

FIRST COPY

A MENTAL-EDUCATIONAL SURVEY OF REA SCHOOL,
TERRE HAUTE, INDIANA

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CHAPTER I

INTRODUCTION

I. THE NECESSITY FOR MENTAL-EDUCATIONAL MEASUREMENT OF SCHOOL CHILDREN

Recognition of the fact that learning did not always parallel teaching led progressive educators into two fields of investigation, (1) to find better methods of teaching, and (2) to obtain a better understanding of the child. It is with the latter that this study is concerned. When H. E. Hawkes said, "our present system of education has been built upon the maintenance of standards and selection,"¹ he implied that there had been no other major consideration in the development of the system.

The maintenance of standards included a prescribed curriculum and the enforcement of an established degree of attainment. Selection involved rejection or separation of those who "pass" from those who "fail". The Democratic theory that all men were created equal led people to assume further that all children were created equal and alike in degree of intelligence and capacity, and to imagine

¹ Herbert E. Hawkes, E. T. Lindquist, C. R. Mann, The Construction and Use of Achievement Examinations. (New York: Houghton, Mifflin Company, 1936), p. 447.

that providing for the same type of instruction with the same standards of achievement for all children was giving equal rights to all.

More recently it has been recognized that these "standards" are often the cause of a dislike for school, "failures", and crime. These "standards" were built for, and were attained by, only those of superior bookish ability. Every examination of any group of individuals has shown that many have fallen short of these "standards". The tardy recognition of this fact has led to the realization that all children are not alike in abilities and capacities, and that there is a need for studying the mental-educational abilities of each pupil. There must be standards to fit not only the various levels of ability but also the level of attainment of any pupil at any given time in order not to attempt to teach that which the pupil is not capable of learning, that which he is not ready to learn, or that which he has already learned.

Many school systems are meeting this need by some type of cumulative record whereby the mental possibilities of the child are recorded with his achievements, attitudes, aptitudes, and personal characteristics. Through such records each child may be instructed according to his ability to learn; remedial work may be intelligently done; promotions and recognitions may be based upon improvement; and

feasible goals may be established.

The purpose of the survey discussed in this thesis was to furnish the nucleus of such records for the pupils of Rea School, Terre Haute, Indiana. Educational guidance must be a continuous program of testing. Undue value must not be placed upon single tests. All obtainable evidence should be weighed and testing should be for the pupil, never against him. A file card is shown in Chapter V, page 93, of this study.

E. Horn states,

(a) the movement is still in a formative stage; (b) mental ability is still too exclusively ascribed to determined forces; (c) misconceptions exist concerning the degree to which intelligence, as measured by tests, enters into achievement; (d) it is becoming increasingly evident that the prognosis of scholarly achievement may be better accomplished by special aptitude and achievement tests which concentrate on defined areas of subject matter; and (e) it is too often forgotten that there are areas of personality and social achievement in which the ingredients are not limited to intelligence.²

II. THE IMPORTANCE OF THIS STUDY

A study of the children of Rea School, Terre Haute, Indiana, is important because it is the desire of the teachers and the supervisory officers to give the pupils the best possible educational advantages. The range

of mental ability and educational achievement in each class is as varied as in any other school of unselected pupils.³

The primary purpose of any survey is to compare the case being studied with some other case or cases, granting there are similarities enough between the opposing sides to justify such comparison. In the present study the comparison has been made with the established norms of the tests used. The large number of cases with the wide sampling of testees used in preparing the tests, and the revisions of the tests for further improvement justify their use for such purpose.

The first concern of a survey is with group averages. The second concern depends upon the use to be made of the survey and the scope of the testing program to be undertaken. The present study has been made with the hope that a need for further testing will be proved and that such tests as will assist the teachers and administrative officers in providing a program which will serve the largest possible range of pupil abilities and educational needs may be made available to the school.

III. THE NATURE OF THIS STUDY

The nature of any survey test is a measurement of the general levels of ability or achievement and a comparison

of these findings with the norms for other similar groups. A mental-educational survey measures the general levels of the intelligence and the achievement of the testees. In this case the comparison has been made with the established norms of the tests used.

The tables and figures given here compare the class medians of the scores obtained in the intelligence tests with the established norms for the class.

The medians of all the achievement scores were treated in the same way to ascertain present educational levels, and the medians of the intelligence and of the achievement scores were compared to judge whether the classes had attained the educational levels possible in accordance with their respective levels of intelligence.

CHAPTER II

DISCUSSION OF THE TRENDS IN THE SURVEY

TESTING MOVEMENT

The trends in the development of survey testing may be divided into four main divisions: (1) trends in testees, the types of subjects tested; (2) trends in construction, developing tests that may be administered, scored, and the results used, by an average investigator; (3) trends in purpose, uses to which the scores might contribute; and (4) trends in standardization. In the standardization of tests, progress has been made in securing higher degrees of validity, reliability, correlation, and more meaningful statements of findings. The present study has been concerned with one type of testee, the children of Rea School, and with the meaningfulness of the findings.

The present testing movement was stimulated in the United States by Goddard's translation of the Binet Tests into the English language, in 1906. Since that time a large amount of mental testing has been undertaken, much of which was no doubt conscientiously performed, but produced no lasting results because of the difficulty in formulating objective conclusions. Classroom methods were generally studied in the early efforts to use survey testing

for the betterment of educational programs. The purpose of the tests was the evaluation of teaching and the improvement of supervision.

The Portland School Survey of 1910 was an attempt to evaluate the teaching done in the classrooms of that city. In this report there was no possible basis for comparison with similar instruction in other communities and there was an entire lack of objective evidence.

¹
Leonard P. Ayers' survey of the public schools of Springfield, Illinois, in 1914, recorded six hundred eighty-four classroom visits and two hundred seventy-three written reports on recitations. Quantitative information was made available on certain characteristics of classroom technique. In the same year Frank M. McMurray in a survey of elementary schools attempted to set up four standards by which to evaluate types of teaching.

During the World War more attention was centered on the testing of individual mental capacities, and in 1918, Flexner and Bachman ² made a survey of the schools of Gary, Indiana. This survey recorded teacher technique and pupil performance. The tabulations were so objective

¹
Second Year Book of the National Conference of Supervision and Directors of Education, Scientific Method in Supervision. (New York: Teachers College, Columbia University, 1929), p. 4.

²
Ibid., p. 6.

that the Gary survey remains one of the outstanding pieces of measurement. The development of the trends in survey testing which have been most helpful in the educational field have been outgrowths of careful studies of the needs, uses, and practicability of the material offered. There has been a decrease in the amount of testing material accepted with a corresponding increase of the value of the material produced. Tests accepted at present are constructed on sufficient experimentation and revision to insure educational worth. Results are stated in standardized objective terms. Because of these developments, objective testing is gaining the approval of educators and layman and is becoming a very important part of any educational program. Tests are now constructed to be used by the average classroom teacher. Much material on uses and interpretations is available, and teacher training institutions offer a broad field of instruction in testing. There is an increasing willingness on the part of these institutions to assist in the making of tests, and in administering, scoring, and interpreting them.

3

In 1920, W. L. Connor made an attempt at teacher rating in which he enlisted the help of teachers in setting up seven standards by which to evaluate "concrete acts" in classroom teaching.

3

W. L. Connor, "A New Method of Rating Teachers," Journal of Educational Research, May, 1920, p. 338.

Another important trend has been the measurement of pupil activities for the purpose of more effective instructional practices. C. A. Pollock, in 1924, undertook a survey of children's interests in scientific facts and used the findings as a basis for curriculum material in general science. Another early attempt at using results for the teacher and the child was L. J. Brueckner's survey of the use of the supervised study period.

After the Winnetka Plan was undertaken, one of the first attempts was made at a survey which would compare the activities of pupils under widely different plans of instruction. C. W. Washburne and others made, in 1926, a survey of the Winnetka public schools. A large amount of material was gathered in this survey. An example of the type of material is the number of questions asked and the number of responses received from the testees. A criticism of the findings of the Winnetka Survey did much toward bringing added efforts to procure weighted questions and responses.

Out of hundreds of testing projects for the general measurement of classroom activities have come attempts at surveying for better results in specific subjects. That is, diagnostic surveys came into general use with the intent of using the results for remedial teaching and remedial supervision. The Board of Education of Racine, Wisconsin,

sponsored such a survey of the teaching and learning activities of spelling, in 1926. Here a careful measurement was made of the intelligence and achievements of pupils in order to obtain an objective record of the effectiveness of the teaching procedure in use. The survey resulted in, (a) some very definite statements of erroneous activities, (b) a plan for teaching spelling which has been very generally accepted including the pretesting step, and (c) clearer statements of mental processes performed by the children. The results of this survey have been generally used to secure better instruction and pupil performance in spelling.

From the foregoing discussion, it can be seen that the results of survey testing have become much more definite and productive. In 1933, the United States Office of Education reported "testing programs in twenty-three states in the union".⁴

A large per cent of the tests and testing information is for high school and junior high school use, but an increasing amount is being offered for elementary grades. Increased value in testing activities is being attained through the availability of comparable forms of examinations.

⁴ Paul M. Sangren, "Present Tendencies in the Uses of Educational Measurements," Review of Educational Research, Vol. V, Number 5, December, 1935, pp. 455-468.

This availability has also partially overcome a tendency' to give undue significance to the findings of a single test--one of the outstanding criticisms against the testing movement. In the field of intelligence testing, there is a need for the further establishment of equivalent scores among the more generally accepted tests.

The most prevalent use being made of survey tests, at present, is to give an overview of a group condition, to be followed by other types of tests, if need be, for the purpose of prognosis, diagnosis and remedial treatment, instruction, grouping, marking, experimentation, research, guidance, and administrative programs. The present trend is away from grouping as a teaching and learning aid, although from the standpoint of the teacher, grouping is an instructional aid. There appears no outstanding criticism against the other uses of mental-educational measurement. Generally speaking, the least skill prevails, at present, in diagnostic testing. Woody, in a study on the effects of measurement on instruction made the conclusion that "measurement properly conceived is an integral part of the complete teaching process and, as such, becomes an important agency in directing the choice of subject matter and methods of teaching".⁵

CHAPTER III

THE METHOD OF PROCEDURE IN THIS STUDY

The general procedure of the survey included administering the Metropolitan Readiness Tests in 1B, the Otis Group Intelligence Scale from 1A through 6A, and the New Stanford Achievement Test from 2A through 6A. The Metropolitan Readiness Tests and the Otis Group Intelligence Scale were administered soon after the beginning of the fall term of 1936 and the New Stanford Achievement Test was administered near the close of the same term.

The Metropolitan Readiness Tests were used because of the marked correlation between the scores obtained in these tests and in other favored primary intelligence tests,¹ and because these tests have attempted to give detailed information about achievements that are related to learning activities performed in the first grade. A justification of the Otis and Stanford tests has been included in a discussion of the tests--lists of tests, page 96. In interpreting the findings of the Metropolitan Tests as in the Otis Intelligence Scale Tests, it should be

¹ Jacob S. Orleans, Metropolitan Readiness Tests, Manual of Directions. (New York: World Book Company, 1933), p. 18.

remembered that all group intelligence tests explore "area" of mental growth, rather than "altitude" of subject learning, and children who fall short in class participation often obtain comparatively high intelligence scores because general experience plays a large part in the responses in "area" measurement. This is especially true with retarded children--being older, they have more experience from which to draw. Young children who may prove later to be especially bright may not show particularly high scores in an "area" test.

The tests were all administered by the same person except one class of 2A's. These tests were scored by the teachers and an office assistant.

Following the general procedure of a mental-educational survey as stated on page 4 of this study, the first scores were obtained in the 1B class from the Metropolitan Readiness Tests. The second step was to obtain intelligence scores for the remainder of the school, 1A to 6A inclusive, from the Otis Intelligence Scale. The third test administered was the Stanford Achievement test, given in all classes from 2A to 6A inclusive. The intelligence scores and the achievement scores for each class were tabulated on the profile chart of the Stanford test. The medians of all scores were found in order to compare the mental and educational levels of the various classes with the norms established on the tests.

Since the aim of the study was to find out whether or not the standards set up for all children within the grades represented in this school were being attained or were attainable, the final tables and figures in each division of the study show the number of children at grade--within one-half year--below grade, and above grade.

CHAPTER IV

THE REPORT OF THE FINDINGS OF THIS STUDY

I. GENERAL FINDINGS

Under general results will be shown findings which were recorded for the entire school from the tests given in the fall and spring terms. The fall term 2A class was small, nineteen pupils, but fifty-five children in 2A in the spring term were tested and the two groups put together making a most satisfactory total of seventy-four 2A's. The 6B class was next in size and it will be noted later that their median scores compare to an advantage with the other classes. Table I, page 16, shows the number of pupils tested in each class, with names of the tests used.

TABLE I

NUMBER OF PUPILS TESTED IN EACH CLASS,
WITH NAMES OF TESTS USED*

	Otis Primary								Otis Advanced					
	1B	1A	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	Total	
Number	69	42	66	22	36	24	34	31	41	22	41	27	455	
	Stanford Primary						Stanford Advanced							
	1B	1A	2B	2A	3B	3A	4B	4A	5B	5A	6B	6A	Total	
Number				55	19	33	21	31	31	36	19	41	27	313
Total	69	42	66	96	69	45	65	62	77	41	82	54	768	

*Between the time of giving the two general types of tests a total of thirty-one children were withdrawn from the classes.

Table II, which is given below, classifies the three hundred sixty-six I. Q. scores in their respective grades. There were three hundred eleven pupils with I. Q. scores of ninety or above. This is an average number in an unselected group.

TABLE II
CLASSIFICATION OF THE I. Q.'S
OF THE PUPILS, BY GRADES

I. Q.'s	Below 60	60 - 69	70 - 79	80 - 89	90 - 99	100 - 109	110 - 119	120 - 129	130 - 139	Above 139
1A		1	3	1	6	11	17	5	1	
2B				5	5	17	24	11	1	
			1*	1*	0*	7*	5*	5*		
2A			3 ^a	4 ^a	4 ^a	13 ^a	20 ^a	10 ^a	1 ^a	
3B		1	3	2	4	7	9	7		
3A		1	1	3	5	4	5	2		
4B			1	3	7	9	9	2		
4A			3	3	7	11	7			
5B			2	6	8	14	6			
5A				2	7	8	2			
6B			1	5	12	13	10			
6A		1		5	12	5	4			
Total		4	15	36	73	106	98	32	2	
Total number of I. Q.'s										366

* Fall term.

^a Spring term. The fifty-five spring term 2A's included here for comparison with achievement were given the mental test as 2B's in the fall term. They are not included in this total.

The three hundred eleven average, and above, pupils shown in Table III, which is given below, are 85 per cent of the number tested. Thirteen and nine-tenths per cent may be expected to require special instruction. One and one-tenth per cent should be in special schools.

The intelligence quotients of Rea School pupils as a whole are not exceptional. Forty-nine per cent of the school had intelligence scores considered normal or average. Since group tests are "area" tests, a part of the 34 per cent above average belong no doubt in the average group. The 10 per cent of dull pupils would be found in any school of similar size. The children with intelligence quotients below 80 create a real problem in any class.

TABLE III

INTELLIGENCE QUOTIENTS OF ALL PUPILS OF THE SCHOOL
TO SHOW RELATIVE DEGREES OF ABILITY*

Intelligence Quotients	Number of Pupils	Per Cent
Genius or Near Genius Above 140	0	0
Very Superior Intelligence 120-140	34	9
Superior Intelligence 110-120	98	27
Normal or Average 90-110	179	49
Dullness 80-90	36	10
Boderline Deficiency 70-80	15	4
Definitely Feeble-minded Below 70	4	1
Total	366	100

* William A. McCall, How to Measure in Education. (New York: The McMillan Company, 1922), p. 79.

The histogram of the distribution of I. Q. scores follows the general shape of a true histogram indicating that the distribution of I. Q. scores conforms in general with the distribution of I. Q. scores of any average group of American school children. The twelve cases with I. Q. scores of 78 and below constitute 3.1 per cent of the group. Forty-seven children, 12.2 per cent, made I. Q. scores between 78 and 90. In the group with average I. Q. scores there are 236 pupils, 61.1 per cent of the school. Ninety-one pupils, 23.6 per cent of the school, have I. Q. scores above 114. These are not unusual scores. Figure 1, page 20, shows this distribution.

