adjective is defined in terms of function. He thinks too much emphasis is laid on the Parts of Speech. The sentence is the unit in language and the ~~xxxxxxxxxxxx~~ ~~xxxxxxxxxxxx~~ study of grammar should be based on the sentence, not on the ~~xxxxxxxxxxxxxxxxxxxxxxxx~~ word. In his book, Grammar and Thinking, he says that to define a sentence as a "combination of words" is to describe it from the wrong end. "The sentence is the prior thing; the word is something analysed out of it". (24) He claims that the older view, which aimed at the perfect usage of language, failed because (1) it assumed that language could be made stationary^a and (2) conceived the standards too rigidly. He also calls attention to the ~~fact~~ possibility that the present view, which aims ~~xxxxx~~ primarily at the understanding of speech ~~xxxxxxxx~~ and is based on a purely scientific motive, may ~~xxxxxx~~ place too much emphasis on the changeableness of English.

(23) Sheffield, A. D., Rational Study of English Grammar. School Rev. 18:618-26. N. '10.
 (24) Sheffield, A.D., Grammar and Thinking. G.P. Putnam's Sons. 1912. p 30.

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~~Green (25), Hale (26), Zeitlin (27)~~

Green (25) objects to the nomenclature of grammar texts and finds that, if grammar is to be taught in the elementary schools, "the whole of the traditional categories need revision, and some must be abandoned altogether". Hale (26) objects to the classification of sentences as Declarative, Interrogative, Imperative and Exclamatory as unsatisfactory because it does not cover all sentences, is not a mutually exclusive classification, and is not "homogenous" ^{since} because the Imperative belongs to the "Mood" class. Zeitlin (27) shows the difficulty in distinguishing the Parts of Speech from each other. While function is claimed by ^{the} grammarians to be the basis of classification, it ~~is~~ is not a satisfactory basis. Nouns, for example, may serve in many other than substantive functions.

(25) Green, J.A. The Teaching of English. Jour. of Exper. Ped. 1:226-232. 1911-12.
 (26) Hale, Wm. Gardner, Classification of Sentences and Clauses. School Rev. 21:338-97. Je. '13.
 (27) Zeitlin, Jacob, On the Parts of Speech: the Noun. The Eng. Jour. 3:137. Mch. '14.

If one wishes further evidence of the lack of agreement as to the aim of English grammar, a perusal of a number of texts is sufficient. Davenport and Emerson (28) regard grammar as a "culture study". Brown and DeGarmo (29) lay chief stress on its logical value. Hyde (30) says the purpose is to lead the pupil to use the knowledge of fundamental facts of grammar "in the interpretation of literature and ~~the~~ in the expression of his own thought". Kittredge and Arnold (31), while admitting that "ability to speak and write correctly does not depend on the knowledge of grammatical rules", yet maintain that "an acquaintance with grammar is of great help in acquiring correctness of speech". Southworth (32) says that grammar has two aims: "(1) to give the learner power to express his own thoughts with precision and (2) to enable him to understand the thoughts of others". Webster and Cooley (33)

(28) Davenport and Emerson, The Principles of English Grammar. MacMillan. 1898. Preface.
 (29) Brown and ~~DeGarmo~~ DeGarmo, ~~Elementary~~ Elements of English Grammar. Werner School Book Co. 1900. Preface.
 (30) Hyde, Mary F. Practical English Grammar. D.C. Heach and Co. 1900. Preface.
 (31) Kittredge and Arnold, The Mother Tongue. Book II. Ginn and Co. 1900. Introduction XVII.
 (32) Southworth Gordon A. , English Grammar and Composition. Thos. R. Shewell and Co. 1901. Preface.
 (33) Webster and Cooley, The New Webster-Cooley Course in English. Second Book. Houghton Mifflin Co. 1903. Suggestions to Teachers.

hold that the study of grammar"prepares the student for the study of any other language", that "it is one of the means of ridding our common speech of some of its worst errors", and that "it affords the student models of elegant and powerful sentence-structure". Manley and Hailman (34) lay stress on the "stimulation and liberation of thought and feeling rather than upon certain borrowed technicalities of speech of little or no value in modern English". Wisely (35) stresses familiarity with sentence structure. Robbins and Row (36) claim that the study of grammar" is one of the means"of gaining power to express oneself in "appropriate, correct, clear, forceful language". Gilbert and Harris (37) say that grammar should be "the handmaid of expression". Blount and Northrup (38)

(34) Manley and Hailman, The English Language. C.C. Birchard and Co. 1903. Foreword.

(35) Wisely, John B., An English Grammar. Atkinson, Mentzer and Grover. 1906. Preface.

(36) Robbins and Row, Grammar and Composition. Row, Peterson and Co. 1907. Introduction.

(37) Gilbert and Harris, Guide Book to English, Book II. Silver Burdett and Co. 1907. Preface.

(38) Blount and Northrup, An Elementary English Grammar. Henry Holt and Co. 1911. Preface.

state that "while to know the correct form will not necessarily make us use the correct form, the knowledge will help us to correct, and it will give us the ability to criticise and improve our ~~language~~ usage". Prince (39) enumerates three aims of grammar: (1) "ability to analyse intelligently the best literature of our language", (2) ~~correct use of language~~ correct use of language, and (3) preparation for the study of a foreign language.

As a summary of ^{the various claims as to the value of grammar,} ~~the whole situation, I can find no~~ _{is found} better statement, than the one made by Supt. W.H. Maxwell before the National Education Association in 1915. He enumerates the aims of grammar as follows:

- 1) To cultivate the habit of orderly and logical thinking.
- 2) To cultivate the power to interpret the meaning of ~~language~~ language and appreciate its significance.
- 3) To establish habits of correctness in oral and written expression.
- 4) To impart knowledge of conventional grammatical facts and rules.
- 5) To organize a basis for, and to give facility in, the study of other languages". (40)

(39) Prince, John T., A Practical English Grammar. Ginn and Co. 1910. Preface.

(40) Maxwell, W. H., Report of the Committee on Tests and Standards of Efficiency in Schools and School Systems, Part. C. Report, National Education Association, 1915. pp 565-573.

Criticisms of the Results of Grammar Teaching.

In reviewing the various statements which reveal the lack of agreement as to a central aim of the study of grammar, the question suggests itself ~~whether~~ as to the ~~results~~ ^{this subject} whether the results of instruction in grammar have been satisfactory or not. Inquiry brings two answers. One is, that pupils do not learn very much ~~grammar~~ even if it can be ~~mastered~~; the other, that ~~the~~ grammar, ~~which is learned~~ ~~is~~ mastered, is useless. A contributor in the Atlantic (41) writes under the title "Grammarless Age". He laments the lack of ~~grammar~~ ^{grammar} knowledge on the part of pupils and tells of a city boy who wrote "would of gone" and was told by his college teacher that he never could pass in ~~his~~ his course till he knew the difference between a verb and a preposition. A writer in the Nation (42) attempts to find reasons for the poor English used by pupils. After suggesting as causes of the pupil's deficiency the ~~hearing~~ hearing of poor English in the home and school, and the influence of newspapers and cheap magazines, he goes on to say that pupils study grammar when they should have composition, composition when they should have grammar and composition, and literature alone when they should also have grammar. ~~Edwin Fairley~~ ⁽⁴³⁾ claims

(41) Grammarless Age. Atlantic. 109:855-7. (Contributors' Club)
 (42) Miller, R.D., The Teaching of English. Nation. 90:208. 1910.
 (43) Fairley, Edwin, The Question of Formal Grammar. Educ. Administr. and Superv. 2:181. 1916.

that New York City spends 42 per cent of the time for English in Elementary schools on formal grammar and maintains that, when critics say that pupils cannot write or speak correctly, it shows how useless formal grammar is for developing mastery of the language. He ~~also~~ also holds that to think of grammatical rules when composing tends to hinder thought, and concludes that it would be better to spend the time ^{in drill} on accepted forms of correct speech, reading aloud, ^{and} oral composition. ~~and~~

(44) Susan Anderson Fish [^] thinks the poor results in English due to the fact that teachers have been attempting too much and advocates minimum essentials consisting of the relation of ⁽¹⁾ subject and predicate, (2) phrases and dependent clauses, (3) independent clauses, (4) plurals of nouns, (5) comparison of adjectives and adverbs, and (6) the principal parts of speech.

(44) Fish, Susan Anderson, What Should Pupils Know of English when they Enter High School? The Eng. Jour. 3:166. 1914.

school study under the following

The principal criticisms of grammar as an elementary school study may, according to Klapper, (45) be summarized as follows: (1) Grammar does not teach pupils to speak and write correctly; (2) there is little or no correlation, in most schools, between courses in grammar and in composition; (3) grammar texts and grammar courses abound in "sterile verbal subtleties"; (4) the subject is taught as a ~~xxxxx~~ drill and memory subject rather than as a thought study; (5) There is an undue variety of ~~xxxxxxxx~~ terminology. Based on an examination of ten texts in grammar (46) Klapper found the following facts supporting the last mentioned criticism: good in "He is good" was called Attribute Complement ~~xxxxxxxx~~ according to 3, Subject Complement by 1, Predicate Adjective by 5, and Adjective Attribute by 1; John in "This is John" was classed as Attribute Complement according to 3, Predicate Noun by 4, Subject Complement by 1, Predicate Nominative

(45) Klapper, Paul, The Teaching of English. D.Appleton And Co. 1915. Ch. XIII.
(46) The following texts were used: Mead, Reed and Kellogg, Mother Tongue, Whitney, Carpenter, Buehler, Krapp, Longman's, Metcalf, Maxwell.

by 1, and Noun Attribute by ~~ans~~ 1; red in "We painted the barn red" was classed as Objective Complement according to 4, Predicate Objective by 1, Objective Predicate by 1, Adjective Object Complement by 1, Object Attribute Complement by 1, Objective Complement by 1, and according to one it was disposed of by supplying "to be". Klapper holds that the criticisms are due to "poorly organized ~~courses of study~~ courses of study and faulty methods of teaching" rather than to "inherent limitations of grammar as an elementary school subject"; (47) ~~but~~ ^{and he} suggests ~~that~~ we must look "to a liberal reduction in the requirements of courses in formal grammar, to a simplification and standardization of its terminology, and to the introduction of methods of teaching which emphasize the function rather than the form".(48)

(47) Klapper, The Teaching of English. p 262.

(48) Ibid.

Recent Attempts to Improve Grammar Instruction.

That superintendents and teachers ^{are} ~~were~~ alive to the criticisms of grammar is evidenced by the efforts which have been made to remedy the defects. Committees ^{have been} ~~were~~ appointed by the National Council of Teachers of English for ~~the~~ correlating ~~the~~ elementary and high school courses in English and by the Department of Superintendency of the National Education Association ~~for~~ ^{on} ~~marking~~ "Uniform ~~Nomenclature~~ Nomenclature in English Grammar". (49)

Statistical studies ^{have begun} ~~began~~ to ~~appear~~ to appear. Tabulations ^{have been} ~~were~~ made of the errors in the language used by school children and attempts ^{are} ~~made~~ to make grammar instruction more functional. These ^{efforts} ~~studies~~ will be reviewed ~~summarized~~ in the next chapter.

(49) See chapter two.

6. Summary of the Chapter.

has shown
 Summary.-- This chapter ~~shows~~ that during the last twenty-five years there has been a lack of uniformity in the aim of grammar teaching. The two ~~principals arguments~~ purposes which have have been most pronounced are (1) logical ~~general~~ discipline of the mind and (2) mastery of English both in understanding and expression. The critics of grammar as an elementary school subject, ^{have} maintain that these purposes are not realized by present courses and methods in grammar. The controversy has been ~~based~~ based on ~~personal~~ personal opinion rather than on scientifically determined facts. The situation has ~~reached~~ become such that proposals are made to decrease the amount of time ~~given~~ given to formal grammar in the curriculum or even to eliminate the subject altogether. ~~xx~~ Whatever may be the weight of opinion on either side of the controversy, ^{by the defenders of grammar} the claim may justly be made that a subject which has remained an integral part of the school curriculum for ^{such} ~~centuries~~ as long a time ~~and~~ ^{as} grammar ~~and~~ should not be eliminated without scientific proof of its failure to produce the results which have been claimed for it. ^{On the} ~~other~~ ^{other} side The opponents have a right to demand that if grammar has the values claimed for it, those values be demonstrated. Either view, therefore, calls for scientific

The most recent of these is the proposal announced ~~ix~~
by Flexner (50) that "The Modern School would not hesitate
to take the risk to mental discipline involved in
dropping the study of formal grammar. It would, tentatively,
at least, also risk the consequences to correct speech
involved in the same step." ~~XXXXXXXXXXXX~~

(50) Flexner, Abraham, A Modern School. The General
Education Board. 1917. p 17.

scientific investigation and demonstration of the value or lack of value of grammar for any of the following purposes: (1) logical discipline, including conventional terms necessary for effective thinking; (2) practical mastery of English both in respect to comprehension and expression; and (3) mastery of foreign languages, a purpose which has not been as important in educational discussions as the other two.

Several such investigations have already been made, and they will be reviewed in the next chapter.

CHAPTER II.

REVIEW AND SUMMARY OF PREVIOUS INVESTIGATIONS.

/, General Plan of the Chapter.

This chapter will show the specific setting of our problem by reviewing the scientific investigations which have already been made regarding the problems of grammar. The first part of the chapter contains a survey of studies that have been published. The second part presents an analysis of these studies with respect to materials used, methods, and results.

2. Review of Previous Investigations.

2. In 1904 Dr. J. M. Rice published two articles in
 in the Forum, ⁽¹⁾ ~~35: 269-294, 440-458~~, on "The Need of a New
 Basis in Education." In these articles he reports an ~~ixxx~~
 investigation, which, although not directly a study of
 grammar, involved methods which ~~xxxxxx~~ were ^{later} employed by ~~others~~.
~~Hayt~~. Rice gave language tests ^{to} ~~xxx~~ 8,357 pupils in
 22 schools in 9 different cities. The test ~~xxxxxx~~
 consisted in reading to the pupils a story about
 Pestalozzi and having the pupils ~~xxxxxx~~ write
 it in their own words. The reproductions were graded by
 separating them into five groups according to degree of
 merit. Based on this study Rice makes the following
 statement about ~~xxxx~~ the value of grammar: " It is

possible to roll up class averages of eighty or ninety
 per cent in language where the art of expression - or
 language as the term is commonly understood outside of
 school - is in a most deplorable state. This was
 abundantly demonstrated by my own test, which, as a
pure and simple test of the power of expression, caused
the utter collapse of all structures that had been
artificially propped up by technical grammar and all kinds
of devices under the sun.

I do not wish to be understood by this as casting a
 vote against the study of technical grammar in the
 elementary school. Indeed, I do not see how the teacher
can guide her pupils in their composition work without
a reference to grammar. But I do wish to impress the
fact that grammar- i.e., from the standpoint of
composition- is merely one of any number of forces that
aid in the development of the power of expression, and
cannot be looked upon as a substitute, for or gauge of,
the ability to write. pp 455-6.

(1) Forum, 35: 269-294, 440-458.

The first statistical investigation of the values of the study of English grammar of which any report is found was made by Hoyt(2) in 1906. This study first presents a brief historical survey of English grammar in which it is shown that "no English grammar was available for use until near the close of the Elizabethan age, when a little grammar was published for the use of foreigners who wished to learn the language" and that "the language had attained its greatest vigor and beauty before the 'science of speaking and writing correctly' had been formulated"(3).

Hoyt finds that the various attitudes toward the study of grammar may be summarized under three types as follows:

1. Those who believe in teaching no formal grammar in the elementary schools.
2. Those who would have grammar taught as a distinct regular subject.
3. Those who would have it taught only incidentally in connection with language work" (4)

The claims regarding the values of the study of English grammar are summarized in the following five points

(2) Hoyt, Franklin S. The Place of Grammar in the Elementary Curriculum. Teachers College Record. Vol. 7, No. 6. 1906.

(3) Ibid. p # 3

(4) Ibid. p # 6

Grammar

- "(1) disciplines the mind;
- (2) prepares for the study of other languages;
- (3) gives command of an indispensable terminology;
- (4) enables one to use better English;
- (5) aids in the interpretation of literature" (5)

Against the first of these claims Hoyt argues that ~~trans~~ transfer of training is not sufficient to retain a subject in the curriculum, that grammar as usually taught in the elementary school is beyond the reasoning abilities of

(5) Loc. cit. p 7.

children and that by taking up the pupil's time, it hinders rather than promotes his mastery of English.

Against the second point he argues that most children study no other language, that English is essentially "a grammarless tongue", and that, by the time a pupil takes up the study of a foreign language, he has forgotten most of his grammar.

Against the third point he argues that the indispensable terminology is very limited, and that it is much more profitably acquired by actual use.

Hoyt's main contribution relates to the claims that grammar "enables one to use better English" and "aids in the interpretation of literature". His method of investigation is that of concomitant variation. He argues that if the study of formal grammar helps pupils to use better English, then those who excel in grammar should also be found to excel in English. In order to test whether this be so or not, he prepared three examinations, one in composition, one in grammar, and one in interpretation. The composition examination consisted in having pupils write for forty minutes on "How would you spend a thousand dollars if that sum should be given you to spend during the Christmas holidays? Why would you spend the money as you propose rather than in any other way?" The test in grammar was based upon the first four stanzas of Gray's Elegy (See Appendix). The test in interpretation required the pupil to express in his own words the thought of four ^{other} stanzas of Gray's Elegy, ~~other than those used for the grammar test.~~ These tests were given to pupils in the first year high school in three cities. However, as the teachers in two of the cities failed to conform to the directions for

giving the test, the results which were finally tabulated consisted of complete sets of tests from 200 students in ^{only} one high school. After checking and tabulating the results of these tests, Hoyt found the following ⁽⁶⁾ correlations based upon the marks of two judges:

	A's marks	B's marks	A's and B's marks combined	Average of A's and B's correlation	Probable true correlation
Grammar and Composition	.12	.23	.23	.18	.30
Grammar and Interpretation	.22	.19	.28	.21	.35
Interpretation and Composition	.27	.30	.32	.28	.41

~~His conclusion is as follows:~~

"While the results of the research need to be verified by other similar tests given under varying conditions and by tests made to show the effect of a thorough grounding in grammar upon the ability of pupils to use better English and the interpretation of language as compared with the effect of no instruction at all in formal grammar, still our results warrant the conclusion that the teaching of grammar is of little avail in strengthening one's power to use language. ⁽⁷⁾

^C Hoyt's experiment was repeated by Rapeer ⁽⁸⁾ ~~Rapeer~~ ^{He} gave the test used by Hoyt to high school pupils in Minneapolis during the month of February 1907 using the same directions and methods as those that were used by Hoyt. He obtained the following correlations:

(6) 2. Teachers College Record, November 1906, p. 18
 (7) 3. Ibid, page 21. 19, 21.
 (8) 4. Rapeer, Louis W., The Problem of Formal Grammar in Elementary Education, Journal of Educational Psychology, Volume IV, p. 125-138, March 1913.

After comparing ^{these} his results with the correlations of high school marks from Regents Examinations as given by E. S. Thorndike in his Educational Psychology, chapter IV, Hoyt ~~further concludes~~ concludes that "there is about the same relationship existing between grammar and composition and grammar and interpretation, as exists between any two totally different subjects, as grammar and geography" (7)

His final conclusions are as follows:

Grammar and composition .23	Probably true	correl.	.3
Grammar and Interpretation.10	"	"	.2
Composition and Interpretation .24	"	"	.3

Rapeer concludes that grammar does not have any apparent support as a school subject and suggests that it should be postponed to the last part of the eighth grade, that ^{it} should be studied only in so far as it seems to be necessary, that constant attention should be given to the elimination of language errors, and that text should be selected carefully. He also suggests that "strong students are frequently strong in several subjects and weak pupils are frequently poor in several subjects. How large the latter correlation is in general we do not at present know. Perhaps much of the small correlation found by the investigations can be accounted for on this basis". (9)

(9) Loc. cit. p 128.

At the meeting of the National Education Association in 1910 Supt. Charles S. Meek ⁽¹⁰⁾ ~~of Boise, Idaho~~ reported a ^{investigation} ~~revelation~~ statistical of the language errors of elementary school children in Boise, Idaho. The following table summarizes his results:

TABLE I.

Language Errors of Elementary School Children in Boise, Idaho.

	Grades		
	First	Eighth	All
1. Verb errors	50%	37%	40%
2. Double negatives	4	3	3
3. Mispronunciation	17	17	17 20
4. Misuse of pronouns	19	18	17
5. Errors in the use of adverbs	5	7	6
6. Colloquialisms	8	13	13

- The most frequent errors in the use of verbs were
1. Confusing past and perfect participles 49%
 2. Confusing ~~have, ain't, got~~ have, ain't, got 20
 3. Failure to have subject and predicate agree 8
 4. Confusing shall and will 5
 5. Using and for to with the infinitive 6

The investigation shows that ~~that~~ (1) poor English is due to the repetition of a few errors, (2) ~~that~~ the errors are comparatively constant throughout the grades, (3) ~~that~~ the school course has not succeeded in eliminating the ^{and} errors, (4) verb- errors predominate, ^{those} errors in the use of participles being the most common.

(10) Meek, C.S., English in Elementary Schools. Report of the National Education Association. 1910. pp 434 - 6

In 1912 C.L. Hooper ^{an investigation} reported a ~~study~~ of "The Influence of the Study of Latin on the Student's Knowledge of English Grammar" (//). ~~Thanksgiving~~ His results were obtained by giving tests in grammar to 90 students in Teachers' College, Chicago. Two types of questions were used. One called for sentences illustrating such elements as "Causal Clause", "Participial Phrase", "Predicate Noun", "Restrictive Clause". The other was based on a selection ^{of literature} and called for explanation of a certain punctuation, or the construction of words or phrases. The following results were obtained:

TABLE II.

The Relation of the Study of Latin to the Student's Knowledge of English Grammar.

Number of students	Number of years of Latin in High school	Average standing in grammar test.
22	4	56.6%
10	3	52.5
30	2	50.4
8	1	56.5
<u>90</u>	0	44.7
90		

The author concludes that the study of Latin has considerable influence on the student's knowledge of English grammar.

(//) Hooper, C.L., The Influence of the Study of Latin on the Student's Knowledge of English Grammar. The English Journal. 1: 393- Sept. '12.

7. The most elaborate investigation which has been made of the problems of formal English grammar was reported by Thomas H. Briggs⁽¹²⁾ in 1913. In the first part of his treatise Briggs gives a historical sketch of grammar and the teaching of grammar based on Sayce's article on Grammar in the Encyclopedia Britanica, Abelson's The Seven Liberal Arts, Mullinger's Schools of Charles the Great, Barbour's The Teaching of English Grammar, Monroe's A Text-Book in the History of Education, and Carpenter, Baker, and Scott's The Teaching of English. In the second part he ~~states~~^{begins} by stating the general claims for grammar. He finds these to be the same as enumerated by Hoyt⁽¹³⁾. ^{He also finds that none} no further claims ^{have} ~~have~~ been ^{made} proposed since after 1906. He defines formal grammar by saying that it means "grammar highly organized and taught as a strict science, chiefly for its own sake or as a discipline ^{for} of the the mind" (14); also that "the worth of any fact in formal grammar is determined by its function in a logical scheme rather than by any significance in the uses of life".⁽¹⁵⁾

- (12) Briggs, Thomas H., Formal English Grammar as a Discipline. Teachers College Record, Vol. XIV, No. 4, 1913.
 (13) See page summary of Hoyt's study, page 28.
 (14) Briggs, Formal English Grammar as a Discipline. p 7
 (15) Ibid.

Barbour, Chubb, Hinsdale, Woodward, Laurie, Leonard, and Sheffield are quoted to illustrate the general claims for formal grammar as a discipline. The specific claims are illustrated by quotations from Hinsdale and the Committee of Fifteen. After examining all the specific claims found in the writings of educational theorists, Briggs reduces them to the following statements:

"It is held that work in formal grammar trains children

A. with rules or definitions:

- 1) to see likenesses and differences,
- 2) to critically test a definition,
- 3) to thoroughly apply a definition,
- 4) to make a rule or definition;

B. with reasoning:

- 5) to test reasons,
- 6) a. to take from a mass of data all that are necessary and to use them in reaching a judgment,
- b. to demand all necessary data before drawing a conclusion,
- 7) to reason in other fields, e.g., in arithmetic,
- 8) to reason syllogistically,
- 9) to detect 'catches' ". (16)

Two fallacies are charged against the arguments of those who have based their conclusions ~~axioms~~ regarding these special claims on observations of school work and its results: (1) That a pupil after having studied formal grammar ~~as~~ reveals intellectual power is no proof that this power was developed by the study of grammar. (2) The elimination of the less gifted grade by grade ~~raises~~ results in leaving ^{only} the most gifted for the study of the formal subjects in the upper grades. (17)

(16) Loc. cit. p 12

(17) Ibid. p 13

In order to test these claims experimentally the following series of exercises were arranged:

1. For "ability to see likenesses and differences."
Groups of words, numbers, figures, or sentences from which the pupils were asked to select those which were alike or which differed in some specified manner.
2. For "ability to judge a definition."
Series of definitions from which to select the best, *or to correct those which were faulty.*
~~or faulty definitions to be corrected.~~
3. For "ability to thoroughly apply a definition."
Definitions followed by numerous ~~xxx~~ examples from which to select the one fitting the definition in question.
4. For "ability to make a rule."
Lists of words on the basis of which to formulate a rule for spelling.
5. For "ability to ~~xxxxxx~~ judge reasons."
~~xxxxxx~~ Series of alleged reasons for certain facts. ~~xxxxxx~~ The pupils were asked to mark the valid reasons.
6. For "ability to select from unorganized data all necessary facts and to use only those in reaching a conclusion".
Series of practical problems.
7. For "reasoning ability of children in arithmetic".
Problems in arithmetic.
8. For "ability to reason syllogistically".
Syllogisms from which to select those which were faulty.
9. For "ability to detect 'catches'".
Statements in which there were "catches".
10. For "ability to make prompt and accurate associations".
Opposites-test, analogous-test, ^{and} direction-tests.
11. For "ability to correct errors and ~~xxxx~~ point off sentences."
Sentences with two expressions from which to select the right one, sentences containing errors, ~~xxxxxx~~ paragraphs not punctuated or capitalized.
12. For "knowledge of formal grammar after the training period."

These tests were arranged in pairs and their relative difficulty adjusted through rules for scoring based on results from preliminary results obtained in the seventh and eighth grades in two New York schools.

The pupils selected for the experiment ^{were} ~~xxxxxxxxxxxx~~ "two seventh grades, consisting of the children of well-to-do parents and members of the university family" (18). Room I had 15 boys and 25 girls. Room II had 16 boys and 13 girls. The groups were approximately equal in ⁱⁿ age and scholastic ability as ranked by their teachers in history and geography and as shown by standardized tests in ~~xx~~ numbers.

The experiment was conducted ~~xxxxxxxxxxxx~~ as follows:

- 1/ The first series of tests was given to both groups.
- 2/ Group I was given three months of instruction in three 30 minute periods per week; ^{while} formal grammar, ~~xxxxxxxxxxxxxxxxxxxxxxxx~~ Group II had language and composition.
- 3/ At the end of three months the second series of tests ^{was} ~~were~~ given to both groups.
- 4/ ~~The~~ Group II was given three months of instruction in formal grammar, three 30 minute periods per week, while Group I had language and composition.

(18) Loc. cit. p 50.

5/ At the close of this three-month period the first series of tests ^{were} given to both groups.

The results were tabulated so as to show the amount of gain by each group for each of the two periods. Some of the tests proved too difficult or had to be eliminated for other reasons. The following table summarizes the results obtained:

TABLE III.

Gains in Various Tests by Groups after Three Months
of Instruction in Grammar or in Language and Composition.

First period

Second period

Table	Test series	Gain by I with Gram.	Gain by II without Gram.	Gain by I without Gram.	Gain by II with Gram.
VI	1	1.14	3.44	3.41	.46
VII	1			2.05	1.45
VIII	1	2.07	1.05	.24	1.98
IX	1	.50	.05	.09	.39
X	2	14.56	14.24	.55	-3.43
XI	2	1.47	1.24	.70	.71
XII	3	2.69	3.05	-2.11	1.27
XIII	3	-.47	1.12	2.01	.68
XIV	3	.49	-2.39	3.67	2.73
XV	3	1.42	.36	2.79	3.24
XVI	3	1.28	.23	.93	1.85
XVII					
XVII	5	2.40	1.09	3.18	3.07
XVIII	5	2.94	1.47	2.18	2.40
XIX	6	.29	.40	-.23	-.29
XX	7	.123	.158	.210	.142
XXI	7	.372	.347	.080	-.134
XXII	8	.60	.61	.48	.03
XXIII	8	.28	-.18	.06	.60
XXIV	9	.15	.12	.77	.68
XXV	10	2.13	2.86	1.78	.70
XXVI	10	.39	-.42	2.40	3.59

The tests in Series 11, for "ability to correct language and to point off sentences", were ~~given~~ not given before the first three-month practice period, consequently the results do not show the double check which appears in case of the other series. The first test shows the ability of Group I after three months of instruction in grammar, and of Group II after a similar period of instruction in composition and language. The second test shows the ability of Group I after an added three-month instruction in composition and language, and of Group II after a similar period of instruction in formal grammar.

TABLE IV.

Gains in Ability to Correct Language Errors. ~~MMMM~~ The First Test Shows Gains of Group I after Three Months of Instruction in Grammar and of Group II after a Similar Period of Instruction in Language and Composition. ~~IX~~ The Second Test Shows Gains of Group I after a Succeeding Period of Instruction in Language and Composition and of Group II after a Similar Period of Instruction in Grammar.

Table	Group	<i>No. of test (19X)</i>	First test	Second test <i>(20)</i>	Gain
XXVIII	I	(50)	.228	.227	-.001
	II		.177	.240	.063
XXIX	I	(51)	-.70	-.04	.66
	II		-1.86	-.28	1.58
XXX	I	(52)	2.50	4.83	2.33
	II		2.61	4.77	2.16
XXXI	I	(53)	14.43	17.08	2.65
	II		13.55	16.77	3.22
	I			.96	
	II			.73	

(19) Test (50) consisted of such exercises as the following: "Mark out the incorrect word in each sentence. (1) You (was were) no doubt right." Test (51) asked the pupil to put a check mark before each sentence containing no language error. Some of the sentences were: "He couldn't hardly wait", "He talks too loud", "He seen his error". Number (52) asked the pupil to correct eight language errors in a passage. This test was thought to be most typical of actual life situations. Number (53) called for the capitalizing and punctuation of ~~express~~ two passages.

(20) The first test repeated.

As to the success of the two groups in mastering the grammar, Briggs states that "It was the opinion of the teacher that Room II learned more of the formal grammar than Room I, an opinion ~~amplified~~ confirmed by the ~~tax~~ test" (21). In the grammar test Group I scored 29.09 as compared with 44.76 ~~tax~~ by Group II.

In order to obtain some data concerning the results of grammar "as it is ordinarily taught" the tests were ~~also~~ given in five public schools ~~xxxxxxxxxx~~ and in the seventh grades of two state normal schools in Illinois. In this way the records of 295 pupils were obtained. The results obtained corroborated those secured in the ~~main~~ experiment, with minor variations. One of these is of importance in ~~connection~~ connection with our ~~present~~ problem. In the tests for "ability to correct language errors and to point off sentences" the experiment showed that the study of grammar was slightly favorable for ability in the tests; in the supplementary investigation the reverse was true. Briggs relies more on the supplementary investigation and concludes that "The advantage seems conclusively with the schools not emphasizing formal grammar" (22).

(21) Loc. cit. p 71.
 (22) Ibid. p 91.

As a summary of his investigation Briggs states the following:

"Although the tests used in this experiment pretend to be no more than rough measures of the abilities in question, it is believed that they have secured results more trustworthy than the judgments of those who have merely philosophized about the matter.....

It may be safely asserted that these particular children after the amount of formal grammar that they had, do not, as measured by the means employed, show in any of the abilities tested improvement that may be attributed to their training in formal grammar. To this statement there is a possible exception on the tests of Group I (Test series I).

It is not claimed that some other children with more extended and better ~~training~~ teaching of formal grammar may not show in these abilities a superiority to similar children without this subject; but certainly it is a matter that will admit of less confident assertion than before. Indeed, the burden of proof now rests with those who believe in a strengthening mental discipline from formal grammar". (23)

(23) Loc. cit. p 92.

In a review of Dr. Briggs' work Prof. Bagley (24) suggests that it is a piece of work that should be repeated for other grades, especially the high school. He also suggests that ^amore definite statement needs to be made as to the exact nature of the training given in formal grammar. Some of the tests ~~sk~~ used should be better adapted to the age and advancement of the pupils. Some ^{preliminary} investigation is ^{also} needed as to the relative values of the inductive and deductive methods for teaching grammar. More than three months should be given to the practice period. Bagley ~~also~~ thinks that separate statements should be given for different age groups and intelligence groups. He takes issue with Briggs in regard to the results in "ability to correct language" etc. on the ground, that little was known "regarding the kind of instruction that these city systems offered in grammar, or what differences existed in the language work between the schools 'emphasizing' grammar and the schools emphasizing 'composition'" (25). He therefor thinks ^{that} the results ~~from~~ from the main experiment are more trustworthy as suggesting "that formal grammar, in spite of its detractors, does function in the improvement of expression". (26)

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- (24) Bagley ~~W.C.B.~~ W.C.B., Abstracts and Reviews. Jour. Educ. Psy. 5: 538-40. '14.
 (25) Ibid. p 540.
 (26) Ibid. p 540.

In 1913 a report was made by the Joint Committee on Grammatical Nomenclature. This committee consisted of five members from the National Education Association, five from the Modern Language Association of America, and five from the American Philological Association and had been appointed ^{after} in ~~response to~~ various appeals (27) urging the need of a uniform terminology for grammar. The committee ^{held} ~~after~~ a number of ~~meetings~~ conferences ^{and} presented their report to the National Education Association in 1913 (28). It consists of a ~~suggested~~ ~~terminological~~ list of terms to be used for designating the various facts with which grammar deals. ^{It makes} ~~There is~~ no attempt at elimination of subject matter.

(27) See example: Rounds, C.R., Reform in Grammatical Nomenclature. School Rev. 19: 610-42. N. '11.
 Rounds, C.R., The Waste of Unlearning. Eng. Jour. 1: 214. Apr. '12.
 Hall, Wm. Gardner, Harmonizing of Grammatical Nomenclature. School Rev. 19: 361-8. Je. '11.

(28) Mex. Annual Report, N.E.A. 1913. pp 316-354.
 For a discussion of the organization and work of the Committee see School Rev. 20:45-52. Ja. '12.

R. A report by the Committee of the National Council of Teachers of English (29) contains some illuminating material in regard to grammar. This committee sent a questionnaire to about 1700 persons and obtained 371 replies from places throughtout the United States. According to the information thus obtained the committee concludes that (1) ~~that~~ the requirements in English are too many, too long, and too vague.

(29) Noyes, Ernest C., The Articulation of the Elementary and High School Courses in English. The Eng. Jour. 3: 303 -. May '14.

"Such different types of work as grammar, oral composition, written composition, rhetoric, spelling, word-study and dictionary work, reading, literature, and memorizing are required at the same time and so general are the recommendations made and so large their content, that individual teachers become bewildered.

At present there seems, in most cases, to be no irreducible minima that must be attained under individual heads. The result is heterogeneity in instruction and in accomplishment. Consequently no definite standard of attainment can be relied upon as the result of grammar-school work."

In respect to the utility of grammar the following statement is made:

"Certain things are being taught that had better be postponed to the high school, since they do not appeal to the capacity and state of development of the elementary school pupil. Too much is asked for in the way of analytical grammar. This subject derives its present untoward emphasis from a widely prevailing conception that it is basic that upon progress in grammar depends language sense, and hence, advance in appreciation and use of language. One extremist who has answered the Committee's blank compares the knowledge of formal grammar to knowledge of the combinations in multiplication. Advance in language ~~power~~ power comes not through the reasoning mind, but through the automatic unreasoning ear; ear-training makes for real advance in language and ear-training only, with the young. The time-devouring demands of formal English grammar are outrageous; the results on language use are practically nil. The elementary school should sharply delimit the term "grammar" as applying to analytic formal grammar - the grammar that encumbers absorptive little minds with useless terminology - and emphasize grammar in the sense of correct use, the facts to be drilled on as use and not terminologized".

With regard to the amount of time devoted to the study of grammar the committee states the following:

" Grammar in most schools seems to occupy from $1/2$ to ~~xxx~~ $3/5$ of the school time devoted to English in the last 3 years of the elementary course. The content of the courses in grammar ranges from the extreme of formal technical study to the very simplest treatment of the parts of speech, the sentence, and elementary syntax, with stress upon constructive work and the correction of faulty English. The courses considered vary so widely that all that can safely be said about them is that, on the whole, grammar receives too much time and is taught too intensively and too analytically. None but the very simplest instruction in formal analytic grammar is needed ~~xxx~~ by elementary-school pupils".

The committee recommends ~~that~~ the outline prepared by G.A.Mirick, assistant commissioner of education of New Jersey, According to this outline grammar should be taught ~~constructively~~ constructively. All complicated and unusual expressions are to be omitted and the emphasis is to be laid on correct habit formation. The topics to be studied are included in the following list: (1) subject and predicate, ~~(2) classes~~ (2) classes of sentences according to meaning, (3) parts of speech and their uses (omitting minute subdivisions), (4) noun, adjective, and adverb phrases and clauses, (5) classes of sentences according to form, (6) analysis of simple sentences containing not more than two phrases, (7) analysis of compound sentences containing two simple clauses, (8) analysis of complex sentences containing one dependent clause, (9) synthesis of two or three short statements, (10) principal parts of verbs by drills in sentences, (11) conjugation in the indicative mood, including verbals treated as parts of speech according to their use, (12) declension of relative and personal pronouns.

The test of a pupil's ~~knowledge~~ knowledge of grammar is to be his ability to use it in oral and written language.

The report of the Committee on Economy of Time (30)

contains a chapter of The Essentials in Composition and Grammar by James Fleming Hasic. ^{Part I of this} ~~attax~~ ~~book~~

~~gives~~ ^{gives} chapter ~~contains~~ a Survey of Investigations in which brief reviews are ^{made} ~~given~~ (1) of "The Batters" Report, and investigation of ~~language~~ ability conducted in Chicago in 1905 to determine the ability of pupils to reproduce in their own words a story which had been read to them,

(2) The Hillegas-Thorndike Composition Scale, (3) The Harvard-Newton Composition Scale, (4) The Illinois Experiment testing the relative importance ^{to be} ~~to be~~ given to oral and written composition in the high school. Part II ^{gives}

a survey of tests and investigations in grammar. ~~investigations~~

Brief mention is made of the following: (1) Hoyt' Report on grammar, (2) Briggs's report, (3) Charters's report, (4) investigations now in process at Harvard University on the "the natural history of the sentence in the expressions of children, with the purpose of learning at what stages ~~the~~ instruction in certain phases of grammar and composition will supply actual needs". Part III deals with

(30) Fourteenth Yearbook of the ~~Society~~ National Society for the Study of Education. Pt.II. 1915.

"Standards of Attainment". Reference is made to the report of the Committee on the Six-Year Course of Study before the National Education Association in 1908 when ~~an~~ an attempt was made to establish standards for attainment ^{for} at the end of the sixth school year. ~~Another~~ A similar attempt was made by the Joint Committee of Thirty on a national English Syllabus in 1914. The Committee of the National Council of Teachers of English also made ~~another~~ report(31) in 1914.

~~It is the purpose of this report~~
~~to summarize~~

As a "Summary and Conclusion" of the whole report ~~the~~

~~following~~

the committee holds that "At the end of about a decade

of study, investigation, and discussion of the problem of economy in language and grammar it appears that progress has been made:

- 1) In singling out those activities which are most valuable and in setting up definite standards of attainment.
- 2) In eliminating much abstract and formal material, especially in English grammar. If the grammatical aspects of composition have been consistently dealt with in the grades below, forty recitations in the grammar grades should suffice to organize all the science of grammar likely to be useful to a child of fourteen. This implies that the regular terms for grammatical concepts are used whenever there is occasion to refer to grammatical forms and relations in connection with either speech or writing.

(31) Noyes, Ernest C., The Artifulation of the Elementary and High School Courses of Study. Eng. Jour. 3:303.1914. (Reviewed in the present chapter)

- 3) In developing standards of measurement by which the results of work in composition may be more accurately determined. Only a slight beginning can be recorded here, however; so complex a product as a written paper cannot be measured as to its various qualities by a single scale like that of Hillegas.
- 4) In laying a foundation of educational principles in accordance with which details of economy may be worked out."

"The language course must be thought of mainly in terms of habit. Power to speak and write, not to define technical terms or state rules of correctness, is the end to be attained.....

The mere distribution through a series of years of fact, principles, and practice exercises to develop knowledge and skill which it is supposed will be needed later must be replaced by experiences and formulations which are of real use here and now.....

Personal idiosyncrasy and subjective impression must be corrected and supplemented by objective standards by means of which educational experience in one set of circumstances may be compared with like experience in other circumstances, and by which the value of certain kinds of subject-matter and types of reaction may be more accurately determined" (32)

(32) Loc. cit. pp 109,110.

In 1915 "A Course of Study in Grammar Based Upon the Grammatical Errors of School Children of Kansas City, Missouri" (33) was published by W.W. Charters and Edith Miller. The basis for this study was found in an investigation of the schools of Kansas City. This investigation sought to discover (1) the "errors in the use of oral and written language forms violating rules of grammar" ~~()~~ made by pupils in the elementary schools, (2) "what rules ~~were~~ in grammar were necessary in order to include and understand these items", ~~()~~ and (3) "what items in the present course of study in Kansas City were included but unnecessary, and what items should be included but were omitted" (34).

The materials collected consisted of "all the written work of all the grades from three to seven" for one month. ~~()~~ Errors in oral language ~~were reported~~ as heard in the school rooms or on the playground were reported by the teachers. It was discovered that a comparatively small number of papers revealed all the types of errors, and the suggestion is made that for a school of 6000 pupils, one paper of 150 words from each pupil will be ample material for the investigation.

The following table combines the results presented in separate tables by Charters and Miller, omitting errors that were found to occur rarely.

(33) The University of Missouri Bulletin. Vol. 16, No. 2.
 (34) Ibid. p 3.
~~() Ibid. p 3~~

TABLE IV,1.

Language Errors of Kansas Elementary School Children
in Kansas City Schools.

Errors	Examples	Per Cent	
		Oral	Written
Confusion of tense form.	I seen.	24	5
Agreement of subject and verb.	You was.	14	19
Wrong verb.	Lay for lie. Aint.	12	7
Double negative.	He isn't hardly.	11	1
Redundance.	Mother she said so.	10	11
Wrong form of noun or pronoun.	Theirself. 2 Sheeps. Thaxxaxixas.	2	16
Wrong tense form.	Attacted. Had ought.	5	5
Subject of verb not in the nominative.	Us girls went.	4	1
Confusion of adjectives and adverbs.	Do that quick.	4	6
Misplaced modifier.	I only have one.	0	6
Pronoun not agreeing with antecedent.	Nobody can do what they like.	0	4

Some errors occurring in written work only were:

(1) failure to put a period at the end of a sentence,

(2) confusion of such words as; two and too, (3)

confusion of dependent and independent clauses, (4)

failure to put apostrophe to indicate possession, (5) and
omission of subject.

Based upon the tables of errors other tables were
formulated showing the grammatical rules covering the
various mistakes and the grammatical facts which a person
must know in order to understand the rules. There is also
a table showing what omissions may be made from the present
course in grammar.

The list of recommended omissions ^{is} ~~are~~ as follows:

- (1) Exclamatory sentences, (2) the interjection, (3) the appositive, (4) the nominative of address, (5) the nominative by exclamation, (6) the objective complement, (7) the adverbial objective, (8) the indefinite pronoun, (9) the objective complement, (10) the objective used as a substantive, (11) the classification of adverbs, (12) the noun clause, (13) conjunctive adverbs, (14) the retained objective, (15) the moods (except possibly the subjunctive of to be), (16) the infinitive, except the split infinitive, (17) the objective subject, (18) the participles except the definition and the present and past forms, (19) the nominative absolute, (20) the gerund. (3)-

Numbers 6 and 9 refer to different pages in the text-book in grammar.

The following additions were recommended:

- (1) The pronoun what, (2) proper and numeral adjectives. (36)

In a Postscript the following statement is made regarding the limitations of the study: "The contents of the course of study in elementary grammar in the Kansas City schools is not dealt with here. The problem is simply and solely to find out what the course of study would be if it were based upon the errors of the children. The problem of the content of the course of study requires such serious consideration that it can be determined only by practical experience and opinion aided by other scientifically conditioned studies". (37)

(35) Loc. cit. p. 44.

(36) Ibid. px

(37) Ibid. p 45.

An investigation similar to that made in Kansas City is reported by Earhart and Small (38). ~~xxxxxxxxxxxx~~
 Language errors in the elementary schools of Boise, Idaho formed the basis of the study. These ^{errors} were tabulated and their percentage ~~xxxxxxxx~~ calculated for each grade. It was found that thirteen verbs cause 85.1% ^{percent} of all the verb errors. Four verbs (see, do, come, go) cause 51.3% ^{percent} of all verb errors. These errors proved surprisingly constant throughout the grades. In order to eliminate these errors individual cards were prepared for the pupils in grades 1-4, covering mistakes in the use of see, come, do, go, ain't, had, ~~was~~ got, double negative, misuse of pronouns and adverbs, and also cases of mispronunciation. Private consultations were held with each pupil and special drills and exercises instituted for each.

(38) Earhart, Gertrude and Small, Jennie, English in the Elementary School. El. School Jour. 16: 32-48. Sept. '15.

b. "A Study of the Preferences of Secondary School

Pupils for the Various Subjects and their Reasons for the Preferences" was reported by Brown and Minnick (39) in 1915. The questionnaire method was used in this investigation. About 1600 pupils in Decatur, Dubuque, and Hackensack were asked to indicate their preferences according to the following directions:

1. In the list of subjects below, number each subject now on your program, in the order of your preference. (Indicate by No. 1 the subject you like best, etc.)
2. What two subjects now on your list program do you think will be of most value to you after leaving school or college? Give the most useful as first choice.
3. The pupil was asked to state reasons for the answer to question 2.
4. Directed the pupil to name the most useless subject.
5. Asked which subject a pupil would like to drop.
6. Asked what subjects should be added to the program.

The principal results are shown in the following tables:

TABLE V.

Percentage of Pupils Ranking Grammar as their First Second, Third, or Last Choice among School Subjects.

City		Percentage of pupils who ranked Grammar as their			
		1st	2nd	3d	Last choice.
Decatur, Ill.	Boys	7	17	7	31
	Girls	0	9	36	34
	All	3	13	17	27
Dubuque, Iowa	Boys	27	27	4	10
	Girls	43	19	26	13
	All	35	23	16	16
Hackensack, N.J.	Boys	0	17	58	8
	Girls	5	15	21	11
	All	3	16	35	10

(39) Brown, J.C. and Minnick J.H., A Study of the Preferences of the Secondary School Pupils Etc. Educ. Adm. & Superv. 8: 598-610. Nov. '15.

TABLE VI.

Rank Given to Grammar as a School Subject by Pupils in Three Cities. Total Number of Subjects 23.

	Decatur		Dubuque		Hackensack	
	# Boys	Girls	Boys	Girls	Boys	Girls
By first choice	21	20	6	1	21	21
By combining first, second and third choice	21	20	10	2	18	20
For utility, first choice	21	20	12	2	21	23
For utility, first and second choice	21	20	14	2	21	23

per cent
40% of the pupils were boys.

By sampling the replies the authors found a correlation of plus .33 between Utility and Preference in the choices made by the pupils.

m. In 1916 a report was made by Betz and Marshall (40) on errors in written language of pupils in the third grade of Kansas City. They read compositions and tabulated the errors found. Fifty-five per cent of all the errors were ^{errors} in punctuation and capitalization; 17 per cent were language errors; and 28 per cent were grammar errors, one-half of which were in the use of verbs.

(40) Betz, Annette and Marshall, Esther, Grammar Based on Errors. Eng. Jour. 5:491-500. '16.

71. m. The "Second Report of the Committee on Minimal Essentials in Elementary-School Subjects" (40) contains a chapter on Minimal Essentials in Elementary Language and Grammar by W.W.Charters. Five points of view are suggested for determining the minimal elements to be emphasized in a course in grammar for the elementary grades. They are"(1) Discipline of mental activities,(2) a knowledge of the structure of thought as exhibited in the sentence, (3) the understanding of literature,(4) the improvement of speech through the artistic use of grammatical information, and (5) the improvement of speech through the elimination of errors". The remainder The main portion of the chapter is given to a review of various studies in the language errors of school children, such as those by Meek, ~~RatzxaxaxMarakakix~~ Charters and Miller, and Betz and Marshall (42) After a comparison Charters finds that the results obtained agree in the main with those which were secured in ~~tax~~ his study of Kansas City schools both in regard to types of errors found and relative proportion of errors under each type.(43

(42) Charters, W.W., Minimal Essentials in Elementary Language and Grammar. The Sixteenth Yearbook of the National Society for the Study of Education. Pt.I. 1917.
 (43) See pp 32, 52 , and 58a.
 (43) See p 53.

3. Standardized Tests and Scales for Grammar.

0. In 1915 Prof. Starch published (40) the following scales and tests for grammar:

1. Grammatical Scale A. This consists of groups of three or four sentences, arranged in steps of equal difficulty from 5 to 16 (~~steps 15 and 16~~ steps 15 and 16 consist^{ed} of one and of two sentences respectively) Each sentence gives in a parenthesis two ways in which it may be stated. The direction is to cross out the one which is thought to be wrong, to cross out both if both are thought to be wrong ^{or} and to underline them if they are thought to be ~~right~~ correct.

2. Grammatical Scale B. Similar to Scale but consisting of steps from 7 to 12. ~~amixxm~~

3. Grammatical Scale C. Similar to Scales A and B, but consisting of steps from 8 to 11.

4. Punctuation Scale A. ^{This consists of} ~~Six~~ groups of three or four sentences, arranged in steps of equal difficulty from 6 to 16 (Step 13 has two sentences, 14 has one, 15 is omitted, 16 has one sentence). The test consists in punctuating the sentences, the comma being the mark used in most cases.

