

THE SUPERVISORY VALUE OF THE
OTIS GROUP INTELLIGENCE
TEST.

by

Ellen Grace Greenwood

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Approved

Raymond A. Schwegler
Department of Education.

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J. Kelly

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Chapter 1.

Introduction

1. The greatest and most significant achievement in experimental psychology in the past three decades has been the development of mental tests where-by native intelligence, capacity, or endowment may be measured and used as a reliable criterion in providing for individual differences, abilities, and aptitudes. Mental tests are used not only by the school administrator, but they are used very effectively by the social worker, the industrial manager, and the director of vocational guidance.

The growth and development of intelligence testing has been phenomenal in the past decade. Every magazine, periodical or review, whether educational, scientific, sociological, industrial or vocational has its articles concerning the need, use, and value of intelligence testing. Thru the use of mental testing many perplexing problems of the educator, the social worker, juvenile court officers, state wardens, and physicians have been solved on a scientific basis. Altho valuable results have already been achieved thru intelligence testing, the day is just dawning when the real significance of the careful measurement of intelligence will be realized by the educational,

social, and industrial world.

After years of experimentation and mental diagnoses, psychologists agree with Stern, that "Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements: it is general mental adaptation to new problems and conditions of life". Binet after years of experimentation was lead to say: "It seems to us that intelligence is a fundamental faculty, the alteration or the lack of which is of the utmost importance for practical life. This faculty is judgment, otherwise called good sense, initiative, the faculty of adapting one's self to circumstances." Intelligence is a composit thing consisting of many specific intelligences. In diagnosing intelligence one discovers its various types and functions existing in different degrees and qualities. The chief activities of intelligence are judgment, comprehension, reasoning, and memory. This diagnosing of the various aspects of intelligence is of all importance to an individual in know-in what type of vocation, profession, or intellectual activity he can best succeed.

Our present stage of achievement in mental testing represents the results of a vast amount of work done in the psychological laboratories since the time of Sir Francis Galton. As early as 1877 he suggested the use of the reac-

tion experiment for the diagnosis of temperament. In connection with anthropological measurements of weight, height, eye-color, and the like, he further developed a number of simple tests which he hoped would make it possible to "obtain a general knowledge of the capacities of a man by sinking shafts, as it were, at a few critical points".

In the early nineties mental tests came into prominence in America. Interest first centered in the question of the relation of mental to physical variations, in the determination of the range and the type of mental variation, and in the problems of class and child psychology. The tests given resembled those used by the psychologists in the investigation of the simpler mental processes.

In Germany, a few years later, similar tests were developed for the diagnosis of insanity and for the analysis of the abnormal mind.

In France at approximately the same time as in America, interest in individual psychology lead to the formation of tests of a different kind. Alfred Binet and his followers came to believe that intelligence could not be determined as well by tests used to discriminate sensory ability, as by the tests of the higher functions of intelligence, such as imagination, comprehension, suggestibility, judgment, and reason. The first mental tests were concerned with the measurement of the specific faculties of intelli-

gence. They were strictly tests of the different mental processes or of the different states of consciousness. They tested the various motor and sensory capacities for attention and perception, for association, and for suggestibility, for imagination and invention, and for memory and learning.

Today, we do not believe that intelligence is a clean-cut mental phenomenon, and that it can be measured by measuring any one of its various aspects. Intelligence, rather, is a very complex phenomena consisting of many special functions and specific intelligences, all of which must be measured in order to get a reliable estimate of the intelligence of an individual. It was Alfred Binet, the great French psychologist, who first realized this fact that intelligence could not be measured by a single mental test that tested only one of its aspects, but that it could be measured adequately only by the use of a series or group of intelligence tests which would check the functioning of all the various aspects of mentality. Any mental test to be reliable must provide for wide range testing in which no single function of intelligence is omitted. Stern has well said that: "We must test the different phases of the activity of intelligence and seek to construct a general picture of the degree of intelligence from the different results, partially accordant, partially variant as they will be." It was just

this thing that Binet did when he gave us his scale which included tests to cover in general the chief psychological characteristics that constitute general intelligence.

In 1905 Binet in conjunction with Simon published the first series of the Binet-Simon tests, the purpose of which was chiefly to detect mental subnormality. After further experimentation Binet and Simon came to the conclusion that tests could be devised which would not only measure mental deficiency but which could also be used to measure general intelligence. They therefore in 1908 published a definite graded scale for intelligence testing, which consisted of fifty-six tests, which covered the ages of from three to twelve, inclusive. These tests were simple tasks such as the child might be expected to perform and were graded and grouped to suit the age of the child.

In 1911 the authors published a revision of the 1908 scale, in which some tests were entirely changed, while others were only redistributed. The scale has been widely used thruout Europe and America, and has received the attention of the foremost psychologists who have made noteworthy revisions and adaptations of it.

The first American revision was published by Goddard in 1911, entitled: "The Binet-Simon Measuring Scale of Intelligence, Revised." In 1913 a very excellent translation of the scale from the French was made by Dr. Town. In

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recent years valuable adaptations of the scale have been made by Kuhlmann, Schwegler, Wallin, Winch, and Terman.

Since its publication, the Binet-Scale has been keenly diagnosed and criticised, resulting in a more accurate placing of the tests in the scale, and a more accurate evaluation of the responses made by the child. The two latest and best revisions of the scale are the Stanford Revision and Extension of the Binet Scale by Terman in 1916 and the Point Scale by Yerkes, Bridges, and Hardwick in 1914. The Stanford Revision uses the same classification of tests according to age, with an addition of certain tests to those originally used by Binet. Its chief value consists of the intelligence quotient as the index of mentality.

The Yerkes Point Scale discards the grouping of tests according to age, and adopts a system of scoring by the use of points for each response. Instead of expressing the results of the test in terms of the intelligence quotient, Yerkes proposed the coefficient of mental ability, which is the ratio of the score made to the average score for a child of the age of the individual examined.

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2. Two types of intelligence tests exist today--one type testing strictly intellectual function, the other testing motor function. Each of these tests has a significant role in the field of mental testing. This is unquestionable,

for no one doubts, today, that there are two types of people as to intellectual function—those who are idea minded or think in terms of symbols, and those who are motor minded or who think best in terms of motor function or performance. Each type of intelligence can be adequately measured only by those mental tests adapted to it.

The chief criticism of the Binet Scale has been that it measured intelligence in terms of language function alone. Ayres has said: "The tests predominantly reflect the child's ability to use words fluently, and only in a small measure his ability to do acts." Tests of this type cannot be used with the foreign child, the speech defective, the deaf child, and other children with language handicaps. To meet this situation the form-board or various performance tests have been devised. The essential characteristic of these tests is that they require no kind of language response in order to be passed successfully.

The form-board test was first used by Seguin as a means of training feeble-minded children. Doctors Healy and Goddard have also used it with success in testing juvenile delinquents and mental defectives. All those who know best recommend it highly for measuring the complexity of the mental processes. Jones used it to determine learning capacity and speaks of it as "a very good test of native ability." Norsworthy claims that it has diagnostic value

and measures to a certain extent the ability to deal quickly and well with a new situation. Witmer states that "the form-board is one of the best tests rapidly to distinguish between the feeble-minded and the normal child. Goddard says: "We have in our laboratory no other test that shows us so much about a child's condition in so short a time."

Other form-board tests that have been successfully used are: the Knok Cube tests, the Healy tests, and the Pintner-Patterson tests.

Today, then, we have two types of mental tests: first, those which measure intellectual ability in terms of language response, best illustrated by the Binet-Scale and its various adaptations; and second, those which measure intelligence thru certain performance tests. Both of these are of value to mental testers, and each may be successfully used as a check upon the other.

3. Until very recently the Stanford Revision and the Yerkes Point Scale were the chief tests used for mental testing in America. During the recent European war there arose a great need for a type of test that could be given to a large number of men at the same time. A test was need that would group men according to their intelligence, and at the same time could be given to large numbers of men by a single experimenter. To meet this need the Army Alpha Test was devised

and given to over a million and three fourths soldiers. This was the first attempt at group testing. The success of the experiment was so remarkable, that educators have used the same principle in devising group tests for school purposes.

A large number of school group tests have already been produced, chief of which are: the Otis General Intelligence test, the Standard, the Terman Group, and the National Intelligence Tests. The latter test which consists of two forms, Scale A, and Scale B was prepared under the auspices of the National Research Council, and is a revision of the Army Intelligence test adapted to school purposes. Other tests are the Dearborn Group, the Mentimeter, by Trabue and Trowbridge, and the Myers Mental Measure. At this time there is not enough data to ascertain which of the tests is the best for school administrators. Only by wise use can the specific merits and defects of the different tests be shown.

The problem of this thesis is to determine the reliability and value of the Otis Group test as a supervisory device. And if it can be shown that such group tests can be used successfully in grouping children according to mentality, the school supervisor need no longer depend entirely on the individual mental test in classifying children.

Altho the latter is the most accurate mental test, and has been used successfully in classifying school systems; yet it requires a great amount of time and money expenditure in its administration in large school systems. As group tests become perfected they will largely take the place of the individual tests where large numbers are to be tested. Yet they can never be substituted for the individual test in those cases in which fine point testing is desired. For all institutional cases, mental defectives, subnormal and retarded children, individual delinquents, and for specially gifted children the individual test will give a more accurate, clearer picture of the general intelligence of the subject than the group test can possibly give. In all cases in which careful mental diagnoses are necessary, the individual test is the only test that can be used with any degree of accuracy. But for the ordinary problems of grade placement and promotion, where the need of testing is more for the grouping of children of similar mental ability, than it is to determine the specific degree of individual intelligence, the group test may be used as successfully as the individual test. In addition to being more economical both in the time and effort required in its administration, the group test has an added advantage over the individual test in that "children in school have

learned to work together, and some difficulties may be avoided which often arise when a child is taken out of a class and confronted, individually, by a strange examiner." For the timid child, for those having speech difficulties, and for those whose confidence is hard to secure, the group test will be a most satisfactory substitute for the Binet test which largely tests mental ability in terms of language function.

The Otis Group Intelligence Scale was devised to measure the native mental ability of any individual, whether child or adult, who has had the equivalent of three or four years of schooling. According to Terman "it was the first scientifically grounded and satisfactory scale for testing subjects in groups". Thru this scale Dr. Otis has done much to free intelligence tests from the influence of the personal equation of the examiner.

The Otis test cannot take the place of the Binet or other methods of individual examination, for the two methods supplement each other. The group test will serve as a basis for the general classification of children above the fourth grade, while the individual test will be necessary to place all exceptional or puzzling cases.

This thesis will show the value of the Otis test in classifying a public school system.

OTIS GROUP INTELLIGENCE SCALE

Devised by ARTHUR S. OTIS

Edition 1920

ADVANCED EXAMINATION: FORM A

Examination Number..... Name.....
(First name, initial, and last name)

Age last birthday..... years. Birthday.....
(Tell in figures) (Month, day)

School..... Grade.....

City..... Date..... 19.....
(Month, day, year)

(Do not write below this line.)

Remarks or Further Data

- I
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

TEST	SCORE
I	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Score	
Norm	
IB	
PR	

OGIS:A-5'

TEST 1

Following Directions

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Sample problem : Write the fifth letter of the alphabet.(E)

Begin here :

1. Do you understand that each letter is to be a capital made like printing and put in the parenthesis after the problem? If so, write C in the parenthesis.() 1
2. Will you remember not to ask any questions during the examination? If so, write Q.() 2
3. Will you remember not to look toward the paper of any other pupil during the examination? If so, write L.() 3
4. Will you remember not to turn over your booklet or any page of it at any time unless you are told to? If so, write B; if not, write N.() 4
5. Write the letter O.() 5
6. Write the eighth letter of the alphabet.() 6
7. Write the same letter that you were told to write in the fifth problem.() 7
8. Write the letter which follows the third letter of the alphabet.() 8
9. Write the letter which the letter L follows in the alphabet.() 9
10. If K comes after R in the alphabet, write K; if not, write R.() 10
11. Suppose all the even numbered letters in the alphabet (that is, the 2d, 4th, 6th, etc.) were crossed out. The fifth letter left, not crossed out, would be what letter?() 11
12. Write the letter which follows the letter which comes next after B in the alphabet.() 12
13. If E and F appear together in the alphabet, write E, unless T and Z also appear together in the alphabet, in which case write T instead.() 13
14. Write the letter which is the third letter to the right of the letter which is midway between K and O.() 14
15. Suppose that the first and second letters of the alphabet were interchanged, also the third and fourth, the fifth and sixth, etc. Write the letter which would then be the 14th letter in the alphabet.() 15
16. A certain letter is the second letter to the left of another letter. This other letter is the fifth letter to the right of Q. What is the "certain letter" first mentioned?..() 16
17. A certain letter is the fourth letter to the right of another letter. This other letter is midway between two other letters. One of these last two letters is next after E in the alphabet and the other is just before K in the alphabet. What is the "certain letter" first mentioned?() 17
18. If the letters in the word IF appear in the same order that they do in the alphabet and if the same is true of the letters in the word AN, write the letter Z. But if this is true of only one of these words, write the last letter of that word.() 18
19. Find the letter which, in this sentence, appears a second time nearest the beginning. Write it, using a capital.() 19
20. Find the two letters in the word AFTER which have just as many letters between them in the alphabet as in the word. Write the one of these two letters that comes first in the alphabet.() 20

Score.....

TEST 2

Opposites

Samples: { up(short, down, small, low, young)
hot.....(warm, ice, dark, cold, fire)

DIRECTIONS. Look at the first word on each line, think what word means exactly the opposite of it, find that word among the five words in parenthesis on that line and draw a line under it.

Begin here :

1. east.....(north, west, south, pole, equator)..... 1
2. yes.....(may-be, wrong, no, sure, nothing)..... 2
3. top.....(bottom, side, cover, inside, feet)..... 3
4. before.....(late, now, soon, when, after)..... 4
5. difficult.....(hard, quick, soft, easy, common)..... 5
6. friend.....(brother, acquaintance, enemy, wife, stranger).... 6
7. succeed.....(win, decline, fail, accede, try)..... 7
8. command.....(officer, shout, order, obey, soldier)..... 8
9. beautiful.....(crooked, handsome, old, ugly, dirty),..... 9
10. brave.....(painful, fear, weak, stingy, cowardly)..... 10
11. pride.....(sorrow, humility, miserable, conceit, proud)..... 11
12. expand.....(burst, smaller, contract, vanish, stay)..... 12
13. genuine.....(coarse, counterfeit, adulterated, worthless, impure) 13
14. help.....(person, work, push, give, hinder)..... 14
15. love.....(like, anger, hate, strange, lover)..... 15
16. graceful.....(rough, homely, miserable, awkward, stout)..... 16
17. extravagant....(miser, humble, economical, poor, wasteful)..... 17
18. cause.....(reason, because, origin, effect, why)..... 18
19. abolish.....(alter, create, continue, destroy, change)..... 19
20. loyal.....(treacherous, enemy, thief, coward, jealous)..... 20
21. always.....(sometimes, often, occasionally, seldom, never).... 21
22. fickle.....(silly, constant, stationary, solid, sober)..... 22
23. therefore.....(since, why, may-be, there, cause)..... 23
24. however.....(nevertheless, moreover, whether, even, never).... 24
25. unless.....(and, therefore, however, also, if)..... 25

Score.....

TEST 3

Disarranged Sentences

Samples:	{	men money for work.....	(<u>true</u> false)
		uphill rivers flow all.....	(true <u>false</u>)
		ocean waves the has.....	(true false)

DIRECTIONS. The words on each line below make one sentence if put in order. If the sentence the words would make is *true*, underline the word *true* at the side of the page. If the sentence they would make is *false*, underline the word *false*.

Begin here:

- | | | | |
|-----|---|--------------|----|
| 1. | eat grass cows..... | (true false) | 1 |
| 2. | sail ocean ships the on..... | (true false) | 2 |
| 3. | sun morning the the in sets..... | (true false) | 3 |
| 4. | trees birds nests the in build..... | (true false) | 4 |
| 5. | mountains live the in whales..... | (true false) | 5 |
| 6. | comes Christmas a but year once..... | (true false) | 6 |
| 7. | float iron water on will..... | (true false) | 7 |
| 8. | days there in are week seven a..... | (true false) | 8 |
| 9. | usually are of made tables wood..... | (true false) | 9 |
| 10. | has short very a a neck giraffe..... | (true false) | 10 |
| 11. | cream ice children like most..... | (true false) | 11 |
| 12. | milk bees flowers gather the from..... | (true false) | 12 |
| 13. | obtained 'sea sugar from is water..... | (true false) | 13 |
| 14. | fuel wood are coal and for burned..... | (true false) | 14 |
| 15. | substances light lead gold and are very..... | (true false) | 15 |
| 16. | rivers lakes and many desert has a..... | (true false) | 16 |
| 17. | moon earth the from feet twenty the is..... | (true false) | 17 |
| 18. | hump camel has a his a back on..... | (true false) | 18 |
| 19. | grow and apples ground oranges the in..... | (true false) | 19 |
| 20. | music fond people many' are of..... | (true false) | 20 |
| 21. | and eat good gold silver to are..... | (true false) | 21 |
| 22. | clouds rain sky from comes the the in..... | (true false) | 22 |
| 23. | mile a a a travel snail in can minute..... | (true false) | 23 |
| 24. | automobile pocket man his keeps a his in..... | (true false) | 24 |
| 25. | vote persons twenty-one cannot under..... | (true false) | 25 |

Right.....Wrong..... Score.....

TEST 4

Proverbs

DIRECTIONS. Read each proverb, find the statement that explains it, and put the number of that statement in the parenthesis before the proverb.

Proverbs (Group 1)

- () Make hay while the sun shines.
- () A drowning man will grasp at straws.
- () A stitch in time saves nine.
- () Rats desert a sinking ship.
- () In a calm sea every man is a pilot.
- () Destroy the lion while it is young.
- () He who would eat the kernel must crack the nut.
- () One swallow does not make a summer.
- () People who live in glass houses must not throw stones.
- () A mouse must not think to cast a shadow like an elephant.

Statements to Explain Proverbs in Group 1

1. It pays to attend to troubles before they get worse.
2. Leadership is easy when all goes well.
3. Make the best of your opportunities.
4. Those who would reap rewards must work for them.
5. It pays to do only one thing at a time.
6. Desperate people cling to absurd hopes.
7. False friends flee from us in disaster.
8. Weed out bad habits before they are too firmly established.
9. It is best to be silent when there is nothing to say.
10. Those who have faults should not criticize others.
11. Do not attempt the impossible.
12. A single sign is not convincing.

Proverbs (Group 2)

- () Every rose has its thorn.
- () A tree is known by its fruits.
- () All is not gold that glitters.
- () Where there is much smoke there must be some fire.
- () No wind can do him good who steers for no port.
- () Plant the crab tree where you will, it will not bear sweet apples.
- () A bird in the hand is worth two in the bush.
- () Too many cooks spoil the broth.
- () Meddle not with dirt — some of it will stick to you.
- () It is a long road that has no turn.

Statements to Explain Proverbs in Group 2

1. Environment will not change one's nature.
2. There is no happiness without its pain or sorrow.
3. Appearances are often deceptive.
4. It is better to be content with little than to gamble for more.
5. One cannot have the same luck forever.
6. No object can be attained without some sacrifice.
7. Deeds show the man.
8. We cannot help those who have no object in life.
9. Suspicions usually have some basis.
10. Association with evil is sure to leave its effect.
11. Who undertakes too much accomplishes little.
12. Division of responsibility brings poor results.

Score.....

TEST 5

Arithmetic

DIRECTIONS. Place the answer to each problem in the parenthesis after the problem. Do any figuring you wish on the margin of the page.

1. If a boy had 10 cents and earned 5 cents, how much money did he have then? () cents 1
2. At 4 cents each, how much will 12 pencils cost? () cents 2
3. If a man had \$25 and spent \$10, how much money did he have left? ... () dollars 3
4. At 6 cents each, how many pencils can be bought for 48 cents? () pencils 4
5. A boy spent 20 cents and then earned 30 cents. How much more money did he have than at first? () cents 5
6. How far can a train go in 5 hours at the rate of 40 miles per hour? () miles 6
7. How long will it take a glacier to move 1000 feet at the rate of 100 feet a year? () years 7
8. If $2\frac{1}{2}$ yards of cloth cost 20 cents, what will 10 yards cost? () cents 8
9. If 2 pencils cost 5 cents, how many pencils can be bought for 50 cents? () pencils 9
10. If a man walks east from his home 7 blocks and then walks west 4 blocks, how far is he from his home? () blocks 10
11. If a boy can run at the rate of 5 feet in $\frac{1}{8}$ of a second, how far can he run in 10 seconds? () feet 11
12. A ship has provisions enough to last a crew of 20 men 50 days. How long would they last a crew of 40 men? () days 12
13. One schoolroom has 7 rows of seats with 8 seats in each row, and another schoolroom has 6 rows of seats with 9 seats in each row. How many more seats does one room have than the other? () seats 13
14. If 10 boxes full of oranges weigh 500 pounds, and each box when empty weighs 5 pounds, what do all the oranges weigh? () pounds 14
15. Town X is 30 miles north of Town Y. Town Y is 15 miles north of Town Z. How far is Town Z from Town X? () miles 15
16. If $3\frac{1}{2}$ yards of cloth cost 70 cents, what will $2\frac{1}{2}$ yards cost? () cents 16
17. If a strip of cloth 36 inches long will shrink to 33 inches when washed, how long will a 48-inch strip be after shrinking? () inches 17
18. If Frank can ride a bicycle 300 feet while George runs 200 feet, how far can Frank ride while George runs 300 feet? () feet 18
19. A hotel serves a mixture of 3 parts cream and 2 parts milk. How many pints of cream will it take to make 25 pints of the mixture? () pints 19
20. If a wire 20 inches long is to be cut so that one piece is $\frac{2}{3}$ as long as the other piece, how long must the longest piece be? () inches 20

Score

TEST 6

Geometric Figures

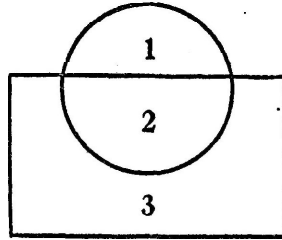


Fig. I

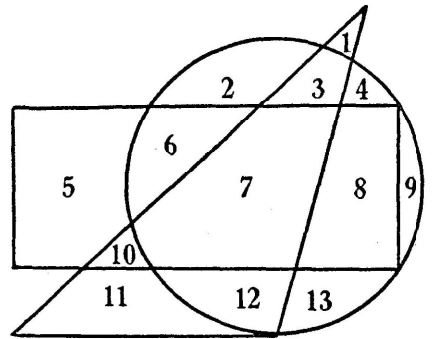


Fig. II

DIRECTIONS. Each problem asks a question that is answered by a number. Write the answer to each problem in the parenthesis after the statement of the problem.

Sample problem :

Look at Fig. I. What number is in the circle but not in the rectangle?.....(1)

1. What number in Fig. I is in the rectangle but not in the circle?.....() 1
2. What number in Fig. I is in both the rectangle and the circle?.....() 2
3. Look at Fig. II (at the right). What number is in the rectangle but not in the circle nor in the triangle?.....() 3
4. What number in Fig. II is in the rectangle and in the triangle but not in the circle? () 4
(The remaining questions all refer to Fig. II.)
5. What number is in the circle and in the rectangle and in the triangle?.....() 5
6. What is the smallest number that is in the triangle but not in the circle nor in the rectangle?.....() 6
7. What is the largest number that is in the circle but not in the triangle nor in the rectangle?.....() 7
8. Write the number that is in the lowest space that is in the triangle and in the circle but not in the rectangle.....() 8
9. Find the geometrical figure (circle, triangle, or rectangle) that has the least number of spaces in it. Write that number of spaces.....() 9
10. How many spaces are there each of which is in all three geometrical figures?.....() 10
11. How many spaces are there each of which is in one and only one geometrical figure?..() 11
12. How many spaces are there each of which is in two and only two geometrical figures?() 12
13. We may say that space 12 is *like* space 3 because they are *both* in the circle and triangle but not in the rectangle. Any space is *like* another which is in exactly the same geometrical figures. Write the number of the space which is like space 6.....() 13
14. Write the number of the space which is like space 1.....() 14
15. How many other spaces are there like space 9?.....() 15
16. There is no other space like space 5, so we may call space 5 *unique* (yūneek). Any space is unique which has no other space like it. Examine spaces 8, 9, 10, 11, 12, and 13 in order until you find another unique space. Write its number.....() 16
17. How many unique spaces are there in Fig. II?.....() 17
18. What is the greatest number of unique spaces which it is possible to make by overlapping a circle, triangle, and rectangle? (You may draw any figures you wish on the margin of this page).....() 18
19. Also what is the least number of unique spaces possible?.....() 19
20. What is the greatest number of spaces which it is possible to make by overlapping a circle, triangle, and rectangle?.....() 20

Score.....

TEST 7

Analogies

Samples: { finger: hand — toe: (?) foot, knee, arm, shoe, nail
 clothes: man — fur: (?) coat, animal, hair, skin, cloth
 tall: short — fat: (?) man, wide, thin, boy, heavy

DIRECTIONS. The first sample means: Finger is to hand as toe is to what? Underline the word on each line that should go in the parenthesis in place of the question mark.