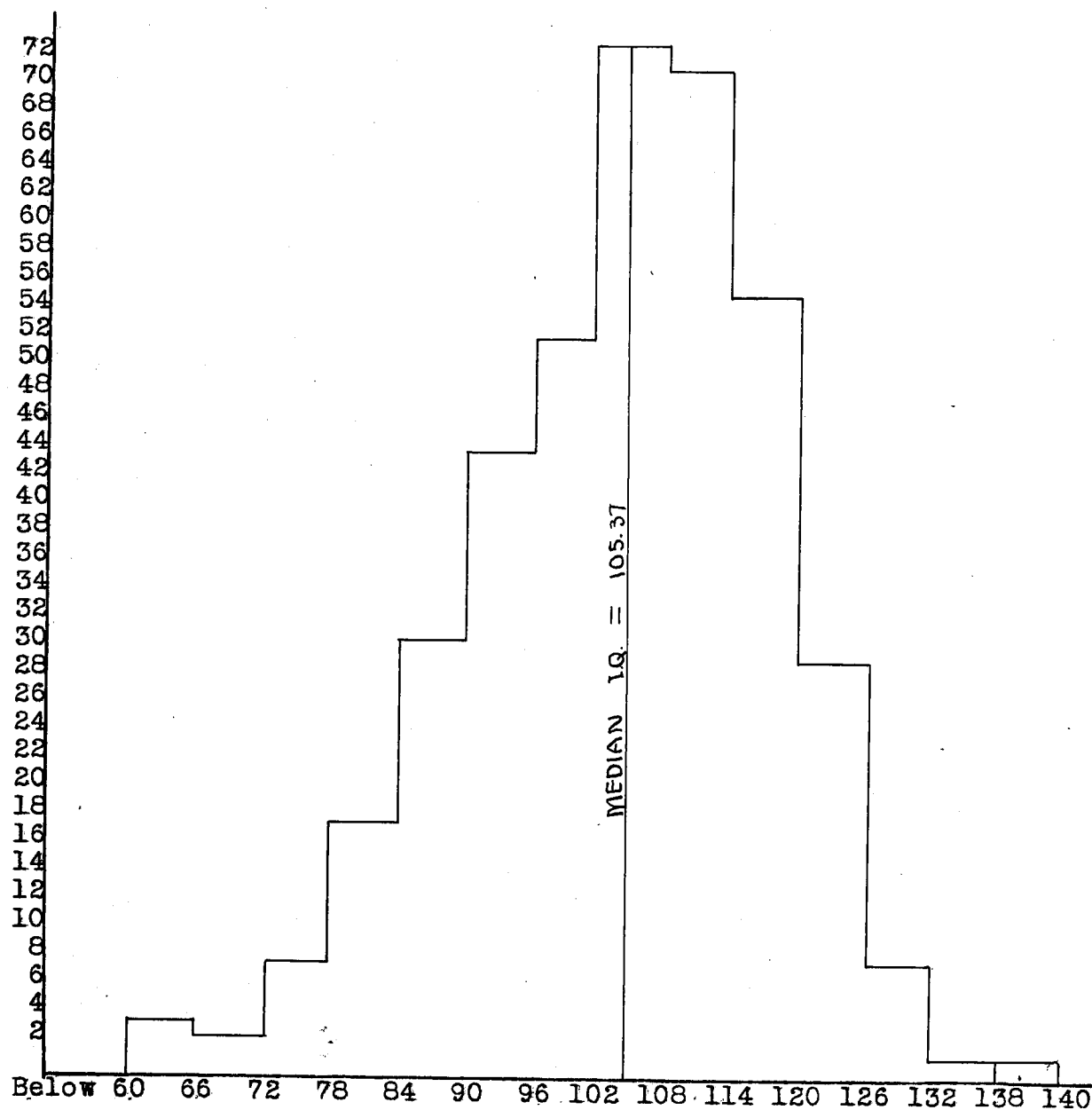


FIGURE 1
HISTOGRAM REPRESENTING DISTRIBUTION
OF I. Q.'S OF THE PUPILS
OF REA SCHOOL
TERRE HAUTE,
INDIANA

In Figure 2, page 22, the medians of the M. A.'s are above the norm in 2A, slightly above in 3B and 3A. Beyond 3A the M. A.'s drop below the norm, through 6A. The M. A. medians of 5A and 6A are the same. The C. A. is always below the norm except in 2A and 4A. In 4B, 6B, and 6A the C. A.'s are very close to the norms of the respective classes next below. The slow pupils in these classes who have not reached the chronological age allowed to them in the opinion of the educators who established these norms would have a moral right to progress more slowly.

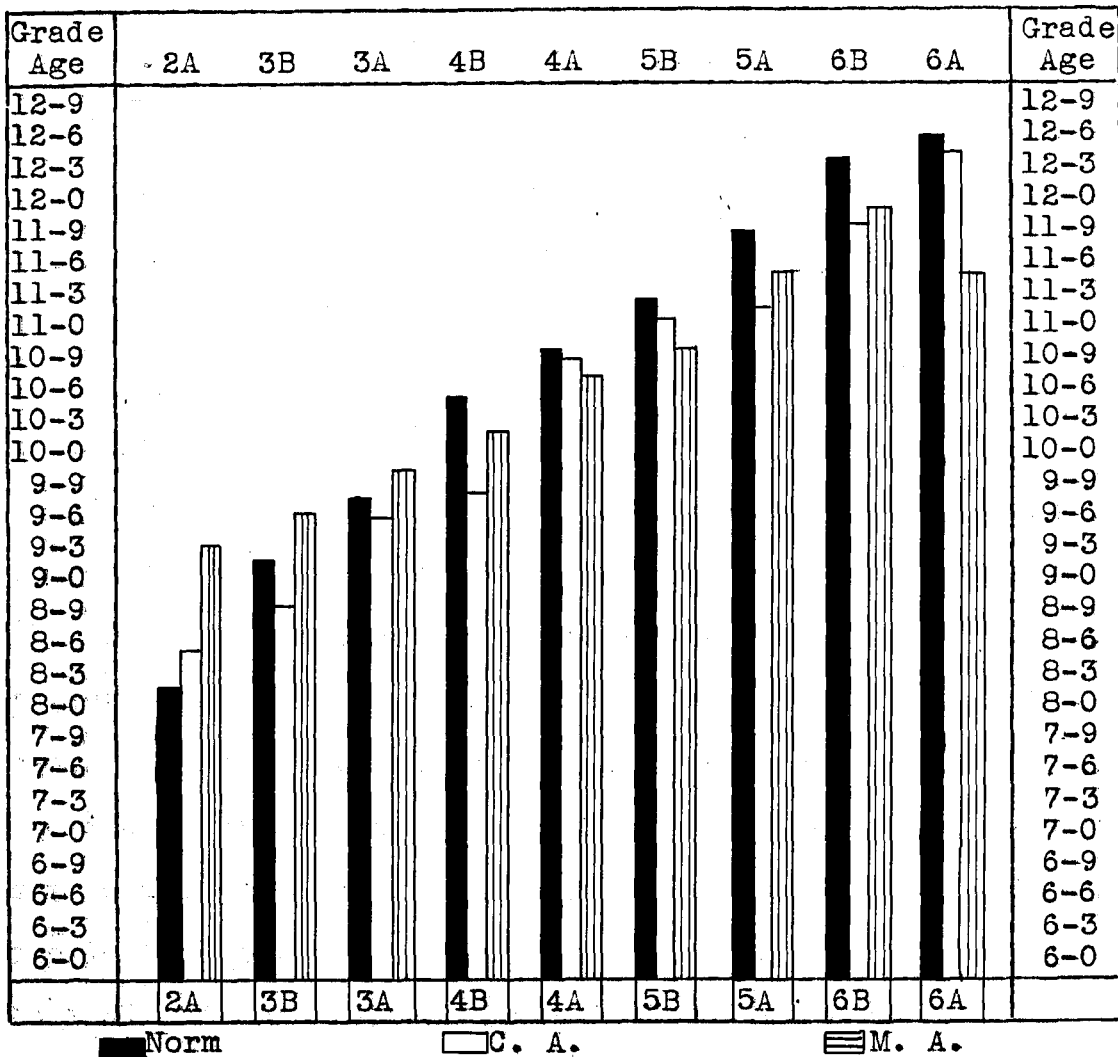


FIGURE 2

A COMPARISON OF THE MEDIANS OF THE MENTAL
AND CHRONOLOGICAL AGES, BY CLASSES,
WITH THE STANDARD NORMS

In Figure 3, page 24, the median scores of each class in C. A. and M. A. are shown in relation to the norm in terms of months above and below the norm.

It should be recalled that the "area" test of intelligence produces relatively high mental scores which is especially true for retarded children. The M. A.'s in 2A and 3B appear very high but fall low from 5B through 6A.

Since the median score for each class has been used, the C. A. line shows that there are some children in 3B who are entitled to four more months in which to increase their achievement scores, some in 4B are entitled to nine months, and some in 5A and 6B are entitled to seven months more time in the elementary school. The median of the mental ages of the 6A class is so far below the median of the chronological ages because there were some older children who had low I. Q. scores though only one I. Q. score in 6A, Table II, page 17, was low enough to indicate that slower progress would not have benefited the pupil.

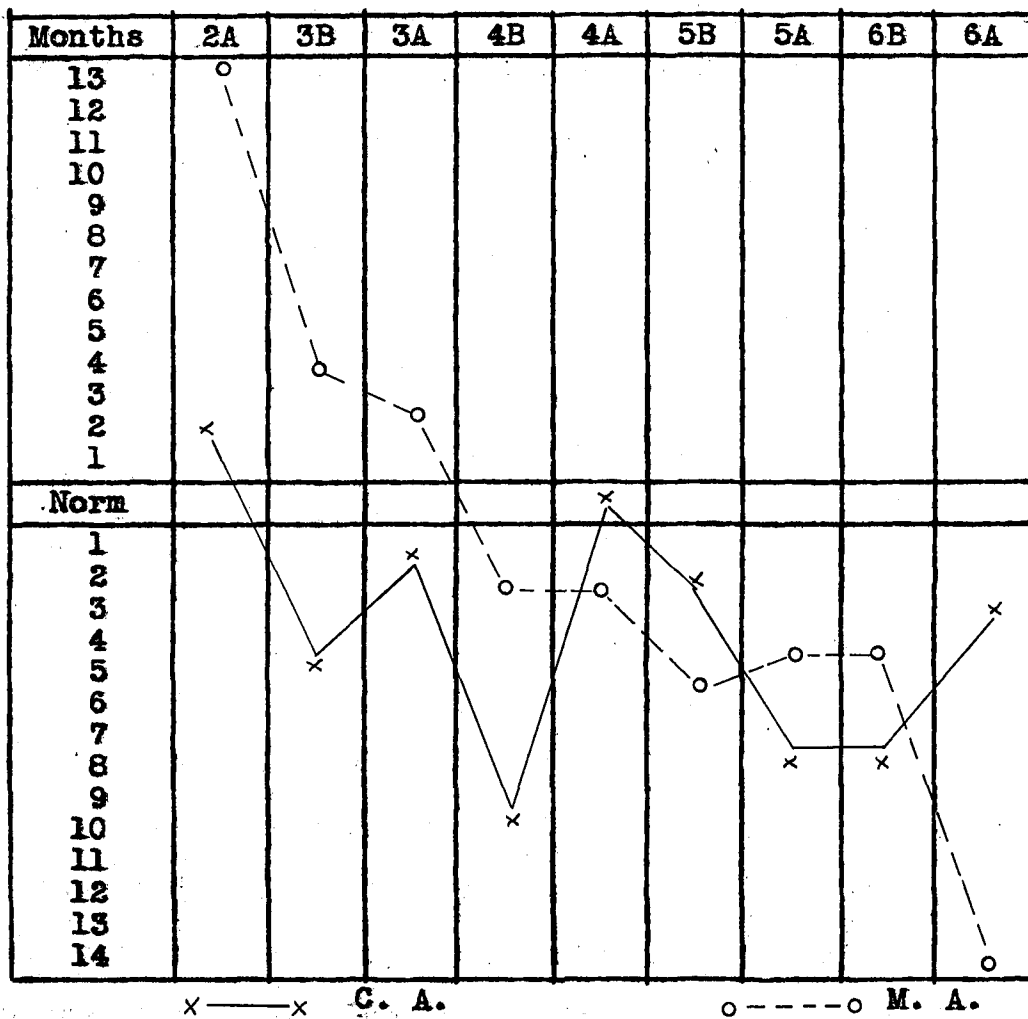


FIGURE 3

RELATION OF C. A. AND M. A. OF EACH CLASS
TO THE NORMS EXPRESSED IN MONTHS

A general survey of medians in Table IV, page 26, shows the primary grades always closer to the normal medians. There is a noticeable lag in mental age in the fifth and sixth grades. Baker¹ states that dull children show higher maturity in the lower grades but do not progress on the usual levels. They reach their mental maturity earlier than normal and superior children.

A reasonable comparison exists between M. A. and its norm until 6B. The drop begun at that point becomes too great in 6A.

Since grade age is based on total achievement, the same relations exist between each of these scores and the norm.

The I. Q.'s and percentiles are satisfactory up to 6A.

The achievement of 3A should have come nearer to the norm because this was the oldest class using the primary achievement test. On the same basis an excuse might be offered for 4B as it is the youngest class using the advanced test. The average difference between the medians of the total achievements of the nine classes and their respective class medians is 6.1 per cent.

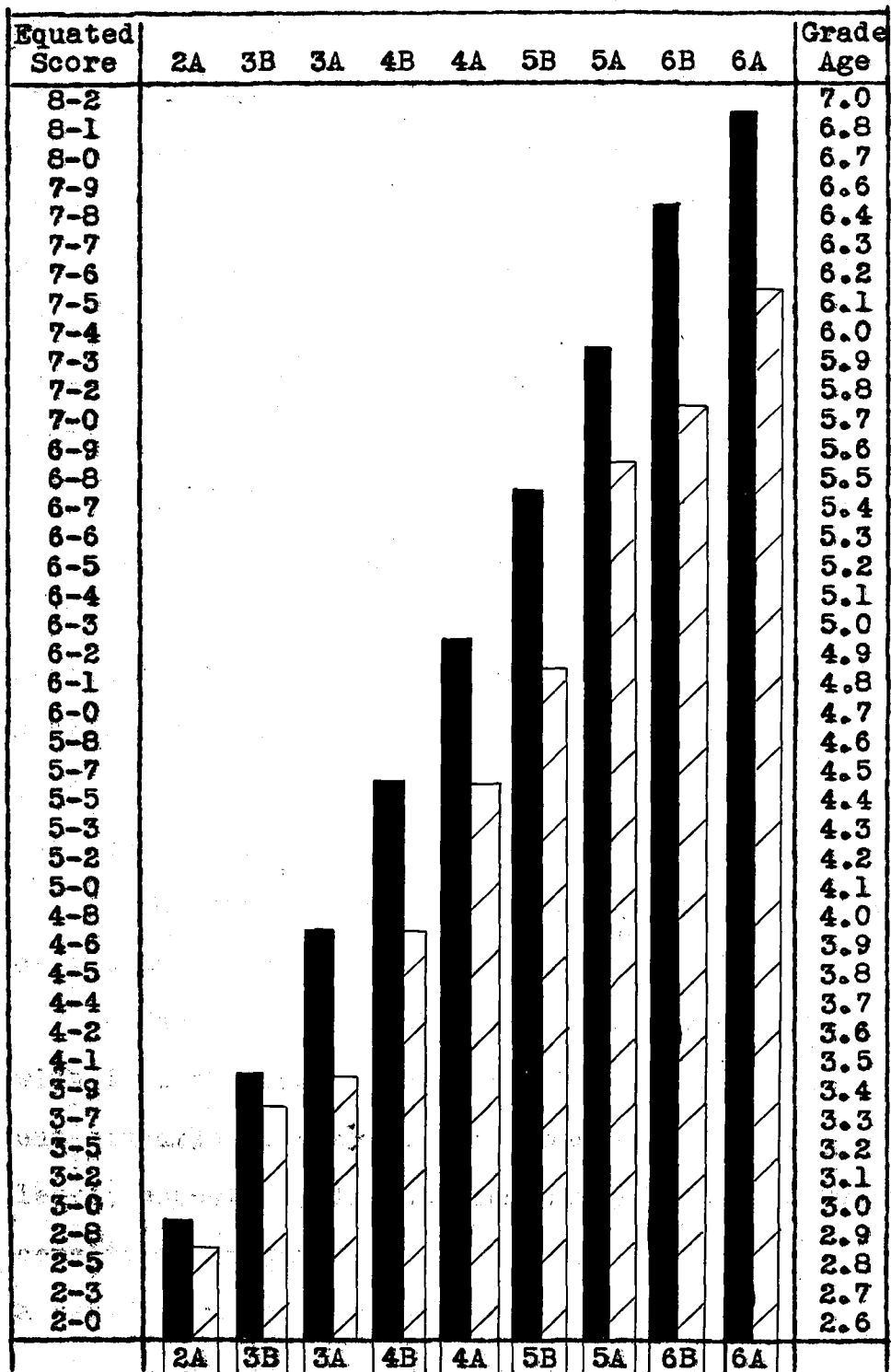
¹
Harry J. Baker, Review of Educational Research, Vol. V, Number 3, June, 1935, p. 191.


