A Comparison of school marks with standard norms.

Herbert Grayson
University of Massachusetts Amherst

Follow this and additional works at: https://scholarworks.umass.edu/theses


This thesis is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Masters Theses 1911 - February 2014 by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
A COMPARISON OF SCHOOL MARKS WITH STANDARD NORMS

GRAYSON - 1939
A COMPARISON OF SCHOOL MARKS
WITH STANDARD NORMS

BY
Herbert Grayson

A Thesis Submitted in Partial Fulfillment of the Requirements for the Master of Science Degree

Massachusetts State College
1939
TABLE OF CONTENTS
TABLE OF CONTENTS

Table of Contents ........................................... I
Index of Graphs ............................................. 1

CHAPTER I---INTRODUCTION

(1) Variables in Teachers' Estimates ................. 1
(2) The Resulting Lack of Reliability .............. 2
(3) Improving Reliability of Essay Test ........... 2
(4) Reliability of Standard Tests ................. 3
(5) Essay and Objective Tests Supplementary .... 4

CHAPTER II---REVIEW OF RELATED LITERATURE

(1) The Teacher's Mark as a Measure of Achieve-
ment ......................................................... 6
(2) The Teacher's Mark in Prediction ............... 8
(3) The Cause of Inadequacies in Teachers'
Marks ....................................................... 9
(4) Teachers' Marks vs. Standard Scores .......... 10
(5) Standard Tests in School ......................... 11
(6) I.Q. vs. School Success ......................... 13
(7) Articulation between Junior H.S. and Senior
H.S. .......................................................... 15

CHAPTER III---PURPOSE AND PROCEDURE

(1) The Problem ............................................. 17
(2) The Subjects .......................................... 17
(3) The Material ........................................... 18
CHAPTER IV—STANDARDIZED TEST RESULTS

1. Intelligence Results for Group A
2. Stanford Achievement Scores for Group A
3. Cooperative Achievement Scores for Group A in the Foreign Languages
4. Cooperative Achievement Scores for Group A in English
5. Cooperative Achievement Scores for Group A in Mathematics
6. Cooperative Achievement Scores for Group A in the Social Studies
7. Cooperative Achievement Scores for Group A in the Sciences
8. Intelligence Results for Group B
9. Stanford Achievement Scores for Group B
10. Summary

CHAPTER V—RESULTS OF TEACHERS' MARKS

1. Average Marks in Grade 8 for Group A
2. Average Marks in Grades 9 to 12 for Group A
3. Average Marks in the Foreign Languages for Group A
4. Average Marks in English for Group A
5. Average Marks in Mathematics for Group A
6. Average Marks in the Social Studies for Group A
7. Average Marks in the Sciences for Group A
8. Average Marks in Grade 8 for Group B
INDEX OF GRAPHS

GRAPH 1—Showing the Distribution of I.Q. Ratings for Group A in 1934. 22

GRAPH 2—Showing the Distribution of Stanford Achievement Test Scores for Group A in 1934. 24

GRAPH 3—Showing the Distribution of Cooperative Test Scores in Elementary Latin for Group A in 1935. 26

GRAPH 4—Showing the Distribution of Cooperative Test Scores in 2nd. Year Latin for Group A in 1936. 26

GRAPH 5—Showing the Distribution of Cooperative Test Scores in Elementary French for Group A in 1936. 28

GRAPH 6—Showing the Distribution of Cooperative Test Scores in 2nd. Year French for Group A in 1937. 28

GRAPH 7—Showing the Distribution of Cooperative Test Scores in 3rd. Year French for Group A in 1938. 28

GRAPH 8—Showing the Distribution of Cooperative Test Scores in Freshman English for Group A in 1935. 30

GRAPH 9—Showing the Distribution of Cooperative Test Scores in Sophomore English for Group A in 1936. 30

GRAPH 10—Showing the Distribution of Cooperative Test Scores in Junior English for Group A in 1937. 32

GRAPH 11—Showing the Distribution of Cooperative Test Scores in Senior English for Group A in 1938. 32

GRAPH 12—Showing the Distribution of Cooperative Test Scores in Elementary Algebra for Group A in 1935. 34
GRAPH 13—Showing the Distribution of Cooperative Test Scores in Plane Geometry for Group A in 1936. 34

GRAPH 14—Showing the Distribution of Cooperative Test Scores in Advanced Mathematics for Group A in 1937. 35

GRAPH 15—Showing the Distribution of Cooperative Test Scores in World History for Group A in 1935. 35

GRAPH 16—Showing the Distribution of Cooperative Test Scores in United States History for Group A in 1933. 37

GRAPH 17—Showing the Distribution of Cooperative Test Scores in Biology for Group A in 1936. 37

GRAPH 18—Showing the Distribution of Cooperative Test Scores in Physics for Group A in 1937. 39

GRAPH 19—Showing the Distribution of Cooperative Test Scores in Chemistry for Group A in 1938. 39

GRAPH 20—Showing the Distribution of Intelligence Quotient Ratings for Group B in 1938. 41

GRAPH 21—Showing the Distribution of Stanford Achievement Test Scores for Group B in 1938. 42

GRAPH 22—Showing the Distribution of Teachers' Marks in Grade 8 for Group A in 1934. 46

GRAPH 23—Showing the Distribution of Teachers' Marks in Grades 9 to 12 for Group A in 1935-38. 47

GRAPH 24—Showing the Distribution of Teachers' Marks in Elementary Latin for Group A in 1935. 49

GRAPH 25—Showing the Distribution of Teachers' Marks in 2nd. Year Latin for Group A in 1936. 49
GRAPH 26—Showing the Distribution of Teachers' Marks in 1st. Year French for Group A in 1936. ... 50

GRAPH 27—Showing the Distribution of Teachers' Marks in 2nd. Year French for Group A in 1937. ... 50

GRAPH 28—Showing the Distribution of Teachers' Marks in 3rd. Year French for Group A in 1938. ... 50

GRAPH 29—Showing the Distribution of Teachers' Marks in Freshman English for Group A in 1935. ... 52

GRAPH 30—Showing the Distribution of Teachers' Marks in Sophomore English for Group A in 1936. ... 54

GRAPH 31—Showing the Distribution of Teachers' Marks in Junior English for Group A in 1937. ... 56

GRAPH 32—Showing the Distribution of Teachers' Marks in Senior English for Group A in 1938. ... 56

GRAPH 33—Showing the Distribution of Teachers' Marks in Elementary Algebra for Group A in 1935. ... 57

GRAPH 34—Showing the Distribution of Teachers' Marks in Plane Geometry for Group A in 1936. ... 57

GRAPH 35—Showing the Distribution of Teachers' Marks in Advanced Mathematics for Group A in 1937. ... 59

GRAPH 36—Showing the Distribution of Teachers' Marks in World History for Group A in 1935. ... 59

GRAPH 37—Showing the Distribution of Teachers' Marks in United States History for Group A in 1936. ... 61
GRAPH 38—Showing the Distribution of Teachers' Marks in Biology for Group A in 1936

GRAPH 39—Showing the Distribution of Teachers' Marks in Physics for Group A in 1937

GRAPH 40—Showing the Distribution of Teachers' Marks in Chemistry for Group A in 1938

GRAPH 41—Showing the Distribution of Teachers' Marks in Grade 8 for Group B in 1938

GRAPH 42—Showing the Distribution of Teachers' Marks in Grade 9 for Group B for First Half of Year in 1939

GRAPH 43—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Elementary Latin for Group A in 1935

GRAPH 44—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 2nd. Year Latin for Group A in 1936

GRAPH 45—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 1st. Year French for Group A in 1936

GRAPH 46—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 2nd. Year French for Group A in 1937

GRAPH 47—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 3rd. Year French for Group A in 1938

GRAPH 48—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Freshman English for Group A in 1935

GRAPH 49—Showing the Comparison of Percentile Scores and Cooperative Achievement Test and Teacher's Marks in Sophomore English for Group A in 1936
GRAPH 50—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Junior English for Group A in 1937. 76

GRAPH 51—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Senior English for Group A in 1933. 76

GRAPH 52—Showing the Comparison of a Composite of Percentile Scores of Cooperative Achievement Tests and Teacher's Marks of 4 Years in English for Group A. 73

GRAPH 53—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Elementary Algebra for Group A in 1935. 80

GRAPH 54—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Plane Geometry for Group A in 1936. 80

GRAPH 55—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Advanced Mathematics for Group A in 1937. 82

GRAPH 56—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in World History for Group A in 1935. 82

GRAPH 57—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in United States History for Group A in 1938. 84

GRAPH 58—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Biology for Group A in 1936. 84

GRAPH 59—Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Physics for Group A in 1937. 86
GRAPH 60---Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Chemistry for Group A in 1933. . . . . . . . . . . 36
Chapter I

INTRODUCTION

As long as we have schools and pupils and teachers we shall probably have "marks." In the course of education down through the years to the present day, some sort of criteria has had to be set up by which teachers could measure the achievement of those being taught. It matters little whether we measure this achievement in letters or in numbers; they are still marks. Of recent years these marks have been under scrutiny as never before and many facts have been unearthed.

Variables in Teachers Estimates—Many variables enter into a teacher's estimate of a pupil's achievement. Pressey (1) emphasizes habits, temperamental adaptability, and other traits of character as elements which should be taken into account in the effort to obtain a total or adequate measure of a pupil. Thorndike (2) lists among such factors health, freedom from worry and various moral qualities. On the whole, achievement as recorded by marks still represents an effort on the part of the teacher to evaluate his work. It is his conception of how much value his work has been to his pupils. Until recent years this


personal evaluation has been the teacher's sole means of measurement. But with the coming of achievement tests, both in battery form and in selected subjects, the teacher now may compare his evaluation with those of thousands of others thus either condemning or praising his own methods.