(40) Starch, Daniel, The Measurement of Achievement in English Grammar. Jour. Educ. Psy. 6: 167-186. Dec. '15.

5. English Grammar Test 1, ^{which} measures a pupil's knowledge of the parts of speech.

6. English Grammar Test 2, ^{which} measures ^a the pupil's knowledge of the case forms of nouns and pronouns.

7. English Grammar Test 3, ^{which} measures ^a the pupil's knowledge of tense and ^{mode} ~~mode~~ of verbs.

b. Standardized tests have been devised by B.R. Buckingham (41) as follows:

- 1. March Test in Grammar: Seventh Grade- First Half.
- 2. June Test in Grammar: Seventh Grade- First Half.
- 3. March Test in Grammar: Second Half of Seventh Grade to Second Half of Eighth Grade.
- 4. Ma June Test in Grammar: Second Half of Seventh Grade to Second Half of Eighth Grade.

These tests consist of questions on the formal elements of English grammar. Standards are indicated by the per cent of pupils which have answered each question correctly.

(41) Buckingham, B.R., Principles of Scale Derivation with Special Application to Arithmetic, Geography, History, and Grammar. Bulletin of the Extension Division, University of Indiana. ~~1917~~ Vol. 2, No. 6. 1917. pp 49-65.
 Also Seventeenth Annual Report of the City Superintendent of Schools, New York City. Survey of the Gary and Prevocational Schools. 1916.

Analytical Summary of Previous Investigations.

In order to facilitate comparison the foregoing reviews of previous investigations are here summarized in tabular form.

TABLE VII.

Summary of Previous Investigations Relating to Formal English Grammar.

Author	Year	Subjects or Materials	Methods	General Results.
Rice	1904	8, 357 pupils in 22 schools in 9 cities	Reproduction test for expression	Raised question as to utility of grammar.
Hoyt	1906	200 high school pupils	Tests in Grammar, Composition and Interpretation	Correlation of Grammar and Composition .23, Grammar and Interpretation .28.
Meek	1910	Pupils in Elementary Grades, Boise, Idaho.	Tabulation of errors.	Tables showing grammatical errors of pupils.
Cooper	1912	90 College Freshmen	Tests, Statistics	The study of Latin promotes the knowledge of English Grammar.
Briggs	1913	49 pupils of 7th grade.	Practice group and Check group, Tests.	Formal English grammar does not make for mental discipline.
Speer	1913	200 high school pupils, Freshmen.	Repetition of Hoyt's tests.	Correlation of .23 for Grammar and Composition and .10 for Grammar and Interpretation.
Wm. N.C., Teaching English	1913	271 replies to	Questionnaire	Statement of present status of English Grammar.
Wm. on Economy of Time	1915		Conferences	Suggestions for economy of time in teaching English.
Winters and Miller.	1915	Pupils in Kansas City Schools.	Tabulation of mistakes.	Tables showing relative frequency of language mistakes.
Hart and Hall	1915	Pupils in grades 1-4, Boise, Idaho.	Tabulation of mistakes.	Tables showing frequency of mistakes.
Wm. Minck	1915	1600 pupils in 8 cities.	Questionnaire.	Lists of pupils' preferences of subjects.
Arch	1915	Answers by 1000 pupils	Ratio method.	Scales, A,B,C for grammar; Punctuation Scale; Standardized grammatical tests, 1, 2, 3.
ingham	1916	Answers by 3, 196 pupils	Ratio method	Standardized Grammar Tests.

By examining Table VII it will be found that certain generalizations can be made as to methods that have been used, persons who have served as subjects, and results that have been obtained.

~~On~~ Methods.-- The forms of investigations may be grouped as follows:

- 1) Examinations or tests of the conventional type followed by correlating the grades obtained in grammar with those obtained in other subjects. (Hoyt, Rapeer, Hooper).
- 2) A Practice and a Check Group which receive different kinds of instruction and are given various kinds of tests to measure the results. (Briggs).
- 3) Tabulation of language errors made by school children in their oral and written work. Statistical treatment to show the relative frequency of the various mistakes. (Meeks, Charter and Miller, Earhart and Small.)
- 4) Obtaining the judgment of pupils regarding their preferences with respect to the different school subjects, their utility, etc. (Brown and Minnick).
- 5) General questionnaire. (Committee, National Council of Teachers of English).
- 6) Committee conferences for determining standards and considering methods and means.

b. Subjects.-- The investigations are notable for the effort which has been made to study the problems under school conditions rather than in the laboratory. The use of a large number of subjects tends to make up for the more exact control of conditions in the laboratory.

c. Results.--

1. Grammar as a school subject may be ranked very high, on the basis of preference or utility or both, by pupils in one city while it is ranked very low by pupils in another city. The investigation by Brown and Minnick substantiates what one frequently frequently hears in discussions about grammar. Some people claim that the subject is disliked by the pupils and that consequently it must be quite unprofitable. Others claim that the pupils like grammar. ~~and that it could well be studied for its own sake, even if it had no correlative values.~~ Both are probably right. It remains for someone to analyse the problem so as to show what factors produce ^{the} different attitudes which pupils take to this subject.

2. Grammar has some relation to the study of Latin but the nature of the relation is not known. The investigation is of interest mainly for its suggestiveness relative to the argument that grammar prepares the student for the efficient study of a foreign language. It raises the question as to which is cause and which is effect. Does grammar prepare for the study of a foreign language or does the study of a foreign language prepare for a better knowledge of English grammar or are both the study of the same ~~or common~~ elements? If the last, then what are these elements?

3c) The disciplinary value of grammar has been strongly questioned by the experiment of Dr. Briggs and the burden of proof now rests "with those who believe in a strengthening mental discipline from formal grammar." The case is not to be regarded as finally closed, however. The defenders of grammar may claim that a certain specific type of grammar instruction, different from that which was given by Briggs, will have disciplinary value. They may claim that grammar will discipline the mind if it is taught by a certain method or if it is taught to pupils of a certain age, or if it is taught for a certain length of time. But to deserve credence such claims must be supported by positive evidence. Up to the present no such evidence has been presented by anyone.

4a) There may be some connection between the study of grammatical facts and rules and the elimination of such language errors as those tabulated by Meeks, Charters and others. If there is such a connection, its nature is not known. If grammar is the most effective means for eliminating these errors, it should be studied as early as possible in order to prevent the errors from becoming fixed habits. If the errors can be eliminated before a pupil reaches a maturity sufficient for the mastery of formal grammar, and the nature of the errors indicates that this should be possible, then grammar as a means for such elimination becomes superfluous.

53) The correlation between knowledge of grammar and ability ~~in writing~~ ^{to write} a composition is plus .23, ($\pm .05$), according to Hoyt and Rapeer. The correlation between knowledge of grammar and the ability to express in one's own words the thoughts contained in four stanzas of Gray's Elegy is plus .28 according to Hoyt, ~~plus~~ plus .10 according to Rapeer ($\pm .05$). The relationship thus demonstrated is, as it appears to me, subject to the following ~~limitations~~ limitations:

a) According to the report of the Committee of the National Council of Teachers of English⁽⁴²⁾ "the content of courses in grammar ranges from extreme formal technical study to the very simplest treatment of the parts of speech, and elementary syntax, with stress upon constructive work and the correction of faulty English". This being the case, ~~xx~~ any generalization concerning the utility of grammar, ^{in order to be safe,} must be made only for the type of grammar which has been investigated. Other types of grammar study may have different values.

(42) Cf Summary on page 47 of this chapter.

figure
 (2) A correlation \wedge may or may not have significance. According to Spearman () "it must be remembered (in evaluating correlation tables) how little scientific significance usually attaches to any single correlation coefficient considered by itself. Such a correlation almost always admits of indefinitely numerous interpretations. To eliminate this equivocality and penetrate down to the underlying truths every correlation needs to be regarded in the light of all the others. Not ~~as~~ the single correlation, but their inter-relation, is the vital matter".

(3) The writing of a composition on such a topic as, "How would you spend a thousand dollars, if that sum should be given to you to spend during the Christmas holidays?" may involve many other abilities beside that of expression. The situation suggested is ^{in a sense,} unreal; ~~hence,~~ hence, pupils with lively creative imagination ~~xxxxxxxxxx~~ might be expected to excel in such a test, while the matter-of-fact pupil might be bewildered.

(4) The ~~ability of~~ ^{interpretation of} poetry may involve other abilities than does the interpretation of prose. ~~The~~

() Spearman, C., Theory of Two Factors. Psy. Rev. 21: 101-115. '14.

5 Problems Resulting from Previous Investigations.

These considerations suggest the following questions as indicative of needed investigations concerning the ~~relative~~ value of ~~the~~ the study of grammar for the practical mastery of English:

a. ~~1~~ What correlation, if any, is there between ~~knowledge~~ a specific kind of grammatical knowledge and general ability in composition?

b. ~~2~~ What significance do such correlations have? Is ~~that~~ the specific kind of grammatical knowledge in question correlated only with composition or is it also correlated with other school subjects. How do the coefficients of correlation compare? Do other school subjects correlate with composition? If so, how do the correlations so obtained compare with those which obtain between grammar and composition?

c. ~~3~~ What correlation, if any, is there between mastery of English grammar and the ability to interpret prose?

d. ~~4~~ What explanations can be found for correlations that may be found? *discovered?*

The following chapters will present facts in answer to these questions.

CHAPTER III.

THE RELATION OF FORMAL ENGLISH GRAMMAR TO COMPOSITION.

I. General Plan of the Chapter.

This chapter will present^a somewhat detailed statement of an investigation made to discover the amount of correlation between the mastery of formal English grammar of a specific type, such as it has been found in Minnesota schools for a series of years, and ability in English composition. The materials for this investigation were obtained through the courtesy of the^{State} Department of Education from the ~~permanent~~ records on file in the State Capitol.

2. Character and History of State High School Board
Examinations in Minnesota.

The system of State High School Board Examinations which has been in vogue in Minnesota for the last thirty-six years has exerted a strong influence on the public schools of the state. The Fifth Annual Report of the State High School Inspector (1) contains the following account of the history of this system:

"Our system of state examinations has been in operation seventeen years. The first questions were prepared under the supervision of Dr. Folwell, and were sent out in the fall of 1881. At the beginning, examinations were expected of all schools holding relations to the board. Later, the schools were classified, and those in the first class were exempted. Recently examinations were made optional for all. The amount of time devoted to the examinations has been very much reduced also. Formerly, the program of examinations occupied at least a month of the school year. Then it was reduced to half a month, and now it is practically confined within the modest limits of a week at the close of the year.

The main purpose of state examinations is not to test students, but to promote the general efficiency of the schools.....Many communities and boards desire some trustworthy standard. Superintendents and teachers without experience are helped by examination papers from outside. The main purpose of a state examination should

(1) Aiton, Geo. B., Fifth Annual Report. 1898. pp 19-20.

be to encourage and reinforce good teaching all along the line.

Secondarily, the state examination is, of course, a test. It should determine, approximately, at least, whether an instructor's work has merit or not, and should also show in most cases whether a student has or has not acquired a fair degree of mastery. In this respect, a community has a trustworthy evidence of what is going on in school. More than one school in this state has been regenerated by public sentiment requiring a better, that is to say, at least a fair showing in the state examinations.

For the past two years, though not officially charged with the duty, I have given close attention to the reading of the June papers. Each reader has made notes on the characteristics of the papers passing through his hands. I have been struck by the remarkable correspondence between the inferences drawn by the readers and my own impressions, though gained often by a very few minutes in the classroom. With now and then an exception, the consensus of opinion drawn from the notes of the ten or twenty readers of as many subjects tallies very closely with my own previously formed opinion of the general efficiency of any particular school." (pp. 35-36). X

In the absence of a state course of study these examinations have served to set standards and to indicate lines of development in the various subjects. Almost all the schools in the state, with the exception of the large cities, have taken the examinations. Some have counted the results in the final grade of the students, others have used the examinations mainly as a standard by which to judge the general efficiency of the school.

The first state examination in English grammar was given in 1894. From then on for about twenty years the questions in this subject were prepared by or under the direction of the State High School Inspector, ~~xxxxxxx~~ Mr. Geo. B. Aiton, who had definite and strong convictions as to what the nature of the study of grammar should be. In his First Annual Report, 1894, he states his view as follows: "Grammar is the logic of the common school. If well taught in connection with thoughtful reading it gives a student ability to understand thought, a step certainly necessary to thinking".

Also "zeal for composition and business forms, a worthy desire to be practical, has led to the neglect of the very important study of grammar. Well-founded weariness with the technicalities of many texts has led to the neglect of the logical discipline given by thoughtful work on the essentials of construction". (p 15). (2)

How consistently this ideal has been maintained is shown in a recent ~~ix~~ personal letter which we are

permitted to quote: "English grammar is the logic of elementary education. College logic is not rhetoric. It is an aid to rhetoric in that speech should be orderly, not illogical. Grammar is not composition. It is an aid to composition in that composition should not be ungrammatical; but composition should come leaping to the point of ~~the~~ pencil or pen hot from the brain, the result of deep interest.

Of late years I began to despair of ever getting grammar taught well. It may be ~~that~~ for that reason that syntax has no place below the high school".

Table ~~II~~ shows what grammar has meant in Minnesota in accordance with this ideal.

(2) Aiton, Geo. B., First Annual Report of State High School Inspector. 1894. p 15.

TABLE VIII.

Character of State High School Board Examination in English Grammar.

Year	Separate clauses into subj. vrb, and complement	Give constructs of subord. clauses.	Give constr. of Infinit.	Give constr. of words.	Rewrite with change of voice	All other questions.
The numbers indicate the percent which the quest. made of the exam.						
1905	13	21	11	23	8	24
1906	30		24	36		10
1907 A	31	18	10	32	6	3
" B	20	30	9	32	9	
1908 A	20	20	20	40		
" B		20	20	30	5	25
1909	20	20	20	35	2	3
1910	20	20	20	30	5	5
1911 A	26	25	20	20	9	
" B	25	25	25	25		
1912 A	24	20	20	32	4	
" B	17	30	20	33		
1913 A	40	20	20	20		
" B	40	20	20	20		
1914 A	35	25	20	20		
" B	30	20	20	30		
Average	24.4	20.9	18.7	28.6	3.	4.4
1894 (3)	24	14	12	10	8	24

(3) The first State High School Board Examination in Grammar ~~xxxx~~ for Minnesota schools was given in 1894. It appears that the content of this examination was practically the same as that of the examinations from 1905 to 1914.

92

3. Methods of Conducting Teachers' Examinations in
Minnesota.

Teachers' State Examinations have been given in Minnesota since 1899. The general method of giving these examinations, ^{and} as well as the State High School Board Examinations is the same. Printed questions are sent out from the ~~state~~ state Department of Education in sealed envelopes. The examinations are conducted in accordance with ^{specific} given instructions. In ~~state~~ Teachers' Examinations the papers are forwarded to the Department of Education without preliminary grading. In the High School Board Examination the papers are graded by persons in the local school and only those which receive a passing grade are forwarded. The papers are then carefully graded by the Department of Education, and the marks placed on record, and certificates issued. The following statement from G.M. Cesander, Assistant Superintendent of Education, indicates the ^{great} care with which the department performs this work: "An experienced head reader is appointed to supervise the work in each subject in which papers are submitted, and a number of properly ^{qualified} readers assigned to assist in the marking thereof. The head readers confer with the Department of Education who has general supervision of the work on the method of procedure, the relative value of the questions in each subject, and the per cent to be accorded.

At this conference, it is generally made clear that where questions appear unduly difficult and probably beyond the scholarship of the average applicant, due allowance is made in cases where a good general knowledge of the subject is indicated by the answers to other questions. When the development of the reasoning power of the student is a part of the underlying principle of a subject, credit for correct method is given, even if though an error may appear in the final result of the given problem.

After the preliminary conference with the Department representative, each head reader explains thoroughly and carefully to his corps of assistants the method of marking to be followed, and each question is explained, fully discussed and analyzed and the per cent to be accorded thereon determined. To prevent error due to lack of ability in the readers or any error due to lack of understanding of the method of marking agreed upon, the head reader reviews the first few papers marked by each reader. The mark given for each question is indicated opposite that question on the margin of the paper, and the final mark noted on the outside of the folded paper. All final marks are verified as to addition and those papers bearing marks ranging from 55 to 74 are reviewed by the head readers to insure protection to the applicant against errors of omission in the consideration of questions.

similar
A method ~~generally similar~~ to the above is followed in the marking of papers from the High School Board Examination^s, with the exception that only three grades are given 75 plus, 65 plus, and Failed.

An analysis of the contents of Teachers' Examinations ~~during the last six years~~ in English Grammar and Composition for the last six years is presented in Tables ^{XI} IV and ^{XII} V.

74

TABLE IX.

Character of Teachers' State Examinations in
English Grammar.

Questions	1911	1912	1913	1914	1915	1916	Total
Separate clauses into subject, verb, and complement.	1	2	1	1	1	1	6
Construction of subordinate clauses	1	1	1	1	1	1	6
Construction of words	1	2	1	1	1	1	7
Illustrate various Parts of Speech in sentences		1			2	1	4
Rewrite with change of voice	1	1	1				3
Uses of Infinitives		1	1			1	3
Conjugations of Declensions		3	1				4
Infinitives or Participles sentences				1	1		2
Correct errors in amp passage	1						1
Write a passage correctly	1						1
Insert pronouns	1						1
Punctuate	1						1
Methods of teaching						1	1

75
TABLE X.

Character of Teachers' State Examinations in
English Composition.

Questions	1911	1912	1913	1914	1915	1916	Total
Write and essay, xxx composition, or story.	1	1	1	1	1	1	6
Write a letter	1	1	1	1	1	1	6
Capitalize and punctuate		1	1	1	1	1	5
Write a paragraph correctly 1					1	1	3
Use certain words in sentences			1			1	2
Rules for the comma			1	1			2
The forms of composition				1		1	2
Write a paragraph on a topic sentence						1	1
Methods of teaching						1	1

22. Correlations Based on Marks from Teachers' State Examinations.

It appears from these analytical tables that in Minnesota grammar has had a consistent specific meaning. It also appears that composition has had a fairly definite aim. Here, then, there would seem to be an excellent opportunity to discover ~~whether~~ to what extent the mastery of ~~gex~~ this type of grammar correlates with the ability in composition work of the kind indicated.

The grades upon which the following correlation tables ~~were~~ are based were obtained from the records of the State Department of Education. They represent the results obtained by candidates who presented themselves at the July examinations for Teachers' State Certificates. As some elimination had to be made in order to avoid the handling of too many records, it was thought best to take the grades of these candidates only who (1) had taken the examination in all the subjects ~~wixx~~ concerned, namely; arithmetic, composition, geography, grammar, and history, and (2) had not presented credits obtained from former examinations in any of these subjects. In the examinations for 1911, 1912, and 1913 a further elimination was necessary and this was done by taking the first 200 cases according to the alphabetical arrangement of the records.

The number of cases which remained after these eliminations had been made and which appear in the correlation tables presented in this chapter were as follows:

	1911	1912	1913	1914	1915	1916	Total
Tabulated	200	200	200	272	205	200#	1277
Sampled by alphabetical method ##	400 425	425	425				1827## 1827

Grammar and Composition 200, History and composition 191, arithmetic and composition 177, geography and composition 200.

Figures are approximate.

Approximate number of records represented by for all the years. Each record contained five credit marks; hence, the total number of ~~xxxxxxx~~ credits tabulated was 6,385 ~~xxxxxxx~~ the number of credits sampled was ~~xxxxx~~ approximately 3,135.

Of the applicants for certificates 11 per cent were men and 89 per cent were women. (4)

Number of Cases Tabulated and Sampled in Correlation Table. The age of the applicants is shown in the following table:

TABLE XI.

Average and Median Age of Candidates Taking Teachers' State Examinations. Quartile or Probable Error.

	1911	1912	1913	1914	1915	1916
Average age	18.4	18.4	18.3	18.5	18.6	19.2
Median age	18.5	18.6	18.5	18.7	18.7	19.3
Quartile(5)	.8	.9	.7	.8	.8	1.0

(4) ~~xxxxxxx~~

The percentage of men at each examination was as follows: 1912, 10; 1913, 11; 1914, 12; 1915, 12.5; 1916, 10.

(5) The Quartile is "half the difference between the 25 percentile and the 75 percentile". Cf. Thorndike's Mental and Social Measurements. 1916. p 44. The Quartile gives the range above and below the Median which includes 50 per cent of all the cases. Fifty per cent of all the applicants in 1916 were between 18.3 and 20.3 years of age.

The 200 cases tabulated for 1912 represent 62 of the 86 counties of Minnesota. The largest number from any county was 13. As the distribution in the other examinations probably was about the same, we may assume that the ~~cases~~ total number of cases gives a fair representation of the situation throughout the state.

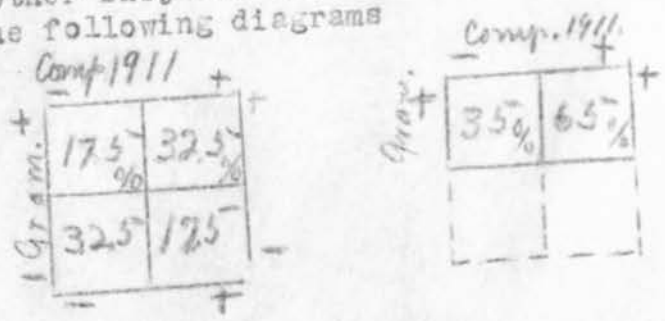
represent

~~The following tables~~

In order to graphically the degree of relationship between composition and grammar, composition and arithmetic, composition and history, and composition and geography as it appears according to the standings obtained, the following correlation tables have been prepared. The dots in these tables represent the records of individual candidates. Thus, if a dot appears in the upper row under the number 60 it means that the individual represented obtained between 90 and 100 in grammar and between 60 and 70 in composition. If the correlation is perfect the dots will be arranged along the diagonal from the upper right hand corner to the lower left hand corner. If there is no correlation the dots will not tend to cluster along a diagonal. If the dots cluster along the diagonal from the upper left hand corner to the lower right hand corner the correlation would be negative, that is; those who had high standings in one subject would have low standings in the other and vice versa. Below each table are given

the following facts are given: (1) The Medians of the two subjects, (2) the Quartile Range of each, (3) The Quartile, (4) The Median Retention ⁽⁶⁾, and (5) the correlation according to the ~~xxxxxxxxxxxx~~ table for Unlike-signed Pairs (7).

(6) The Median Retention ~~xxxxxxxxxxxx~~ represents the number of ~~xxxxxxxxxxxx~~ individuals which are above the Median in both subjects or below the ~~xxxxxxxxxxxx~~ Median in both. Thus if the Median Retention ~~xxxxxxxxxxxx~~ for grammar and composition in 1911 is 65 per cent, it means that 65 out of every 100 individuals either excelled in both subjects or were poor in both; in other words, they obtained similar grades, with respect to the Median, in both subjects. There would therefore be 35 per cent of the persons who took these examinations who obtained a standing above the Median in one subject and below in the other. The Median Retention may also be interpreted as meaning that of the candidates who were above the Median in one subject the given per cent were above ~~xxxxxxxxxxxx~~ the Median in the other subject. The two interpretations are illustrated in the following diagrams



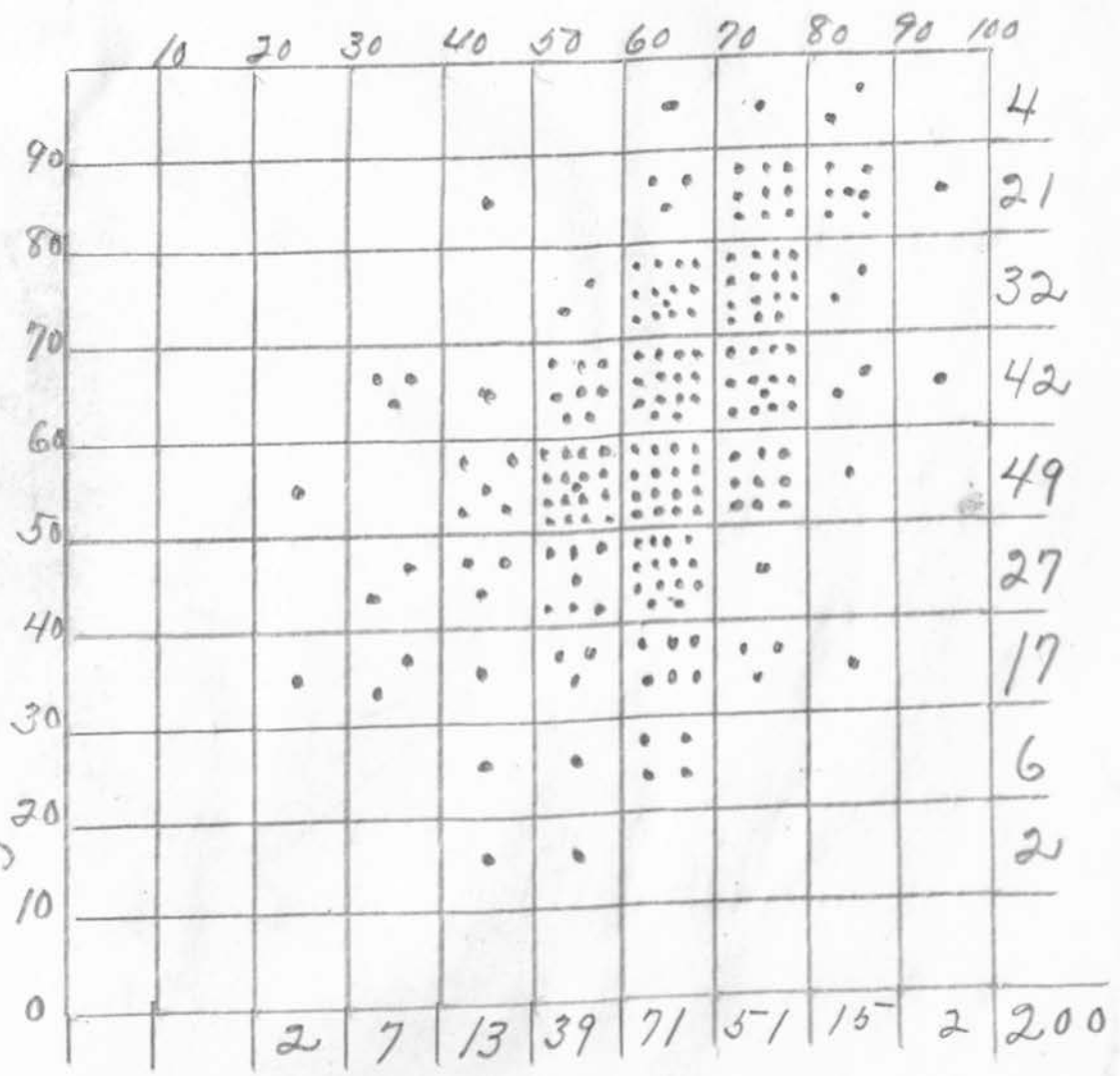
(7) Thorndike; Mental and Social Measurements. 1916. p 228.

TABLE XII.

Teachers' State Examination, 1911. Correlation Table for Grammar and Composition.

Composition, 1911.

Grammar, 1911.



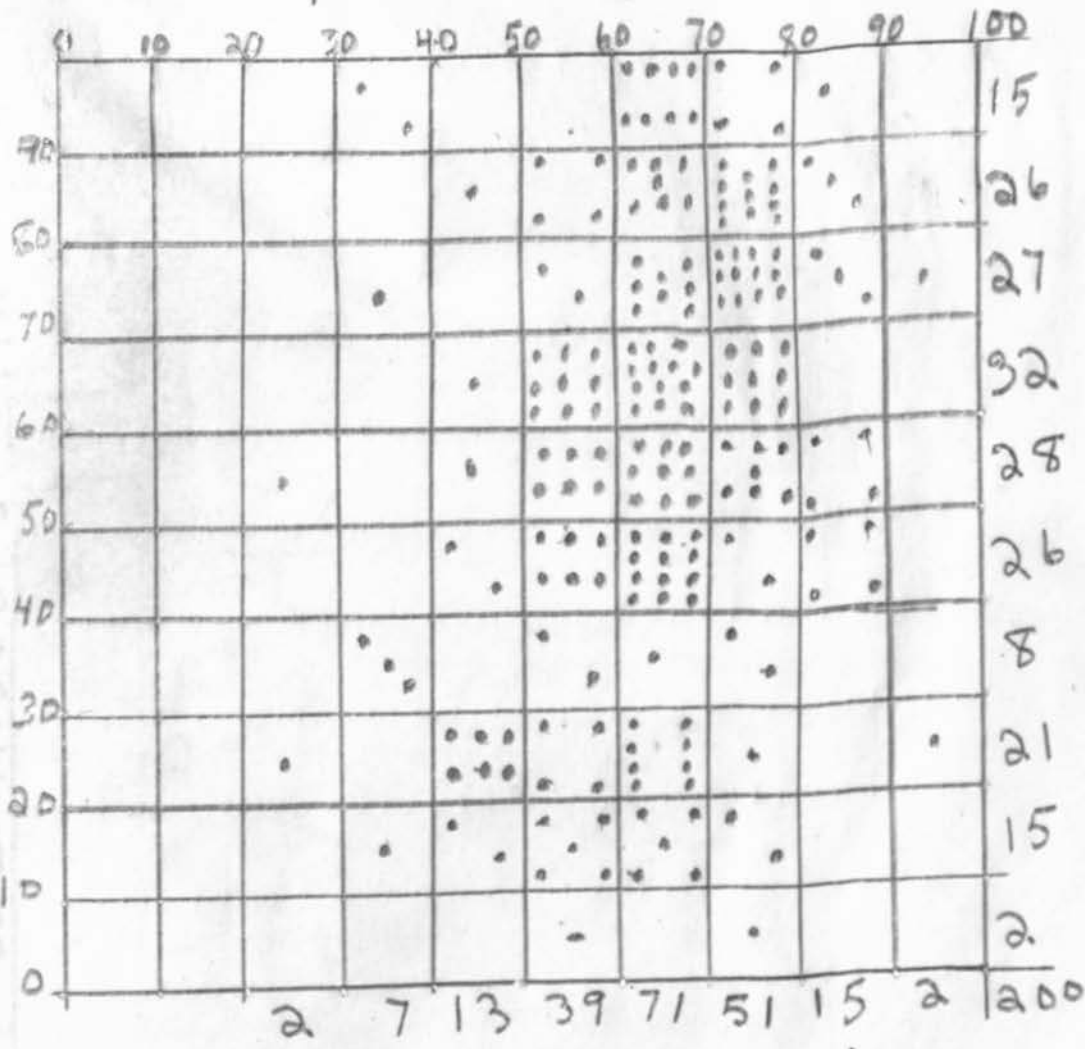
	Median	Quartile	Range	Quartile	Median Retention	$\frac{C}{T}$
Composition	65.5	73.5	- 57.5	8.1	65%	.45
Grammar	59.8	72.2	- 49.3	11.5		

TABLE XIII.

Teachers' State Examination, 1911. Correlation Table for Arithmetic and Composition.

Composition 1911.

Arithmetic III.

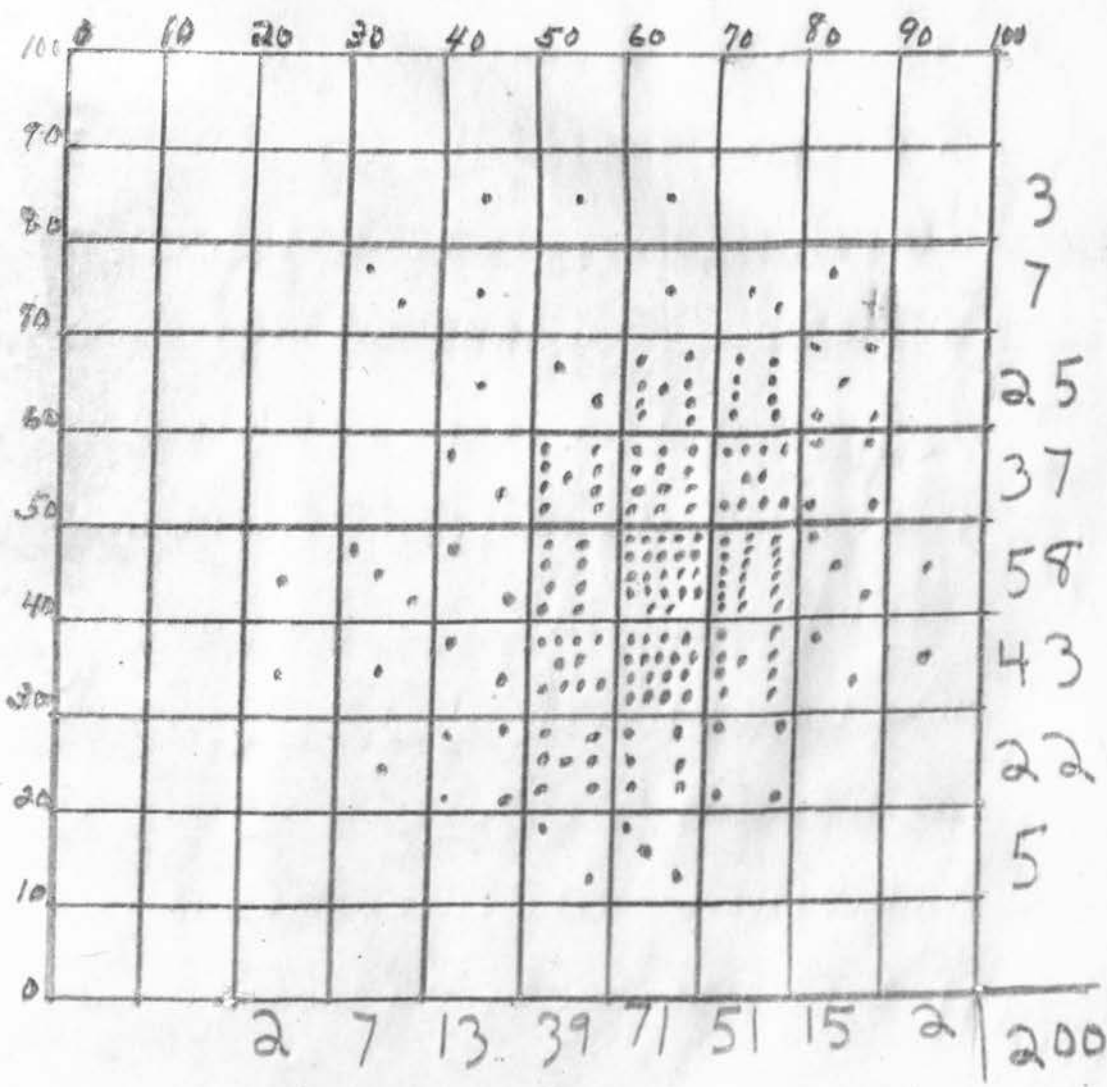


	Median	Quartile	Range	Quartile	Median	r
					Retention	
Composition	65.5	73.5	- 57.2	8.1	60.2%	.31
Arithmetic	60.0	76.8	- 41.5	17.7		

Teachers' State Examination, 1911. Correlation Table for History and Composition.

Composition 1911.

U.S. History 1911.

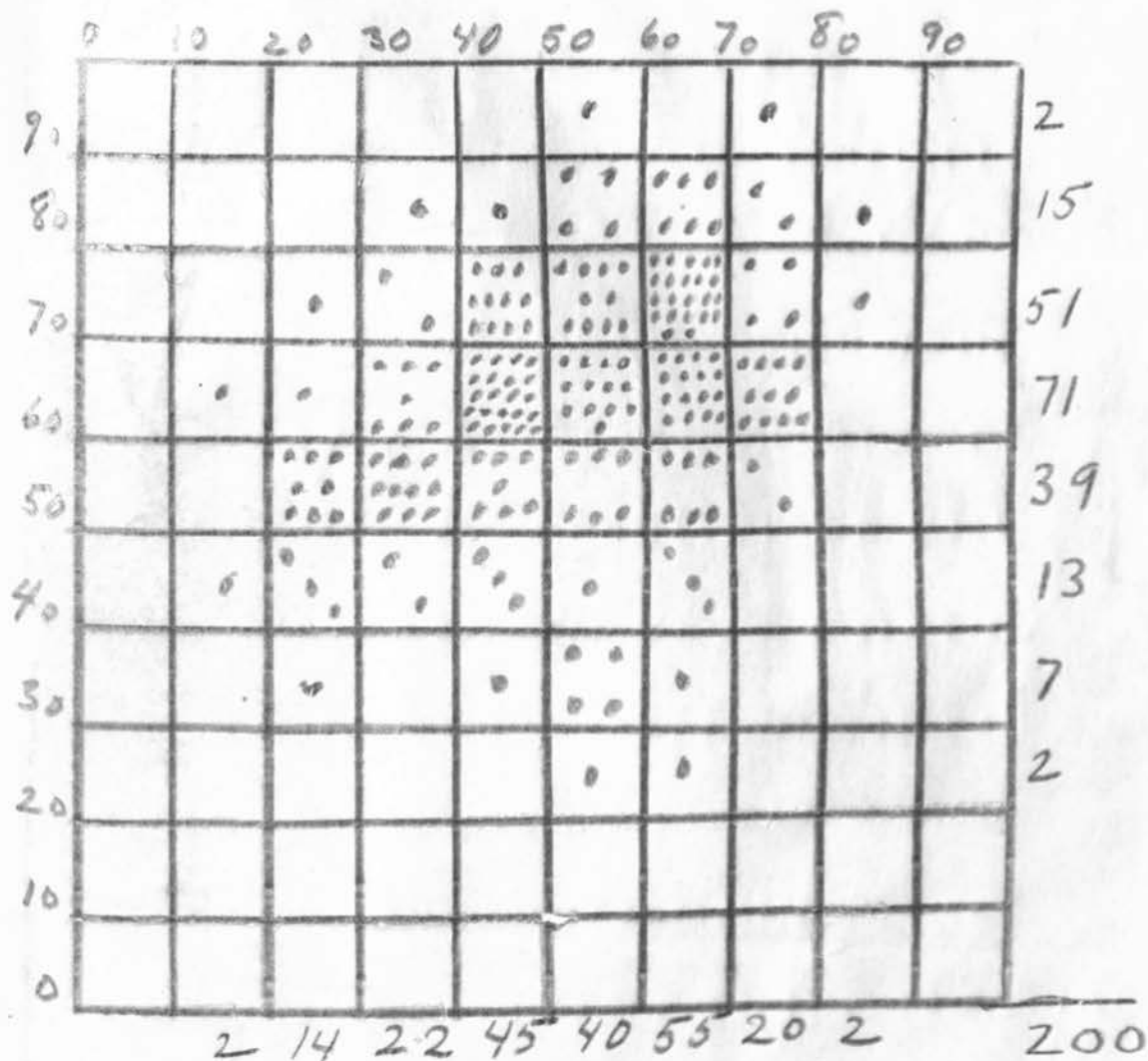


	Median	Quartile	Range	Quartile	Median Retention	F
Composition	65.5	73.5	-57.2	8.1		
History	45.2	56.0	-35.3	10.4	56%	.19

TABLE XV.

Teachers' State Examination, 1911. Correlation Table for Geography and Composition.

Geography 1911



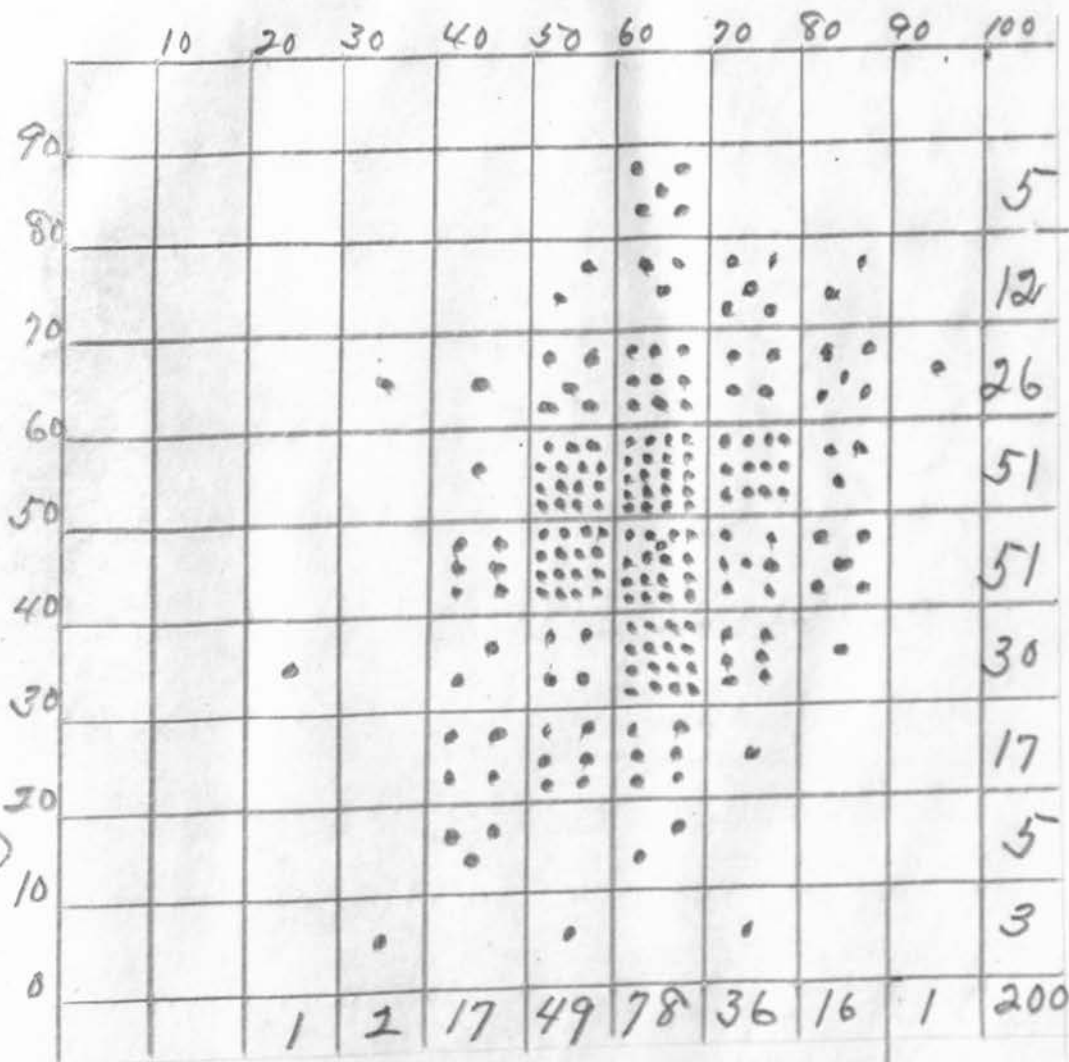
	Median	Quartile	Range	Quartile	Median	Retention	r
Geography	54.3	64.9	- 42.7	11.1			
Composition	65.5	73.5	- 57.2	8.1	61%		.34

TABLE XVI.

Teachers' State Examination, 1912. Correlation Table for Grammar and Composition.

Composition, 1912.

Grammar, 1912.



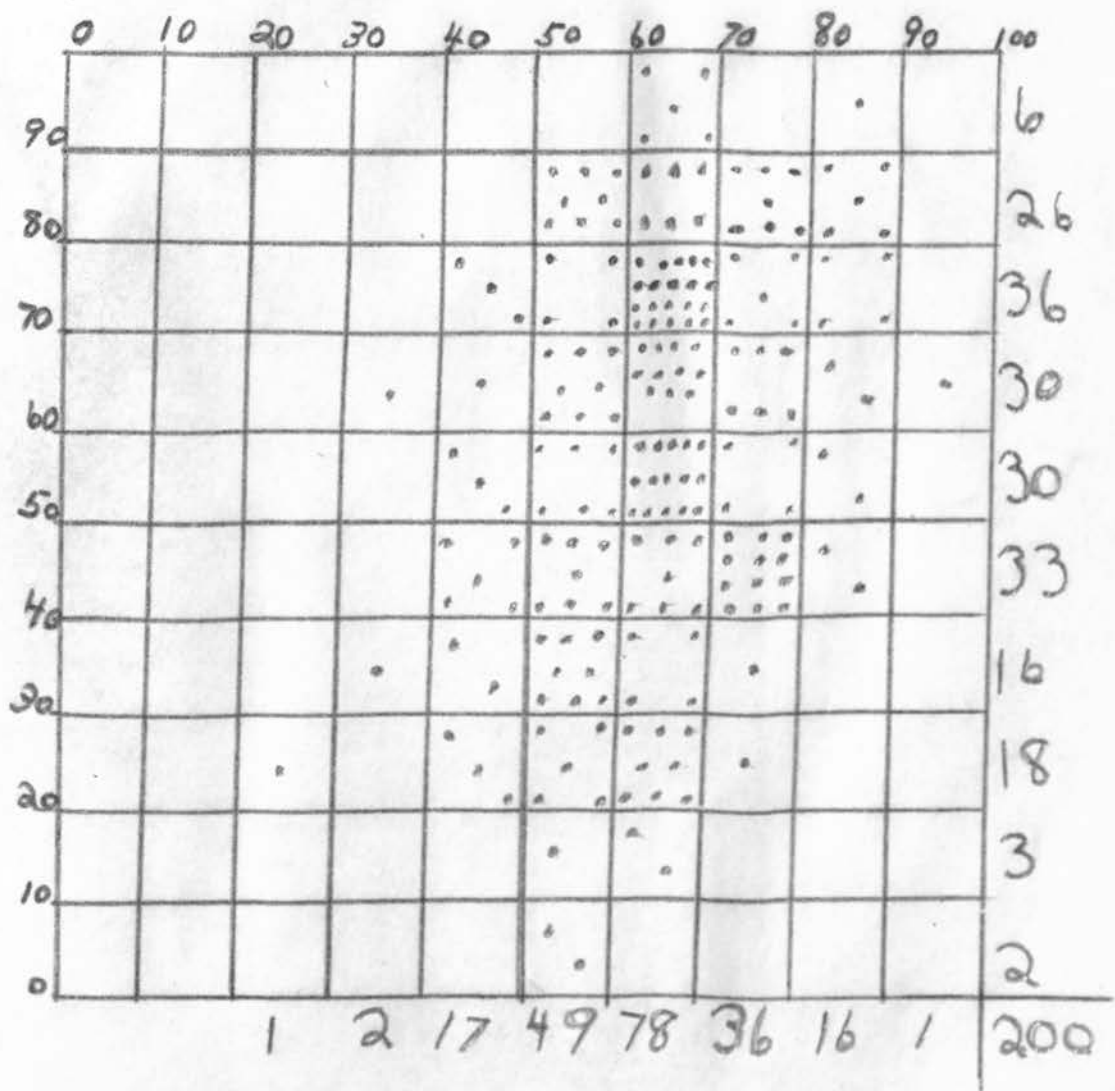
	Median	Quartile	Range	Quartile	Median Retention	$\frac{C}{T}$
Composition	64.0	70.8	56.1	7.4	57%	.22
Grammar	43.3	59.0	38.3	10.4		

TABLE XVII.

Teachers' State Examination, 1912. Correlation Table for Arithmetic and Composition.

Composition 1912.

Arithmetic 1912.



	Median	Quartile Range	Quartile	Median Retention	$\frac{r}{s}$
Composition	64.0	70.8 - 58.1	7.4	57%	.32
Arithmetic	59.3	75.0 - 43.3	15.9		

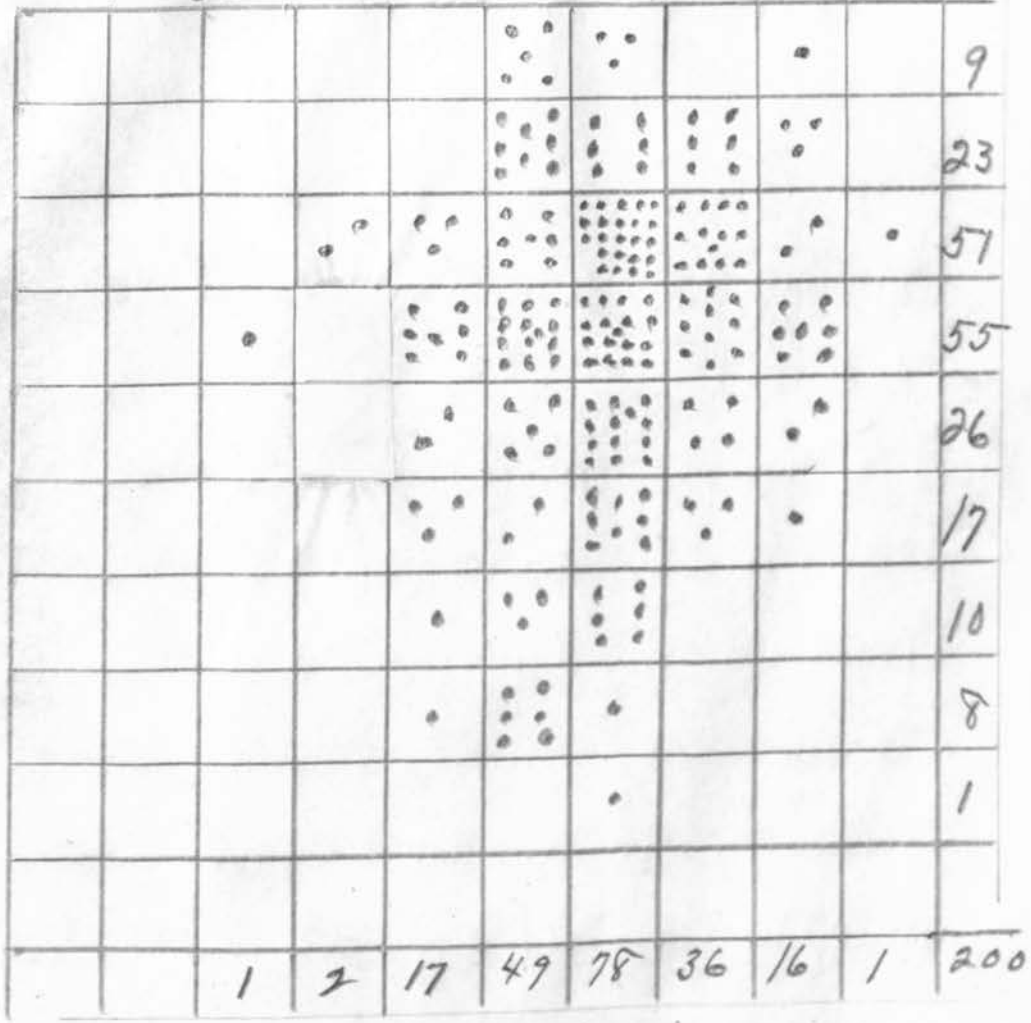
TABLE XVIII.