TABLE IV
GENERAL RESULTS OF TESTING PROGRAM
IN TERMS OF MEDIANS

Medians	Otis Primary								Otis Advanced			
	1B	1A	2B	2A	3B	3A	4B	4A	5B	5A	6A	6A
M. A.		8- 2	8-11	9-4	9- 6	9-10	10-3	10- 8	10-10	11-5	11-11	11-5
Norm				8-3	9- 2	9- 8	10-5	10-10	11- 3	11-9	12- 3	12-7
C. A.	6-5	7-11	8- 1	8-5	8-10	9- 7	9-8	10-10	11- 1	11-2	11- 8	12-4
I. Q.		111.9	111	111	109	100	106	103	101	101	102	96
Percentile Based on I.Q.	47*	83	82	82	77.5	50	69	60	53	53	57	37
	Stanford Primary						Stanford Advanced					
Total Achievement	71*			25	37	39	46	55	61	66	70	75
Norm				28	39	46	55	62	67	73	78	81
Grade Age				2.8	3.3	3.4	3.9	4.4	4.8	5.3	5.7	6.1
Norm				2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.8

* Metropolitan Readiness Scores

Figure 4, page 28, shows that the median of total achievement scores is below the norm in each class. In 3A, 4B, and 4A the achievement is at the level of the previous class norm. The median of the 5B's is below the norm for 4A. The 5A median is higher than the 5B norm but does not reach its own norm. The total achievement medians of the 6B's and 6A's are lower than the norms of the classes below.



Achievement in equated score and grade age. 

Norm. 

FIGURE 4

COMPARISON OF MEDIAN TOTAL ACHIEVEMENT SCORES
AND MEDIAN GRADE AGE OF EACH CLASS
WITH THE STANFORD NORM

Figure 5, page 30, shows the range of total achievement scores in 2A to be normal. In all other classes except 4B the median of the total achievement drops too far below the norm. A line across the lower ends of the achievement ranges would show that some children who are being taken along by each class are not making any progress in achievement. A line drawn across the upper ends of the same range would show an even "step up" in achievement through 4A and an acceleration from 5B through 6A.

The M. A. range in 2A and 3B extends high. This has been explained before by the fact that the intelligence tests measured "area" or general experience. In 3B, 3A, and 4A the achievement line should have started nearer the end of the M. A. line. In 5B, 5A, and 6B the upper end of the M. A. line should have been more nearly reached by the upward achievement range.

The range intervals are not weighted and the presence of one low or one high score pulls the line to the level shown.

These lines do show the range of abilities to be dealt with in each class. This is a general situation under the present educational system. St. John says, "there is found at any level, especially in the elementary school, a very great heterogeneity of brightness; . . . there is found also, at any level, a very great heterogeneity of mental ages".²

²
Charles W. St. John, Educational Achievement in Relation to Intelligence. (Cambridge, Mass.: Harvard University Press, 1930), p. 59.

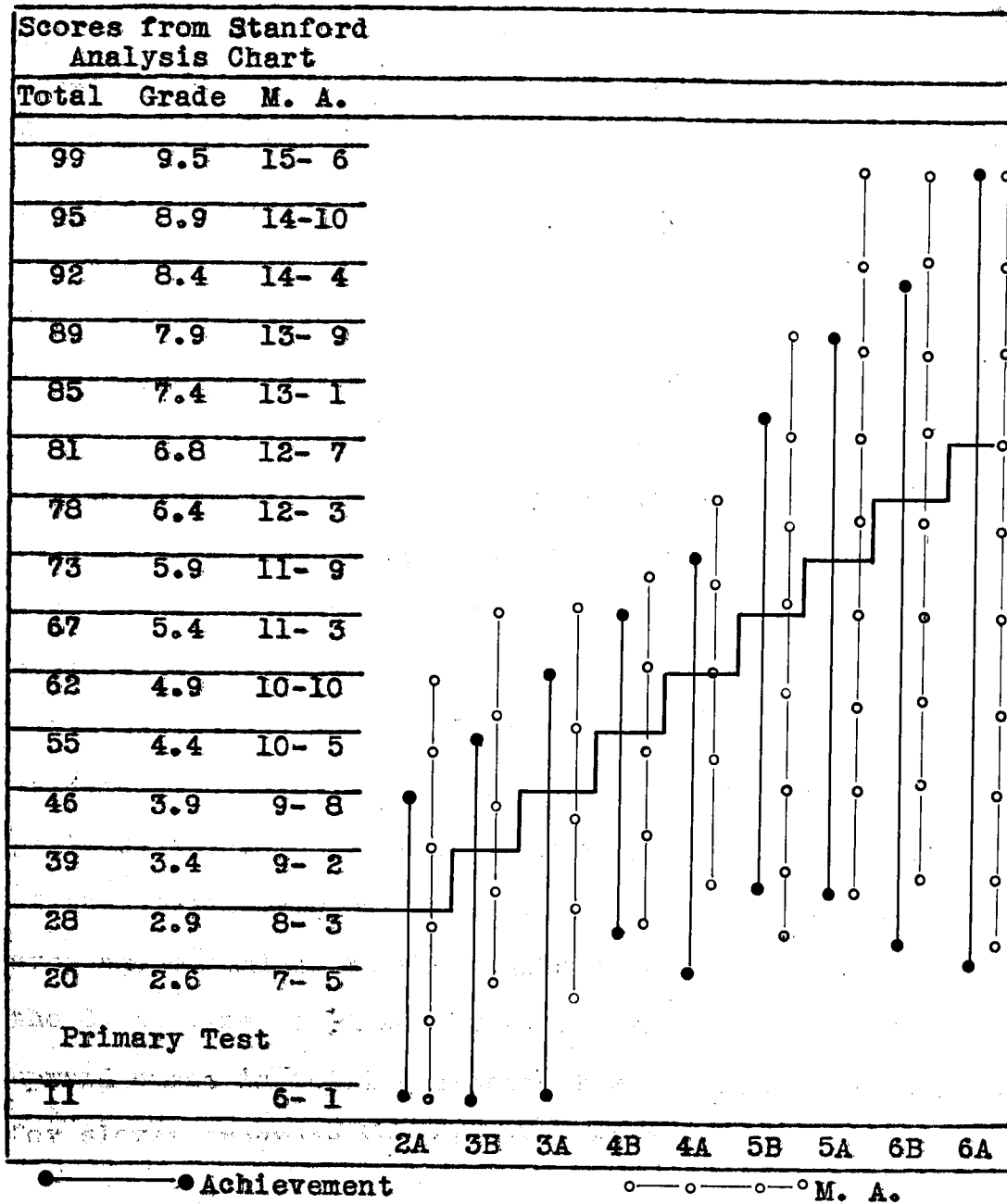


FIGURE 5

RANGES IN MENTAL AGES AND IN TOTAL ACHIEVEMENT SCORES
OF THE GRADES TESTED

Since total achievement must be given the most important place in any general consideration of pupil performance, it has been related to as many different items as possible. Table V, page 32, makes a comparison between the per cent of pupils scoring within the grade and above the grade in total achievement and the same measure of per cents in M. A.'s and C. A.'s. The same comparison is made with the per cents of I. Q.'s at or above 90. The same scores are expressed in Figure 6, page 33.

In Figure 6 the very noticeable fall in C. A. in the 3B class with C. A. continuing far below M. A. through 3A and 4B gives graphic proof that some of the members of these classes should be allowed to progress more slowly. The educational experience of many of the children of this school ends when they reach the legal age for withdrawing. This is sure to happen in the cases of children who are not capable of doing the regular work of junior high school. Many of them could progress more slowly and still not be considered over age according to the standard norm of M. A. Comparing the C. A. line of 4A and 5B with their M. A. line and their upward curve in total achievement strengthens the argument for slower progress for slower minded pupils.

TABLE V

PER CENTS OF PUPILS IN EACH CLASS AT AND ABOVE GRADE
IN MENTAL SCORES AND TOTAL ACHIEVEMENT

Items	2A	3B	3A	4B	4A	5B	5A	6B	6A
Per Cent of I. Q.'s At and Above 90	93.2	81.8	76.1	87.1	80.6	77.7	89.4	85.3	77.7
Per Cent of M. A.'s At and Above Grade (Within One-Half Year)	98.7	91.0	85.7	67.7	54.8	50.0	52.6	53.6	37.0
Per Cent of C. A.'s At and Above Grade (Within One-Half Year)	98.7	63.7	66.7	49.2	58.1	55.6	36.9	48.8	59.2
Per Cent of Total Achievement Scores At and Above Grade (Within One-Half Year)	70.2	66.6	47.6	42.0	45.2	47.3	47.4	42.1	29.0

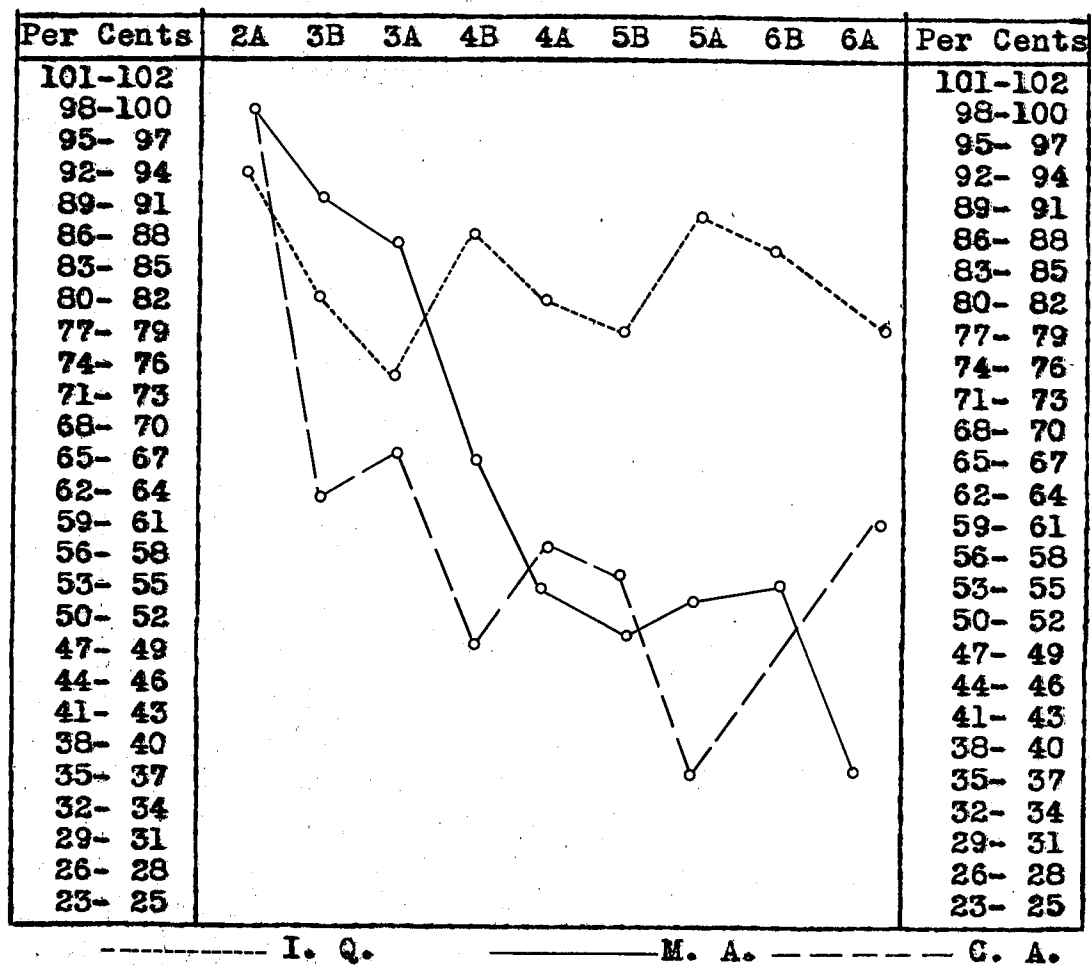


FIGURE 6

PER CENT OF PUPILS IN EACH CLASS SCORING
 AT AND ABOVE GRADE IN I. Q.,
 M. A., AND C. A.

A comparison of the M. A. and total achievement in Figure 7, page 35, shows that the 6B and 6A classes are doing as well as they could be expected to do unless some remedial program is found to fit their particular needs.

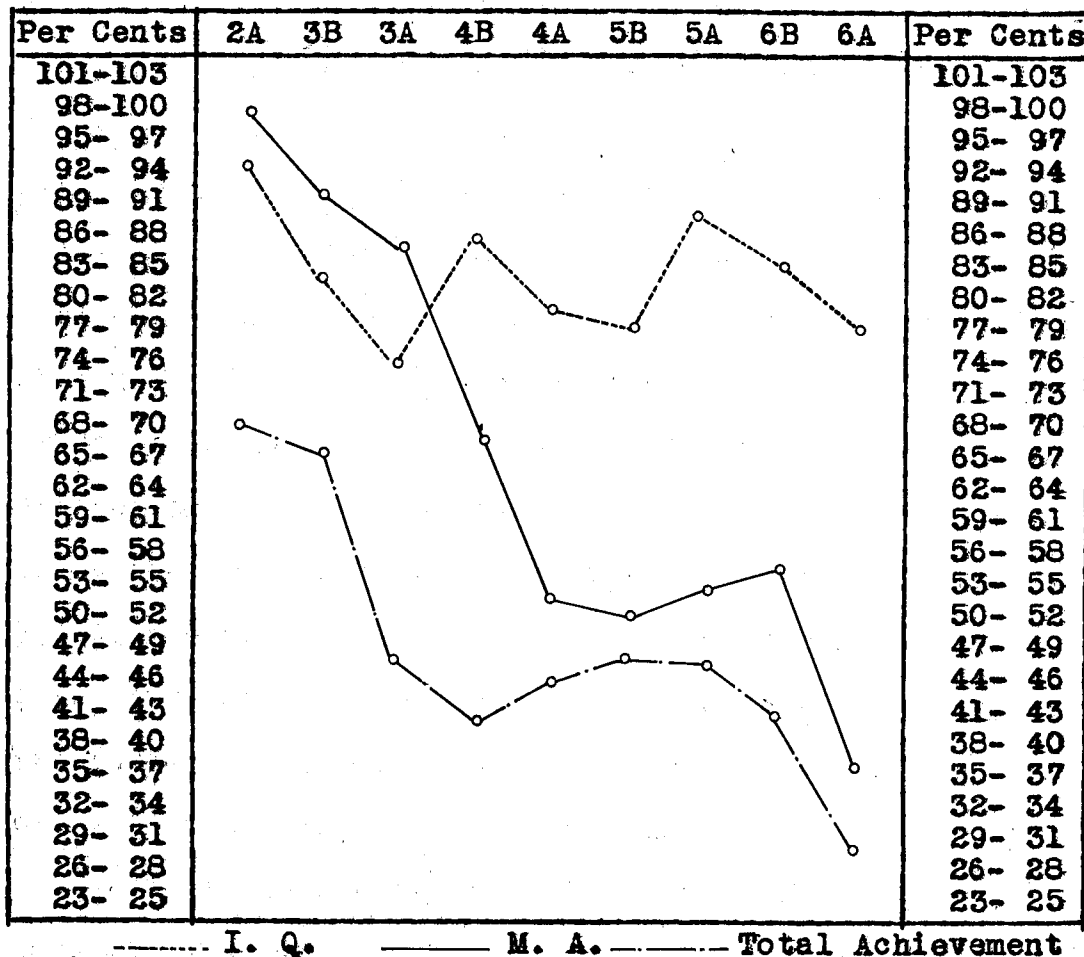


FIGURE 7

PER CENT OF PUPILS IN EACH CLASS SCORING
AT AND ABOVE GRADE IN I. Q., M. A.,
TOTAL ACHIEVEMENT

To secure Table VI, page 38, the total scores of each class were distributed according to the Stanford grade scale. This table shows the number of children in each class who were at the time of the study in the upper and lower halves of the grade as established by the Stanford norm. The largest number of pupils were in the right grade in 2A. It should be remembered that the 2A class was the largest class tested and the scores should more nearly distribute on a normal curve. The number of pupils within the grade exceeds the number below the grade in 2A and 3B but throughout the remainder of the classes the reverse is true with three times as many scores below the grade as there are within the grade in 6A. Five B, 5A, and 6B contained the largest number of pupils above grade but again in this case 6A was low. In most classes the number of scores in the half year next below are very close to the number within the grade.

To translate these numbers into per cents Figure 8, page 39, was made.

Figure 8 shows the per cents of children at grade, within one-half year, above grade, and below grade.