Begin here:

1. hand: arm — foot: (?) leg, toe, finger, wrist, elbow 1
2. peeling: banana — shell: (?) skin, orange, egg, juice, ripe 2
3. wool: sheep — feathers: (?) pillow, rabbit, bird, goat, bed 3
4. coal: locomotive — (?): automobile . . . motorcycle, smoke, wheels, gasoline, horn 4
5. man: woman — brother: (?) daughter, sister, boy, mother, son 5
6. automobile: wagon — motorcycle: (?) . . walking, horse, buggy, train, bicycle . . . 6
7. hospital: the sick — (?): criminals . . . doctor, asylum, judge, prison, sentence . . 7
8. hat: head — thimble: (?) finger, needle, thread, hand, sewing 8
9. captain: ship — mayor: (?) state, council, city, ship, boss 9
10. better: good — worse: (?) very good, medium, bad, much worse, best 10
11. grass: cattle — bread: (?) butter, flour, milk, man, horses 11
12. large: object — loud: (?) soft, small, heavy, weight, sound 12
13. king: kingdom — president: (?) vice president, senate, republic, queen, democrat 13
14. revolver: man — (?): bee wings, honey, flying, wax, sting 14
15. egg: bird — (?): plant seed, shell, leaf, root, feathers 15
16. education: ignorance — (?): poverty . . laziness, school, wealth, charity, teacher . 16
17. circle: square — sphere: (?) circumference, cube, round, corners, ball 17
18. point: line — line: (?) surface, pencil, dot, curve, solid 18
19. sanitation: disease — (?): accident . . . doctor, hospital, bandage, cleanliness, care 19
20. ordinary: exceptional — many: (?) . . . all, none, few, common, more 20
21. sunlight: darkness — (?): stillness . . . quiet, sound, dark, loud, moonlight 21
22. peninsula: land — (?): ocean river, lake, cape, gulf, water 22
23. ellipse: circle — (?): square cube, curve, oval, circle, diamond 23
24. violence: anger — (?): love caressing, hate, temper, hope, happiness 24
25. evolution: revolution — crawl: (?) baby, floor, stand, run, hands and knees 25

Score

TEST 8

Similarities Test

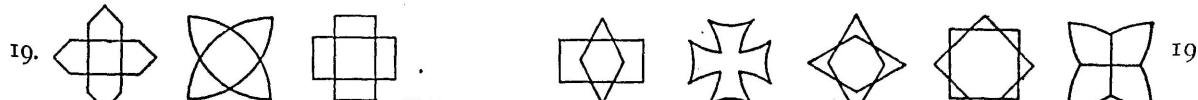
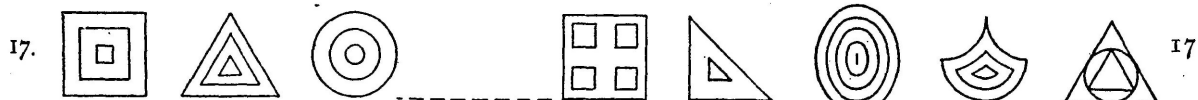
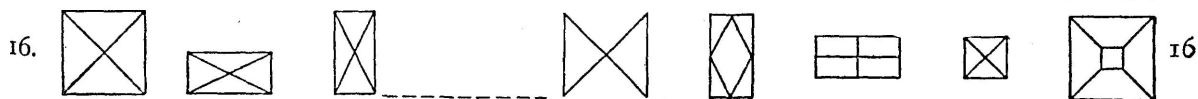
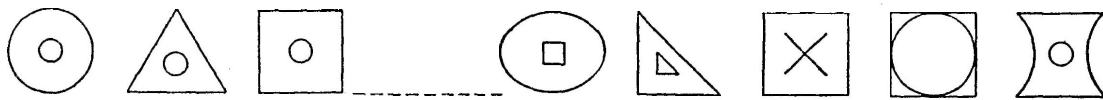
Samples: { hat, collar, glove.....hand, cane, head, shoe, house
 rose, daisy, violet.....bush, red, plant, bed, pansy
 desk, bed, chair.....book, table, floor, pencil, coat

DIRECTIONS. Find the way in which the first three things on a line are alike. Then look at the five other things on the same line and draw a line under the one that is *most* like the first three.

1. red, white, green.....rose, paper, grass, soft, blue..... 1
2. apple, peach, pear.....seed, tree, plum, juice, peel..... 2
3. pan, bowl, basket.....pail, handle, knife, fork, spoon..... 3
4. snake, cow, sparrow.....tree, doll, pig, feather, skin..... 4
5. ship, bicycle, carriage.....sail, automobile, wheel, ocean, harness 5
6. cannon ball, wire, penny.....dollar bill, bone, string, pencil, key... 6
7. president, captain, general.....ship, army, king, republic, soldier.... 7
8. book, teacher, newspaper.....pencil, magazine, ink, card, box..... 8
9. ax, knife, shears.....hammer, razor, hoe, rake, fork..... 9
10. ivory, snow, milk.....butter, rain, cold, cotton, water..... 10
11. day, say, gay.....night, said, joy, happy, lay..... 11
12. nut, turnip, potato.....shell, tree, bush, milk, apple..... 12
13. strong, bad, fast.....and, man, soon, round, come..... 13
14. generous, kind, honest.....strong, selfish, wise, loyal, rich..... 14
15. joy, anger, fear.....habit, memory, hate, life, hearing.... 15

Continue below in the same way.

Sample:



Score.....

Narrative Completion

DIRECTIONS. For each numbered blank in the story, choose the best word of the three in the list having the same number as the blank. Underline the word you choose. You may write these words in the blank spaces if you wish but only the underlining counts. Do nothing about the blanks that are not numbered.

The Reward of Kindness

Underline words here

Once upon a there was a that lived in a One as he was roaming about, he stepped on a and it stuck in his In great pain he out of the in search of some one who would out the

At last he saw a and went up to him as if to say, "..... pull this out of my" The saw what was the and was so to see the lion suffer that he forgot to be frightened. Very he pulled the thorn out of the lion's foot. The was so that he the shepherd's and went away without him.

Not long after, the was blamed for a cruel deed which he had not The said: "He die. Throw into the lion's den." So the king's men shepherd and put him into the with a great It was the very the shepherd had near the forest. And lo! Instead of the the lion only licked his hand.

The was amazed. He the shepherd to his power over the Then the how he had the of Upon this, the said, "This man no deed. Let him go." So the freed and after that no him of Have you heard this story before?

- | | | | |
|--------------|----------|-----------|----|
| 1. time | place | man | 1 |
| 2. man | lion | dog | 2 |
| 3. street | garden | forest | 3 |
| 4. tack | thorn | rock | 4 |
| 5. back | hand | foot | 5 |
| 6. came | limped | ran | 6 |
| 7. shepherd | hunter | woodsman | 7 |
| 8. glad | sorry | anxious | 8 |
| 9. gently | nicely | suddenly | 9 |
| 10. angry | hungry | grateful | 10 |
| 11. hand | sheep | dog | 11 |
| 12. eating | thanking | harming | 12 |
| 13. hunter | king | people | 13 |
| 14. must | may | will | 14 |
| 15. man | shout | lion | 15 |
| 16. fighting | killing | helping | 16 |
| 17. lion | shepherd | king | 17 |
| 18. explain | give | keep | 18 |
| 19. softened | relieved | satisfied | 19 |
| 20. hunger | anger | suffering | 20 |
| 21. king | people | men | 21 |
| 22. cruel | kind | good | 22 |
| 23. dog | lion | shepherd | 23 |
| 24. knew | accused | hurt | 24 |
| 25. many | other | cruel | 25 |

Score.....

TEST 10

Memory

DIRECTIONS. Read each question and if the right answer, according to the story, is *yes*, draw a line under the word *yes*. If the right answer is *no*, draw a line under the word *no*. But if you do not know the right answer, because the story didn't say, draw a line under the words *didn't say*.

Samples :	{	Was the story about a king?	(yes	no	didn't say)
		Was the king's daughter sixteen years old?	(yes	no	didn't say)
		Was she ugly?	(yes	no	didn't say)

Begin here :

- | | | | | |
|---|------|-------------|-------------|----|
| 1. Was the king fond of hearing stories? | (yes | no | didn't say) | 1 |
| 2. Did the king offer his daughter to any one who could tell him a story that would last forever? | (yes | no | didn't say) | 2 |
| 3. Did he offer all his kingdom also? | (yes | no | didn't say) | 3 |
| 4. Did he say, "but if he fails he shall be cast into prison"? | (yes | no | didn't say) | 4 |
| 5. Was the king's daughter pretty? | (yes | no | didn't say) | 5 |
| 6. Did she like stories, too? | (yes | no | didn't say) | 6 |
| 7. Did the story say that after a long time a young man came and offered to tell the king a story? | (yes | no | didn't say) | 7 |
| 8. Did the first man's story last a week? | (yes | no | didn't say) | 8 |
| 9. Was the first man's head cut off? | (yes | no | didn't say) | 9 |
| 10. Did the king then order another man to tell him a story? | (yes | no | didn't say) | 10 |
| 11. Did each man's story last longer than that of the one before? | (yes | no | didn't say) | 11 |
| 12. Were all the young men who came to tell stories handsome? | (yes | no | didn't say) | 12 |
| 13. Did a handsome young man say to the king, "I can tell you a story that will last forever"? | (yes | no | didn't say) | 13 |
| 14. Did the king beg the young man not to try? | (yes | no | didn't say) | 14 |
| 15. Was the king's daughter afraid he would fail? | (yes | no | didn't say) | 15 |
| 16. Did she love him and so not want to see him killed? | (yes | no | didn't say) | 16 |
| 17. Did the young man tell the princess to have no fear? | (yes | no | didn't say) | 17 |
| 18. According to the young man's story, did a rich man order a huge granary built? | (yes | no | didn't say) | 18 |
| 19. Did he have it filled with oats to the very tip-top? | (yes | no | didn't say) | 19 |
| 20. Was a very small hole left between the bricks near the ground? | (yes | no | didn't say) | 20 |
| 21. Was the hole just big enough to let one little ant through? | (yes | no | didn't say) | 21 |
| 22. Did the young man say that one day a little ant went in and carried off a grain of wheat? | (yes | no | didn't say) | 22 |
| 23. Did he say that the next day another little ant went in and carried off another grain of wheat? | (yes | no | didn't say) | 23 |
| 24. Did the king plead with the young man to tell him what happened after that? | (yes | no | didn't say) | 24 |
| 25. Did the young man say, "Why, after that the ants just kept on carrying off the wheat"? | (yes | no | didn't say) | 25 |
| 26. Did the king finally say, "Man, man, your story will last forever"? (yes | no | didn't say) | 26 | |
| 27. Did he say, "Take my daughter and half my kingdom and don't speak to me again"? | (yes | no | didn't say) | 27 |
| 28. Did the young man marry the princess? | (yes | no | didn't say) | 28 |
| 29. Did the king ever want to hear another story | (yes | no | didn't say) | 29 |
| 30. Was the name of this story, "The story that had no end"? | (yes | no | didn't say) | 30 |
| Have you heard this story before? | (yes | no) | | |

Score

Chapter II

The Problem and Procedure of Study.

1. The problem of this thesis is to study the value of the Otis Group Test as a supervisory device in the classification of a school system. The study was made in the Lawrence schools, which were reclassified on the basis of the test.

The primary aim of the thesis is to discover (1) the effects of the Lawrence reclassification and (2) the degree of reliability with which the Otis test was used, both of which are essential in establishing the supervisory value of the test.

The study of the problem was made from three viewpoints: (1) the effects upon the Lawrence schools resulting from the reclassification; (2) the facility of the administration of the Otis test and the general effects resulting from its use; and (3) the degree of reliability with which the test was used.

2. The Procedure

In November 1919 the writer in conjunction with several others gave the Otis General Intelligence Test to all the public school children of Lawrence, from the fourth

to the eighth grades, inclusive. Upon the basis of the results of these tests the children were immediately reclassified. With a few exceptions every child whose ability warranted it was given a special promotion. The exceptional cases were retained because of the nature of their work, their application, their physical condition, and the teacher's prejudice. No demotions were made. The reasons for this were: (1) the reliability of the Otis test as a supervisory device had not been established, and the whole procedure was a matter of experiment; (2) with the exception of one school, slow sections for classes did not exist which could care for those who would be demoted; and (3) it was judged that the discouragement which would result from demotion would counter-balance the value to be derived from it.

The organization of the Lawrence schools greatly facilitated the reclassification of the children. In the elementary schools each grade is divided into B and A classes, the latter being a half-year in advance of the former. At the regular semi-yearly promotions the pupils of the B class enter the A class, and the A class pupils enter the B section of the next higher grade.

In the Junior high-school, which comprises the 7th and 8th year, the same class divisions exist. In addition to these divisions, each class was roughly grouped

into three sections according to ability,- the dull group the normal group, and the accelerated group.

In the elementary school the reclassification consisted in transferring children of very superior intelligence into the next higher class. In one school, where slow and fast sections for certain classes existed, regroupings together with special promotions were made.

In the Junior high-school the reclassification consisted only in the regrouping of children on the basis of ability. After the mental tests were given an additional group of children, however, was recognized. All children of the Junior high-school were thus grouped as superior, normal, dull, and mentally retarded. Terman's classification was used as the basis of the grouping. All children with an I.Q below 70 were placed in the lowest or most inferior group; those with I.Q's between 70 and 90 were considered as dull and were placed in group 3; those with I.Q's of 90 to 120 were placed in the normal group; and those with I.Q's above 120 were considered as superior and were placed in the highest group of the grade.

3. The Sources of Data.

The investigation sought information on three points:

I. The effects of the reclassification.

--- --

a. The immediate effects.

- (1) The similarity of ability secured in classes.
- (2) The nature of the marks received by all groups of students.
- (3) The quality and quantity of work produced according to teachers' judgment.

b. The specific effects.

The nature of the school work of children of dull, normal, and superior intelligence.

II. The General Effects of the Administration of the Otis Test.

a. The resulting school spirit.

b. The attitude of the community.

c. The Superintendent's estimate.

III. The degree of reliability with which the Otis test was used.

- a. The correlation between Otis I.Q.'s and school failures.
- b. The percent of failures of children receiving special promotion.
- c. The correlation of the Otis test with the Stanford Revision of the Binet test.

The sources of data for part I were: (1) the intelligence quotients of 1005 children; (2) the mental age and grade placement of all children in the 5th and 6th grade classes that were affected by the special promotions; (3) a questionnaire answered by 17 elementary teachers and 11 Junior high school teachers; and (4) the quality of school work, as represented by teachers' marks for 269 5th and 6th grade children.

The sources of data for part II were: (1) personal interviews with supervisors and principals; (2) replies from a personal letter sent to the parents of all children receiving special promotion; and (3) a statement made by the Superintendent concerning the effects of the use of the intelligence tests upon the school system.

The sources of data for part III were: (1) the Binet and Otis I.Q.'s for 62 Junior high-school children and for 92 grade children; (2) the number of failures of children who received special promotion; and (3) the I.Q.'s of both Junior High-school and Grade children.

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Chapter III.

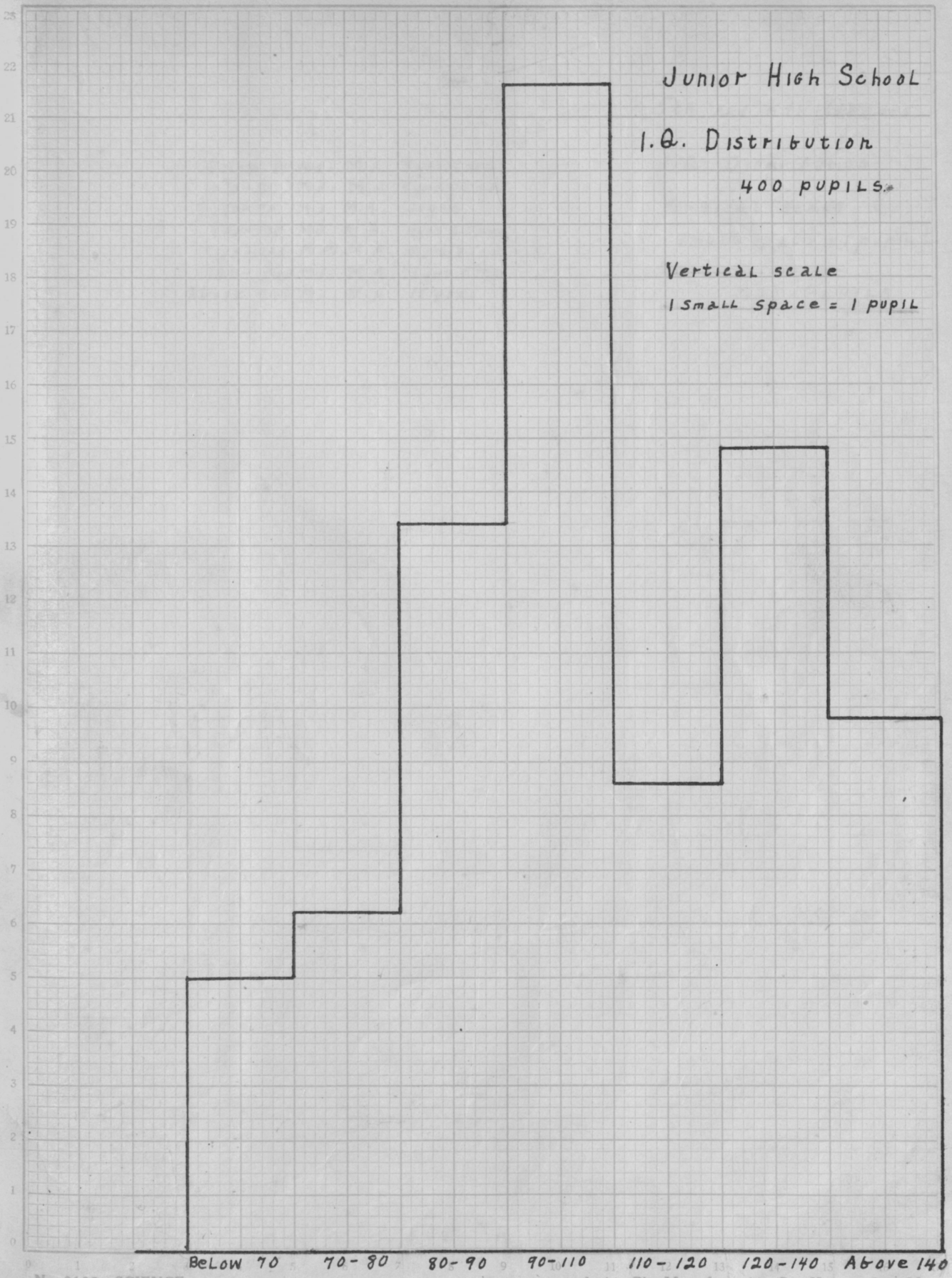
The Effects of the Reclassification of the Lawrence Schools on the Basis of the Otis General Intelligence Test.

I. The Results Obtained from the Otis Test in the Lawrence Schools.

The results obtained from giving the Otis test are presented in the form of graphs, tables, and charts. No attempt is made to interpret the test results since the burden of the thesis is to discover the supervisory value of the test as shown in the effects of the reclassification. Furthermore, no interpretation of the results is given for it has not yet been ascertained what degree of mentality any given Otis I.Q. designates. The I.Q.'s will be of special interest to those interested in the reliability of the Otis test. They give the basis on which the Lawrence schools were reclassified.

The I.Q. results are given separately in the form of distributions for the Junior high-school, the 5th and 6th grade school children, and for the various Lawrence school buildings, Figs.1-2, 4-11.

Table I gives the number and per cent of students enrolled in grades above the 3rd in each of the designated I.Q.groups.



Junior High School

I.Q. Distribution

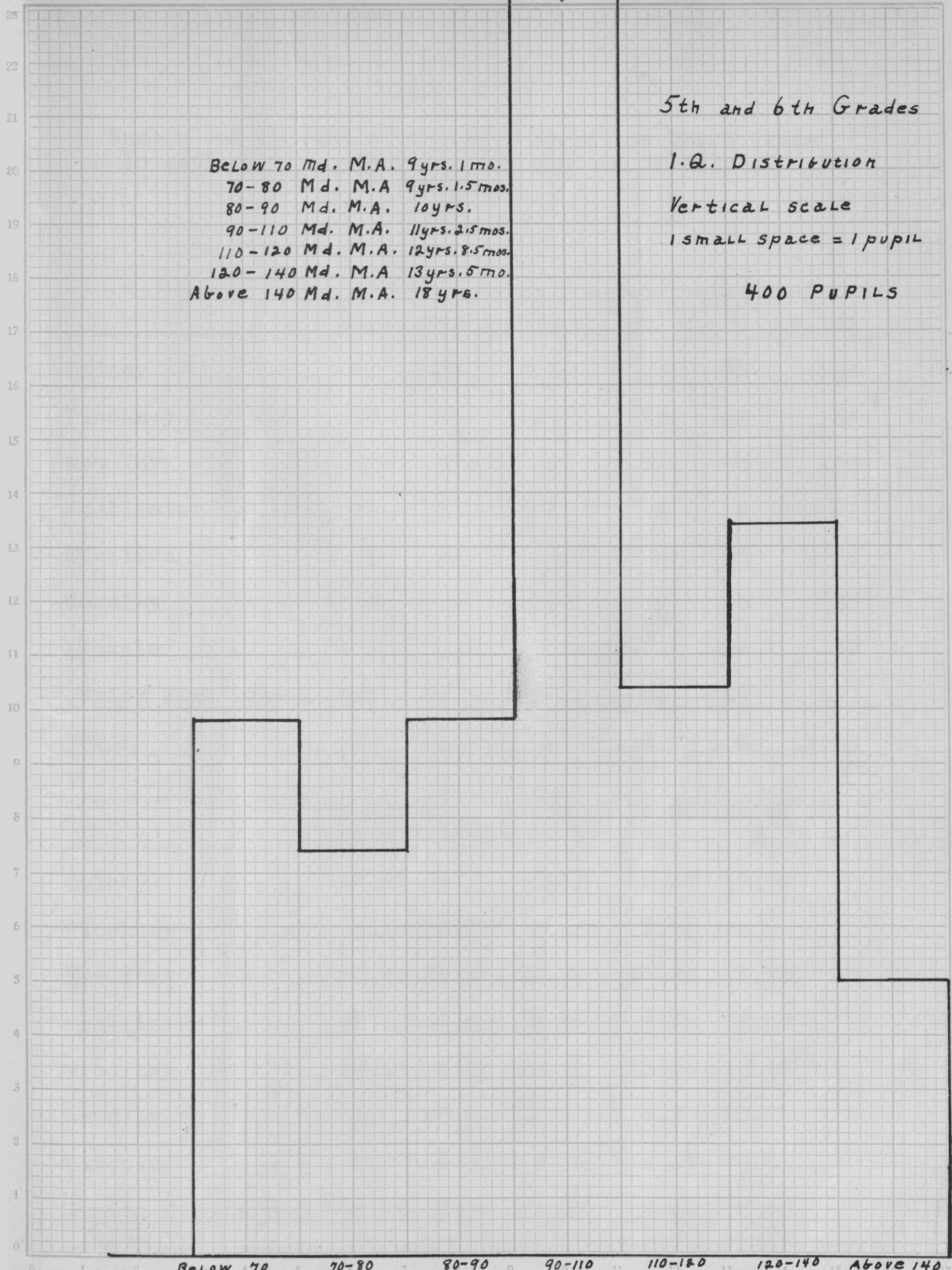
400 pupils

Vertical scale

1 small space = 1 pupil

Below 70 70-80 80-90 90-110 110-120 120-140 Above 140

Fig. 1



Below 70 Md. M.A. 9 yrs. 1 mo.
 70-80 Md. M.A. 9 yrs. 1.5 mos.
 80-90 Md. M.A. 10 yrs.
 90-110 Md. M.A. 11 yrs. 2.5 mos.
 110-120 Md. M.A. 12 yrs. 8.5 mos.
 120-140 Md. M.A. 13 yrs. 6 mo.
 Above 140 Md. M.A. 18 yrs.

5th and 6th Grades

I.Q. Distribution

Vertical scale

1 small space = 1 pupil

400 PUPILS

FIG. 2.

TABLE I.

Number and Percent of Students Above the Third Grade
in each of the I.Q. Groups for all the Schools of
Lawrence.

	110 and above:	90- 110	80- 90	70- 80	Below: 70	Total	*
Quincy	70	50	15	9	25	169	
Pinckney	50	54	16	12	32	164	
New York	20	27	22	14	23	106	
McAllister	15	19	7	2	4	47	
Woodlawn	8	12	8	9	28	65	
Cordley	8	9	3	0	5	25	
Lincoln	0	3	2	3	24	32	
Junior High School	166	108	67	31	25	397	
TOTAL	337	282	140	80	166	1005	

	110 and above %	90- 110 %	80- 90 %	70- 80 %	Below 70 %	
Quincy	41.42	30	8.87	5.38	14.79	
Pinckney	30.48	32.31	9.87	7.31	20.	
New York	18.86	25.47	20.75	13.20	21.70	
McAllister	31.91	40.42	14.89	4.25	8.57	
Woodlawn	12.30	18.46	12.30	13.84	43.07	
Cordley	32.	36.	12.	0.0	20.	
Lincoln	0.	9.37	6.25	9.37	75.	
Junion High School	41.81	27.20	16.87	7.80	6.22	
TOTAL	35.5	28.05	13.93	7.96	16.51	

The above tables show that 33.5 per cent of the 1005 children tested had intelligence quotients of 110 and above; 28.05 per cent had I.Q.'s ranging from 90 to 110; 13.93 per cent had I.Q.'s between 80 and 90; 7.96 per cent I.Q.'s between 70 and 80; and 16.51 per cent had I.Q.'s below 70. These data indicate, with the exception of those who made I.Q.'s below 70, that there is an increasing per cent of students in each of the higher I.Q. groups. The table also shows that 62 per cent of the enrollment from the fourth grade to the senior high-school had I.Q.'s above 90.

The results of the test for the 4th grade were not used as a basis for classification. These results were considered as questionable, since such a large percentage of the children made I.Q.'s below 70 or had mental ages below 8. Without doubt some of these children had mental ages below 8, but probably not such a high percentage as the test results gave. Fig.3 shows the I.Q. distribution for this grade.