(2) The Resulting Lack of Reliability---The result of the almost innumerable variables in teacher's estimates of pupil achievement is the consequent lack of their reliability, for the reason that normal schools and colleges give but very little attention to this phase of the training of teachers. Even in marking the same examination papers, different teachers have been known to vary as much as forty percentage points in the marks they assign. Another cause for the unreliability of teacher's marks is the lack of uniformity in marking systems. Certain systems have 60 as a passing grade while others use 70 and still others use letters A, B, C, etc. which however, still retain a numerical rating, the A corresponding to the figures 95 to 100 etc. With such heterogeneous systems of marking along with the ever present variables entering into these systems there is little cause for wonder at the lack of reliability in teacher's marks.

(3) Improving Reliability of Essay Test---It is generally considered by educators that the essay-type test still has its place in educational practice. Of recent

years, however, it has been severely criticized because of its unreliability as a measure of achievement. For the testing of memory and mental skills involved in problem solving, the standardized, or even the informal objective examination is unquestionably better, but if properly constructed and administered, the essay type test has not as yet had an equal in testing the processes of reflective thought. The construction of the test plays the primary role in improving the reliability. Burton (4) offers seven suggestions for improvement in construction that cover practically all the points of any essay examination. In brief, he thinks that: 1. The questions should be specifically designed to test a specific learning product; 2. the questions should be constructed so that they can be solved only by the designated learning product; 3. the questions should have equal or different assigned values; 4. the questions should cover adequately the product; 5. the questions should be clear and definite as to import and meaning; 6. definite standards should be set up for evaluating the answers; 7. rate and ability should be considered when both items are concerned.

(4) Reliability of Standard Tests—Standard tests originated many years ago as a result of controversies of educators and laymen as to how much accomplishment there actually was in various school subjects. School marks meant nothing more or less than a descriptive term. They

were interpreted in terms of poor, good, excellent, etc.
which describe the achievement of pupils in comparison with a standard. But what was the standard? There was none, so educators set about to get one. They gave tests to many schools in many localities and scientifically analysed the results. After analysis, the tests were revised and the procedure repeated until tests were devised that covered the subject matter common to all schools and that presented norms, or a standard, or a basis for comparison. For years educators have been working on standard tests and constantly improving them until now they are considered as the most reliable measure devised for the determining of pupil achievement.

(5) *Essay and Objective Tests Supplementary*---Essay and objective tests must always be supplementary, in the measurement of achievement, to certain factors of industry, will and persistence, school attitude, emotional stability, mental age and intelligence. Of these factors only two can be determined by standard tests, i.e. mental age and intelligence. The others must be determined by estimates of the teacher. Pressey (5), in a study of a seventh grade group for the purpose of measuring the relative importance of various factors in determining school marks, found that there was a correlation of .69 between school attitude and

school marks, from which he concluded that school attitude was almost as important a factor as intellectual strength in contributing to school success.

The present study is an attempt to compare the ranks which were given by teachers in their classes with the ranks which the pupils obtained on standard tests in an attempt to arrive at certain inconsistencies in marking in the Holden High School. It is hoped that certain conclusions may be drawn which may be of aid to other schools which are seeking the solution to a like problem.
REVIEW OF RELATED LITERATURE
Chapter II

REVIEW OF RELATED LITERATURE

In dealing with a subject that has to do with teacher's marks one can find a vast quantity of literature on the subject. Educators have attacked the problem of assigning marks as a measure of achievement, from all angles. On the whole, however, the consensus of opinion as to the purpose, abuses and uses, is fairly well centralized.

(1) The Teacher's Mark as a Measure of Achievement—Ross (1) in a study similar in some aspects to the study of the author states:

It is undoubtedly true, as has been pointed out by Kelly, Starch and others, that there are wide differences in the individual ratings of a single paper, and the relative values assigned to individual questions, and the like. But one fact is often overlooked, namely, that it is one thing to assign an absolute value to a question or paper and quite another thing to estimate its relative value. Teachers may not be able to agree as to whether a pupil is due 78 or 87 on a single examination paper, and yet have little difficulty in agreeing that the pupil is better or poorer than other members of the class. When a teacher has been with a group of children for a year, she is likely to be able to differentiate between the poor, average, good, and excellent ones, even though she might not agree with another teacher as to the exact numerical value of the varying degrees of achievement.

This gives an angle to the value of marks which has hitherto been more or less neglected, namely, that a teacher in constant contact with her charges consciously or sub-

(1) Ross, C. C., "The Relation Between Grade School Record and High School Achievement." p. 5.
consciously may assign marks of achievement to her pupils that will place them in a fairly accurate relative rating of achievement. This is important for the reason that the author intends to show the relationship of these teachers' achievement marks with achievement marks of standardized tests. If the statement of Ross is true there should be a fairly high correlation between the two. Standardized tests give exactly what Ross claims teachers marks give, namely, a relative position in achievement. No less a statistical authority than T. L. Kelley (2) says of teacher's marks:

In the attempt to meet these standards (those of guidance) and to meet them on the spot and without a moment's delay, one of the richest sources of information is likely to be only very partially utilized. Reference is made to that product accumulated by every pupil—school grades. Whatever capacity it is that a grade, say, in mathematics, stands for, it is measured with a high degree of accuracy when the records of several years and of several teachers are combined. A pupil's record is the most complete, detailed and accurate of all records of the ordinary pupil from his entrance in school to his entrance into work.

Fleming (3) in a study on achievement in the high school writes:

Frequently in our criticism of the validity of teacher's marks as a criterion of academic success we seem not so much to decry the use of marks in principle, but merely to discard them or label them of little value when they are a record of the

(2) Kelley, T. L., "Educational Guidance." p. 84.
past rather than an index of present performance for which we are trying to provide a new test as a predictive instrument. Elementary marks are discarded when the worker is trying to predict high school success; yet he proceeds to use high school marks for the period under consideration as a criterion of high school success, and one basis for evaluating his test.

In his investigation of high school achievement Fleming (4) sets up five factors for his comparative criteria, namely:

(a) Teacher's estimate of leadership.
(b) Actual leadership as expressed in offices held in extra-curricular activities.
(c) Teacher's estimate of general intelligence.
(d) Teacher's estimate of school attitude.
(e) The year's mark in individual school subjects.

His main criterion was academic achievement as expressed by an average of the school grades.

(2) The Teacher's Mark in Prediction---In an attempt to predict high school success from an analysis of the grade school record Ross (5) says: "The best basis for predicting high school success would seem to be a combination of the following: Intelligence ratings, to afford some measure of native endowment; standard achievement tests, to give objective evidence as to prerequisite academic preparation; and teachers' ratings in the grades, to afford a measure of the attitudes and moral habits

(4) Fleming, C. W., op. cit., p.53.
(5) Ross, C. C., op. cit., p.44.
already acquired, which are such important factors in determining high school success." Teachers' marks as a sole basis of prediction has very little standing with educators, mainly because of the unreliability of the marks. Classic examples of wide ranges of scores assigned the same test by different teachers are so well known that they need no quoting here. Each teacher, by his mark on the examination, makes a prediction that the pupil will go far in the subject; should never have taken the subject, etc. The weak value of the teacher's mark in the prediction is evident.

(3) The Cause of the Inadequacies in Teacher's Marks---

Gilliland and Jordan, (6) in a treatise on the relationship of educational measurements and the classroom teacher state on the inadequacy of traditional examinations that there are three major reasons for the inadequacy, namely:

1. They have been constructed without a clear understanding of their purpose.
2. They have not been constructed so as to make possible an accurate rating when corrected.
3. They are not corrected accurately even when made properly.

Starch (7) in his book on "Educational Psychology", makes

some very pertinent statements on the inadequacy of teacher's marks due to opinions of various teachers in evaluation of classes as a whole:

A point frequently raised by teachers to justify unusually high or low marks is that the particular class in question is an unusually good one or poor one. Such a claim ought to be allowed only if it can be justified by good evidence. There are, of course, differences in classes, but these are almost never as great as we are inclined to believe. Large differences between successive classes in the same subject are for the most part illusory for the reason that the judgment of an individual teacher is more likely to deviate from a correct estimate than the average ability of a group deviates from the average of other groups. The teacher who says to each succeeding class that this is the best class he has ever had in this subject would possess, if this judgment were correct, a magic power for elevating the intellectual level of human beings.

(4) Teacher's Marks vs. Standard Scores---In attempting to show the relationship between achievement as recorded by teacher's marks and achievement as recorded by standard tests it might be desirable to see what a few authorities have to say on these subjects. Writing on the value of opinions of teachers vs. objective conclusions Gilliland and Jordan (8) state:

A subjective judgment can never have the force of an objective conclusion, for the object idea is based not upon one's own experience, but upon data obtained by methods set as a result of combined experiences and judgments of others, and is more concrete in form and substance than the subjective thought. The tendency of the subjective conclusion is to disregard objective data. The subjective judgment is therefore always open to

criticism, to doubt and to successful attack. The objective conclusion, is in just the reverse position; based upon data scientifically collected and standardized, it is impregnable.

It is evident from the above that marks, which are a result of subjective judgment, should not even be placed in the same category as scores on standard tests, which are objective. Geyer (9) asks the question: "Are such marks likely to serve long in arousing pupils to effort?" The answer is probably in the negative because of the evidence to pupils that marks do not depend upon achievement, and never will the desire for achievement offer an appeal until it is more fairly and accurately measured. Standardized tests do this exactly, because they are independent of any subjective thought or conclusions.