Teachers' State Examination, 1912. Correlation Table for History and Composition.

Composition, 1912

10 20 30 40 50 60 70 80 90 100

U.S. History, 1912.



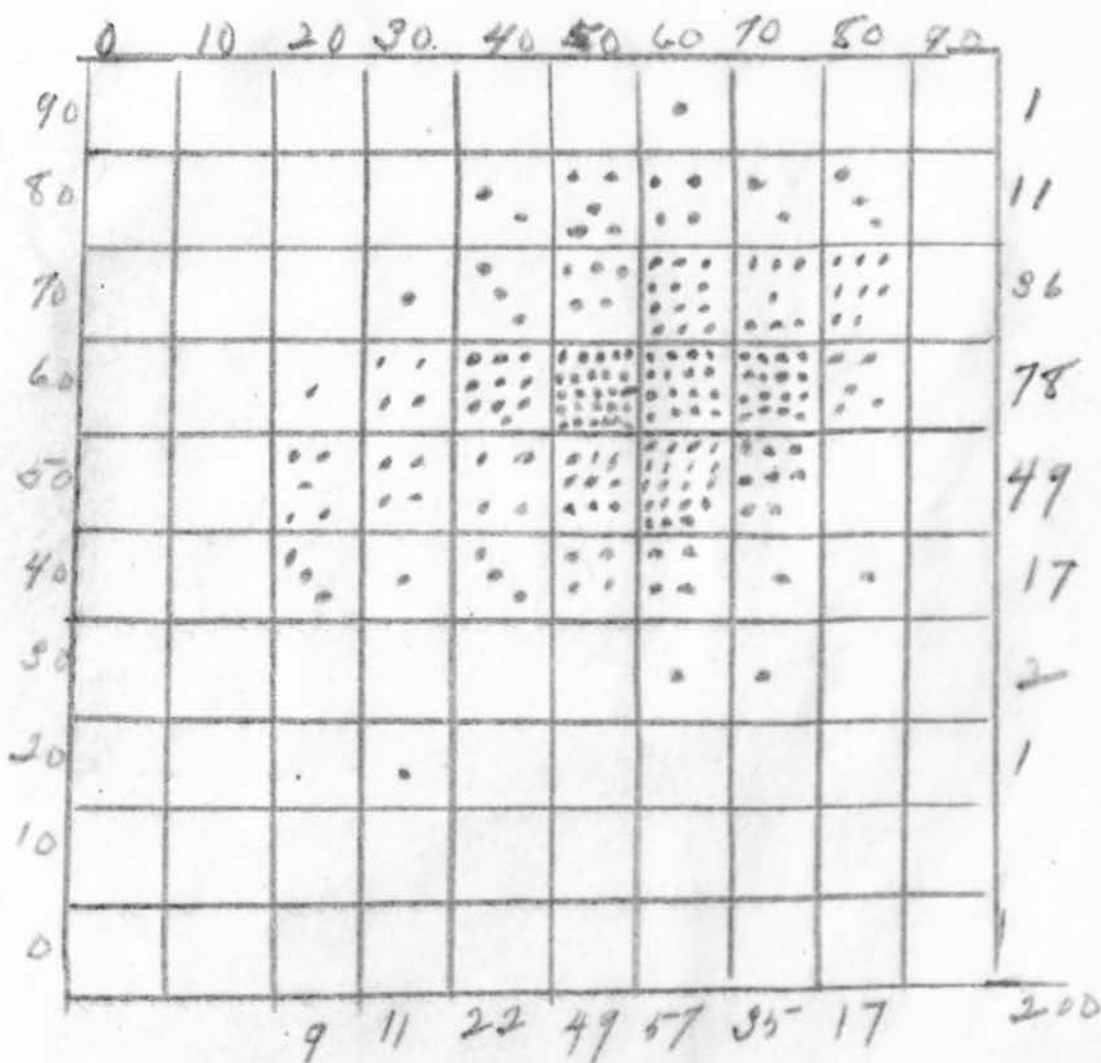
	Median	Quartile	Range	Quartile	Median Retention	F
Composition	64.0	70.8	56.1	7.4	82 %	.32
History	66.9	76.5	55.4	10.6	53 %	.11

TABLE XIX.
Table XIX.

Teachers' State Examination, 1912. Correlation Table
for Geography and Composition.

Geography 1912

Composition 1912



Range

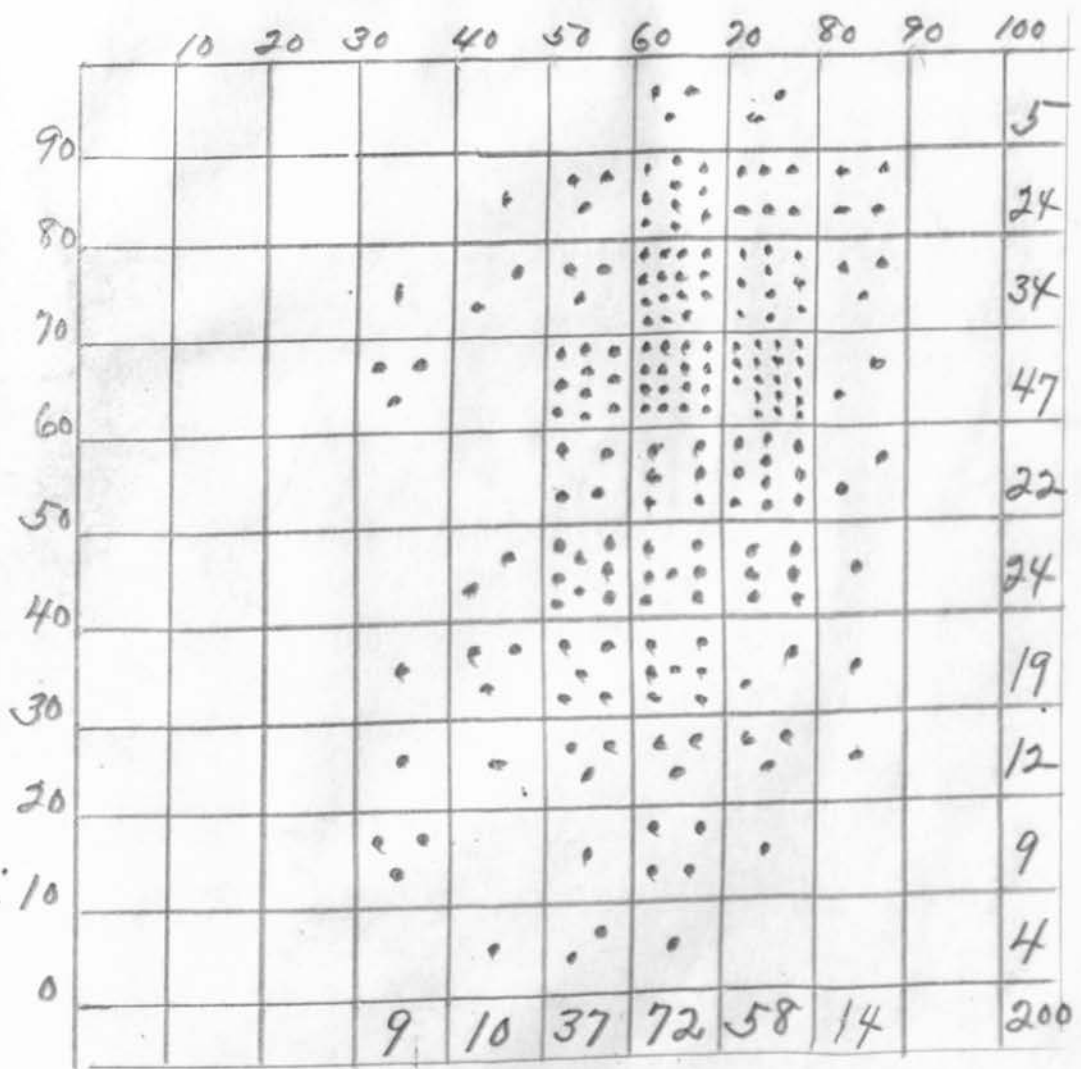
	Median	Quartile	Retention	Quartile	Median	Retention	
Geography	61.6	70.6	51.6	9.5			7
Composition	64.6	70.8	56.1	7.4	55%		.16

TABLE XX.
Table XX

Teachers' State Examination, 1913. Correlation Table for Grammar and Composition.

Composition, 1913.

Grammar, 1913.

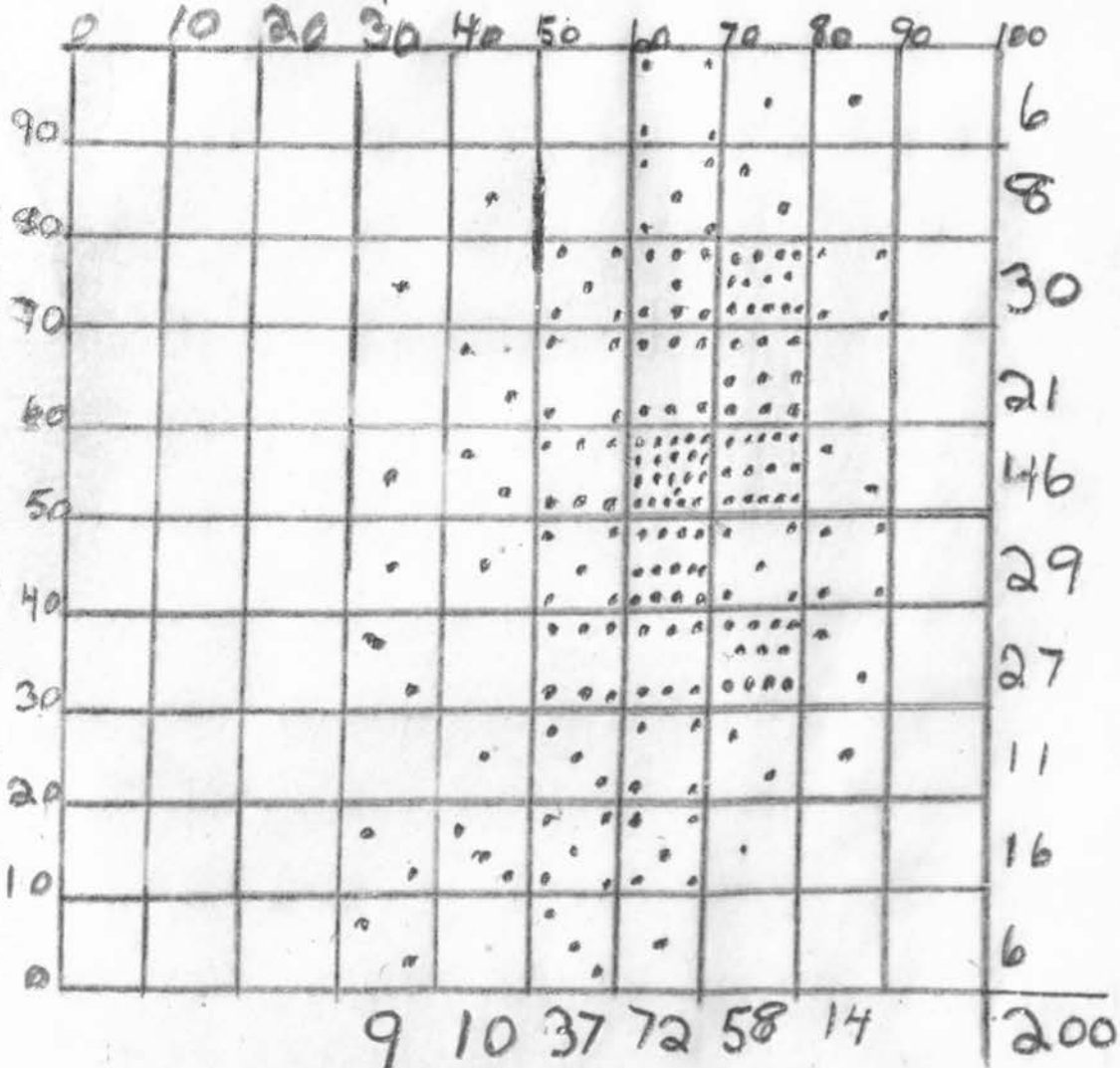


	Median	Quartile Range	Quartile	Median Retention	r
Composition	66.1	73.8 - 58.4	7.7	56 %	.19
Grammar	62.1	73.8 - 42.5	15.7		

TABLE XXI.
 Tablex
 Teachers' State Examination, 1913. Correlation Table
 for Arithmetic and Composition.

Composition 1913.

Arithmetic 1913.



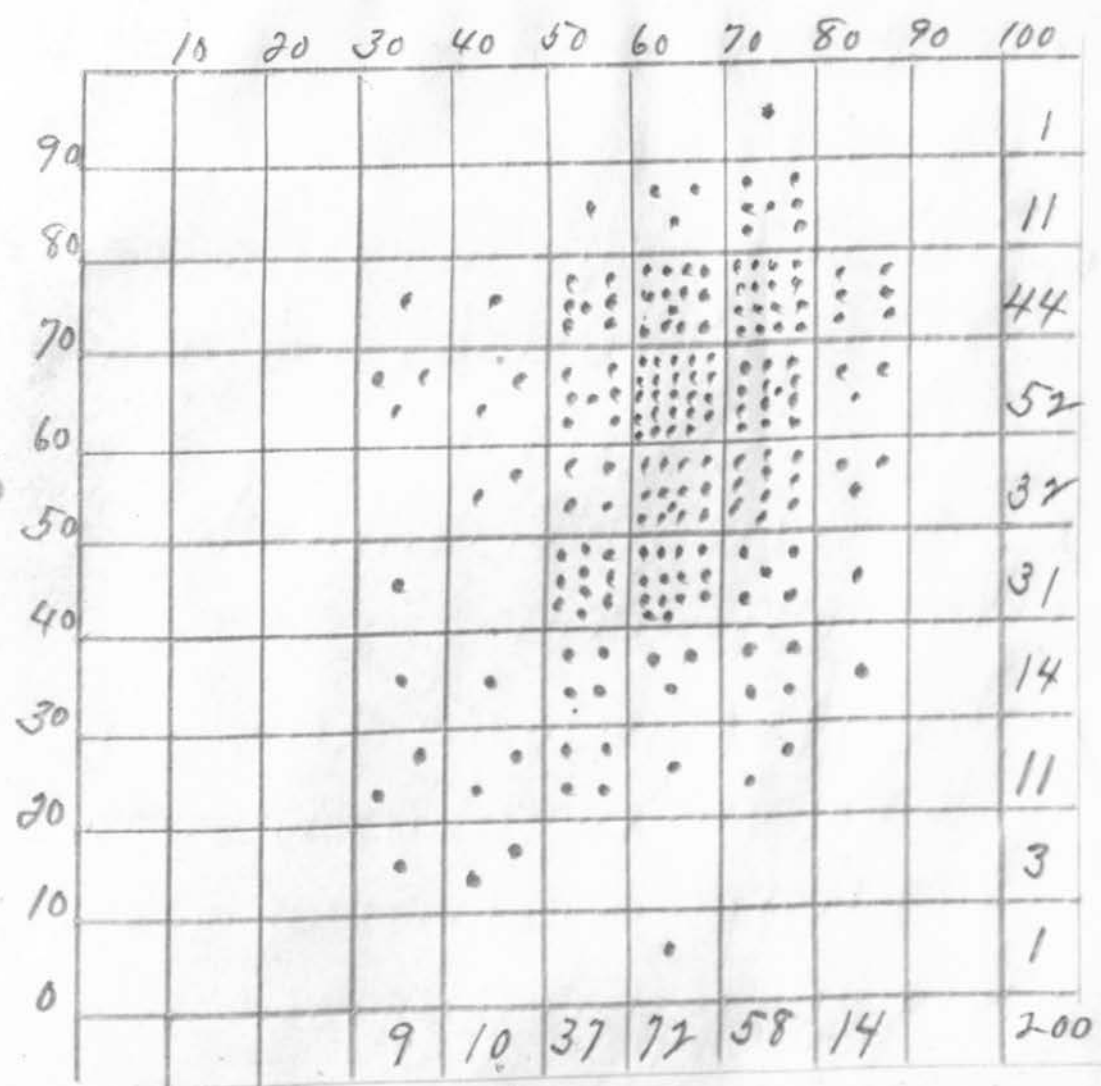
	Median	Quartile Range	Quartile	Median Retention	r
Composition	66.1	73.8 - 58.4	7.7	57%	.22
Arithmetic	52.4	67.1 - 36.3	15.4		

TABLE XXII.

Teachers' State Examination, 1913. Correlation Table for History and Composition.

Composition, 1913.

U.S. History, 1913.



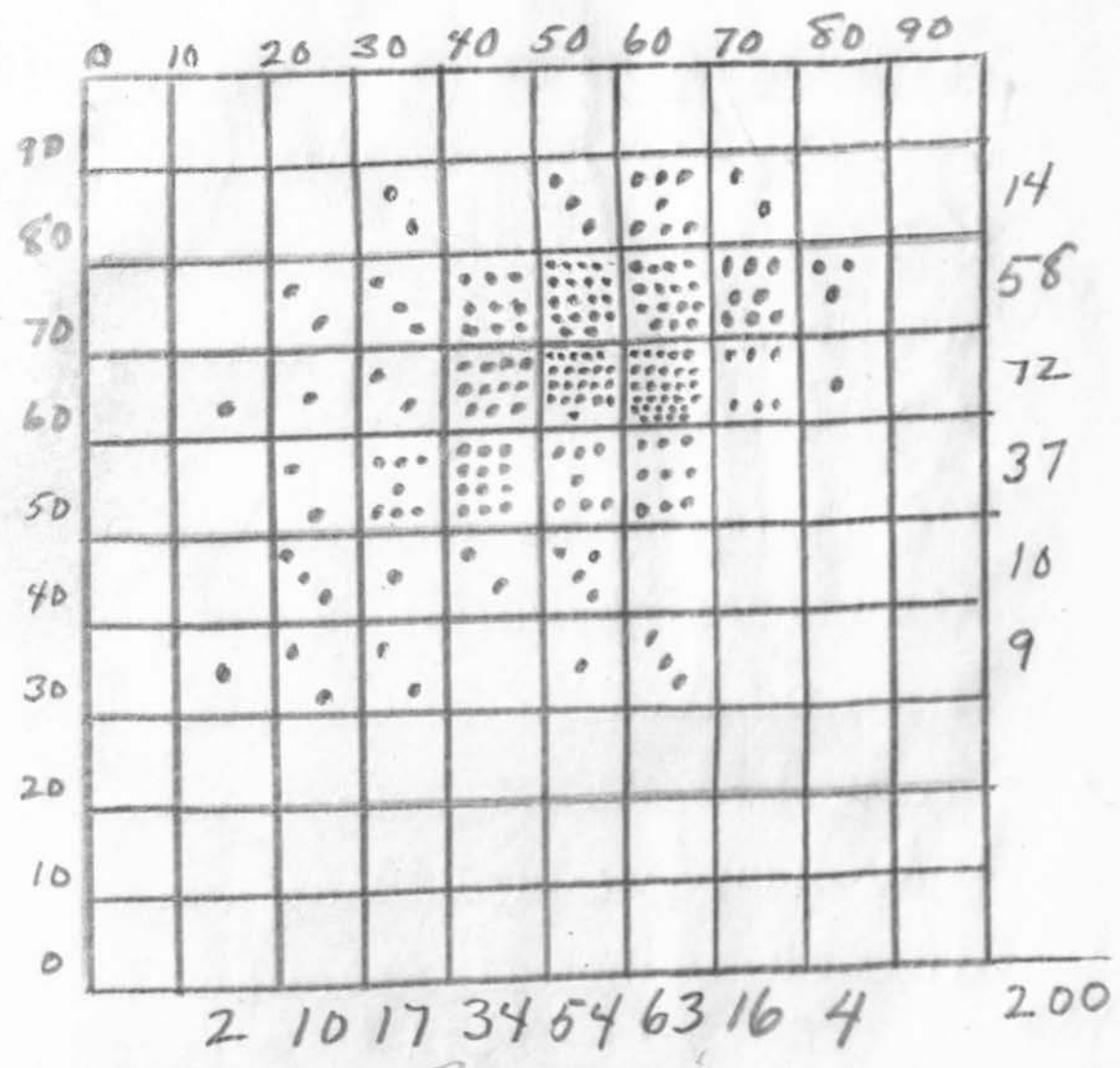
	Median	Quartile Range	Quartile	Median Retention	r
Composition	66.1	73.8 - 58.4	7.7	58 %	.25
History	61.5	71.4 - 46.8	12.3		

TABLE XXIII.

Teachers' State Examination, 1913. Correlation Table for Geography and Composition.

Geography 1913

Composition



	Median	Quartile	Retention	Quartile	Median	Retention
Geography	56.8	65.2	46.2	9.5		
Composition	66.1	73.8	58.4	7.7	58.2%	.25

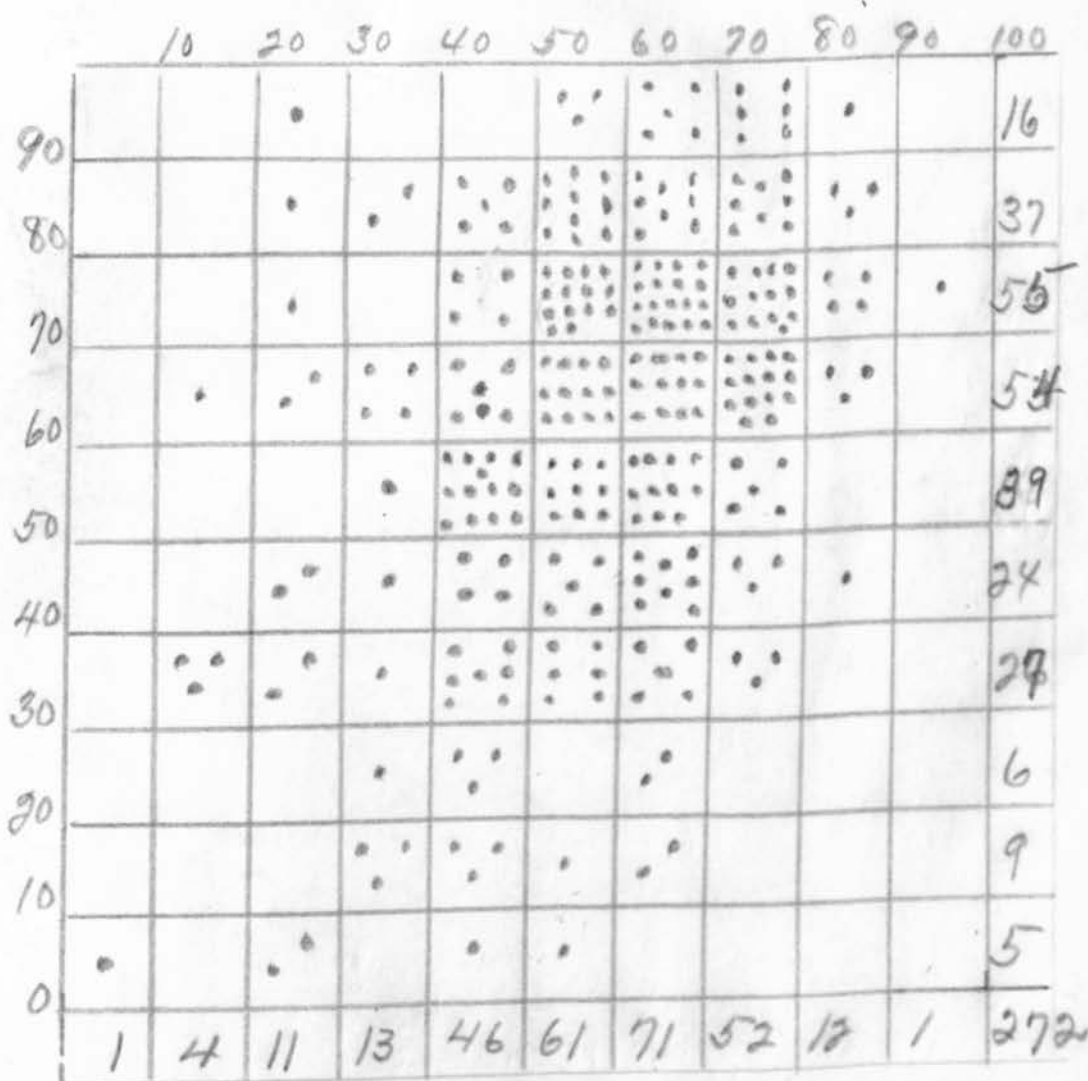
History

TABLE XXIV.

Teachers' State Examination, 1914. Correlation Table for Grammar and Composition.

Composition, 1914

Grammar, 1914

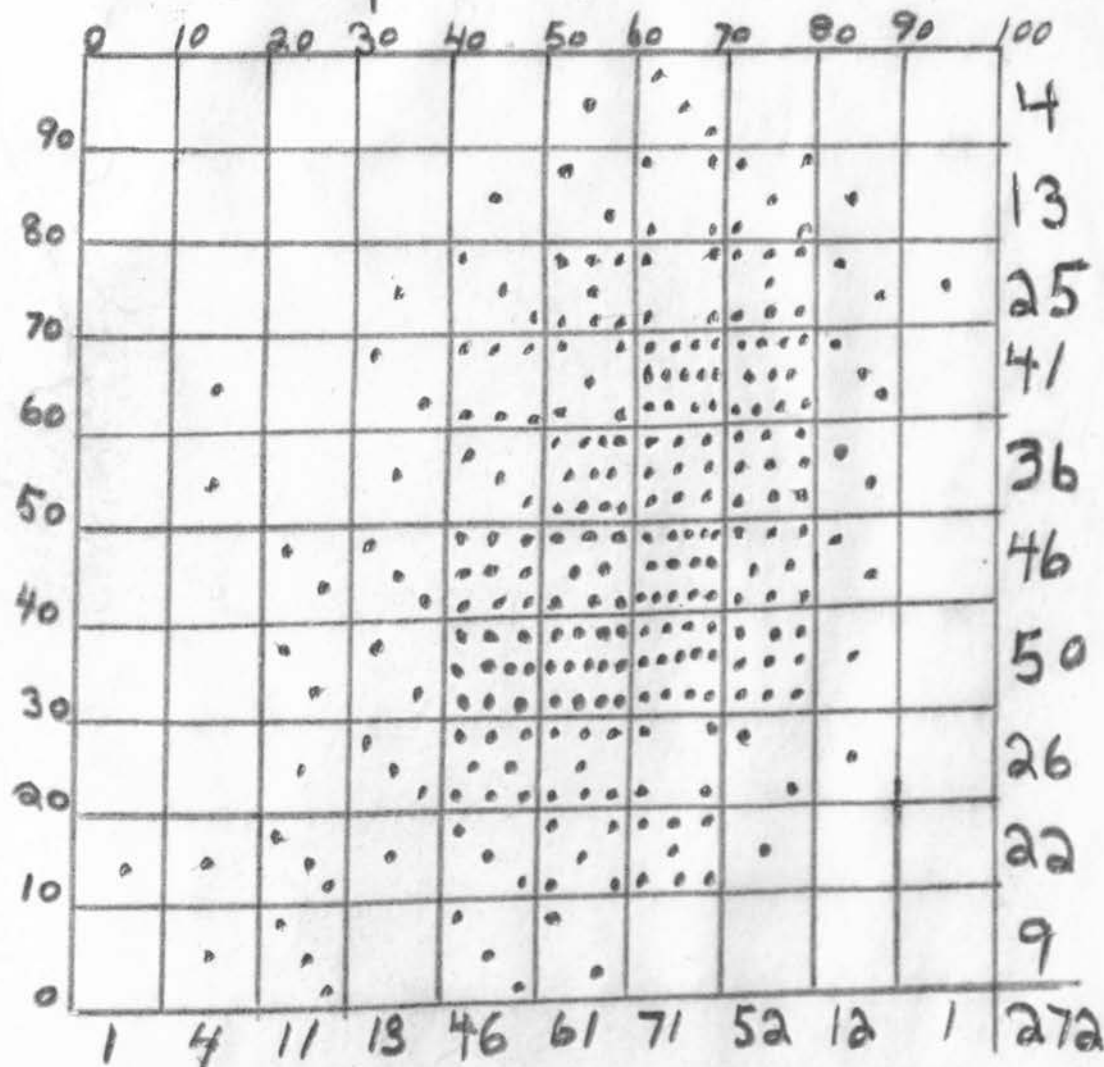


	Median	Quartile	Range	Quartile	Median Retention	r
Composition	60.0	69.6	- 48.5	10.6	59%	.29
Grammar	64.8	77.3	- 43.8	14.3		

Teachers' State Examination, 1914. Correlation Table for Arithmetic and Composition.

Composition 1914.

Arithmetic 1914.



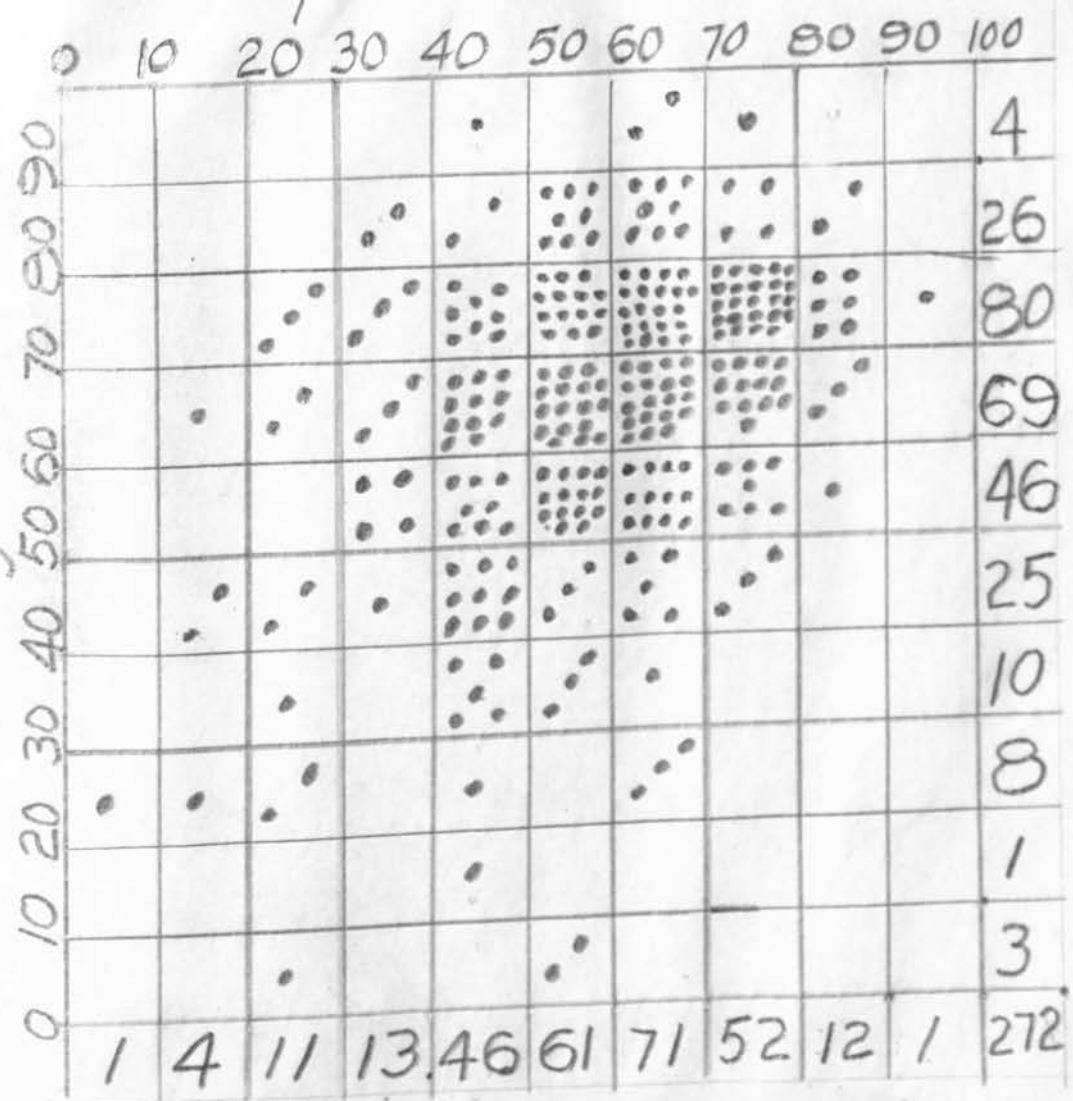
	Median	Quartile	Range	Quartile	Median	r
					Retention	
Composition	60.0	69.6	48.5	10.6	60%	.31
Arithmetic	46.1	63.7	32.2	15.8		

TABLE XXVI.

Teachers' State Examination, 1914. Correlation Table for History and Composition.

Composition 1914

U.S. History 1914

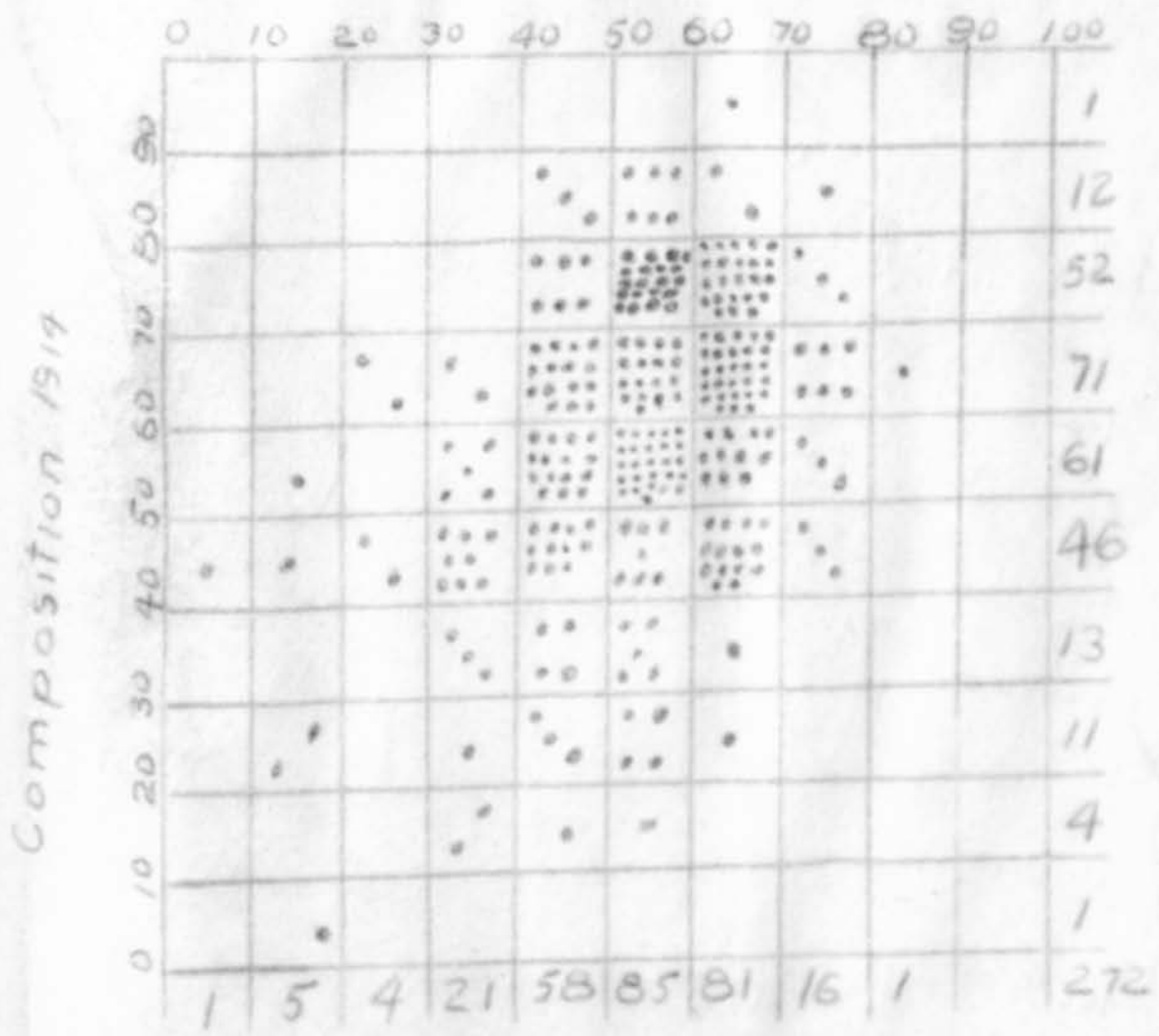


	Median	Quartile	Range	Quartile	Median Retention	r
Composition	60.0	69.6	- 48.5	10.6	60%	.31
History	66.2	75.2	- 54.6	10.3		

TABLE XXVII.

Teachers' State Examination, 1914. Correlation Table for Geography and Composition.

Geography 1914



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 1211 KNOTTEH.C.U.

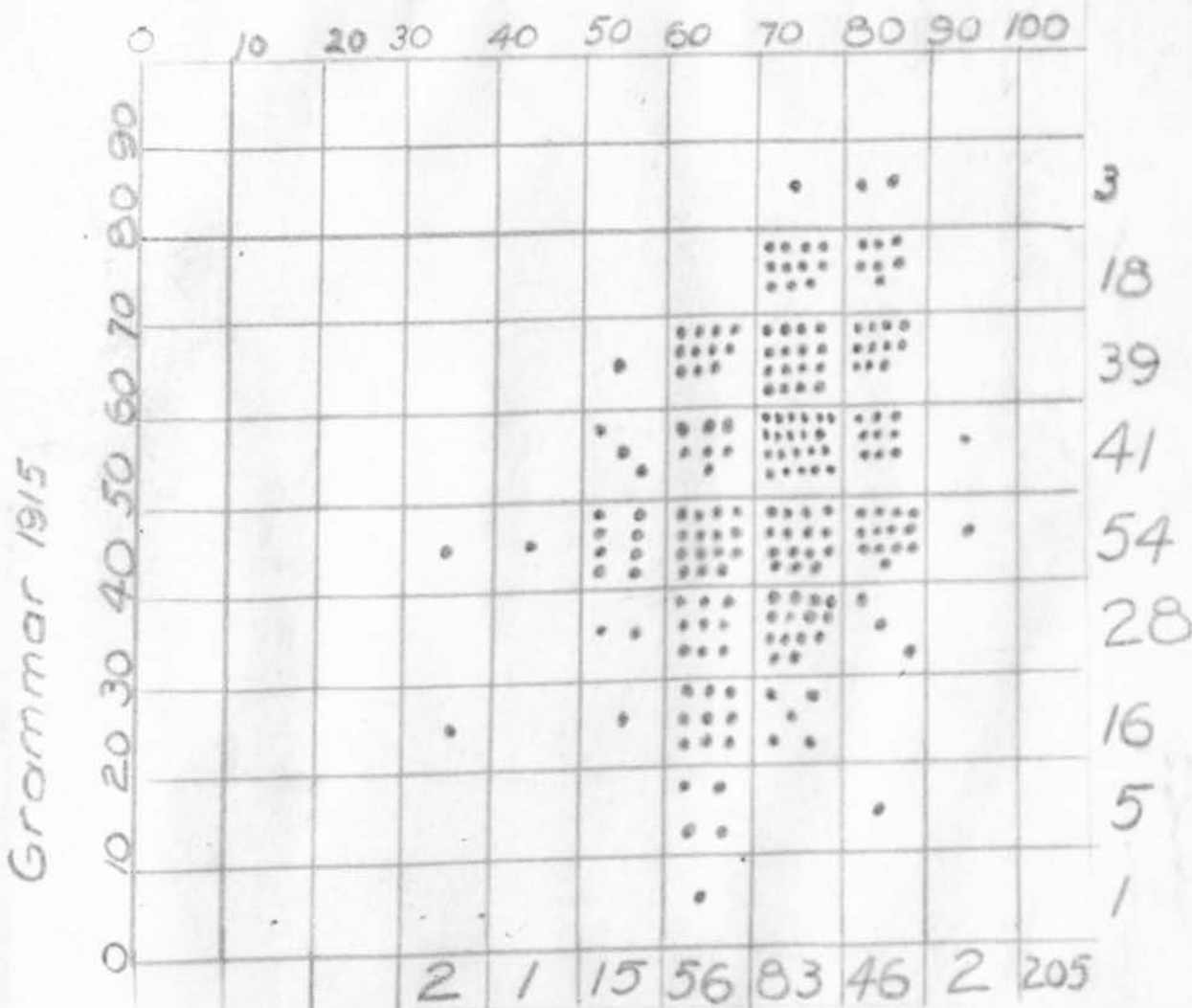
Composition 1914

	Median	Quartile Range	Quartile	Median Retention	r
Geography	55.5	63.7 - 46.4	8.7	62 %	.35
Composition	60.0	69.6 - 48.5	10.6		

TABLE XXVIII.

Teachers' State Examination, 1915. Correlation Table for Grammar and Composition.

Composition 1915

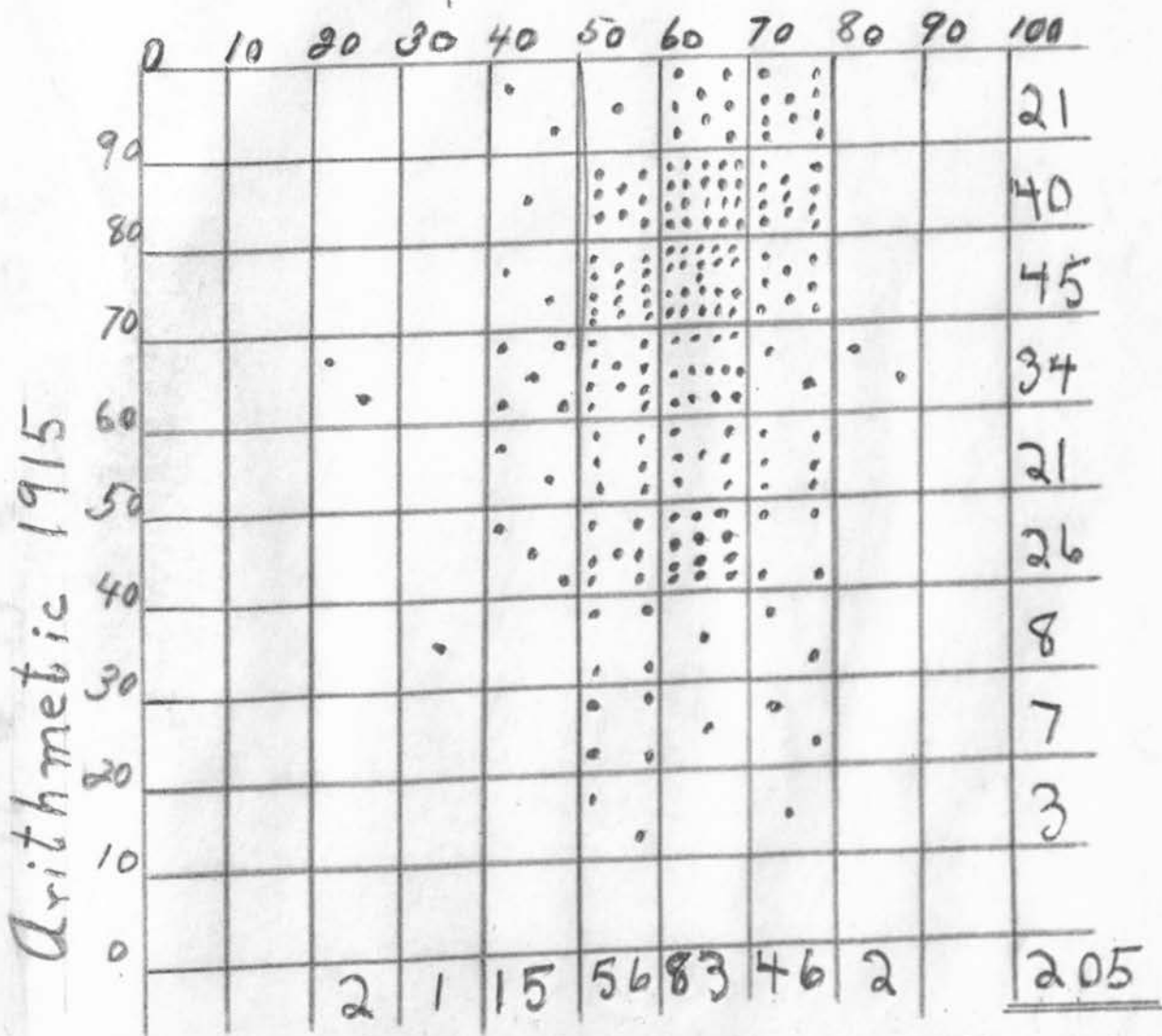


	Median	Quartile	Range	Quartile	Median Retention	r
Composition	63.4	69.6	55.9	6.9	60 %	.32
Grammar	49.7	62.3	40.2	11.1		

TABLE XXIX.

Teachers' State Examination, 1915. Correlation Table for Arithmetic and Composition.

Composition 1915

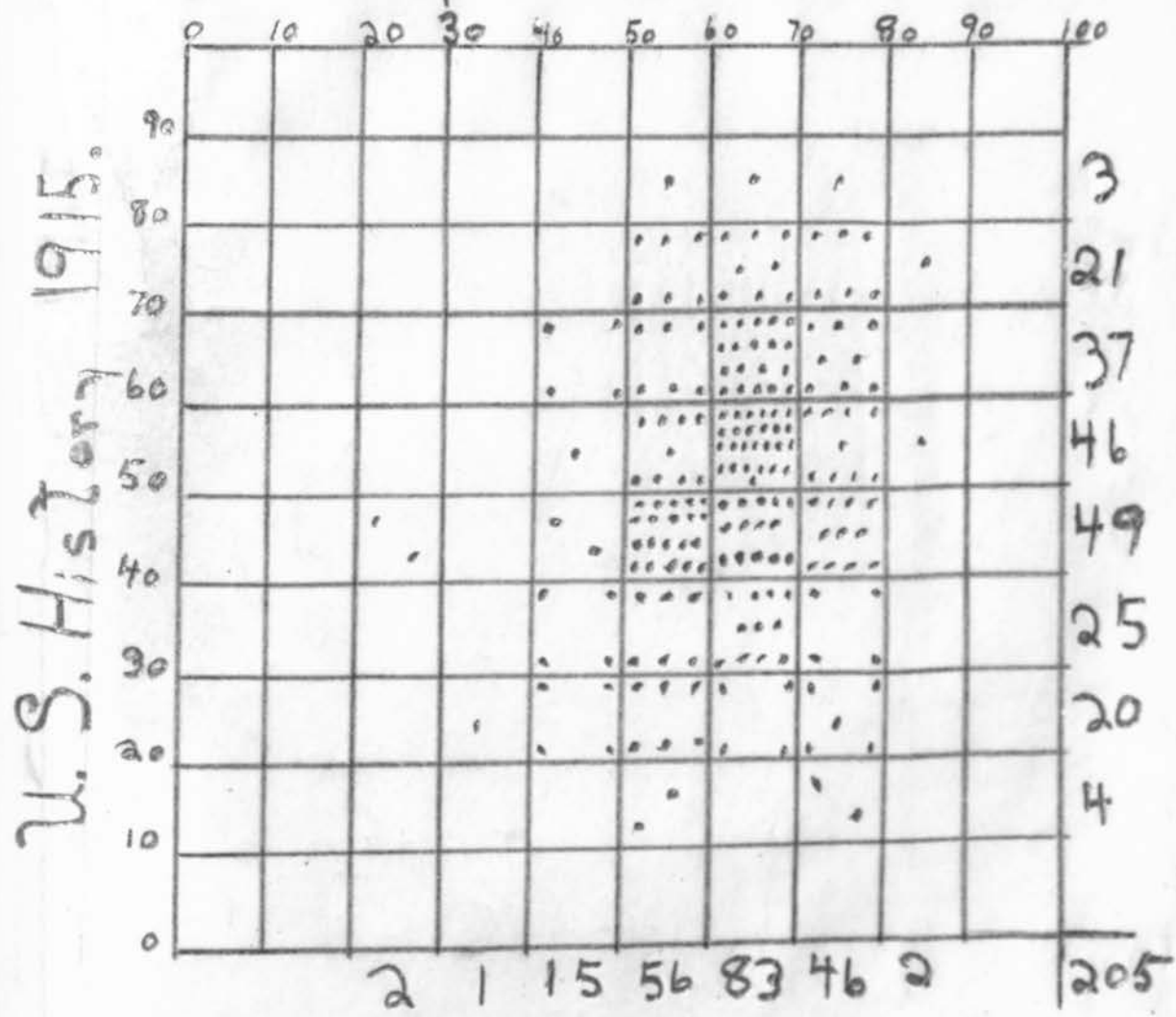


	Median	Quartile	Range	Quartile	Median Retention	r
Composition	63.4	69.6	55.9	6.9	58%	.25
Arithmetic	70.8	82.5	53.3	14.6		

TABLE XXX.

Teachers' State Examination, 1915. Correlation Table for History and Composition.

Composition 1915.