Fig.11 shows the I.Q. distribution for a school of Negro children. The graph shows that 75 per cent of the colored children made I.Q.'s below 70 in the Otis test. Various studies of the intelligence of Negro children do show them to be inferior to white children, mentally, but whether such a high percentage of these children should have I.Q.'s below 70 is not established.

1.0 Distribution 4th Grade

Below 70	Md. M.A.	Below 8
70-80	Md. M.A.	8 yrs. 6 mo.
80-90	Md. M.A.	8 yrs. 8 mo.
90-110	Md. M.A.	9 yrs. 8 mo.
110-120	Md. M.A.	10 yrs. 9 mo.
120-140	Md. M.A.	10 yrs. 11 mo.
Above 140	Md. M.A.	12 yrs. 2.5 mo.

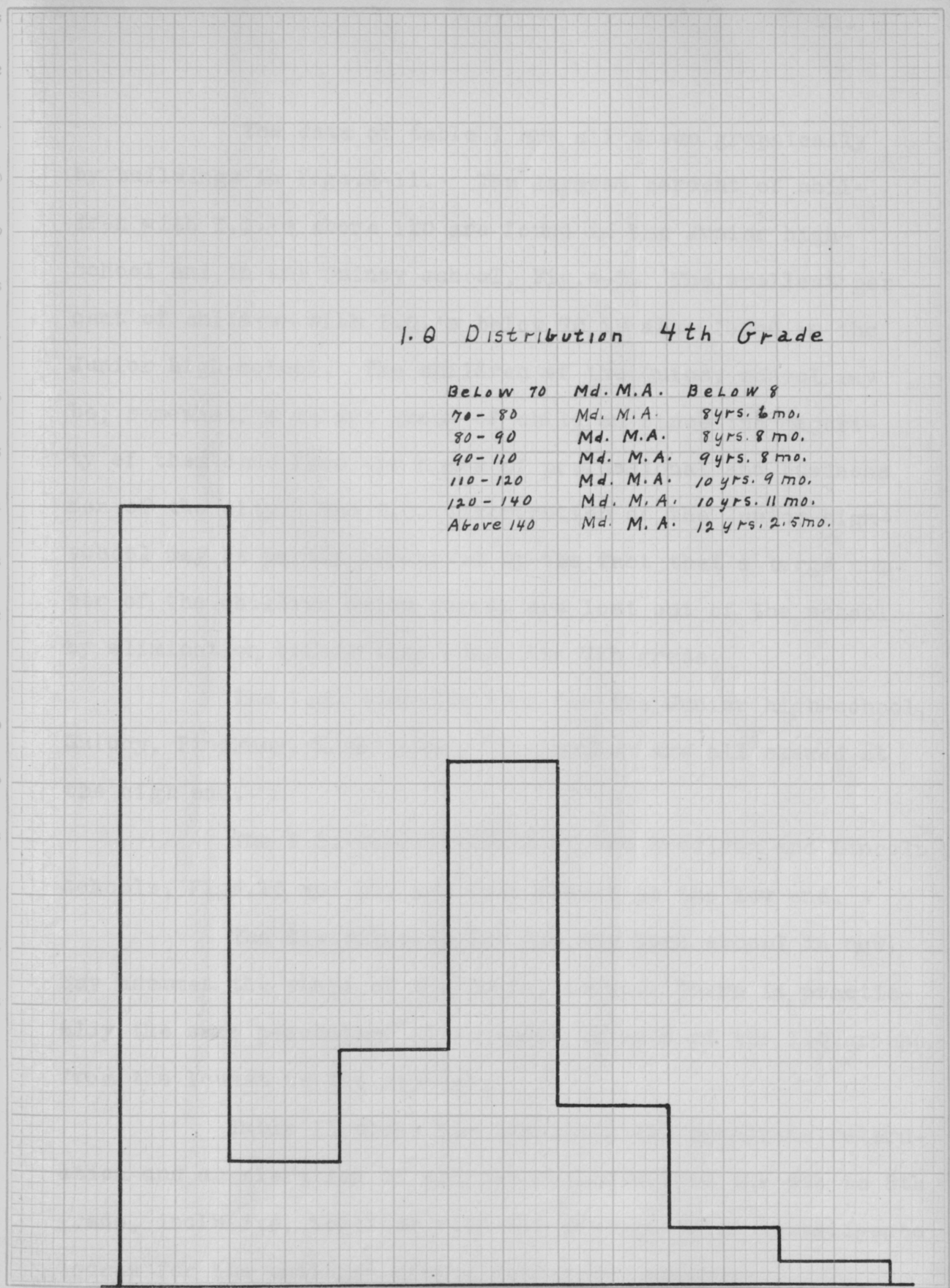


FIG. 3

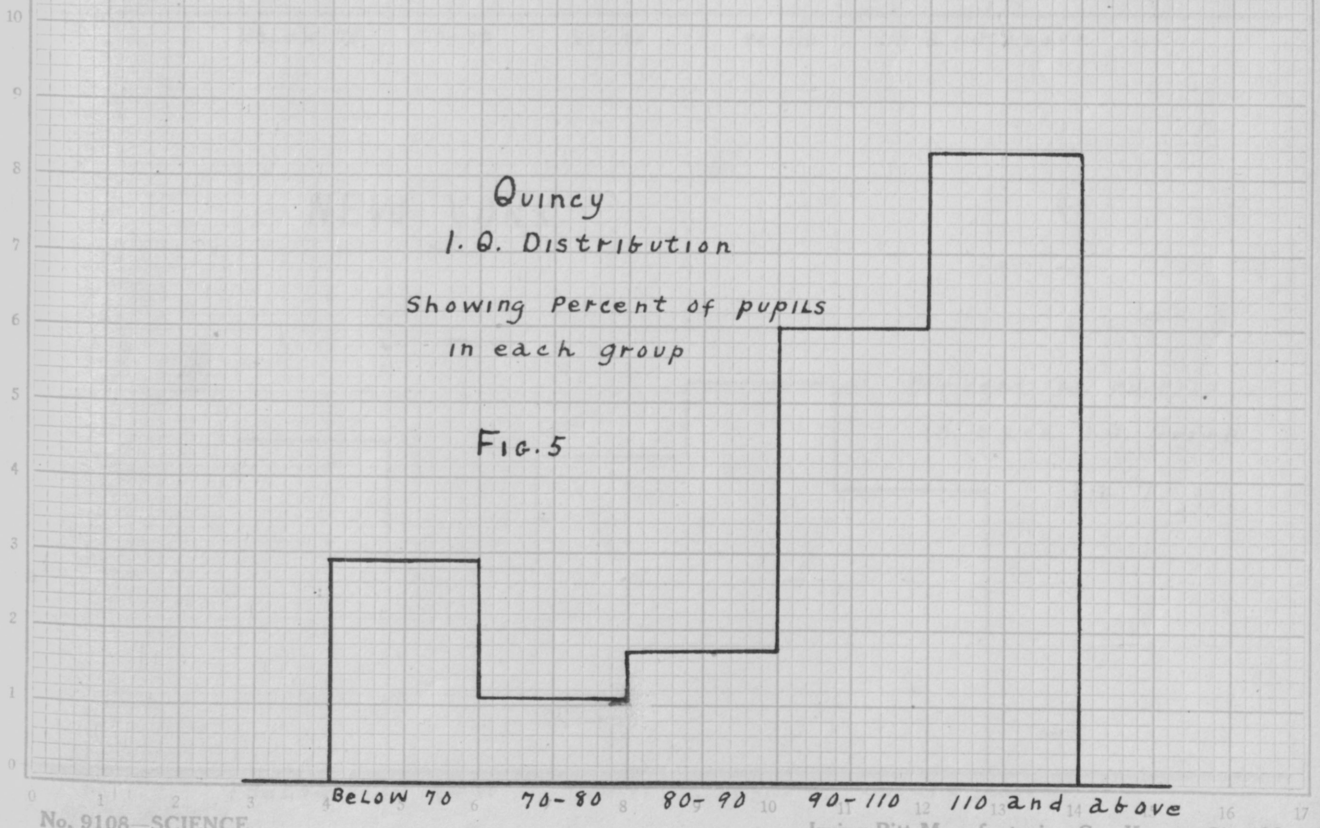
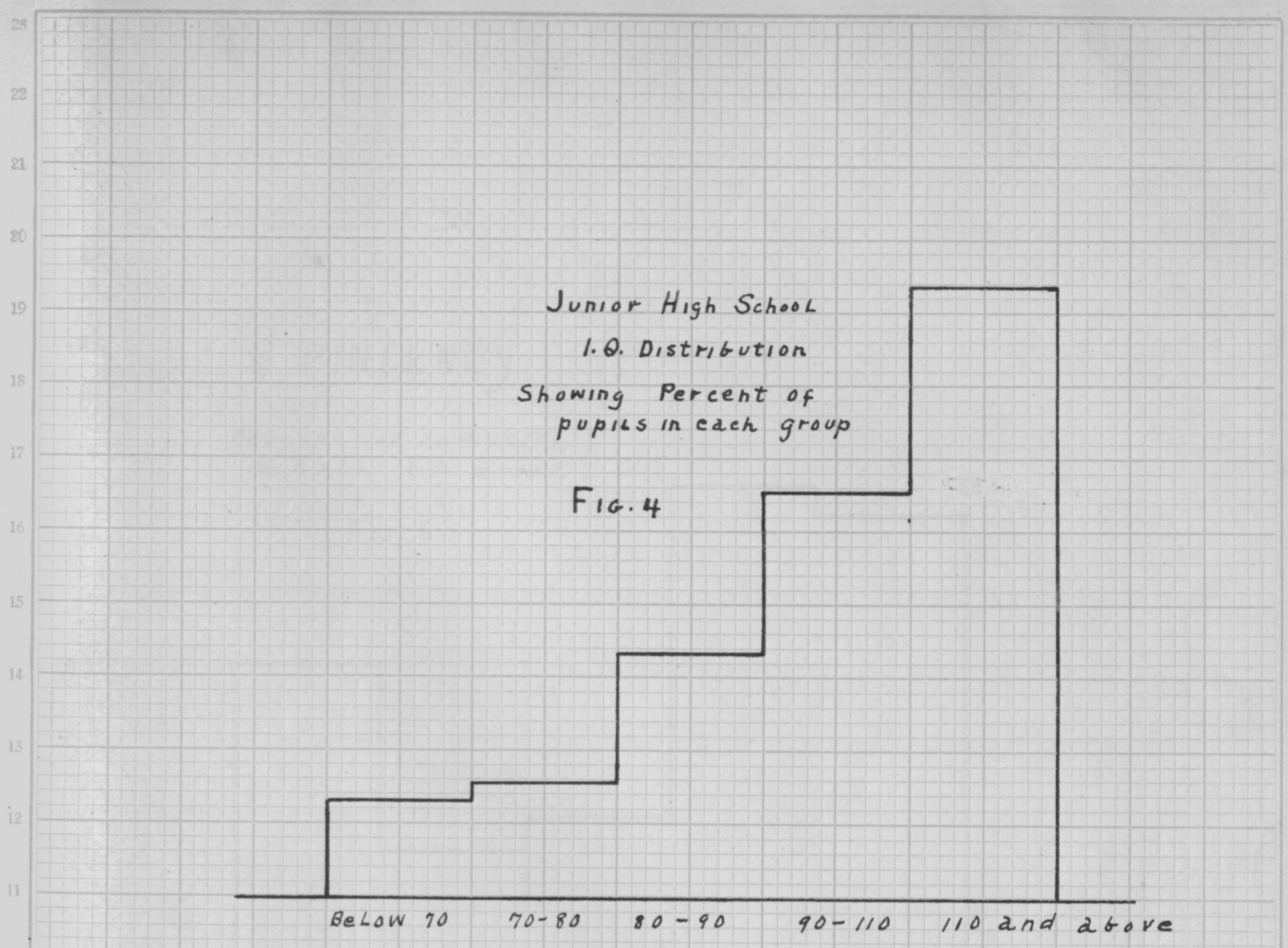
The data of table I are all shown graphically by buildings in Figs.4-11. The largest percent of children with I.Q.'s above 110 are found in the Junior high-school and in the Quincy school, Fig.4-5. The smallest percent of children with I.Q.'s below 70 is also found in the Junior high-school. The children of the Quincy school may be, somewhat, a select group of children since the majority of them come from the homes of professional and business men of the city. The I.Q. distribution of the Junior high-school may be partly explained by the fact that a large number of the children below normal are lost out of the school by elimination before they reach the 7th grade.

The I.Q. distributions for the Junior high-school, Quincy, Pinckney, McAllister, and Cordley are all skewed at the high end.

The I.Q. distributions of the Woodlawn and Lincoln schools, Figs.10 and 11, are both skewed at the low end.

The distribution for the New York school in now way assumes the shape of the normal curve. There is practically the same percentage of students in each of the I.Q.groups from the lowest to the highest.

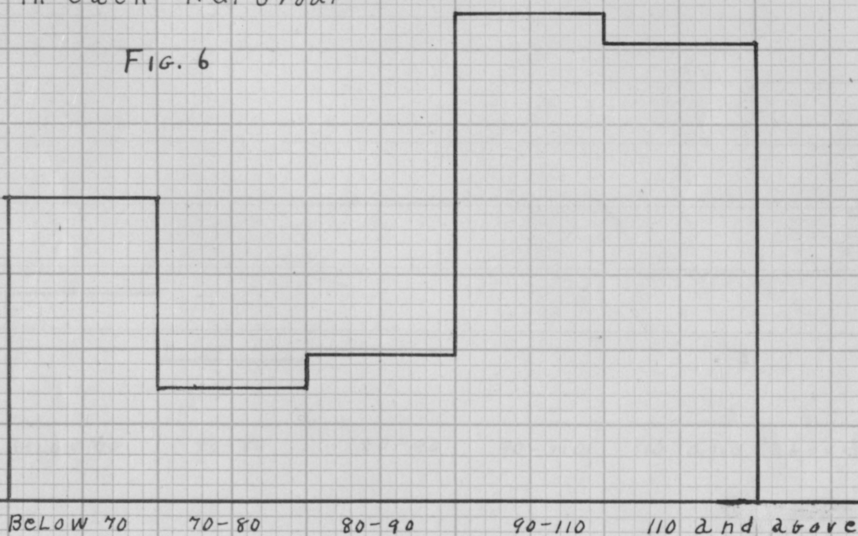
Table II shows the chronological age-grade retardation and acceleration of all the children from the 4th to 8th grade, inclusive, together with the average total intelligence scores for the children of the respective grades.



PINCKNEY

Percent of PUPILS
in each I.Q. Group

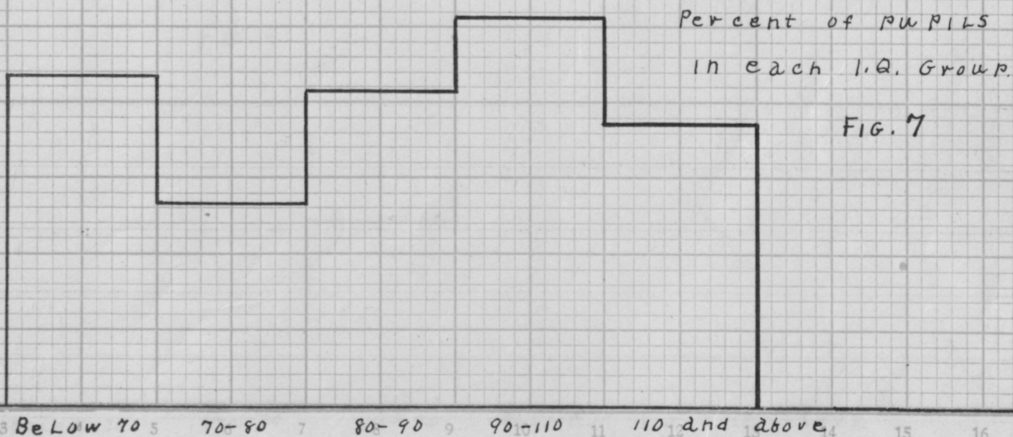
FIG. 6



NEW YORK

Percent of PUPILS
in each I.Q. Group

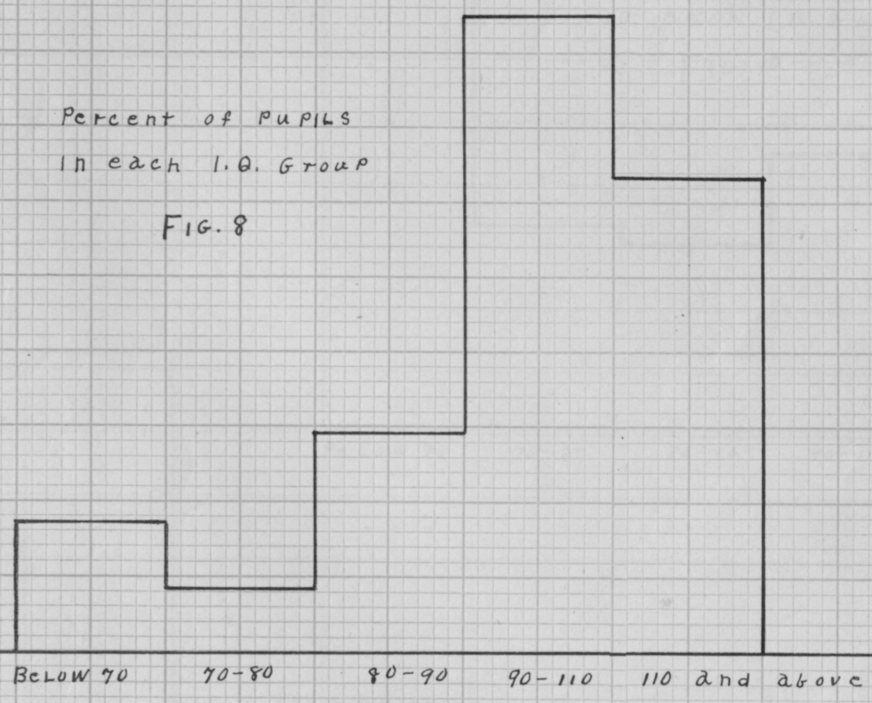
FIG. 7



McALLISTER

Percent of PUPILS
In each I.Q. Group

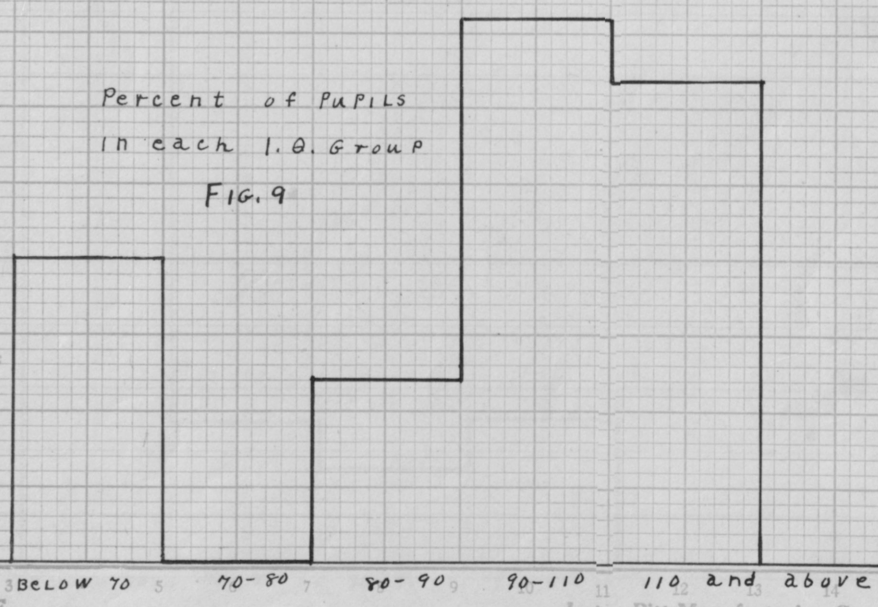
FIG. 8



CORDLEY

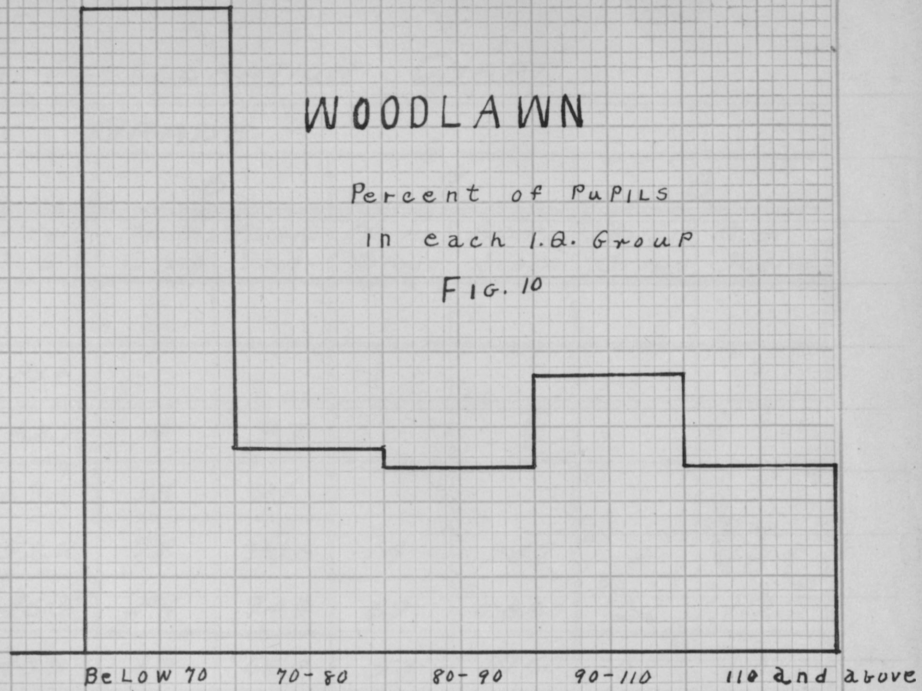
Percent of PUPILS
In each I.Q. Group

FIG. 9



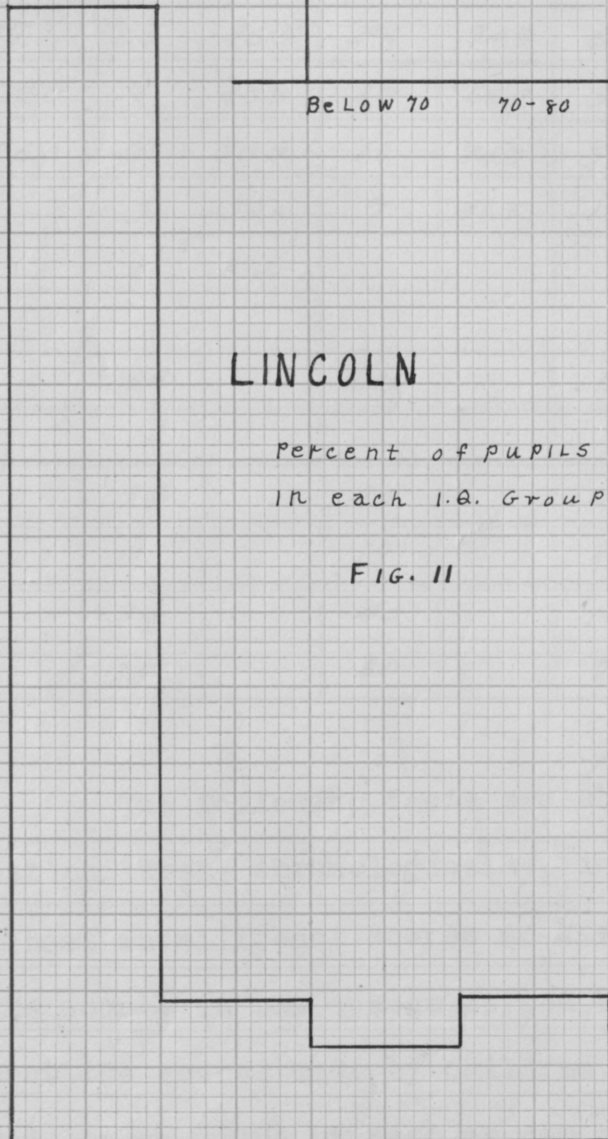
WOODLAWN

Percent of Pupils
in each I.Q. Group
FIG. 10



LINCOLN

Percent of pupils
in each I.Q. Group
FIG. 11



RETARDATION-ACCELERATION CHART.

AGE	GRADE									
	4		5		6		7		8	
	No. in Group	Aver. Score	No. in Group	Aver. Score	No. in Group	Aver. Score	No. in Group	Aver. Score	No. in Group	Aver. Score
7	1	51								
8	29	40.9	9	81.6						
9	80	39.0	25	62.7	4	93				
10	52	33.0	85	63.4	36	91				
11	25	36.0	75	52.2	72	90.6	14	94.7	2	101.5
12	11	17.1	20	46.5	54	74.9	69	108.84	20	112.15
13	5	22.8	7	40.3	23	66.2	54	97.66	42	110.76
14	1	26.0	3	38.3	10	74.3	31	82.48	33	94.18
15			3	39.0	7	41.5	17	80.23	16	94.61
16			1	13.0			3	42.66	7	72.57
17									2	55.00
Total	204		228		206		188		122	Grand Totals
										948
Retarded	42		34		40		51		25	192
Per Cent Retarded	20.5		15		19		27		20	20.3%
Accelerated	30		34		40		14		22	140
% Accelerated	14.7		15		20		7.4		18	14.76%

The following facts are shown by this table: The youngest children, chronologically, in the various grades made the highest intelligence scores or have the highest mental ages. The scores in the spaces marked between the heavy lines represent the scores made by children who fell into the normal age-grade group. The highest scores are always made by the accelerant children whose scores are immediately above the norm-

al age-grade scores. Below the normal age-grade scores are the scores made by the retarded children. The chart shows that in every instance the latter are lower, and that the greater the retardation the lower the scores that are made.