(5) Standard Tests in School—Writing on the Stanford Achievement Tests—the tests used by the Holden School System in May of the eighth grade the same authors, Gilliland and Jordan (10) have the following to say:

The Stanford Achievement Tests are by far the most satisfactory measurement of school achievement. Individual tests of the different school subjects have been described and their respective advantages pointed out. Each of these tests has its particular advantages and uses, but for a satisfactory general measure of school attainment the Stanford Tests have combined most of the important features of several others and made uniform the nature and procedure of the

(9) Geyer, Denton L., "Introduction to the Use of Standardized Tests.," p. 9.

tests so that the administrator or teacher may rank her pupils on the basis of attainment.

Burton (11) takes a slightly different view on standardized tests from those heretofore quoted: "The best advice to give teachers in regard to standard tests is to emphasize the fact that they are not universal nor all inclusive testing instruments. They are reasonably adequate and accurate measures for some kinds of learning; and not, in any sense, of other types of learning. Additional testing techniques will always be necessary."

Burton (12) also lists the advantages and disadvantages of standard tests. For the advantages he claims that they are:

1. Ready made.
2. Easy to give.
3. Easy to score.
4. Economical of time and energy.
5. Distinctly objective.
6. Provide a norm or standard.

Of the sixth advantage he says: "A norm or standard is provided which is fair comparative measure for groups of approximately the same social, economical, and intellectual background." For the disadvantages Burton (13) lists the following:

(13) Ibid.
1. They may cause the teacher to stress facts and skills as ends, memory and drill as processes.
2. They are not complete measuring instruments.
3. They are not always absolutely accurate.
4. They do not always measure what they purport to measure.

Of disadvantage 4 he writes: "In high school there is the additional limitation that educational objectives are not so simple, easily defined, and agreed upon as in the elementary school. Standardized tests are, therefore, much less valuable."

(6) I.Q. vs. School Success—Scores on intelligence tests are used as part of the data used by the author in this study. The tests used were (14) "The Terman Group Test of Mental Ability." Terman (15) in his book "The Measurement of Intelligence," writing on the relation of the I.Q. to the quality of the child's school work, has this to say: "The school work of 504 children was graded by the teachers on a scale of five grades: very inferior, inferior, average, superior, and very superior. When this grouping was compared with that made on the basis of I.Q., fairly close agreement was found." This is significant for the reason that in this study the author will show that on a rating of a five point scale, similar

(14) Terman, L. M., "Terman Group Test of Mental Ability.," World Book Company, New York.
(15) Terman, L. M., "The Measurement of Intelligence.," p. 73.
to the one Terman used, the relationship was anything but similar. Writing on the correlation between I.Q. and the teachers' estimates of the children's intelligence Terman (16) states:

By the Pearson formula the correlation found between the I.Q.'s and the teacher's rankings on a scale of five and .43. This is about what others have found, and is both high enough and low enough to be significant. That it is moderately high in so far corroborates the tests. That it is not higher means that either the teachers or the tests have made a good many mistakes."

Then he proceeds to prove that the mistakes are with the teachers and not the tests. Ross (17) in an analysis of high school achievement claims that investigations have discovered that general mental ability, even though it probably is the most important single factor in school accomplishment is still only one factor. He finds that a perfect correlation of mental ability and achievement can never be expected because a pupil's accomplishments do not have a perfect correspondence with ability to achieve. Haggerty (18) in a treatise on "Measurement of Human Capacities" is firmly convinced that intelligence itself is insufficient to accomplishment, to wit:

It is not at all probable that a perfect test or measure of intelligence would give a perfect

(16) Terman, L. M., op. cit., p. 75.
(17) Ross, C. C., op. cit., p. 5.
correlation with school success or with success in later life. A more accurate measure of intelligence than any we now have would only render the inadequacy of intelligence more apparent, for the simple reason that success is not quantitatively coterminous with intelligence, but with intelligence in combination with other significant traits not subject to evaluation by tests of the type currently used as measures of intelligence.

(7) Articulation between Junior H. S. and Senior H. S.—Judd, (19) in a survey study of measurement in the public schools of Cleveland writing on the relation between elementary schools and high schools, says of that relationship:

The sharp distinction in school organization between the elementary school and the high school comes from a period when most of the pupils of the elementary school did not expect to go on into the higher schools. The high school of 25 years ago was intended for small, select classes. Today the situation is different. Thus the eighth grade at the close of the school year 1912-13 enrolled 3,924 pupils, 3,625 of whom were promoted at the end of the year. The high school first-year class of 1913-14 enrolled during the first semester 2,870 students. These figures show conclusively that there is in fact a close relation between elementary schools and high schools. On the other hand, the break in methods and in courses of study is sharp. The first-year student in the high school finds that he is expected to work independently, to do much outside work preparing his lessons, and to assume social responsibilities which he did not know in the grades. There is a community of interest between the elementary schools and the high schools. Such a conclusion leads to the further obvious statement: there ought to be an intimate understanding between the elementary schools and the high schools. This intimate understanding ought ultimately to lead to an uninterrupted form of organization.

These quotations of Judd are very applicable to the problem in which the author is involved. Some local and visiting school authorities informed of the situation as it exists in the schools of Holden come out with the flat statement that a junior high school would be the immediate solution to our problem. The author is inclined to believe that this statement, however, lacks substantiation as the seventh and eighth grades are completely departmentalized and the subject content fairly well integrated and correlated with that of the first-year in high school. Where there does seem to be a great difference, however, is in the amount of home study. More will be said of this angle in a later chapter.
PURPOSE AND PROCEDURE
Chapter III
PURPOSE AND PROCEDURE

Several recent studies have been made in an attempt to discover the most efficient method of using intelligence tests, standard tests and teacher's marks as supplementary aids in diagnosing pupil weaknesses and ranking them in achievement. The present study is an attempt to complete in detail certain phases of the picture now available only in outline form.

(1) The Problem—This study is a comparison of achievement, as recorded by school grades, with accomplishment as recorded by standard tests. Certain degrees of success for pupils entering high school were prognosticated by grammar school teachers who arrived at their forecasting through a combination of the results of intelligence tests, achievement tests and school marks. The pupils apparently have not lived up to the predictions of these teachers. It is the purpose of this study to investigate these predictions and the subsequent high school achievement in an endeavor to arrive at the cause of inconsistency.

(2) The Subjects—The subjects involved in this study of comparative achievement are 52 pupils who graduated from high school in June, 1933, hereafter known as Group A, and 74 pupils who are at present in Grade 9, or freshmen in the school, hereafter known as Group B.
The study was made in the town of Holden, Massachusetts. A small New England town of approximately 4,000 population. Holden is located only a few miles from Worcester in the heart of central Massachusetts. Essentially the town is suburban, being mainly residential in character. One small textile mill supports a minority of the population.

The schools involved in the study are typical of small town modern New England communities. Three grammar schools with grades 1-8 inclusive in each and a modern well-equipped high school with a staff of 10 teachers and a teaching principal. In the high school, where the main body of this study was made, the majority of the teachers have been in continuous service for a number of years.

(3) The Material—For the two groups of pupils information was collected by means of the following instruments:

(A) Terman Group Test of Mental Ability (Form B)
(B) New Stanford Achievement Test
(C) Cooperative Achievement Tests in the following subjects:

Latin 1-2
World History
English 1-2-3-4
Algebra
Plane Geometry
French 1-2-3
Biology
(D) Teacher's marks

(E) Questionnaire to parents of pupils

(F) Questionnaire to pupils

(4) Procedure—The general procedure followed in this study was as follows:

(a) Collection of data. The test scores were obtained from the files of the school. The pupil's marks were obtained from the permanent record cards of the grammar schools and the high school. The questionnaire to parents was sent to all parents of pupils in the seventh and eighth grades. The questionnaire to pupils was filled out by all pupils in Group B.

(b) Tabulation of data.

(c) Comparison of data. Some type of graph had to be devised to show comparison of distribution of teacher's marks and objective test scores. It being necessary to get equivalent scores for the base-line, the scores of objective tests were transmuted to percentiles and equivalent distance was represented by the following scale:

<table>
<thead>
<tr>
<th>Percentile scores of</th>
<th>0-9 equal teacher's marks of 50-59</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;</td>
<td>&quot; 10-29 &quot; &quot;                    &quot; &quot; 60-69</td>
</tr>
<tr>
<td>&quot;</td>
<td>&quot; 30-69 &quot; &quot;                    &quot; &quot; 70-79</td>
</tr>
<tr>
<td>&quot;</td>
<td>&quot; 70-89 &quot; &quot;                    &quot; &quot; 80-89</td>
</tr>
<tr>
<td>&quot;</td>
<td>&quot; 90-100 &quot; &quot;                    &quot; &quot; 90-100</td>
</tr>
</tbody>
</table>
This scale of marking was the system used by the high school teachers in transmuting objective test scores to record book marks. It approximates a normal distribution.

Further information regarding specific details of procedure may subsequently be found in appropriate chapters.
Chapter IV
STANDARDIZED TEST RESULTS

This chapter reports the results obtained by the pupils of the two groups on the standardized tests which were administered at different periods. As pointed out before, Group A comprises 52 pupils who were in Grade 8 in 1934 and have since graduated from high school while Group B comprises 74 pupils who were in Grade 8 in 1938 and this year in Grade 9. Group A will be considered first. The test results will be reported under appropriate paragraph headings.

(1) Intelligence Results for Group A—Graph I shows the distribution of Intelligence Quotient ratings for Group A taken from the Terman Group Test of Mental Ability, Form B, administered in 1934. The range of I.Q.'s is from 82 to 128. The median I.Q. is 103. The distribution is slightly skewed but sufficiently normal to warrant the conclusion that the class approximates a normal group. The median I.Q. of the average Grade 8 is between 100 and 105 which again places this group as being average in intelligence.