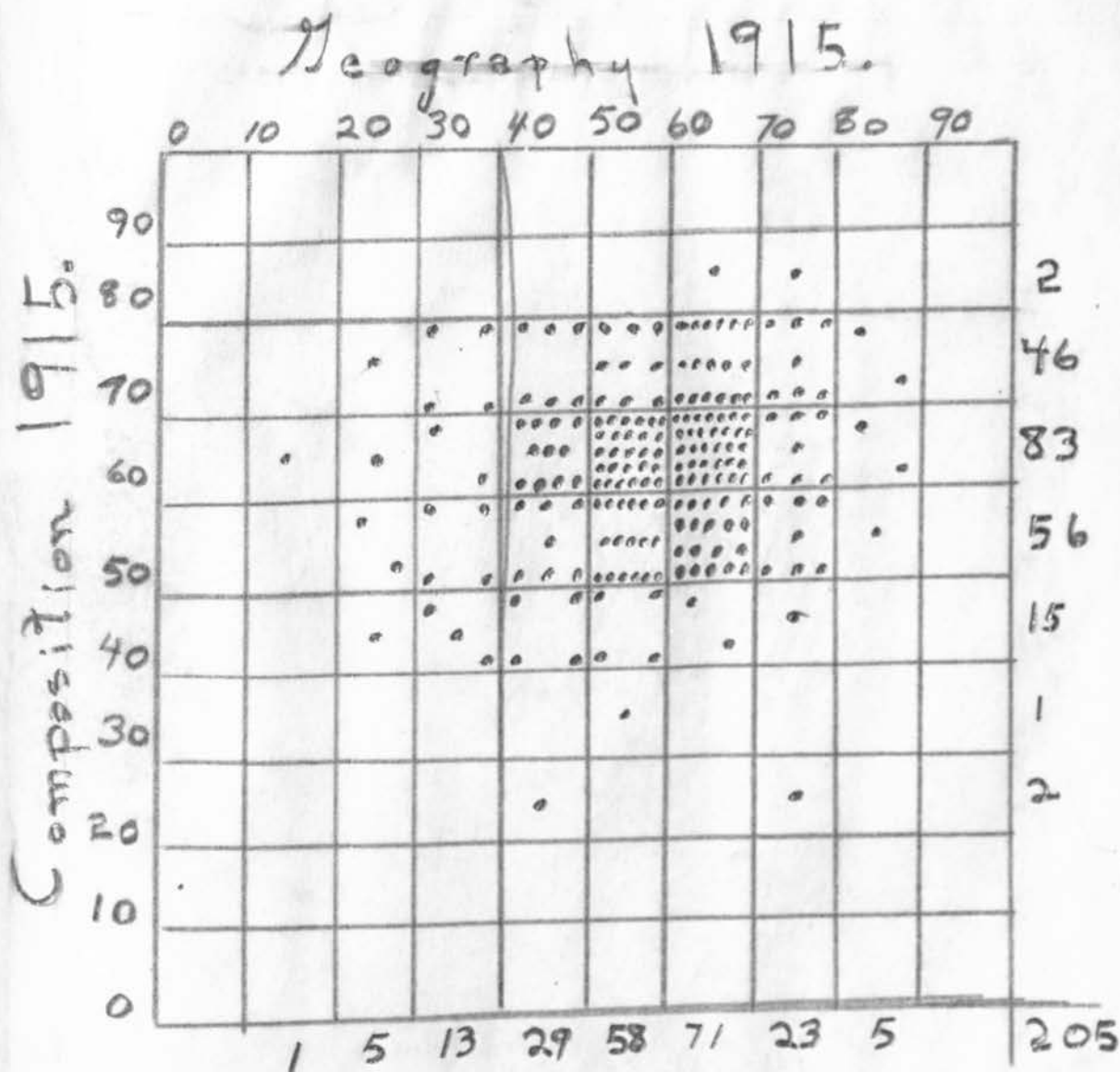
	Median	Quartile	Range	Quartile	Median Retention	r
Composition	63.4	69.6	55.9	6.9	57%	.22
History	51.0	62.7	40.4	11.2		

Composition
Arithmetic

U.S. History 1915
Composition 1915

TABLE XXXI.

Teachers' State Examination, 1915. Correlation Table
for Geography and Composition.

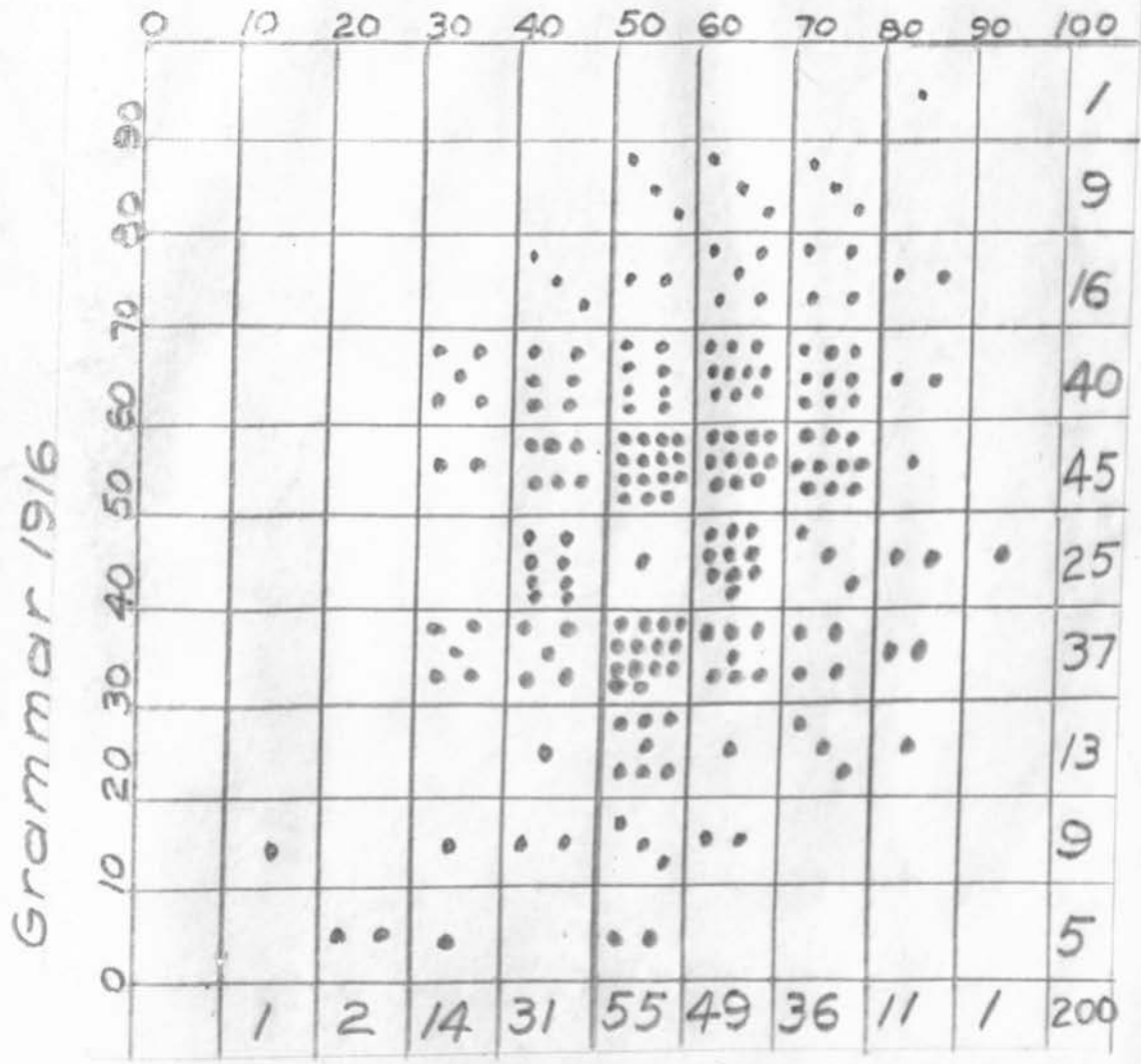


	Mean	Range	Number	M.R.	r
Geography	59.4	66.8 - 50.5	82	55.2%	.16
Composition	63.4	69.6 - 53.9	69		

TABLE XXXII.

Teachers' State Examination, 1916. Correlation Table for Grammar and Composition.

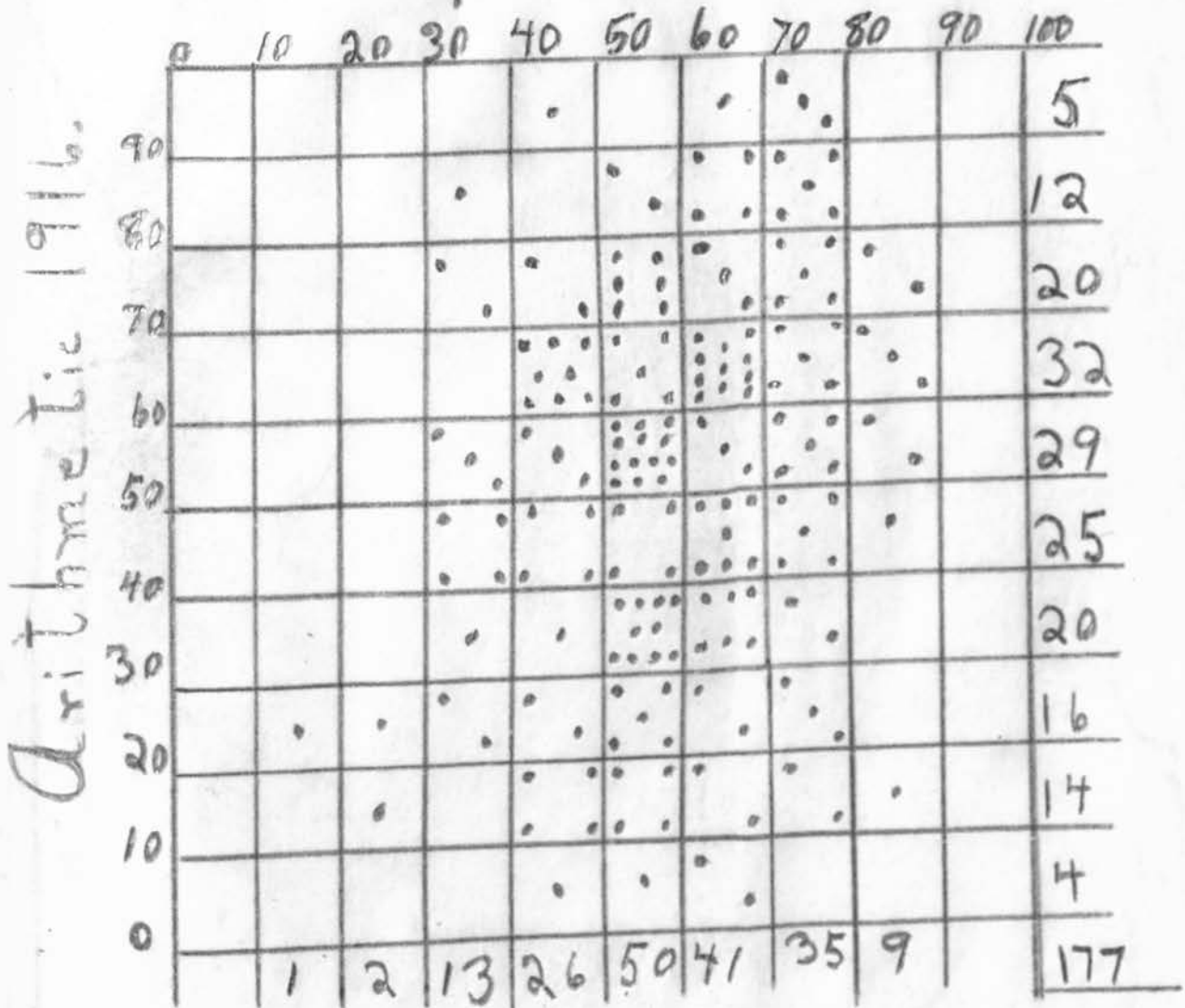
Composition 1916



	Median	Quartile	Range	Quartile	Median	r
					Retention	
Composition	59.5	69.6	50.4	9.6	57%	.22
Grammar	52.2	64.0	36.2	13.9		

Teachers' State Examination, 1916. Correlation Table for Arithmetic and Composition.

Composition 1916.



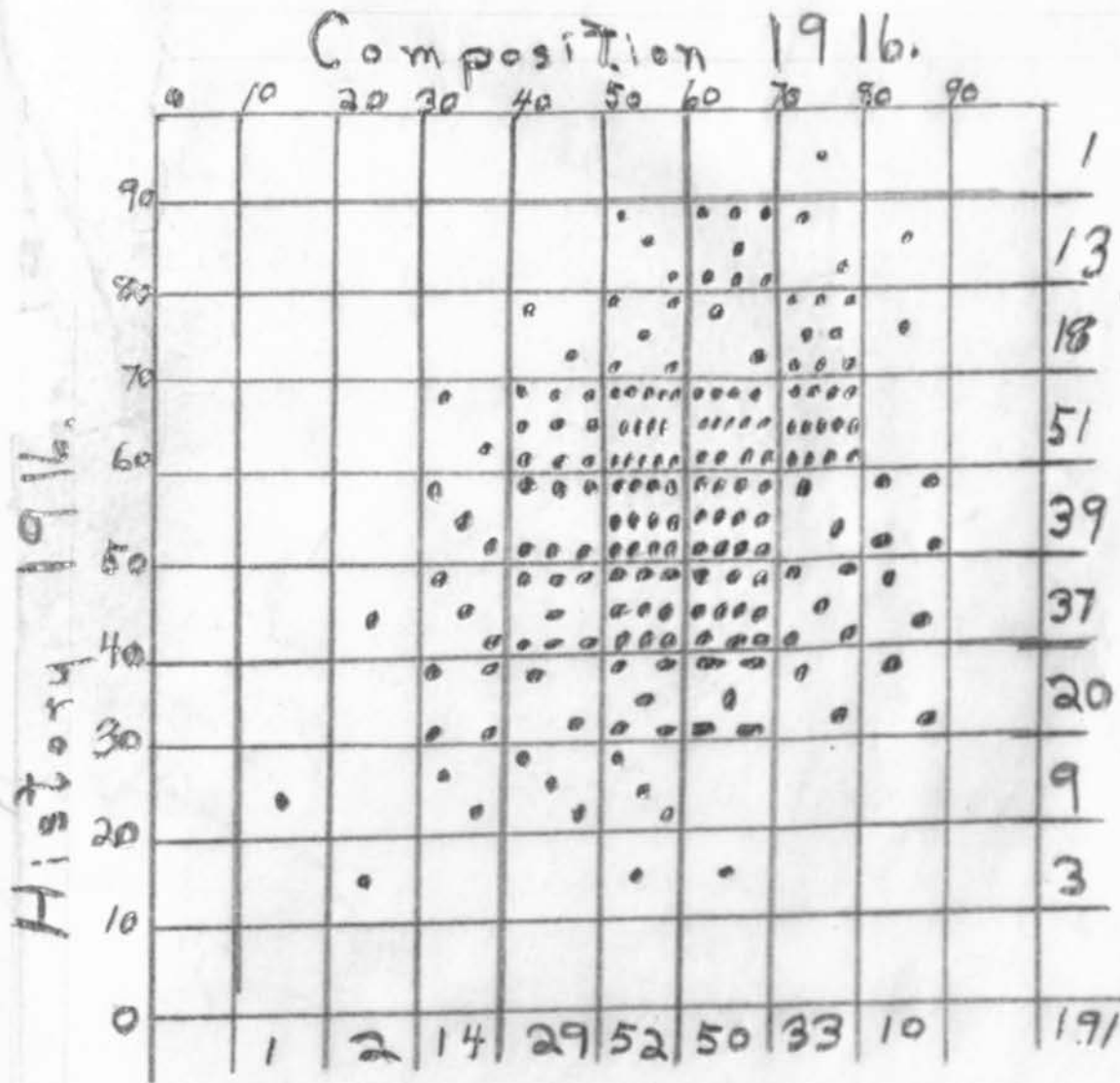
	Median	Quartile	Range	Quartile	Median Retention	r
Composition	59.3	70.0	50.4	9.8	56%	.20
Arithmetic	53.3	67.8	35.0	16.4		

examined 1916

appon
tor

TABLE XXXIV.

Teachers' State Examination, 1916. Correlation Table for History and Composition.

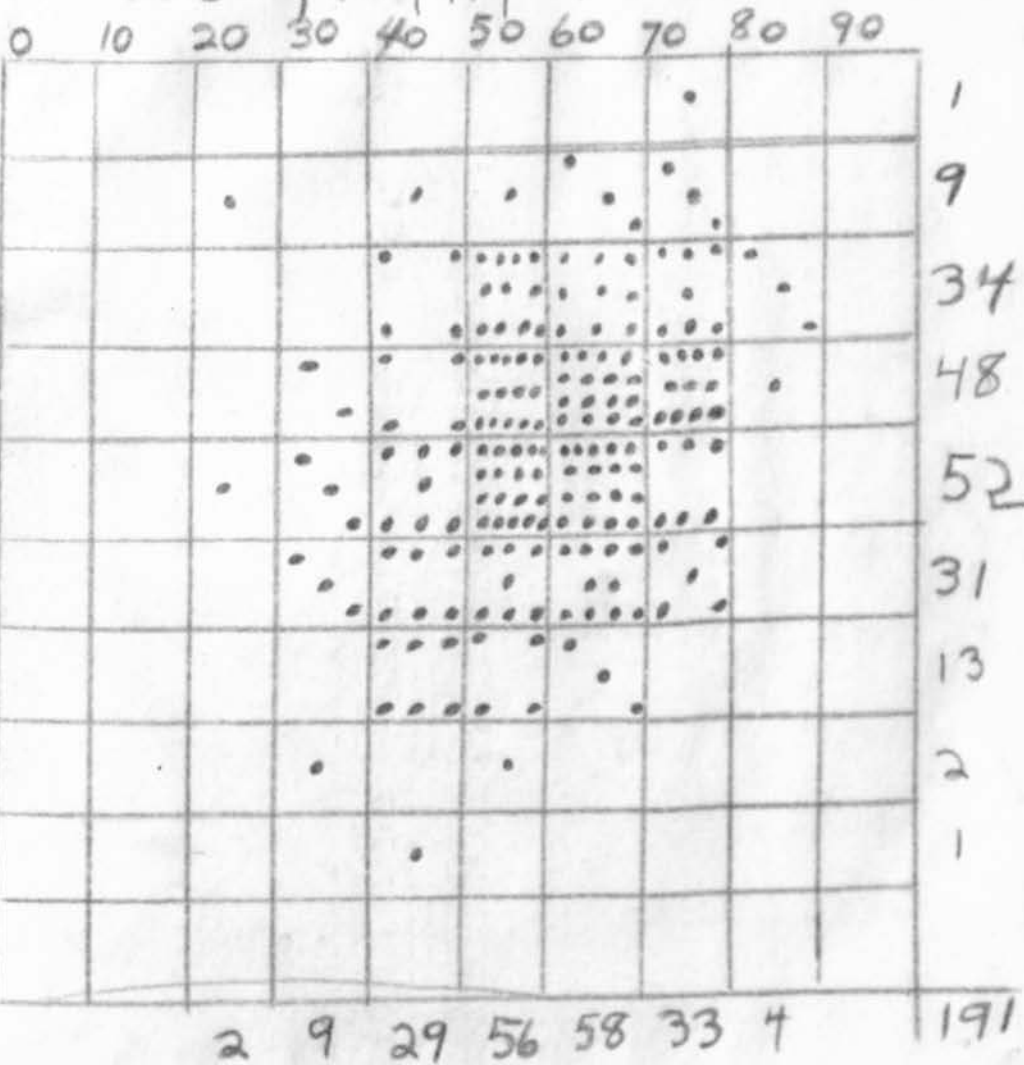


	Median	Quartile Range	Quartile	Median Retention	r
Composition	59.5	69.0 - 50.4	9.3	58%	.25
History	56.8	66.9 - 44.3	11.3		

TABLE XXXV.

Teachers' State Examination, 1916. Correlation Table for Geography and Composition.

Geography 1916.

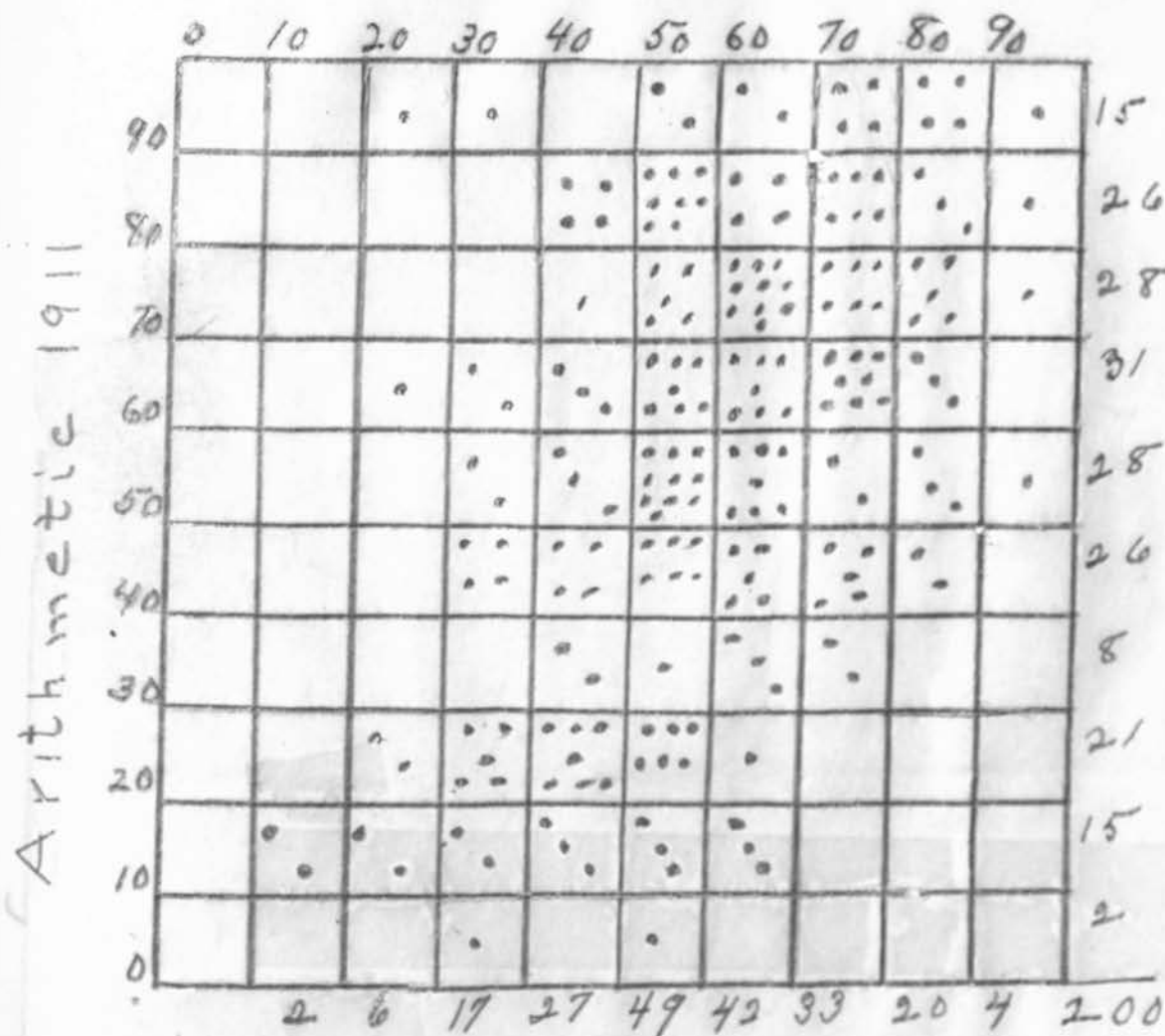


	Median.	Quartile	Range.	Quartile	Median Retention	r
Composition	59.3	69.2	- 50.2	9.5	58.4%	.26
Geography	59.9	68.1	- 51.4	8.4		

TABLE XXXVI.

Teachers' State Examination, 1911. Correlation Table
for Arithmetic and Grammar.

Grammar 1911

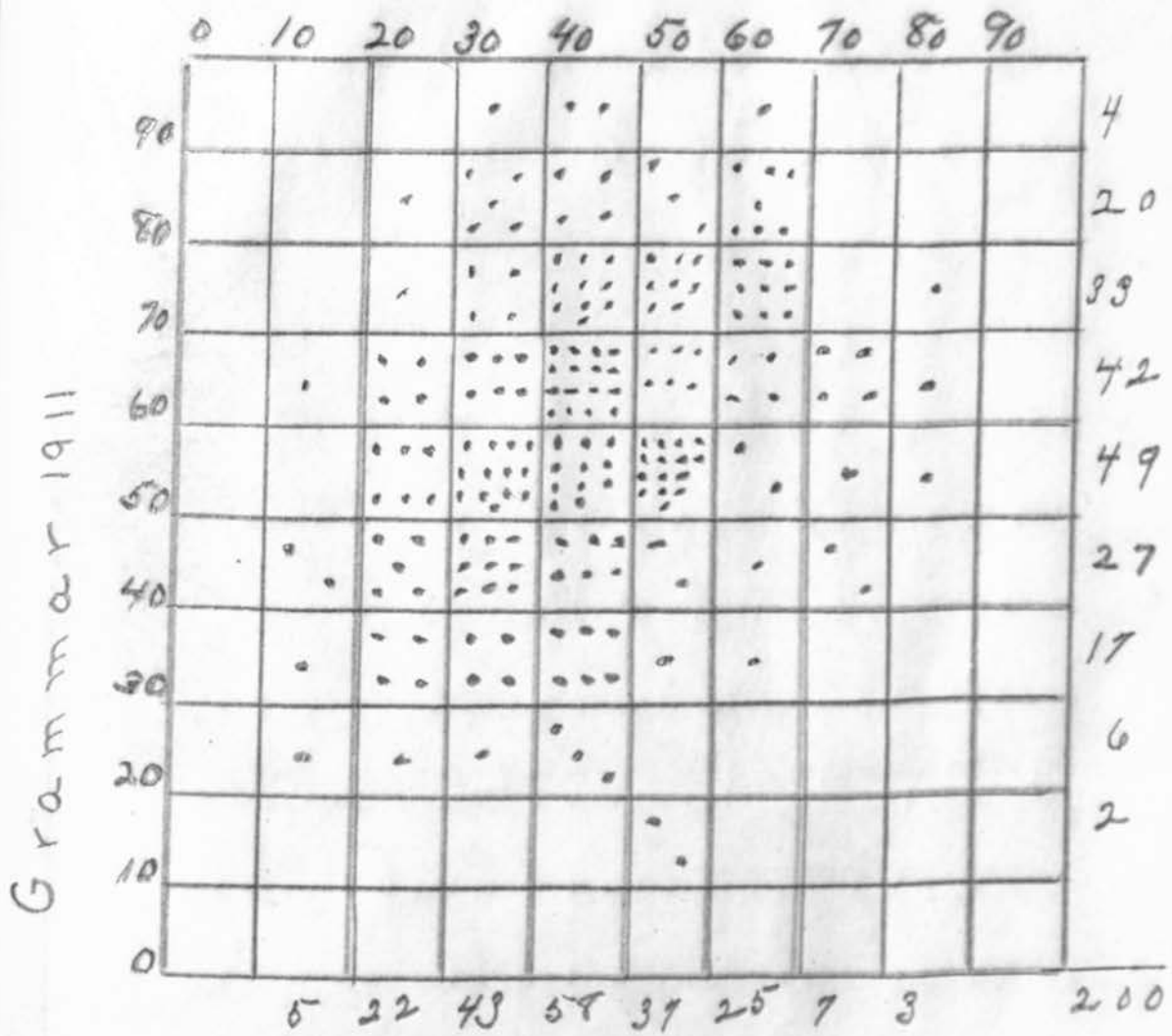


	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	59.8	72.2	- 49.3	11.5	63.6%	
Arithmetic	60.0	76.8	- 41.5	17.7	58.8%	.47

TABLE
Table XXXVII.

Teachers' State Examination, 1911. Correlation Table
for History and Grammar.

History 1911

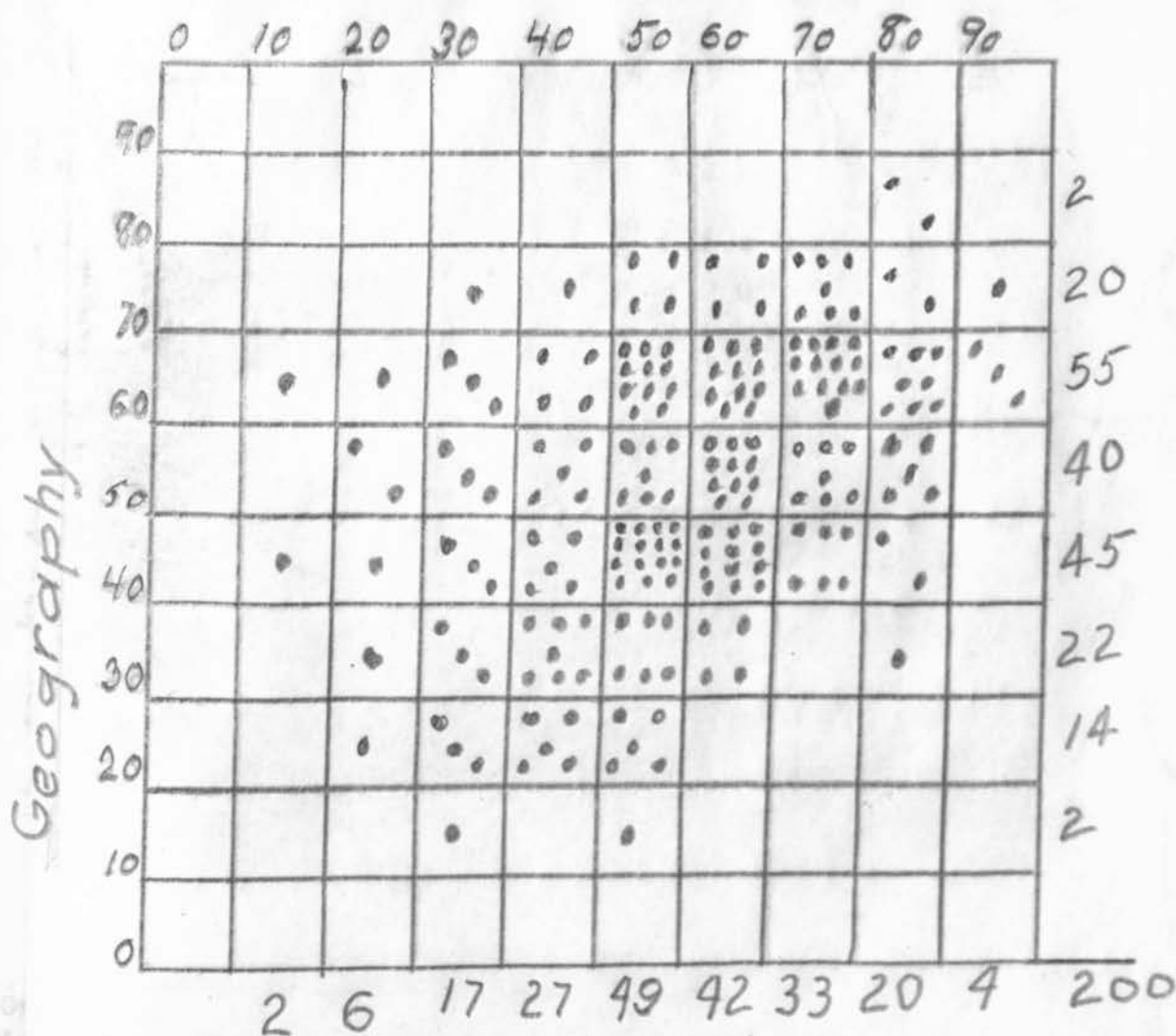


	Median	Quartile	Range	Quartile	Median Retention	#
History	45.2	56.0	36.3	10.4		
Grammar	52.4	63.9	36.3	13.8	60%	.31

TABLE XXXVIII.

Teachers' State Examination, 1911. Correlation Table for Geography and Grammar.

Grammar 1911

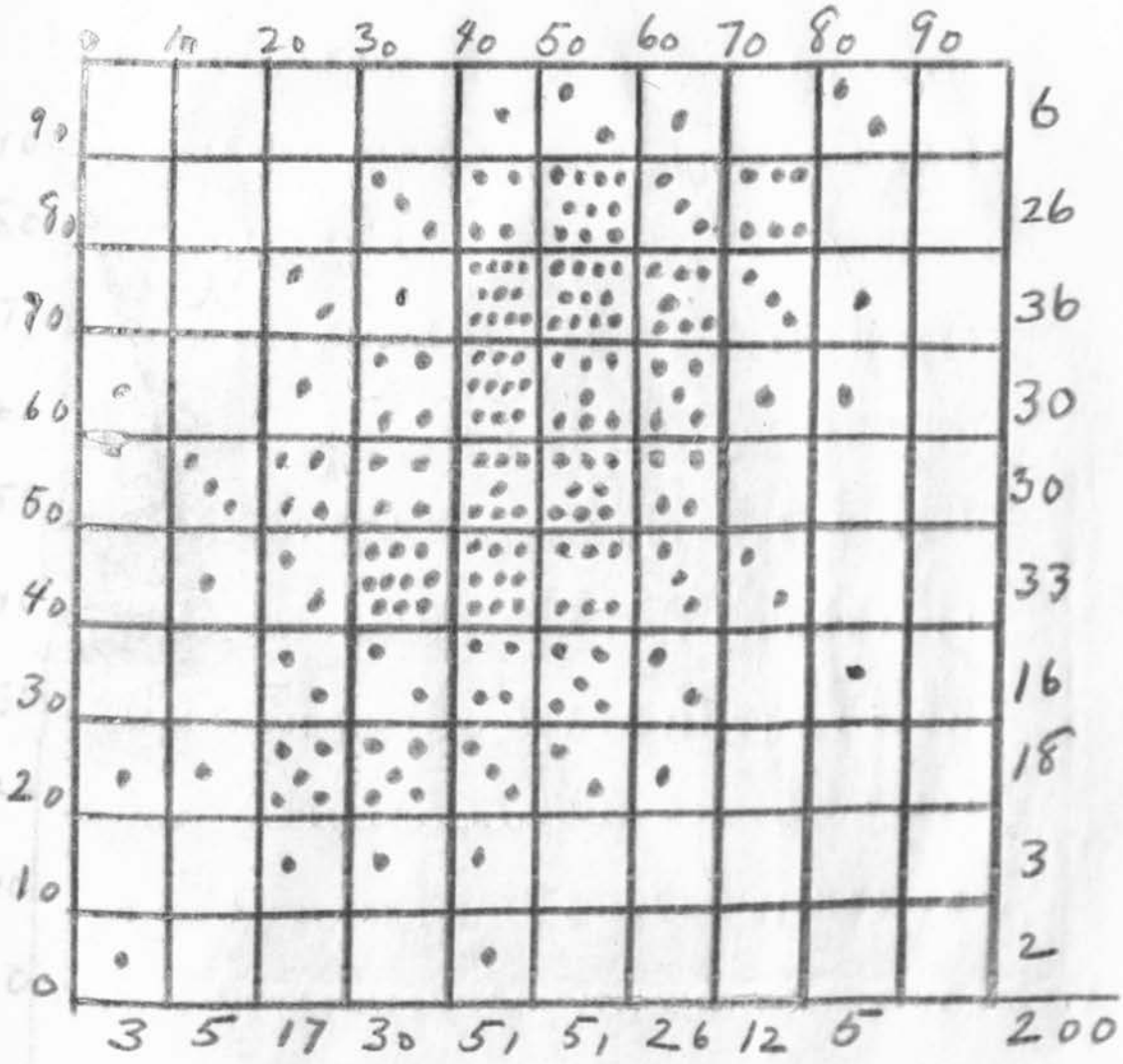


	Median	Quartile	Range	Quartile	Median Retention	
Grammar	59.8	72.2	- 49.3	11.5		
Geography	54.3	64.9	- 42.7	11.1	64.2%	.43

TABLE XXXIX.

Teachers' State Examination, 1912. Correlation Table for Arithmetic and Grammar.

Grammar 1912

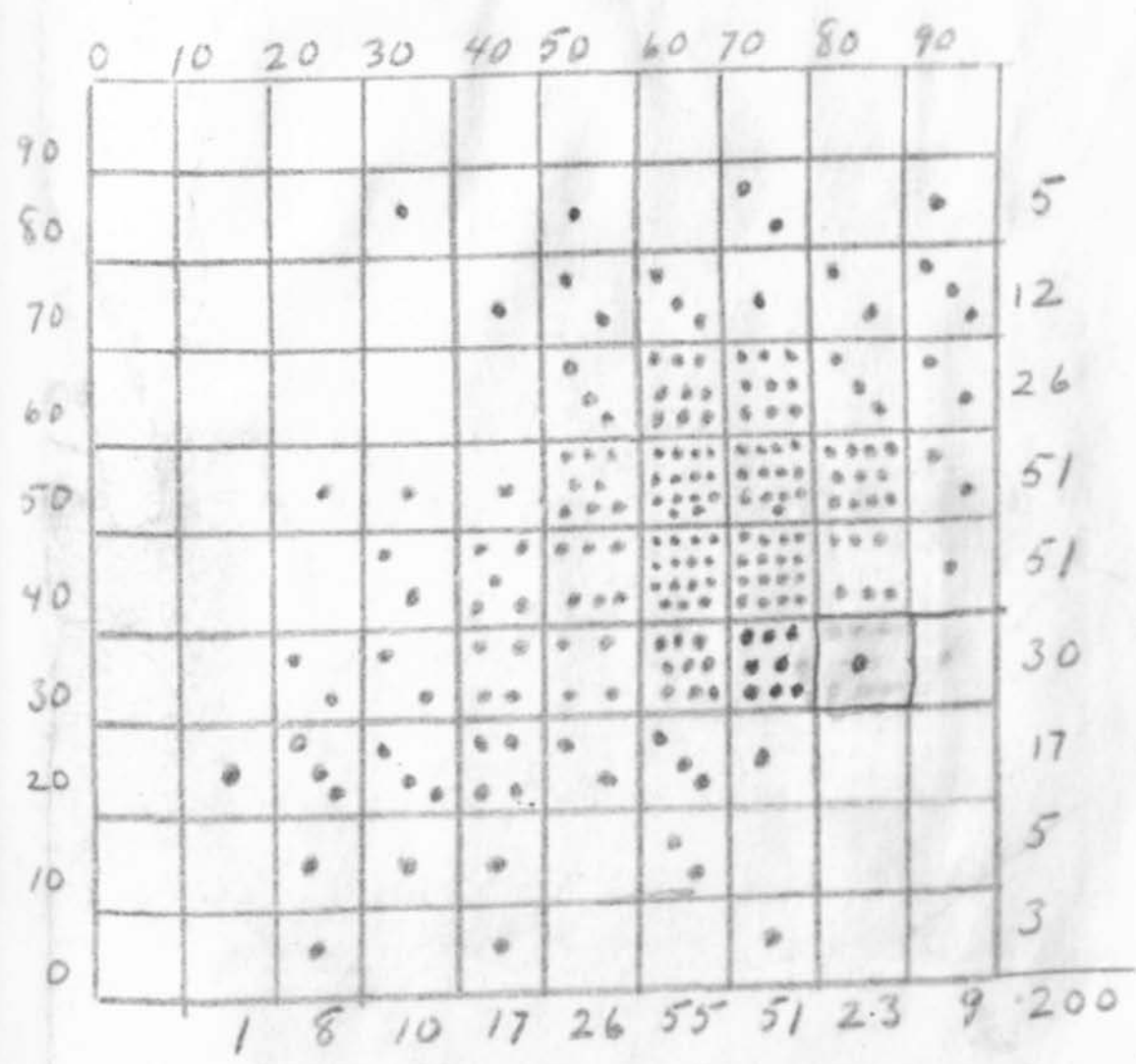


	Median	Quartile	Range	Quartile	Median Retention	#
Grammar	48.8	59.0	- 33.3	10.4		
Arithmetic	59.3	75.0	- 43.3	15.9	64%	.42

TABLE XLc

Teachers' State Examination, 1912. Correlation Table for History and Grammar.

History 1912



	Median	Quartile	Retention	Quartile	Median Retention	r
History	66.9	76.5	55.4	10.6		
Grammar	48.8	59.0	38.3	10.4	60.4%	.33

Teachers' State Examination, 1912. Correlation Table for History and Grammar.

Grammar 1912

0 10 20 30 40 50 60 70 80 90

0 10 20 30 40 50 60 70 80 90

3 2 17 30

Median 48.8

Quartile 59.0

Retention 38.3

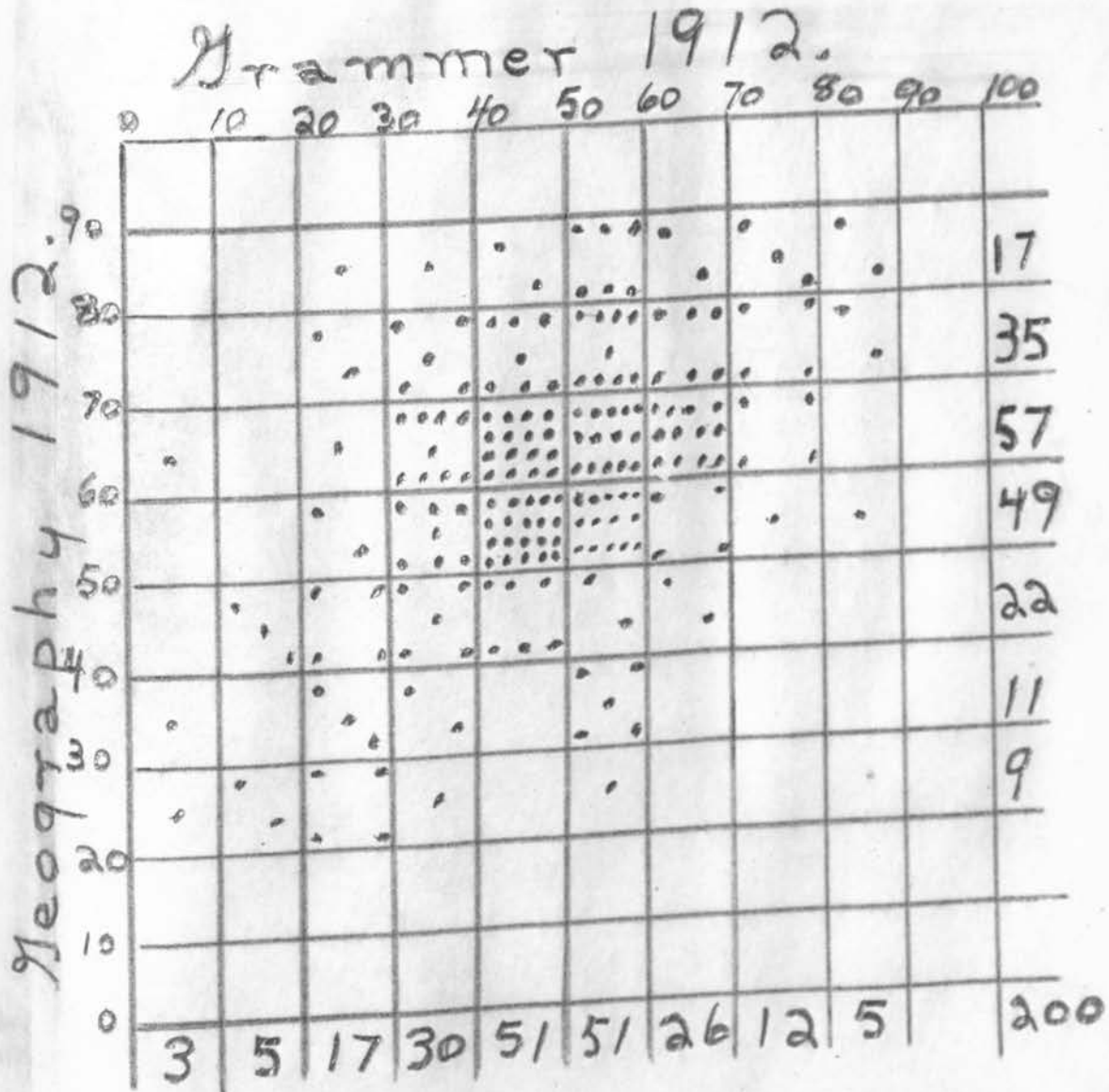
Median 66.9

Quartile 76.5

Retention 55.4

TABLE XLI.

Teachers' State Examination, 1912. Correlation Table for Geography and Grammar.

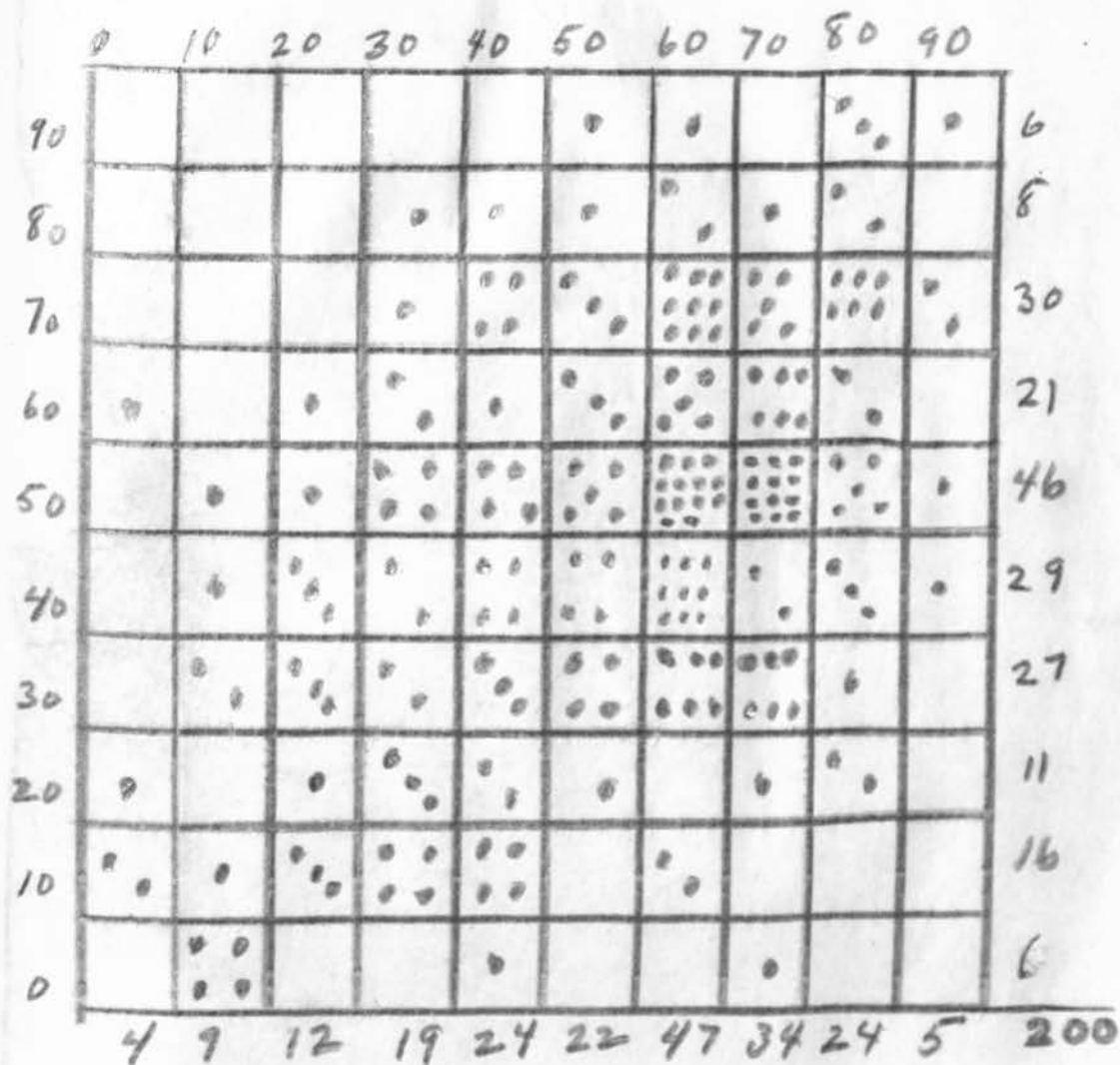


	Median	Quartile Range	Quartile	Median Retention	r
Grammar	48.8	59.0 - 33.3	10.4	62 %	.37
Geography	61.6	70.6 - 51.6	9.5		

TABLE XLII.

Teachers' State Examination, 1913. Correlation Table for Arithmetic and Grammar.