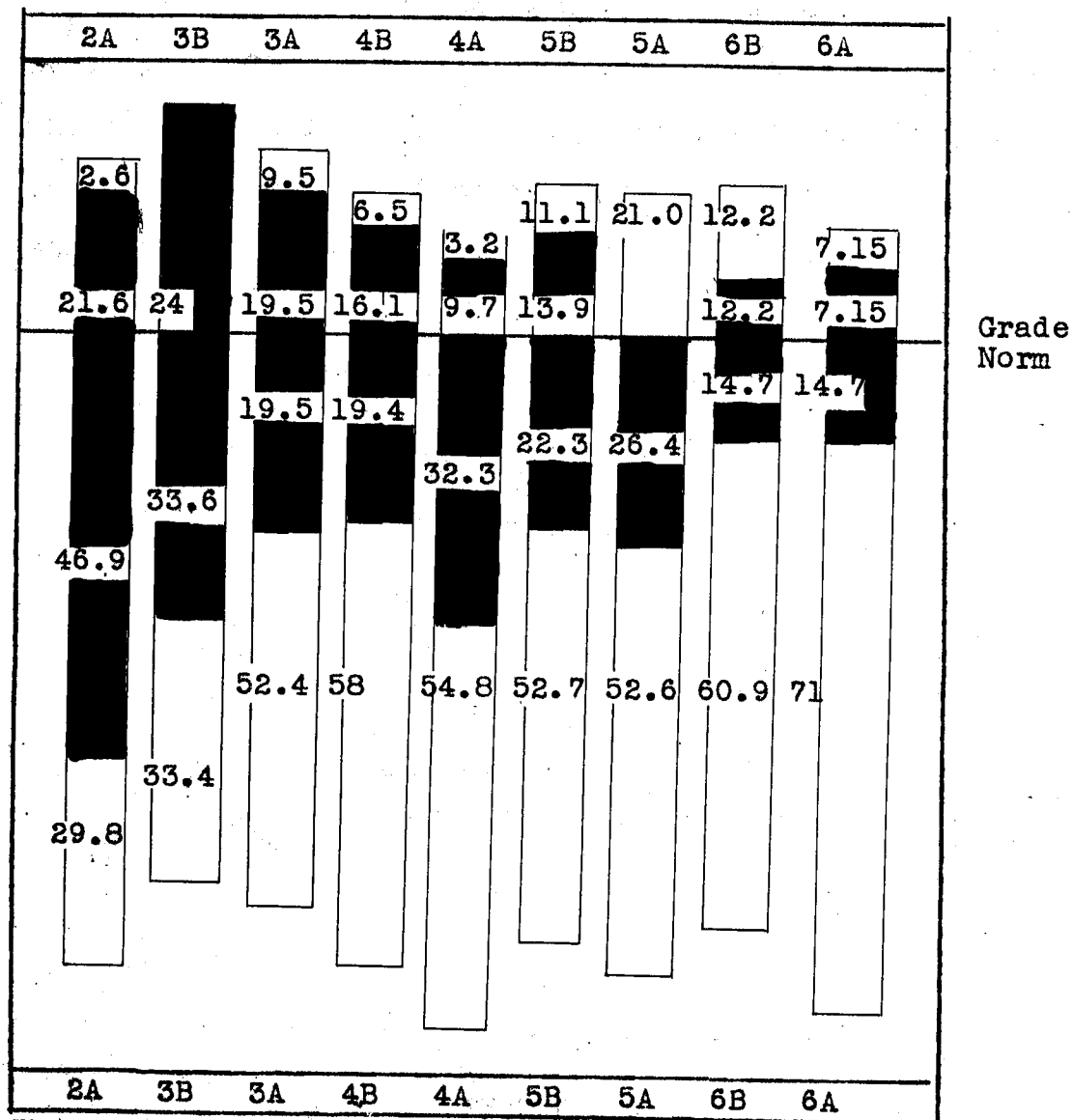
The per cents of children at grade by classes make a downward curve. The per cents are approximately: 2A, 68; 3B, 57; 3A, 39; 4B, 35; 4A, 32; 5B, 36; 5A, 26; 6B, 27; 6A, 22. In the same manner the per cents below grade make

an upward curve. In the 5A class there were no pupils whose scores were in the upper half of the grade but 21 per cent of the class scored above the grade. This was the smallest class tested and the scores could be expected not to follow the normal curve.

TABLE VI

THE GRADE PLACEMENT OF THE PUPILS IN EACH CLASS
ACCORDING TO TOTAL ACHIEVEMENT

Grade Scale	2A	3B	3A	4B	4A	5B	5A	6B	6A	Total
9.0 - 9.5									1	1
8.5 - 8.9								1		1
8.0 - 8.4								1	1	2
7.5 - 7.9							1	2		3
7.0 - 7.4						1		1	2	4
6.5 - 6.9							3	5	4	12
6.0 - 6.4						3	0	6	6	15
5.5 - 5.9				1	1	5	5	10	5	27
5.0 - 5.4				1	3	8	3	4	5	24
4.5 - 4.9			2	5	10	4	3	4	2	30
4.0 - 4.4		3	4	6	10	12	2	4		41
3.5 - 3.9	2	8	4	10	5	1	1	2		33
3.0 - 3.4	15	11	8	8	1	2	1			46
2.5 - 2.9	35	9	2		1			1	1	49
0.0 - 2.4	22	2	1							25
Total	74	33	21	31	31	36	19	41	27	313



The shaded area represents at grade within one-half year.

FIGURE 8

PER CENTS AT GRADE IN UPPER HALF YEAR
AND LOWER HALF YEAR, AND PER CENTS
ABOVE AND BELOW GRADE
BY CLASSES

This graph is read as follows: the term "upper half year" means the scores above the norm for that grade.

In Figure 9, which is given below, the per cent above grade in the entire school need not be much larger. The per cent below grade is unquestionably too large. If the per cents of children at grade could be exchanged with those below grade, the picture would be more satisfactory.

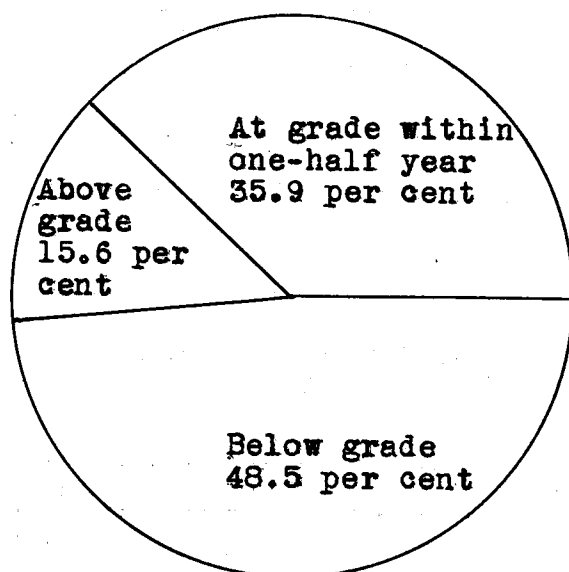


FIGURE 9

PER CENT OF PUPILS ABOVE, BELOW, AND AT GRADE
WITHIN ONE-HALF YEAR, STANFORD ACHIEVEMENT
TEST

II. FINDINGS IN SEPARATE CLASSES

Results in the classes tested for intelligence only.

Sixty-nine cases in 1B were tested with a median total score of seventy-one. The per cent of attainment shown in Table VII, which is given below, and in all other tables and figures for 1B, 1A, and 2B was obtained by dividing the median of the test, or sub-test, by the possibility in the item. Securing a per cent of attainment as explained above in order to state results in these classes in like terms was one means used to compare 1B's, 1A's, and 2B's.

TABLE VII

DISTRIBUTION OF TOTALS FOR METROPOLITAN READINESS TEST 1B

Total Scores	Number of Cases
98 - 105	5
90 - 97	4
82 - 89	10
74 - 81	8
66 - 73	15
58 - 65	9
50 - 57	3
42 - 49	3
34 - 41	6
26 - 33	3
18 - 25	1
10 - 17	1
2 - 9	1
Total	69

Median 71
Possibility 124 = 57 per cent attainment

The median chronological age of 6-5 shown in Table VIII, which is given below, is logical when children entering the first grade are six years old or to be six within a period of about eight weeks. Many of these children seemed very young in ability to follow instructions and in sustained attention.

TABLE VIII
DISTRIBUTIONS OF C. A.'S OF PUPILS IN 1B

Ages	Number of Cases
9-6 to 9-11	2
9-0 to 9- 5	0
8-6 to 8-11	1
8-0 to 8- 5	1
7-6 to 7-11	6
7-0 to 7- 5	5
6-6 to 6-11	18
6-0 to 6- 5	32
5-6 to 5-11	4
Total	69
Median 6-5	

The indications of the sub-tests are quoted from the Manual of Directions for the Readiness Tests. Sub-test 5 was placed last because there is no number knowledge test to be used in comparison with the Otis Test used in 1A and 2B. The results in these three first primary classes were used chiefly to show that none of the classes tested in the three first primary grades

were exceptional.

Table IX, page 44, presents the findings of the tests given in the three first primary classes with the median scores, possible scores, and a per cent of attainment, as further evidence that these are average classes.

TABLE IX
TRANSLATION OF MEDIAN SCORES MADE BY 1B INTO PER CENTS
FOR COMPARISON WITH 1A AND 2B

	Metropolitan Reading Readiness	Medians	Possible Scores on This Test	Per Cent of Achievement by <u>Median</u> <u>Possibility</u>
I. Q.				
PR.		47		
M. A.		6-5		
C. A.				
Norm				
Total		71	124	57
	Test Number			
Readiness to learn	1	11.6	23	50
Mental maturity based on experience	2	5.8	11	52
Language comprehension	3	12	19	63
Sustained attention	4	13	15	86
General knowledge	6	12.3	16	77
Number knowledge	5	18	40	45

The following statements of the "readiness" of the 1B group are based upon directions for interpretation in the Manual of Directions. The total scores only were considered.

1. Twenty-two pupils, 31.9 per cent of the class, aged six years and above made total scores below sixty points and are not ready to proceed with the formal curriculum of the first grade.

2. One pupil, 1.4 per cent, between six years and six years, six months scored above ninety-five points and would be almost certain to succeed in first grade work. The others scoring above were older.

3. Eleven children, 16 per cent, over six years scored below forty points and are almost sure to need special class training. They should not attempt reading or numbers until they are more mature.

4. This leaves thirty-five children, 50.7 per cent, who would be considered of average readiness and reasonably sure to complete 1B work in one semester.

The high scores made in general knowledge and sustained attention are no doubt due to the fact that fifteen of the children were seven years and over. The responses of older children being due to more experience.

A general comparison of the intelligence of the three classes is shown in Table X, page 47. The scores

from the Readiness Test have been used for comparison with intelligence and with achievement. The right to do this was assumed from statements of achievement correlations and intelligence correlations made by the editor of the Manual of Directions.³

Table X shows 95 per cent of the pupils to be of average intelligence. The per cents below average and above average are small.

³ Jacob S. Orleans, Metropolitan Readiness Tests-Manual of Directions. (New York: World Book Company, 1933), p. 18.

TABLE X
COMPARISON OF THE I. Q.'S OF 1A AND 2B

	Number of Cases	Number Between 76 and 124	Per Cent Between 76 and 124	Number Above 124	Per Cent Above 124	Number Below 76	Per Cent Below 76
1A	42	40	95.2	1	2.4	1	2.4
2B	66	63	95.5	1	1.5	2	3.0
Total	108	103	95.4	2	1.8	3	2.8
	Number of Cases	Number Con- sidered Average	Per Cent Con- sidered Average	Number Above Average	Per Cent Above Average	Number Not Ready	Per Cent Not Ready
1B	69	35	50.7	1	1.4	33	47.9

In Table XI, which is given below, the medians obtained from the I. Q.'s, totals, and percentiles are placed together for comparison. The 1A and 2B classes made similar scores.

TABLE XI

COMPARISON OF MEDIANS OF I. Q.'S, TOTAL
ACHIEVEMENTS, AND PERCENTILES

	Metropolitan	Otis Intelligence Scale	
	1B	1A	2B
I. Q.'s		111	119
Totals	71	38.4	47.3
Percentiles	47	82.3	83.1

To make Table XII, page 50, the eight sub-tests of the Otis Intelligence Scale--Primary--were classified under the same titles as the sub-tests of the Metropolitan Readiness Tests.

Again the 1A and 2B scores are very much alike. From a comparison of Table XI, page 48, and Table XII, page 50, Table XIII, page 51, was made.

TABLE XII

TRANSLATION OF MEDIAN SCORES MADE BY 1A AND 2B INTO PER CENTS
FOR COMPARISON WITH 1B

	Otis Intel- ligence Test 1A and 2B	Medians of 1A's	Possible Score	Per Cent of Achievement Based on Median Possibility	Medians of 2B's	Possible Score	Per Cent of Achievement Based on Median Possibility
I. Q.		111.9			111		
PR.		83.1			82.3		
M. A.		8-2			8-11		
C. A.		7-11			8-1		
Norm		26			34.6		
Total		38.4	85	45.2	47.3	85	55.6
	Test Number						
Readiness to learn	1	8.4	16	52.5 65	9.2	16	57.8 66.4
	2	9.3	12	77.5	9.0	12	75
Mental maturity based on experience	6	1.6	7	22.8	2.7	7	38.5
	5	3.5	8	43.7 32.7	3.5	8	43.7 41.1
Language comprehension	7	4.8	10	48	5.3	10	53
Sustained attention	3	5.4	12	45	6.6	12	55
	4	2.2	10	22 33.5	5.6	10	56 55
General knowledge	8	5.7	10	57	6.9	10	69
Number knowledge							

TABLE XIII

PER CENTS OBTAINED BY COMPARING CLASS MEDIAN
WITH POSSIBLE SCORE

Predictions of Tests	Classes		
	1B	1A	2B
Readiness to learn	50	65	66.4
Mental maturity based on experience	52	32.7	41.1
Language comprehension	63	48	53
Sustained attention	86	33.5	55
General knowledge	77	57	69
Total	57	45.2	55.6

The close relation between the per cents obtained by the three classes indicated a correlation between the Metropolitan Readiness scores and the Otis Intelligence scores. These three primary classes are alike in intelligence. When fifty-five of the above 2B's were tested by the Stanford Achievement test, they obtained scores related to the other classes above them. There is a uniformity of intelligence and achievement of the pupils throughout the school.

Recent findings prove that the I. Q.'s of these children will remain fairly constant.⁴ The same data show that dull children tend to reach their mental maturity earlier than normal and superior children. In defining intelligence testing, St. John says intelligence

⁴ Arthur M. Jordan, Review of Educational Research, Vol. V, June, 1935, p. 191.

tests measure what the child has learned. The assumption is that the extent to which one actually has learned through experience is proportionate to his capacity or his ability to learn.⁵ For the discrepancies which do occur in the I. Q. scores from different tests taken by the same individual, Lincoln gives these causes; "flutuations in ability, interest, attention, or whatever one may choose to call it, unstable or psychopathic personality, temporary retardation in mental growth and deficiencies in environment or training".⁶

Results in separate classes taking achievement test.

For each class there is given a table showing, the medians, with norms, in intelligence and achievement scores. Each table also contains the number and per cents of pupils at grade age, within one-half year, above grade, and below. These tables are used at this point for closer study of classes and will be used again in the discussion of per cents obtained by the entire school.

With each table will appear a profile of achievement scores for that class.

5

Charles W. St. John, Educational Achievement in Relation to Intelligence. (Cambridge, Mass.: Harvard University Press, 1930), p. 28.

6

E. A. Lincoln, "The Constancy of Intelligence Quotients--A Case Study," Journal of Educational Psychology, Vol. 13, November, 1922, pp. 484-495.

In 2A there were seventy-four pupils tested for achievement with results shown in Table XIV, page 54.

The information on C. A. and M. A. for this class is especially interesting because in no other class in the school is there such a large per cent of children at grade chronologically, 83.8 per cent, and above grade mentally with a combined per cent at and above grade of 98.7 per cent. This group attained the highest total achievement per cent and the highest score in word meaning.

Ninety-three and two-tenths per cent of the class had I. Q. scores of ninety and above. Seventy and two-tenths per cent scored a total achievement at and above the grade. The median chronological age is one month above the norm. The per cents above grade, on sub-tests, are low but the per cents at grade are satisfactory. The larger per cents below grade in paragraph meaning and arithmetic reasoning are, probably, due to the fact that this is the lowest class taking the achievement test and the reading presented a difficulty.

The profile, Figure 10, page 55, shows the median scores for all sub-tests to be at grade, within the lower half. Since there was a large number of children who were below grade in each sub-test, the profile shows especially good work on the part of the children at grade and above.