It is interesting to note that the oldest child in the 4th grade, who was 14 years old, made a score of 26, while the youngest child in the grade, 7 years old, made a score of 51. In the 5th grade the lowest intelligence score was 13 made by a 16 year old individual, while the highest score was 81.6 made by an 8 year old child. The data of this table show that altho a retarded child may be twice as old, chronologically, as another child, yet his score is only from 1/6 to 1/2 as high. The conclusion drawn is that the correlation of I.Q.'s and chronological age among children of any given grade is negative. In other words the older children in a given grade have lower I.Q.'s than the younger children.

The table also shows the per cents of pupils in each of the grades that are retarded and accelerated. In grades 5, 6, and 8 approximately, the same per cent of pupils are retarded that are accelerated. In grades 4 and 7 a larger per cent of children are retarded. The chart shows that the greatest per cent of retardation is in the 7th grade. This may partly be explained by the fact that a number of over-age and dull pupils enter the first year of the Junior high-school for the special types of school work offered, but are gradually elimi-

nated before they finish the 8th grade or reach the Senior high-school. This is shown in the chart. The retardation is 7 per cent less in the 8th grade than it is in the 7th.

The average total per cent of retardation for the 4th to the 8th grade, inclusive is 5 per cent greater than the acceleration. Since the data show that from 15 to 27 per cent of the children in a given grade are retarded, the conclusion is drawn that previous to the reclassification, the children were not placed in the school system so that they could advance according to ability.

II. The Immediate Effects of the Re-classification of Children According to Ability.

Since only four months have elapsed since the Lawrence schools were reclassified on the basis of the Otis test, it is too early to measure the lasting or permanent effects of the classification. Yet at this time some effects of the classification are plainly observable. Very marked indications of the value of the experiment have been shown in (1) the greater similarity of ability in classes, (2) the higher marks received by all groups of students, and (3) the better quality and greater quantity of work produced according to teachers' judgment.

1. The Decrease in the Mental Age Range in Classes.

The primary purpose of giving the Otis General Intelligence test was to secure a scientific basis on which

children could be grouped according to ability and properly placed in the school system.

Since the decrease in the range of mental age within classes is first of all desirable, the question might well be asked: Did such a decrease result after the reclassification? A careful study has shown that there is a marked decrease in the range of mental maturity, which also means that a greater similarity of ability was secured in the respective classes. The effect of this greater similarity of ability upon school work has been so marked that substitute teachers and casual visitors have noted it with great interest. This observation is not ungrounded, for a comparative study of the mental age range before and after the reclassification shows that the latter has been materially shortened.

The results of this study are shown in Figs.12-31. The graphs show three things: (1) the distribution of ability in classes, in the terms of mental age, (2) the promotion of those of advanced mental maturity, and (3) the distribution curves of mental ages within classes as they existed after all the special promotions were made.

Figs.12 and 13 show the effect of the reclassification on a 6 A class in the Quincy school. The range of mental age or mental maturity was decreased, materially, by promoting the two children of fourteen and eighteen year old intelligence; and a better distribution of ability was se-

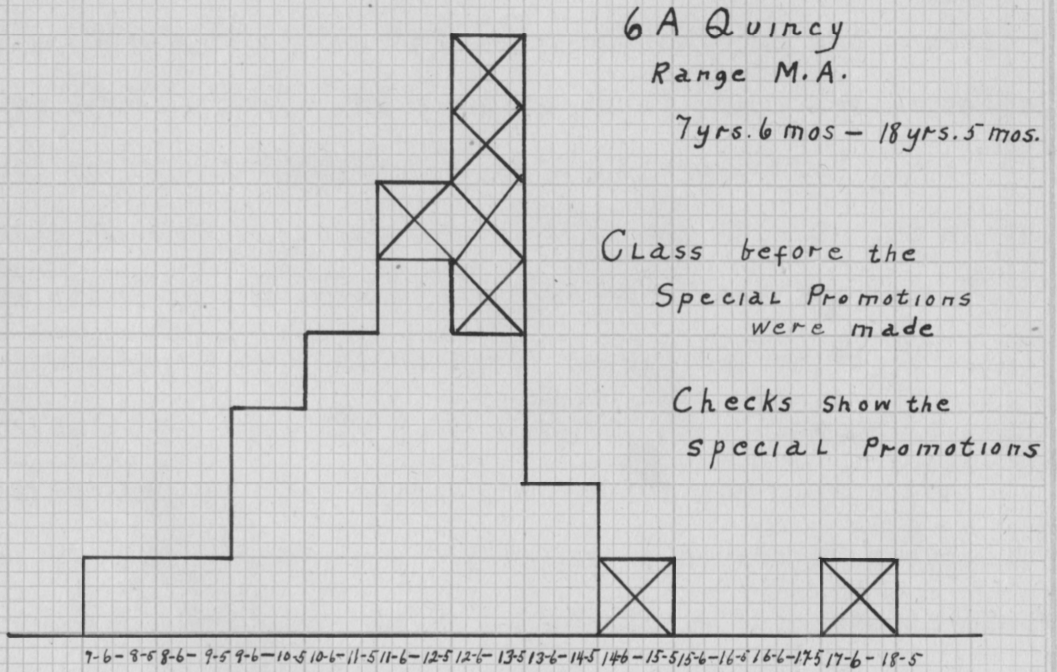


FIG. 12

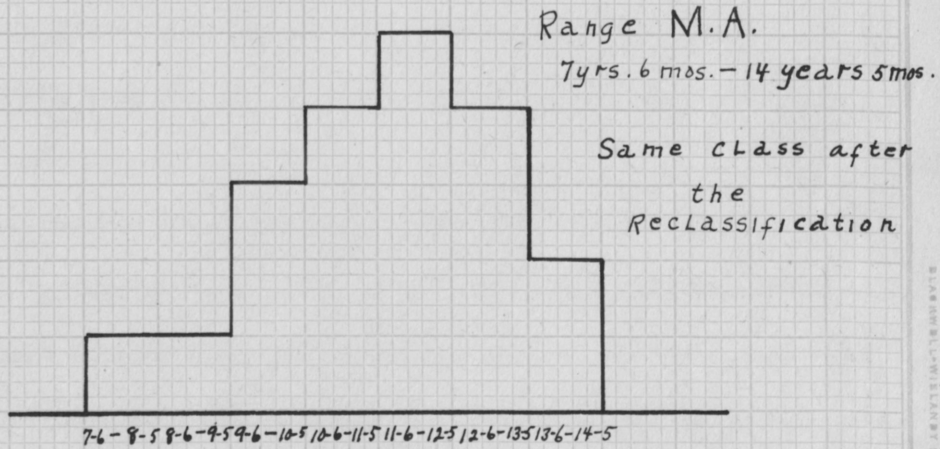


FIG. 13

LABORATORY OF THE U.S. DEPARTMENT OF LABOR

cured by promoting the five brightest students in the mental age groups from 11 years and 6 months to 13 years and 5 months. The effect of the classification on the distribution curve may readily be seen in comparing Figs.12 and 13. Fig.14 shows the curve after the special promotions were made into the class. The special promotions again skewed the curve, but they represent children that are much younger, chronologically, than the other members of the class. The school administration could not provide classes for such a small number of specially gifted children, and they had to be placed in the regular classes. But in a year such children will, probably, be ready for an additional special promotion, while the rest of the class continues to progress, normally.

The reclassification in all the schools, with the exception of Pinckney, consisted only in the promotion of children with I.Q.'s of 120 and above. In the Pinckney school not only the mentally superior child was promoted, but those of inferior ability were placed in slower sections of classes, already then existing.

Thus since the reclassification consisted for the most part in the promotion of the child of exceptional ability, the result is that while the upper ends of the mental age distribution curves more nearly assume the normal probability curve, the lower ends still remain weighted with those who had mental ages several years below that of the median of the class.

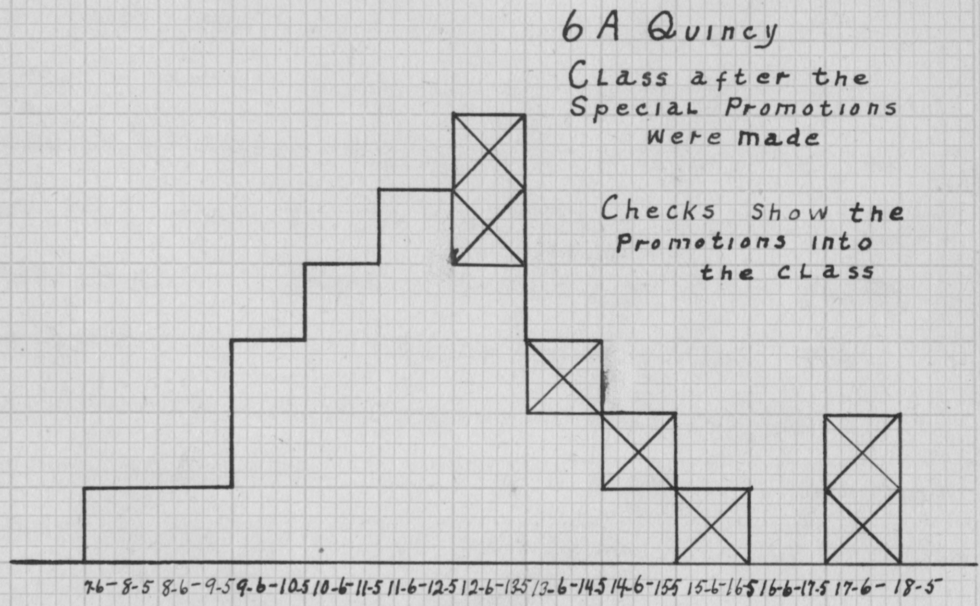


FIG. 14

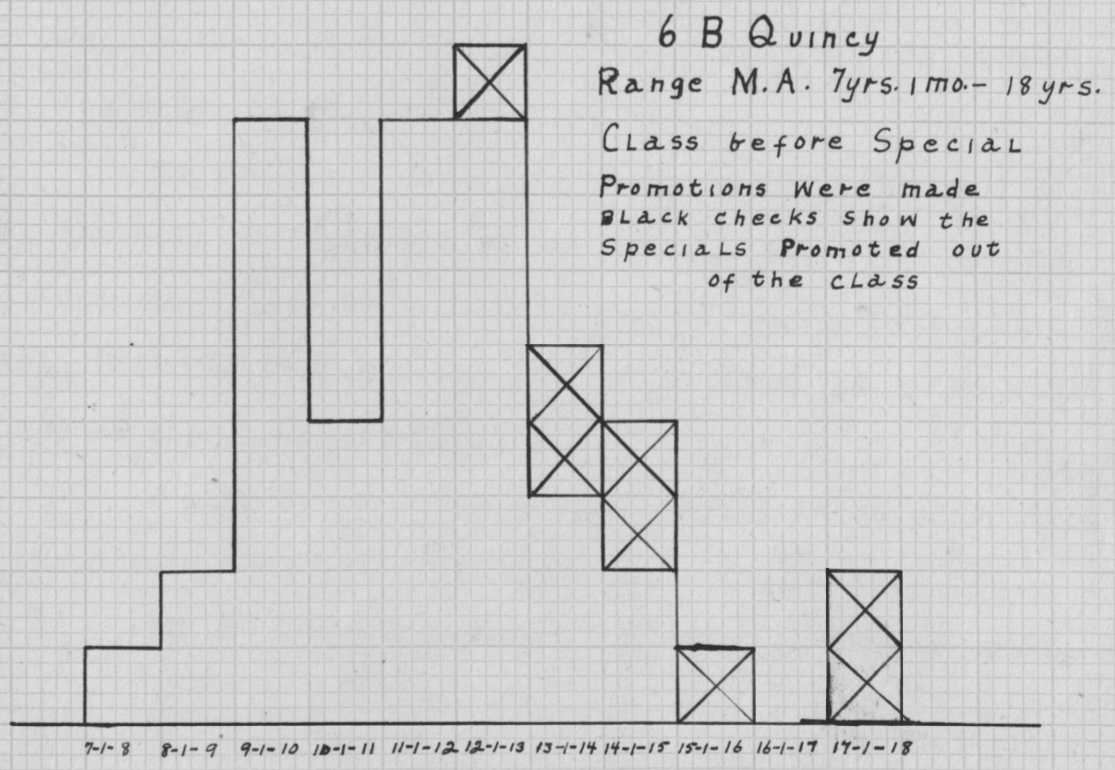


FIG. 15

This is very clearly shown in Figs. 13, 15, 16, and 27.

The effect of decreasing the range of mental maturity in classes by eliminating those at both ends of the curve is strikingly shown in the 6th B class, Pinckney, Figs. 17-19. Figure 18 shows a range of mental age of ten years, - from 7 years and 9 months to 17 years and 8 months. The black checks in Fig.18 show the number of children taken out of the class by reclassification. Fig.19 shows the same class after all transfers and promotions were made. The curve closely approximates the normal curve, and shows a far greater similarity of mental age in the class than existed before the reclassification. The range of mental maturity was reduced nearly one half of what it had been previously.

Figures 20 to 25 inclusive show in a less marked degree the value of the reclassification.

Figure 26 shows, very particularly, the need of taking the dull children out of the class. Fig.27 shows the effect upon the class by promoting the gifted children. Had the dull children been removed from this class the curve would have become approximately normal.

Fig.28 shows practically a normal curve after all promotions were made both out of and into the class.

Fig.30 shows the effect of reducing the bi-modal

6B Quincy

Class after the Special Promotions were made into the class

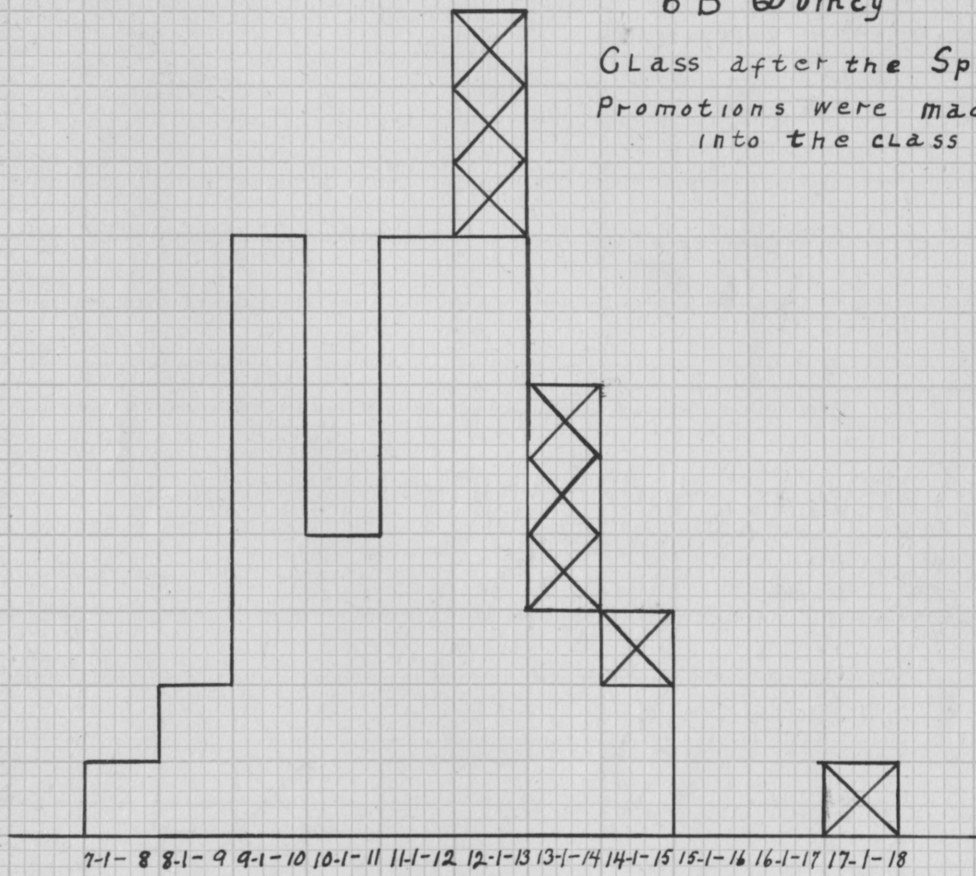


FIG. 16

6 B Pinckney

Class before the Special Promotions were made

Range M.A.

7 yrs. 9 mos. - 17 yrs. 8 mos.

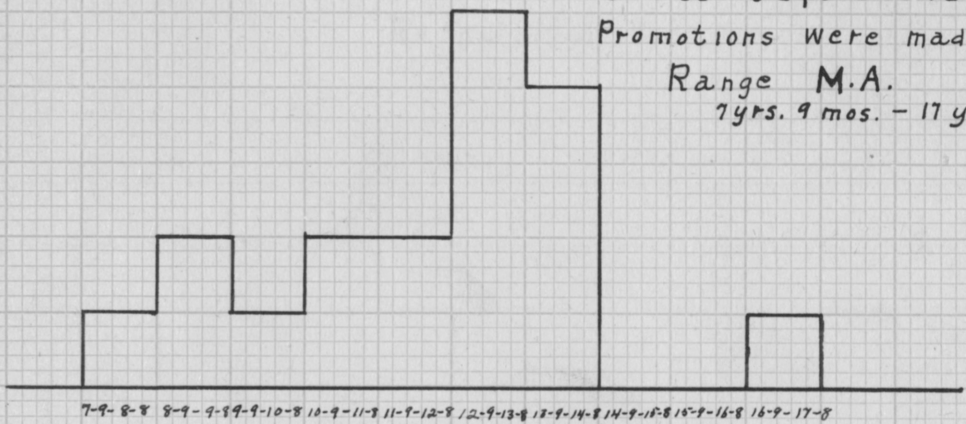


FIG. 17

Same Class after the Promotions were made out of the class.

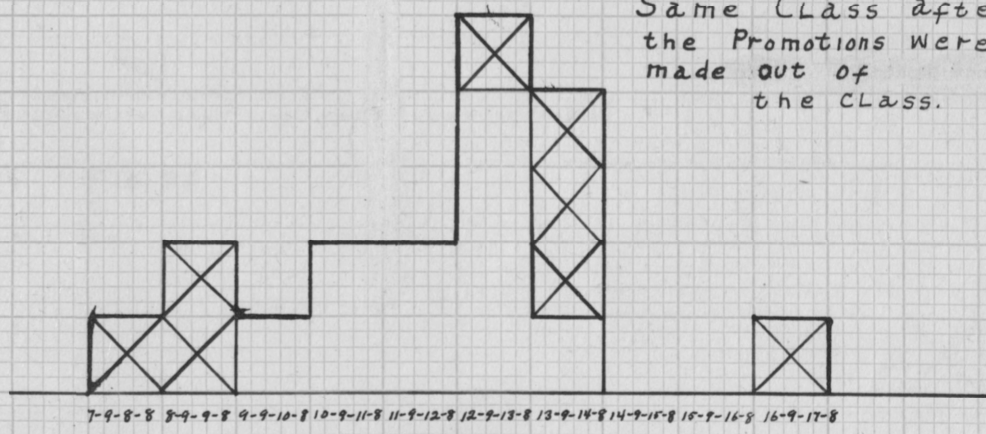


FIG. 18

Same Class after ALL the Promotions were made

Black checks are the Promotions into the class

Range M.A.

9 years 9 mos. - 15 yrs. 8 mos.

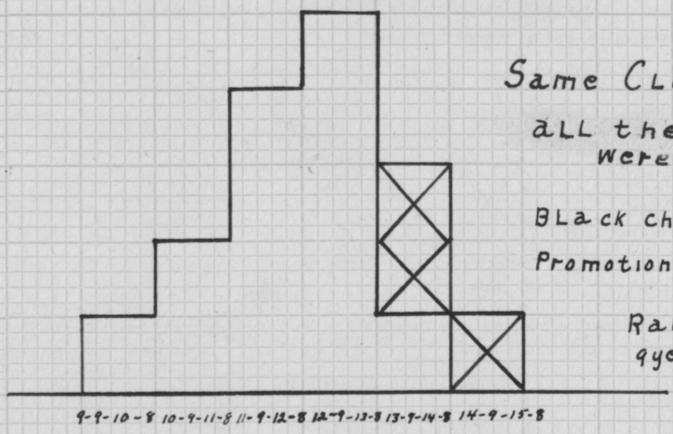


FIG. 19

CLASSIFICATION: UNCLASSIFIED DATE: 08-29-2012 BY: 60322 UCBAW

5 A Pinckney
 Class before the Special
 Promotions were made
 Range M.A. 7yrs. 9 mos. - 16yrs. 5 mos.

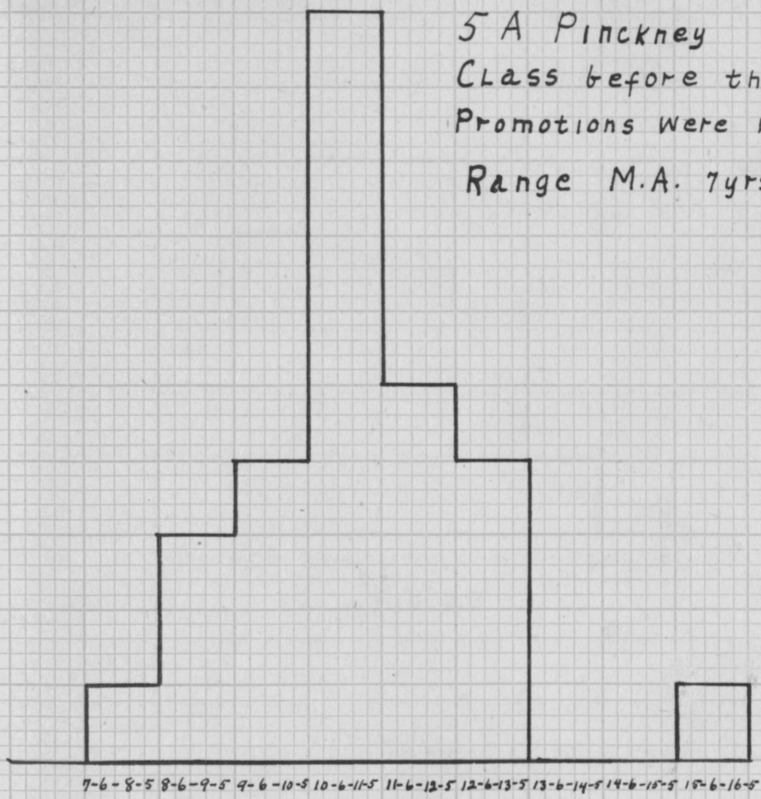


FIG. 20

Same class
 after the
 Promotions
 were made
 Range M.A.
 7-6 - 14-5
 Checks show
 Promotions
 into the class.

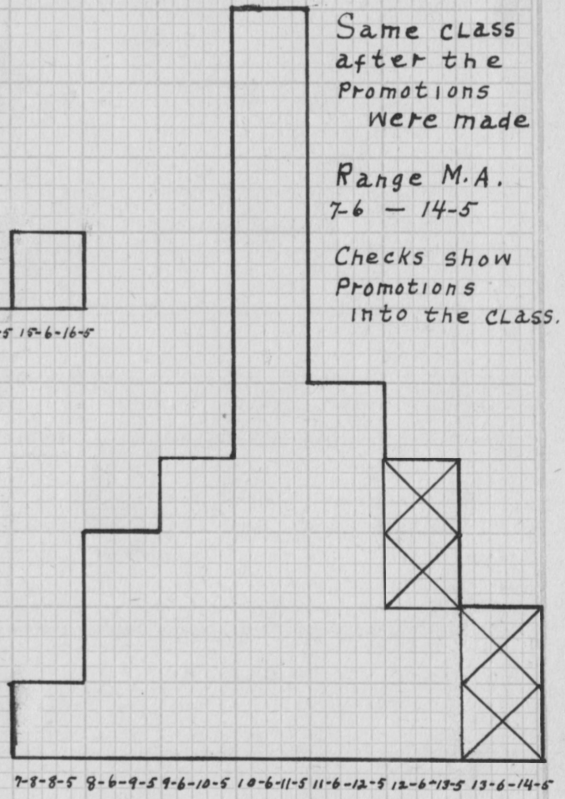


FIG. 21

Black checks show the
 Special Promotions
 out of the class.

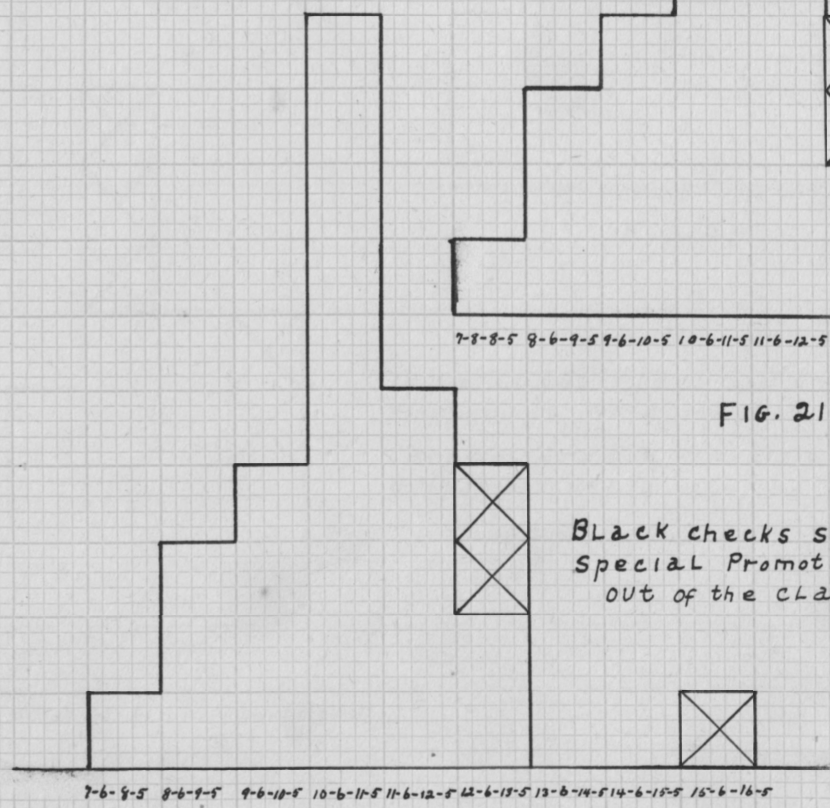


FIG. 22

6A Pinckney

Class before the Special Promotions were made

Range M.A. 9yrs. 5mos. - 17yrs. 4mos.