Grammar 1913

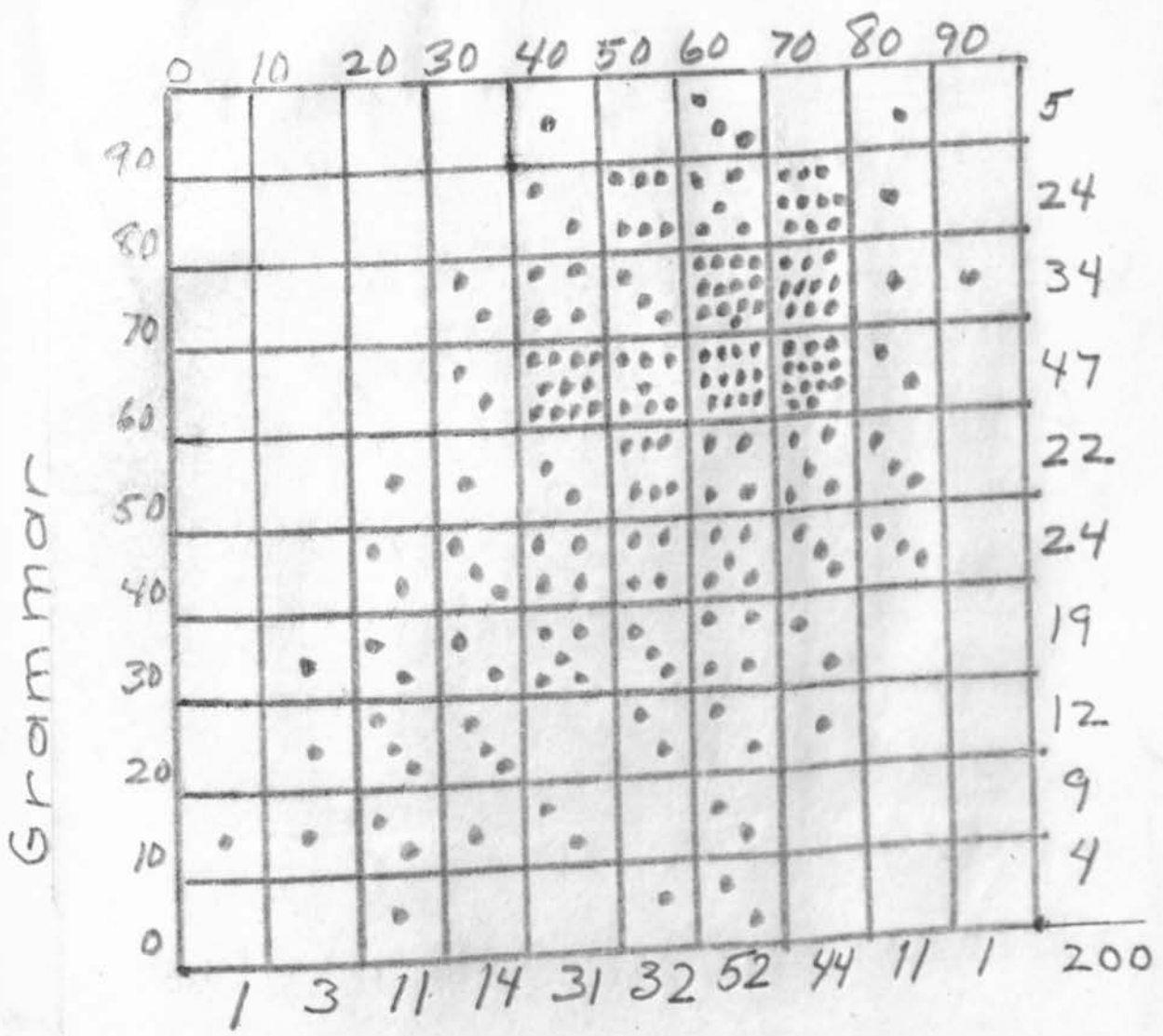


	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	62.1	73.8	- 42.5	15.7		
Arithmetic	52.4	67.1	- 36.3	15.4	62.6%	.38

TABLE XLIII.

Teachers' State Examination, 1913. Correlation Table for History and Grammar.

History 1913

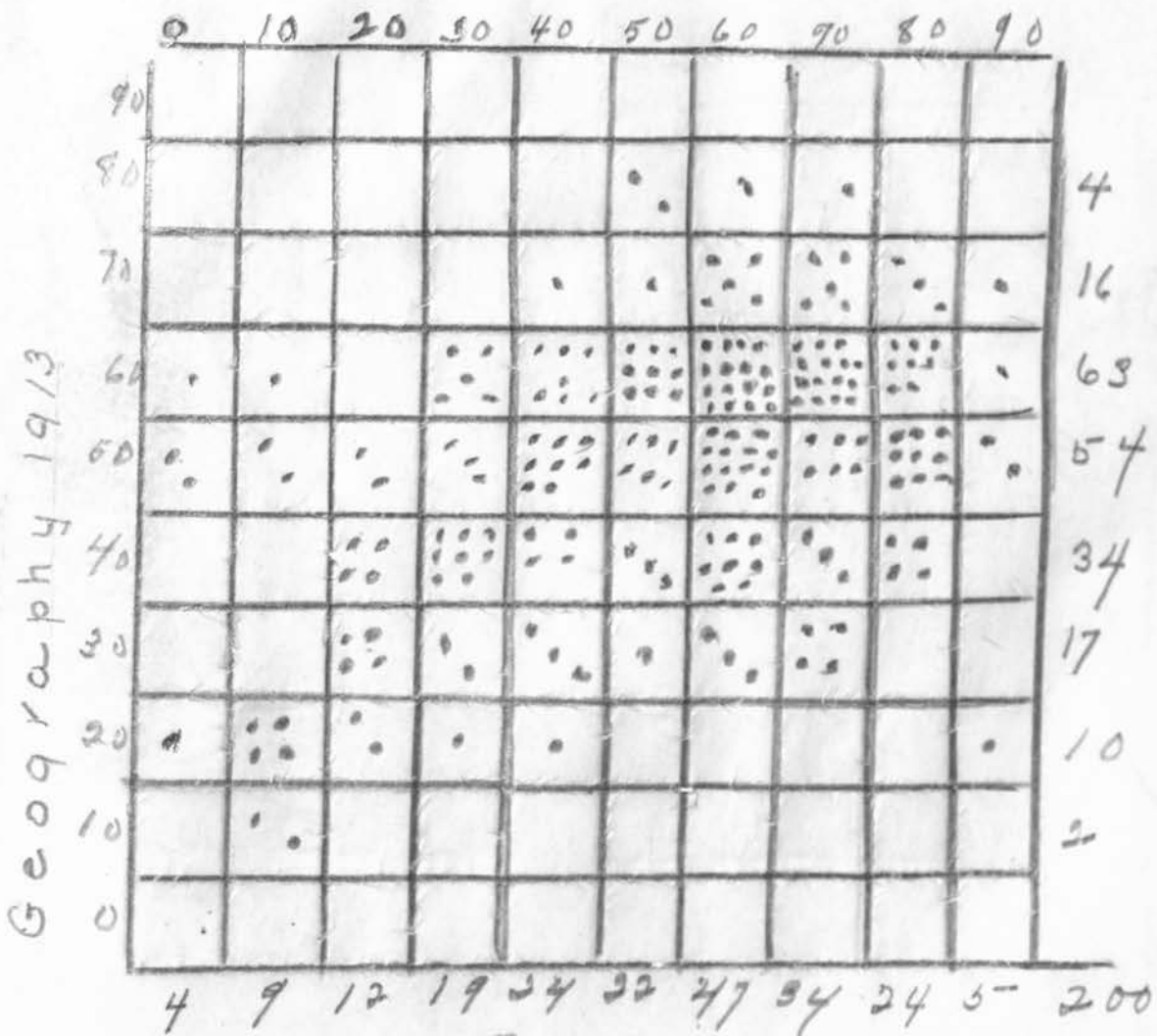


	Median	Quartile	Range	Quartile	Median Retention	*
Grammar	62.1	73.8	- 42.5	15.7	61.6%	.35
History	61.5	71.4	- 46.8	12.4		

TABLE XLIV.

Teacher' State Examination, 1913. Correlation Table for Geography and Grammar.

Grammar 1913

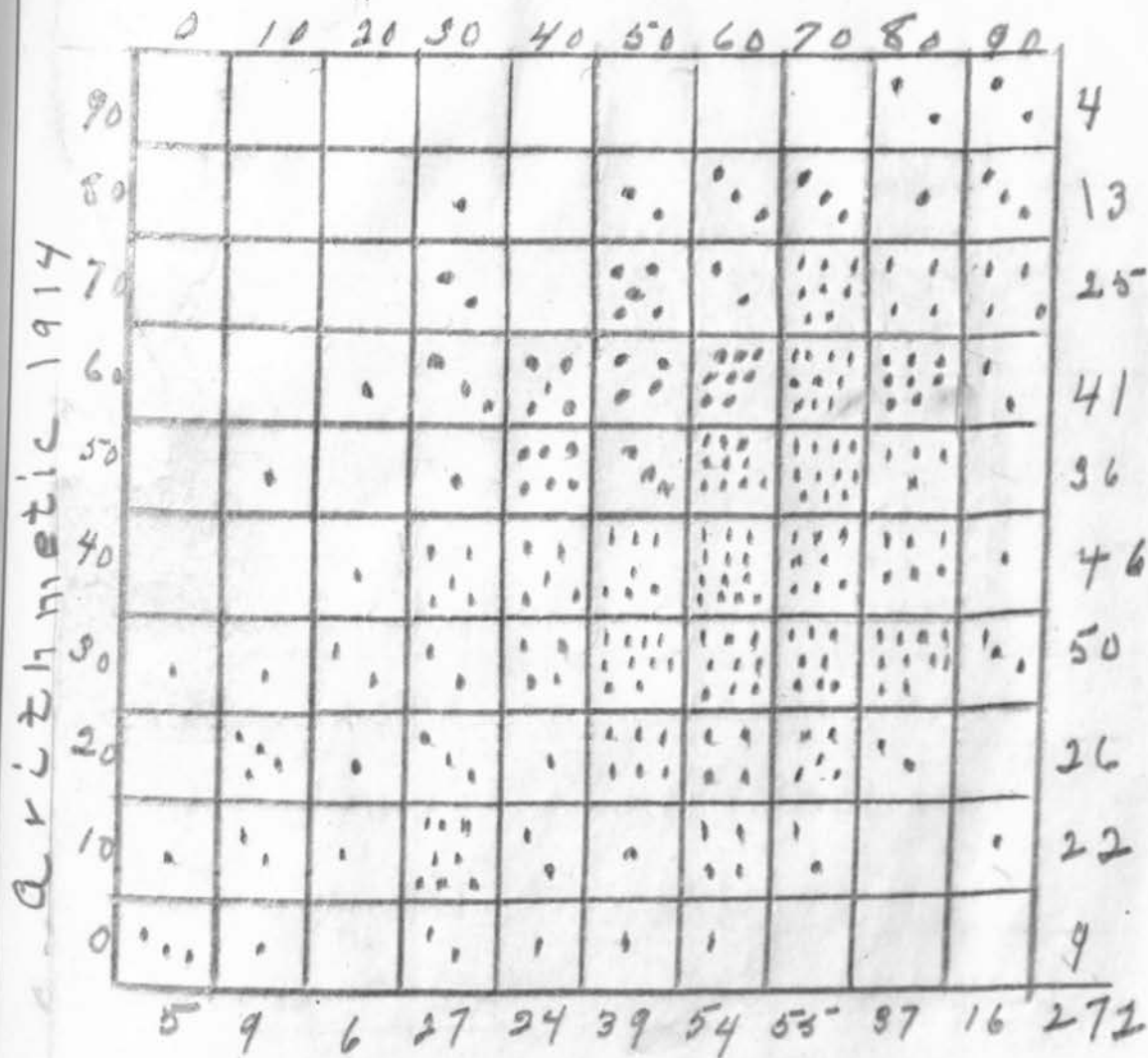


	Median	Quartile	Retention	Range	Quartile	Median	Retention	r
Grammar	62.1	73.8	42.5		15.7			
Geography	56.3	65.2	46.2		9.5	60.2%	.31	

TABLE XLV.

Teachers' State Examination, 1914. Correlation Table for Arithmetic and Grammar.

Grammar 1914



	Median	Quartile	Range	Quartile	Median Retention	r ²
Grammar	64.8	77.3	- 48.3	14.3	60%	.31
Arithmetic	46.1	63.7	- 32.2	15.8		

Good work 1914

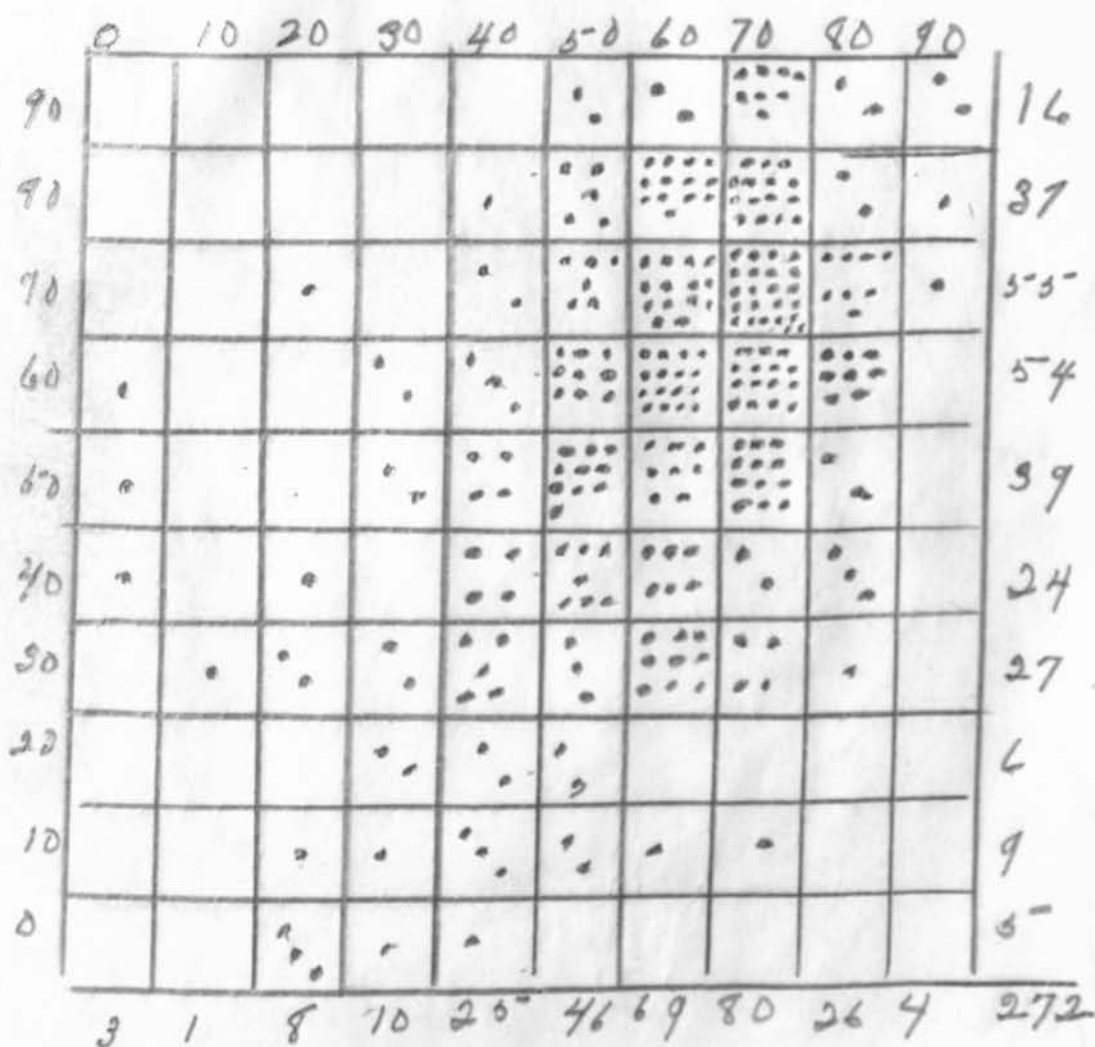
Examined

TABLE XLVI.

Teachers' State Examination, 1914. Correlation Table for History and Grammar.

History 1914

Grammar 1914



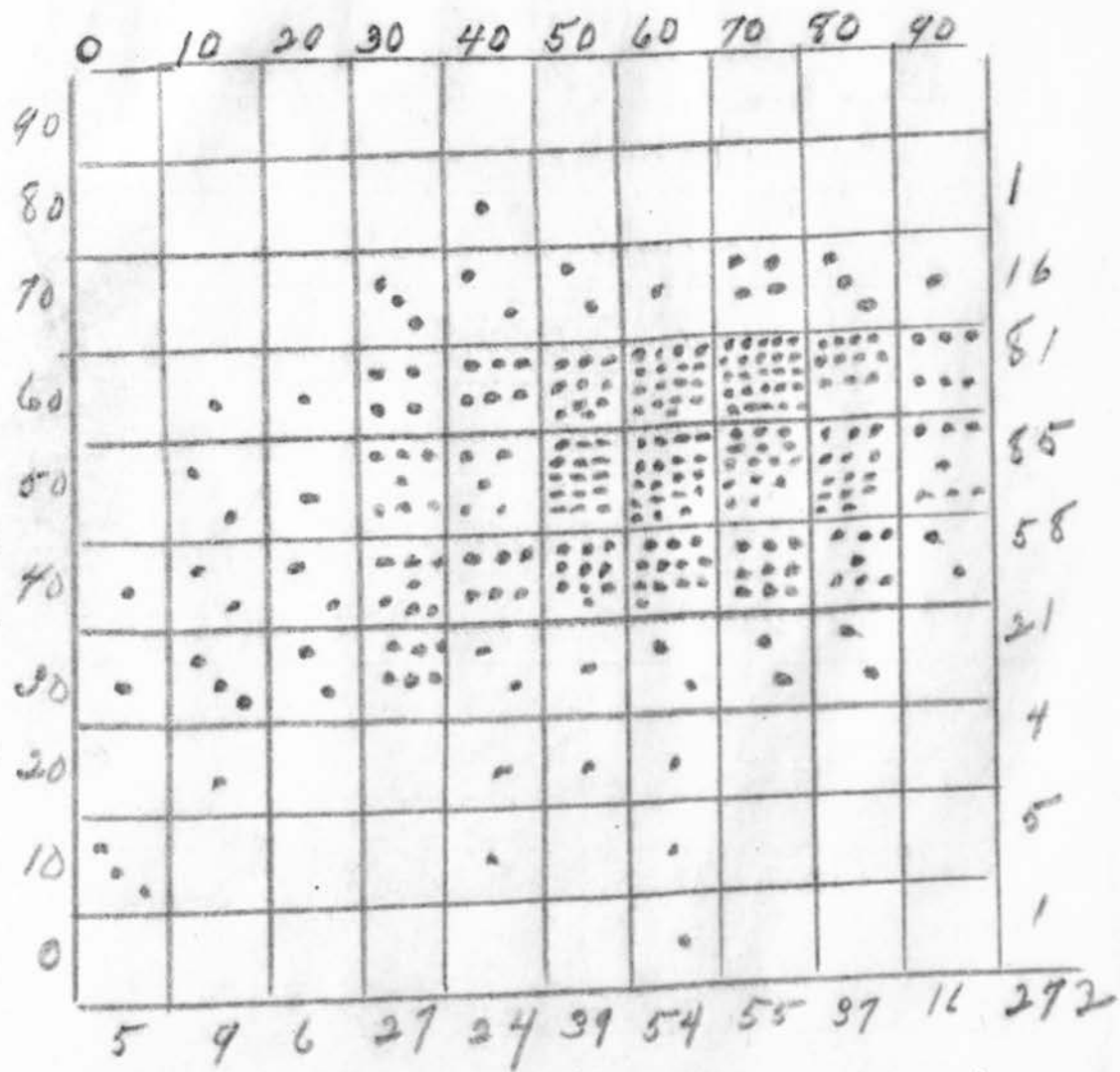
	Median	Quartile	Range	Quartile	Median Retention	r
History	66.2	75.2	- 54.6	10.3		
Grammar	64.8	77.3	- 48.8	14.3	65%	.45

TABLE XLVII.

Teachers' State Examination, 1914. Correlation Table for Geography and Grammar.

Grammar 1914

Arithmetic
Geography 1914



	Median	Quartile	Range	Quartile	Median Retention	%
Grammar	64.8	77.3	- 43.8	14.3		
Geography	55.5	63.7	- 46.4	8.7	58%	.25

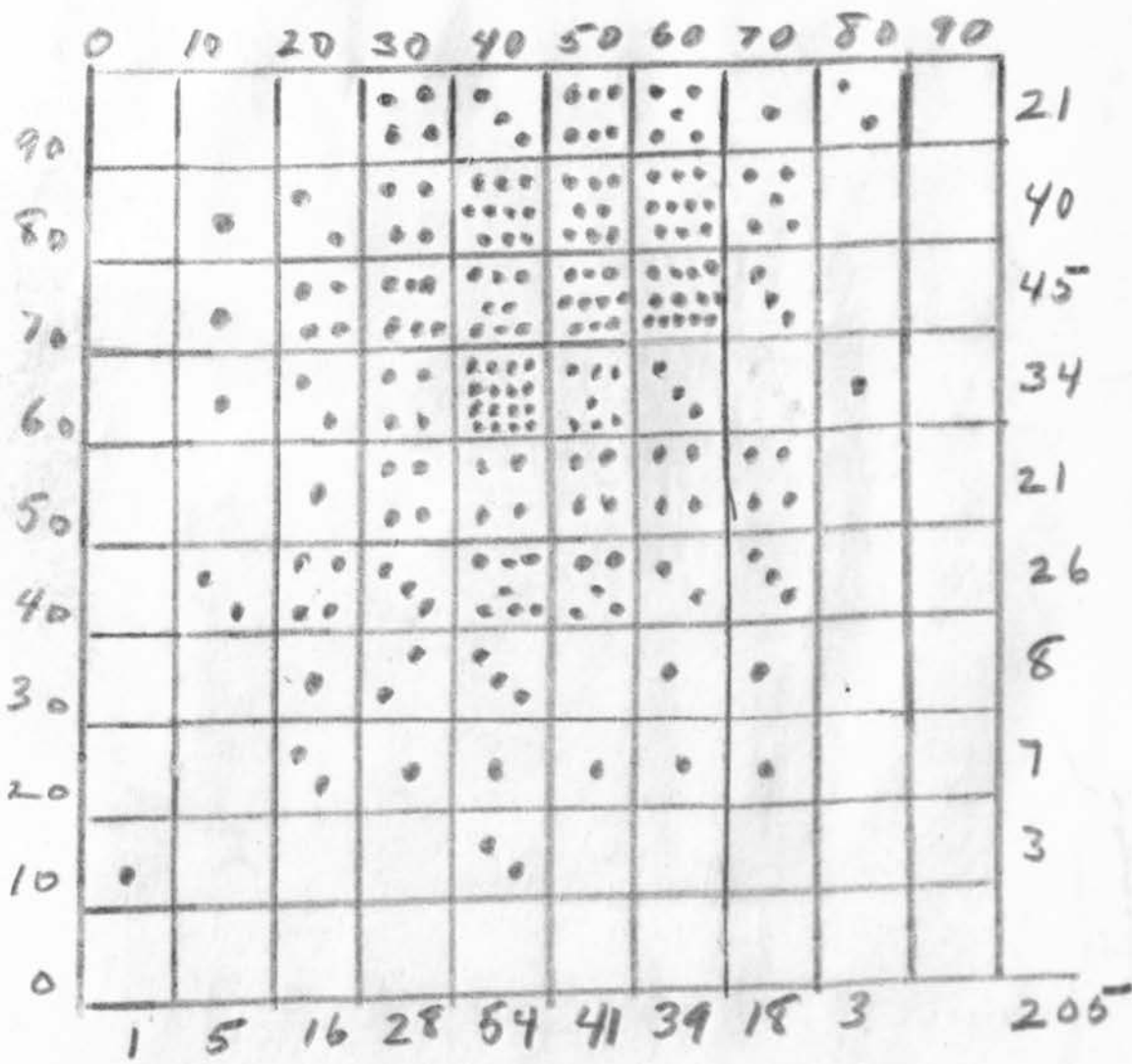
Arithmetic

TABLE XLVIII.

Teachers' State Examination, 1915. Correlation Table for Arithmetic and Grammar.

Grammar 1915

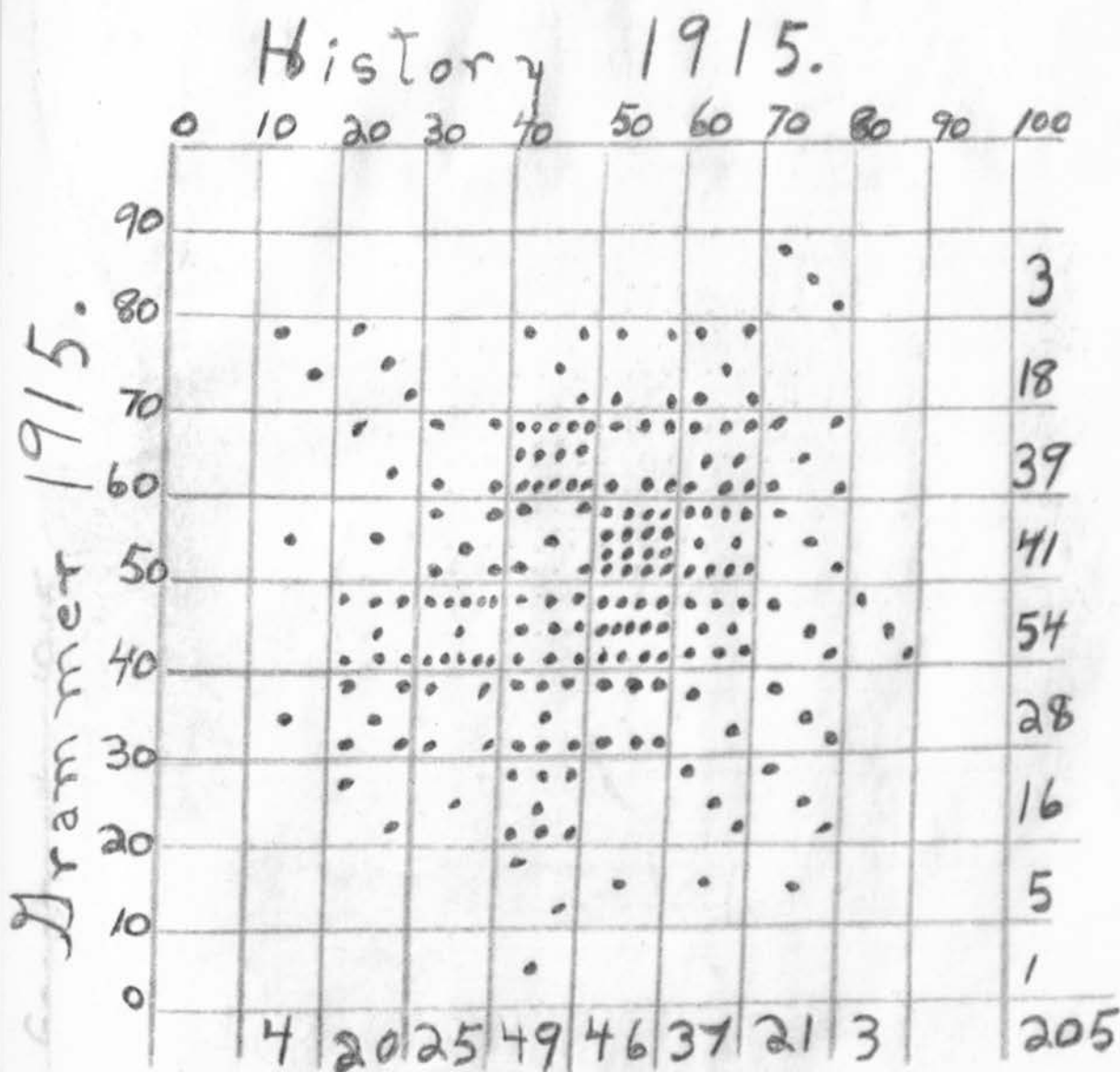
Arithmetic



	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	49.7	62.3	40.2	11.1	60%	.31
Arithmetic	70.8	82.5	53.3	14.6		

TABLE XLIX.

Teachers' State Examination, 1915. Correlation Table
for History and Grammar.



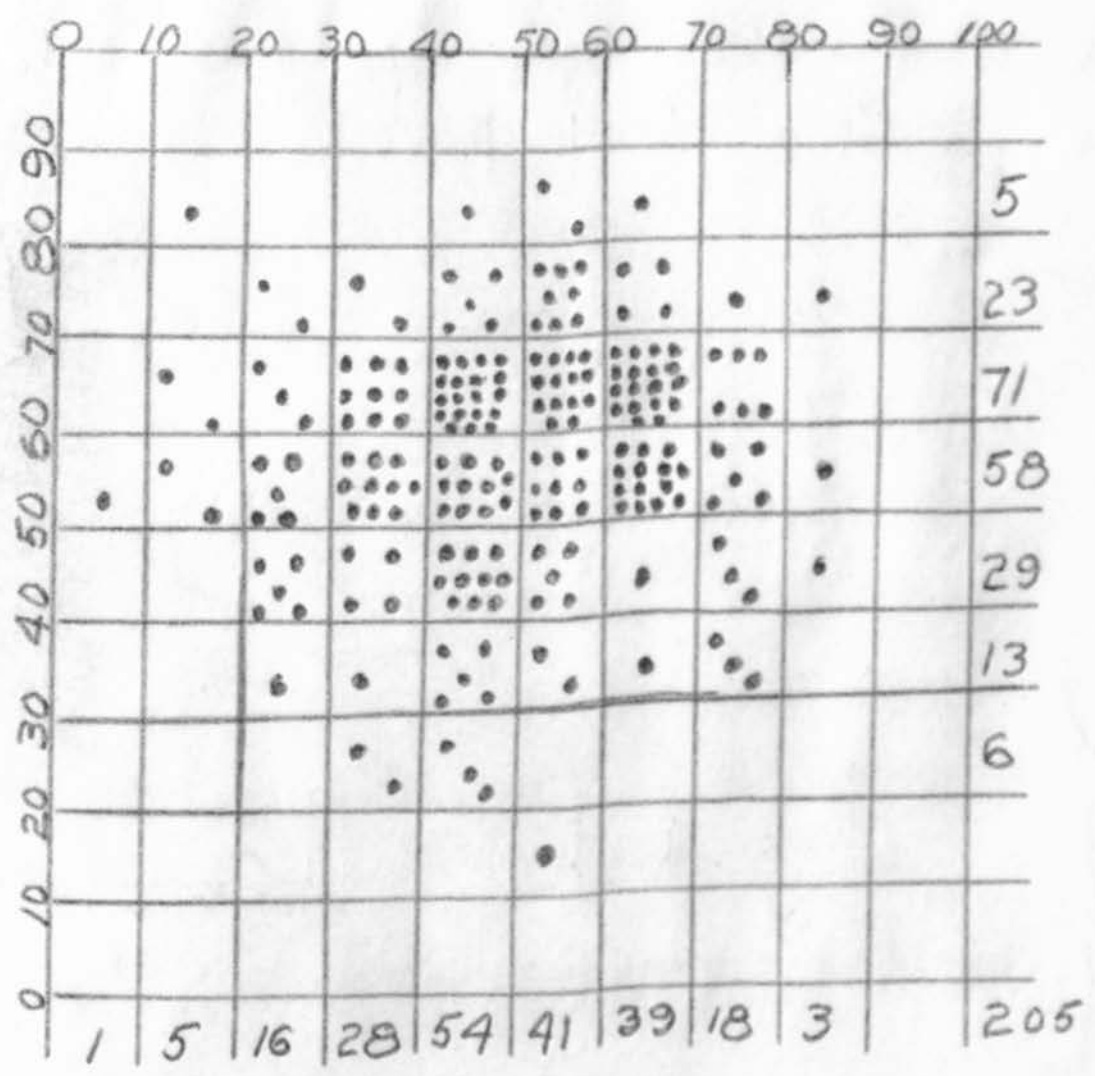
	Median	Quartile	Range	Quartile	Median Retention	r
History	51.0	62.7	40.4	11.2	56 %	.19
Grammar	49.7	62.3	40.2	11.2		

TABLE XXX L.

Teachers' State Examination, 1915. Correlation Table for Geography and Grammar.

Grammar 1915

Geography 1915



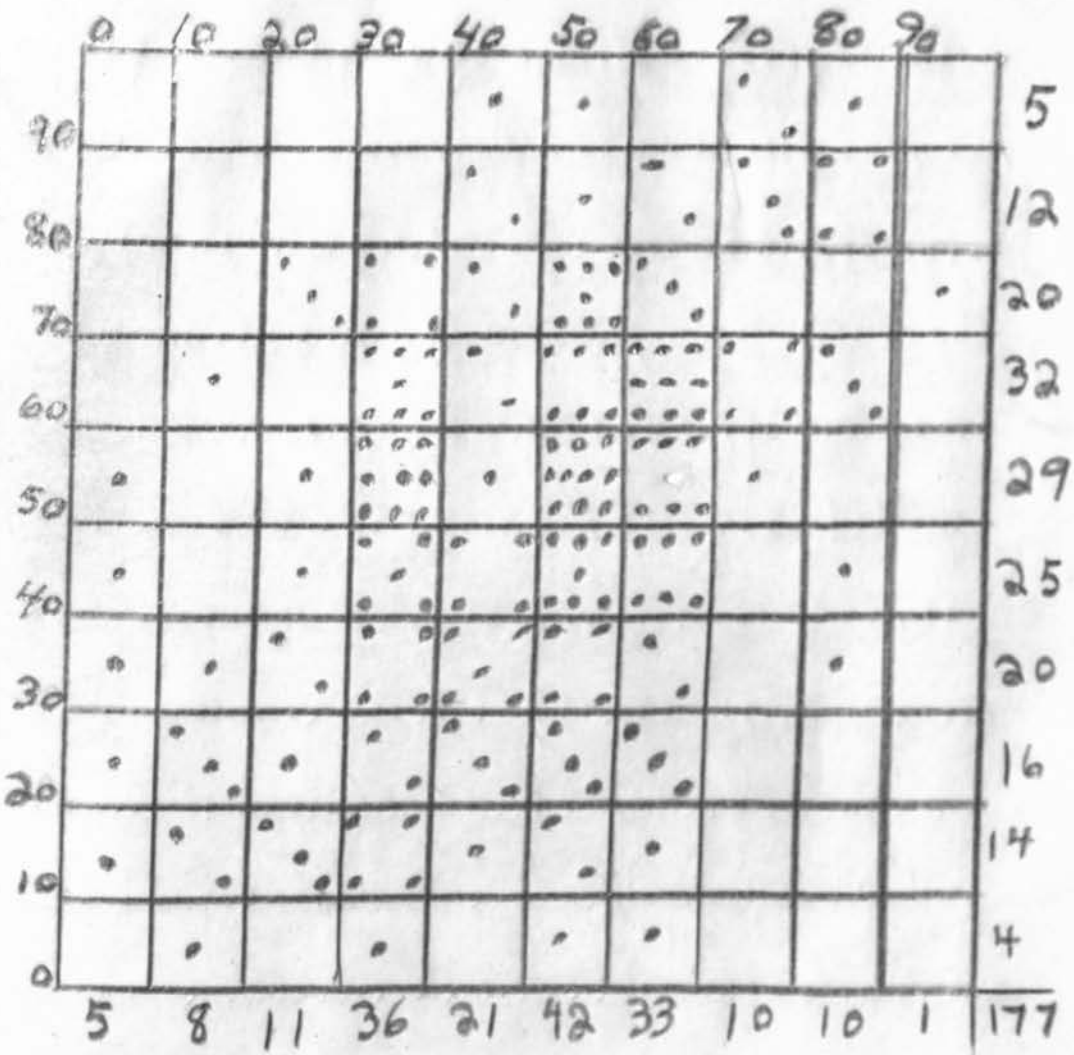
	Median	Quartile Range	Quartile	Median Retention	r
Grammar	49.7	62.3 - 40.2	11.1	56 %	.19
Geography	59.4	68.8 - 50.5	8.2		

TABLE LI.

Teachers' State Examination, 1916. Correlation Table for Arithmetic and Grammar.

Grammar 1916.

Arithmetic 1916.

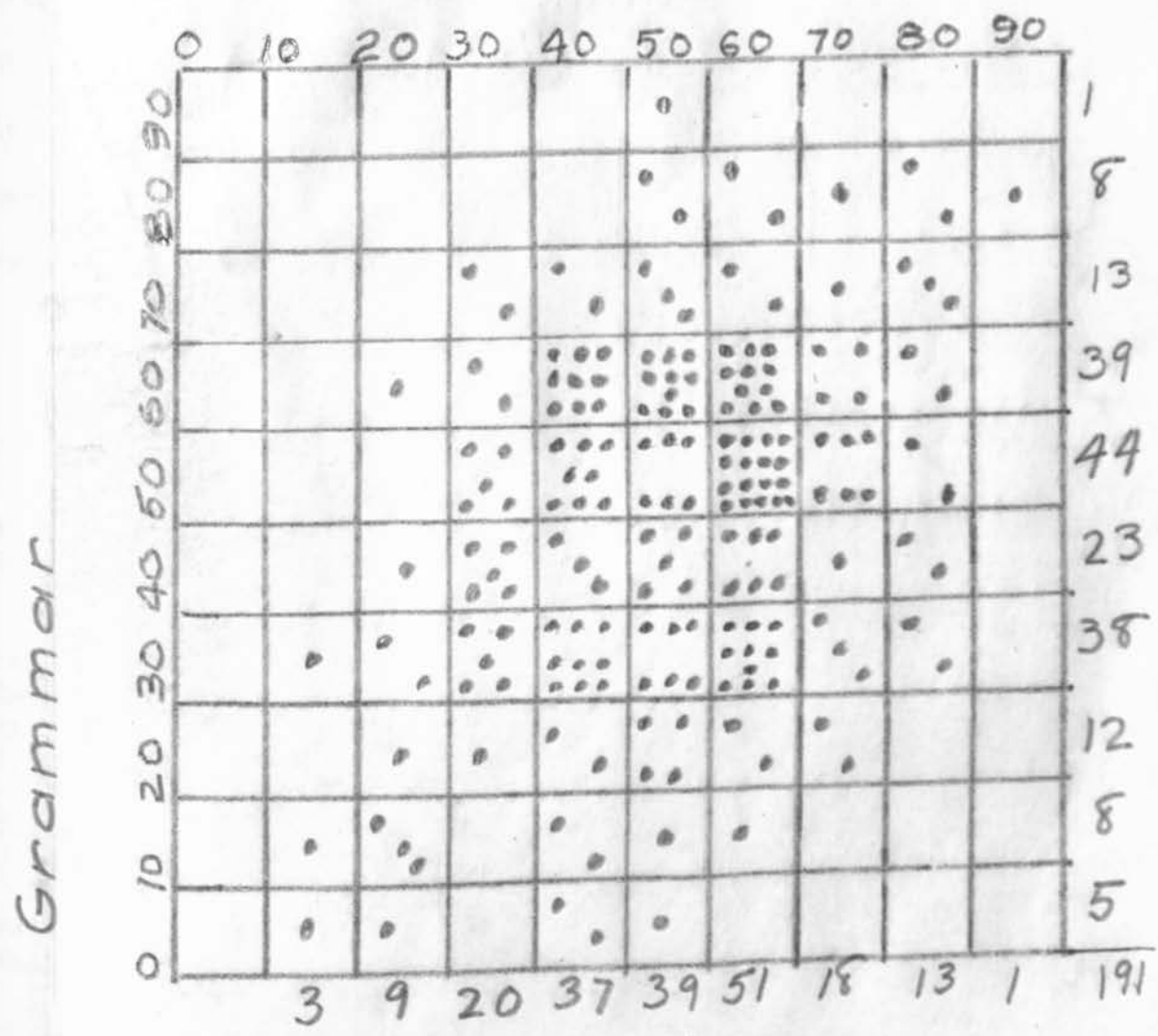


	Median	Quartile	Range	Quartile	Median Retention	*
Grammar	51.8	63.0	- 35.7	13.7		
Arithmetic	53.3	67.3	- 35.0	16.4	61.8%	.36

TABLE LII.

Teachers' State Examination, 1916. Correlation Table for History and Grammar.

History 1916



	Median	Quartile	Range	Quartile	Median Retention	#
History	56.8	66.9	44.3	11.3	xxx	
Grammar	52.2	62.8	36.0	13.4	57.8%	.24

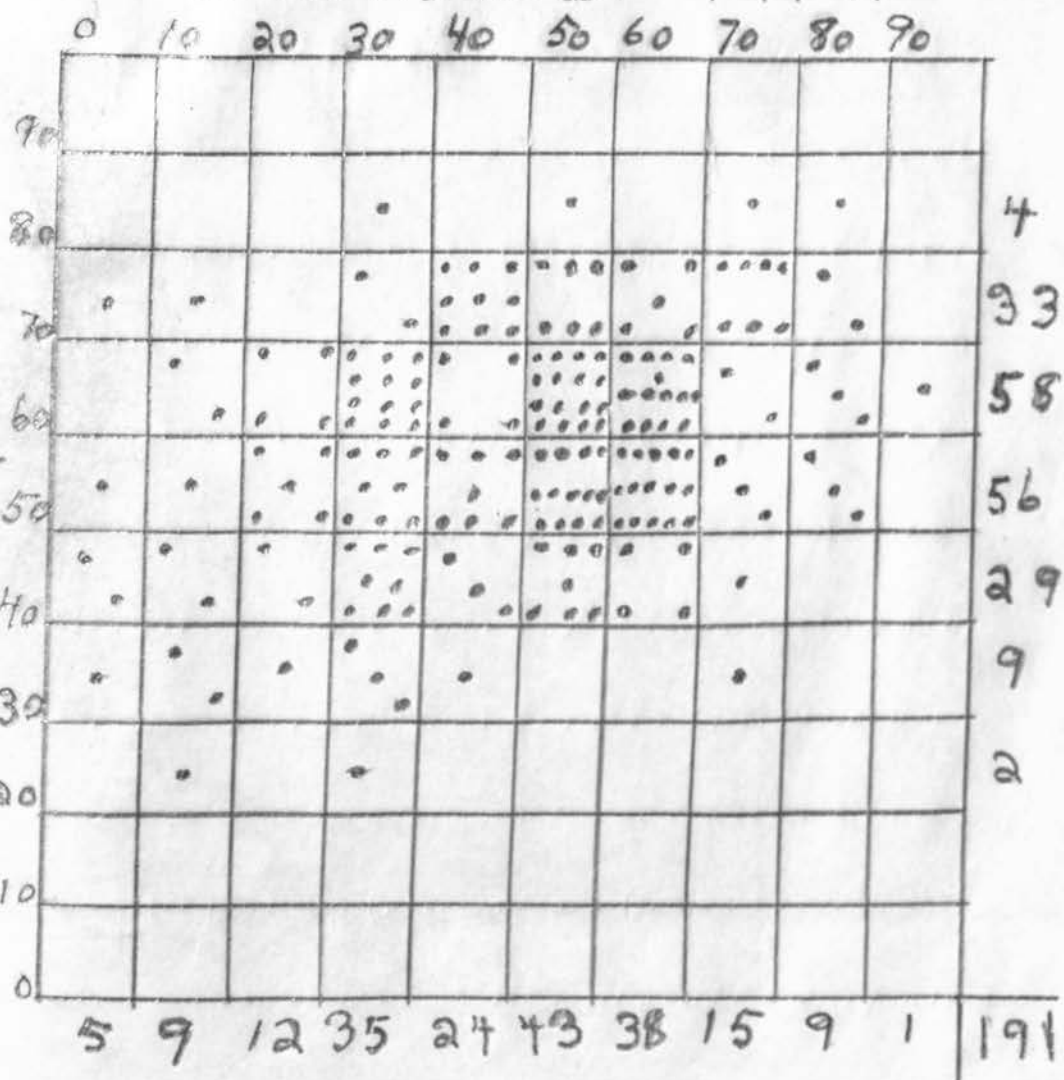
Handwritten notes and a partial scatter plot on the left page of the notebook. The notes include "Math", "Grammar", and "History". The partial scatter plot shows a grid with axes from 0 to 90, similar to the one on the right page.

TABLE LIII.

Teachers' State Examination, 1916. Correlation Table for Geography and Grammar.

Grammar 1916.

Geography 1916.



	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	58.4	63.0	- 36.3	13.8		
Geography	50.7	63.2	- 51.4	8.4	56.4%	.20

TABLE LIV.

Summary Table of Correlations in Per Cent of Median Retention and Pearson Coefficients.

Subjects	Years					Average	Average
	1911	1912	1913	1914	1915	1916	
	MR r	MR r	MR r	MR r	MR r	MR r	MR r
Grammar and Composition	65 .45	57 .22	56 .19	59 .29	60 .32	57 .22	59# .28#
History and Composition	56 .19	53 .11	58 .25	60 .31	57 .22	58 .25	57 .22
Arithmetic and Composition	60 .31	57 .22	57 .22	60 .31	58 .25	56 .20	58 .25
Geography and Composition	61 .34	55 .16	58 .25	62 .35	57 .16	58 .26	58 .25
History and Grammar	60 .31	60 .32	62 .35	65 .45	56 .19	58 .24	60 .31
Arithmetic and Grammar	65.6 .47	64 .42	63 .38	60 .31	60 .31	62 .36	62.4 .50
Geography and Grammar	64 .40	62 .37	60 .31	58 .25	56 .19	56 .20	59 .29
Spelling and Grammar		58 .25					

Explanatory Notes:

MR signifies Median Retention and represents the per cent of cases in the respective correlation tables which excelled or were deficient in the two subjects correlated. See note on page 29

r signifies the Coefficient of Correlation according to the formula for Percentage of Unlike Signed Pairs (Thorndike's Mental and Social Measurements, p 171). Perfect correlation would be represented by ± 1.00 . If there is little or no correlation the figure will be 0.00 or nearly so.

The Probable Error of these correlation figures according to the formula $.67 \frac{1-r^2}{\sqrt{n}}$ is $\pm .04$ to $.05$.

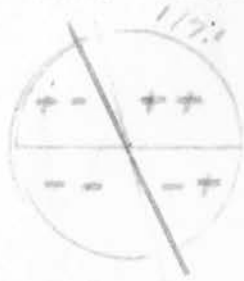
For explanations of the various statistical terms and formulae used the reader is referred to Thorndike's Mental and Social Measurements, Teachers College, Columbia University, 1916.

In the grammar examination for 1911 four of the eight questions were in nature composition questions. This no doubt accounts for the higher correlation between grammar and composition for this year. Omitting the figures for 1911, the average for grammar and composition would be MR 58, r .25.

These correlations may readily be represented geometrically as illustrated in the following ^{Figures} ~~table~~. The sectors marked $++$ and $--$ represent the Median Retention. The sectors marked $+ -$ and $- +$ represent the cases which were above the median in one subject but below in the other. If there were no correlation the lines would cross at right angles. Composition and history for 1912 illustrates a very small correlation, MR 53, r.11.

Gram.-Comp. G.-Hist. A.-Arith. G.-Geog.

911



912



913



914



915



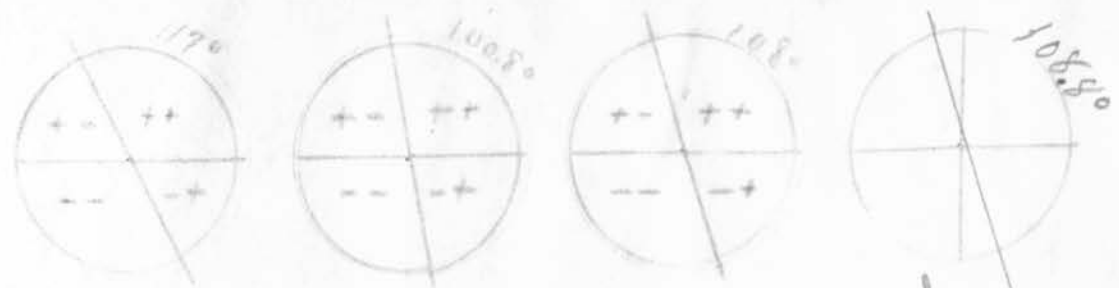
916



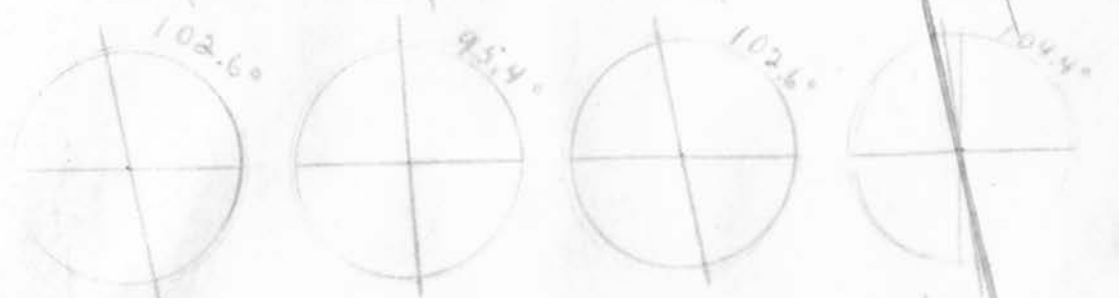
Fig. 1. Correlations of Grammar with Composition, History, Arithmetic, and Geography in Teachers' State Exxx Examinations 1911-1916. The Amount of Correlation Indicated by the Size of the Sectors Marked ++ and --.

Comp.-Gram. C. - Hist. C. - Arith. C. - Geog.

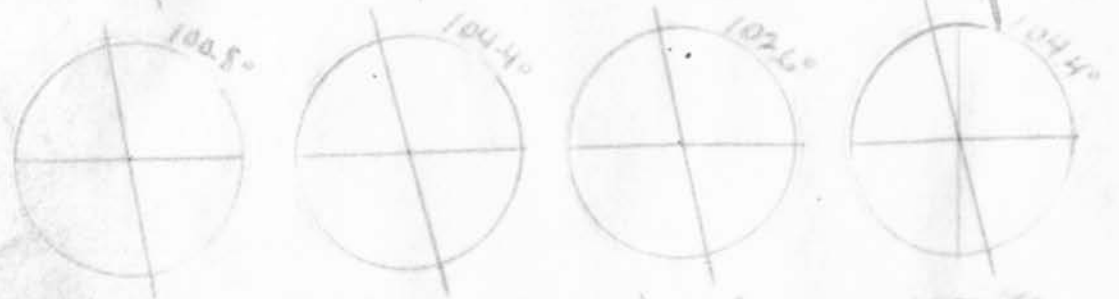
1911



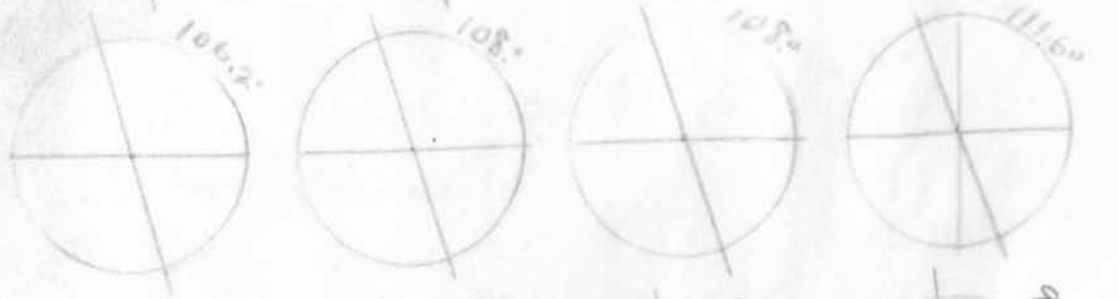
1912



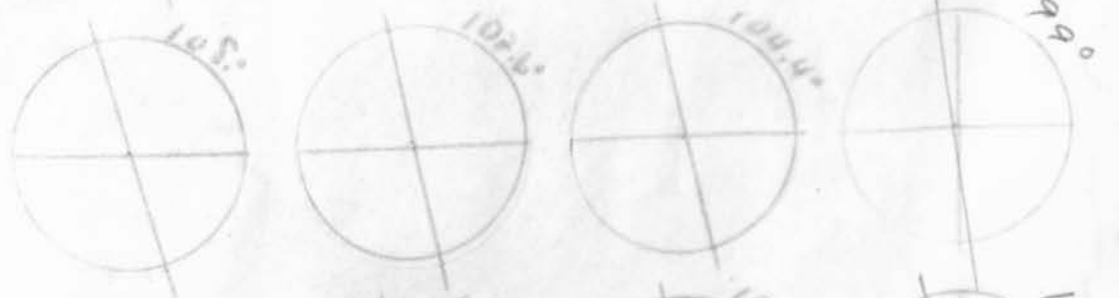
1913



1914



1915



1916

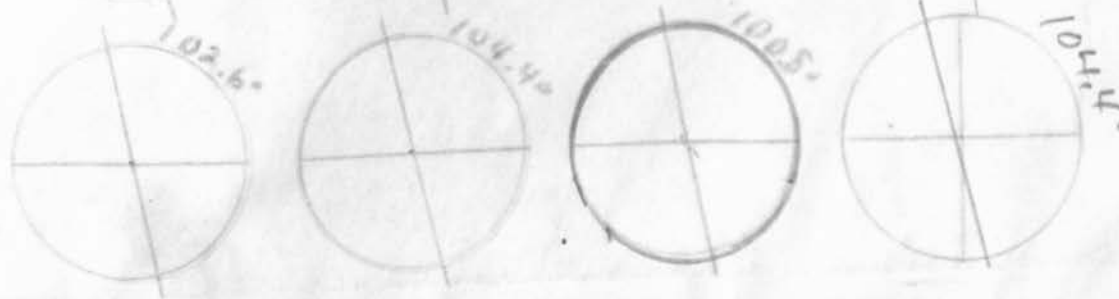


Fig. 2. Correlations of Composition with Grammar, History, Arithmetic, and Geography in Teachers' State Examinations for 1911-1916. The Amount of Correlation Indicated by the Size of the Sectors Marked + + and - -.