The fact that this was the largest group tested may have produced the more satisfactory results.

TABLE XIV

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 2A CLASS

Items	Norms	Median Scores of This Class	Grade *	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	111							
PR.	50	82							
M. A.	8-3	9-4	3.6	42	56.8	1	1.3	31	41.9
C. A.	8-3	8-5	3.0	11	14.9	1	1.3	62	83.8
Total achievement	28	25	2.8	2	2.6	22	29.8	50	67.6
Paragraph meaning	28	20	2.6	5	6.7	35	47.3	34	46.0
Word meaning	28	25	2.8	4	4.0	22	29.8	49	66.2
Average reading	28	20	2.6	3	4.0	28	38.0	43	58.0
Dictation	28	23	2.7	1	1.3	19	25.7	54	73.0
Arithmetic reasoning	28	20	2.6	5	6.7	31	41.9	38	51.4
Arithmetic computation	28	25	2.8	0	0.0	28	38.0	46	62.0
Arithmetic average	28	23	2.7	2	2.6	30	40.6	42	56.8

* Norm 2.9

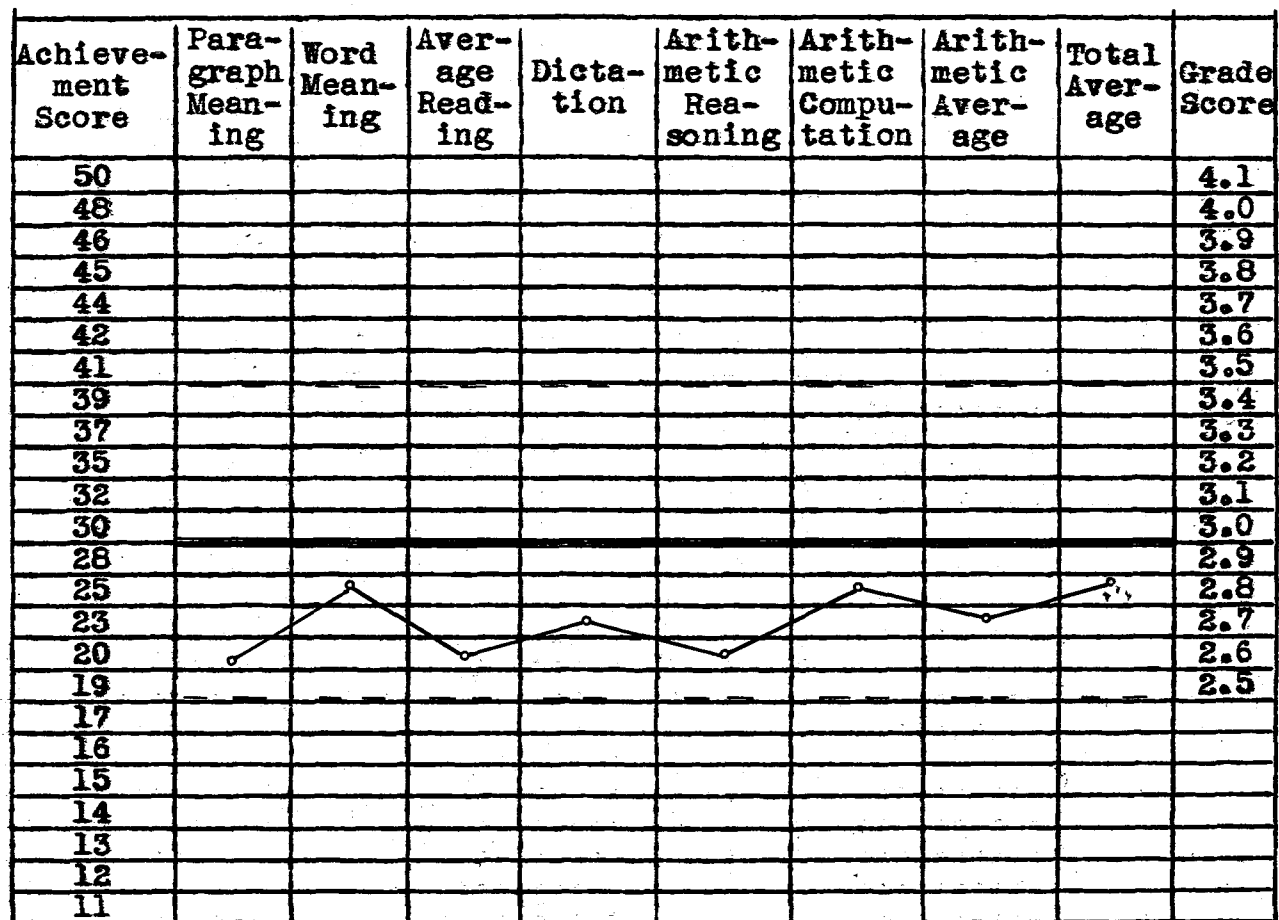


FIGURE 10

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 2A

Table XV, page 57, shows that the per cent of pupils at, and above, grade chronologically lowered noticeably. There were some high I. Q.'s that brought the per cent of M. A. next to the highest of all classes. The per cent at, and above, grade in total achievement is also second from the highest. The class ranked high in arithmetic reasoning.

Eighty-one and eight-tenths per cent of the class had I. Q.'s at, or above, ninety. Sixty-six and six-tenths per cent made a total achievement score at, or above, the grade. The median chronological age shows the class five months younger than the norm. The word meaning median is near the norm.

The profile, Figure 11, page 58, shows all sub-test medians at grade, with arithmetic reasoning in the upper half and all others in the lower half.

TABLE XV
INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 3B CLASS

Items	Norms	Median Scores of This Class	Grade Range*	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	109							
PR.	50	53							
M. A.	9-2	9-6	3.7	14	42.5	3	9.0	16	48.5
C. A.	9-2	8-10	3.2	7	21.2	12	36.3	14	42.5
Total achievement	39	35	3.2	3	9.0	11	33.4	9	57.6
Paragraph meaning	39	35	3.2	6	18.2	10	30.3	17	51.5
Word meaning	39	35	3.2	5	15.2	12	36.3	16	48.5
Average reading	39	32	3.1	5	15.2	11	33.3	17	51.5
Dictation	39	32	3.1	8	24.2	14	42.5	11	33.3
Arithmetic reasoning	39	39	3.4	12	36.3	7	21.2	14	42.5
Arithmetic computation	39	32	3.1	0	0.0	9	27.3	24	72.7
Arithmetic average	39	37	3.3	0	0.0	5	15.2	28	84.8

* Norm 3.4

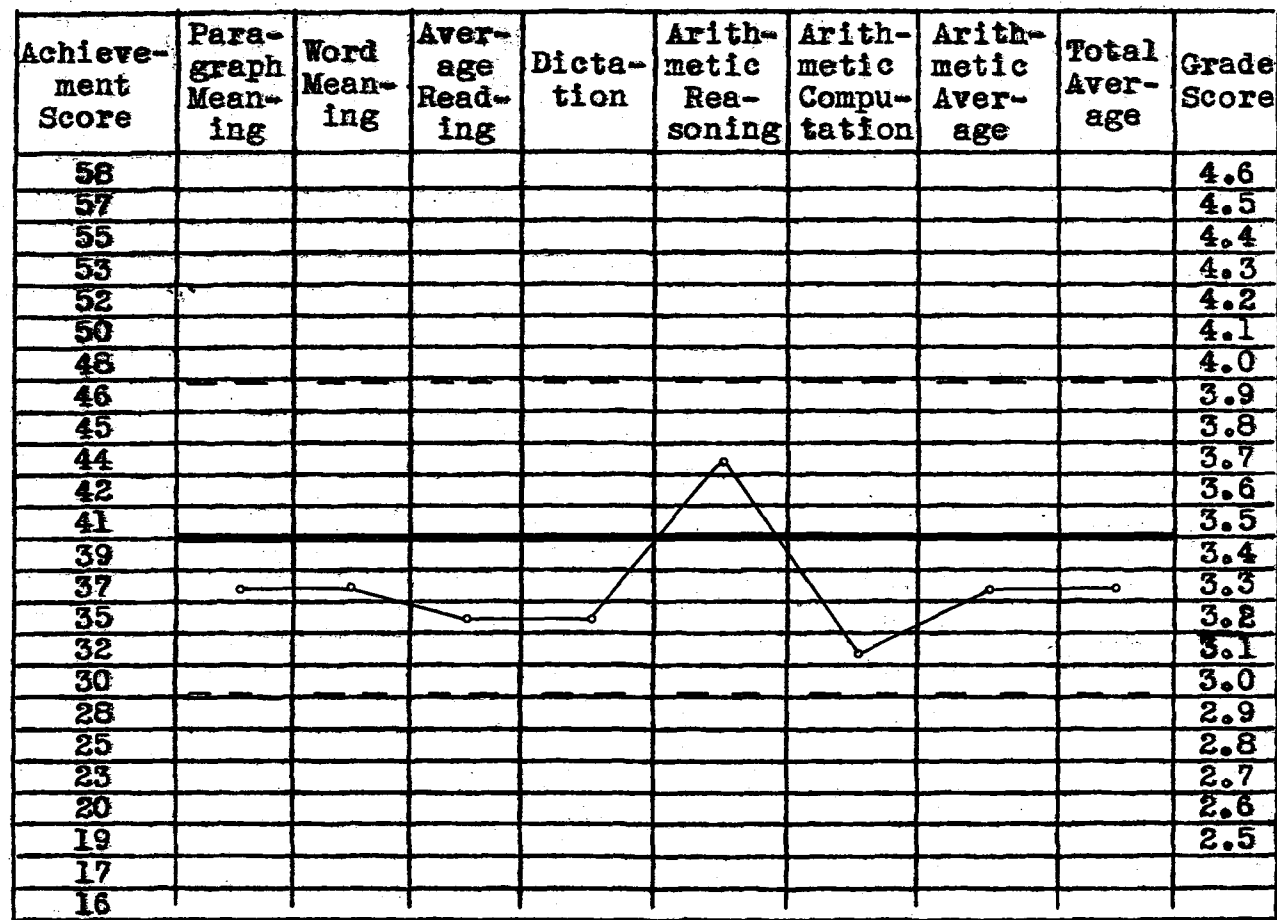


FIGURE 11

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 3B

Table XVI, page 60, shows the 3A class to have attained the best relation between M. A. and C. A. and the class norm. The median chronological age of the class is one month below norm. Seventy-six and one-tenth per cent of the class have I. Q.'s of ninety or above. Forty-seven and six-tenths per cent have total achievement scores at, or above, the grade norm.

In the profile, Figure 12, page 61, four of the eight sub-test medians fall below the grade but uniformly remain within one month of the lower line. As in 3B, the highest median score is in arithmetic reasoning, which involved reading. The three reading medians are at grade. The class shows uniform subject achievement but a much lower per cent at, and above, grade as to total achievement than the 2A's and 3B's.

TABLE XVI

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 3A CLASS

Items	Norms	Median Scores of This Class	Grade Norm*	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	101							
PR.	50	53							
M. A.	9-8	9-10	4.0	6	28.6	3	14.3	12	57.1
C. A.	9-8	9-7	3.8	7	33.3	7	33.3	7	33.4
Total achievement	46	39	3.4	2	9.5	11	52.4	8	38.1
Paragraph meaning	46	41	3.5	3	14.3	10	47.6	8	38.1
Word meaning	46	39	3.4	2	9.5	12	57.1	7	33.4
Average reading	46	39	3.4	3	14.3	12	57.1	6	28.6
Dictation	46	39	3.4	3	14.3	11	52.4	7	33.3
Arithmetic reasoning	46	44	3.7	5	23.8	10	47.6	6	28.6
Arithmetic computation	46	42	3.6	0	0.0	9	42.9	12	57.1
Arithmetic average	46	39	3.4	3	14.3	11	52.4	7	33.3

* Norm 3.9

Achievement Score	Paragraph Meaning	Word Meaning	Average Reading	Dictation	Arithmetic Reasoning	Arithmetic Computation	Arithmetic Average	Total Average	Grade Score
64									5.1
63									5.0
62									4.9
61									4.8
60									4.7
58									4.6
57									4.5
55									4.4
53									4.3
52									4.2
50									4.1
48									4.0
46									3.9
45									3.8
44									3.7
42									3.6
41									3.5
39									3.4
37									3.3
35									3.2
32									3.1
30									3.0
28									2.9
25									2.8

3A-NORM.

FIGURE 12

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 3A

In Table XVII, page 63, for the 4B class, the grade age based on achievement begins to fall below the norm and continues to do so through 6A. Eighty-seven and one-tenth per cent of the class have I. Q.'s at, or above, ninety. Only 42 per cent made total achievement scores at, and above, the grade norm. The median C. A. shows the class to be seven months younger than norm.

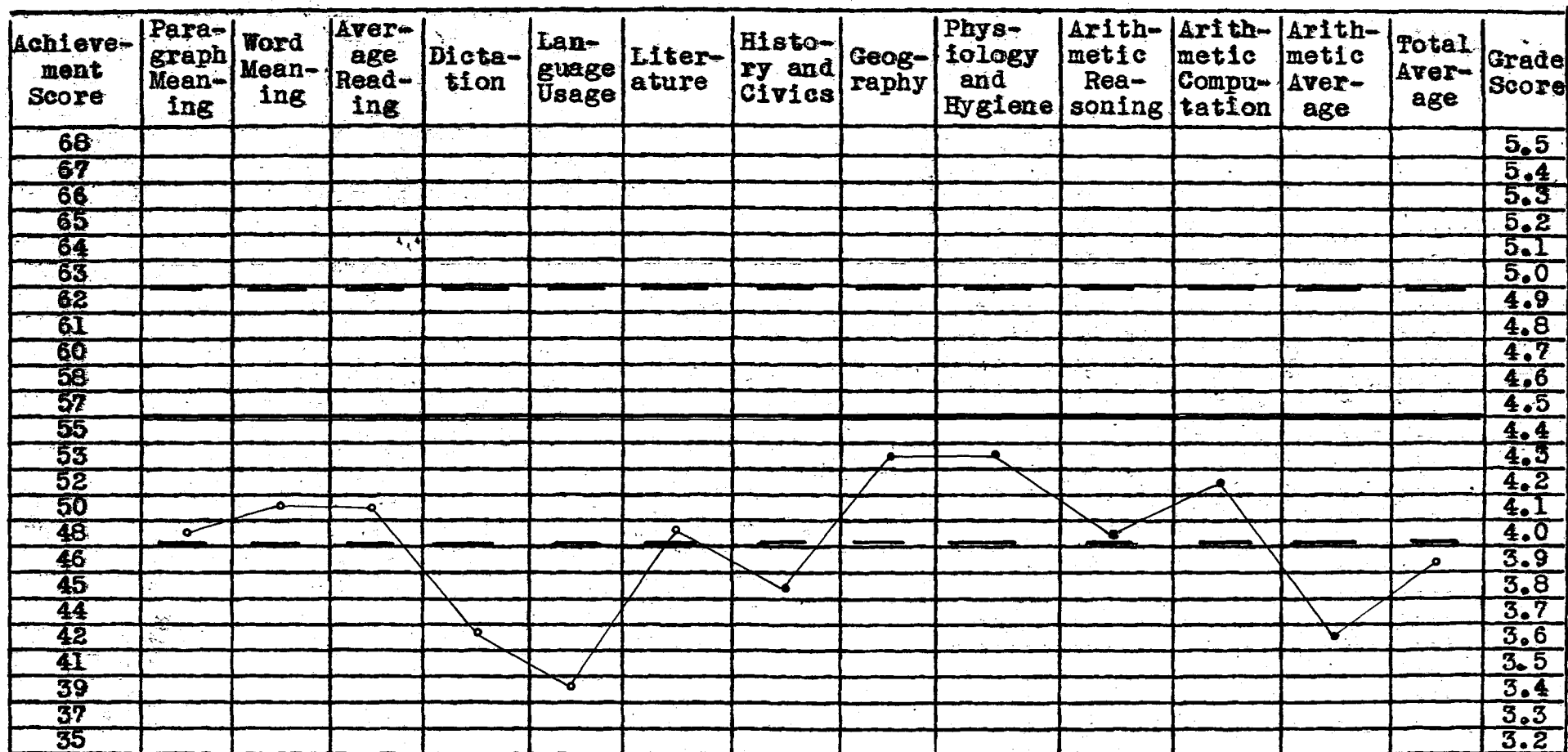
The profile, Figure 13, page 64, shows the class below grade in dictation, language usage, history-civics, and arithmetic average. The three reading scores are at grade, in the lower half. This is the first language usage score and shows only 29 per cent of the class at, and above, grade.