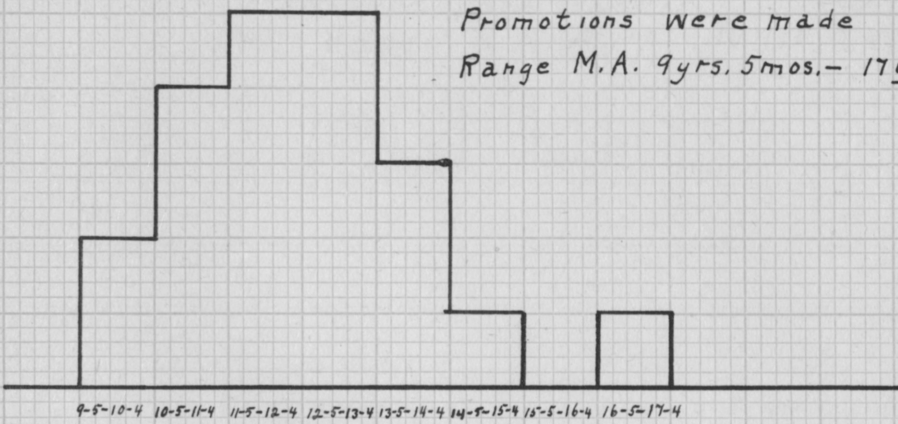


FIG. 23

Same Class after the special promotions were made

Range M.A. 9yrs. 5mos. - 15yrs. 4mos.

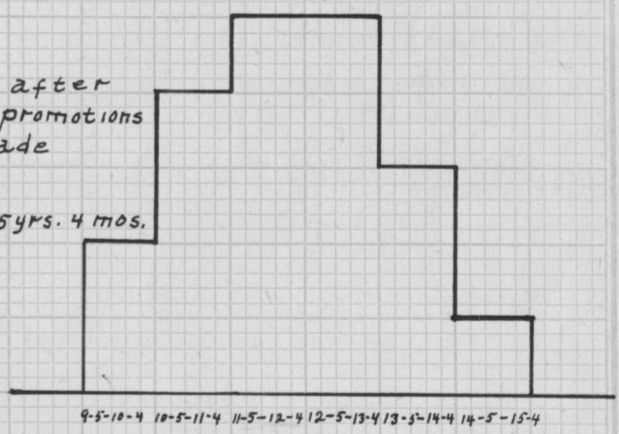


FIG. 24.

Same Class after all the special promotions were made

Checks show the special promotions made into the class

Range M.A. 9yrs. 5mos. - 15yrs. 4mos.

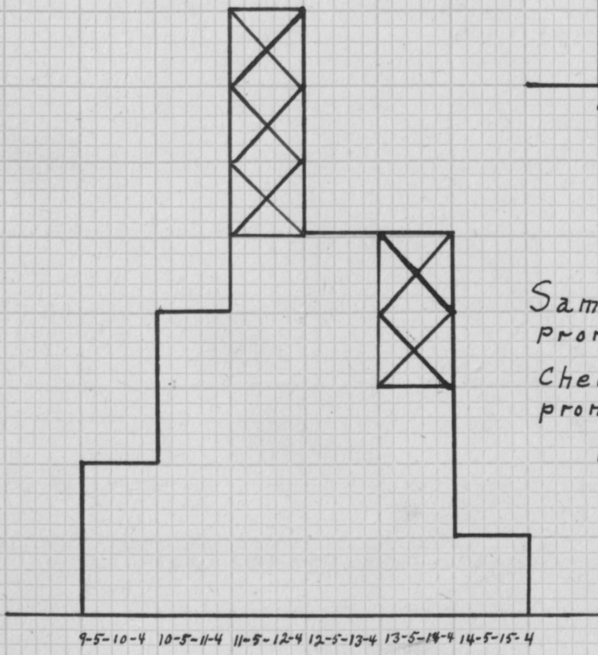


FIG. 25

curve of Fig.29, until the number of pupils at the upper end nearly equals the number at the lower end.

Fig.31 shows a class from which no special promotions were made. At least five children at the upper end of the curve should have been promoted in order to have lessened the range of mental age in the class. Several causes were germane for not making these special promotions, chief of which was the teachers' prejudice.

Although this is the first year that reclassification according to ability has been attempted in Lawrence, the effect as shown by the graphs has been to decrease the range of mental maturity in classes from 25 to 50 per cent. This points to a greater similarity of ability in such classes, a condition necessary if children are to progress according to ability. The classes would have been still more nearly homogenous as to ability had the children represented at the lower end of the frequency distributions been removed from the classes. The graphs as a whole show that Otis test results can be used effectively in reducing the mental age range, and in securing a greater similarity of ability in classes, which makes it possible for classes to function more effectively as units.

2. The Effects of the Classification as Shown by the Comparative Increase and Decrease in Teachers' Marks.
-

5 B Mc ALLISTER
 Range M.A. 7yrs.1mo. - 15yrs.1mo.
 Class before the Special Promotions were made.

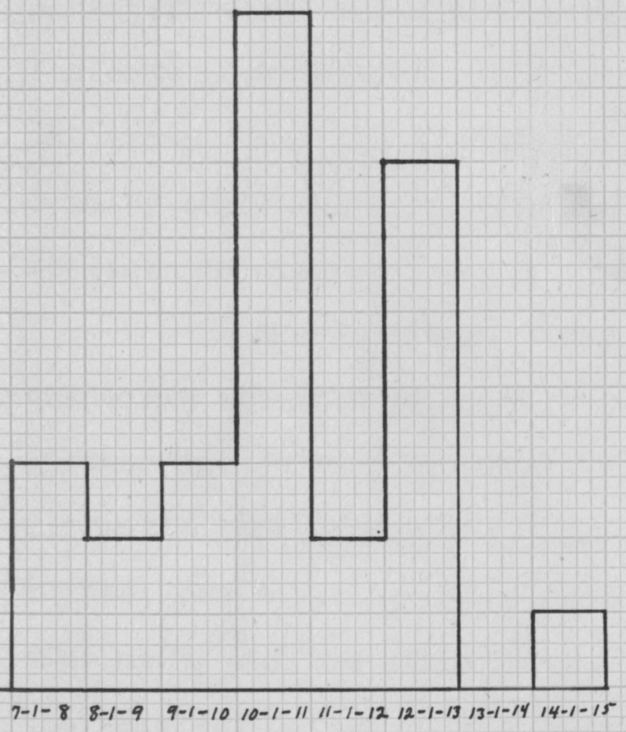


FIG. 29

Same CLASS
 after the Promotions
 were made
 Range M.A.
 7yrs.1mo. - 13yrs.

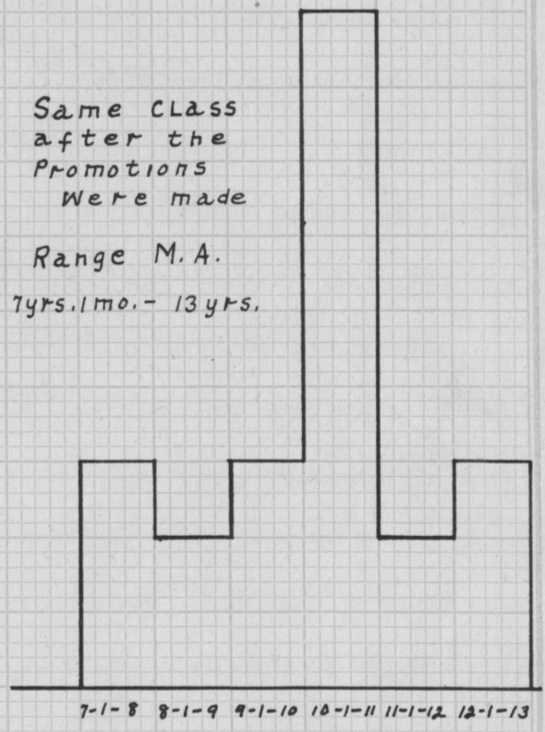
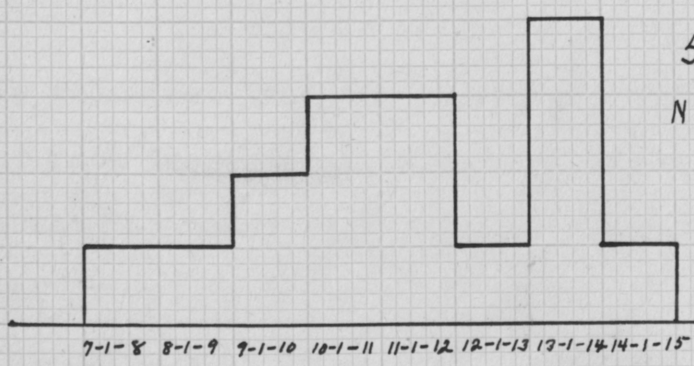


FIG. 30



5 A Mc ALLISTER
 No Special Promotions
 were made
 Range M.A. 7yrs.1mo. - 15yrs.

Graph shows need
 for Special Promotions

FIG. 31

The real value of the reclassification can be shown partly by the nature of the work done after the classification. This was determined by making a study of the comparative increase or decrease in teachers' marks given the student before and after the reclassification. Data were used for only those students who were in classes affected by special promotions. In order to discover the nature of the work done by pupils of different ability the results obtained from students in each of the I.Q. groups were tabulated separately.

The data were secured as follows: A weighted grade was obtained for each child by taking the average of his grades made in reading, English and literature, spelling, arithmetic, and geography. Two such weighted grades were obtained, one covering marks given before any special promotions were made, and the other covering the same teacher's marks for the same child four months after the reclassification. From these two grades the per cent of increase or decrease for each student was computed.

The results of the study in the grade schools strikingly point out that the majority of students in each I.Q. group made increases in their grades; and that the most significant increases were made by children in the most inferior mental group. A far greater number of these children received higher marks than those that received lower. The majority of

the group made from 0 to 30 per cent increases in their grades, while only one child received a mark 31 to 35 per cent lower than he did before the special promotions. A number of these students made 30 to 100 per cent increases in their grades. The good effects of classifying children according to ability cannot be doubted when, even the most inferior group, those having I.Q.'s below 80 were for the most part able to do a much better quality of school work as indicated by teachers' marks.

In the group of students whose I.Q.'s ranged from 80 to 90 only 3 students of the whole group received lower marks, while 28 pupils received higher marks- 17 of these receiving from 0 to 14 per cent increases in grades, 7 from 20 to 29 per cent increases, and 4 receiving from 45 to 54 per cent increases.

The results for the group whose I.Q.'s were from 90 to 110 show that these children were also able to make much better grades after the reclassification. The majority of this group received from 4 to 35 per cent increases in grades; while the range of the per cent of increase reached as high as 95 per cent and the range of the per cent of increase reached only 35 per cent.

Not only were the children in the low I.Q. groups able to make increases in their grades, but the children who received the highest I.Q.'s in the Otis test also received

higher marks when grouped according to ability. The results for both the I.Q. groups from 110 to 120 and from 120 and above show that a very large majority of these children received increases in their grades, and that the range of the per cent of increase was approximately twice that of the range of decrease.

Since the majority of children in each of the I.Q. groups made better grades, the conclusion is drawn that the children were successfully grouped on the basis of the Otis I.Q.'s.

That children who were grouped according to ability were able to do better work as indicated by teachers' marks is further shown in a similar study of the per cent of increases and decreases in pupils' grades for each of the I.Q. groups of the Junior high-school. The results obtained from this study corroborate the grade school results for every I.Q. group, except the group of children whose I.Q.'s were above 120. The group in which the greatest per cent of increase was made was that whose I.Q.'s were below 80. Fig.37 shows the significant results of the classification upon this group of children. Only two pupils of the group received lower marks. The majority of the group received from 0 to 52 increases in their marks, while exceptional pupils made 65, 75, 100, and 149 per cent increases in marks.

Junior High School

A comparative study of the percent of increase or decrease of teachers' Grades 5 months after the reclassification on the basis of the Otis Tests for those students whose I.Q.'s were below 80.

Vertical scale = no. of pupils

Horizontal scale = percent increases or decreases

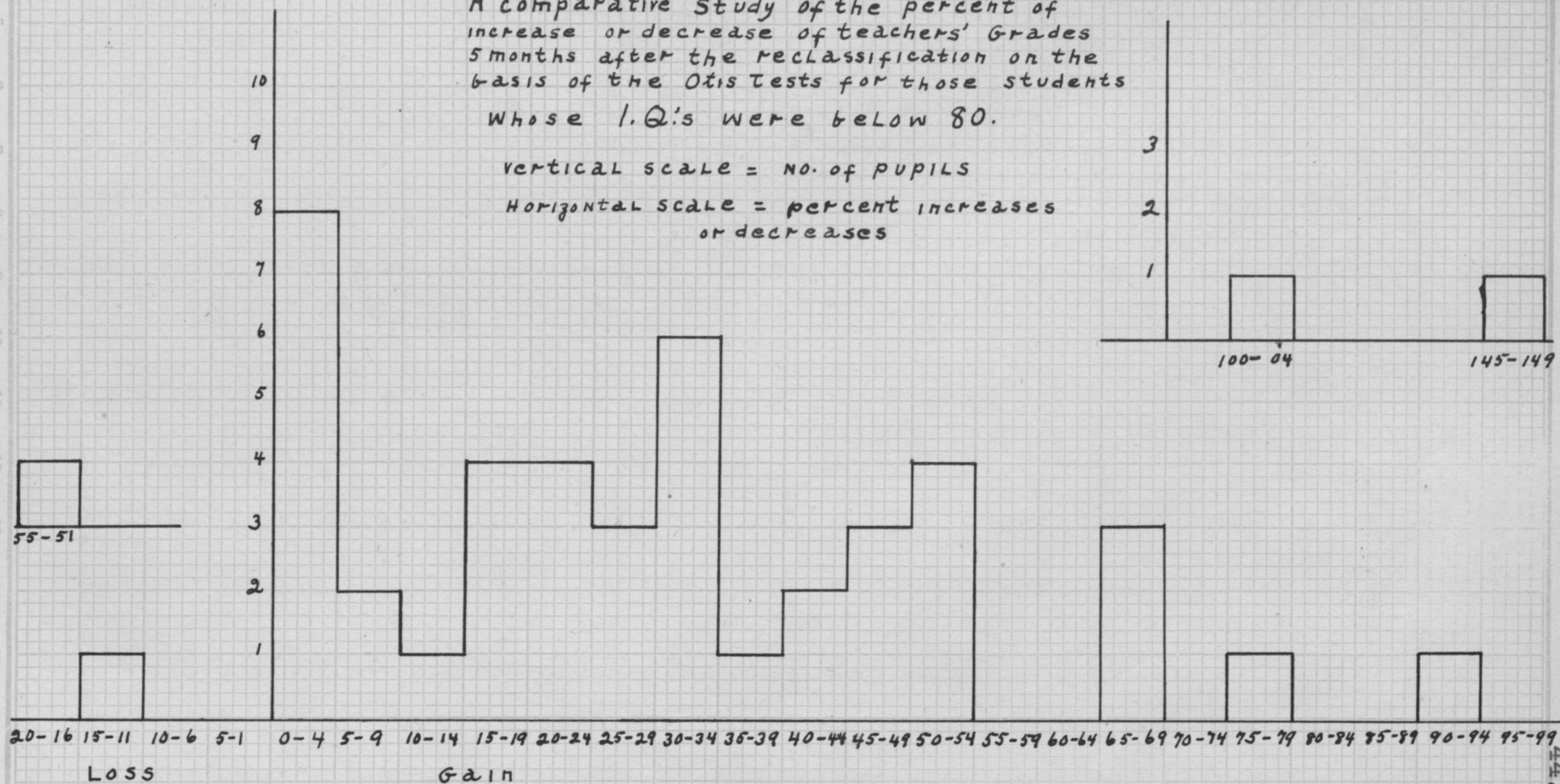


FIG. 32.

Junior High School

The comparative percent of increase or decrease of teachers' Grades 5 months after the reclassification for the Group

Whose I.Q.'s were from 80-90

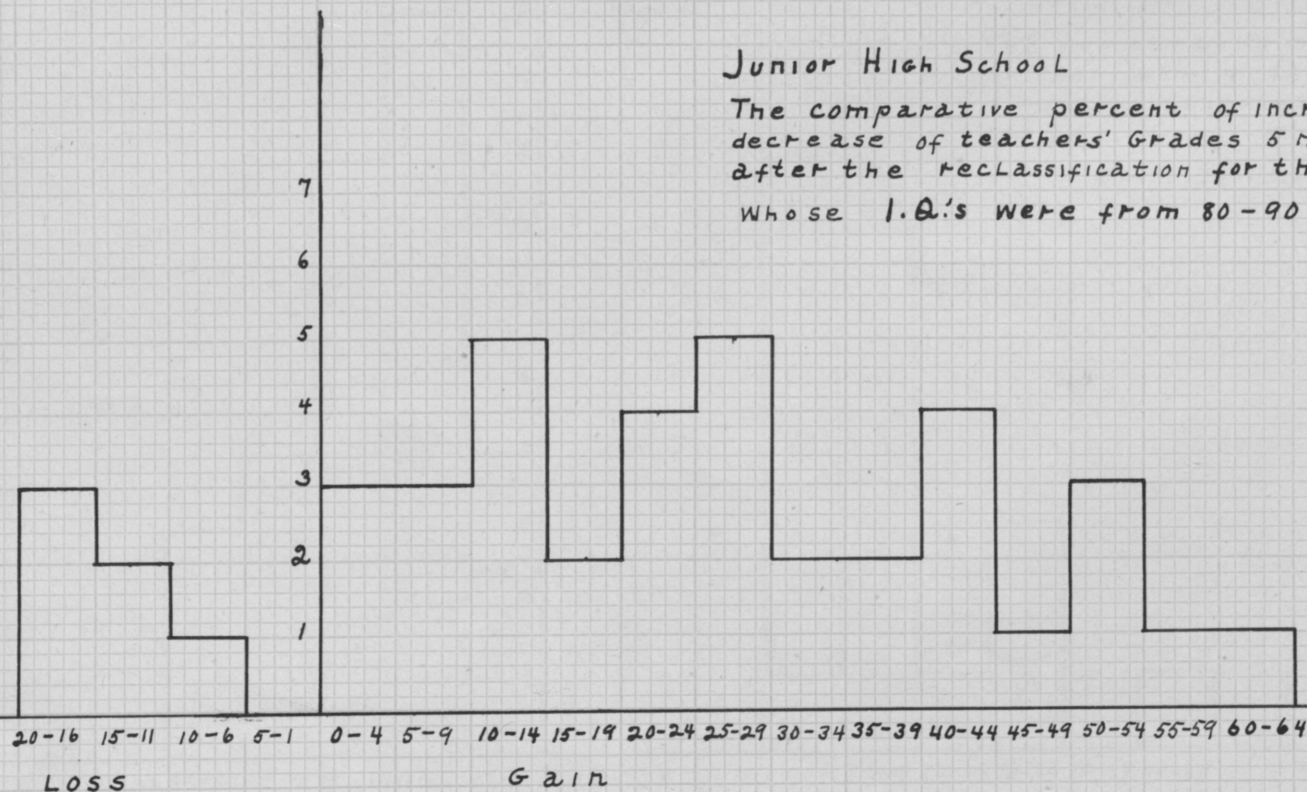


FIG. 33.

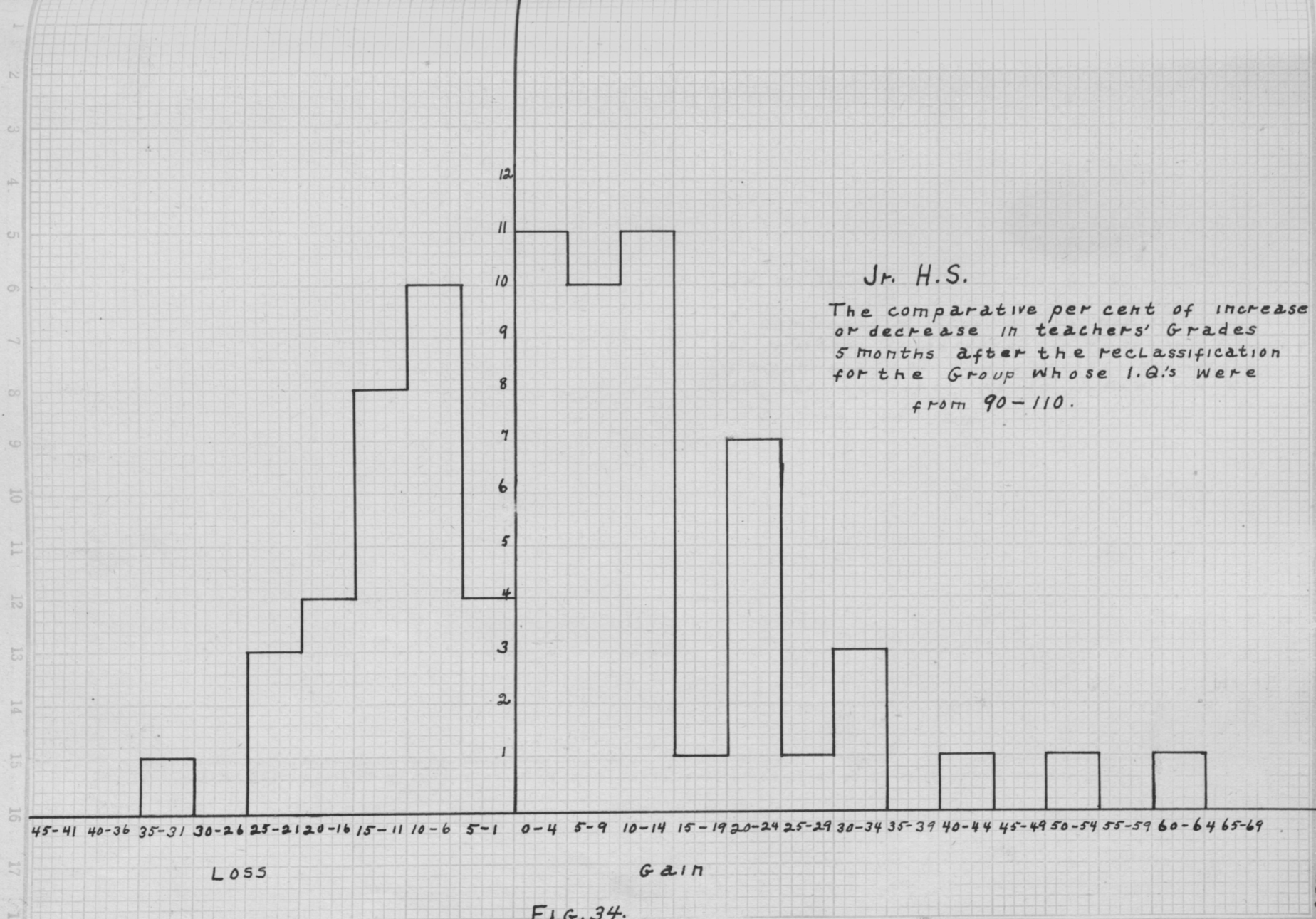


FIG. 34.

Jr. H.S.