(2) Stanford Achievement Scores for Group A—Graph 2 shows the distribution of achievement scores for Group A taken from the New Stanford Achievement Test, Form Z, administered in the 9th month of Grade 8, 1934. The range of total scores on this test is from 83.7 to 116.1. The
Graph 1. Showing the Distribution of I.Q. Ratings for Group A in 1934.
median is 101.5 while the standard norm for this test when given in the 9th month of Grade 8 is 95, thus showing that this group is above the average in achievement. A check with the norms again shows that the median pupil in this class is on a level of the average pupil who has attended school for eight months in Grade 9; this places the present group approximately nine months ahead of national norms. The distribution shows a positive skewness with 38 pupils out of a total of 52 exceeding the norm. A correlation of the I.Q.'s of this group with their Stanford Achievement scores gave a very high figure of .87. This coefficient was determined by the Spearman Rank-Difference method, the formula of which is

\[ \rho = 1 - \frac{6ZD^2}{N(N^2-1)} \]

where \( D \) is the difference between the ranks of the measures in the two series and \( N \) is the total number of measures.

(3) Cooperative Achievement Scores for Group A in the Foreign Languages---In the languages Cooperative Tests were given to classes in first and second year Latin and to first, second and third year French. Graph 3 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in Elementary Latin administered in June, 1935. The range of scores is from 8 to 56. The median of this group is 37, while the norm of the standard test is 50. The negative skewness of this distribution is severe showing that the class was
Graph 2. Showing the Distribution of Stanford Achievement Test Scores for Group A in 1934.
decidedly below normal in accomplishment. Out of a total of 19 in the class only 4 pupils equalled or exceeded the standard norm of 50, while the highest rank was only at the 56th percentile level.

Graph 4 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in Latin II. This test was given in June, 1936. The range of scores is from 8 to 93. The median of this class is 45 and the norm of the standard test 50, as is the norm in all percentile ratings of standard tests. This distribution is very irregular but has a much greater range than that as shown in Graph I. A definite improvement in achievement is shown in the second year of Latin over that of the first year. Of a total of 14 in the class 7 pupils equalled or exceeded the standard norm as against only 4 in first year Latin.

Graph 5 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in Elementary French given in June, 1936. The range of scores is from 9 to 93. The median is 61, which is 11 points above the standard norm of 50. The distribution shows an irregular curve as is the case usually when the measures are few, but is positively unbalanced with the mode midway between the 60 to 70 percentile rating. Of a class numbering 21 there are 12 that equalled or exceeded the standard norm indicating that this group is definitely above the average in achievement.
Graph 3. Showing the Distribution of Cooperative Test Scores in Elementary Latin for Group A in 1935.

Graph 4. Showing the Distribution of Cooperative Test Scores in 2nd. Year Latin in 1936.
Graph 6 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in French II, given in June, 1937. The range of scores is from 19 to 97. These results show an improvement in maximum and minimum scores over the elementary test the previous year. The increases are 4 points above the high of 1936 and 10 points above the low. The median of this group, however, is 5 points lower, 55. This, nevertheless, exceeds the standard norm of 50 by 5 points. In the class of 16 there are 10 that equal or exceed the standard norm with the mode of the distribution midway between the 70 to 80 percentile rating. This class also is above the average in achievement.

Graph 7 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in French III, given in June, 1938. The range is from 5 to 86. This shows considerable decrease in the high and low scores compared with the test results in Elementary and 2nd. year French. The high dropped 7 points from the 1936 test and 11 points from the 1937 test. The low dropped 4 points from the 1936 test and 14 from the 1937 test. The median also fell to 51, just 1 point above the standard norm of 50. This was a drop of 10 points from the 1936 test and a drop of 4 points from the test of 1937. These results indicate a gradual diminishing in achievement as the student progresses in the
Graph 5. Showing the Distribution of Cooperative Test Scores for Group A in Elementary French in 1936.

Graph 6. Showing the Distribution of Cooperative Test Scores for Group A in 2nd Year French in 1937.

Graph 7. Showing the Distribution of Cooperative Test Scores for Group A in 3rd Year French in 1938.
language. The diminishing never reaches a point below average achievement, however. This 3rd. year French class would be called a normal or average one.

(4) Cooperative Achievement Scores for Group A in English—Graph 8 shows the distribution of scores in percentile rating taken from the Cooperative Achievement Test in English I, given in June, 1935. The range of percentile levels is from 3 to 98. The median is 60 which is 10 points above the standard norm of 50. The distribution shows an irregular curve, bi-modal in character with the modes at the 15th and 85th percentile level. Of a total of 52 pupils taking the test 31 equalled or exceeded the national norm indicating the class is considerably above the average in accomplishment.

Graph 9 shows the distribution of percentile levels taken from the Cooperative Achievement Test in English II, given in June, 1936. The range of scores in this class is from 8 to 91. The median is 52 which is 2 points above the standard norm of 50. The distribution shows a bi-modal curve with 9 pupils at the 35th percentile level and 9 pupils at the 75th. 48 pupils took this test and from this group 25 equalled or exceeded the national average. This group is slightly above the average in achievement.

Graph 10 shows the distribution of percentile levels taken from the Cooperative Achievement Test in English
Graph 8. Showing the Distribution of Cooperative Test Scores for Group A in Freshman English in 1935.

Graph 9. Showing the Distribution of Cooperative Test Scores for Group A in Sophomore English in 1936.
III, given in June, 1937. The range of scores in percentiles is from 21 to 92. The median of this group is 64, which is 14 points above the standard norm of 50. The distribution curve is extremely irregular caused by the wide range with a small number of measures of a heterogeneous group. From a total of 23 pupils taking the test only 7 failed to equal or exceed the national norm. This class is decidedly above the average in achievement.

Graph 11 shows the distribution of scores in percentile ratings taken from the Cooperative Achievement Test in English IV given in June, 1938. The range is from 15 to 93. The class median is 60 which is 10 points above the standard norm of 50. Of a total of 26 pupils taking the test 16 equalled or exceeded the national norm. The distribution curve is irregular but shows a definite leaning to the positive side. The mode is at the 65th percentile level. This class is definitely above the average in achievement. In the four years of English the range varied between 3 and 21 on the low end and between 91 and 98 on the high end. The median never went below the standard norm level, varying 12 points between 52 and 64.

(5) Cooperative Achievement Scores for Group A in Mathematics—Graph 12 shows the distribution of percentile ratings taken from the Cooperative Achievement Test in Elementary Algebra given in June, 1935. The range is
Graph 10. Showing the Distribution of Cooperative Test Scores for Group A in Junior English in 1937.

Graph 11. Showing the Distribution of Cooperative Test Scores for Group A in Senior English in 1938.
from 3 to 97. The class median is 48 which is 5 points below the standard norm of 50. The distribution is negatively skewed with the mode at the 45th percentile level. 16 pupils, out of a total of 37 taking the test equalled or exceeded the standard norm. The class is below average in achievement in Algebra.

Graph 13 shows the distribution of percentile levels taken from the Cooperative Achievement Test in Plane Geometry administered in June, 1936. The range of percentiles is from 16 to 97. The median percentile of this class is 65 which is 15 points above the standard norm of 50. The distribution curve is very irregular and peculiar in that no pupil received a score between the 40th and 60th percentile. Also the distribution is odd in that the mode lies at the 35th percentile while the median is 65. In this class of 17 pupils there were 10 that equalled or exceeded the national norm. This group is definitely above the average in achievement in Plane Geometry.

Graph 14 shows the distribution of percentile ratings taken from the Cooperative Achievement Test in Advanced Mathematics given in June, 1937. The range of percentiles is from 68 to 99. The class median percentile is 82, which is 32 points above the standard norm. The distribution is positively skewed with the mode placed at the 95th percentile level. Although the class is small all 10 pupils exceeded the standard norm. This class is
Graph 12. Showing the Distribution of Cooperative Test Scores for Group A in Elementary Algebra in 1935.

Graph 13. Showing the Distribution of Cooperative Test Scores for Group A in Plane Geometry in 1936.
Graph 14. Showing the Distribution of Cooperative Test Scores for Group A in Advanced Mathematics in 1937.

Graph 15. Showing the Distribution of Cooperative Test Scores for Group A in World History in 1935.
far above the average in achievement.

(6) Cooperative Achievement Scores for Group A in the Social Studies—Graph 15 shows the distribution of scores in percentiles taken from the Cooperative Achievement Test in World History administered in June, 1935. The range of percentiles is from 12 to 63. The median percentile of the group is 45 which is 5 points below the standard norm of 50. The distribution shows a slight negative skewness. The mode lies at the 45th percentile level. Of a total of 43 pupils in the class only 18 equalled or exceeded the standard norm. It is significant that in a group as large as this no pupil exceeded the 68th percentile. This class is below average in achievement.

Graph 16 shows the distribution of percentile ratings taken from the Cooperative Achievement Test in United States History given in June, 1938. The range of percentiles is from the 12th level to the 98th level. The median percentile of this group is 70 which is 20 points above the national norm of 50. The distribution is very irregular showing a heterogeneous group. The curve is bi-modal with the modes lying at the 75th and 95th percentiles. Only 6 pupils out of a total of 26 that took the test failed to equal the standard norm. This class is far above the average in achievement.

(7) Cooperative Achievement Scores for Group A in the Sciences—Graph 17 shows the distribution of scores
Graph 16. Showing the Distribution of Cooperative Test Scores for Group A in United States History in 1938.

Graph 17. Showing the Distribution of Cooperative Test Scores for Group A in Biology in 1936.
in percentile levels taken from the Cooperative Achievement Test in Biology, administered in June, 1936. The range of scores in percentiles is from 1 to 96. The median percentile of this group is 54 which is 4 points above the standard norm of 50. The distribution shows an irregular curve with the mode at the 5th percentile. This is an unusual situation with the mode so far removed from the median. Of a total of 41 pupils in the class 22 of them equalled or exceeded the national norm. Although this class has quite a few that apparently have accomplished but little, as a whole it must be considered as above the average in achievement.