TABLE XVII

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 4B CLASS

Items	Norms	Median Scores of This Class	Grade *	ABOVE GRADE		BELOW GRADE		WITHIN-GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	106							
PR.	50	69							
M. A.	10-5	10-3	4.3	7	22.5	10	32.3	14	45.2
G. A.	10-5	9-8	3.9	7	22.6	17	54.8	7	26.6
Total achievement	55	46	3.9	2	6.5	18	58.0	11	35.5
Paragraph meaning	55	48	4.0	6	19.4	15	48.4	10	32.2
Word meaning	55	50	4.1	7	22.6	9	29.0	15	48.4
Average reading	55	50	4.1	7	22.6	12	38.7	12	38.7
Dictation	55	42	3.6	5	16.2	18	58.0	8	25.8
Language usage	55	39	3.1	3	9.6	22	71.0	6	19.4
Literature	55	46	3.9	4	12.9	15	48.4	12	38.7
History and civics	55	45	3.8	3	9.6	19	61.4	9	29.0
Geography	55	53	4.3	2	6.5	9	29.0	20	64.5
Physiology and hygiene	55	53	4.3	9	29.0	13	42.0	9	29.0
Arithmetic reasoning	55	48	4.0	6	19.4	15	48.4	10	32.2
Arithmetic computation	55	52	4.2	1	3.2	15	48.4	15	48.4
Arithmetic average	55	42	3.6	2	6.5	18	58.0	11	35.5

* Norm 4.4



4B-NORM

FIGURE 13

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 4B

In Table XVIII, page 66, in the 4A class, the C. A. is at norm with the M. A. dropping only slightly below. Eighty and six-tenths per cent of the class have I. Q.'s at, or above, ninety. Forty-five and two-tenths per cent have total achievement scores at, and above, the grade.

In the profile, Figure 14, page 67, the arithmetic computation, arithmetic average, the total, and grade age are near enough to the lower half to be called at grade. This leaves only language usage and literature below grade. The reading scores are well within the grade.

TABLE XVIII

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 4A CLASS

Items	Norms	Median Scores of This Class	Grade 4.0*	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	104							
PR.	50	63							
M. A.	10-10	10-8	4.6	9	29.0	14	45.2	8	25.8
C. A.	10-10	10-10	4.9	8	25.8	13	41.9	10	32.3
Total achievement	62	55	4.4	1	3.2	17	54.8	13	42.0
Paragraph meaning	62	58	4.6	4	12.9	15	48.4	12	38.7
Word meaning	62	61	4.8	5	16.1	14	45.2	12	38.7
Average reading	62	58	4.6	5	16.1	15	48.4	11	35.5
Dictation	62	57	4.5	8	25.8	15	48.4	8	25.8
Language usage	62	50	4.1	5	16.1	20	64.6	6	19.3
Literature	62	48	4.0	3	9.6	22	71.1	6	19.3
History and civics	62	57	4.5	4	12.9	16	51.6	11	35.5
Geography	62	57	4.5	4	12.9	13	42.0	14	45.1
Physiology and hygiene	62	57	4.5	8	25.8	16	51.6	7	22.6
Arithmetic reasoning	62	61	4.8	4	12.9	13	42.0	14	45.1
Arithmetic computation	62	55	4.4	0	0.0	21	67.7	10	32.3
Arithmetic average	62	55	4.4	3	9.6	17	54.8	11	35.6

* Norm 4.9

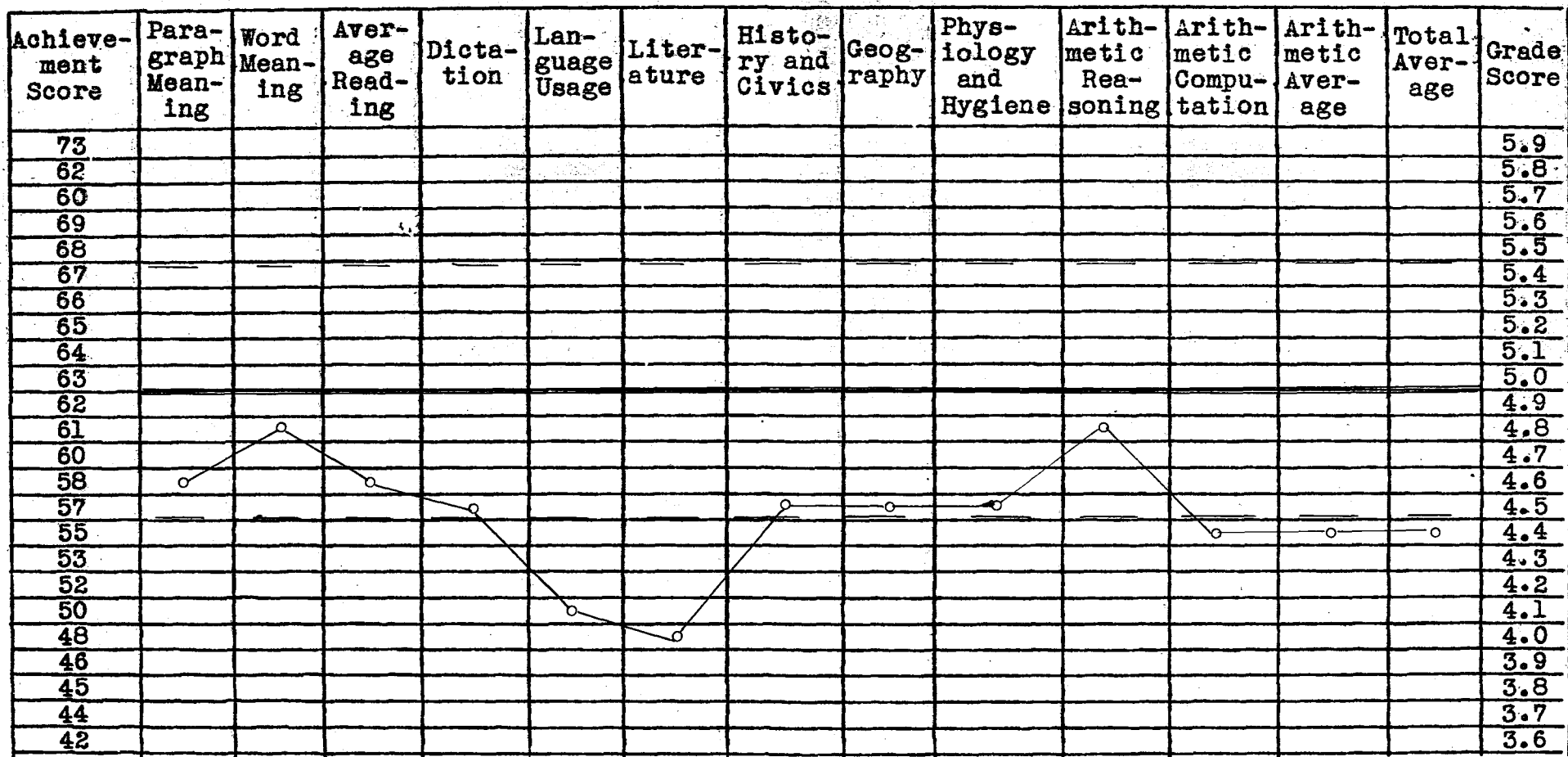


FIGURE 14

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 4A

The 5B scores recorded in Table XIX, page 69, show that the median total achievement score falls below the norm for the preceding class. The median C. A. falls four months below the norm. Only 77.7 per cent of the class have I. Q.'s at, or above, ninety. Forty-seven and three-tenths per cent of the class made median achievement totals at, and above, the grade.

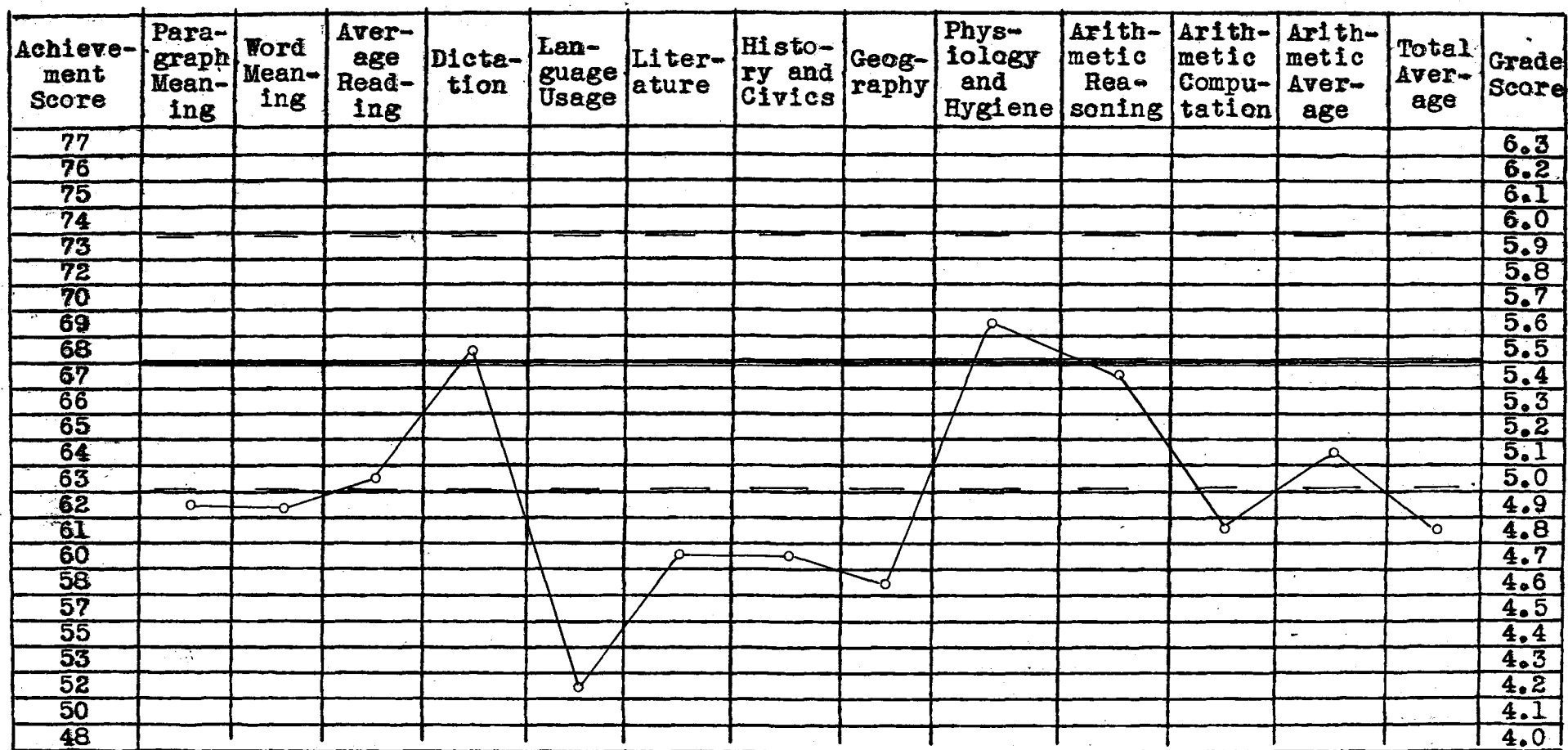
On the profile, shown in Figure 15, page 70, the arithmetic reasoning median is near enough to be called at norm. This with the score actually within grade produce a reasonable profile. No lower class has made any median scores above the norm except the 3B's, where arithmetic reasoning scored above the norm. Language usage is quite low, with the three reading scores at the lower line of the grade.

TABLE XIX

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 5B CLASS

Items	Norms	Median Scores of This Class	Grade *	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	101							
PR.	50	53							
M. A.	11-3	10-10	4.9	12	33.3	18	50.0	6	16.7
C. A.	11-3	10-1	5.0	9	25.0	16	44.4	11	30.6
Total achievement	67	61	4.8	4	11.1	19	52.7	13	36.2
Paragraph meaning	67	62	4.9	7	19.4	18	50.0	11	30.6
Word meaning	67	62	4.9	5	13.8	18	50.0	13	36.2
Average reading	67	63	5.0	6	16.7	16	44.4	14	38.9
Dictation	67	68	5.5	17	47.2	14	38.8	5	14.0
Language usage	67	52	4.2	6	16.6	23	63.9	7	19.4
Literature	67	60	4.7	7	19.4	22	61.2	7	19.4
History and civics	67	60	4.7	3	8.3	22	61.1	11	30.6
Geography	67	58	4.6	7	19.4	21	58.4	8	22.2
Physiology and hygiene	67	69	5.6	17	47.3	13	36.1	6	16.6
Arithmetic reasoning	67	68	5.5	14	38.9	13	36.1	9	25.0
Arithmetic computation	67	62	4.9	0	0.0	29	80.6	7	19.4
Arithmetic average	67	64	5.1	3	8.4	15	41.6	18	50.0

* Norm 5.4



58-NORM.

FIGURE 15

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 5B

In the 5A class, shown in Table XX, page 72, the intelligence of this group was the highest of any class except the 2A's. Eighty-nine and four-tenths per cent of the class had I. Q.'s at, or above, ninety. Forty-seven and four-tenths per cent made total achievement scores at, and above, grade. The median C. A. of the class was seven months below the norm.

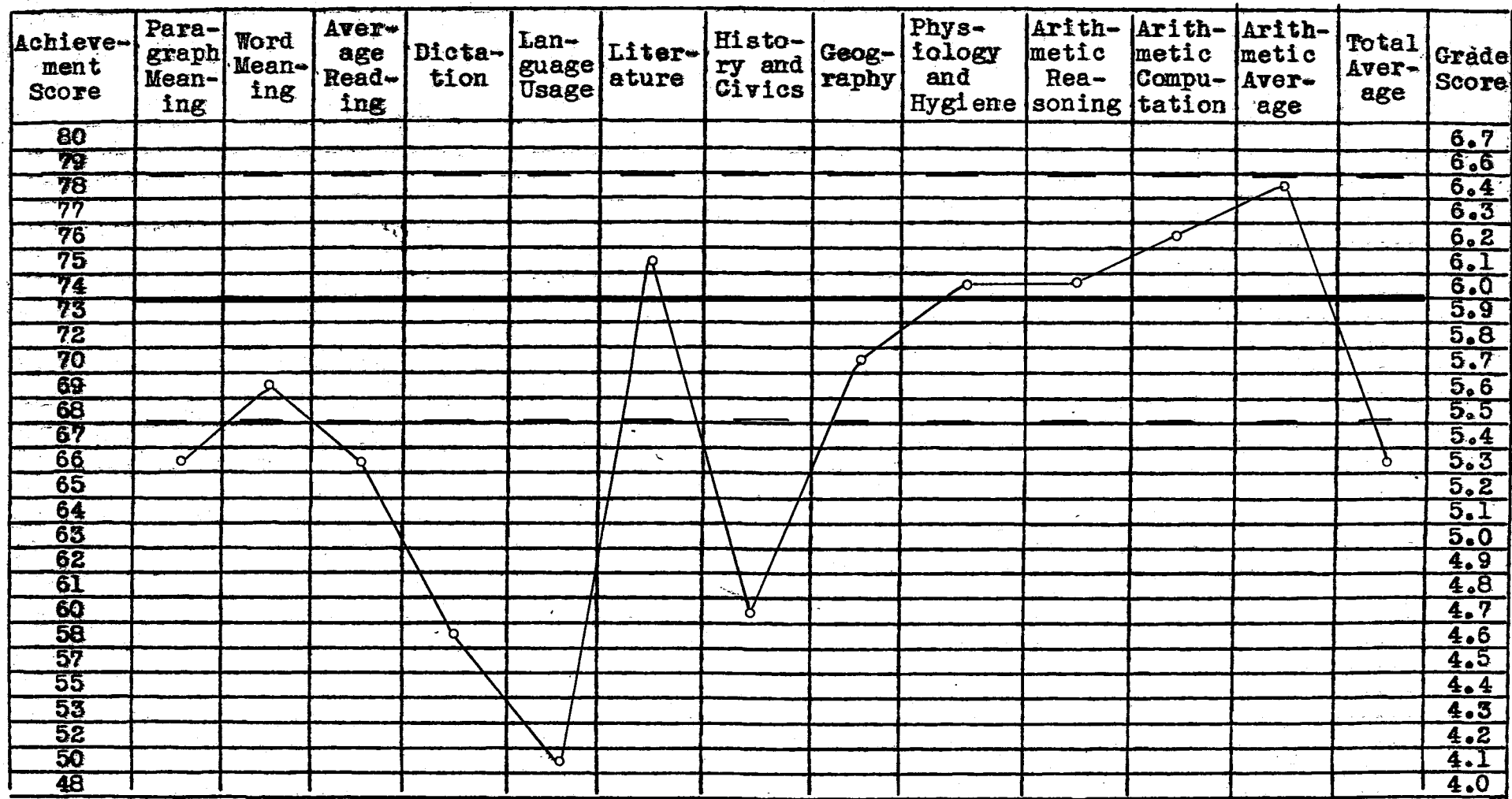
Figure 16, page 73, has the largest number of medians in the upper half of the grade span. Of the three reading scores, only word meaning is within grade and language usage is extremely low.