A comparative study of the per cent
of increase or decrease in teachers' Grades
5 months after the special promotions
for the students whose I.Q.'s were
from 110-120

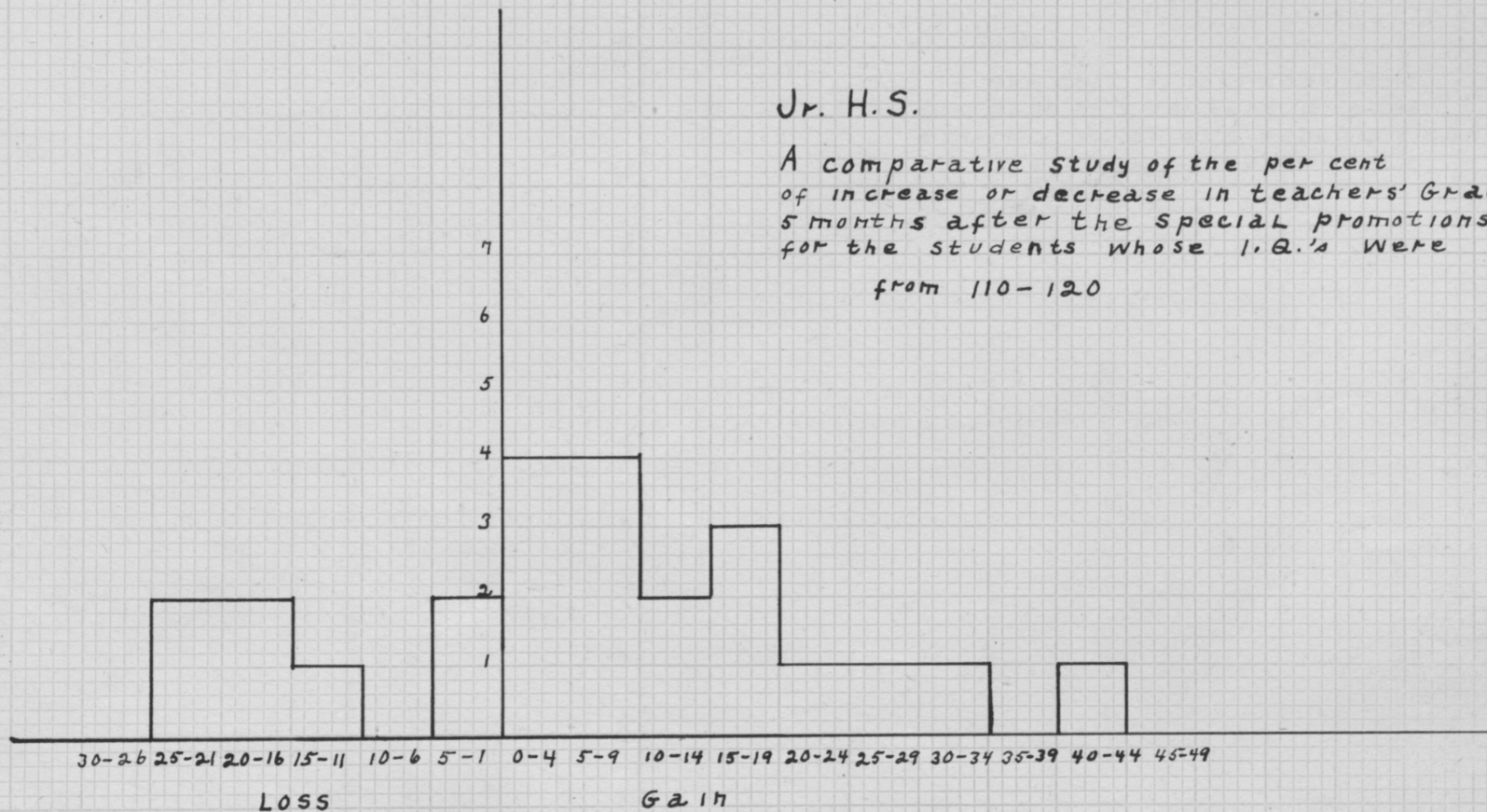
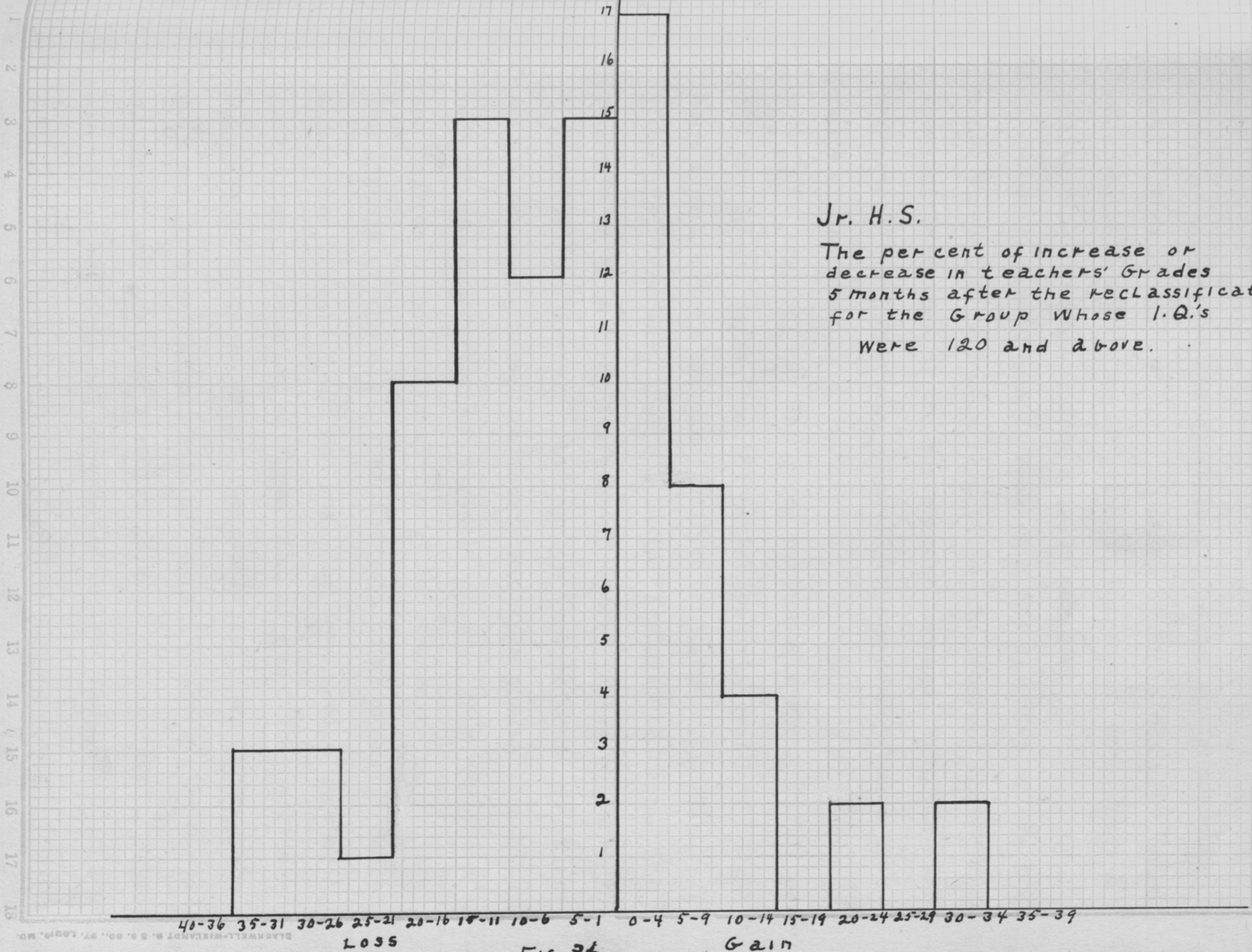


FIG. 35.



Jr. H.S.

The percent of increase or decrease in teachers' Grades 5 months after the reclassification for the Group whose I.Q.'s were 120 and above.

FIG. 36.

LOSS

GAIN

The results shown in Fig.38 for the group whose I.Q.'s were from 80 to 90 are almost as striking. The large majority made from 0 to 65 per cent increases, while only 6 pupils made decreases, from 6 to 20 per cent.

Figs.39 and 40 show that the majority of the students whose I.Q.'s ranged from 90 to 120 received higher marks, and that the range of the per cent of increase in marks for the two higher I.Q.groups of children was nearly twice the range of decrease.

Fig.41 for the group of students whose I.Q.'s were 120 and above, shows that the marks received by these students were approximately the same, with a tendency to be slightly lower than they were previous to the reclassification. The students in this group represent the most gifted children in the Junior high-school. The results were affected doubtless by the following considerations: First, a greater quantity of work was done after the classification. This was shown in the replies to a questionnaire sent the teachers concerning the effects of the classification upon student work. Second, a superior student could not make the same record or showing in a group of superior children that he could in the classes composed of children of all degrees of ability. Third, the work was more nearly adjusted to the abilities of the superior children, and a higher standard of work was expected. Fourth, the gifted children had apparently learned bad habits of work

before their promotion, habits of comparatively mediocre achievement in terms of their ability.

Conclusions: This study of the comparative increase and decrease in teachers' marks given pupils after the reclassification shows (1) that the majority of the students in each of the I.Q. groups with the exception of the highest I.Q. group in the Junior high school made increases in their grades, (2) that the most significant increases in grades were found in both the Junior high-school and the grade schools to be in the groups whose I.Q.'s were below 80. Some of these students made from 100 to 149 per cent increases in their grades. These data prove that the reclassification has resulted in better work even in the most inferior groups, as indicated by teachers' marks. The study further shows (3) that in certain groups the number of pupils that made decreases in grades was insignificant when compared to the number that made increases, Figs. 37 and 38. Fig. 37 shows that only two pupils out of forty-six made lower grades than they made previous to the reclassification.

The data as a whole show that while some pupils made lower grades, the reasons for which, the study did not attempt to discover, the larger number of pupils made higher marks. The higher marks given after the reclassification indicate that the pupils did a better quality of school work after they were grouped according to ability, or in other words, placed where their mental maturity warranted. This conclusion

is justifiable for:

1. The marks were given by teachers who were not biased toward the tests, but who were in some instances opposed to the reclassification.
2. The comparative increases and decreases in grades were obtained from the same teacher's grades of a pupil who had been in a class affected by the reclassification.
3. The higher marks were received by children of all types of ability, with the most significant increases being made in the groups of most inferior ability.
4. The higher marks represent a better quality of school work as is indicated by the replies of both Junior high-school and grade teachers to a questionnaire in which they said that all groups of children did a better quality of school work after the reclassification. (Section III, Chapter III).

That the teachers' marks may be used as a fairly reliable criterion of pupils' work is shown by the relation found to exist between the quality of school work and the intelligence quotients. This relation is shown for 269 fifth and sixth grade pupils in reading and geography, in tables III and IV. Both tables show that a fairly high positive correlation exists between the Lawrence teachers' marks and intelligence quotients.

Showing the Quality of School Work in Reading and Intelligence Quotients of 269 Fifth and Sixth Grade Students of Lawrence for the First Semester

1919

QUALITY OF SCHOOL WORK	INTELLIGENCE QUOTIENTS													
	Below 70		70-80		80-90		90-110		110-120		120-140		140 & Above	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5 E	1	3	1	4	5	13	14	15	5	16	6	20	7	78
4 G	8	19	3	12	6	16	31	33	15	47	14	47	1	11
3 M	20	48	11	44	17	45	43	46	11	34	10	33	1	11
2 P	11	25	8	32	7	21	5	5	1	3				
1 F	2	5	2	8	2	5	1	1						
Total	42	100	25	100	37	100	94	100	32	100	30	100	9	100
Median	2.40		2.22		2.56		2.95		3.26		3.35		4.35	
Quartile Deviation	.74		1.13		1.14		1.14		1.02		.57		.17	

An examination of this table shows that only 3 per cent of students with I.Q.'s below 70 made an excellent grade in reading; whereas 78 per cent of the students with I.Q.'s above 140 did excellent work in this subject. Furthermore it will be seen that no student with an I.Q. above 120 failed; and whereas one per cent of the students whose I.Q.'s were between 90 and 110 failed, no child with an I.Q. above 110 failed. The quality of school work as shown by the median grade of each group steadily increases from the lowest to the highest group. The median quality of school work done by pupils with intelligence quotients above 140 is twice as great as that done by pupils whose I.Q.'s were below 70.

TABLE IV.
Showing the Quality of School Work in Geography and Intelligence Quotients of 269 Fifth and Sixth Grade Students for the First Semester 1919.

QUALITY OF SCHOOL WORK	INTELLIGENCE QUOTIENTS													
	Below 70		70-80		80-90		90-110		110-120		120-140		140 & Above	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5 E	2	5					12	13	11	34	7	23	2	22
4 G	3	7	3	12	10	27	41	44	12	38	9	30	5	56
3 M	19	44	17	68	19	51	32	34	9	28	12	40	2	22
2 P	18	42	4	16	8	22	7	7			2	7		
1 F	1	2	1	4			2	2						
Total	43	100	25	100	37	100	94	100	32	100	30	100	9	100
Median	2.13		2.44		2.55		3.14		3.50		3.11		3.50	
Quartile Deviation	1.08		.87		.51		1.14		.19		2.24		.95	

In the above table it may be seen that while only 7 per cent of the students who had a quotient below 70 did a good quality of school work, 56 per cent of the students who had a quotient above 140 did good work. Further it may be seen that, whereas 42 per cent of the students whose I.Q.'s were below 70 did poor work, only 7 per cent of those who had I.Q.'s between 120 and 140 did poor work.

The medians indicate that there is a gradual increase in the quality of work for each higher I.Q. group with the exception of the two highest groups where the quality remains approximately the same.

General Conclusion: Since a large number of pupils representing all degrees of mentality made better grades after the reclassification, the conclusion may be drawn that grouping children according to mental ability enables them to do a better quality of work. Better classification of pupils, which also made possible a better adaptation of work to individual differences in ability, apparently is the one explanation for the better marks received by the majority of pupils of each I.Q. group, with the one exception. The marked increase in the grades of children of the most inferior ability shows that such children were better classified and could accomplish more when grouped. This indicates that the Otis test succeeds in grouping or picking out children of the different degrees of ability, and thus enables them to work more effectively.

Chapter III. (Continued)

III. The Specific Effects of the Reclassification upon
Children of Superior, Normal, and Dull Intelligence.

The data for this section were obtained thru a questionnaire sent out thru the Superintendent's office to every teacher and principal of the city. The purpose of the questionnaire was to get the teachers' judgments as to the effects of the reclassification upon the gifted, normal, and retarded children. The questions asked may be found in the inclosed form of the questionnaire on the following pages. A few typical answers returned from the teachers are given under A in the appendix.

The results are tabulated for the Junior high-school and the grade schools, separately. The questionnaire was answered by 11 teachers in the Junior high-school and 18 teachers in the grade school, just five months after the reclassification had been made.

--

The Grade-Teachers' Judgments as to the Effects of the Reclassification on the Basis of the Otis Tests.

I. Effects on bright children.

	Teachers' Replies		
	Equal	Better	Poorer
1. Quality of school work done--	11	7	0
2. Quantity of school work done--	9	8	0

Lawrence, Kansas.
April 13, 1920.

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond A. Keck

EFFECTS OF OTIS INTELLIGENCE TESTS

- I. Effects on bright children.
 1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
 2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
 3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude)
 4. Is an ideal of work developed not to fall below ones standard rank or group?
 5. Is a conscious spirit of rivalry developed among the sections or groups?
 6. Remarks (Add anything not covered by the above which you think should be stated)

- II. Effect on Normal Children.
 1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.
Remarks.
 2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work. Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.
 3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section?

- 2 -

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)
 - 1.
 - 2.
 - 3.
 - 4.
2. Is there an improvement (1) in quality, (2) in quantity of work done?
3. Is there an increase of (1) interest and (2) effort in school work?
4. Remarks.

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

- 1.
- 2.
- 3.
- 4.

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable?

Note - List the specific factors on which you base your judgment.

In regard to quality and quantity of school work done after the reclassification, the teachers are about equally divided as to whether it is equal to, or better than it was before. It is significant, however, that no teacher considered the quality of work poorer than, or the quantity of work less than, it had been before; while 7 teachers out of 18 believed the quality to be better than, and 8 believed the quantity of work to be greater than it had been before.

3. Is there an attitude _____			
developed to be in the first	Yes	No	Among promoted
rank, section, or group of the			
class-----	14	0	1

4. Is there an ideal of		
work developed not to fall be-		
low one's standard, rank or group-	12	1

The subjective effect of the reclassification on bright children is very note-worthy. Fourteen teachers believed that an attitude had been developed among these students to be in the first rank, section, or group of their classes. No teacher answered the question negatively. In connection with this a very strong ideal of work has been developed not to fall below one's group or rank in the class. Only one teacher said that this attitude had not been develop-

ed. If the reclassification served no other purpose than to develop such ideals to do standard work and to strive to do better work, its value to bright children can not be doubted.

	Yes	No	Some cases
5. Is there a conscious spirit of rivalry developed among the sections or groups?-----	8	3	2

No unanimity of agreement exists among the teachers in regard to the spirit of rivalry that was developed by the reclassification. However, there is an indication that such a spirit of rivalry was developed between the sections and groups, since 8 teachers answered the question affirmatively and 2 teachers believed it existed between certain individuals and groups.

6. Remarks: By teachers.

"Discipline is easier when bright children have work to do."

"Children were not informed as to the reason why the Otis tests were given, or of the ranking received, and therefore no spirit of rivalry was developed."

"Children take an added interest in work."

"Discipline has been made more effective, for the bright children now have more to do."

"In a few cases the bright child has taken an attitude that work is not essential to his progress."

II. Effects on Normal Children.

	Yes	No	Partly
1. Are they conscious of the purpose and use of the tests in placing and promoting those of their own group?	5	4	9

These replies indicate that these children do not understand the significance of the mental tests given them. They know that on the basis of these tests certain children were given special promotion, but further than that, the whole procedure was vague to them. Four teachers say that the normal children did not understand the purpose of the tests, while nine teachers say that they were only partly conscious of it.

2. Remarks:

"Parents know why their children are given special promotion. This leads to discussions at home and among children."

"Pupils often ask, 'What did I do in the test? What do you have to make to go on?'"

"They are enthusiastic about the tests and like to take them."

"The parents of normal children are sometimes hurt about the promotions. They don't always understand the purpose of the tests."

3. Quality of work done by normal children -----	Equal 9	Better 9	Poorer 0
4. Quantity of work done by normal children-----	9	9	0

As to the quality and quantity of work done by children of normal intelligence, the teachers are just equally divided between saying that the quality of work is equal to or better than, and that the quantity of school work is both equal to or greater than it had been previous to the testing. It is significant to note that none of the teachers considered that pupils with normal intelligence did either a poorer quality or a less quantity of work after the reclassification. Since half the teachers say that both a better quality and a greater quantity of work is produced, the reclassification has no doubt been valuable to normal children.

5. Is there an attitude developed to be in the first rank, section, or group of the class? -----	Yes	No
	17	0
6. Is there an ideal of work developed not to fall below one's standard, rank or group?	14	0
7. Is there an ambition developed in some to secure special promotion or a transfer into the next higher section or group? -----	17	0

The replies show that subjective effects of the reclassification have been of exceedingly great value to normal children in developing in them an attitude to be in the highest section of their class, and not to fall below their present school attainments. All teachers, with the exception of one, judge that the tests stimulate normal children to do better work, and generate a strong ambition in them to secure special promotions with others of their classes.

7. Remarks:

"The parents, too, work to secure special promotion for their children."

"The greater number of normal children have a very strong ambition to secure special promotion or a transfer into the next higher section or group."

III. Effects on Retarded Children.

1. How has the work been adapted to them?

Replies of teachers:

"Through review of past work."

"Frequent drills and reviews."

"Special help for a few children in the ungraded room."

"Problems more simple, and more drill."

"A different lesson plan on similar subjects and problems."

"Smaller groups for more individual help."

"Essentials are stressed more. More time is taken for explanation."

"Brighter children are allowed to act as teachers for the retarded children."

	Yes	No	Some Cases
2. Is there an improvement in the quality of school work?-----	10	1	
3. Is there an improvement in the quantity of school work?-----	8	3	
4. Is there an increase in interest and effort in school work? -----	11	1	1

The large majority of the above replies indicate that dull children do both a better quality and a greater quantity of work, with an increase in interest and effect in school work after they are grouped. These replies show that the grade teachers have succeeded in adapting work to the ability of the dull child, and that the reclassification has been especially valuable to him. It has motivated his work, making improvement and note-worthy achievement possible.

5. Remarks:

"Retarded children ask to go to the ungraded room for special help in work below average. They voluntarily stay after school for help."

"There is a great increase of interest in all branches of work."

"Discipline takes care of itself. Fewer failures."

"Has not encouraged them to work for special promotions."

"Some of the retarded children care very little to put forth effort--others are keenly awake."

"Tests do not appeal to slow children. A different method is perhaps better for such."

"School work is of higher quality and more uniform."

"The retarded class has been aided immensely by the change."

"The slow pupils are given a chance by not being over-shadowed by the quicker children."

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest?

1. "There is an increase of interest."

2. "Effort to be present and on time. Children who are absent desire to make up work; and none want to fall below standard."

3. "Quantity of work is better than before."

4. "Ambition is developed to secure special promotion."

5. "Enthusiasm has been aroused and stimulated."

6. "A greater realization, on the part of children, of their own deficiencies."

7. "School spirit has been stimulated."

8. "Created rival spirit which makes the teachers' work easier."

9. "It has grouped children of equal mentality."

10. "It has balanced the classes."

11. "Stimulating to the bright pupils, moderately so to the mediocre, and not at all to the slow pupil."

12. "Prevents idleness."

13. "The lack of information concerning the objects of the tests has created dissatisfaction as to the special promotions."

14. "Shows pupils that each individual case is being considered and being placed where it belongs."

15. "Pupils know that any special effort on their part will be recognized."

16. "Raises spirit of school and community."

17. "Creates a strong desire to keep work up to standard."

18. "Bright children have enough to do to keep them busy and interested."

19. "Dull children understand what they are doing and become interested."

20. "Greater interest is shown in all classes because all are doing work suited to their ability."

21. "Normal pupils compete with children of their own ability and thus competition is keener."

V. As far as you have been able to judge have the results upon children of special promotion been:

(No. of replies)

1. Beneficial or desirable15

- (No. of replies)
2. Disadvantageous or undesirable----- 1
3. In a few cases undesirable----- 2

(These children got the idea that they did not need to work after being promoted, and as a result failed.)

VI. Factors upon which teachers based their judgments.

1. Quality and quantity of work done.
2. Quality and quantity of reviews and tests.
3. Attitude toward school work as daily expressed in the school room.
4. School spirit as displayed on the school ground, in contests, and in organization meetings.
5. The child's progress since the test.
6. The attitude of both children and parents.

Summary:

The conclusions of the teachers concerning the effect of the tests upon the bright children are: discipline has been easier since the bright pupil has had enough to do; interest is much greater in school work, as shown by the quality and quantity of work done; higher ideals of work and achievement have been developed; and while some few of the bright children feel that they can "slide" since they were given the special promotion, yet with the majority of the superior children the effect of the tests have been

beneficial. The chief value of grouping bright children is that they can be given a sufficient amount of work to have opportunity to work up to the limits of their ability. This challenge to the bright child has caused him to become more alert mentally, more interested, and equally successful, if not more so, in all school work.

The chief value of the classification to normal children has been that it has stimulated them to do better work, to do a greater amount of work, and to reach higher attainments than they had previously reached. For some of the normal children work has become intensely motivated and interest has become dynamic, causing them to do both a better quality and a greater quantity of work. The effect of the classification has not only caused the majority of normal children to do equally as good school work if not better, but it has caused many of them to have a strong ambition to secure special promotions or transfers into the next higher sections or groups of their classes.

The classification has had a very special value to dull children, for all school work has been carefully adapted to them. The success with which this adaptation of work has met is shown in (1) the greater interest of these children in school work and (2) the markedly better quality of work produced by them.

The grade teachers as a whole feel that the re-

classification has been highly beneficial to all classes of students. The special value of the reclassification as recognized by the grade teachers are: (1) a better quality of school work has been produced in a large number of classes in each group, (2) a greater quantity of work is produced in a significant number of classes of normal and superior children, (3) all classes of students did as well in both quality and quantity of work if not better than they did previous to the reclassification, (4) a greater interest in school work is shown by practically every student, (5) a strong ambition has been developed in a large number of students to secure special promotion, and (6) problems of discipline and adaptation of school work have become simplified. These effects have caused both pupils and teachers to be more happy and interested in the work they are doing; and these conditions have made greater school achievements possible.

Briefly the replies to the questionnaire show that in the judgments of the teachers the reclassification has proved valuable to the grade schools.

Chapter III. (Cont.)

The Junior High School Teachers' Judgments Concerning the Effects of the Reclassification.

I. Effects on bright children.

	Equal	Better	Poorer
1. The quality of school work done-----	3	7	0
2. The quantity of school work done-----	3	7	0

The majority of the teachers believe that since the bright children have been grouped, they are doing not only a better quality of work, but also a greater quantity of work. No teacher considers that bright children do poorer work or less work than they formerly did.

3. Is there an attitude developed to be in the first rank, group, or section of the class -----	Yes	No	Among certain pupils.
-----	7	0	3

4. Is there an attitude of work developed not to fall below one's standard, rank or group-----	7	0	1
--	---	---	---

The teachers practically as a whole say that a positive attitude is developed in bright children to be in the first rank, section or group of the class. Two of the

teachers say that this attitude is developed only among certain groups, while one teacher says it is developed only among the girls. An ideal of work is also established not to fall below one's present school achievements. The replies to questions 3 and 4 show that the subjective effects of the classification on bright children are effective in producing the better quality and the greater quantity of school work, as indicated by the replies to questions 1 and 2.

Yes	No	Among Groups I and II
-----	----	--------------------------

5. Is there a conscious spirit of rivalry developed among the sections or groups?----- 7 2 1

The majority of the teachers believe that a conscious spirit of rivalry is developed. However, in some instances, the teachers say that this rivalry exists only among certain more ambitious students, and among the pupils of the two upper groups of each grade.

II. Effects on normal children.

Yes	No	Partly
1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? -----		
2	0	9

The Junior high-school teachers are of the same opinion as the grade teachers concerning whether normal children are conscious of the purpose of the tests. Nine of eleven teachers say that the children are only partly conscious of this purpose.

	Equal	Better	Poorer
2. Quality of work done by normal children -----	3	6	0
3. Quantity of work done by normal children -----	2	7	0

Normal children do a better quality of work after the regrouping. Three teachers in their replies noted that the work of the normal children was poorer immediately after the classification but improved rapidly; so that in a short time they were doing better work than they did before. The replies to question 3 indicate that the quantity of work done is greater. This may explain why some pupils in the new adjustment to school work did a poorer quality of work at first, but soon rapidly improved.

	Yes	No	Among certain pupils.
4. Is there an attitude developed to be in the first rank, section, or group of the class?-----	9	0	1
5. Is there an ideal of work developed not to fall below one's standard, rank, or group?-----	8	0	
6. Is there an ambition developed in some to secure special promotion or a transfer into the next higher section or group?	8	0	1

The number of replies to the above three questions show a most desirable effect of the tests upon normal children. The teachers practically as a whole are agreed that since the classification a positive attitude has been developed to be in the highest group of the class and not to fall below one's present rank or group. One teacher believes that this attitude has been developed among only certain pupils or groups. But, nevertheless, the replies indicate that this attitude is developed, which, no doubt is the explanation for the better quality and greater quantity of work produced by children of normal intelligence.