(8)

In view of the fact that some authors have preferred the Tertile Retention as a figure for correlation it was *for the purpose of comparison* thought best to use this method for the most significant tables. The results were as follows:

TABLE ~~LV~~ LV.

Correlations of Composition with Grammar, History, and Arithmetic in ~~State~~ Teachers' State Examinations for 1911-1916. Amount of Correlation in ~~Table~~ Per Cent of Tertile Retention.

Subjects	1911	1912	1913	1914	1915	1916	Average
Grammar and Composition	% 45	% 37	% 40.5	% 42	% 45	% 39.5	41.5
History and Composition	40	35	45.5	37	41	44.5	40.5
Arithmetic and Composition	45	43	44.5	45.5	38	38	42.3

Representing the averages of the distributions for each examination geometrically and by per cents we get the following ~~table~~ *Figures (9) showing this* tables of average Tertile Distribution:

- (8). Carter, Ralph E., Correlation of Elementary Schools and High Schools. El. School Teach. 12:109-118. 1911.
Clement, J. O., Standardization of Schools of Kansas. Chicago. 1912.

(9) Explanatory Notes: *Figure* The reading of the ~~table~~ for Grammar and Composition would be as follows: Of the 1277 cases 14.91% were in the upper ~~table~~ Tertile in both subjects, 10.41% were in the middle Tertile, and 16.16% were in the lower Tertile. That is, 41.48% were in the same Tertile group in both subjects. This constitutes the Tertile Retention. 6.75% were in the upper Tertile in grammar but in the lower Tertile in composition, 11.75% were in the upper Tertile in grammar but in the middle Tertile in composition, etc.

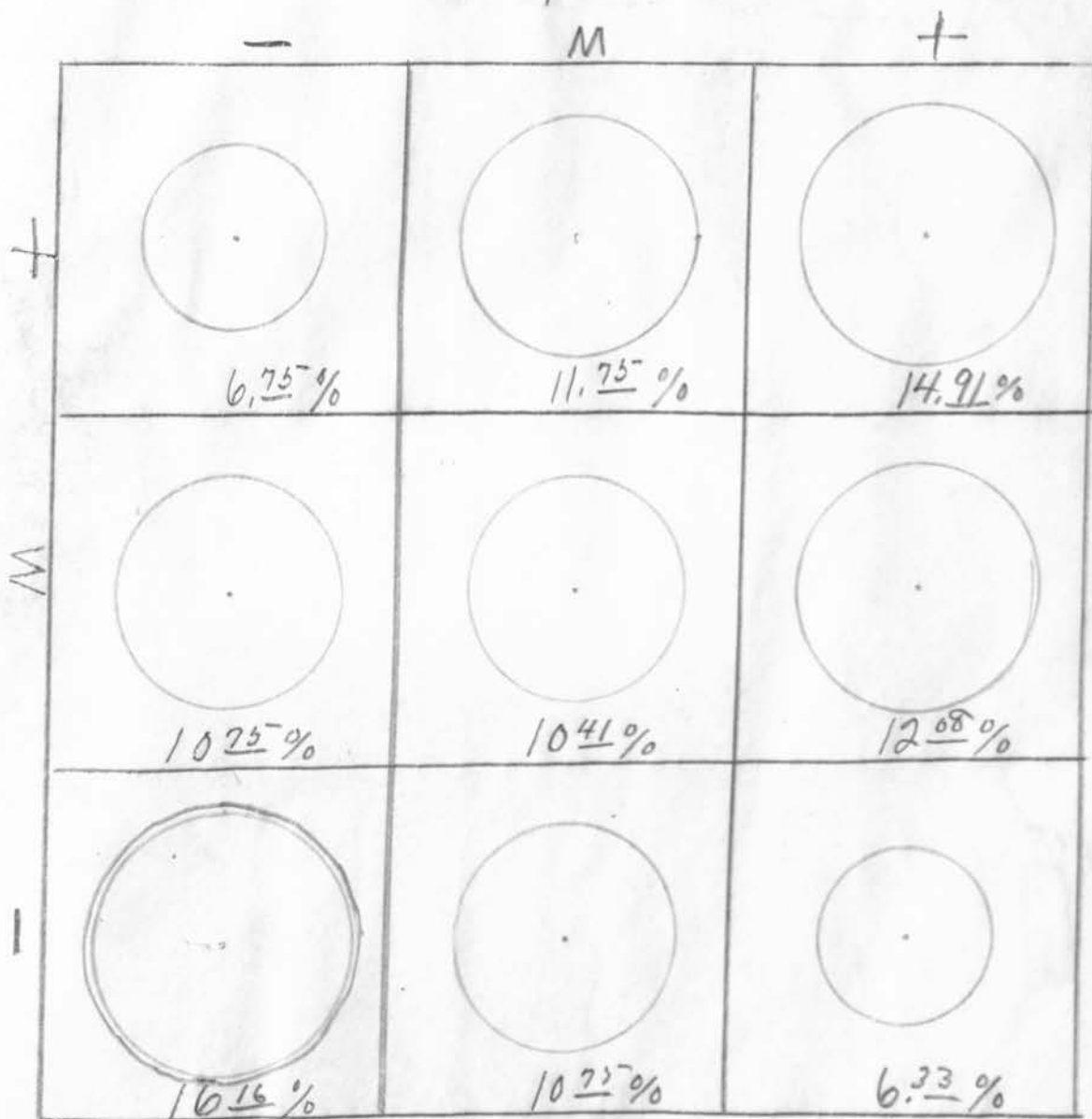
Tertile Distribution

Teachers' State Examinations

1911-1916

Composition

Grammar.



1277 Cases.

Fig. 3. Average Per Cent of Tertile Distribution of Marks in Grammar and Composition in Teachers' State Examinations for 1911-1916.

Average Per Cent of Tertile Distribution
 Teachers' State Examination

1911-1916

Composition.

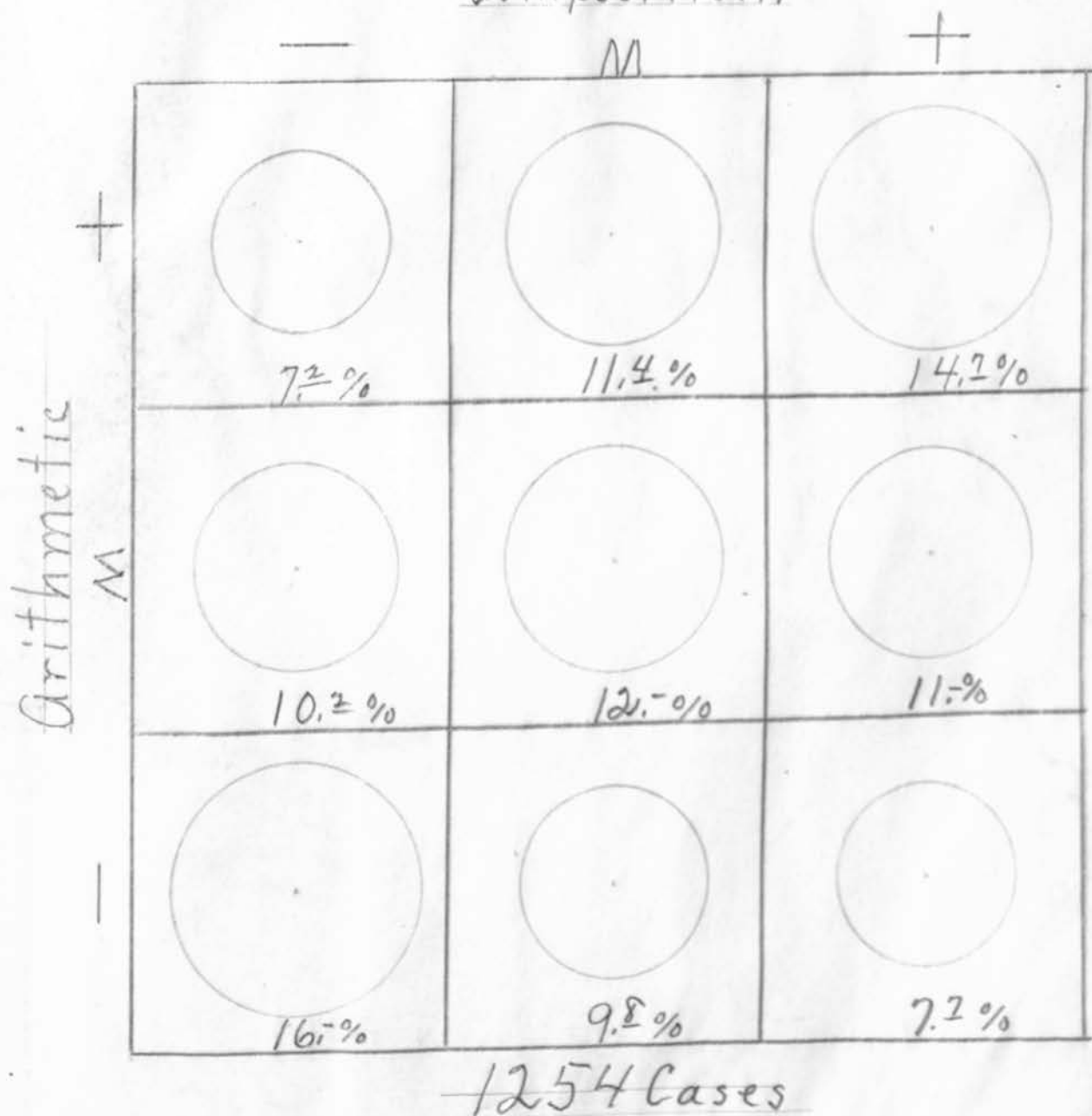
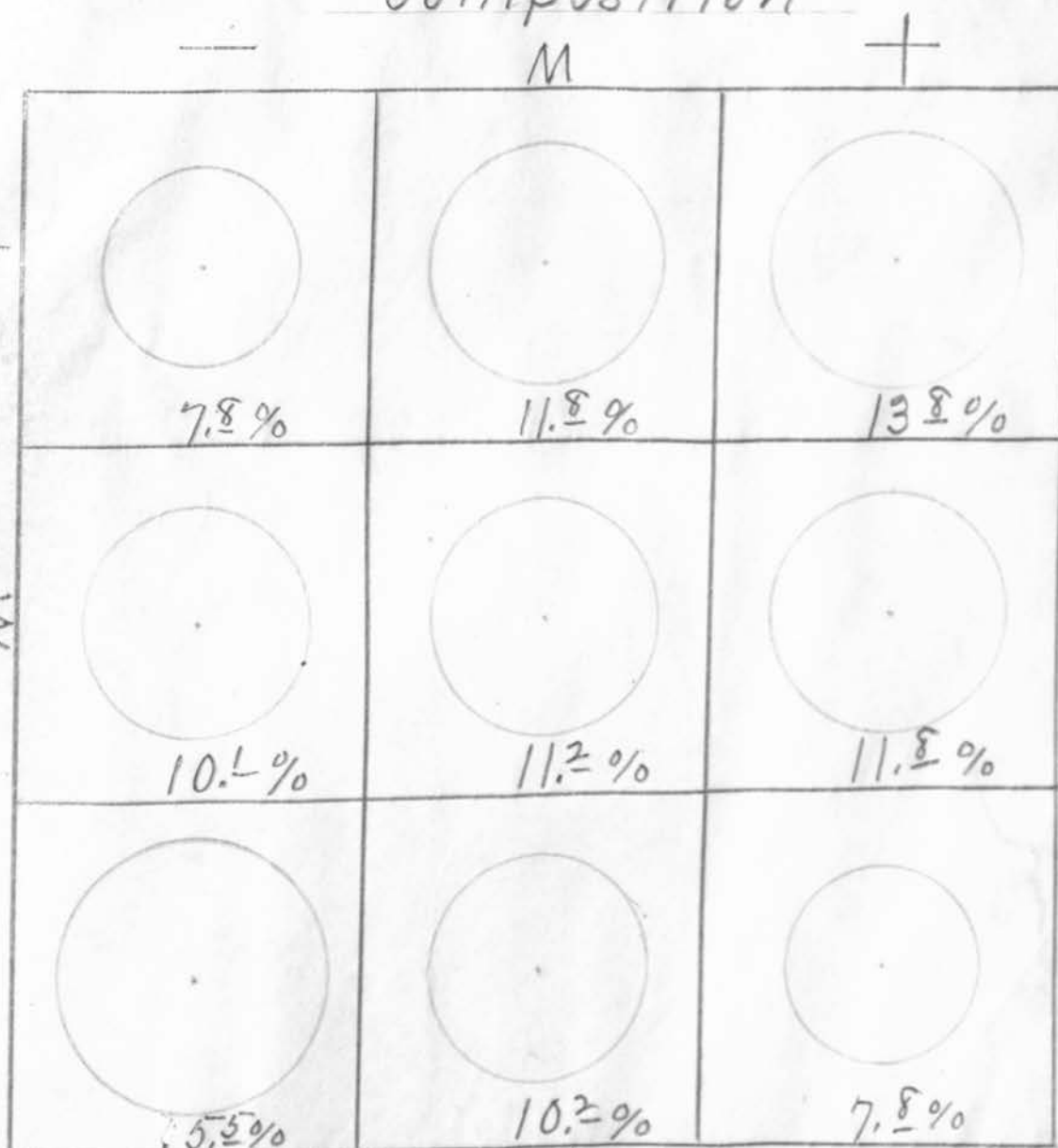


Fig. 4. Average Per Cent of Tertile Distribution of Marks in Arithmetic and Composition in Teachers' State Examinations for 1911-1916.

F. 9.5
 Tertile Distribution
 Teachers' State Examinations
 1911-1916
 Composition

U.S. History.



1268 Cases

Fig. 5. Average Per Cent of Tertile Distribution of Marks in History and Composition in Teachers' State Examinations for 1911-1916.

5. Correlations Based on Marks from State High School Board Examinations.

In order to obtain further evidence in the case an investigation was made of the returns of the State High School Board examinations for 1914 and 1915. In these examinations only those papers which are marked pass by the teachers or superintendents are forwarded to the state department. It is therefor impossible to show any figure of correlation based upon the entire ~~returns~~

number of papers written. However, as the State Department classifies the papers received into the three classes 75 plus, 65 plus, and Failed, some indication of the presence or absence of correlation should appear from the study of these groups. The results are presented in the following ^{Figures} tables:

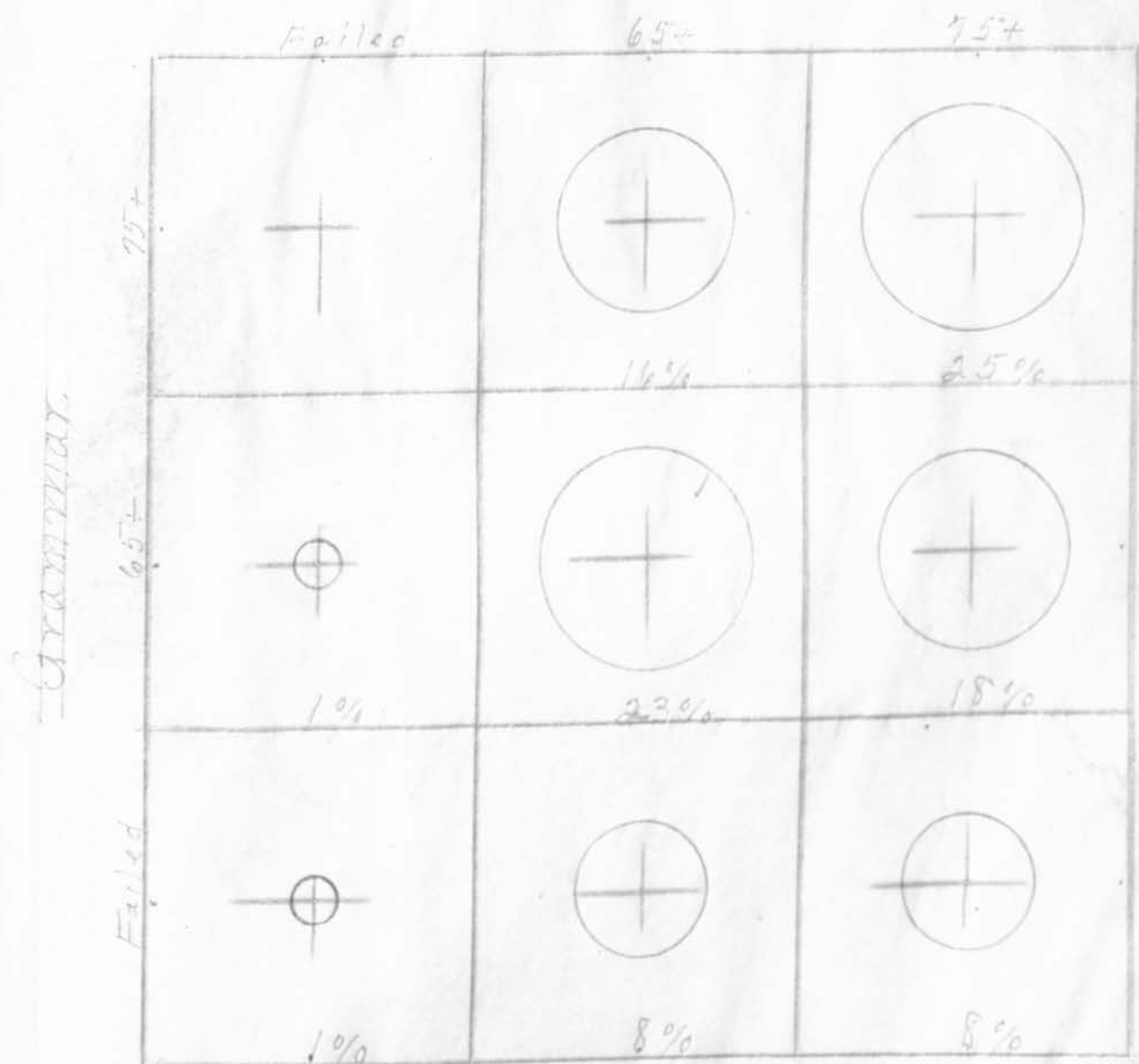
Figure

About 100

Explanatory Notes. The *Figure* table for Grammar and Composition for 1914 is read as follows: Of the 897 cases here tabulated and representing the returns from towns and cities in various parts of Minnesota, 25% were graded as 75 plus in both subjects by the State Department, 16% were graded as 75 plus in grammar but 65 plus in composition, 18% were given 75 plus in composition but 65 plus in grammar, 23% were given 65 plus in both subjects, 1% were given Failed in composition but 65 plus in grammar, etc.

Composition.

1914












897 Cases.

Fig. 6. Distribution of Grades in Grammar and Composition in the State High School Board Examination for 1914.

Fig. 7.

History

1914

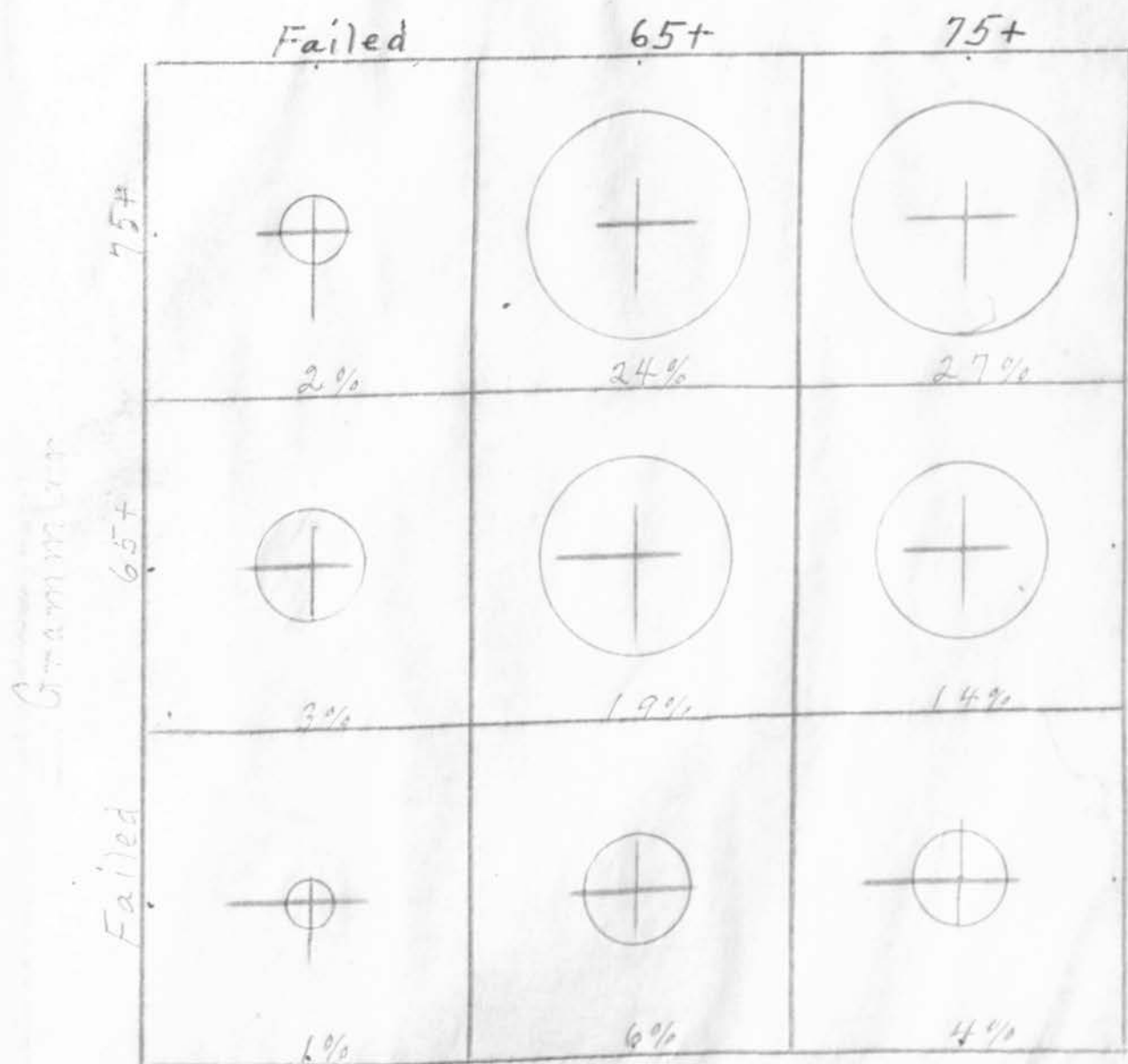
		Failed	65+	75+
Grammar	75+	 2%	 14%	 25%
	65+	 4%	 17%	 20%
	Failed	 3%	 8%	 7%

867 Cases.

Fig. 7. Distribution of Grades in Grammar and History in the State High School Board Examination for 1914.

Composition

1915



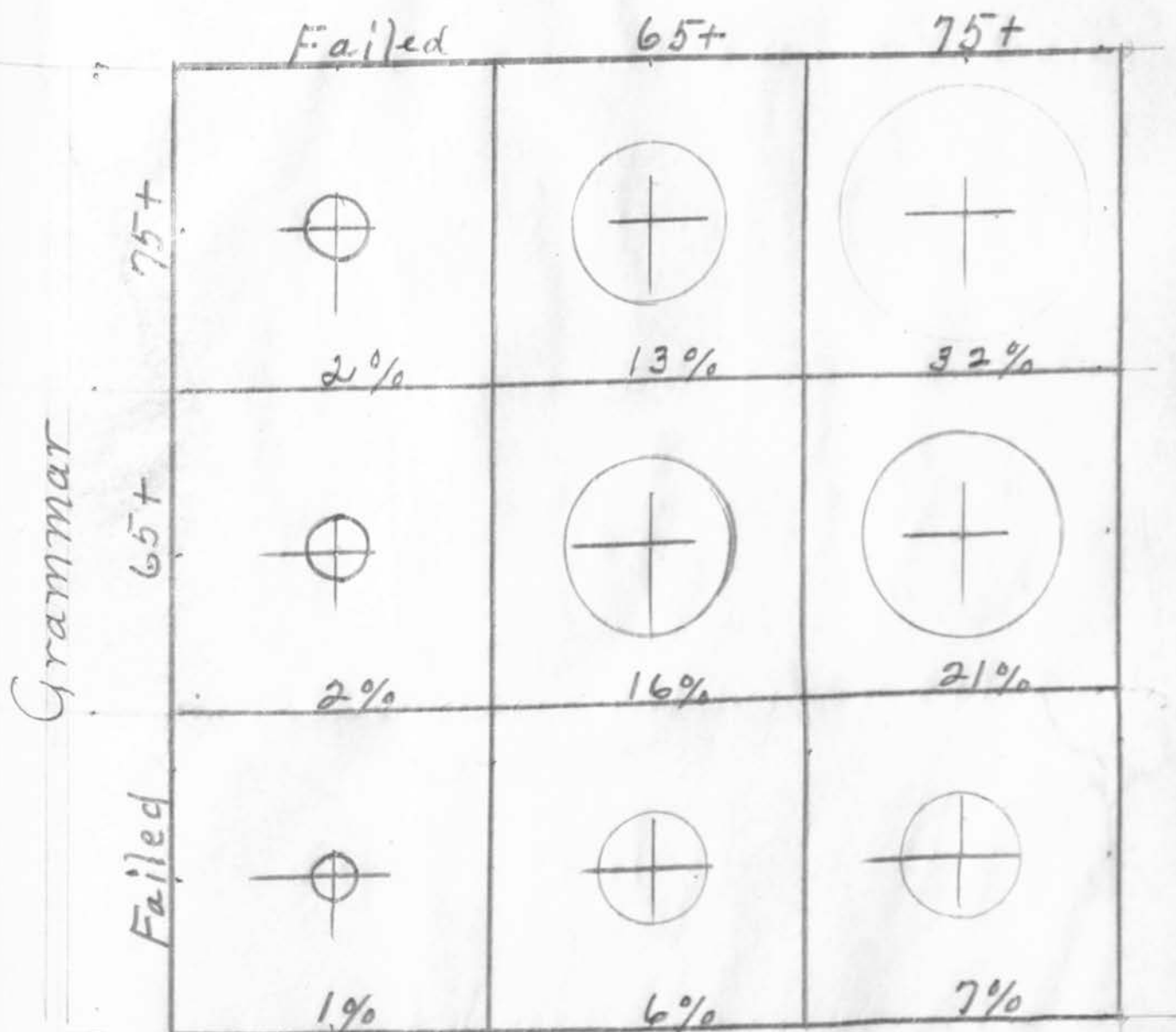
~~1401~~ Cases.
601

Fig. 3. Distribution of Grades in Grammar and Composition in the State High School Board Examination for 1915.

Fig. 9

State High School Board Examination

U.S. History, 1915



1022 Cases.

Fig. 9. Distribution of Grades in Grammar and History in the State High School Board Examination for 1915.

History.

1915

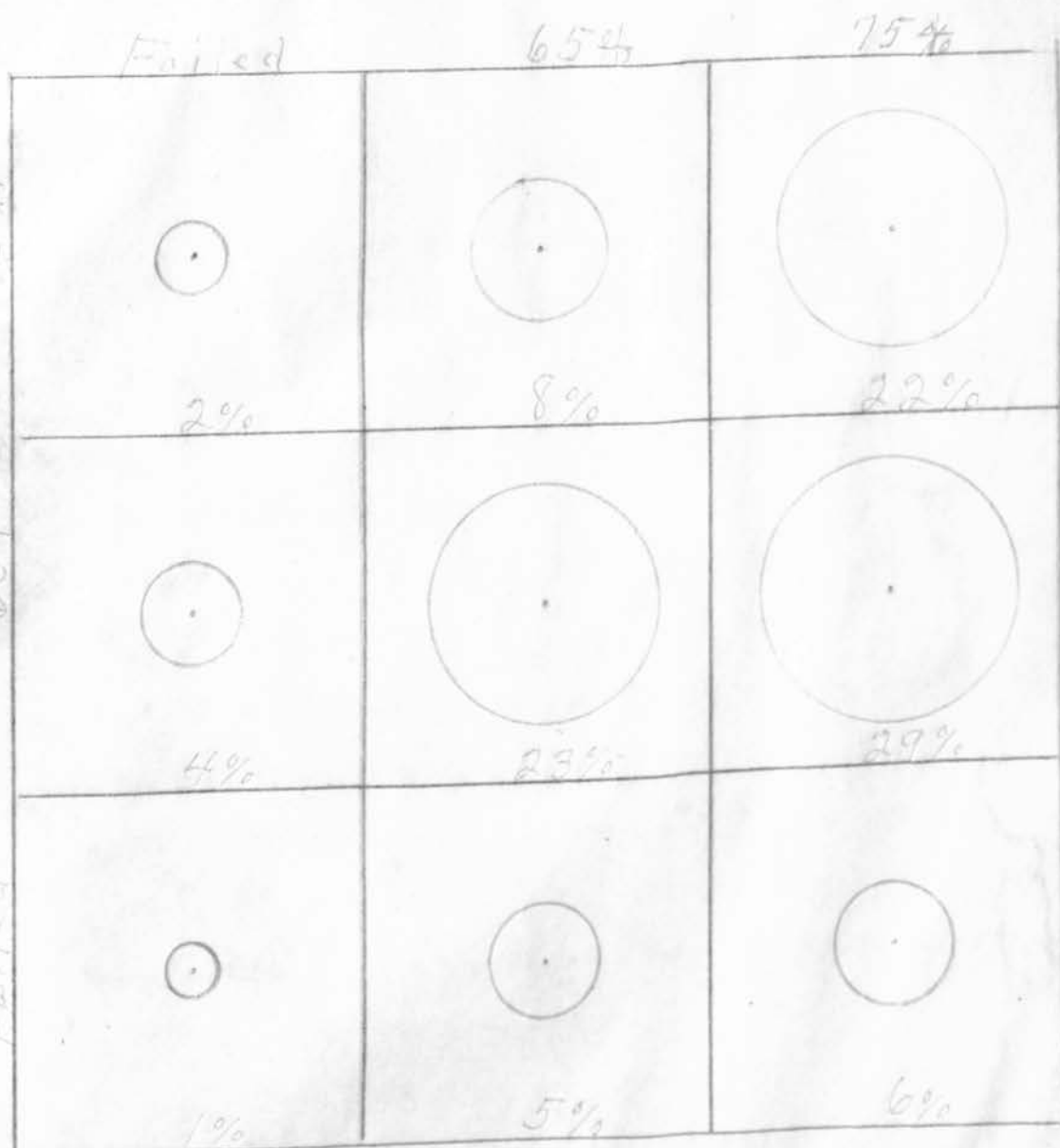
1401 Cases.

Fig. 10. — Distribution of Grades in History and Composition in the State High School Board Examination for 1915.

It appears that the situation revealed by these tables corresponds in the main to that which was found in the Teachers' Examinations. There is about as much correlation between grammar and composition as there is between history and composition or between history and grammar.

An analysis of the records shows that the percentage of failures differs markedly for the various subjects. Out of 100 grammar papers written about 47% were failed by the home markers and about 10% more by the state, making about 57% of total failures.

For Out of 100 composition papers the corresponding figures are 20% ^{and} 4%, or a total of 24%.

For Out of 100 history papers the figures are 26% ^{and} 8%, or a total of 34%.

From this it will appear that, if all the papers had been forwarded and if, as no doubt would have been the case, nearly all the papers failed at home would have been failed by the state, the tables representing the ~~results~~ total number of grades would show approximately as large a percentage of cases in the Failed column as in those marked 65 plus, or 75 plus, except in the case of grammar where the Failed column would show the largest percentage. This means again that the four squares in the presented tables not found in the Failed column may quite safely be accepted as representative of a Tertile Distribution.

6. Correlations Based on Pupils' Final Marks in Two Minnesota Cities

These results are further corroborated by an investigation which was made of the final school grades of pupils in two typical cities, Northfield and Red Wing, in Minnesota.

Each group of cases in the following tables represents a single class, the four groups in the ~~city~~ Northfield, being high school classes, I, II, III, and IV for the year 1915-1916, and those in ~~city~~ Red Wing, being high school classes I and II for the same year. The figures of correlation while based on too limited a number of cases to be reliable, are significant because they suggest the same conclusion as the studies already presented, namely; that there is as much relationship between English grammar and arithmetic, history, or other school subjects as between it and composition, and that there is as much relationship between composition and these other subjects as there is between it and English grammar.

TABLE LVI.

Correlations Based on Pupils' Final Marks in Two Minnesota Cities.

City	Gram. and 9th Comp.			Gram. and Arith.			Gram. and Hist.			Gram. and Lat. Gram.			Gram. and Alg.		
	Cases	r	PE	Cases	r	PE	Cases	r	PE	Cases	r	PE	Cases	r	PE
	56	.53	.06	56	.44	.07	56	.65	.05	26	.72	.06	51	.63	.05
	40	.65	.04	40	.68	.06	40	.48	.08	21	.72	.07	40	.60	.06
	24	.64	.08	24	.47	.10	24	.31	.12	16	.35	.14	24	.46	.10
	29	.43	.07	25	.47	.10	25	.10	.13	14	.39	.15	29	.16	.11
Av.		.56			.50			.45			.58			.50	
	53	.48	.07												
	41	.44	.08	41	.56	.07	41	.61	.07	33	.48	.09			
Av.		.46													

City	9th Comp. and Arith.			9th Comp. and Hist.			9th Comp. and 10th Comp.		
	Cases	r	PE	Cases	r	PE	Cases	r	PE
N	56	.14	.69	56	.54	.06	66	.67	.04
	40	.52	.08	40	.49	.08	37	.73	.05
	24	.47	.10	24	.37	.11			
	25	.28	.12	26	.30	.12			
Av.		.32			.46		.69		
RW	53	.42	.07	53	.59	.07	34	.74	.05
	41	.42	.08	41	.41	.08			
	Av.		.42		.51			.74	

7. Correlations Reported by Other Investigators.

In order to ^{obtain} present a check on the correlations which have been given and give a basis for comparison and further verification it will be well to note some results obtained by other investigators in their study of various problems.

Miles* found the following correlations based on 106 cases:

Grammar and Language with spelling r.67, with reading .59, arithmetic .67, geography .75, history .56, High School English .55, H. S. Mathematics .53, H.S. history .46, H.S. foreign language .61.

Clement** gives the Tertile Retention between various subjects as follows: (Number of cases in parenthesis) Grammar is completed in the seventh grade in the schools investigated)

TABLE LVII.

Correlations in Terms of Tertile Retention Between English Seventh and Other School Subjects. From Clement.

School No.	Subjects	Cases	Tertile Retention
School No. 5.	English 7, history 7	(112)	52
	" arithmetic 7	(123)	49
	" English 8	(112)	54
School No. 7.	English 7, English 8	(98)	51
School No. 2.	English 7, English 8	(97)	51
	" Latin 8	(72)	46
School No. 3.	English 7, English 8	(95)	59
	" Latin 8	(78)	55
School No. 4.	English 7, English 8	(73)	48

*Miles, Walker A., A Comparison of Elementary and High School Grades. Ped. Sem. Dec., 1910.

** Clement, John Addison, Standardization of Schools of Kansas, 1912.

Summary of ^{The} Chapter. ~~IX~~

~~a)~~ Grammar, as it has been understood in Minnesota, has meant a definite method and content. As shown by the state examinations for a number of years it has consisted of (a) giving the construction of certain words, (b) separating propositions into subject, verb, and complement, (c) giving the construction of subordinate propositions, and (d) giving the construction of infinitives. These four kinds of exercises have constituted 95.3 per cent of the content of State High School Board Examinations from 1905 to, and including, 1914. ~~The first three exercises~~ Teachers' State Examinations have followed the same lines. ~~as the~~ The first three ~~exercises~~ exercises ~~as~~ were found in every examination from 1911 to, and ~~including~~ including, 1916.

~~b)~~ Composition, according to Teachers' State Examinations, has meant ~~the~~ ability ^(a) to write a composition, an essay, or a story, (b) to write a letter, (c) to capitalise and punctuate a given selection, and (d) to correct the language errors in a given selection.

23) As thus understood grammar and composition, according to the marks of Teachers' State Examinations for 1911-1916, show the following average correlations:

	Composition	Arithmetic	Geography	History	Av. P.E. rank
Grammar	.25 (.23#)	.38	.29	.31	.04-
Composition		.22	.25	.25	.05

~~Arithmetic~~ See note on page 122.

24) In terms of Median Retention the correlation is as follows:

	Composition.	Arithmetic.	Geography.	History.
Grammar	58% (59%#)	62%	59%	60%
Composition		57	58	58

See note on page 122

This means that if one were to look for persons who rank above the Median in grammar, the largest number is found among those who are above the Median in arithmetic, history comes second, and the chance is equal in the case of composition and geography. If one were to look for persons ~~examining~~ ranking above the Median in composition, there is an even chance of finding them among those who are above the Median in grammar, geography, or history, and a slightly lesser chance in the case of arithmetic.

22 In terms of Per Cent of Tertile Retention the average of the correlations figured is as follows:

	Composition	Arithmetic	History
Grammar and	41.5	42.3	40.5

In order to obtain a comparison between ~~Taxika~~ Median Retention and Tertile Retention, the actual retention in each case was divided by the chance retention. ~~xxxx~~ Thus, since the chance Median Retention is 50 per cent, the ratio of an actual retention of 58 per cent would be 58 : 50, or, expressed as a quotient, 1.16. The Tertile Retention by chance is 33.3 per cent. ~~xxx~~ The ratio of an actual retention of 41.5 per cent would therefore be 41.5 : 33.3, or 1.25. ~~xxxxxx~~ By quotients obtained in this manner the actual Median and Tertile Retentions between grammar and other subjects compare as shown in the following table:

TABLE ~~xxxx~~LVIII.

Relationship Between Grammar and Other Subjects as Shown by Comparison of Median and Tertile Retentions.

	Composition	Arithmetic	History
Grammar xxx (M.R.)	1.16	1.24	1.20
(T.R.)	1.25	1.27	1.22

73 According to the results from State High School Board Examinations the relation of grammar to other subjects is as follows:

TABLE LIX.

Relationship of Grammar to Other Subjects as Shown by Per Cent of Retention in the Same Groups, i.e.; 75 plus, 65 plus, and Failed.

		Per Cent Marked 75 plus in Both Subjects	Per Cent Marked 65 plus in Both Subjects	Per Cent Marked Failed in Both Subjects	Per Cent in all Groups
Grammar and Composition, '14		25	23	1	49 38
" " '15		27	19	1	47
Grammar and History, '14		25	17	3	45
" " '15		32	16	1	49
Composition and History '15		22	23	1	46

7) According to the final marks of pupils in two city schools in Minnesota the average correlation of grammar with other subjects is as follows:

TABLE LX.

Average of Correlations Between Grammar and ^{Composition with} Other Subjects in Two Minnesota Cities.

City	Gram. Comp.	Gram. Arith.	Gram. Hist.	Gram. Lat.	Gram. Alg.	Comp. Arith.	Comp. Hist.	Comp. 10th Comp.
N.	.56	.50	.45	.58	.50	.32	.46	.69
R.W.	.46	.41	.56	.61		.42	.51	.74

These facts lead to the general conclusion that the ~~maximum~~ amount of relationship between grammar and composition, as these subjects have been interpreted in Teachers' State Examinations and in State High School Board Examinations in Minnesota, is practically the same as the relationship between either of these subjects and arithmetic, geography, or history. The significance of this relationship will be discussed in chapter five.

CHAPTER IV.

THE RELATION OF GRAMMAR TO THE UNDERSTANDING OF SENTENCES.

1. The Application of Standardized Tests and Scales.

During the last few years there has been a remarkable progress in the field of educational tests and measurements. Standardized tests and scales, things wholly unknown ten years ago, are now available in practically all school subjects. Hitherto these measures have been used mainly for purposes of educational diagnosis. The individual differences of pupils in the various grades are readily measured. The work of one teacher can be compared with that of another teacher. The attainments of one grade can be measured against the attainment of other grades or against the same grade in other schools. School records can be standardized so that they may be accepted in any other school and so that they will have definite historical ~~value~~ ^{significance}. The great value⁽¹⁾ of standardized tests and scales for the purposes mentioned suggests that they may also be used to measure the results of school subjects in such a manner as to show the ~~relationship~~ amount of relation between a certain attainment in one subject and a certain attainment in another subject. The reliability of a statement of correlation between subjects or parts of subjects must be directly proportional to the exactness of the measures ~~applied~~ ^{as well as} applied and the number of pupils tested.

(1) Haggerty, M.E. Some Uses of Educational Measurements. School and Soc. 4: 761-771. '16.

2. Correlations of Grammar and Understanding of Sentences Based on Returns from Five Minnesota Cities.

Two studies of the relation between formal English grammar and the understanding of sentences are presented in this chapter. In both cases the results are based on measurements by means of standardized tests or scales.

The first study was based on returns from five cities or towns in different parts of Minnesota. The number of cases from each school was as follows: Blackduck 13, Dodge Center 18, Elenwood 29, Kenyon 28, Luverne 51, Total 139.

The grammar test consisted of the following rearrangement of ~~the March Test in English for~~ the March Test in English for ^{New York} grades 7B - 8B used by Buckingham in the Survey of Gary and Prevocational Schools(✓).

(✓) Seventeenth Annual Report of the City Superintendent of Schools, New York City. Jan. 1916. p 31.

ENGLISH GRAMMAR.

Name _____ Sex _____ Grade _____ School _____

Age _____ yrs. _____ mos. _____ days. Teacher _____ Date _____

Read each of the following questions and write your answer in the blank space following. Answers may be brief but must be clear. Use diagrams if you wish in places where indicated.

1. Write the principal parts of sweep, drive, write.

2. Make a list of the verbs in the following sentences and after each verb write its mode, voice and tense:

a. Cassius, be not deceived.

b. Death will certainly knock at every door.

c. The territory claimed by the English had been called New Netherlands.

3. Pick out the phrase in the following sentence and tell what it modifies:

"The windows were white with frost."

4. In each of the following sentences select the subordinate clauses and tell the syntax (use in the sentence) of each:

a. Books were written that they might give pleasure.

b. I was reminded of those days when I had known neither care nor sorrow.

BOND

c. The children played that they were keeping house.

5. Analyze the following sentence by diagram or otherwise:

"Columbus did not know that he had discovered a new continent."

6. Draw a line under all the nouns in the following passage:

"In winter I get up by night
And dress by yellow candlelight,
In summer, quite the other way,
I have to go to bed by day."

7. Underline all pronouns in the following:

"I tell you he is a selfish fellow, one whose only thought is of himself. Those who have anything to do with him are likely to regret it."

8. Write a sentence containing a relative pronoun in the objective case, and underline the word.

9. In the following sentence give the case of the italicized word and state how it is used in the sentence:

"I gave *him* a letter for my friend, the attorney."

10. Give an example, in a sentence, of the positive degree of the adverb better, and underline it.

The rearrangement was based on the ~~various assigned~~ percentage of correct answers obtained for each question from 3,196 pupils in a Preliminary Test given by Buckingham. It was thought that by ~~rearranging~~ arranging the questions in order of their difficulty, ~~the~~ beginning with the easiest, the test would be less likely to discourage pupils ^{the} (3).

In order to show in detail the nature of the grammatical knowledge possessed by the pupils whose records were tabulated, the following table was prepared:

TABLE LXI

Percentage of Pupils Who Answered Each Question

~~The correctly.~~ Grammar Test Correctly.

Question.	Buckingham standards #	Boys	Girls	Boys and Girls
1	46	54	30	32
2 a	15	00	00	00
b	47	8	6	7
c	28	0	4	2
3	40	35	56	45
4 a	42x 30	32	43	38
b	20	27	32	30
c	36	15	33	25
5	12	5	10	8
6	10	17	42	30
7	x2x 10	x1 22	x2x 43	x2x 33
8	6	1	10	6
9	5	22	39	31
10	0	0	0	0

(3) For Directions and Rules for Scoring see Appendix.

The table shows that the girls excelled the boys in answering every question except the first and the second (b). The pupils, taken as a single group, excelled in ability to recognize and give the construction of subordinate clauses, to recognize nouns and pronouns, and to give the case and construction of nouns and pronouns. They were ~~xxx~~ somewhat deficient in knowledge of the principal parts of verbs; very deficient in the ability to recognize verbs and give their mode, voice, and tense; and slightly deficient in the ability to analyze a sentence.

The ~~xxxxxxxx~~ ability to grasp the meaning of sentences was measured by the "Reading Test: Understanding of Sentences" prepared by the Bureau of Cooperative Research at the University of Minnesota. (4)

(4) See Appendix.

The measurements were made in October, 1916. The papers were first graded by the teachers in charge according to specific directions (5). They were then forwarded to the Bureau of Cooperative Research, University of Minnesota, and were carefully checked for possible errors in grading or tabulation. As all the pupils ~~took~~ had taken the same examination in each ~~both~~ subjects, the grades were gathered into one correlation table. The highest ~~max~~ score possible in grammar was 140. No pupil scored more than 100. The Median score ~~for~~ in grammar is 39.4; Quartile Range 24.9 - 58.0; Quartile 16.6. The Median for the Sentence Test is 57.7; Quartile Range 50.2 - 65.6; Quartile. (xxx) By the method of Median Retention the correlation is 55.8%. The coefficient of correlation by Unlike-signed pairs in .17; by the formula for R it is .10, which transmuted into r becomes .15 or .17 according to which one of two tables is used. The Probable Error is .06.

(6)

(5) See Appendix

(6) For explanation of terms used see Thorndike's Mental and Social Measurements. xxx

TABLE LXII.

Correlation Table for Grammar and the Understanding of Sentences. Based on Returns from Five Minnesota Cities.

Sentence ~~Test~~ Scale

Grammar Test.

	0-30	40	50	60	70	
90		• •			•	3
80		• •	• •	• •		6
70		• •	• • •	• • •	•	9
60		• •	• • • •	• • •	• • •	12
50		• • •	• • •	• • • •	• • •	24
40		• • •	• •	• • •	•	14
30		• • •	• • • •	• • •	•	24
20		• • •	• • • •	• • •	• • •	24
10	•	• • •	• • •	• • •	•	16
0	• •	•	• •	• •		7
	3	31	46	43	16	139

Av. # grade 43.7 36.2 39.5 48.7

MR 55.6%
r .17

R. +.10 r .15 or .17 ±.06

* Based on divisions (units) of 5 for Grammar.

149

An examination of the scores showed that 30 per cent of the girls reached or exceeded the median grade of the boys in ~~the~~ grammar. ~~In~~ On the Sentence ~~Understanding~~ Scale only 40 per cent of the girls obtained scores of ~~60 or~~ 50 or over, while 47 per cent of the boys obtained such scores. In other words, the girls excelled in grammar and the boys excelled in the understanding of sentences. In order to discover the correlation between the two tests ~~for~~ according to groups based on sex separate correlation tables were prepared. The results were as follows:

TABLE LXIII.

Correlations of Grammar and Understanding of Sentences. Based on Returns from Five Minnesota Cities.

	Median Retention	r by Unlike-Signed Pairs	r by Formula for R.	P.E.
Boys(64)	62.8%	.39	.51	.09
Girls(75)	48.0%	-.06	-.02	

The average grade in grammar corresponding to each step on the Sentence Scale is as follows: (7)

TABLE LXIV.

Average Grade in Grammar ~~for~~ Corresponding to Each Step on the Scale for Understanding of Sentences.

	30 or less	40	50	60	70
Boys(64)		35	28	41	51
Girls (75)		50	50	44	51
Boys and girls(139)	43.7		36.2	39.5	48.7

(7) Based on units of 5 for grammar.

TABLE LXV.

Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 64 Boys.

Table II. Boys.
Sentence ~~Test~~ Scale
0-30 40 50 60 70

90							
80					•		1
70		•					1
60			••	••		•	5
50		••	••	••••	••••	••••	16
40			•	•		•	3
30		•	••••	•			6
20		•••	•••	•••		•	16
10		•	•••	•••			10
0	••	•	••	•			6

2 9 24 22 7 64

Av. # 35 28 41 51

WR 67.8%

$R = +.34 = r .51 \text{ or } .54$

$r, 39$

$\pm .09$

Average grade in grammar.