TABLE XX

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 5A CLASS

Items	Norms	Median Scores of This Class	Grade *	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	101							
PR.	50	53							
M. A.	11-9	11-5	5.6	6	31.6	9	47.4	4	21.0
C. A.	11-9	11-2	5.3	1	5.3	12	63.1	6	31.6
Total achievement	73	66	5.3	4	21.0	10	52.6	5	26.4
Paragraph meaning	73	66	5.3	4	21.0	12	63.1	3	15.9
Word meaning	73	69	5.6	3	16.0	8	42.0	8	42.0
Average reading	73	66	5.3	3	16.0	11	57.7	5	26.3
Dictation	73	58	4.6	1	5.3	13	68.4	5	26.3
Language usage	73	50	4.1	5	26.3	13	68.4	1	5.3
Literature	73	75	6.1	7	37.0	8	42.0	4	21.0
History and civics	73	60	4.7	3	15.8	13	68.4	3	15.8
Geography	73	70	5.7	3	15.8	8	42.1	8	42.1
Physiology and hygiene	73	74	6.0	3	16.0	7	37.0	9	47.0
Arithmetic reasoning	73	74	6.0	8	42.0	9	47.4	2	10.6
Arithmetic computation	73	76	6.2	5	26.0	7	37.0	7	37.0
Arithmetic average	73	78	6.4	8	42.0	8	42.0	3	16.0

* Norm 5.9



5A-NORM.

FIGURE 16

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 5A

Table XXI, page 75, shows 85.3 per cent of the class had I. Q.'s at, or above, the grade. Forty-two and one-tenth per cent made total achievement scores at, and above, the grade span. Again, as in 5A, the median C. A. was seven months below the norm. Another similarity between the two classes was the difference of four months between the M. A. and norm.

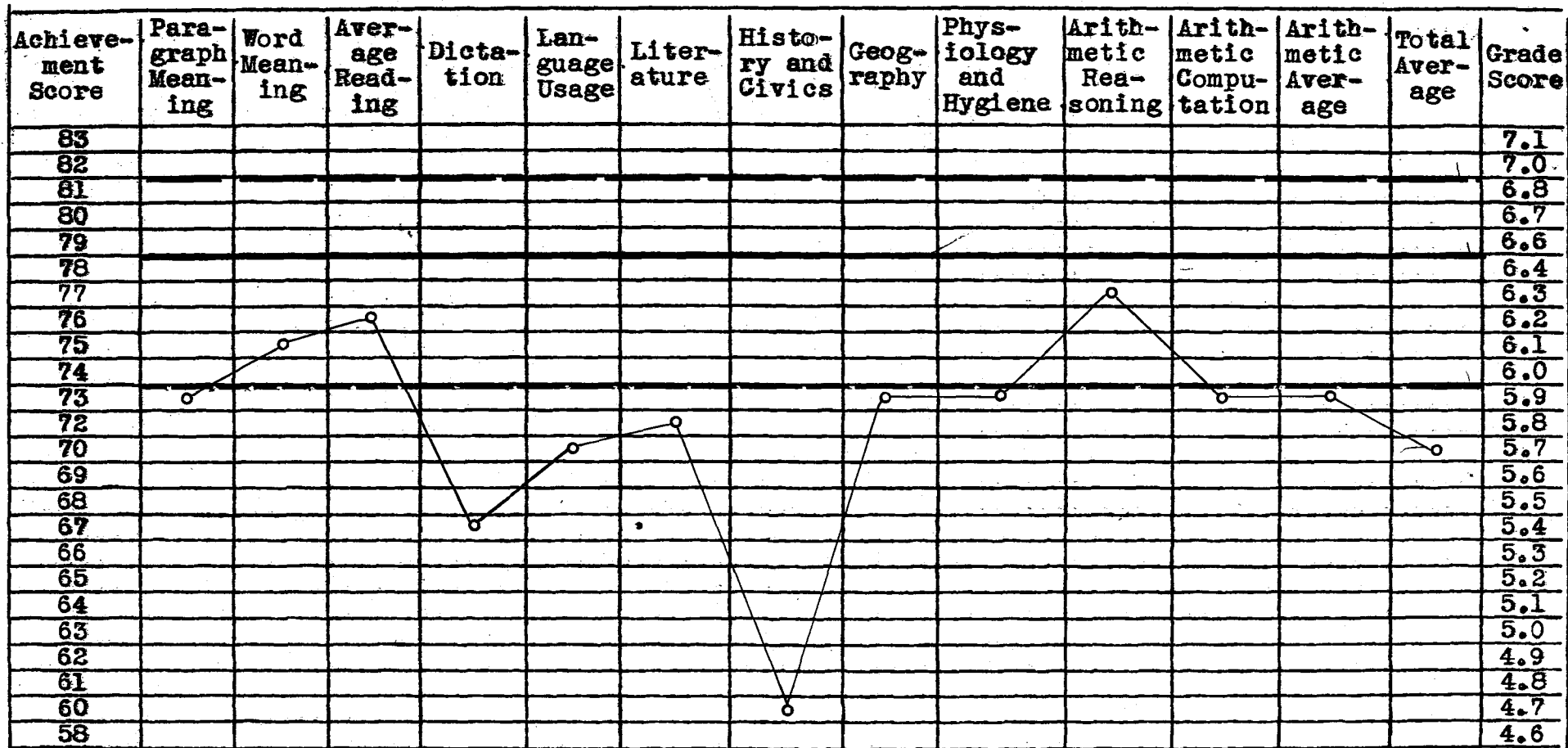
On the profile, Figure 17, page 76, eight of the sub-test medians are within the lower half of the grade span. The three reading scores are at grade. The language usage median is higher than in the fifth grade.

TABLE XXI

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 6B CLASS

Items	Norms	Median Scores of This Class	Grade * 1927	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	102							
PR.	50	57							
M. A.	12-3	11-11	6.1	15	36.6	19	46.4	7	17.0
C. A.	12-3	11-8	5.8	9	21.9	21	51.2	11	26.9
Total achievement	78	70	5.7	5	12.2	25	60.9	11	26.9
Paragraph meaning	78	73	5.9	13	31.7	20	48.8	8	19.5
Word meaning	78	75	6.1	14	34.1	19	46.4	8	19.5
Average reading	78	76	6.2	9	21.9	17	41.5	15	36.6
Dictation	78	67	5.4	6	14.7	27	65.8	8	19.5
Language usage	78	70	5.7	11	26.9	22	53.6	8	19.5
Literature	78	72	5.8	13	31.7	21	51.2	7	17.1
History and civics	78	60	4.7	6	14.7	31	75.6	4	9.7
Geography	78	73	5.9	8	19.5	20	48.8	13	31.7
Physiology and hygiene	78	73	5.9	6	14.7	20	48.8	15	36.5
Arithmetic reasoning	78	77	6.3	14	34.1	14	34.1	13	31.8
Arithmetic computation	78	73	5.9	7	17.1	20	48.8	14	34.1
Arithmetic average	78	73	5.9	9	21.9	20	48.8	12	29.3

* Norm 6.4



6B- NORM.

FIGURE 17

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 6B

The 6A class, Table XXII, page 78, is the only class that fell below one hundred in median I. Q. The median was ninety-six, with only 77.7 per cent of the class having I. Q.'s at, or above, ninety. Twenty-nine per cent of the class made total achievement scores at, and above, the grade. Chronologically the class was three months below the norm.

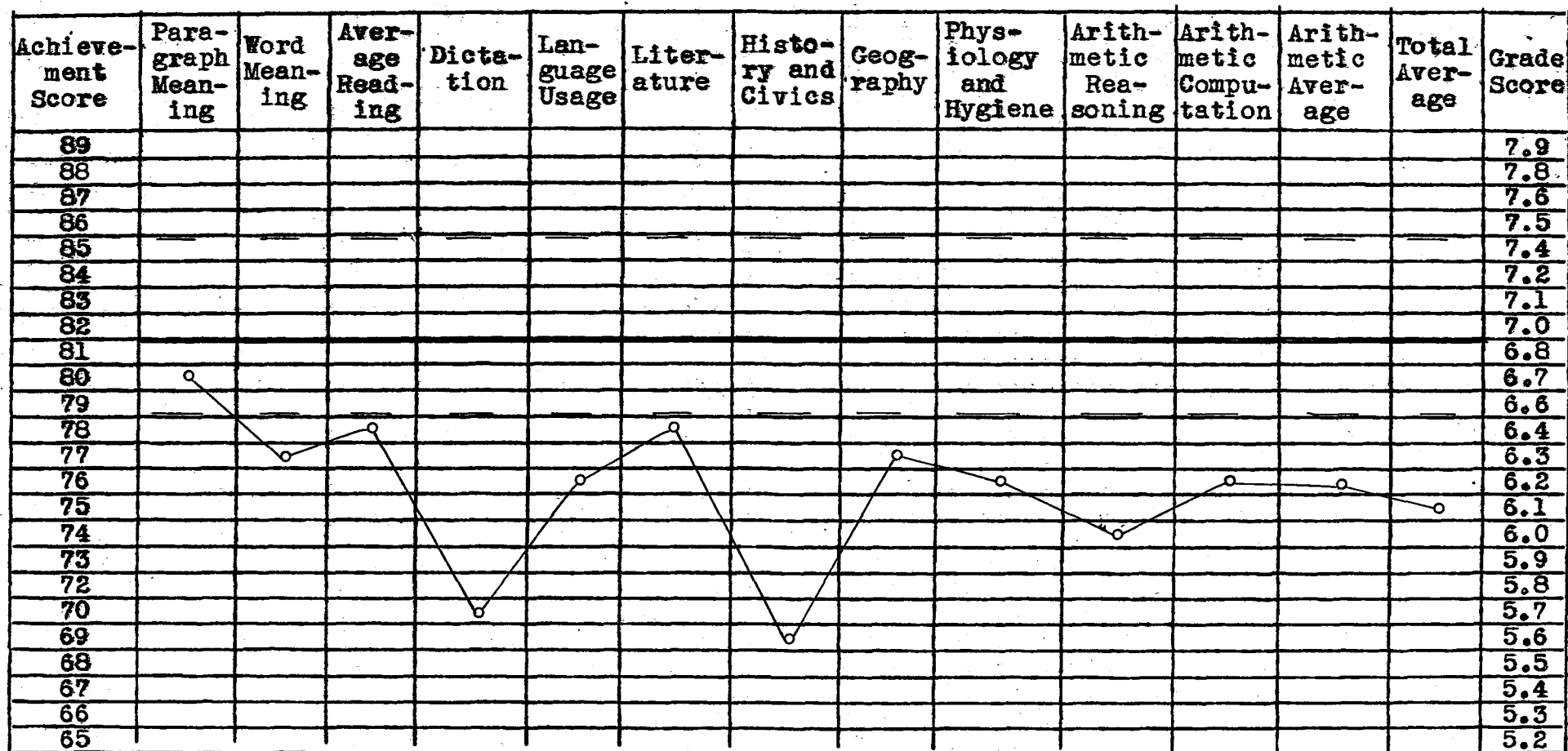
The profile, Figure 18, page 79, shows all sub-test medians below the grade span except paragraph meaning. The other two reading scores are close to the low line. The language usage median is higher in both sixth grade classes than in the fourth and fifth. This may be due to the fact that much language participation in the lower grades is oral.

TABLE XXII

INTELLIGENCE AND STANFORD ACHIEVEMENT SCORES OF THE 6A CLASS

Items	Norms	Median Scores of This Class	Grade ages*	ABOVE GRADE		BELOW GRADE		WITHIN GRADE	
				Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
I. Q.	100	96							
PR.	50	37							
M. A.	12-7	11-5	5.6	7	28.0	17	63.0	3	11.0
C. A.	12-7	12-4	6.6	8	29.6	11	40.8	8	29.6
Total achievement	78	75	6.1	2	7.0	19	71.0	6	22.0
Paragraph meaning	78	80	6.7	8	29.6	12	44.4	7	26.0
Word meaning	78	77	6.3	5	19.0	18	66.0	4	15.0
Average reading	78	78	6.4	4	14.7	14	52.0	9	33.3
Dictation	78	70	5.7	2	7.0	21	77.7	4	15.0
Language usage	78	76	6.2	5	18.8	19	70.2	3	11.0
Literature	78	78	6.4	10	37.0	14	52.0	3	11.0
History and civics	78	69	5.6	5	19.0	21	77.7	1	3.3
Geography	78	77	6.3	6	22.0	16	59.0	5	19.0
Physiology and hygiene	78	76	6.2	2	7.3	19	70.2	6	22.5
Arithmetic reasoning	78	74	6.0	5	19.0	18	66.0	4	15.0
Arithmetic computation	78	76	6.2	9	33.7	16	59.0	2	7.3
Arithmetic average	78	76	6.2	5	19.0	18	66.0	4	15.0

* Norm 6.8



6A-NORM.

FIGURE 18

PROFILE OF THE ACHIEVEMENT OF THE PUPILS IN 6A

III. SIGNIFICANT COMPARISONS AND RELATIONS OF THE ENTIRE SCHOOL

In Table XXIII, page 81, the highest per cent at grade in total achievement was made by the class having the highest per cent at grade in C. A., the 2A class. The second place in both the above scores is in 3B. The lowest per cent at grade in total achievement was made by the 6A's, who had next to the lowest C. A. per cent at grade. The 6A class also has the lowest M. A. per cent at grade. The columns of M. A., C. A., and total achievement at grade run in nearly parallel decreasing scores.

There is not any relation between the scores in the three above grade columns.)

TABLE XXIII

PER CENT AT AND ABOVE GRADE IN M. A. AND C. A.
TO COMPARE WITH AT AND ABOVE
IN TOTAL ACHIEVEMENT

Class	Per Cent at Grade in M. A.	Per Cent at Grade in C. A.	Per Cent at Grade in Total Achieve- ment	Per Cent Above Grade in M. A.	Per Cent Above Grade in C. A.	Per Cent Above Grade in Total Achievement
2A	41.9	83.8	67.6	56.8	14.9	2.6
3B	48.5	42.5	57.6	42.5	21.2	9.0
3A	57.1	33.4	38.1	38.6	33.3	9.5
4B	45.2	26.6	35.5	22.5	22.6	6.5
4A	25.8	32.3	42.0	29.0	25.8	3.2
5B	16.7	30.6	36.2	33.3	25.0	11.1
5A	21.0	31.6	26.4	31.6	5.3	21.0
6B	17.0	26.9	29.9	36.6	21.9	12.2
6A	11.0	29.6	22.0	26.0	29.6	7.0

There was no similarity in Table XXIV, which is given below, between any of the columns except a nearly parallel movement of scores in Word Meaning and I. Q.'s. These two columns are shown in Figure 19, page 83.

TABLE XXIV

PER CENT OF PUPILS IN EACH CLASS SCORING
AT AND ABOVE THE GRADE IN TWO
READING SUB-TESTS, LANGUAGE
USAGE, TOTAL ACHIEVEMENT,
AND I. Q.'S

Class	Para- graph Mean- ing	Word Mean- ing	Lan- guage Usage	Total of all Sub- Tests in Achieve- ment	I. Q. Per Cent at or above 90
2A	52.7	70.2		70.2	93.2
3B	69.7	63.7		66.6	81.8
3A	52.4	42.9		47.6	76.1
4B	51.6	71.0	29.0	42.0	87.1
4A	51.6	54.8	35.4	45.2	80.6
5B	50.0	50.0	36.0	47.3	77.7
5A	36.9	58.0	31.6	47.4	89.4
6B	51.2	53.6	46.4	42.1	85.3
6A	55.6	34.0	29.8	29.0	77.7

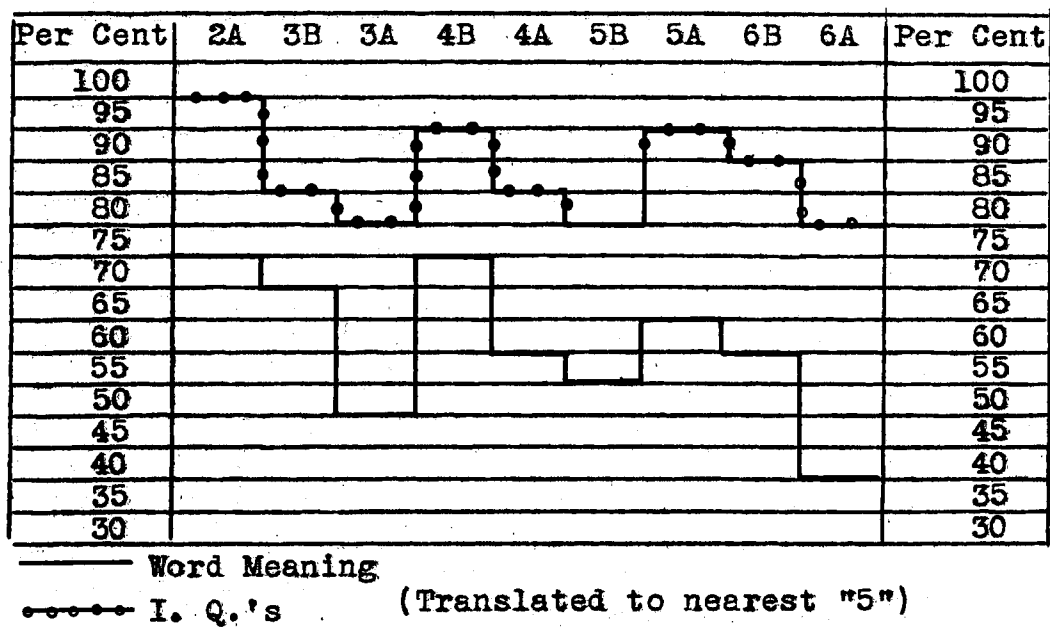


FIGURE 19

CORRESPONDENCE OF I. Q.'S AT AND ABOVE 90
 AND WORD MEANING SCORES AT AND ABOVE
 GRADE

In Table XXV, which is given below, the levels of reading ability that would have to be considered in each class if each teacher attempted a reading program that would give reading instruction to each pupil at his particular level.