Graph 18 shows the distribution of percentile ratings taken from scores of the Cooperative Achievement Test in Physics administered in June, 1937. The range of scores in percentiles is from 19 to 93. The median percentile of this class is at the 50th level which is exactly at the point of the standard norm. The distribution shows almost a straight line with but two variations. The mode lies at the 55th percentile. In this small class of 9 pupils 4 scored below the 50th percentile, 1 equalled it and 4 exceeded it. This class is average in achievement.

Graph 19 shows the distribution in percentile ratings taken from the Cooperative Achievement Test in Chemistry administered in June, 1938. The range of scores
Graph 18. Showing the Distribution of Cooperative Test Scores for Group A in Physics in 1937.

Graph 19. Showing the Distribution of Cooperative Test Scores for Group A in Chemistry in 1938.
in percentiles is from 16 to 98. The median percentile of this group is 63, which is 33 points above the standard norm of 50. The distribution shows two distinct frequency polygons as no pupil made scores equivalent to the percentiles between 20 and 50. The mode of the larger polygon lies at the 85th percentile level. Of a total of 13 pupils in this class, 11 equalled or exceeded the national norm. This group is far above the average in achievement.

---

(8) **Intelligence Results for Group B---Graph 20**

shows the distribution of Intelligence Quotient ratings for Group B taken from the Terman Group Test of Mental Ability, Form B, administered in 1938. The range of I.Q.'s is from 78 to 136. The median I.Q. is 103. The distribution is bi-modal with the two modes lying at the 90th and the 120th I.Q. rating. This indicates that the class is divided fairly evenly into high and low groups. The median I.Q. of the average Grade 8 is between 100 and 105 which places this group on the whole as being average in intelligence.
Graph 20. Showing the Distribution of I.Q. Ratings for Group B in 1938.
Graph 21. Showing the Distribution of Stanford Achievement Test Scores for Group B in 1938.
(9) Stanford Achievement Scores for Group E—Graph 21 shows the distribution of achievement scores for Group E taken from the New Stanford Achievement Test, Form Z, administered in the 9th month of Grade 8, 1938. The range of total scores on this test is from 75.2 to 114.3. The median is 97.8 while the standard norm for this test when given in the 9th month of Grade 8 is 95, thus showing that the group is above the average in achievement. A median of 97.8, when interpreted in terms of standard norms shows that the median pupil in this class is on a level of the average pupil in the third month of Grade 9. This places the present group approximately four months ahead of national norms. The distribution shows a positive skewness with 45 pupils out of a total of 74 equaling or exceeding the national norm of 95. A correlation of the I.Q.'s of this group with their Stanford Achievement scores gave a significant coefficient of .85, a high correlation. The coefficient was determined by the Spearman Rank-Difference method.
So far as achievement is concerned, Group A presented the following picture:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Below Norm</th>
<th>At Norm</th>
<th>Above Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stanford Achievement</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Latin I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French III</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English III</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English IV</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plane Geometry</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Advanced Math</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>World History</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States History</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Group B

<table>
<thead>
<tr>
<th>Subject</th>
<th>Below Norm</th>
<th>At Norm</th>
<th>Above Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Stanford Achievement</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
RESULTS OF TEACHERS' MARKS
Chapter V
RESULTS OF TEACHERS' Marks

This chapter reports on the marks received by the pupils in Group A in the various subjects in which standardized tests were administered. Group B has never had any standardized tests in specific subjects, thus the only report will be on their Grade 8 marks and the average mark for one-half of the present year. In the Holden school system the mark of 60 is "passing." Group A will be considered first. The findings will be reported under appropriate paragraph headings.

(1) Average Marks in Grade 8 for Group A—Graph 22 shows the distribution of average marks in Grade 8 for Group A in 1934. The range of the pupils marks is from 55 to 93. The median mark is 80 which is 5 points above the school norm of 75. The distribution is positively skewed. The mode lies between the 80 to 90 baseline division. Of a total of 52 pupils in the group only 9 failed to equal a mark of 75.

(2) Average Marks in Grades 9 to 12 for Group A—Graph 23 shows the distribution of average marks received by the pupils in Group A over the four-year period in High School from 1935 to 1938. The marks range from a low of 63 to a high of 92. The median mark is 77 which is 2 points over the school norm of 75. The distribution is slightly skewed but sufficiently normal to warrant the conclusion that there is an approximate normal distribution of marks.
Graph 22. Showing the Distribution of Teacher's Marks in Grade 8 for Group A in 1934.
Graph 23. Showing the Distribution of Teachers' Marks in Grades 9 to 12 for Group A in 1935-38.
over the four-year period. The actual distribution in the five point marking scale shows in percentage: 2% A's--32% B's--48% C's--12% D's and 6% E's. In the four-year average 16 pupils, out of a total of 52, failed to equal a mark of 75 but only two of these 16 failed to get a passing average of 60.

(3) **Average Marks in the Foreign Languages for Group A**—Graph 24 shows the distribution of average marks received by the pupils in Elementary Latin in 1935. The marks range from a low of 72 to a high of 95. The median mark is 87. The distribution shows a positive skewness with a bi-modal character. The modes are at the marking points of 85 and 95. With 19 pupils in the class only one pupil failed to equal the school norm of 75 and all pupils passed the course.

Graph 25 shows the distribution of average marks received by the pupils in 2nd. year Latin in 1936. The range of the marks is from 72 to 95. The median pupil received a mark of 83. In the two years of Latin the range remained the same but the median dropped 4 points from 87 to 83. The distribution is pyramidal in shape and shows, as did the previous Graph, a severe positive structure. The class was small with only 14 pupils. From this number only two pupils received the lowest mark of 72. All others equalled or exceeded the school norm of 75.
Graph 24. Showing the Distribution of Teacher's Marks in Elementary Latin in 1935 for Group A.

Graph 25. Showing the Distribution of Teacher's Marks for Group A in 2nd. Year Latin in 1936.
Graph 26. Showing the Distribution of Teacher's Marks for Group A in 1st. Year French in 1936.

Graph 27. Showing the Distribution of Teacher's Marks in 2nd. Year French in 1937 for Group A.

Graph 28. Showing the Distribution of Teacher's Marks for Group A in 3rd. Year French in 1938.
Graph 26 shows the distribution of average marks received by the pupils in Elementary French in 1936. The range of marks is from a low of 65 to a high of 95. The median mark is 81, which is 6 points over the school norm of 75. The distribution shows a slight positive skewness with the mode lying at a mark of 85. In the small class of 21 pupils only 3 failed to equal the school norm of 75 and all pupils passed the course.

Graph 27 shows the distribution of average marks received by the pupils in 2nd. year French in 1937. The range of marks is from 62 to 95. The median mark is 82 which is 7 points above the school norm of 75. The range in the two years of French varied only 3 points at the low end and remained the same at the high end. The median increased one point in the second year of the language. The distribution shows a tendency to lean toward the high end of the base-line scale. In this group of 16 pupils only two failed to equal or exceed the school norm of 75. All pupils passed the course.

Graph 28 shows the distribution of average marks received by the pupils in 3rd. year French in 1938. The range of marks is from a low of 65 to a high of 92. The median pupil received a mark of 82 which is 7 points above the school norm of 75. The range dropped 3 points at the high end over the two previous years in French. The median varied only one point in the three years. The distribution shows a positive skewness with the mode at the marking
Graph 22. Showing the Distribution of Teacher's Marks for Group A in Freshman English in 1935.
point of 85. This class is very small with only 12 pupils. From this group 11 equalled or exceeded the school norm of 75.

(4) **Average Marks in English for Group A**—Graph 29 shows the distribution of average marks received by the pupils in Freshman English in 1935. The range of marks is from 50 to 92. The median mark is 75 which just equals the school norm of 75. The distribution is very slightly skewed but not enough to warrant saying that it is not normal. The mode lies at the marking point 75. In this group of 52 pupils, 29 of them equalled or exceeded the school norm of 75. All but two pupils passed the course.

Graph 30 shows the distribution of average marks received by the pupils in Sophomore English in 1936. The range of these English marks is from a low of 62 to a high of 92. The median mark is 74, just one below the school norm of 75. The distribution is only slightly skewed and approximates a normal one. In this group all pupils passed the course and 28 of a total of 48 pupils equalled or exceeded the school norm of 75.

Graph 31 shows the distribution of average marks received by the pupils in Junior English in 1937. These English marks range from 65 to 92. The median mark is 75 which just equals the school norm. The distribution is only slightly skewed and approximates a normal one for all practical purposes. Of this group of 28 pupils, 20
Graph 30. Showing the Distribution of Teacher's Marks for Group A in Sophomore English in 1936.
equalled or exceeded the school norm of 75. All pupils passed the course.

Graph 32 shows the distribution of average marks received by the pupils in senior English in 1938. The range of these marks is from a low of 62 to a high of 88. The median mark is 75 which just equals the school norm. The distribution shows a slight positive skewness with the mode at the marking point of 85. Of a total of 26 pupils in this class 18 of them equalled or exceeded the school norm of 75 and all of them passed the course. In the four years of English the range varied 15 points, from 50 to 65, at the low end and only 4 points, 88 to 92 at the high end. The median was practically constant, varying but one point in the four years of the subject.

(5) Average Marks in Mathematics for Group A

Graph 33 shows the distribution of average marks received by the pupils in Elementary Algebra in 1935. The range of marks in this Algebra group is from 65 to 95. The median mark is 76 which is one point above the school norm of 75. The distribution curve is fairly symmetrical with a slight positive skewness. Of a total of 37 pupils that took the course 27 of them equalled or exceeded the school norm of 75 and all of them passed the course.

Graph 34 shows the distribution of average marks received by the pupils in Plane Geometry in 1936. The range of marks in this group is from a low of 65 to a high
Graph 31. Showing the Distribution of Teacher's Marks for Group A in Junior English in 1937.