TABLE LXVI.

Correlation Table for Grammar and Composition Understanding of Sentences. Based on the Records of 75 Girls.

Table III. Girls.

Sentence Test. Scale

	0-30	40	50	60	70	
90		••			•	3
80		••	••	•		5
70		•	•••	•••	•	8
60		••	••	•	••	7
50		•••	•••	•	•	8
40		•••	•••	•••		11
30		•••	•••	•••	•	18
20		••	•••	•	••	8
10	•	••		••	•	6
0				•		1
	1	22	22	21	9	75
Avg.		50	50	44	51	

M R 48%
r = .06

R = +.012 - r.02

Average grade in grammar

5. Correlations of Grammar and Understanding of Sentences
Based on Returns from Seventeen Schools in One School
System.

The following study presents results of tests given to
the A section of the eighth grade in seventeen schools in
St. Paul at the beginning of the second semester, 1916-7.

The grammar test consisted of ^{the following} a rearrangement of the
Jude Test used by Buckingham in the New York Survey (8)

(8) Loc. cit.

ENGLISH GRAMMAR

Name _____ Sex _____ Grade _____ School _____
 Age _____ yrs. _____ mos. _____ days. Teacher _____ Date _____

Read each of the following questions and write your answer in the blank space below. Answers may be brief but must be clear.

1. Give an example in a sentence of a participle used as a noun, and underline it.

2. Write a sentence illustrating the use of few as an adjective pronoun (indefinite pronoun).

3. Give an example in a sentence of an adverb of time, and underline it.

4. Write the first person, singular, of the following: Passive voice, indicative mode, present tense of the verb "lead."

5. Give an example in a sentence of that used as a conjunction, and underline it.

6. Give an example in a sentence of an infinitive in the passive voice.

7. Combine the following statements into a complex sentence containing but one subordinate clause: In May a sparrow built a nest. The sparrow had evidently met with disaster earlier in the season. It built its nest in a mass of woodbine. The mass was thick. The woodbine was near my window.

Date _____

Teacher _____

Page _____

Year _____

8. Pick out the verb in the following sentence and after it write its mode, voice and tense: A shower has been brought on by the mild summer breeze.

9. Copy each underlined noun and write after it its number, gender, and case.

Break, break, break! On thy cold gray stones, Oh sea.

10. Make the necessary correction in the following sentence: I am sure it could not have been them.

11. Write a sentence containing a noun phrase, and underline the phrase.

12. Write a sentence containing the comparative of ill, and underline the word.

13. Change the following complex sentence into a simple sentence without altering its meaning: We saw that it was wise to give in.

14. Write the feminine of lord, earl, tiger.

In order to determine definitely the nature of the grammatical knowledge possessed by the pupils, the percentage of correct answers for each question was calculated. The results are shown in the following table:

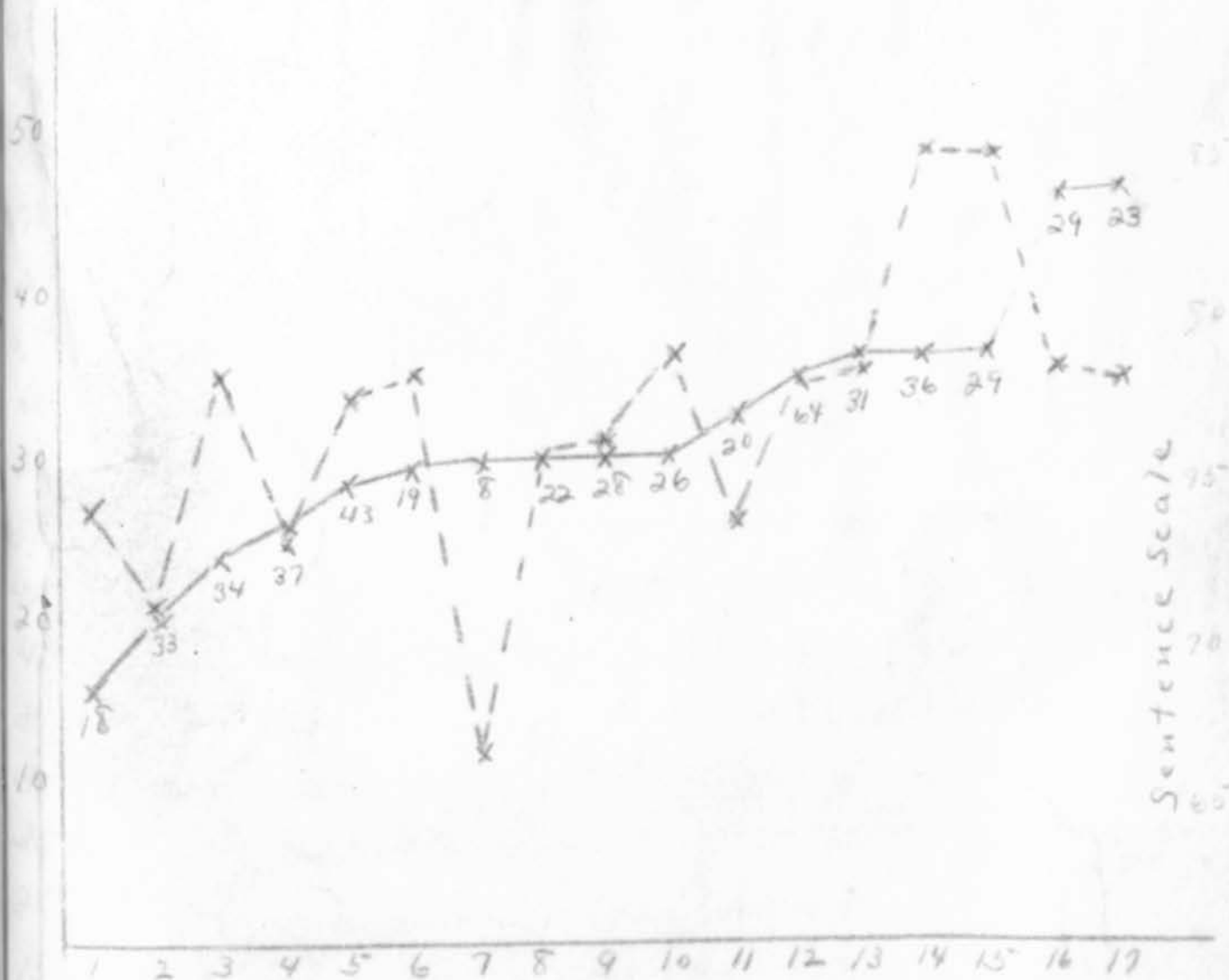
TABLE LXVII.

Percentage of Pupils Who Answered Each Question in the Grammar Test Correctly.

Question.	Percentage who answered each question correctly					
	All pupils	Boys	Girls	Group I	Group II	
1	.49	.03	.03	.02	.01	.03
2	.30	.42	.42	.41	.36	.47
3	.30	.45	.42	.47	.35	.55
4	.34	.01	.01	.01	.00	.02
5	.30	.34	.33	.34	.29	.38
6	.20	.01	.01	.01	.01	.02
7	.21	.04	.04	.04	.03	.06
8	.15	.01	.00	.01	.00	.01
8	.15	.01	.00	.01	.00	.01
9	.13	.33	.31	.34	.22	.43
10	.11	.23	.18	.26	.18	.30
11	.09	.20	.25	.31	.25	.31
12	.07	.04	.03	.05	.01	.03
13	.05	.04	.07	.02	.04	.05
14	.02	.00	.00	.00	.00	.00

(~~XX~~) Standards by the Buckingham Preliminary Tests.
 See p 137

By comparing this table with the questions used it is seen that the pupils excelled in knowledge of the form and construction of nouns and pronouns, the use of noun phrases and the classification of adverbs. They were almost wholly deficient in knowledge of the use of participles and infinitives, the conjugation of verbs, the structure of a complex sentence, the comparison of adverbs, and the feminine of certain nouns.



Schools by Medians

— : Grammar - - - - : Sentence Test.

Figures for each school show number of pupils.
Median for grammar 31.1 Median in Sentence Test 37.2

FIG. 11. Median Scores of Eighth Grade Pupils in Seventeen City Schools for Grammar and Understanding of Sentences.

In order to make comparison possible the scores of the individual pupils were thrown into two correlation tables. In the first are ²⁶⁰ 240 cases representing nine schools which ranked low in grammar. The second consists of ²⁴⁰ 200 cases representing eight schools which ranked high in grammar. The Median in grammar for the first group is 35.7; for the second group, 37.0. The correlation between ~~the two~~ grammar and understanding of sentences according to the two measures used ~~in~~, in terms of Median Retention, 59 per cent in both groups. In ^{terms of} r by Unlike-signed Pairs it is .23, $\pm .04$. According to the formula for R it is .24 for the first group and .19 for the second, which transmuted into r is .37-.40 for the first and .30-.33 for the second. (4)

The fact that practically every record in column headed 85 ^{according to} the Sentence Scale was exactly 85, ^{the} the apparent bimodal distribution is due to the arrangement of the table. The two columns headed 80 and 85 could ^{as well} have been arranged as one.

(//) For explanation of terms see Thorndike's Mental and Social Measurements.

Correlation Table for Grammar and Understanding of Sentences. Based on Returns from Nine Schools Which Ranked Low in Grammar.

158
156

Sentence ~~Test~~ Scale.

158

	60	65	70	75	80	85	
55							
50							
45							
40	•						1
35				•			1
30		•		•		• •	4
25			•			• • •	4
20				• • • •		•	5
15			•		•	• •	4
10		• • •	• • •	• • • •	•	• • •	16
5	•	•	• • •	• • • •		• •	11
0		• •	• • •	• • • •	•	• • •	21
	• • •	•	• • • •	• • • •		• • • •	34
	• • •	• • • •	• • • •	• • • •		• • • •	34
	• • • •	• • • •	• • • •	• • • •	• • •	• • •	32
	• • • •	• • •	• • • •	• • • •	• • •	• • • •	40
	• • •	• •	• • • •	• • • •		• • • •	25
	• • •	• •	• • • •	• • • •	•	•	19
	• •	•	• • •	• • •			5
	23	23	62	94	6	52	260

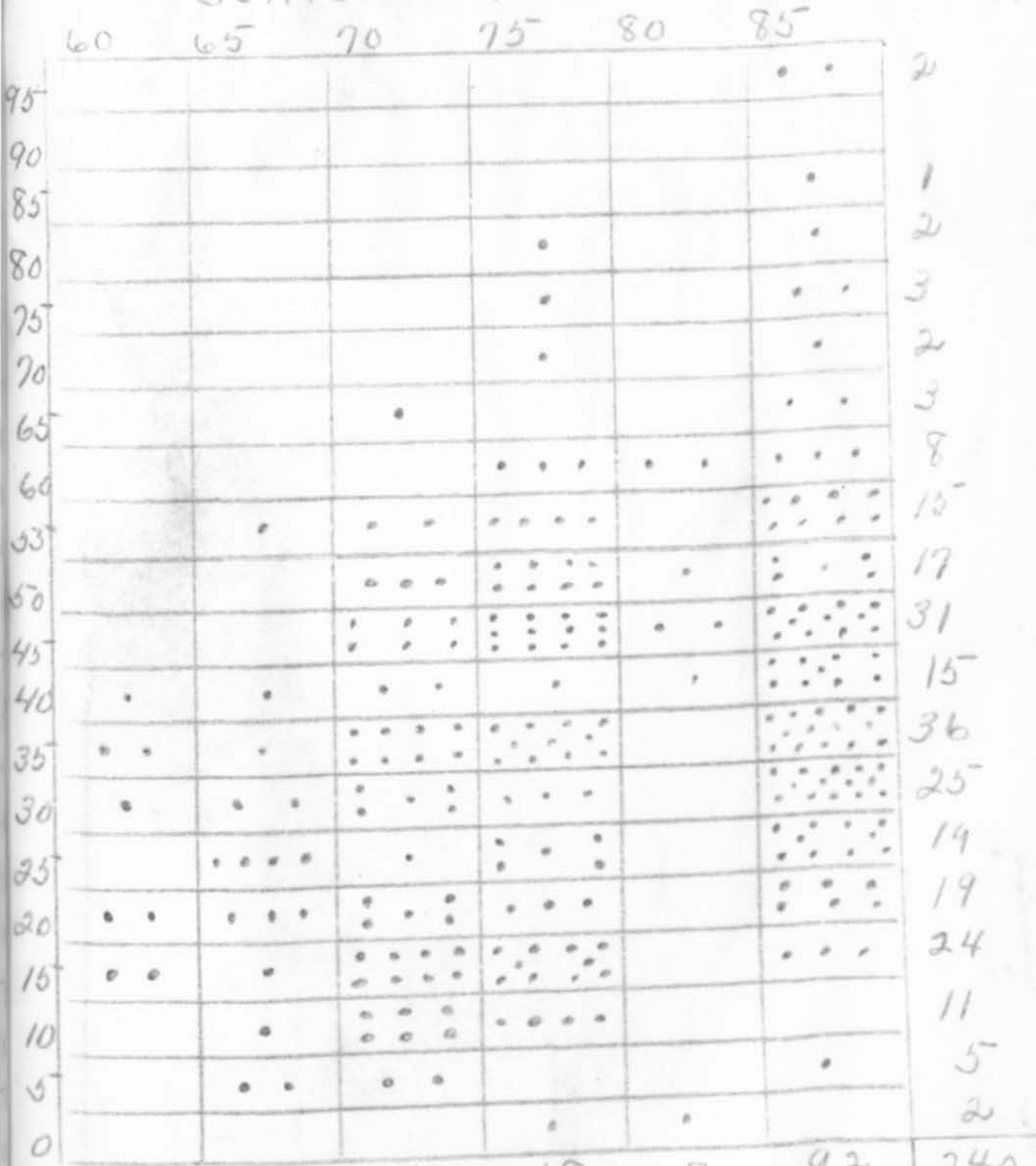
	Median	Quartile Range	Quartile	Median Retention	r
Grammar	25.7	35.7 - 16.5	9.6		
Sentence Test	76.2	79.6 - 71.1	4.05	59	.28
				$R = 244 = r .37 \times 40$	

TABLE LXIX.

Correlation Table for Grammar and Understanding of Sentences. Based on Returns from Eight Schools Which Ranked High in Grammar.

156
~~157~~
159

Sentence ~~Test~~ Scale.



8 16 49 68 7 92 240

Median Quartile Range Quartile Median Retention r

Grammar 37. 48.9 - 24.7 12.1 59 .28

Sentence Test 78.3 86.7 - 73.7 6.5

$R.193 = r .30 \text{ or } .33$

The amount of correlation in case of each group is clearly seen in the next ^{Figure} ~~table~~ showing the Median grade in grammar for each half-step on the Sentence Scale.

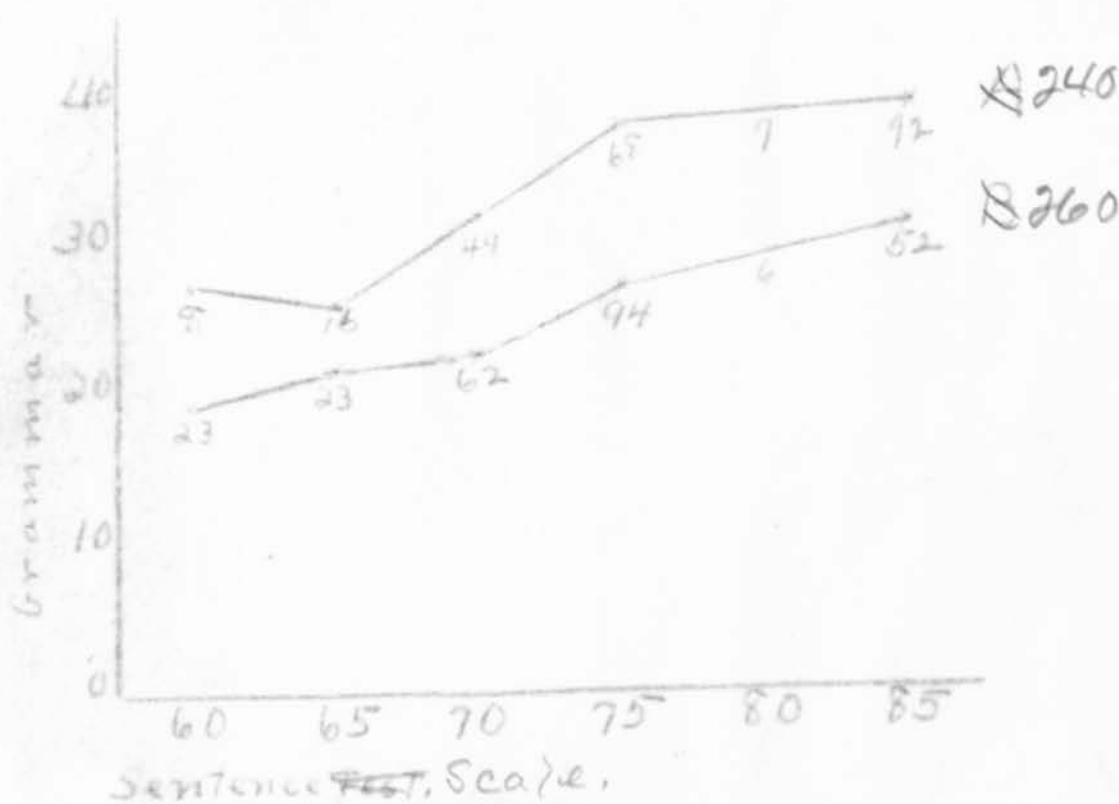


Fig. 12. Median Score in Grammar for Every Half-Step on the Scale for Understanding of Sentences. Curve Marked 240 Shows Medians for Eight Schools Ranking High in Grammar. Curve Marked 260 Shows Medians for Nine Schools Ranking Low in Grammar.

In order to discover the amount of correlation in groups according to sex, ~~two~~ separate correlation tables were made for the boys and ^{for} the girls. The Median in grammar for the girls is 33 and for the boys it is 28.5. The girls excel by .06 of a step on the Sentence Scale. According to the ratio of distribution in the two measurements this would correspond to a difference of .6 in grammar as compared with ^{the actual} a difference of 4.5 as shown by the difference of Medians in that subject. The correlation in terms of Median Retention is 63 per cent for the boys and 69.4 per cent for the girls. In terms of r by Unlike-signed Pairs it is .40 for the boys and .32 for the girls (P.E. = .03)

TABLE LXX.

Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 235 Boys.

163

Sentence ~~Test~~ Score, Boys

	60	65	70	75	80	85	
95						• •	2
94							
85							
80							
75						•	1
70				• •			2
65		•	•			• •	4
60				•	•	•	3
55			•	• • •		• • •	7
50				• • •		• • • •	7
45			• •	• • • •	•	• • • •	17
40	• •	• •	• •	• • •		• • •	15
35		•	• •	• • • •	•	• • • •	23
30	• • •	•	• • • •	• • • •		• • • •	30
25	• •	• •	• • • •	• • • •		• • •	21
20	• •	• • •	• • •	• • • •		• • • •	23
15	• • •	• • •	• • • •	• • • •	•	• • •	37
10	• •	• •	• • • •	• • • •		• •	23
5	• •	• • •	• • •	• • • •		•	13
0	•	•	•	• • •	•		7
	19	22	49	77	5	63	235

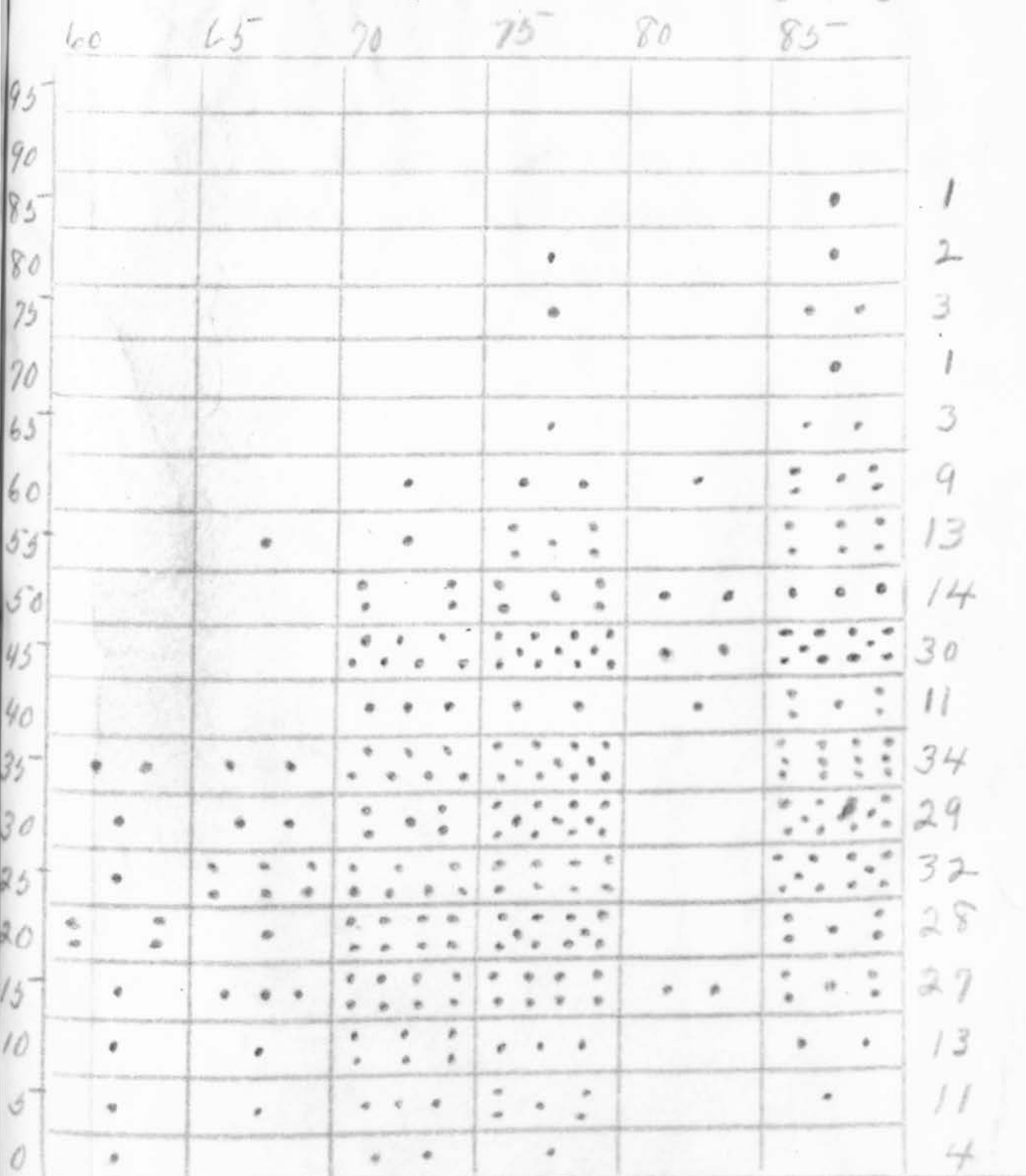
	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	28.5	39.4	16.8	11.3	63%	.40
Sentence Test	76.8	85.3	71.8	6.8		

TABLE LXXI.

Correlation Table for Grammar and Understanding of Sentences. Based on the Records of 265 Girls.

164

Sentence Test Scale, Girls



12 17 62 85 8 81 265

	Median	Quartile	Range	Quartile	Median Retention	r
Grammar	33.0	46.6	-	22.0	12.3	.32
Sentence Test	77.4	83.9	-	73.0	60.4%	

Figures 13 and 14 show the relative grades obtained by the boys and the girls for each of the three Quartile divisions, the 25, 50, and 75 percentile.

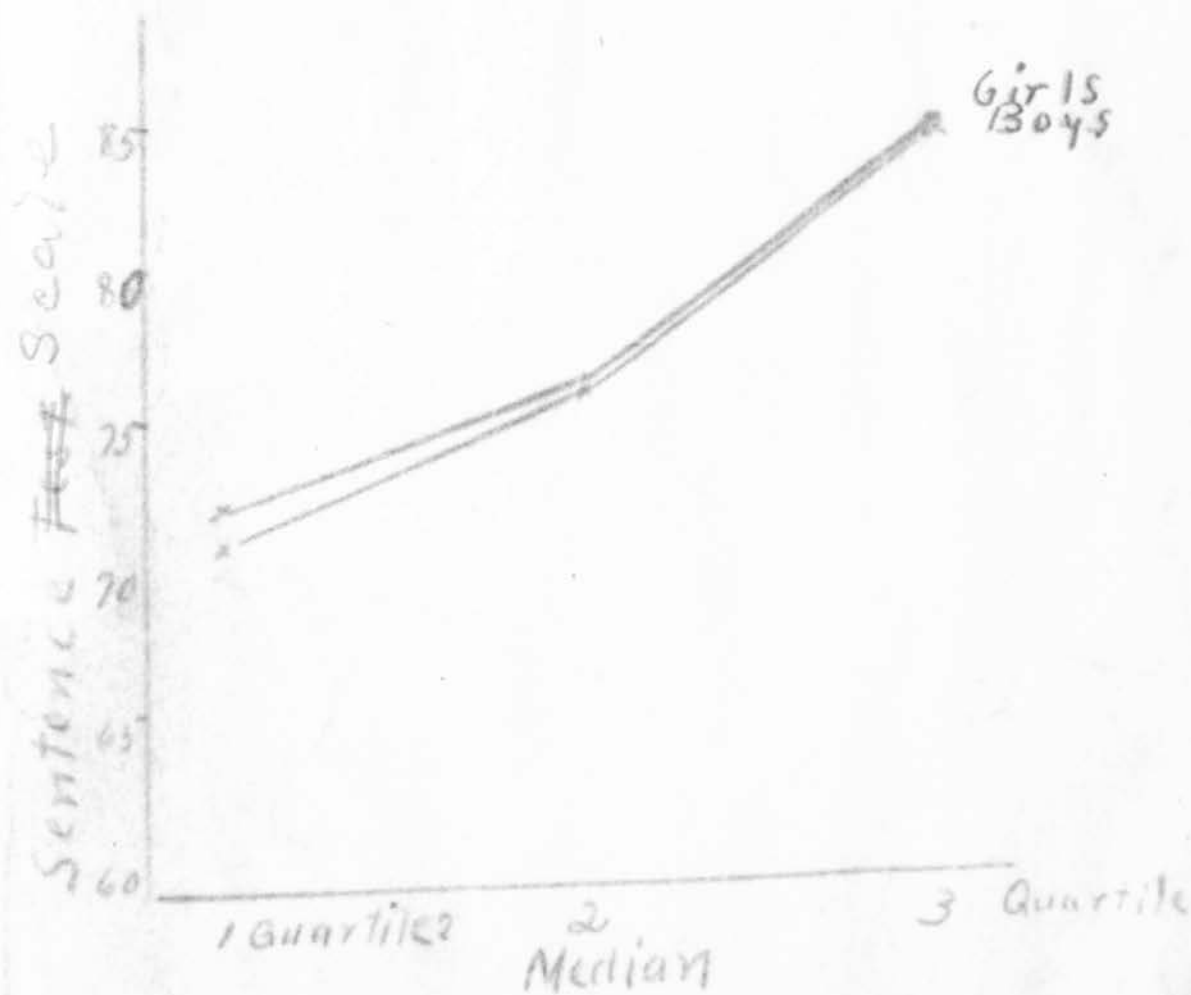


Fig. 13. Relative Scores of Boys and Girls in the Understanding of Sentences.

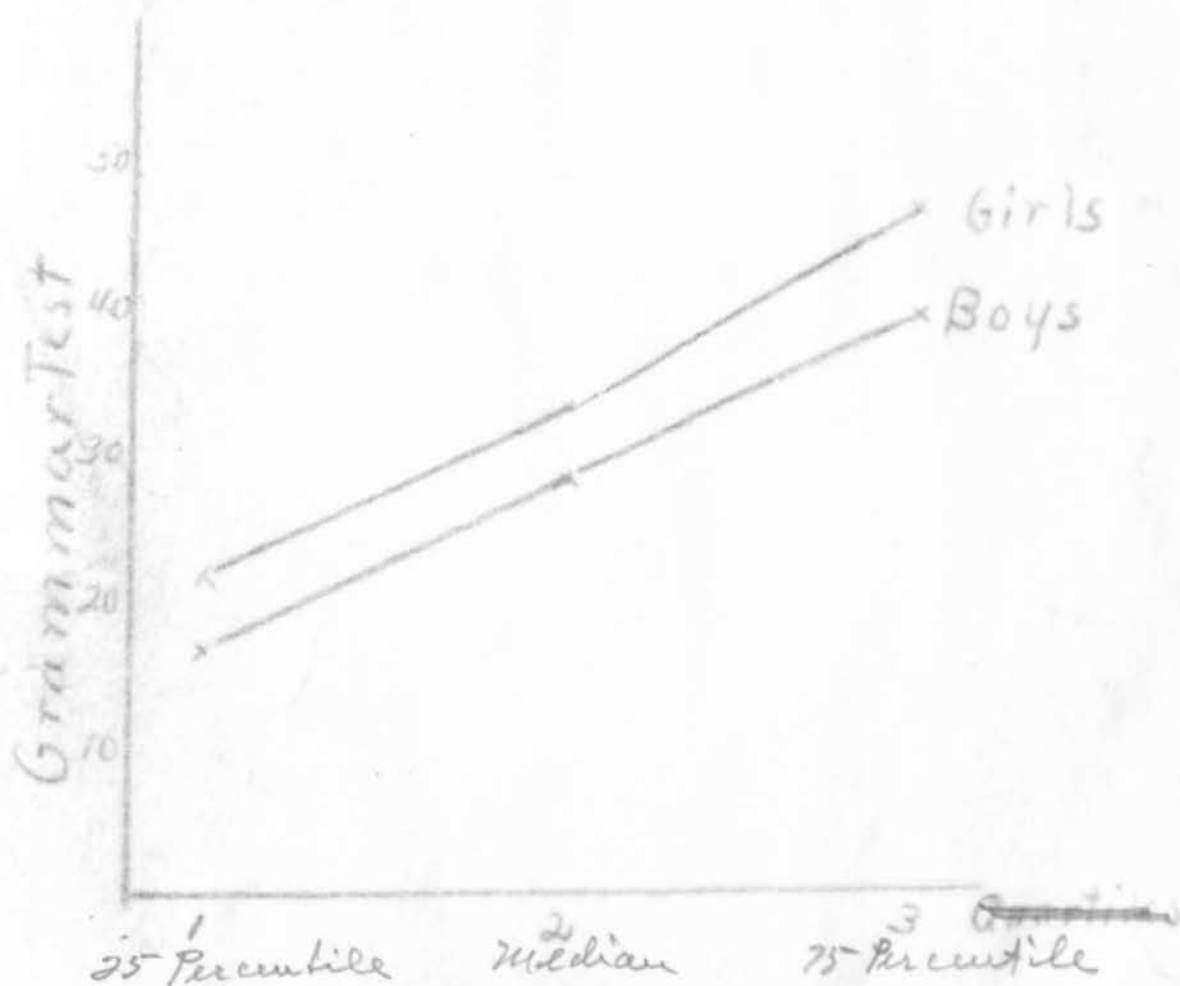
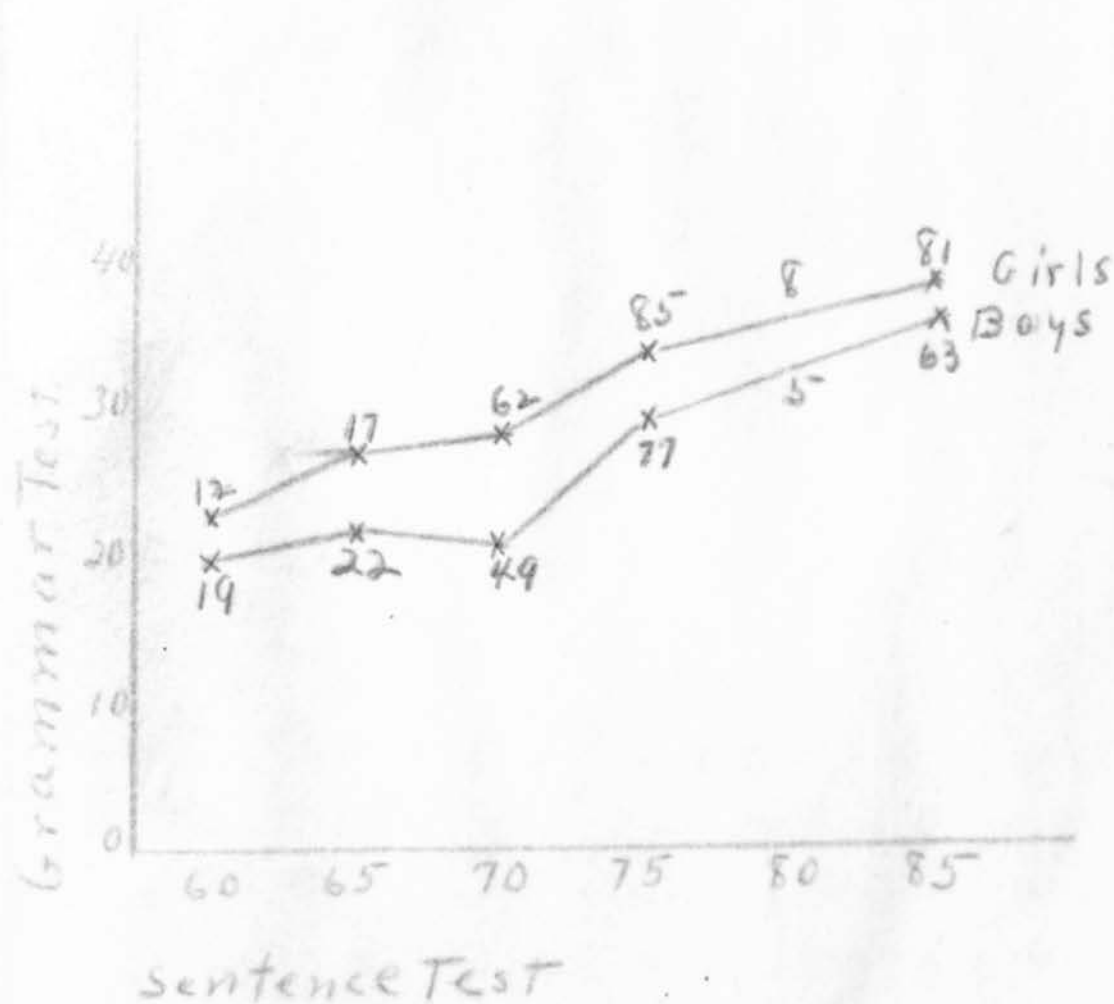


Fig. 14. Relative Scores of Boys and Girls in the Grammar Test.

Figure 15⁵ shows the correlation between grammar and the understanding of sentences by median scores for boys and girls in grammar for each half-step of the Sentence Scale. By comparing this figure with ~~that which shows~~ that which shows the curves for the two groups of schools it is readily seen that the correlation is higher ^{somewhat} ~~in~~ for both the boys and the girls than for either of the two groups of schools. (12)

(12) See page 168.



Median Scores of Boys and Girls.

Fig. 13. Relative Scores of Boys and Girls in the Grammar Test for Every Half-Step on the Sentence Scale.

~~Summary~~ 4. Summary of the Chapter.

a. The amount of correlation between knowledge of formal English grammar and the ability to understand sentences, as measured by standardized tests and scales, is as follows:

TABLE LXVII.

Summary of Correlations Between Grammar and the Understanding of Sentences.

First Study. 139 cases in five Minnesota cities.

	Median Retention	r by Unlike-signed Pairs	r by Formula for R
Boys (64)	62.8%	.39	.51 ± .09
Girls (75)	48.0%	-.06	-.02
Boys and girls (139)	55.8%	.17	.15-17 ± .06

Second Study. 500 cases in one school system. 17 schools.

Boys (235)	65%	.40	
Girls (265)	60.4%	.32	
Boys and girls (500)	59%	.28	.37-.40 ± .04
(Median, Gram. 25.7)			
Boys and girls (240)	59%	.26	.30-33 ± .04
(Median, gram. 37)			

b. In both studies the ~~xxxxxxxxxxxx~~ correlation was higher in the group which had the lower score in grammar. In the first study the Median in grammar for the boys is 30 and for the girls, 44.1. The correlation between the knowledge of grammar thus indicated with ability to understand sentences is .39 or .51 (according to method used) for the boys and ~~xxxxxxxxxxxx~~ -.06 or -.02 for the girls. In the second study the Median in grammar for boys is 23.5 and for the girls it is 33.0. The correlation between the knowledge of grammar, thus indicated, and the ability to understand sentences is .40 for the boys ~~xx~~

and .32 for the girls. If the records of boys and girls be taken together and arranged in two groups according to the Median score in grammar, it is found that the group ~~xxxxx~~ which has a low Median score in grammar shows as high correlation between grammar and understanding of sentences as the group which has a high Median score in grammar.

172

CHAPTER V.

INTERPRETATIONS AND SUMMARY.

1. The Significance of Correlations.

This chapter contains some studies dealing with the significance of the correlations reported in chapters three and four.

The first question which suggests itself is, whether pupils who excel in one school subject are likely to ~~excel~~ also excel in other school subjects, irrespective of the content of such subjects. Miles (1) claims that "if a pupil makes a good mark in one subject he will be quite apt to make good marks in all subjects. Similarly, the pupil who is poor in one subject will tend to be poor in all". Frailey ^{and Crain (2)} states that "high ability is comparatively constant; excellence in one activity means similar excellence in another; ~~Lack of of~~ ⁽³⁾ lack of ability in one line means lack of ability in others". Gray ⁽³⁾ found in his study of the grades of high school pupils that the variations from year to year are smaller than usually supposed.

(1) Miles, Walter R., Comparison of Elementary and High School Grades. University of Iowa Studies in Educ. Vol. 1, No. 1. p 10. and Crain, G.M.,

(2) Frailey, L.E. Correlation of Excellence in Different School Subjects Based on a Study of School Grades. Jour. Educ. Psy. 5:141-54. '14.

(3) Gray, G.T., Variation in the Grades of High School Pupils. Warwick and York. 1913.

(4) Starch holds that the children of the same family are on an average, equally good or equally good peer in all ~~in all~~ studies. Hart and Spearman (5) claim that reality "In ~~reality~~ all the facts indicate unanimously, that the correlation arises through all the performances, however different, depending partly on a General Common Factor". They also call attention to the harmony of this view with the "recent surprising regeneration of 'mental tests'". For this appears to be due to both their purpose and method having been transformed in accordance with the theory of a General Factor", ^{They say} as ~~shown~~ by ~~the fact~~ that such tests now offer "as wide a range as possible rather than narrow tests for specific abilities". Webb (6) presents evidence of a common factor as "revealed in most attempts to estimate intelligence qualities".

(4) Starch, D., The Inheritance of Abilities in School Studies. School and Society. 2:608, Oct. 23, '15.
 (5) Hart, Bernard and Spearman, C., General Ability, Its Existence and Nature. Brit. Jour. Psy. 5: 51-85. '12.
 (6) Webb, E., Character and Intelligence. Brit. Jour. Psy. Monogr. Suppl. '15.

Kelley's work on Educational Guidance (7) is based upon correlations between grades obtained in the fourth, fifth, sixth, and seventh grades with grades obtained in first year high school work. He finds that it is possible on the basis of the elementary school record in the upper grades to predict approximately what grades a pupils will obtain in the first year of the high school.

~~xxxxxxxxxxxx~~ Hollingsworth (8) claims that, ~~xxxx~~ if individuals are allowed to develop to the limit of their capacity and excell their fellows in one type of work, they are likely to excell also in others.

(7) Kelley, T.L., Educational Guidance. Teach. Coll.

'14.
 (8) Hollingsworth, H.L., Correlation of Abilities as Affected by Practice. Jour. Educ. Psy. 4:405-15. '13.

175

2. The General Tendency to Excel in All Subjects or to Be Deficient in All.

If there is a general tendency for pupils who excel in one subject to excel in all subjects, there should be some evidence of it in the records used as a basis for the studies reported in the previous chapters. In order to discover any such evidence that might exist the grades from the Teachers' State Examinations¹⁹¹⁴ in arithmetic, composition, geography, grammar, and history were classified as High (H) or Low (L) according to whether they were above or below the Median in the subject concerned. This method was used in preference to the Tertile, Quartile, or Quintile division in order that comparisons ^{might} ~~should~~ be possible with correlations obtained in terms of Median Retention. The result of this classification was a table like the following sample:

TABLE LXXIII.
Median Correlations.

Teachers' State Examination, 1914. Sample Part of Table, Showing Rank of Each Examinee as High or Low with Reference to the Median in Each Subject.

Pupil No.	Arith.	Comp.	Geog.	Gram.	Hist.
1	L	L	H	L	H
2	H	H	H	L	H
3	H	L	H	H	H
4	L	H	L	H	H
5	H	H	L	H	H
6	H	L	H	L	L
7	L	L	L	L	L
8	L	L	L	H	H
9	L	H	H	H	H
10	L	L	L	H	L
11	L	L	L	H	L
12	L	L	H	H	H
13	L	L	L	L	L
14	H	L	L	L	L
15	H	H	H	L	L

In order to obtain a check on the results a similar table was prepared for the examination of 1915. From these tables it became possible to compute the number of ~~xxxxxxx~~ pupils who ranked high in all subjects, in four, three, two, one, or none. The results are as follows:

TABLE LXXIV.

Distribution of Ranks in Each of Five Subjects Based on the Teachers' Examinations, 1914-1915.

Number of pupils who ranked high in	1914	%	1915	%
5 subjects	34	12.5	28	13.6
4	46	16.9	22 28	13.6
3	60	22.1	38	18.5
2	55	20.2	47	22.9
1	36	13.2	48	23.4
0	41	15.0	16	7.8
	<u>272</u>		<u>205</u>	

TABLE LXXV.

Distribution of Ranks in Each of Five Subjects as It Would be According to Chance.

By the law of chance the probability would be as follows:

5 High	1 chance	3.1% 3.1%
4	5	15.6
3	10	31.2
2	10	31.2
1	5	15.6
0	<u>1</u>	3.1
	32	

Comparing the results obtained in the examinations tabulated with what might be expected by a chance combination, it appears that the number of High in all subjects, in terms of average per cent of the two examinations, is *as follows:* ~~to the chance expectancy as 13:3.~~

Comparison of Actual Distribution With Chance Distribution.

High in	Low in	Av. % cases 1914, 1915	% cases by chance
5	0	13	3
4	1	15	18
3	2	20	31
2	3	22	31
1	4	16	16
0	5	11	3

Twenty-four per cent of the pupils were either high in all the subjects or low in all; four times as many as there would be by mere chance. Fifty-seven per cent were high in four or five subjects or low in four or five; one and one-half times as many as there would be by chance. After subtracting the percentage of cases explainable by chance ~~ixix~~ there remains 18 or 19 per cent to be accounted for. ~~ix~~ This number is practically identical with the correlation in terms of Median Retention between composition and grammar or between either of these subjects and arithmetic, geography, or history. The ~~Median Retention~~ Average Median Retention of grammar and composition ~~was 59~~ ^{is} 59 per cent. The percentage of Variations would therefor be ~~42~~ ⁴¹, and the number of cases not accounted for by chance ~~18~~ ¹⁸ of the ~~ix~~ as related to grammar ~~xxx~~ composition, arithmetic, geography, ~~xxx~~ or history ~~was~~ ^{is} 59.7, showing that 19.4 per cent of the cases ~~were~~ ^{are} not accounted for by chance. The average of the Median Retentions of composition as related to

grammar, arithmetic, geography, or history ^{is} ~~was~~ 53 per cent, showing that 16 per cent of the cases ^{are} ~~were~~ not accounted for by chance.

By taking each case of a High in grammar and comparing it with the ^{corresponding} ranking in composition, arithmetic, geography, and history it ~~was~~ found that the total number of rankings differing from the rank in grammar ^{is} ~~was~~ 213. By mere chance it should have been 272 out of 544 possible variations. The number of like rankings would therefor be ~~222~~ 331 as compared with 272 by chance, showing that the Median Retention between grammar and composition, arithmetic, geography, and history (taken collectively) was 60.8 per cent.

3. Correlation Between Age and Mastery of Grammar or Ability in the Understanding of Sentences.

(9)
Kelley found that "the correlation between average class standing and age, using all the data, is $-.31$ ".

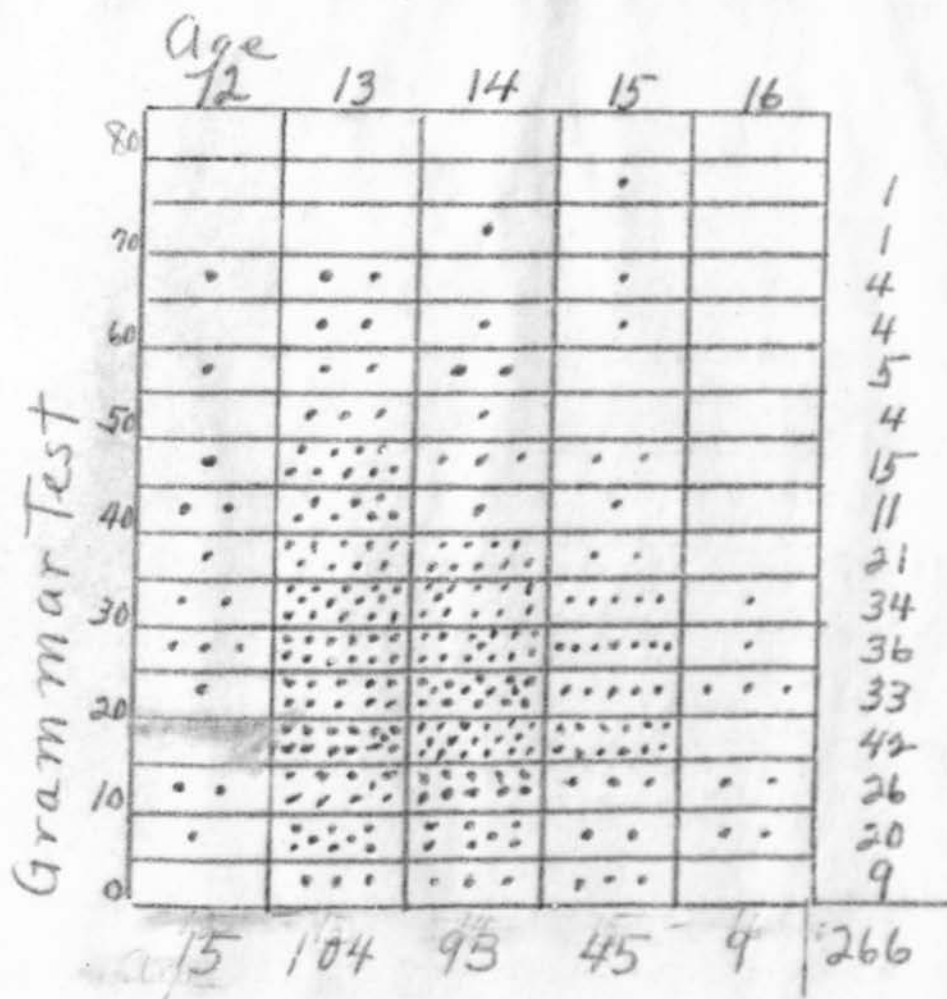
He explains this by saying that "The occasion of a negative total correlation, $-.31$, is probably due to the fact that dull and over-age pupils are advanced more rapidly than their talents warrant, thereby always keeping them in a class which ~~tax~~ taxes their capacities and in which they can secure only low marks"

~~xxxxxxxxxxxxxxxx~~

If Kelly is right there should be a negative correlation between ^{age and} the grades obtained in the tests in grammar and the understanding of sentences in the eighth grade. In order to discover whether there is any such ~~xxxxxxxxxxxxxxxx~~ relationship, ^{The following} correlation tables were prepared. These tables show that there is a negative correlation, $r = -.24$, between age and rank in the grammar test and a similar correlation, $r = -.28$, between age and the understanding of sentences:

TABLE LXXVII.

Correlation Table for Age and Attainment in Grammar.



Median Retention — 57.8%
 r by U.S. — .24

$R = .07 = r = .09 \text{ or } .11$

TABLE LXXVIII.

Correlation Table for Age and Understanding of Sentences.

Sentence ~~Test~~ Scale,

	0	65	70	75	80	85	
16	•	•	•	• •			8
15	••••	••••	••••	••••	•	••••	45
14	••••	••••	••••	••••	•	••••	88
13	••••	••••	••••	••••	•	••••	101
12			••••	••••	•	••••	15
	24	23	61	92	6	51	257

MR - 59%
 r - .28

This relation between age and marks is further shown by the following figures, which give the median grade for each year and which show graphically the fact that the younger pupils in the eighth grade obtained better marks in both tests:

~~Correlation of Age and Grade (Mark)~~

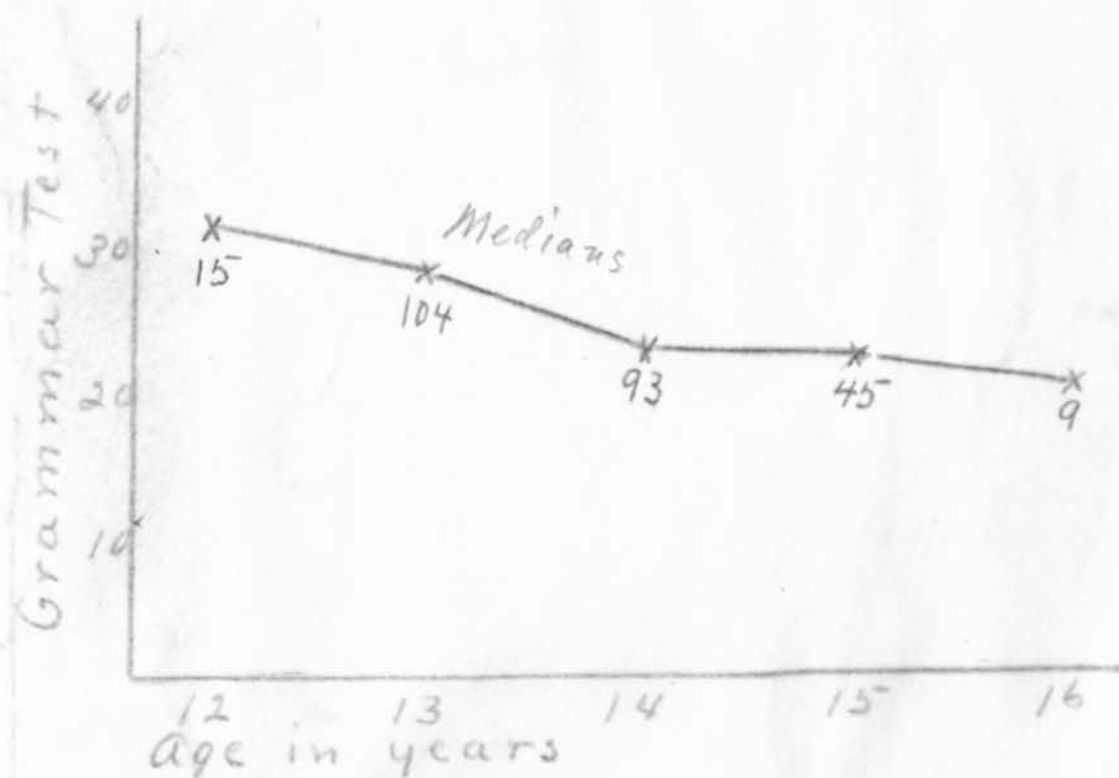


Fig. 10. Relationship Between Age and Attainment in Grammar Shown by Curve of Medians. Numbers ~~Indicates~~ on the Curve Indicate the Cases.