III. Effects on retarded children.

1. How has the work been adapted to them?

Replies of the teachers:

1. "There needs have been studied and the work applied to them."
2. "By giving work that appeals to their interests."
3. "By appealing to their every day life-problems."
4. "More individual work."
5. "Methods more objective and concrete. Problems given that are related to the child's experiences and home life."
6. "Simpler explanations applied as nearly as possible to experiences of individual pupils."
7. "Subject matter is given in a much simpler form."
8. "Quality of work less than that for the standard."

9. "Quantity of work less than that for the standard."
10. "Less exacting demands are made of them."
11. "Methods are simplified."
12. "By outlining the subject and teaching only the main points of the lesson."
13. "By using objects and graphic illustrations more."
14. "By using memory rather than developing the reasoning powers."
15. "Much concrete work."
16. "More drill on fundamentals."
17. "In English by the use of short simple stories, which are first read, then told, and finally reproduced in the form of written composition."
18. "History projects less developed."
19. "In written work form and accuracy of sentence structure and spelling are emphasized. Only the most common errors of speech or writing are corrected."
20. "In making assignments, leading ideas in lesson are pointed out, attempting to develop the idea of cause and effect."
21. "Just the fundamentals are given."
22. "Simpler language and material."
23. "Quantity of work has been reduced."
24. "By requiring little unsupervised study."

	Yes	No
2. Is there an improvement in the quality of school work?-----	9	0
3. Is there an improvement in the quantity of school work? -----	1	3
4. Is there an increase in interest and effort in school work? -----	8	1

The most marked effects of the Junior high-school reclassification are upon dull and retarded children. The large majority of the teachers believe that there has been a great improvement in the quality of school work. It is important to note that while dull children do a better quality of work they do not do a greater quantity of work. The results from this section of the questionnaire are very similar to the results obtained in the comparative study of increase and decrease in grades made by dull children, Fig.37, page .

The fact that dull children make such a marked improvement in school work when they are grouped and the work is adapted to them, proves the value of grouping these children.

Remarks:

1. "A better quality of work is produced."
2. "Many pupils take part in discussions who were indifferent before."
3. "The dull child from the good home does better work."
4. "There is little interest in school work shown in the retarded class, unless home surroundings are good."
5. "Altho, more school work is done, indifference and lack of interest remain."
6. "A small proportion does not respond to any provision that is made for them."
7. "A few are ambitious to rank high."

8. "Develops self confidence in the individual."

9. "Group 4 has done much better work by having children of approximately the same ability together."

10. "Pupils of the ability of group 4 have been reached, which would have been impossible in a mixed group."

11. "Dull pupils are willing to volunteer to answer, and to ask questions about points in the lesson that are not clear, when bright pupils are not in their classes."

12. "Develops group rivalry."

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest?

1. A desire to be in the higher groups has been created.

2. Subject presentation is much simplified.

3. Some children who are placed in a low group give up trying to do any thing.

4. Children realize that a higher standard of work is expected of them to keep up with their division.

5. Dull pupils are more expressive.

6. Bright pupils desire to excel.

7. Dull pupils are less self-conscious, and perhaps slightly more interested.

8. Bright pupils show more self-esteem, but strive to maintain their standard.

9. Retarded pupils, who formerly sat sleepily, now attempt to recite.

10. Rivalry has been established between certain groups of students.

11. Better work has been secured thru the adaptation of work to the various abilities of the groups.

12. Individual and group rivalry over-balances school spirit.

V. As far as you have been able to judge have the results upon children of special promotion been:

	<u>No. of Replies</u>
1. Beneficial or desirable -----	2
2. Disadvantageous or undesirable-----	1
3. Desirable when pupil has the informational background to carry the work in the higher group -----	1
4. Advantages and disadvantages balance each other -----	1
5. Number of teachers not answering ---	6

The Junior high-school teachers according to the above replies are in doubt as to the benefits or desirable effects of the tests upon children of special promotion. Yet in answering the questions relating to the effects of the tests on bright children, they are for the most part agreed that such children do both a better quality and a greater quantity of work. No teacher considered that either the quality or quantity of work done by bright children was poorer than it was before the reclassification. This inconsistency indicates that there is not a prejudice in favor of the mental tests, and that the replies given to the whole questionnaire are not exaggerated, but if anything, are an

underestimation of the effects of the tests.

Summary of the Teachers' Judgments Concerning the Effects of
the Otis Tests on Junior High-school Children:

The bright children do both a better quality and a greater quantity of work. As a group these children are not satisfied with their present attainments, but are anxious to do better work and to be in the highest groups of their classes. The reclassification has caused a spirit of rivalry to be developed which has made school work more interesting and the task of the teacher somewhat lighter.

The normal children are only partly conscious of the purpose of the tests: but the classification has caused them to do both a better quality and a greater quantity of work. The majority of normal children are anxious to receive special promotions, and are thus keenly motivated to do a better quality of work.

The dull children have not realized the meaning of the tests, and their greater interest and better quality of school work is due, largely, to their being classified according to ability. In the two above groups the subjective effects of the tests partly explains the better school work, but in the dull group all the desirable effects have been a result of the reclassification and the adaptation of work. The replies show that dull children do a better quali-

ty of work but not a greater quantity of work, and are more highly interested in their work.

The effects of the classification upon Junior high-school pupils as a whole are: greater interest, better work, in some groups a greater quantity of work, higher ideals of school work and achievement, and a greater self-realization.

The Otis group test has proved valuable as a classification device to both the grade schools and the Junior high-school in (1) grouping children according to ability, (2) in securing a better adaptation of school work to individuals and groups of children, (3) in setting up higher ideals of school achievement, (4) in causing an equal or better quality of work to be produced, and (5) in developing a positive, progressive, and cheerful school spirit which is fundamental in a successful, democratic school system.

A Comparative Summary of the Grade and Junior High-school Teachers' Judgments Concerning the Effect of the Reclassification.

I. Effects on the Bright Children.

The grade teachers are about equally divided as to whether the quality and quantity of work done are equal to or better than they were before, while the majority of the Junior High-school teachers believe that both quality and quantity of work are better than they were before. None of the teachers believe that either quality or quantity of work is poorer after the classification.

Practically all the teachers believe that the bright children have been stimulated to be in the highest rank or group of their classes and not to fall below their present attainments.

The majority of both groups of teachers believe that a conscious spirit of rivalry is developed among the sections and groups, while a few teachers believe that the rivalry exists only among the more ambitious students, and those in the two upper groups of each grade.

All the teachers believe that the reclassification has greatly simplified the problems of discipline of bright children. The bright child is given work equal to his ability and as a result causes no trouble in the school system.

2. The Effects upon Normal Children.

Both Grade and Jr.H.S. teachers are agreed that these children are only partly conscious of the purpose and use of the tests in placing and promoting those of their own group.

The grade teachers are equally divided in saying that both the quality and the quantity of work are equal to and better than they were before, while the majority of Junior High-school teachers say that both quality and quantity of work are better after the classification. None of these teachers consider either the quality or quantity of work poorer than it was previously.

All the teachers are agreed as to the exceedingly great value of the subjective effects of the reclassification. Both grade and Junior high-school children strive to get into the higher groups of their classes, to maintain their standards, and to secure special promotions.

3. Effects upon the Retarded Children.

The teachers in both the grade and Junior high-schools have used many devices in differentiating and adapting school work to the abilities and interests of dull children. This has resulted in a great improvement in the quality of school work with a corresponding improvement in interest and effect in school work. The teachers, practically as a whole, believe that dull children do a better quality of work and

have a greater interest in their work. As to the quantity of work done the Junior High-school teachers say there is no improvement, while the majority of the grade teachers say that there is.

4. Effects upon the General School Spirit and Interest.

All of the replies show that the effect of the reclassification upon school interest and spirit have been remarkable. All classes of students do better work, are more interested in their work, and work with real motives. School work has ceased being uninteresting and has a new meaning to all children. With the adaptation of work every child can achieve more nearly up to the limit of his ability, and can make progress that otherwise would have been impossible. The subjective effects of the reclassification have been exceedingly desirable in creating enthusiasm, rivalry, and increased interest and effort in school work.

None of the teachers deny the positive effects of the reclassification upon the school system, and all are agreed that it has been successful.

5. The grade teachers as a whole, say that the results of special promotion upon the children have been beneficial; while the Junior high-school teachers are widely divided as to the value of the special promotions to bright children. The replies of the Junior High-school teachers indicate

prejudices since they are inconsistent with all their foregoing replies in the questionnaire.

This summary shows that with few exceptions, the judgments of the grade and Junior high-school teachers as to the effects of the reclassification are very similar. According to these judgments all groups of students have been benefited. Some of the groups are able to do both a better quality and a greater quantity of work, others are able to do a better quality of work, while all groups take a greater interest in their work. The general spirit of the school is more alert, progressive, and intelligent. The machinery of the school works more smoothly and a better school product has resulted. Educational aims have been better defined, with the result that school work has been motivated and made vital to the child who has become the center of the school system.

General Conclusion: The specific effects of the classification upon the school system have been positive and show that the Otis test has proved a valuable supervisory device in the Lawrence reclassification. Furthermore, children who were classified upon its basis did a better quality of school work as was shown by both teachers' marks and teachers' judgment. The better quality of school work produced thru-out the school system is an unquestionable proof that the Otis test is a much better basis for classi-

fication than the one formerly in use--that of teachers' marks.

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Chapter III. (Cont.)

IV. The Administration of the Otis Test and the General Effects of the Reclassification.

The data given in this section of the chapter will be of value to school administrators interested in (1) the facility of the administration of the Otis Group Intelligence test and (2) the general effects of the reclassification of a school system upon its basis.

The data are of significant value since they were obtained from (1) the principals, supervisors, and teachers in regard to the school spirit resulting from the reclassification; (2) the patrons of the school in regard to the value of the special promotions to their children; and (3) the Superintendent's judgment of the effects of the use of intelligence tests upon the school system in general.

The Otis test was administered with marked facility and success in the Lawrence schools. Thru careful administration the test was given with little or no opposition from either teachers or patrons. This resulted from a general understanding that the test was given in order that children might be better placed in the school system. Thru efficient supervision and co-operation from all teachers the children as a whole were anxious to take the test and in no cases seemed to fear it. Because of the atmosphere that

had been created, the test was easily given--thirty to forty children taking it at the same time.

After all the tests were given and scored the I.Q.'s were easily obtained from the Otis Norms; and upon them as a basis the children were reclassified. In less than a month the whole procedure of testing and reclassifying was accomplished and school work was proceeding smoothly. That the administration of the new system of classification has been effective and valuable to the school system is shown in the school spirit that was developed, the positive attitude of the community, and the judgment of the Superintendent and teachers.

Group intelligence tests can be used easily and efficiently as a basis of classification when they are administered intelligently, purposefully, and with the cooperation of the teaching force.

General Effects of the Classification.

I. School Spirit.

The spirit that has been developed is constructive, progressive, and more intelligent as to the educational objectives to be attained. Pupils are more interested in their work and keenly desire to excel in order that they may be allowed to enter the higher groups or sections of their classes. The teachers do not need to give incentives to get the majority of their children to do good school work, for

a strong attitude has been developed not to fall below one's present attainments, but to excel them, if possible.

Not only do pupils take a greater interest in their work, but teachers are more anxious to adapt their instruction to all classes of students and to achieve the educational objectives of the school. Special efforts have been successfully made in adapting school work to all groups, and in allowing pupils to progress as fast as their ability will warrant. In a number of cases individual tests have been given certain children and on the basis of these tests children have been permitted to advance according to their ability. The teachers have not only tried to secure a better quality and a higher standard of school work, but they have cooperated well in the reclassification of all pupils.

The most significant effect of the reclassification has been upon pupil interest and achievement. All the data secured in regard to the quality and quantity of pupil work indicate that children do their school work more earnestly, more purposefully, and more successfully.

The attitude of the children toward the tests has been very satisfactory. The children did not fear the tests but rather enjoyed them. In a number of cases children were anxious to take the individual mental tests in order to be properly placed.

Another effect of the tests upon school children

has been that it has produced a healthy spirit of rivalry between various students and between certain sections and groups of students. The results have been more purposeful activity and greater achievements on the part of many pupils. To these pupils, work has become motivated, interesting, and worth while. The spirit of "I don't care, just so I pass" has been very greatly decreased. Achievement has taken the place of failure in the pupils' thinking. The spirit of rivalry has made the task of the teacher easier, and has caused both pupils and teachers to enjoy school work more.

Probably the most commendable effect of the tests upon the school spirit is that it has raised the standard of the educational ideal to be attained, and in this attainment has enlisted the best cooperation on the part of both pupils and teachers. Pupils as never before work toward the limits of their abilities, and make remarkable advances in the quality and quantity of school work done.

2. Observed attitude of the Community.

In order to make a study of the attitude of the community concerning the special promotions, a personal letter was sent out by Superintendent Kent to the parents of all the children who received special promotion. The purpose of the letter was to secure an expression from the parents concerning their judgment of the special promotions.

A sample copy of this letter is given under B in the appendix.

Sixty-one replies to the letter were received. Out of this number sixty very highly approved the special promotions, and believed them to be very beneficial in causing their children to become more mentally alert and to do better school work. Only in one case did the parents feel that the special promotion was not beneficial to their child. The reason given, however, was that the child was ill at the time he was promoted and had to be out of school for some time afterward.

The best method of discovering the attitude of the parents toward the special promotions is to read their replies. For this reason a summary of the outstanding and typical remarks of the parents are given. The interest of the parents in the tests is revealed in the following remarks:

"The special promotions have been beneficial, because of the incentive to work harder."

"We consider this beneficial and a step in the right direction. All children are not born with the ability to acquire knowledge with the same degree of rapidity. The special promotions encourage the bright children."

"We think the tests are a splendid thing. The results of the test give us a better insight into the mental

condition of our child and assists us to make changes in the home life and habits which will be beneficial to the child."

"The promotion of our child has been a great help to him and has caused him to take a new interest in his school work."

"I believe the test is very good for it encourages the child to do better work."

"We are very much pleased with the work of our daughter since her special promotion. Her health has never been hurt, and the promotion was very beneficial to her."

"I am much pleased with the special promotions. It has helped our child in every way."

"The standard of work seems just suited to his ability."

"I am in favor of this plan. If a child is able and can keep up his work I see no reason for holding him back for another."

"I am heartily in favor of special promotions when the ability of the child is clearly demonstrated. It acted as a tonic to my daughter and she has fairly bounded into greater mental and physical vigor."

"It has caused our son to apply himself closer to his studies, and it has been beneficial to him for he is capable of doing the work."

"The promotion was beneficial to our boy for he

has become markedly interested in his work. Before the promotion he had too much idle time."

"Our boy has been getting better grades and doing better work since his promotion. Your intelligence test is alright."

"The promotion was beneficial in that it stirred his pride in achieving something extraordinary; and I observe an interest on his part in sustaining a high record. The promotions stimulate industry as well as ambition."

"I have been pleased with the added interest our daughter has taken in her work and her keen ambition to make good."

"I consider the promotion to be beneficial to our child for it supplied the ambition which she rather lacked."

"Our child is taking a deeper interest in his work than he has ever done before. Am sorry that the system of special promotions has not been used in our city school in the past."

"The promotion was beneficial, for in former years our child was not advanced in his studies as rapidly as his ability permitted which resulted in loss of interest, the memorizing of text books, and other undesirable results.

From the foregoing replies one discovers that the patrons of the school are highly in favor of special promotions on the basis of intelligence tests. They are anxious for their children to be placed where they can do their best work. The parents are greatly pleased with the special promotions for they have caused their children to become more highly interested in school work, to do better work, and to maintain their standards. The tests have succeeded in arousing and stimulating certain bright children, who seemingly had entered a state of mental lethargy, because of the small amount of effort required to do satisfactory class work. Parents of such children are, especially, glad for the desirable effects of the promotion upon their children.

The conclusion can be drawn that the special promotions are favored by the parents, and that they will cooperate with the schools in the new system of classification.

3. The following section gives the Superintendent's estimate of the effects of the use of intelligence tests upon the school system in general:

The effects of the use of intelligence tests upon the school system in general are, as far as I have been able to judge:

1. They have made clear to the teaching staff the existence of the problem of individual differences and have resulted in the teaching corps giving explicit recognition to the existence of the problem as such.

2. This has resulted in a desire on the part of the teachers to arrive at a more nearly satisfactory solution of the problem.

3. This, in turn, has caused the large majority of teachers to be more willing to accept professional direction in supervision.

4. There has been a marked response of support from the group of patrons who have felt in the past that the schools were doing nothing for the bright pupils.

5. There has been a recognizable improvement in a more intelligent, efficient organization and administration of the curriculum both by supervisory officers and by teachers.

6. In brief, the effect seems to have been to make the workers in the public schools realize more keenly the nature of the problem of instruction and to work more zealously to solve that problem and thereby cause the schools to realize more fully the objectives of educational effort.

4. Conclusions:

The general effects of the classification upon

the school system have been (1) the development of school spirit, loyalty, and cooperation to a greater degree: (2) an improvement in the attitude toward school work, which has resulted in children doing their work more happily, easily, and successfully; and (3) higher standards of school achievement which has caused both pupils and teachers to strive harder to produce a better quality of school product.

The cooperation of parents can be easily secured if group test results are used wisely. When patrons understand the real purpose of the new system of classification in better placing their children and in securing better work from them, they are highly in favor of the system and cooperate in making it successful. In the Lawrence schools the parents were highly pleased with the classification, and the administration of the new system has met with marked success in the community.

The effects of the use of intelligence tests (1) in making the teachers clearly conscious of the problem of individual differences and anxious to arrive at a more satisfactory solution of the problem and to accept professional direction; (2) in establishing a more efficient organization and administration of the curriculum both by the supervisory and teaching staff; and (3) in making the workers in

the public schools realize more keenly the nature of the problem of instruction and to work more zealously to solve that problem, all of which are pointed out by the Superintendent, prove the value of such a system of classification and well warrants its adoption.

In brief, the grouping of Lawrence school children on the basis of ability has met with marked success and has proved valuable to the school system. No school administration need fear classification on the basis of intelligence tests when once the co-operation of supervisors and teachers is secured, and a right understanding of the purpose of the reclassification is made prevalent. These two requisites make the administration of the system a success and further increase the valuable effects of the reclassification.

Chapter III (Cont.)

V. Summary and Conclusions.

1. The Results Obtained from the Otis Testing in the Lawrence Schools.

a. 62 per cent of the enrollment from the 4th grade to the senior high-school had intelligence quotients above 90; 13.93 per cent had I.Q.'s between 80 and 90; 7.96 per cent between 70 and 80 and 16.51 per cent had I.Q.'s below 70.

b. The Jr.H.S. distribution of I.Q.'s is markedly skewed at the high end.

c. All the I.Q. distributions by schools, with the exception of the Woodlawn and Lincoln schools, are skewed at the upper end of the curve. The two exceptions are markedly skewed at the low end of the curve.

d. Poor results were obtained from the test in the 4th grade. These results were not used as a basis of classification since a large percentage of children made I.Q.'s below 70 or had mental ages below 8.

e. Very poor results were obtained from the Negro children. 75 per cent of them made I.Q.'s below 70. The test results show that these children did not do nearly as well as White children in the same group intelligence test.

f. The Otis results show that the youngest children chronologically, make the highest intelligence scores. The retardation chart shows that the older a child is and the greater his retardation, the lower his intelligence score. The correlation of I.Q.'s and chronological age among children of any given grade is negative.

g. The retardation chart further shows that in three of the grades the retardation is as great as the acceleration and in two grades it is greater.

The Lawrence experiment in scientific classification of pupils will no doubt greatly aid in solving her retardation problem.

2. The Immediate Effects of the Reclassification.

a. A greater similarity of mental ages was secured in all classes affected by the special promotions. The decrease in the range of mental age in classes was 25 to 50 per cent of the total range.

b. After the reclassification the large majority of children in each I.Q. group, with the exception of one, both in the grade and Junior high-schools made from 0 to 30 per cent increases in their grades, while the range of increase was as high as 150 per cent. Since the increase in grades was general and the majority of children in each ability

group, with one exception, in both types of schools received higher marks, the one apparent explanation is that after children are classified according to ability they do a better quality of school work.

c. The value of the Otis Group test as a classification device is indicated since the majority of children throughout the school system did better work as shown by the higher marks received after the reclassification.

3. The Specific Effects of the Reclassification, Based on Teachers' Judgment.

Effects in the Grade Schools.

a. Superior and normal children do an equal if not a better quality and quantity of school work. (The teacher's judgments were equally divided on this point.)

b. Retarded children show marked improvement in both quality and the quantity of work.

c. All three groups of children are more interested in their work. Normal and superior children strive to do a better quality of work, in order that they may be transferred into the higher groups and sections of their classes.

d. The reclassification on the basis of the tests has had strong suggestive effects to the superior and normal children, but not to dull children.

e. Rivalry has developed among the higher sections and

groups, and problems of discipline have become simplified.

f. Differentiation and adaptation of school work to all classes have been made possible.

g. The grade teachers as a whole believe the reclassification has been beneficial to all classes of children and to the general working of the school system.

Effects in the Junior High School.

a. Both superior and normal children do a better quality and a greater quantity of work.

b. Retarded children do a better quality but not a greater quantity of work.

c. Both normal and superior children have been motivated by higher ideals of work, and have been stimulated to secure special promotions and transfers into higher sections of classes.

d. School work has been adapted to each group with the result that all children are more interested in their work and do a better quality of work.

General Conclusion: Since all the specific effects of the reclassification for both Grade and Junior High Schools have been highly desirable and beneficial to the school system, the Otis Group test is shown to be a valuable supervisory device in classifying a school system.

4. The Effect of the Classification upon the School System in General.

A. Effect on School Spirit.

1. On the part of teachers it is more progressive and intelligent as to the educational objectives to be attained; and further a greater spirit of cooperation has been developed between supervisors and teachers in attaining the higher educational standards.
2. Among a large number of children a healthy spirit of rivalry has been developed.
3. Among all children a greater spirit of interest in school work has been developed.
4. The general school atmosphere is positive and progressive, and is motivated by higher ideals of work and greater achievement.
5. The general school system works more smoothly. All groups of children work more effectively as units since work has been adapted to their various abilities. Problems of discipline have also been solved, giving the teachers' time more to the production of a better school product.

B. Attitude of Parents Toward the Reclassification.

1. Parents favor the special promotions and are greatly interested in what the school is doing for their children.
 2. Parents have directly cooperated in some instances in securing a better grade placement of their child.
-

3. Little opposition has occurred, and that which has occurred is a result of a misunderstanding of the system of classification.

4. The attitude of the community as a whole is highly in favor of classification of children according to ability.

C. The Superintendent's Estimate.

The effects of the tests upon the school system has been germane in causing teachers to define their educational objectives more clearly and to realize to a greater extent the problem of individual differences,—the result being that a higher standard of school work is established, and a better quality of school product is achieved.

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Conclusions Concerning the Reliability of the Otis Test as a Classification Device.

All the data of this chapter prove that the Otis test can be used as a reliable basis for classification for all children above the 4th grade for:

1. The majority of the Lawrence children after the reclassification on the basis of the Otis test results did a better quality of work as indicated by significant increases in teachers' marks. That the higher marks received after the classification are indices of a better quality of

school work is proved by the outstanding fact that they were not confined to (1) specific teachers, (2) to specific groups of children, (3) to specific schools, and (4) to either the grade school or the Junior high school children; but they were received by children of all types of ability thru out the school system.

Furthermore, that the higher marks represent a better quality of school work is proved by the replies of the teachers to the questionnaire. The Junior High School teachers, as a whole, were agreed that all children--superior, normal, retarded--did a better quality of school work after the reclassification. Half of the grade teachers say that superior and normal children did a better quality of work while the other half were agreed that the quality was equal to that which it had been previously, while all grade teachers were agreed that the retarded children made improvement in quality of work. The higher marks given by the teachers and their judgments in the questionnaire are consistent that the Lawrence children did a better quality of work after the reclassification.

The fact that a better quality of work resulted thru out the school system after the reclassification proves that the Otis test furnishes a reliable basis for the classification of a school system.

The Otis test is a reliable basis for classification for:

2. Upon its results children were so successfully grouped according to ability, that teachers had little difficulty to differentiate and adapt school work to each type of ability. Furthermore, the greater interest manifested by all children in their school work proves that they were better grouped, and that the adaptation of work was effective.

3. Finally the Otis test may be considered as a reliable basis for classification since all the effects of the Lawrence reclassification have been highly desirable, beneficial, and satisfactory to all concerned—to pupils and teachers, as well as to parents.

Chapter IV

The Degree of Reliability With Which the Otis Group Intelligence Tests Can Be Used.

The reliability of certain individual intelligence tests has been established, and their supervisory value has been well demonstrated by the successful experiments of Drs. Terman, Whipple, and other. Altho individual tests are the most reliable tests that can be used, yet they are impracticable when large numbers of children are to be tested. If it can be shown that group tests succeed in grouping children according to ability, and are fairly reliable when correlated with individual test results, their supervisory value will be established.

The degree of reliability of the Otis group test is well shown by the results obtained from its use in Lawrence. Its degree of reliability was shown in three ways: First, by the relation between intelligence quotients and school failures; second, by the percent of children receiving special promotion, that failed; and third, by its correlation with the Stanford Revision of the Binet test.

1. The relation between intelligence quotients and school failures.

Tables V and VI show that there is a high positive correlation between low intelligence quotients and

school failures. This fact indicates that the Otis test has succeeded in grouping the Lawrence children according to ability, for the greatest number of failures occurred in the groups of children that had low intelligence quotients, and the fewest in the higher I.Q. groups, while none failed whose I.Q.'s were above 140.