Graph 32. Showing the Distribution of Teacher's Marks for Group A in Senior English in 1939.
Graph 33. Showing the Distribution of Teacher's Marks for Group A in Elementary Algebra in 1935.

Graph 34. Showing the Distribution of Teacher's Marks in Plane Geometry in 1936 for Group A.
of 95. The median pupil received a mark of 84, which is 9 points above the school norm of 75. The distribution shows a positive skewness with the modal point being at the marking point of 85. In the class of 17 pupils that took the course there were 15 that equalled or exceeded the school norm of 75. All pupils passed the course.

Graph 35 shows the distribution of average marks received by the pupils in Advanced Mathematics in 1937. The range of marks is from 65 to 95. The median mark is 82, which is 7 points above the school norm of 75. The distribution shows a positive skewness with the mode being placed at the mark of 85. This class is very small with only 12 pupils. Eleven of these pupils equalled or exceeded the school norm of 75. All pupils passed the course.

(6) Average Marks in the Social Studies for Group A—Graph 36 shows the distribution of average marks received by the pupils in World History in 1935. The range of marks for this group is from 65 to 95. The median mark is 83, which is 8 points above the school norm of 75. The distribution is positively skewed with the mode lying at the mark of 85. This group is of fair size with 43 pupils that took the course. Of this number only two failed to equal or exceed the school norm of 75. All pupils passed the course.

Graph 37 shows the distribution of average marks
Graph 35. Showing the Distribution of Teacher's Marks for Group A in Advanced Mathematics in 1937.

Graph 36. Showing the Distribution of Teacher's Marks for Group A in World History in 1935.
received by the pupils in United States History in 1930. The range of scores of this group is from a low of 62 to a high of 95. The median mark of this class is 80, which is 5 points above the school norm of 75. The distribution is positively skewed with the modal point midway of the 80th and 90th point on the base-line. Of a total of 26 pupils in this group 20 of them equalled or exceeded the school norm of 75. All pupils passed the course.

(7) Average Marks in the Sciences for Group A—Graph 38 shows the distribution of average marks received by the pupils in Biology in 1936. The marks range from 62 to 95. The median pupil of this class received a mark of 77, which is two points above the school norm of 75. The distribution is slightly skewed but not sufficiently, however, to call it anything but normal. Of a total of 41 pupils in this class, 25 equalled or exceeded the school norm of 75. All pupils passed the course.

Graph 39 shows the distribution of average marks received by the pupils in Physics in 1937. The range of marks in this class is from 65 to 88. The median mark of this group is 77, which is two points above the school norm of 75. The distribution shows a positive skewness with the mode being placed at the 85 mark. This group is the smallest class in the study, consisting of only 9 pupils. Of this total 6 of them equalled or exceeded the school norm of 75. All pupils passed the course.
Graph 37. Showing the Distribution of Teacher's Marks for Group A in United States History in 1938.

Graph 38. Showing the Distribution of Teacher's Marks for Group A in Biology in 1936.
Graph 40 shows the distribution of average marks received by the pupils in Chemistry in 1938. The marks varied from a low of 65 to a high of 92. The median of this class is 79, which is 4 points above the school norm of 75. The distribution is positively skewed, but not severely. Of a total of 12 pupils in this class 9 of them equalled or exceeded the school norm of 75. All pupils passed the course.

-----------------

(8) Average Marks in Grade 8 for Group B—Graph 41 shows the distribution of average marks received by the pupils in Grade 8 for Group B in 1938. The range of marks is from 60 to 92. The median mark is 80, which is 5 points above the school norm of 75. The distribution shows a positive skewness with the mode being placed at the 85 mark. Of a total of 74 pupils in this group only 18 failed to equal or exceed the school norm of 75.

(9) Average Marks in Grade 9 for Group B—Graph 42 shows the distribution of average marks received by the pupils in Grade 9 for the first half of the present year, 1939. The range of these marks is from a low of 52 to a high of 87. The median mark of this group is 74, which is one point under the school norm of 75. The distribution is slightly skewed, but for practical purposes
Graph 39. Showing the Distribution of Teacher's Marks for Group A in Physics in 1937.

Graph 40. Showing the Distribution of Teacher's Marks for Group A in Chemistry in 1938.
Graph 41. Showing the Distribution of Teacher's Marks in Grade 8 for Group B in 1938.
Graph 42. Showing the Distribution of Teacher's Marks in Grade 9 for Group B for First Half of Year in 1939.
approximates a normal one. 41 pupils, out of a total of 74, equalled or exceeded the school norm of 75.

(10) Summary—The school norm is 75. Therefore, so far as achievement, as recorded by teacher's marks is concerned, Group A presented the following picture:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Below Norm</th>
<th>At Norm</th>
<th>Above Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 8</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Grades 9-12</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French III</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English I</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>English II</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>English III</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>English IV</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Plane Geometry</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Adv. Math</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>World History</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>U. S. History</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Group B

| Grade 8                  |         |         | X          |
| Grade 9 (½ year)         |         | X       |            |
COMPARISONS OF THE RESULTS OF STANDARDIZED TESTS AND TEACHER'S MARKS
Chapter VI

COMPARISON OF THE RESULTS OF STANDARDIZED TESTS AND TEACHERS' MARKS

This chapter reports on the comparison of the results of standardized tests and the resulting teachers' marks in the subject heretofore dealt with in the previous chapters. As has been explained in Chapter III, the baseline of the graphs in this chapter have two sets of figures, each representing the same distance. The even figures in black, such as 50-60-70 etc., represent the average marks given to the pupils by their teachers. The uneven figures in red, such as 0-9-29 etc., represent the percentile ratings on standard tests. The percentile rating between 0 and 9 represents the teacher's mark between 50 and 60 etc. Only Group A will be considered because Group B has had no standardized tests in specific subjects. The findings will be reported under appropriate paragraph headings.

(1) Comparison in the Foreign Languages—Graph 43 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Elementary Latin in 1935 and a distribution of the teacher's marks in that subject. The graph shows: that one pupil should fail and that no pupil is failing; that 6 pupils should be marked between 60 and 70 and none are so marked; that 12 pupils should be marked between 70 and 80 and only
Graph 43. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Elementary Latin in 1935.

Graph 44. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 2nd Year Latin in 1936.
3 are so marked; that no pupil should receive a mark between 80 and 90 and 8 are so marked; that no pupil should receive a mark between 90 and 100 and 8 are so marked. The teacher is unquestionably marking far in excess of actual achievement as set up by school standards.

Graph 44 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in 2nd. year Latin in 1936 and a distribution of the teacher's marks in that subject. The graph shows: that one pupil should fail and no pupil is failing; that 4 pupils should be marked between 60 and 70 and none are so marked; that 5 pupils should be marked between 70 and 80 and 4 pupils are so marked; that 3 pupils should receive marks between 80 and 90 and 8 pupils are so marked; that one pupil should receive a mark between 90 and 100 and 2 pupils are so marked. The teacher is giving credit where no credit is due; too many high marks and too few low marks.

Graph 45 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Elementary French in 1936 and a distribution of the teacher's marks for the same subject. The graph shows: that one pupil should fail and no pupil is failing; that 5 pupils should be marked between 50 and 60 and that only one pupil is so marked; that 11
Graph 45. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 1st Year French in 1936.

Graph 46. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 2nd Year French in 1937.

Graph 47. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in 3rd Year French in 1938.
pupils should be marked between 70 and 80 and that 9 pupils are so marked; that 2 pupils should be marked between 80 and 90 and that 9 pupils are so marked; that 2 pupils should be marked between 90 and 100 and that 3 pupils are so marked. This teacher is marking in excess of actual achievement. Again it is a case of too few marks below 75 and too many marks above 75.

Graph 46 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in 2nd year French in 1937 and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail and that none are failing; that 3 pupils should be marked between 60 and 70 and that one pupil is so marked; that 7 pupils should be marked between 70 and 80 and that 4 pupils are so marked; that 5 pupils should be marked between 80 and 90 and that 8 pupils are so marked; that one pupil should receive a mark between 90 and 100 and that 3 pupils are so marked. The situation here is precisely the same as in Elementary French; marks are in excess of school standards of achievement.

Graph 47 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in 3rd year French in 1938, and a distribution of the teacher's marks for the same subject. The graph shows: that 2 pupils should fail and that no
Graph 49. Showing the Comparison of Percentile Scores in Cooperative Achievement Test and Teacher's Marks in Freshman English in 1935.
pupils are failing; that no pupils should receive marks between 60 and 70 and that one pupil is so marked; that 7 pupils should be marked between 70 and 80 and that only 2 pupils are so marked; that 3 pupils should be marked between 80 and 90 and that 8 pupils are so marked; that no pupil should be marked between 90 and 100 and that one pupil is so marked. It is obvious that the teacher of French awards comparatively few low marks.

The achievement test records show that in the three years of the language three pupils did not deserve a passing grade and yet all pupils were passed. Likewise the French teacher gives far too many high marks. According to achievement in the three years of French only 13 pupils should have received marks better than 80, whereas 32 pupils were so marked.

(2) **Comparison in English**—Graph 49 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Freshman English in 1935, and a distribution of the teacher's marks for the same subject. The graph shows: that 4 pupils should fail the course whereas 2 pupils are failing; that 12 pupils should be marked between 60 and 70 and that 9 pupils are so marked; that 15 pupils should be marked between 70 and 80 and that 24 pupils are so marked; that 16 pupils should be marked between 80 and 90 and that 15 pupils are so marked; that 5 pupils should
Graph 49. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Sophomore English in 1936.
be marked between 90 and 100 and that 2 pupils are so marked. It is apparent that there are too few low marks, too many average or "C" marks and too few high marks.