Correlation of Age and Marks.

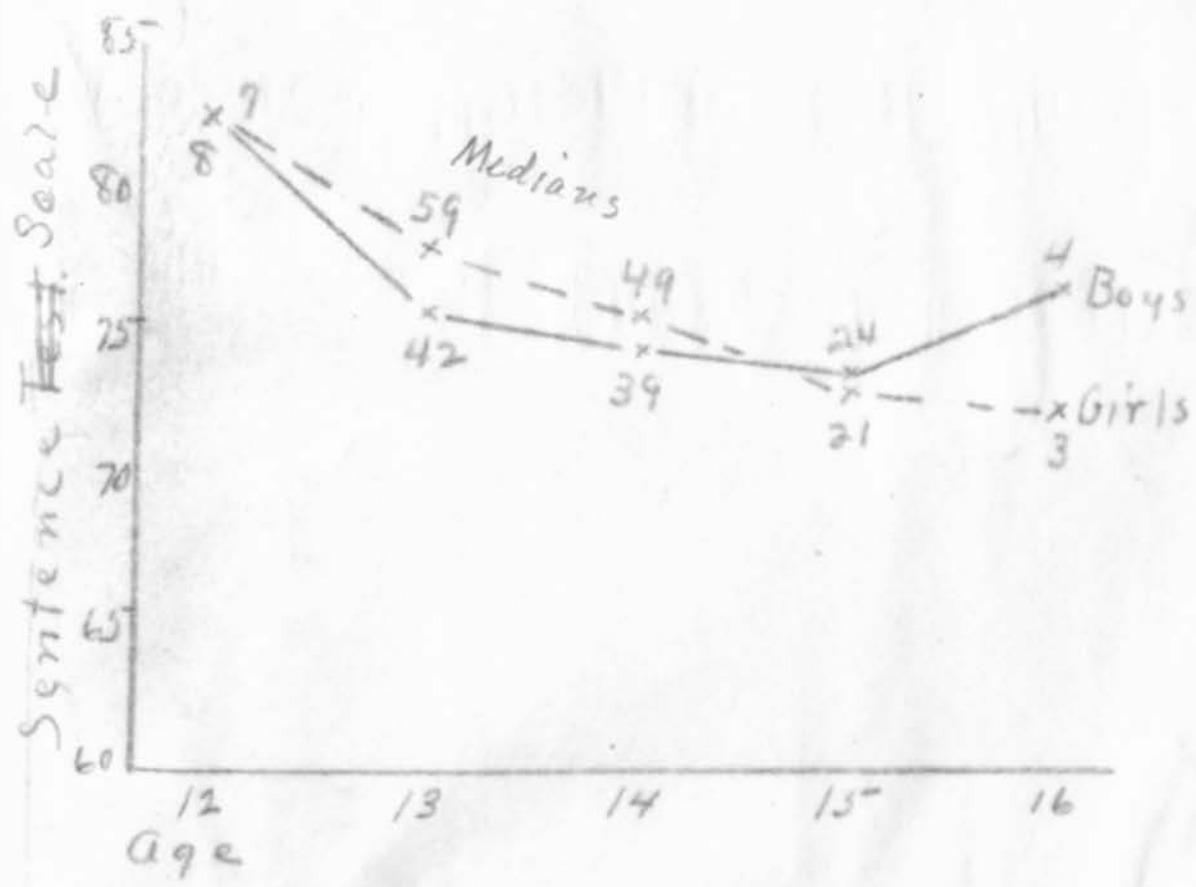


Fig. 17. Relationship Between Age and the Understanding of Sentences Shown by Curve of Medians. Numbers on the Curve Indicate the Cases.

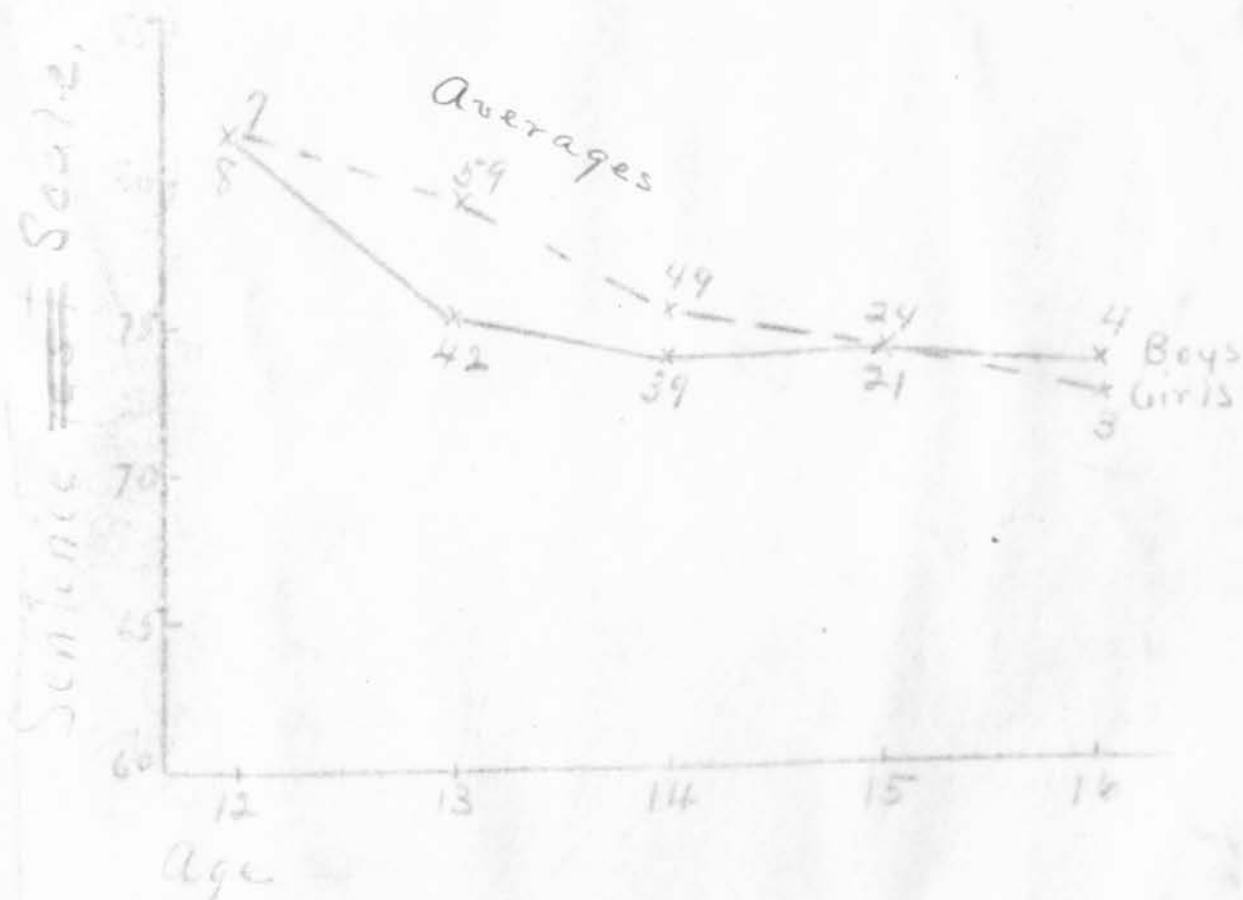


Fig. 18. Same as Fig. 17 but Based on Averages in Place of Medians.

Does this relationship between age and marks obtain in persons seventeen to twenty-two years of age who have taken the Teachers' State Examinations? In order to answer this question ~~the following table~~ a special correlation ~~was prepared~~ table was prepared. It shows the relationship between age and the number of grades above the Median obtained in ~~the following subjects~~ arithmetic, composition, geography, grammar, and history. If there is a negative correlation between age and marks in this group, ~~those~~ ~~those~~ those who were seventeen years of age should have a larger proportion of High's than the candidates who were older. As ~~the~~ ^{that} table shows, there is practically no correlation between age and marks in this group. ~~This is no doubt explainable by the fact that this table deals with persons who are not grouped by any method of promotion such as Kelley describes.~~ (10)

(10) Sp. J. 180.

TABLE LXXIX.

Correlation Table for Age and Number of High Ranks in Five Subjects Based on Teachers' State Examination, 1914.

Correlation, Age and Mark Teachers' State Examination, 1914.

		YEARS						
		17	18	19	20	21	22+	
Nos of High Grades	5							34
	4							46
	3							60
	2							55
	1							36
	0							41
		62	109	59	17	13	12	272

Median Retention 52.4%

r (U.S.) .07, ±.04

The Median Age for each group ~~was~~^{is} as follows:

Those ranking High in 5 subjects, 18.6^{years}; 4 subjects, 18.9; 3 subjects, 18.7; 2 subjects, ~~18.8~~^{18.8}; 1 subject, 18.5; Low in all subjects, 18.5 years.

The ~~number~~ median number of High's obtained for each year of age was as indicated in the following figure.

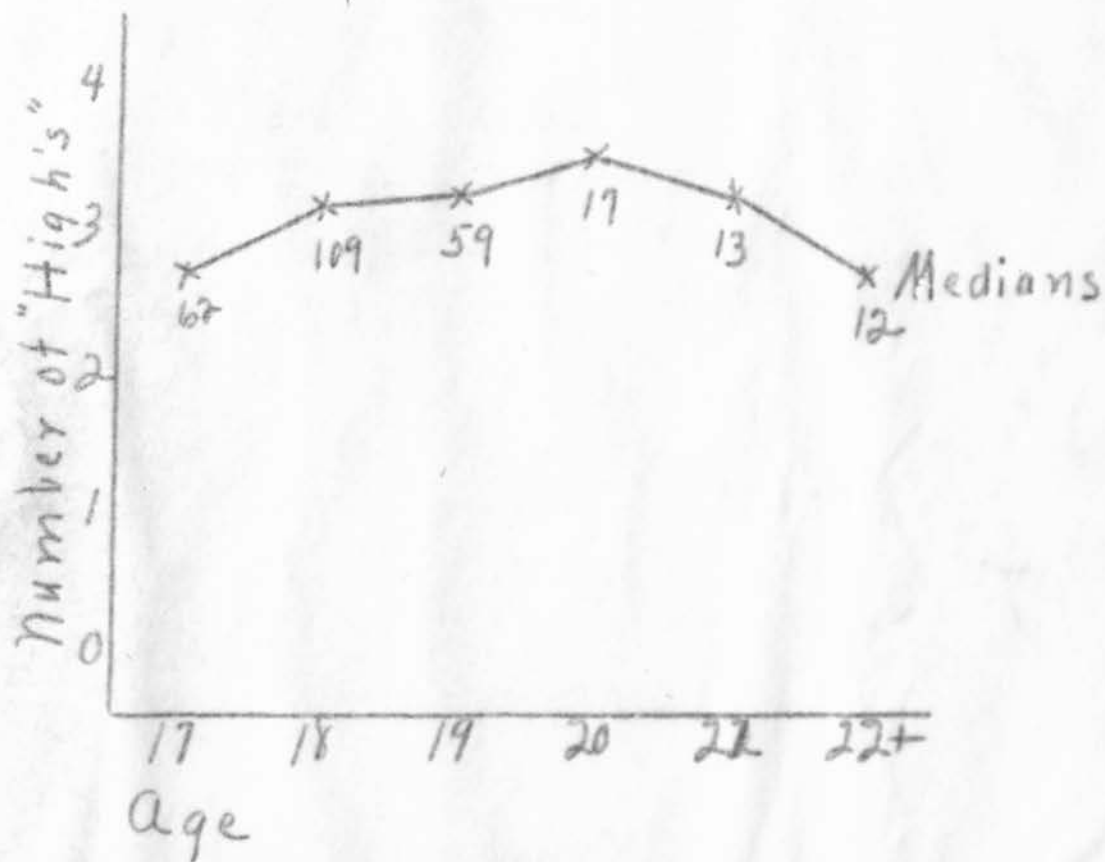


Fig. 10. Relationship Between Age and Number of Marks Above Median Obtained in Five Subjects Based on the ~~ShanhanTsamkaxkx~~ Teachers' State Examination, 1914.

negative
 The ~~xxxxxx~~ correlation between age and examination marks in the eighth grade and the absence of such a the correlation in examination marks of candidates for teachers' certificates is explained by the method of promotion. As noted elsewhere(10) Kelley claims that there is a tendency to advance dull and over-age beyond ~~xxxx~~ what their talents warrant. ~~andxxxxxxxxxxxxxxxx~~ There is a similar ~~xxxxxxxx~~ tendency to hold back those who are bright and under-age. Terman (11) states that "The tendency of teachers is to estimate a child's intelligence according to the quality of his school work in the grade where he happens to be located. This results in overestimating the intelligence of older, retarded children, and underestimating the intelligence of younger, advanced children".

(10) See page 180.

(11) Terman, Lewis M., The Measurement of Intelligence. Houghton Mifflin Co. 1916. p 76.

If this be so, then a negative correlation between age and examination marks is to be expected wherever this method of promotion prevails, as our results show. Where such a method of promotion is not operative, as in the group of persons who take Teachers' State Examination, no correlation is to be expected between age and examination marks, just as our results show.

4. General Summary and Discussion.

The following paragraphs summarize the principal facts that have been presented in this thesis:

a. There appears to be no agreement among writers on education or authors of text-books on English grammar as to the central aim of the subject or the methods to be used.

b. Scientific investigations conducted between 1904 and the present time show that (1) grammar may or may not be highly ranked among the schools subjects by the pupils, (2) the study of Latin probably increases the knowledge of English grammar, (3) there is no evidence for the claim that grammar has disciplinary value, (4) the language errors of school children are of such a nature that continuous drill in the formation of correct habits throughout the grades is the probably remedy required rather than a study of formal elements of grammar in the upper grades, (5) the correlation between knowledge of grammar and ability to write a composition or to give the thought contained in stanzas of poetry is so low as to be regarded by the investigators as negligible.

c. Based on the records of nearly 1300 persons who took Teachers' State Examinations in 1911-1916 the correlation between attainment in formal English grammar, as revealed by ability to give the construction of words, phrases or clauses and to separate propositions into subject, verb and complement, with the ability to write a composition, write a letter, capitalize and punctuate a paragraph, and correct the language errors in sentences or paragraphs is .25, ~~is~~ + .04. This is practically the same as the correlations between grammar and arithmetic, geography, or history and between composition and ~~arithmetic~~ arithmetic, geography, or history. A similar relationship is evidenced by the records from State High School Board examinations for 1914-1915. Records of final marks in two Minnesota city schools ^{also} yield similar results.

d. The correlation between a knowledge of English grammar, as shown principally by the ability to give the construction of subordinate clauses, recognize nouns and pronouns, and give the case and construction of nouns and pronouns, with the ability to understand sentences, as both are measured by standardized tests and scales, is $.17, \pm .06$.

The correlation between English grammar as shown principally by knowledge of the form and construction of nouns and pronouns, the use of noun phrases, and the classification of adverbs, with the ability to understand sentences, as both are measured by standardized tests and scales, is $.28, \pm .04$.

In every grouping of the records, those groups which had a low median score in grammar showed as high or higher correlation between grammar and the understanding of sentences as those groups which had a high median score in grammar.

200

e. There is a definite tendency either to excel in all subjects or else to be deficient in all subjects. This tendency measured in terms of Median Retention and compared with the distribution as it would be by mere chance is equivalent to a correlation of between .20 and .30, and therefor practically of the same amount as the correlations obtaining between grammar and composition and between either of these subjects and arithmetic, geography, or history. There is a possible exception to this in the case of grammar and arithmetic *where the correlation seems to be somewhat higher.*

f. There is a negative correlation of $-.24$ between the age of eighth grade pupils and their mastery of formal English grammar. There is a negative correlation of $-.28$ between the age of such pupils and their ability to understand sentences.

In the case of persons who are 17 to 20 years of age there is ^{a very low direct} ~~is~~ correlation between age and ability to obtain marks above the Median.

These facts are in harmony with recent investigations. In his summary of previous scientific studies of Mental Discipline Rugg (10) gives the following statement of present opinions regarding that problem:

"By one school of specialists, training has been regarded as specific in effect and transfer has been explained as due to 'identical ability-conditioning factors.' However, the typical attitude today is that practice may be generalized and transferred through such factors as: (1) ideational factors, (2) attention factors, (3) attitudinal factors. Thus transfer is possible with central functions through the generalization of various ones of these factors. The emphasis is here on making the method of learning a conscious matter, the conscious organization of methods of procedure, the conscious utilization of methods of improvement, better understanding of how to use mental tools, rather than any transferable change (through practice) in the constitution of the organization itself".

(10) Rugg, Harold Ordway, The Experimental Determination of Mental Discipline in School Studies. Warwick & York, 1916. p 24.

Rugg's own opinion based on his experiment with a college class that was given four months of training in descriptive geometry (11) is expressed in the following words in speaking of "The Possibility of 'Disciplinary

Outcomes' in School Studies" : "The writer believes that formal school subjects find a large part of their disciplinary value in the developing of this ability to analyze the problem and to organize a method of procedure; to build up ideals, or to organize a method of attack. But it is undoubted that they also make habitual, or automatic, many specific constituents of the complex abilities that function in many complex situations".

(11) Loc. cit. p 118.

In his experimental study of The Faculty of Attention Woodrow (11) concludes "that every individual has a certain power or faculty of attention, in the sense that the degree of his attention is determined in part by general conditions which remain effective in spite of variations in the specific type of mental activity in question".

(11) Woodrow, Herbert, The Faculty of Attention. Jour. Exper. Psy. 1: 285- 318. '16.

This conclusion about attention as a constant factor agrees with the doctrine of Mental Discipline as summarized by Rugg(12) and with the theory of General Ability as announced by Hart and Spearman (13) as well as with that of General Intelligence assumed in the tests of intelligence (14). It offers an acceptable explanation for the facts which have been presented in this thesis. ^{Whether} ~~Are~~ general intelligence, attitude, and attention be looked upon as separate factors or as different aspects of a General Factor, it must be expected that in so far as ^{either of these} ~~this~~ factors operated it tends to produce correlation between various activities of an individual. Pupils who have in one way or another come to take an effective attitude toward their studies ~~xxxxxxx~~ must be expected to excel in those subjects ~~xxxxxxxxxxxx~~ ^{to the extent} ~~xxxxxxx~~ that such an attitude is operative in the complex of conditions which may be assumed to exist. The tendency to excel in all subjects or to be deficient in all ~~xxxxxxxxxxxx~~ supports this view. So do the

(12) Loc. cit.

(13) Hart Bernard and Spearman C., General Ability, Its Existence and Nature. Brit. Jour. of Psy. ~~Nxx4~~: 5:51-85. '12

(14) Terman, Lewis M., The Measurement of Intelligence. Houghton Mifflin Co. 1916. pp 44-47.

- (15) Coffman, L. D., The Illinois Survey, ~~1917~~ A Cooperative Investigation. 1917. In the part of this survey devoted to Some Exceptional High School Pupils in Illinois, E.E. Jones states the following conclusion: "It is quite probable that the reasons for distinguishability are to be found in certain psychological conditions not at all reached by the present study. Greater mental acuity, better attentive powers, quicker reactions to the stimuli of the school, better memories, and larger capacities for properly assimilating and association of all sense material presented in text book and recitation; these and many other tendencies peculiar to individual students may account for their superiority in educational work". p 268-9.

5. General Conclusions, Limitations, and Suggested Problems.

a. The facts which have been presented in this thesis warrant the following conclusions:

1) The teaching of formal English grammar as an elementary school subject for the purpose of developing a practical mastery of English, whether in composition or in understanding of sentences, has not been justified by the results. The small amount of correlation, found to exist between grammar and composition, arithmetic, history, geography, or the understanding of sentences, is readily explained by the theory of General Factors operative in the persons concerned and need not involve any ~~xxx~~ functional relationship between the studies as such. This view is supported by the fact that in Minnesota the study of geography is, as a rule, completed in the seventh grade, while formal grammar is studied in the eighth grade. If there is any "transfer" between these subjects, it must, therefore, be from geography to grammar. As the amount of correlation between geography and grammar is slightly higher than the correlation between grammar and composition, on the basis of such correlation, it would be as reasonable, to argue, that geography should be studied for promoting ^{mastery} ~~knowledge~~ of grammar, as that grammar should be studied in order to promote mastery of composition.

The emphasis on grammar as an elementary school subject evidenced by the report of the Committee of the National Council of Teachers of English (14), by the number of pupils failed in the State High School Board examinations in this subject(15), and by its intensity-value as a basic subject in the eighth grade(16) is unwarranted.

(14) See page 47.

(15) See page 137.

(16) Coffman, L.D., The Illinois Survey, A Cooperative Investigation. In the Report on Program of Studies in Town and City Graded Elementary Schools by W. C. Bagley it is shown that 53 per cent of the teachers report final examination in grammar as required in the grammar grade group, and that grammar ranks second to arithmetic in intensity-value as a basic subject in the eighth grade. Only 0.5 per cent of 1407 teachers report grammar as being disregarded in determining promotions, a smaller per cent than is found for any other elementary school subject. pp 137-140.

The educational values of formal English grammar as an elementary-school subject have been sufficiently questioned by this and previous investigations to make it imperative for any community, that wants to obtain ~~xxxxxxxxxxxx~~ results proportionate to the money expended for teaching, to insist, that, if any funds are to be used for the teaching of formal grammar, the purpose of such teaching, shall be made definite and the results measured so as to show whether the purpose is attained or not.

These conclusions ^{are} ~~be~~ subject to the following limitations:

a. Being based on a specific conception of grammar ~~it~~ ^{they} assert nothing regarding the value or lack of value of other types of grammar study. Presumably a course in grammar can be so arranged, both in respect to ~~subject~~ content and methods, that certain definite results will be attained. ~~However~~ However, any such attempt should be expected to demonstrate the results.

b. Grammar may be ~~valuable~~ a profitable study in the high school, even though its value in the grades is questioned.

c. Even if ~~it~~ ^{grammar has} ~~no~~ no value as a means to promote other abilities, it may have a value as an end. It is conceivable that grammatical insight into language may have a value similar to other insights which are the results of experience rather than factors producing ~~an~~ experience. The person who has climbed a mountain may find it ~~not~~ worth while to ~~him~~ look down over the path along which he arrived because it gives him understanding of how he arrived. Perhaps some studies may profitably be pursued simply for the sake of acquiring understanding.

d. ~~XXXXXXXXXXXX~~ The knowledge of grammar may be valuable ^{for} ~~in~~ certain ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ persons in specific situations, as for example, a teacher ~~XXXXX~~ who is to correct a composition or an editor who reads a manuscript and prepares it for the printer.

The study suggests the following problems for further investigation:

a. An experimental study of the methods by which persons of different ages grasp the meaning of difficult sentences. Do they analyze such sentences grammatically, or do they get the meaning in some other way?

b. An analysis of types of grammar teaching.

c. An analysis of the content of grammar for the purpose of discovering what portions of it may be included in the study of other subjects in the grades or high school. Can the subject be "dismembered" and apportioned to other subjects? For example, can the plurals of nouns and the possessives of nouns be as effectively taught in connection with spelling as it now is in connection with grammar?

d. Is it possible to teach grammar for linguistic insight more profitably in connection with the study of a foreign language, through which comparisons are made with English, than it can be done in connection with English alone?

e. The adaptation of statistical methods to a more common use in the measurement of the effects of mastery in one subject or part of a subject on ability in other subjects or ^{an} other parts of the same subject. This requires simplicity and ease of operation, automatic checks for errors, and definiteness of meaning in the results. The ^{growing} ideals of efficiency may be expected to demand that the schools furnish reliable and clear demonstrations of the results which they claim to produce in all the activities and attainments to which measurements can be applied.

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Test in Grammar used by Hoyt.

(Answer as many of the following questions as you can in 40 minutes. The questions are all based on the following stanzas from Gray's "Elegy Written in a Country Church-yard.")

1. The curfew tolls the knell of parting day,
The lowing herd winds slowly o'er the lea,
The plowman homeward plods his weary way,
And leaves the world to darkness and to me.
2. Now fades the glimmering landscape on the sight,
And all the air a solemn stillness holds,
Save where the beetle wheels his droning flight,
And drowsy tinklings lull the distant folds;
3. Save that, from yonder ivy-mantled tower,
The moping owl does to the moon complain
Of such as, wandering near her secret bower,
Molest her ancient solitary reign.
4. Beneath those rugged elms, that yew-tree's shade,
Where leaves the turf in many a mouldering heap,
Each in his narrow cell forever laid,
The rude forefathers of the hamlet sleep.

1. Select and write out in full (a) a compound sentence; (b) a complex sentence.
2. Diagram or analyze the last two lines in the first stanza.
3. Select (a) two phrases and (b) two clauses. Tell what each modifies.
4. Give the part of speech of the first word of each stanza, and tell why you so classify it.
5. What is the case of each of the nouns in the last stanza? What determines the case in each instance?

6. Give the voice, mode, tense, and number of the verbs in stanza 3; also tell whether they are transitive or intransitive and why.
7. Name the adjectives in stanza 3, and tell what the use of each is in the sentence.
8. Give the simple subject, the simple predicate, the complete subject and the complete predicate of the sentence in stanza 4.
9. What part of speech is each of the following words? Give your reason for so classifying it.
First stanza; o'er, homeward.
Fourth stanza; those, many.
10. Select four verb-forms that are not used as simple predicates. As what part of speech is each used?

Note: Taken from Teachers College Record, Nov., 1906. Pub. by Columbia University Press, Columbia University, New York.

10. Score 10: The sentence must contain the word "well" used as an adverb.

Class Scores:

1. Copy the names of the pupils alphabetically in the spaces indicated on the class record sheet.
2. Enter in the appropriate places in the question columns figures indicating the score of each pupil in each question of the test.
3. Total these individual scores at the right of the page. This will give the total value for each pupil. Add these totals and place the sum at the bottom of the column.
4. Total the values for each question at the bottom of each group and add these totals across to the right. The sum thus obtained must equal the sum obtained in adding the columns of totals.
5. Divide the sum of the totals for the boys by the number of boys to obtain their average. Divide the sum of the totals for the girls by the number of girls for their average. Finally, divide the sum of the totals for the boys and girls by the total number of boys and girls for the average of all which may be taken as the class score.

Form 22

DIRECTIONS FOR GIVING AND
SCORING TESTS IN ENGLISH GRAMMAR

ARRANGED BY
BUREAU OF COÖPERATIVE RESEARCH
COLLEGE OF EDUCATION
THE UNIVERSITY OF MINNESOTA

READING TEST: UNDERSTANDING OF SENTENCES

ARRANGED BY
BUREAU OF COÖPERATIVE RESEARCH
COLLEGE OF EDUCATION
THE UNIVERSITY OF MINNESOTA

FOR GRADES SIX TO NINE

INDIVIDUAL SCORE SHEET

NAME _____
SEX _____ AGE _____ YEARS _____ MONTHS
CITY _____, SCHOOL _____ GRADE _____
TEACHER _____ DATE _____

Set IV or 40	Set V or 50	Set VI or 60	Set VII or 70

Time of beginning work _____

Time of completing work _____

Time spent _____

To be returned to the University of Minnesota Bureau of
Coöperative Research, Minneapolis, Minnesota.

SCALE BETA I.

40

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

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

1. What is the cause of hay-fever?.....
2. How large a percentage of people get hay-fever?.....
3. What means could they take to keep from getting it?

Read this and then write the answers to 4 and 5. All questions must be answered from the paragraph. Read the paragraph as often as you need to.

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

4. What two varieties of stoves does the paragraph mention?
5. For what purpose is the extra set of burners?.....

50

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

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

1. What two things are contrasted in this paragraph?
2. How could a man be rich and still not own a single penny of money?.....
3. Name something that is money, but is not exactly wealth?

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

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

4. What are some conditions that might make even the best boy leave school work unfinished?.....
5. What might be the effect of his father's death upon the way a boy spent his time?.....

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

Every one of the million readers of anecdotes, or memoirs, or lives of Napoleon, delights in the page, because he studies in it his own history. Napoleon is thoroughly modern, and, at the highest point of his fortunes, has the very spirit of the newspapers. He is no saint—to use his own words, “no capuchin,” and he is no hero, in the high sense. The man in the street finds in him the qualities and powers of other men in the street. He finds him, like himself, by birth a citizen, who, by very intelligible merits, arrived at such a commanding position, that he could indulge all those tastes which the common man possesses, but is obliged to conceal and deny; good society, good books, fast traveling, dress, dinners, servants without number, personal weight, the execution of his ideas, the standing in the attitude of a benefactor to all persons about him, the refined enjoyment of pictures, statues, music, palaces and conventional honors,—precisely what is agreeable to the heart of every man in the nineteenth century.

1. What other person possesses the same tastes as Napoleon? _____
2. Who is said to have arrived at a commanding position? _____
3. What must the common man do with tastes such as Napoleon indulged? _____
4. Who is said to have “intelligible merits”? _____
5. What does the “man in the street” find in Napoleon? _____

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

Studies serve for delight, for ornament, and for ability. Their chief use for delight is in privateness, and retiring; for ornament, is in discourse; and for ability, is in the judgment and disposition of business; for, expert men can execute, and perhaps judge of particulars, one by one; but the general counsels, and the plots and marshaling of affairs, come best from those that are learned.

To spend too much time in studies, is sloth; to use them too much for ornament, is affectation; to make judgment wholly by their rules, is the humor of a scholar; they perfect nature, and are perfected by experience—for natural abilities are like natural plants, that need pruning by study; and studies themselves do give forth directions too much at large, except they be bounded in by experience.

1. In how many ways may “studies” be misused? _____
2. In what things are learned men said to be the best? _____
3. In what way do studies serve for ornament? _____

Read this and then write the answers to 4 and 5. All questions must be answered from the paragraph. Read the paragraph as often as you need to.

However certain it may seem to be that men work only because they must, and would avoid labor except for the food, clothing, and luxuries that are its rewards, the facts may well be the contrary. It can hardly be the case that men dislike work because they wish to be utterly idle. For mere rest, mere inactivity, is not commonly enjoyed. To have nothing to do is not what men seek. Were that so, we should envy the prisoner shut up in his cell. If men had to choose between a life spent at eight hours of work daily in a factory and a life of eight hours of sitting on a throne without moving hand or foot, many of them would, after trying both, choose the former. Activity of body or mind, at which a man can succeed, is, in and of itself, rather enjoyed than disliked.

4. In what respect is a prisoner in his cell like a man with a million dollars? _____
5. What is stated in the paragraph to be really liked and not objected to? _____

PRELIMINARY TEST.

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

The good woman had risen thus early in order to set about making a scarecrow, which she intended to put in the middle of her corn patch. It was now the last week of May, and the crows and the blackbirds had already discovered the little, green, rolled-up leaf of the Indian corn just peeping out of the soil. She was determined, therefore, to contrive as lifelike a scarecrow as ever was seen.

1. What was the good woman about to do?.....
.....
2. What time of year was it?.....
.....
3. What time of day was it?.....
.....
4. Why did she plan to make a scarecrow?.....
.....
5. What was she going to do with it?.....
.....

FORM 9

DIRECTIONS FOR
GIVING AND SCORING TESTS
IN READING

ARRANGED BY
BUREAU OF COÖPERATIVE RESEARCH
COLLEGE OF EDUCATION
THE UNIVERSITY OF MINNESOTA

VISUAL VOCABULARY

DIRECTION FOR GIVING TEST

I. Preliminary Test

1. See that each child has at least one, preferably two, well sharpened lead pencils.
2. Distribute to each child a copy of the test.
3. Have each child write in the proper place his name, sex, age in years and months, city, grade, school, teacher, and the date of the test. Inspect papers to see that this is correctly done.
4. Doing the test: Direct the children to look at the Preliminary Test. Say to them: "On this page are some words. The reading at the top tells you to do something to these words. Read the lines at the top and do what it says to do. Read the instructions two or three times if necessary. When you have finished, bring your papers to me so that I can see whether you have done the work correctly or not."
5. Have each child as he completes his work bring forward his finished page. Look it over at once to see if he has followed directions. Check the use of each direction. Where directions have not been followed, call the child's attention to that part before giving the Scale R2 Test.

II. Scale R2

1. The preliminary test should have prepared each child to perform the Scale R2 Test correctly. Direct them to turn to Scale R2.
2. Say to the children: "On this page are some words. The reading at the top tells you to do something to these words. Read the lines and do what it says to do. Read the instructions two or three times if necessary. When you have finished, bring your papers to me at the desk. At the signal 'get ready' take up your pencil and look at me. At the signal 'start,' begin work."
3. Have each child as he completes his work bring his paper forward. Keep the time for each pupil. To keep time satisfactorily require two persons, one to call the time as the papers are handed in, the other to record the time on the papers. The record can best be made by recording on each sheet in hours, minutes and seconds, as 10-15-30, the time beginning the test and the time each individual finishes. By subtracting the exact time occupied in the test can be determined.

DIRECTIONS FOR SCORING

Computing Individual Scores

1. Arrange the papers from a single class alphabetically in a pile.
2. Take from the pile the first paper and read through the child's markings until you come to a line in which an error or omission occurs. Place to the left of this line a figure indicating the number of errors and omissions in that line. Read through the remaining lines and indicate in a similar manner the number of errors and omissions. The highest numbered line which the child does with one (or no) omission or error is taken as his score. Draw a line under the figure on the page indicating this score. Check this score on the first page in the blank indicated. Then proceed in a similar manner with each of the other papers of the class.

Class Scores

1. Use class record sheet number 1.
2. Enter in the wide space at the left the name of the pupil and at the appropriate places the figures indicating the number of errors and omissions in each line.
3. Add the numbers in each column and place the sum at the bottom of the score sheet. Find the percentage of error by dividing the sum thus obtained by five times the number of pupils in the class. The score of the class may be taken as the line in which the percentage of error is nearest 20.
4. If no single line gives exactly 20 per cent of error, the actual class score will be intermediate between the two lines which gives nearest 20 per cent of error. By means of Table I, this intermediate value may be calculated.

For example, if a fourth grade class has only 16 per cent of error in line 25, then its rating should be somewhat more than 25. By referring to the table, it is found that 16 per cent of error indicates an additional value of 2.3 to the value of the line. This 2.3 should be added to the 25, giving 27.3 as the ability of the class in question.

Or, if a sixth grade class is found to make only 5 per cent of error in line 35, but 28 per cent of error in line 45, then the score for this grade will be above 35 and below 45. Calculating from the percentage nearest 20, namely 28, and by referring to the table, we find that 3.9 should be subtracted from the 45 in question. Subtracting 3.9 from 45 gives 41.1 as the correct score for the class in question. A more correct rating can often be obtained from the two scores nearest 20 per cent.

UNDERSTANDING OF SENTENCES

DIRECTIONS FOR GIVING TESTS

I. Preliminary Test

1. See that each child has one, preferably two, well sharpened lead pencils.
2. Distribute to each child a copy of the test.
3. Have each child write at the proper place on the first cover page his name, sex, age in years and months, city, school, grade, teacher, and date of test. Make certain that this is properly done before proceeding with the test.
4. Doing the test: Have the children look at the Preliminary Test. Say to them: "On this page are some sentences. Below the sentences are some questions. You are to read through the sentences and then write correct answers to the questions. You need not write complete sentences, but your answers must be definite. Read the instructions and sentences as often as necessary. When you have finished bring your paper to me so that I can see whether you have done the work correctly."
5. Have each child as he completes his work bring his paper forward. Look it over at once to see if he has followed instructions. Do not give Scale Beta 1 until each child understands how to do the preliminary test correctly.

II. Scale Beta 1.

1. The preliminary test should have prepared each child to perform Scale Beta 1 test correctly. Direct the children to turn to Scale Beta 1.
2. Say to the children: "On this page are some selections to be read and below each selection are some questions to be answered. Read the selection and write answers to the questions. Your answers need not make complete sentences but they must be clear and definite. Read the selections and questions as often as necessary but work continuously until you have finished. When you have finished bring your papers to me at the desk. At the signal, 'get ready,' take up your pencil and look at me. At the signal, 'start,' begin work."
3. Have each child as he completes his work bring his paper forward. Keep the time for each pupil.

DIRECTIONS FOR SCORING TESTS

Individual Scores

Read through each paper and note omissions or wrong responses, placing at the left an X for each error. Accept as correct for each question in each set the answers indicated as right in the following key.

BETA I

- Set I, Element 1. Short
2. Two
3. Mary
- Set III, Element 1. The author, An author
2. The printer
3. Went down the road, or equivalent (call went on, went on to Boston, wrong)
4. Two other boys, or two boys
5. Nine o'clock

- Set IV, Element 1. Pollen from plants and weeds, Pollen from plants, Pollen from weeds, Pollen.
2. Two per cent, 2 per cent, 2. One out of fifty, One in fifty, or equivalent. Call A small per cent, or A small number, or A few, wrong.
3. By living in certain places, By going to live in certain places, By finding a place where there is no pollen from weeds.
4. Coal range and gas range.
5. For broiling, Broiling, To broil with, etc.

- Set V, Element 1. Money and wealth.
2. He might have land; He could own property; He could own houses. He could have jewels, or gold and silver. Might have mines, etc.
3. Paper money, A ten dollar bill. Call wrong any answer that confuses paper money with coin, such as "a silver dollar," "a ten dollar gold piece," "a nickel," "a penny."
4. Right responses are such as: If he has to work for a living; If he has to work afternoons and evenings to help his mother; When the father dies; When their parents die; If his father died and to work; If his father died or if sick; His father might die; His father may die; If his father died he has to work; If his father or mother died; If a boy's father dies he has to earn money for his mother; When someone dies in their family; Help support the family; The condition is in case his father died; If his father died he might have to go to work; If his father died he might have to work.

Wrong responses are such as: Playing ball, etc.; Going with bad boys; To work; To earn money; Have to work out to get money; Because to help their mother.

5. Right responses are such as: He would have to work all the time; He would work instead of going to school; He might have to work to support the family; He would have to go out to work; He would have to work; He would have to work afternoons and evenings; work; A boy would work; He had to work afternoons and evenings; To work afternoons and evenings; Working or making his living.

Wrong responses are such as: By the boy not working if his father lost his job; By not doing what his father told him; Sickness; Makes the father work; Loafing and doing nothing; Go with bad companions; Bad and not doing lessons; Idling; Go away and not come back until night.

- Set VI, Element 1. The common man.
2. Napoleon.
3. Conceal and deny them; Deny them; Conceal them; Suppress them.
4. Napoleon.

- Set VII, Element
1. Three, or enumeration of the three.
 2. General plots, counsels and marshalling of affairs. (If two of these are given, give full credit. If but one, count it 0.)
 3. In discourse (most frequent error here due to confusion between serve and use and ignorance of meaning of affectation).
 4. We should envy him. Envy the prisoner. Would want to change places with him. Would want to be a prisoner.
 5. Activity of body or mind at which a man can succeed.

Class Scores

1. Use Record Sheet No. 2.
2. Copy from individual score sheet upon Record Sheet No. 2 the name of each pupil and the number of errors made by him in each element of each set.
3. Total the figures for each set in the broad column immediately at the right of the set in question.
4. Total these results at the bottom of the page in the line marked "Total number wrong." Divide the several totals by the product of the number of individuals times the number of questions in the set. Thus in Set I, let the total number of errors be twelve and the number of individuals in the class twenty. Since the chances of error in Set I are three, you multiply 3 by 20 which gives 60. This 60 you divide into 12 which gives .20 or 20%, the per cent of error made by the entire class in Set I. Set I is then the score for the class if, as is likely, the following set gives a higher percentage of error. In any case, the class score is the number of the set which gives 20% of error.
5. If no single set gives exactly 20% of error, the actual class score will be intermediate between the two sets which gives nearest 20% of error. By means of Table I, this intermediate value may be calculated by the method described under 4 on page 3.

TABLE I
To Estimate the Degree of Difficulty at Which 20 Per Cent of Errors and Omissions Would be Found from Any Given Percentage of Errors and Omissions Between 8.0 and 40.0.

Given percentage	Given percentage		Given percentage		Given percentage		Subtract
	Add	Add	Add	Add	Add	Add	
8.0	8.4	12.0	4.9	16.0	2.3	20.0	0.0
.1	8.3	.1	4.9	.1	2.2	.1	0.0
.2	8.2	.2	4.8	.2	2.1	.2	0.1
.3	8.1	.3	4.8	.3	2.1	.3	0.1
.4	8.0	.4	4.7	.4	2.0	.4	0.2
.5	7.8	.5	4.6	.5	2.0	.5	0.3
.6	7.8	.6	4.5	.6	1.9	.6	0.3
.7	7.7	.7	4.5	.7	1.8	.7	0.4
.8	7.6	.8	4.4	.8	1.8	.8	0.4
.9	7.5	.9	4.3	.9	1.7	.9	0.5
9.0	7.4	13.0	4.2	17.0	1.7	21.0	0.5
.1	7.3	.1	4.2	.1	1.6	.1	0.6
.2	7.2	.2	4.1	.2	1.5	.2	0.6
.3	7.1	.3	4.0	.3	1.5	.3	0.7
.4	7.1	.4	3.9	.4	1.4	.4	0.7
.5	7.0	.5	3.9	.5	1.4	.5	0.8
.6	6.9	.6	3.8	.6	1.3	.6	0.8
.7	6.8	.7	3.7	.7	1.2	.7	0.9
.8	6.7	.8	3.7	.8	1.2	.8	0.9
.9	6.6	.9	3.6	.9	1.1	.9	1.0
10.0	6.5	14.0	3.6	18.0	1.1	22.0	1.0
.1	6.4	.1	3.5	.1	1.0	.1	1.1
.2	6.3	.2	3.5	.2	1.0	.2	1.1
.3	6.2	.3	3.4	.3	0.9	.3	1.2
.4	6.2	.4	3.3	.4	0.9	.4	1.2
.5	6.1	.5	3.3	.5	0.8	.5	1.3
.6	6.0	.6	3.2	.6	0.8	.6	1.3
.7	6.0	.7	3.1	.7	0.7	.7	1.4
.8	5.9	.8	3.0	.8	0.7	.8	1.4
.9	5.8	.9	3.0	.9	0.6	.9	1.5
11.0	5.7	15.0	2.9	19.0	0.6	23.0	1.5
.1	5.7	.1	2.8	.1	0.5	.1	1.6
.2	5.6	.2	2.7	.2	0.4	.2	1.6
.3	5.5	.3	2.7	.3	0.3	.3	1.7
.4	5.4	.4	2.6	.4	0.3	.4	1.7
.5	5.3	.5	2.6	.5	0.2	.5	1.8
.6	5.2	.6	2.5	.6	0.2	.6	1.8
.7	5.2	.7	2.4	.7	0.1	.7	1.8
.8	5.1	.8	2.4	.8	0.1	.8	1.9
.9	5.1	.9	2.3	.9	0.0	.9	1.9

TABLE I—(Continued)

Given percentage	Subtract	Given percentage	Subtract	Given percentage	Subtract	Given percentage	Subtract
24.0	2.0	28.0	3.9	32.0	5.6	36.0	7.2
.1	2.1	.1	3.9	.1	5.6	.1	7.2
.2	2.1	.2	4.0	.2	5.7	.2	7.3
.3	2.2	.3	4.0	.3	5.7	.3	7.3
.4	2.2	.4	4.0	.4	5.7	.4	7.4
.5	2.3	.5	4.1	.5	5.8	.5	7.4
.6	2.3	.6	4.1	.6	5.8	.6	7.5
.7	2.4	.7	4.2	.7	5.8	.7	7.5
.8	2.4	.8	4.2	.8	5.9	.8	7.5
.9	2.4	.9	4.2	.9	5.9	.9	7.6
25.0	2.5	29.0	4.3	33.0	6.0	37.0	7.6
.1	2.6	.1	4.3	.1	6.0	.1	7.7
.2	2.6	.2	4.4	.2	6.1	.2	7.7
.3	2.7	.3	4.4	.3	6.1	.3	7.7
.4	2.7	.4	4.5	.4	6.1	.4	7.8
.5	2.7	.5	4.5	.5	6.2	.5	7.8
.6	2.8	.6	4.6	.6	6.2	.6	7.8
.7	2.8	.7	4.6	.7	6.3	.7	7.9
.8	2.9	.8	4.7	.8	6.3	.8	7.9
.9	2.9	.9	4.7	.9	6.3	.9	8.0
26.0	3.0	30.0	4.7	34.0	6.4	38.0	8.0
.1	3.0	.1	4.8	.1	6.4	.1	8.0
.2	3.0	.2	4.8	.2	6.5	.2	8.1
.3	3.1	.3	4.9	.3	6.5	.3	8.1
.4	3.1	.4	4.9	.4	6.6	.4	8.1
.5	3.2	.5	4.9	.5	6.6	.5	8.2
.6	3.2	.6	5.0	.6	6.6	.6	8.2
.7	3.3	.7	5.0	.7	6.7	.7	8.3
.8	3.3	.8	5.1	.8	6.7	.8	8.3
.9	3.3	.9	5.1	.9	6.7	.9	8.3
27.0	3.4	31.0	5.1	35.0	6.8	39.0	8.4
.1	3.5	.1	5.2	.1	6.8	.1	8.4
.2	3.5	.2	5.2	.2	6.9	.2	8.5
.3	3.5	.3	5.3	.3	6.9	.3	8.5
.4	3.6	.4	5.3	.4	7.0	.4	8.5
.5	3.6	.5	5.4	.5	7.0	.5	8.6
.6	3.7	.6	5.4	.6	7.0	.6	8.6
.7	3.7	.7	5.4	.7	7.1	.7	8.6
.8	3.8	.8	5.5	.8	7.1	.8	8.7
.9	3.8	.9	5.5	.9	7.2	.9	8.7

IN MAKING RETURNS TO THE BUREAU OF COÖPERATIVE RESEARCH AT THE UNIVERSITY OF MINNESOTA, INCLUDE THE CHILDREN'S PAPERS AND THE CLASS RECORD SHEETS COMPLETE.

DIRECTIONS FOR GIVING AND
SCORING TESTS IN ENGLISH GRAMMAR

ARRANGED BY
BUREAU OF COÖPERATIVE RESEARCH
COLLEGE OF EDUCATION
THE UNIVERSITY OF MINNESOTA

DIRECTIONS FOR GIVING TESTS.

I. Materials: Set of questions, Series B, Form 23, and two well sharpened pencils for each pupil.

I. Method.

- 1. Distribute one copy of test to each pupil.
2. Instruct pupils to fill in the name, sex, grade, school, age, teacher and date at the top of page.
3. Then give the following directions to the pupils: 'On the following pages of this sheet you will find some questions in English grammar. I want you to read these questions and answer as many of them as you can. You will be allowed thirty minutes to complete the work. Work carefully but do not waste time. As soon as you complete your work bring your paper to me. Now you may begin work.'
4. Note the time and at the end of thirty minutes call for all papers not yet handed in.
5. As each pupil brings his paper forward mark on it the time occupied in the work.

DIRECTIONS FOR SCORING TESTS

Individual Scores

- 1. Arrange papers alphabetically in a pile, one for the boys and one for the girls.
2. Take the papers in order and grade them according to the following key:
3. Give 10 for a correct answer, 5 for nearly correct according to Specific Directions, 0 for incorrect.

Specific Directions for Scoring Each Answer

- 1, 2, 3, 5, 6, 11. Score 10: Any sentences that meet the requirements of the questions.
4. Score 10: I am lead, or I am being lead.
7. Score 10: In May a sparrow, which had evidently met with disaster earlier in the season, built its nest in a thick mass of woodbine on my window, or equivalent. Score 5 if the main arrangement is correct but commas omitted or other minor mistakes made.
8. Score 10: Has been brought (on). Indicative, passive, present perfect. Score 5 if one mistake is made.
9. Score 10: Stones. Plural, neuter or no gender, objective. Singular, neuter, nominative. Score 5 if one or two mistakes are made.
10. Score 10: I am sure it could not have been they.
12. Score 10: The sentence must contain the word worse used as adjective.
13. Score 10: We saw the wisdom of giving in, or equivalent.
14. Score 10: Lady, countess, tigress. Score 5 if one mistake is made.

Class Scores:

1. Copy the names of the pupils alphabetically in the spaces indicated on the class record sheet.
2. Enter in the appropriate places in the question columns figures indicating the score of each pupil in each question of the test.
3. Total these individual scores at the right of the page. This will give the total value for each pupil. Add these totals and place the sum at the bottom of the column.
4. Total the values for each question at the bottom of each group and add these totals across to the right. The sum thus obtained must equal the sum obtained in adding the columns of totals.
5. Divide the sum of the totals for the boys by the number of boys to obtain their average. Divide the sum of the totals for the girls by the number of girls for their average. Finally, divide the sum of the totals for the boys and girls by the total number of boys and girls for the average of all which may be taken as the class score.