TABLE XXV

SPAN OF GRADES REPRESENTED IN EACH CLASS
IN THE THREE READING SCORES

Class	Grade Norm	Span of Grades Represented by Class	Number of Pupils Scoring Below 2.5* in Either of the Two Reading Sub-Test or Reading Average
2A	2.9	2.5 to 3.5	24
3B	3.4	2.5 to 4.8	5
3A	3.9	2.5 to 5.4	1
			2.6 and below
4B	4.4	2.6 to 6.3	3
4A	4.9	3.2 to 7.0	1
5B	5.4	2.6 to 7.6	1
5A	5.9	3.9 to 7.8	0
6B	6.4	2.7 to 9.5	0 ^a
6A	6.8	3.1 to 9.5	1 ^b

* Grade Age.

^a 3 scored above 9.5.

^b 3 scored above 9.5.

Figure 20, page 86, shows the span of grades represented by the reading scores in each class and emphasizes the extent of the reading program that would be necessary to serve adequately each child in each class. Since the range intervals are not weighted, the bars do not show how many pupils would receive instruction at each level. One pupil may be the cause of the farthest extent of the range. However, such a pupil must receive instruction and is in some cases the most difficult to teach. The center of the bars, lighter area, would be taken care of in the regular grade program but the ends of the bars, darker area, would create the most difficult problems if every child in each class were given reading instruction at the grade of his reading achievement scores on the Stanford chart. The scores which fell below 2.6 were not recorded--such children should be in special schools.

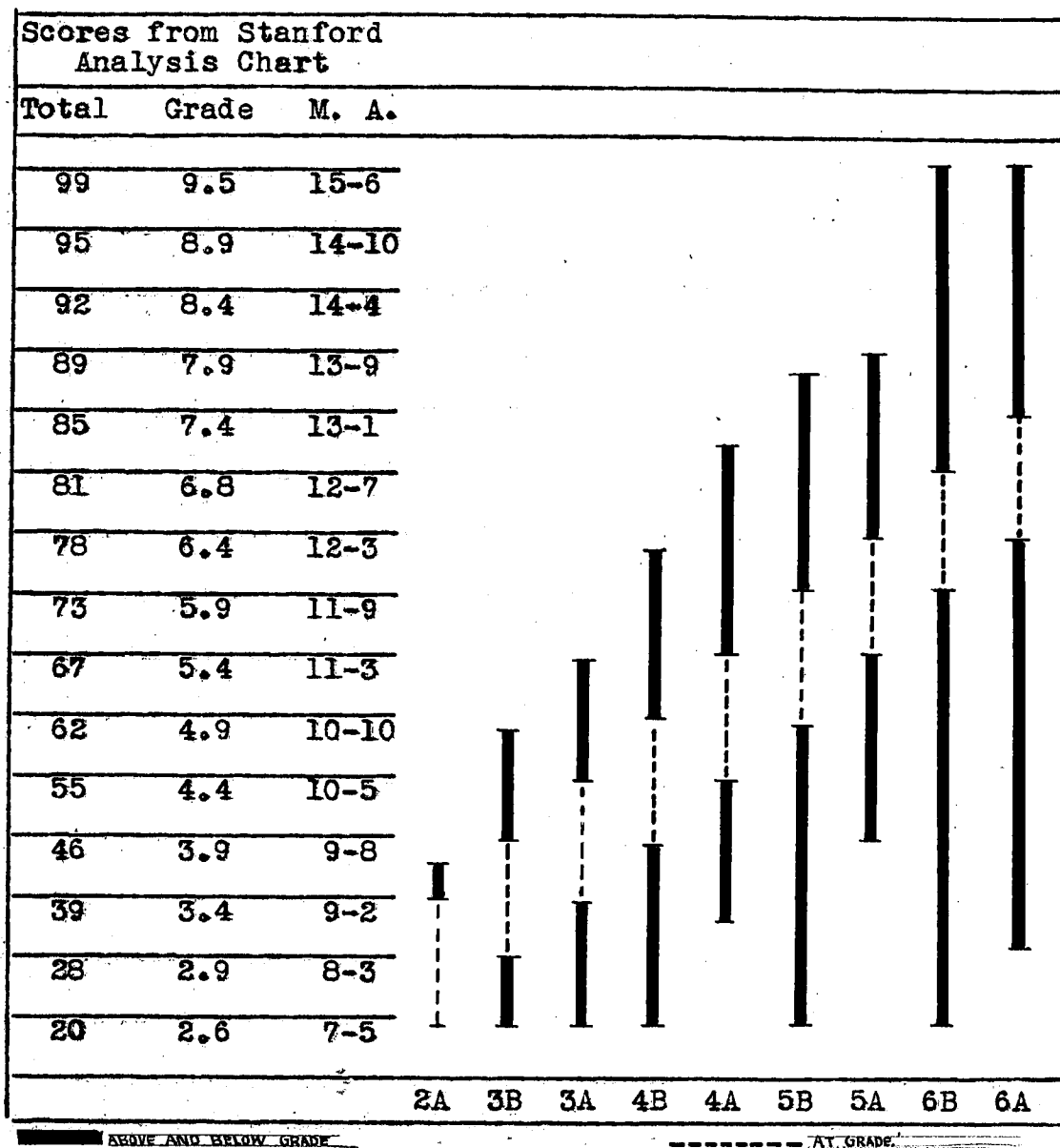
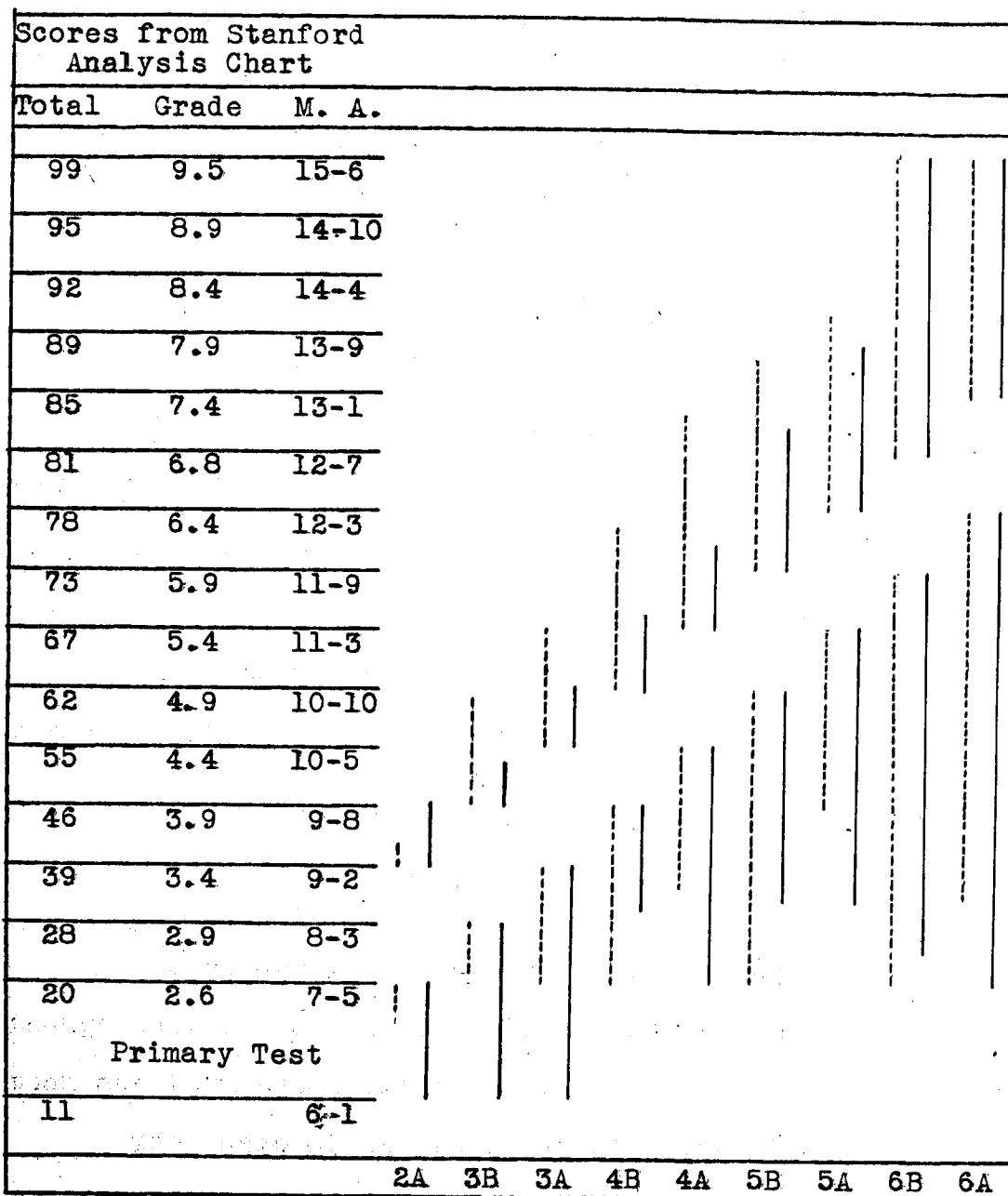


FIGURE 20

SPAN OF GRADES REPRESENTED IN EACH CLASS
IN READING SCORES

In Figure 21, page 88, the range of total achievement scores is not identical with the range of reading scores. In classes where one or two cases extended the scores to the end of the scale, either above or below, there would be identity. There were in all classes, except 4B, 5B, and 6B, children with difficulties in other subjects great enough to extend the total achievement range below the reading range.

Because of the recognition of the major importance of reading achievement, the file card for the recording of test scores used in this study provides spaces for reading test scores. A suggestion as to the form of this file card appears on page 93.



----- Span of reading achievement.

_____ Span of total achievement.

BLANK At grade range in each class.

FIGURE 21

RANGES IN READING SCORES AND IN TOTAL ACHIEVEMENT SCORES

CHAPTER V

SUMMARY OF THE FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

I. CONCLUSIONS BASED ON THE INTELLIGENCE QUOTIENTS

Rea School as a whole is of normal intelligence. There were no I. Q. scores above 139, with 16 I. Q. scores below 80, and a median I. Q. score of 105.

A noticeable per cent of pupils in some classes have not reached the chronological age or the mental age of the standard norm for these scores.

II. CONCLUSIONS BASED ON THE ACHIEVEMENT SCORES

The grade age of each class was below the norm although only one month below in 2A and 3B and never more than one term below except in 6A.

The range of the achievement grades did not reach as high as the range of the mental ages but did extend farther at the lower end. Some children are not attaining their highest possible scores.

The per cent of children in 3A to 6A inclusive who are at grade, within one-half year, is too low to be satisfactory.

The per cent below grade is too large. The per cent of children in the lower half of the grade is generally larger than the per cent in the upper half.

In the school, as a whole, the per cent of children below grades was high.

The highest per cent of children at grade was made in arithmetic computation, however this same subject showed the lowest per cent above grade.

The per cents of children below grade were high in all reading scores and in the subjects requiring reading skills; literature, history, geography, physiology, and especially language. An accumulation from class to class of children on the "borderline" in grade brought all scores down in the upper classes.

There was a noticeable uniformity among the classes throughout the school.

Two retarding factors were discovered. First, the presence of fifty-five children with intelligence quotients below 90 scattered rather evenly throughout the school increased the teaching load and retarded the children who were capable of better work. Second, some slow, but not dull, children are moving faster than their chronological age necessitates. These factors did not account for all of the high per cents of pupils below grades in achievement.

III. RECOMMENDATIONS

Recommendations based on intelligence quotients.

Some special provision should be made for the children with intelligence quotients below 80.

A policy of careful attention to the chronological ages of children with achievement scores at the lower line of the grade and below grade would show some young children in the low achievement group. These young children could be allowed to repeat any class in which an important deficiency was discovered, without regard to the child's intelligent quotient.

Recommendations based on achievement scores. A reading program for the entire school which will attempt in some way to meet the reading ability of each child should be attempted.

The reading and language scores showed a lack in vocabulary and educational experiences which needs to be offset by easier access to a pupil library and more use of visual education.

A testing program should be made possible: (1) to establish verified intelligence scores; (2) to discover progress and weakness in achievement; (3) to discover other factors that effect achievement--health, attitudes, aptitudes, economic conditions, home relations, et cetera; (4) to enrich

the curriculum for children who show acceleration; and
(5) to diagnose the difficulties of children who show
no improvement.

There should be a system of recording all test
results that will not be burdensome to the teachers but
will furnish enough information to be helpful.

SAMPLE FILE CARD*

<div style="display: flex; justify-content: space-between; border-bottom: 1px solid black; margin-bottom: 5px;"> Last Name First Middle </div>			<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Date of Birth</div>			<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Average I. Q.</div>					
INTELLIGENCE SCORES											
Grade	Date	Official Capacity of Testor	Names of Tests			Form	Score	C. A.	M. A.	I. Q.	PR.
ACHIEVEMENT SCORES											
Grade	Date	Names of General Tests	Form	Score	Gr. E. O.	Grade	Date	Reading Tests (Continued)	Form	Score	Gr. E. O.
		Names of Reading Tests									

* The general idea for this file card was taken from Jonathan Murray Lee, A Guide to Measurement in Secondary Schools. (New York: D. Appleton-Century Company, 1930), p. 431.

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APPENDIX

LISTS OF TESTS USED IN THE ORDER OF THEIR USE

1. Metropolitan Readiness Tests for Kindergarten and Grade 1. New York: World Book Company, 1933.

The co-makers of the tests are Gertrude H. Hildreth, Associate in Research and Psychologist in the Lincoln School of Teachers College, Columbia University, and Nellie L. Griffiths, Professor of Education and Supervisor of Elementary School of North Texas State Teachers College, Denton, Texas. The revised table showing the distribution of total scores, by age groups, is based upon a study of more than 7,000 cases. The aim of the test is to measure each child's maximum response under controlled conditions.

2. Otis Intelligence Scale. New York: World Book Company, 1929.

The primary examination, Form A, was used from 1A to 4A, inclusive. The advanced examination, Form A, was used from 5B to 6A, inclusive. The table of norms for the primary tests is based upon the scores of 2,325 pupils throughout the country. The table of norms for the advanced tests is based upon the scores of 25,226 pupils from approximately two hundred cities throughout the country.

Two forms of this test are available, Form A and Form B. They are similar in structure and the total scores from each of them are equivalent. They are both designed to test general mental ability.

3. New Stanford Achievement Test. New York: World Book Company, 1931.

The first publication of the Stanford test, Forms A and B, were standardized and equated on the basis of scores of 1,500 pupils. These norms were revised in 1925 on the basis of a careful sampling of 2,000 cases from elementary school pupils in twenty-four cities or districts in the United States. By a more thorough revision of the tests which was completed in 1929 five new forms, V, W, X, Y, and Z, were made.

The primary examination was used from 2A to 3A, inclusive. The advanced examination from 4B to 6A, inclusive.

The results of the tests are stated on a profile chart which represents the standing of each pupil in each of the tests, making it possible to see in which subjects each child is strong and in which he is weak. Three types of norms are provided on the profile chart; viz., the normal score for each educational age, chronological age, and school grade. When the profile chart is completed, it gives a

complete record of the pupils mental-educational scores
for the tests thereon recorded.

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