Graph 49 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Sophomore English in 1936, and a distribution of the teacher's marks for the same subject. The graph shows: that one pupil should fail whereas no pupil is failing; that 11 pupils should receive marks between 60 and 70 and that 12 pupils are so marked; that 23 pupils should receive marks between 70 and 80 and that 24 pupils are so marked; that 12 pupils should be marked between 80 and 90 and that 10 pupils were so marked; that one pupil should be marked between 90 and 100 and that 2 pupils were so marked. This Sophomore group in English received marks which are remarkably accurate measures of their achievement according to the school standards.

Graph 50 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Junior English in 1937, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail the course and that none are failing; that 5 pupils should be marked between 60 and 70 and that only 3 pupils are so marked; that 9 pupils should be marked between 70 and 80 and that 13
Graph 50. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Junior English in 1937.

Graph 51. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Senior English in 1938.
pupils are so marked; that 11 pupils should be marked between 80 and 90 and that 11 pupils are so marked; that 3 pupils should receive marks between 90 and 100 and that one pupil is so marked. The tendency in the marking of this group is to give too many average or "C" grades and not quite enough low and high grades.

Graph 51 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Senior English in 1938, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail the course and that no pupil is failing; that 2 pupils should receive marks between 60 and 70, whereas 5 pupils are so marked; that 17 pupils should receive marks between 70 and 80 and that 10 pupils are so marked; that 4 pupils should receive marks between 80 and 90 and that 11 pupils are so marked; that 3 pupils should be marked between 90 and 100, whereas no pupils are so marked. There is a complete reversal of practice in the marking of this group. In the three previous years of English there was an evident tendency to give too few high and low marks, and too many average or "C" marks, while in this group of Senior English pupils there were too few average or "C" grades and too many high and low marks.

Graph 52 shows the comparison of a distribution of a composite of percentile scores taken from the Cooperative
Graph 52. Showing the Comparison of a Composite of Percentile Scores of Cooperative Achievement Tests and Teacher's Marks of 4 Years in English.
Achievement Tests in English in the year 1935 to 1939, and a distribution of the teachers' marks for that subject over the same period. The graph shows that the marks received by the pupils over the four-year period were fairly commensurate with actual achievement as set up by the school standards.

(3) **Comparison in Mathematics**—Graph 53 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Elementary Algebra in 1935, and a distribution of the teacher's marks for the same subject. The graph shows: that two pupils should fail the subject and that no pupils are failing; that 6 pupils should receive marks between 60 and 70 and that 8 pupils are so marked; that 21 pupils should be marked between 70 and 80, whereas 19 pupils are so marked; that 5 pupils should be marked between 80 and 90 and that 7 pupils are so marked; that 3 pupils should be marked between 90 and 100 and that 3 pupils are so marked. This group received marks which compare favorably with their achievement record.

Graph 54 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Plane Geometry in 1936, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail in Plane Geometry and that no pupil is failing; that 2 pupils should receive
Graph 53. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Elementary Algebra in 1935 for Group A.

Red--Standardized
Black--Teacher's Marks

Graph 54. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Plane Geometry in 1936 for Group A.
marks between 60 and 70, whereas one pupil is so marked; that 7 pupils should be marked between 70 and 80 and that 4 pupils are so marked; that 5 pupils should be marked between 80 and 90, whereas 7 pupils are so marked; that 3 pupils should be marked between 90 and 100 and that 5 pupils are so marked. There is a definite assigning of too few low marks and too many high marks in this group.

Graph 55 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Advanced Mathematics in 1937, and a distribution of the teacher's marks for the same subject.
The graph shows: that no pupil should fail and that no pupil failed; that no pupil should be marked between 60 and 70, whereas one pupil is so marked; that 2 pupils should be marked between 70 and 80 and that 3 pupils are so marked; that 4 pupils should be marked between 80 and 90 and that 4 pupils are so marked; that 4 pupils should be marked between 90 and 100, whereas only 2 pupils are so marked. The above analysis shows that in this class of Advanced Mathematics, too many pupils were given low marks and too few were given high marks, according to their achievement record.

(4) Comparison in the Social Studies—Graph 56 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in
Graph 55. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Advanced Mathematics in 1937.

Red—Standardized
Black—Teacher's Marks

Graph 56. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in World History in 1935.
World History in 1935, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail and that no pupil is failing; that 5 pupils should receive marks between 60 and 70 and that one pupil is so marked; that 38 pupils should be marked between 70 and 80 and that 16 pupils are so marked; that no pupils should be marked between 80 and 90 and that 19 pupils are so marked; that no pupils should be marked between 90 and 100 and that 7 pupils are so marked. From the achievement record here, no pupil should have been marked over 80, whereas 26 pupils received marks exceeding that figure. A definite case of over-marking.

Graph 57 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in United States History in 1938, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail and that no pupil is failing; that 3 pupils should receive marks between 60 and 70 and that 2 pupils are so marked; that 9 pupils should be marked between 70 and 80 and that 7 pupils are so marked; that 9 pupils should be marked between 80 and 90, whereas 13 pupils are so marked; that 5 pupils should receive marks between 90 and 100, whereas 4 pupils are so marked. In this group too many marks between 80 and 90 were assigned, the difference
Graph 57. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in United States History in 1938.

Graph 53. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Biology in 1936.
being made up by too few marks between 60 and 80, according to the pupil's achievement chart.

(5) **Comparison in the Sciences**—Graph 58 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Biology in 1936, and a distribution of the teacher's marks for the same subject. The graph shows: that 8 pupils should fail the subject, whereas no pupils are failing; that 5 pupils should be marked between 60 and 70 and that 9 pupils are so marked; that 14 pupils should receive marks between 70 and 80 and that 16 pupils are so marked; that 10 pupils should receive marks between 80 and 90 and that 14 pupils are so marked; that 4 pupils should be marked between 90 and 100, whereas 2 pupils are so marked. According to the achievement polygon pupils in Biology are marked too high with the exception of the very upper and lower limits of the scale.

Graph 59 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Physics in 1937, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail in Physics and that none are failing; that one pupil should be marked between 60 and 70 and that 2 pupils are so marked; that 3 pupils should be marked between 70 and 80 and that 3 pupils are so marked; that 2 pupils should receive marks between 80
Graph 59. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks for Group A in Physics in 1937.

Graph 60. Showing the Comparison of Percentile Scores of Cooperative Achievement Test and Teacher's Marks in Chemistry in 1938 for Group A.
and 90 and that 4 pupils are so marked; that 2 pupils should be marked between 90 and 100 and that no pupils are so marked. In this small class, marks coincided fairly well with accomplishment as set up by the school standards. The exception is in the higher marks, 90-100, apparently too few of these were given out.

Graph 60 shows the comparison of a distribution of percentile scores taken from the Cooperative Achievement Test in Chemistry in 1939, and a distribution of the teacher's marks for the same subject. The graph shows: that no pupil should fail in the subject and that no pupil is failing; that 2 pupils should receive marks between 60 and 70 and that 2 pupils are so marked; that 3 pupils should be marked between 70 and 80 and that 6 pupils are so marked; that 5 pupils should be marked between 80 and 90 and that 3 pupils are so marked; that 3 pupils should receive marks between 90 and 100 and that 2 pupils are so marked. The criticism here is the same as in the previous subject, namely, too few of the high marks.
(6) **Summary**—The graphs showed the following:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Marks Too Low for Achievement</th>
<th>Marks Approximately Right</th>
<th>Marks Too High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin I</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latin II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French II</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French III</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English III</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plane Geometry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Mathematics</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>World History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Chapter VII

ANALYSIS OF QUESTIONNAIRE ON HOME STUDY

This chapter is an analysis of the returns of the two questionnaires which were administered in the middle of the present year. The first questionnaire to be discussed was sent to all of the members of the present Freshman class. From this there were 78 returns, or 100%. The second questionnaire was sent to approximately 150 parents of pupils in Grade 7 and Grade 8, of which 90 made returns; a return of 60%.

(1) Questionnaire to Freshmen on Home Study—Below is a facsimile of the questionnaire.

QUESTIONNAIRE TO FRESHMEN ON HOME STUDY

Please give the average time in minutes that you spend daily in preparation for the following subjects:

English, Algebra, Latin, History, Civics, General Science and Junior Business Training

Enter figures in the column marked H if the time is spent at home and in the column marked S.H. if the time is spent in Study Hall.

<table>
<thead>
<tr>
<th>English</th>
<th>Algebra</th>
<th>Latin</th>
<th>History</th>
<th>Civics</th>
<th>Gen.Sc.</th>
<th>J.B.T.</th>
</tr>
</thead>
</table>

This is a serious study. Please be as accurate as possible. As you can see, the Office is not interested in names, only in figures.
Analysis of the questionnaire—From the returns of the questionnaire the following results of home study in specific subjects were determined:

**English.** 44 pupils study the subject of English an average of 33.5 minutes per day at home. 59 pupils study the same subject an average of 30.5 minutes in the Study Hall. 78 pupils, the total number taking the subject, study it an average of 41.5 minutes daily.

**Algebra.** 45 pupils study Algebra an average of 32.5 minutes per day at home. 19 pupils study the subject an average of 23 minutes per day in the Study Hall. 47 pupils, the entire class, study the subject an average of 39 minutes daily.

**Latin.** 37 pupils study Latin an average of 35.8 minutes per day at home. 23 pupils study the subject an average of 30 minutes per day in the Study Hall. 45 pupils, the entire class, study Latin an average of 43.6 minutes daily.

**World History.** 6 pupils study the subject of World History a daily average of 26 minutes at home. 11 pupils study the subject an average of 25 minutes per day in the Study Hall. The class of 15 pupils averages 28.7 minutes in daily preparation for the subject.

**Civics.** 15 pupils average 29.3 minutes per day in studying Civics at home. 26 pupils study the subject 16.5 minutes per day in the Study Hall. 30 pupils, the
entire class, study Civics an average of 35.3 minutes daily.

**General Science.** 36 pupils study General Science an average of 35 minutes per day at home. 49 pupils study the subject an average of 20 minutes per day in the Study Hall. The entire class, 62 pupils, study the subject an average of 38.8 minutes per day.

**Junior Business Training.** 25 pupils study Junior Business Training an average of 39.4 minutes per day at home. 18 pupils study the subject an average of 27 minutes per day in the Study Hall. 31 pupils, the entire class, study the subject an average of 47 minutes daily.

(3) **Questionnaire to Parents on Home Study**—Represented below is a facsimile of the questionnaire sent to parents of pupils in Grade 7 and 8.

**To Parents of Pupils in Grades VII and VIII:**

When pupils enter high school it is necessary to do a good deal of home studying, and we find that during the first year especially they have difficulty in studying independently.

In grammar school they study under constant supervision and since there is very little home work given, they have not learned how to work by themselves.

We believe that if they had regular home work when in Grades VII and VIII and some experience in studying by themselves, they would be more successful when they go to high school.

We are asking you to answer the following questions in order that we may have your point of view and secure your cooperation in our efforts to help them.
Would you object to more home work in Grades VII and VIII?

Can you provide a quiet place and a definite time for home study?

May we count on your cooperation in our effort to help bridge the gap between grammar and high school?

Have you any suggestions for improving the study habits of your child?

(4) Analysis of the Questionnaire—From the returns of the Questionnaire, the following results were obtained:

Question 1. To this question which wanted to know if there would be any parental objection to more home work in Grades 7 and 8, 37 answered yes, 50 wrote no, and 3 were blank. From these results, the conclusion could be drawn that the parents are slightly in favor of more home work for their children in these two grades.

Question 2. To this question, which asked if a quiet place and a definite time for home study could be provided for the child, 83 answered yes, 5 answered no, and 2 were blank. It is evident from these results that even in an heterogeneous group such as this must be, parents are able to give their children the proper surroundings conducive to concentrated study.

Question 3. To this question, which wanted to know if the school department could count on the parent's cooperation in an effort to bridge the gap between grammar
and high school, the answers were practically unanimous. 86 wrote yes, only one said no, and 3 were blank.

**Question 4.** This question asked for suggestions for improving the study habits of the child. Many and varied were the answers received. Some stuck to the point of the question and tried to be constructively critical while others took the entire school department to task—from the Superintendent down to the janitors. Below are a few of the suggestions quoted verbatim which express in the main, the sentiments of the parents:

"I think a longer school day would enable the child to do all his work in school and after school have his time free for the work and play that is so necessary."

"I think if they lengthened the school day an hour or two the children would learn more, seeing the teacher was supervising the study hour."

"Not over one hour of home study."

"Sometimes the children have a great deal of home work and sometimes none. Average it."

"At this age the children should have access to someone who knows the subject studied—when doing the work so that if he wishes he may ask questions at the time he wants to know. We mothers and fathers have not studied the same methods and it is impossible to give any help without confusing the child. Therefore, I am not in favor of more home study."
"Teachers should be sure the pupil understands the subject they are to study."

"Less play will increase study."

"Why not leave out some unnecessary subject in the curriculum to provide a study period during school hours."

"When a pupil leaves school for the day the rest of the time should be his own and devoted to recreation and rest."

"I would suggest that they have at least two days each week free from any home work, and that they have more on the days that they have it."

"Believe the child has sufficient home work. More instruction in the classroom might be beneficial."

"I believe the children have too much work to do at home. I believe if they do their work in school that is about all they can do. After all, they have to go out and get the fresh air and they cannot get it if they have home work."

This question was included in the questionnaire with the idea that it might possibly give a suggestion or a trend of thought that was common to a majority. It did not. The replies, as can be seen from the samples above, were a hodgepodge of suggestions and criticisms.

(5) Summary—Below is a summary of the returns on the Questionnaire to Freshmen.
### Pupils in Class

<table>
<thead>
<tr>
<th>Subject</th>
<th>Pupils in Class</th>
<th>Ave. Min. Study at Home</th>
<th>Ave. Min. Study in S.H.</th>
<th>Total Ave. Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>78</td>
<td>33.5</td>
<td>30.5</td>
<td>41.5</td>
</tr>
<tr>
<td>Algebra</td>
<td>47</td>
<td>32.5</td>
<td>23</td>
<td>39</td>
</tr>
<tr>
<td>Latin</td>
<td>45</td>
<td>35.8</td>
<td>30</td>
<td>43.6</td>
</tr>
<tr>
<td>World History</td>
<td>15</td>
<td>26</td>
<td>25</td>
<td>28.7</td>
</tr>
<tr>
<td>Civics</td>
<td>30</td>
<td>29.3</td>
<td>16.5</td>
<td>35.3</td>
</tr>
<tr>
<td>General Science</td>
<td>68</td>
<td>35</td>
<td>28</td>
<td>38.8</td>
</tr>
<tr>
<td>Junior Business</td>
<td>31</td>
<td>39.4</td>
<td>27</td>
<td>47</td>
</tr>
</tbody>
</table>

So far as amount of time spent in study is concerned, it would appear that the pupils are spending a normal amount of time on their assignments. Opinions were advanced that: 1. The school might increase its facilities for study periods; 2. The school should study the situation regarding average day's assignments; 3. The teacher might make assignments more definite.
STATEMENT OF PROBLEM AND CONCLUSIONS
Chapter VIII

STATEMENT OF PROBLEM AND CONCLUSIONS

This chapter deals with the reiteration of the problem and the statement of the various conclusions that pursuanty resulted.

(1) The Problem--This study was an attempt to determine the cause of inconsistencies apparent in the marks of pupils as they progressed from Grade 8 through high school. Essentially it was a study of comparisons of achievement as recorded by school marks and achievement as recorded by standard tests. Included in the study was an investigation of parental and pupil views on amount of home study, with the idea that this angle might contribute some part of the solution of the problem.

(2) Conclusions--The Grade 8 teachers, through a combination of the results of achievement tests, intelligence tests and school marks, made favorable predictions for the academic success of their pupils in high school. The Grade 9 teachers failed to agree with these prognostications and expressed their disagreement in the marks of the pupils in Grade 9. From the results of this study, however, the Grade 8 teachers were correct in their predictions and the high school teachers as a whole also were in accordance. Not only does this study prove that a large majority of the classes they took achievement tests equalled or exceeded the national norm, but also
that the teachers are marking higher than the school standards of achievement call for. Thus the Grade 8 teachers are correct in their prediction and the Grade 9 teachers definitely wrong. These conclusions are deduced from the following facts:

(A) **General Intelligence.** The general intelligence of the pupils studied was average. Their mean I.Q. in both groups was 103, which is considered to be normal or average intelligence for these grades. Therefore the Grade 8 teachers were partly justified in their favorable prediction.

(B) **Stanford Achievement Scores.** The Stanford Achievement Test, the test given to both groups of pupils studied, is considered as one of the ranking tests in grade schools as a determiner of accomplishment. This test was given in the ninth month of Grade 8. In Group A, the major group in this study, the median pupil was on a level of the average pupil who has attended school for eight months in Grade 9. This group therefore was advanced in achievement approximately nine months ahead of national norms. Group B, the present Freshmen in school, was advanced four months according to national norms. This substantiated the favorable prediction noted above.

(C) **Cooperative Achievement Scores.** In all of the classes in which the Cooperative Achievement Tests were
given in Senior High School, the standard norm was
equalled or exceeded by the class median with the excep-
tion of Latin 1 and 2, Algebra and World History. These
results are as they should be when we consider the intel-
ligence and previous achievement scores of the pupils.
The pupils are progressing normally with the exception
of those in the subjects listed. (It is significant that
two of these three subjects are taught by the same teacher
who has since resigned.) The prediction of the Grade 8
teachers is being realized; and the assumption of sub-
normality made by the Grade 9 teachers is not substan-
tiated.

(D) Teachers' Marks. On page 87 is shown a summary
of the comparison of teachers' marks and school achieve-
ment standards. This shows that in three subjects only,
school marks were below what they should be. The conclu-
sion is evident that teachers are not "marking down"
the pupils as they progress through high school as the
original assumption in the study intimated. Instead,
the teachers are definitely over-marking, as can readily
be seen by examining the chart. Ten subjects out of
seventeen received median marks higher than the school
standards called for on highly-rated achievement tests.
The assumption of the Grade 9 teachers that these groups
are sub-normal is even less substantiated by these results.
(E) **Home Study.** The pupils in the present Freshman class are closely approximating the required amount of outside study. The questionnaire showed that the average pupil with four subjects was studying an average of 40 minutes per subject per day. The school requirements are that assignments should be made so that the average pupil has between two and one-half to three hours of outside preparation. With 40 minutes per subject this gives the average pupil 160 minutes or approximately two and three-quarters hours. Of this time about one hour and 45 minutes is used in the Study Hall. The average pupil has three study periods of 40 minutes each day. So far as amount of time spent on preparation is concerned, the Grade 9 teachers are not justified in saying the pupils are shirking their work.

It is the hope of the author that the method, procedure, and conclusions that developed in this study may be of use to others in a similar situation.
BIBLIOGRAPHY
Bibliography


Ross, C. C., The Relation Between Grade School Record and High School Achievement. Contributions to Education, 166, Teachers College, Columbia University, New York, 1925, pp. 5, 44.


Terman, Lewis M., Terman Group Test of Mental Ability. World Book Company, New York.
Trabue, Marion R., *Measuring Results in Education.*
American Book Company, Boston, 1924, p. 56.
Approved by:

Albert W. Purves

Raymond F. Parkhurst

Sara M. Coolidge

Thesis Committee

Date May 27, 1939