TABLE V.

The Relation Between I.Q.'s and Failures for the First Semester 1919 of 397 Junior High School Students.

<u>Intelligence</u> <u>quotients</u>	<u>No of</u> <u>Children</u>	<u>No. of</u> <u>Failures</u>	<u>Percentage</u> <u>of Failures</u>
Below 70	25	1	4
70-80	31	1	3.2
80-90	67	6	9
90-110	108	2	1.8
110-120	45	1	2.3
120-140	74	1	1.3
Above 140	49	0	0.0
<u>Total</u>	<u>397</u>	<u>12</u>	<u>3.0</u>
Below 90	123	8	6.5
Above 90	274	4	1.4

1. In the above table it may be seen that while 6.5 per cent of the children failed whose I.Q.'s were below 90, only

0.4 per cent failed whose I.Q.'s were above 90. Thus practically five times as many children failed whose I.Q.'s were below 90 as the number whose I.Q.'s were above 90. The table also shows that over six times as large a percentage of failures occurred in the group whose I.Q.'s were between 80 and 90 as occur in the four upper groups, or in the groups whose I.Q.'s were above 90. It is significant to note that only 1.3 per cent failed whose I.Q.'s ranged from 120 to 140 and none failed whose I.Q.'s were above 140.

TABLE VI.
Relation Between I.Q.'s and Failures for the First
Semester 1919 of 472 Grade School children above the
4th Grade

Intelligence Quotients	No. of Children	No of Failures	Percentage of Failures.
Below 70	119	20	16.8
70-80	48	4	8.3
80-90	71	6	8.4
90-110	167	4	2.39
110-120	68	1	1.47
120-140	72	3	4.1
Above 140	27	0	0.0
Total	472	38	8.0

Table VI more strikingly shows the relation between I.Q.'s and failures than table V. 16.8 per cent

of the pupils whose I.Q.'s were below 70 failed. A slightly larger per cent failed in each of the I.Q. groups from 70 to 80 and from 80 to 90 than the total per cent that failed in all the grades above the fourth. As the table shows, the large majority of failures come from children whose I.Q.s were below 90. Both tables show that only a comparatively small per cent of children failed who had I.Q.'s of 90 and above.

This high correlation between Otis I.Q.'s and failures proves fairly well the reliability with which the test can be used in grouping children according to ability.

2. Table VII shows the per cent of failures of the children who received special promotion. The table shows the number of special promotions in each school and the per cent that failed.

Of the grand total of special promotions of children enrolled above the third grade only 5.1 per cent failed. This means that 95 per cent of the children receiving special promotion succeeded in being promoted regularly with the class at the end of the first semester.

In the Quincy school out of 36 special promotions none failed; at Pinckney 2 out of 25 failed; at New York 1 out of 8 failed; at McAllister 1 out of 4 failed; and at Cordley none of the five failed.

These results prove that the Otis test succeeds in picking out the children of very superior intelligence or those whose ability warrants special promotion. Since 95 per cent of the children who received special promotion made good, the Lawrence reclassification is justified and the value of the Otis test for supervision seems to be verified.

TABLE VII

Showing the Per Cent of Students Receiving
Special Promotion in November 1919 that
Failed.

Name of School	No. of special promotions	No. of Failures	% of Failures
Quincy			
To JR High School	5	0	
6B to 6A	13	0	
5A to 6B	8	0	
5B to 5A	4	0	
4A to 5B	2	0	
4B to 4A	4	0	
Total	36	0	0
Pinckney			
To JR High School	2	0	
6B to 6A	4		
5A to 6B	5		
5B to 5A	8		
4A to 5B	2		
4B to 4A	4		
Total	25	2	8%
New York			
To JR High School	1	0	
6B to 6A	6	0	
5B to 5A	1	1	
Total	8	1	12.5%
McAllister			
Total	4	1	25%
Cordley			
Total	5	0	0.0
Grand Total	78	4	5.1%

3. The reliability of the Otis test is further shown by its correlation with the Stanford Revision of the Binet test.

Two correlations were made, one based upon the Otis and the Binet I.Q.'s of 62 Lawrence Junior High school students, and the other upon I.Q.'s obtained from 92 grade school children. Figures 71 and 72 show the two correlations. The correlation for the Junior high-school children was .807 with a P.E. of .078, (Fig.71); while the coefficient for the grade school children was .76 with a P.E. of .0296. Both correlations were made by the use of the Pearson formula.

These coefficients of correlation between the Otis and the Binet I.Q.'s are markedly high. They measure the reliability of the Otis test as used in Lawrence; and prove that the test can be used safely by supervisors as a grouping device.*

4. Summary and Conclusion:-

The reliability of the Otis test as a group test is proved as far as the Lawrence experiment has demonstrated. This experiment only shows, however, the value of

*The reliability of group tests has further been shown by the studies of G.E.Breece and W.H.Pyle of the University of Missouri. L.W.Pressy has also discovered fairly marked correlation between the Primer Scale and the Binet scale. For further description of their experiments and results see division "C" of the appendix.

Junior High School Pupils

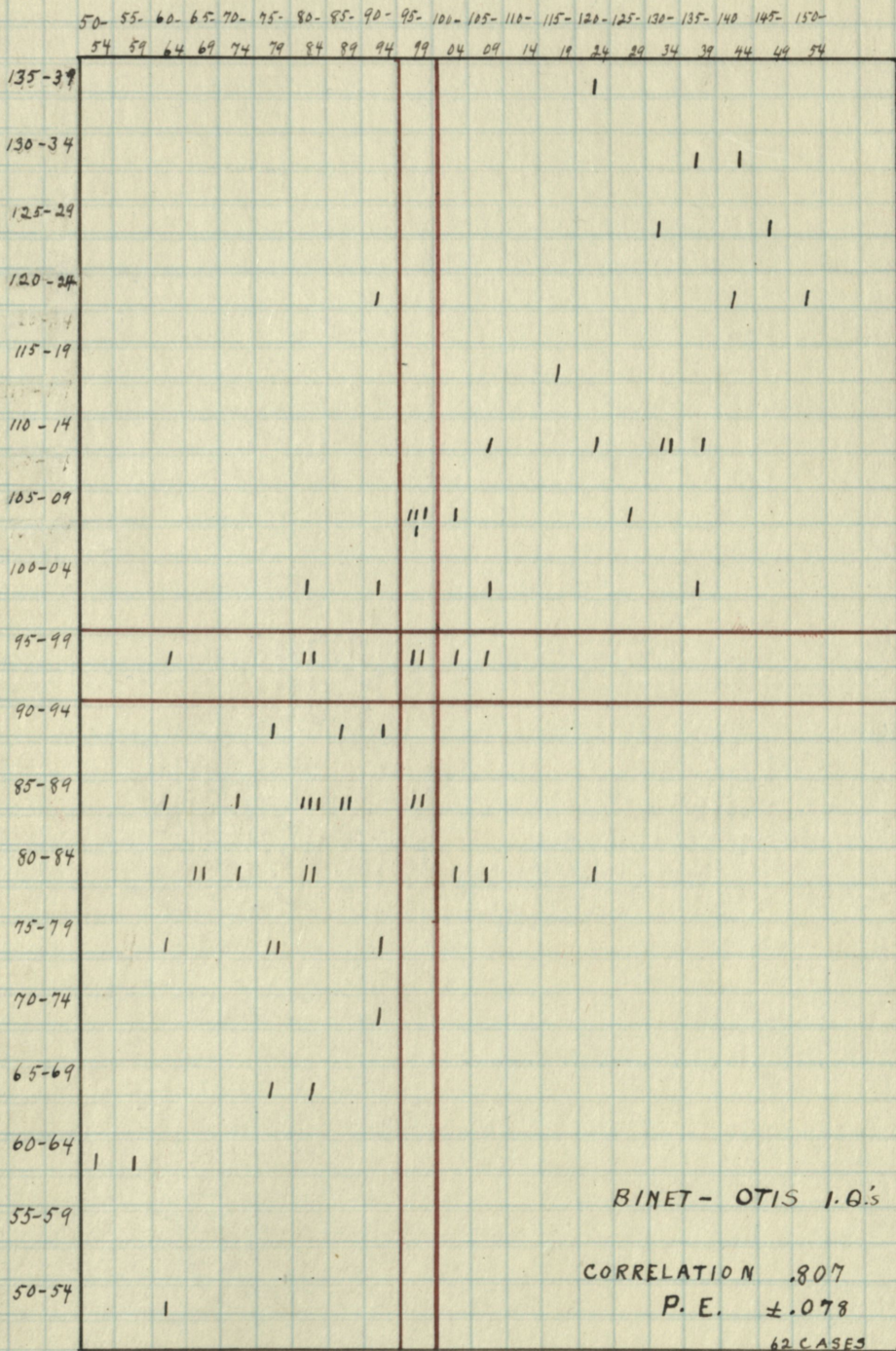


FIG. 37 37.

the Otis test as a grouping device for children enrolled above the 4th grade.

The degree of reliability of the Otis test as a supervisory device in grouping children is shown by:

1. The higher marks received by the children after they were reclassified or grouped according to mental age.
2. The high correlation between I.Q.'s and quality of school work.
3. The high correlation between I.Q.'s and failures.
4. The 95 per cent of children who received special promotion that made good.
5. The high correlation between the Otis and the Binet I.Q.'s.

The conclusion drawn from the above data is that the Otis test results may be used as a reliable basis for school classification and grade placement.

Chapter V.

Summary and General Conclusion.

The following conclusions are drawn from the study concerning:

- I. The supervisory value of the Otis Group Test as a classification device.
 1. The Otis Test results give a reliable basis for the classification of children from the fifth to the eighth grade inclusive for:
 - a. The Lawrence children of these grades when grouped or classified on its basis did (1) a better quality of school work, (2) took a greater interest in their work, and (3) in the most cases did a greater quantity of work.
 - b. 95 per cent of the children who were given special promotion were placed correctly since they received regular promotions with the classes into which they were placed. Only 5 per cent of those who received special promotion failed.
 - c. A high correlation was found to exist between Otis I.Q.'s and the quality of school work.
-

- d. A high correlation was also found between Otis I.Q.'s and school failures.
 - e. Finally, a markedly high correlation was found between Otis and Binet I.Q.'s from the Stanford Revision test. For grade school children this correlation was 76 with a P.E. of $\pm .0296$, for Junior high-school children it was .807 with a P.E. of $\pm .078$.
2. As far as the Lawrence test results have shown the Otis test is not adapted for grade 4.
 3. The Otis test is easily administered. With only a small amount of practice the regular teachers can give the test with the directions that are provided. Furthermore, the test is easily scored, and a school system can be classified upon its results, in terms of either I.Q. or mental age, with little difficulty.
 4. As a result of the use of the test there has been a recognizable improvement in a more intelligent, efficient organization and administration of the curriculum both by supervisory officers and by teachers.
 5. The tests have made clear to the teaching staff the existence of the problem of individual differences, and have resulted in the teaching corps giving explicit recognition to the existence of the problems as such.
-

6. The test has special supervisory value since the children do not fear but rather enjoy taking it.
7. By providing a reliable basis for grade placement, the test results have enabled the Lawrence teachers to solve many perplexing disciplinary problems.
8. All the above data secured in the Lawrence experiment are consistent in showing that the Otis test is a reliable, satisfactory, easily administered, and valuable, supervisory device in scientific classification.

II. The effect upon the Lawrence schools resulting from the reclassification on the Otis Test results.

1. The immediate effects.

- a. A greater similarity of mental ages within classes was secured, which enabled them to function more effectively as units.
- b. A better quality of school work was produced as shown (1) by the higher marks received by the majority of pupils and (2) by the direct replies of teachers made in the questionnaires.
- c. A greater quantity of school work was produced by superior and normal children, and in some instances by retarded children.

2. The general effects.

- a. A more progressive school spirit was developed

- which was dominated by keener interests and purposes.
- b. A healthy spirit of rivalry was developed between the higher groups and sections of classes and between certain individual pupils.
 - c. The parents and patrons of the community have become more interested in the work of the schools and are pleased with the results of the reclassification.
 - d. The child has been made the center of the school system—all school work being planned and organized with reference to his needs and ability.

In brief, both the specific and general effects of the reclassification show that the latter has been highly desirable and successful, and that the Otis test proves to be a valuable supervisory device in school classification.

III. General Conclusions:

1. The Otis test cannot be used for fine point testing but it does succeed reasonably well in roughly grouping children above the 4th grade according to mentality.
2. A school system should be classified upon the basis of mental age rather than upon the intelligence quotient for the latter is only a measure of relative

brightness while the former is a measure of mental maturity. Similarity of mental ability in classes then is only guaranteed by securing a greater similarity of mental ages in such classes.

3. The older a child is in a given grade the lower is his I.Q. Thus intelligence quotients and chronological ages are related inversely.
4. Since it was shown that the youngest children in each grade made the highest intelligence scores, teachers can no longer use the old method of chronological age promotion without doing a great injustice to the children of superior intelligence, who are found to be the real retardates of the conventional lock-step school system.
5. The problem of retardation of children of both low and high intelligence can largely be solved by grouping all children according to mental age, in order that they may progress, normally, according to ability. This grouping of children on the basis of mental maturity, rather than on chronological age can be accomplished only by the use of reliable intelligence tests, either group or individual.
6. The Lawrence experiment has proved the Otis Group Test to be a reliable basis for classifying and group-

ing children according to mental maturity and as a result a helpful supervisory device in securing a higher standard of school work and a more efficient school system.

7. No school system, today, can be democratic, or highly efficient and successful unless such a classification device is used that its children are permitted to progress, normally, according to mental rather than chronological age.

The classification of children according to mental capacity is the most significant administrative problem today. No child can do his best work in a class in which the whole gamut or range of mentality exists. The Lawrence experiment showed that the mental maturity within classes ranged from a mental age of below 8 to a mental age of 18. Dr. Thorndike states that on the basis of psychological tests, in a given class, "the variation is such that some pupils in the grade do four or five times as much work as others in a given time, or do the same amount with a far smaller proportion of errors, or do successfully tasks which others cannot master." Later experiments have shown that the performance ability at the upper end of the range was as much as ten times that at the lower end. All intelligence tests show the enormous differences in intelligence which obtains for any unselected group

of children of a given age.

The Otis test revealed that while the youngest child in the 4th grade, age 7, made an intelligence score of 51, the oldest child in the grade, age 14 made a score of 26. In the fifth grade the youngest child, age 8, made a score of 81.6 while the oldest child in the grade, age 16, made a score of 13. Dr. Terman's experiments on the use of intelligence tests in the educational guidance of high school pupils reveal individual differences in mental ages of from 12 years 8 months to 19 years, and in chronological age from 13 years 1 month to 19 years three months. Further more all such experiments show that in a given class that chronological age and mental maturity are related inversely.

Such studies as these prove to school men that grade placement cannot be reliably made upon chronological age, or without reference to the mental ability of the school child. Investigations have shown, quoting from Dr. Terman that the resulting classification of children has been so far from successful that, generally speaking, the lowest 20 or 25 per cent of pupils in any grade belong mentally in a lower grade, and the highest 20 or 25 per cent in a higher grade. Only the middle 50 or 60 per cent are classified approximately where they should be. Usually more than 15 per cent of pupils are at least two grades removed from the one in which

they belong by mental age. Thorndike has pointed out that even in the most progressive cities the school population is not even approximately divided into groups of similar mental ability or capacity to do the work of the particular grade.

This school problem which is every where prevalent because of the wide range of individual differences, challenges school administrators to classify their school systems upon the basis of intelligence tests. Grade placement and grade promotion should be made on the basis of the child's ability to meet the requirements of the next higher grade. This fact has been lost sight of in school room practice. Dull children are usually found one to three grades above that warranted by their mentality; while bright children are generally found from one to three grades below the location where their mentality would place them. This condition reveals that ordinary teaching procedure does not detect and properly estimate mental ability, and that schools miserably fail in grading children according to mentality.

Children cannot be successfully classified on the basis of teachers' estimates of intelligence. Some schools today have the idea that their classification on the basis of teachers' judgment of intelligence is as reliable as the classifications made by the use of intelligence tests. There

are many fallacies in this assumption. First, it has been shown that the intelligence of retarded children is usually over estimated by teachers, and that the intelligence of superior children is under-estimated. Second, even tho some teachers may detect superior ability, it is with reluctance that they promote the child. Third, intelligence has been judged by teachers on the basis of school performance rather than upon the grade in which the child ought, according to his chronological age, to be doing satisfactory work. Intelligence can be adequately judged only by the quality of work done in the grade that is normal to the child's age. Fourth, teachers are likely to err in judging the intelligence of children coming from the poorer homes, who, by the conditions of their environment are naturally timid and shy and cannot make the response or showing that the less intelligent children can, who are very talkative, cunning, and active. Fifth, teachers' judgments of intelligence are not reliable because they have no standard for normal intelligence, and no scientific methods of judging intelligence.

The day has come when objective mental testing is taking the place of the subjective estimates of teachers. To be of most value to both the child and the school these tests should be given to all children upon their first entrance into the school. This early classification on the basis of mentality is desirable in order that those children

of marked ability may be selected for rapid advancement, and those of low grade mentality may be early segregated. In the past it has been the mentally defective child that has been given the intelligence test, the special attention in ungraded rooms, and an undue amount of expenditure of talent time, and money. As Dr. Monroe has said: "The tendency in our schools is to devote more attention to the subnormal or the mediocre than to the supernormal." Group tests supplemented by individual tests makes it possible for school administrators to place every child in the school system where his ability warrants. When children are thus correctly placed and grouped school work can be more satisfactorily adapted to the needs of the pupil; and as a result, he can work more freely, happily, contentedly, and at a rate normal with his ability.

The intelligence test by providing a scientific basis for grade placement will also largely enable the supervisor to solve his retardation problem. Retardation, which is an alarming problem in many schools, can partly be explained by the fact that children have not been placed where they can work with a maximum of efficiency. Children of unequal ability cannot work together successfully. Those of less ability become laggards in the class and as a result soon become retarded. The retardation of such children becomes greater each successive year until they drop out of

school. This retardation can be materially lessened by grouping children in each grade according to ability; so that school work may be adapted to the various abilities. Such a procedure makes it possible for the less intelligent children to make normal age-grade progress in their group, and prevents the clogging of the lower grades with over-aged and dull pupils. Furthermore, this prevents the holding back of superior children--the real retardates of the school, who have been found to be from two to four grades below that which their ability warrants.

The democratic school system, today must classify and group all children according to mental maturity. The group intelligence test is the only device by which this can be effectively accomplished. This thesis has shown that the Otis Group Test, which is only one of a number of excellent group tests today, has proved to be a reliable and very satisfactory basis for school classification; but only time can show the real results of the classification of the Lawrence schools on the basis of mental ability. However, the results of the reclassification that have become manifest at this early date, highly warrants the whole procedure, and indicates the supervisory value of the Otis and other similar group tests to the school administrator.

VI.

APPENDIXES

- A. Samples of returned questionnaires
 - B. The Superintendent's letter to the patrons.
 - C. Correlations between group and individual test results.
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Lawrence, Kansas.
April 13, 1920.

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond A. Smith

EFFECTS OF OTIS INTELLIGENCE TESTS

I. Effects on bright children.

1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude.)
yes, greater effort is made to do satisfactory work
4. Is an ideal of work developed not to fall below ones standard rank or group? *yes*
5. Is a conscious spirit of rivalry developed among the sections or groups? *yes?*
6. Remarks (Add anything not covered by the above which you think should be stated.) *Discipline is easier when bright children have work to do.*

II. Effect on Normal Children.

1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.

Remarks. *Parents know why their children are given special promotion; this leads to discussions at home and among children.*

2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work.
Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.

- 1 *Better than before.*
- 2 *Greater than before*
- 3 *Desire to be in first rank*
- 4 *Ideal of work developed not to fall below standard.*

3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section? *yes*

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)

1. Effort is made to do greater quantity of work
2. Retarded children try to raise quality of their work; they fail in some instances. Sad!
3. Attitude developed to be up with other children
4. ? ?

2. Is there an improvement (1) in quality, (2) in quantity of work done? *yes*

3. Is there an increase of (1) interest and (2) effect in school work? *yes*

4. Remarks. Retarded children ask to go to Ungraded Room for special help in work "below average"; they voluntarily stay after school for special help.

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

1. There is an increase of interest
2. Effort to be present and on time; children who are absent desire to make up work; and none want to fall below standard.
3. Quantity of work better than before
4. Ambition developed to secure special promotion.

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable? *The special promotions have been beneficial*

Note - List the specific factors on which you base your judgment.

Quality and quantity of work have been up to grade. Bright children have work to do when they are classed with pupils of equal abilities.

Susan Friend

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond A. Hunt

EFFECTS OF OTIS INTELLIGENCE TESTS

I. Effects on bright children.

1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before? *didn't have enough to keep them busy*
3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude. *in lower grade*)
4. Is an ideal of work developed not to fall below ones standard rank or group? *yes.*
5. Is a conscious spirit of rivalry developed among the sections or groups? *yes. Pupils look to that group, would give one*
6. Remarks (Add anything not covered by the above which you think should be stated)

II. Effect on Normal Children.

1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.
Remarks. *Pupils often ask what did I do in the test? what do you have to make to go on?*
2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work.
Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.

I = Better than before. II = Greater than

III. If in first rank very anxious to stay.

IV. More accurate work, much neater also

3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section?

yes. The parents try work to secure special promotions for their children.

5. anything to get in that group.
and where we have the two 6th grade
rooms. The pupils ask daily, any chance
to get in that other room?

EFFECTS OF THIS INTELLIGENCE TESTS

1. Is the quantity of work done by these children (1) equal to (2) better than, or (3) poorer than before? (Understand your answer)
2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
3. Is there an attitude developed to be in the first rank, second or third of the class? (Be specific in describing attitude)
4. Is an ideal of work developed not to fall below once standard rank or group?
5. Is a consistent spirit of rivalry developed among the sections or groups?
6. Remarks (and anything not covered by the above which you think should be stated)

II. Effect on Normal Children

1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Understand one) Yes - No - Partly.
2. What effects has the special provision had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work? Note - Put your answers to the above in the form requested under I, 2, 3 and 4 of the questions asked concerning bright children.

3. Is there an ambition developed in some to secure special position or a transfer to the next higher group or section?

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)

1. A different lesson plan on similar subjects and problems.
2. Smaller groups for more individual help.
3. Problems more simple.
4. More drill

2. Is there an improvement (1) in quality, (2) in quantity of work done? In quality yes, " no

3. Is there an increase of (1) interest and (2) effect in school work? Yes, increase of interest if I keep the work simple enough and doing some thing new for them much of the time. Discipline takes care of itself. Fewer failures

4. Remarks.

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

1. Awakened us to fact all children did not have same mental ability. Something to stand back of grades.
2. Increased quality of class room work.
3. Created rival spirit and that makes my work somewhat easier. Incentive for better work

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable?

Both beneficial and desirable.

Note - List the specific factors on which you base your judgment.

I. Gives pupils a chance to do what they are able to do. Puts them in a group of their equals. Leaves weaker group together where they have a chance to do their best work. Incentive to push on.

Lawrence, Kansas.
April 13, 1920.

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond A. Hunt

EFFECTS OF OTIS INTELLIGENCE TESTS

I. Effects on bright children.

1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude;
Yes. (See below.))
4. Is an ideal of work developed not to fall below ones standard rank or group? *Yes.*
5. Is a conscious spirit of rivalry developed among the sections or groups? *Yes.*
6. Remarks (Add anything not covered by the above which you think should be stated)

II. Effect on Normal Children.

1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.
Remarks.

2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work.
Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.

1. Quality of work - ~~(2)~~ equal to, or even a little better than before.
2. Quantity of work - ⁽¹⁾ equal to before.
3. Attitude toward work - aroused interest and created enthusiasm.

3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section?

In my judgment, Yes.

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)

1. Thorough review of past work.
2. Individual help.
3. Frequent drills and reviews.
4. Special help, for a few children, in the Ungraded room.

2. Is there an improvement (1) in quality, (2) in quantity of work done? *Yes, on the part of most of the children.*

3. Is there an increase of (1) interest and (2) effect in school work? *Yes.*

4. Remarks. *I feel sure that, on the whole, much has been gained from the Otis Intelligence Tests. There is an increase of interest in all branches of school work.*

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

1. *Interest has been increased.*
2. *Enthusiasm has been aroused and stimulated.*
3. *Greater realization, on the part of the children, of their own deficiencies.*
4. *School spirit has been stimulated.*

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable?

Note - List the specific factors on which you base your judgment.

1. *Quality and quantity of daily work.*
2. *Quality and quantity of reviews and tests.*
3. *Attitude toward school work as daily expressed in the school-room.*
4. *School spirit as displayed on the school-ground, in contests, and in our organization meetings.*

Isabel E. Gilmore.

Lawrence, Kansas.
April 13, 1920.

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond A. Hunt

EFFECTS OF OTIS INTELLIGENCE TESTS

I. Effects on bright children.

1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude.)
They seem proud to be in the first group and try to stay in that group.
4. Is an ideal of work developed not to fall below ones standard rank or group? *Yes.*
5. Is a conscious spirit of rivalry developed among the sections or groups? *Yes.*
6. Remarks (Add anything not covered by the above which you think should be stated)

II. Effect on Normal Children.

1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.
Remarks.
2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work. Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.
 1. *Quality of work equal to that before.*
 2. *Quantity of work is greater than before.*
 3. *Attitude is to try and get into the first division.*
 4. *The ideal of work developed is not to fall below ones standard rank and if possible to attain ^{promotion} the first class.*
3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section? *Yes.*

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)

- 1. In English 1A⁴ I use short stories, such as those found in *Yonk's Companion*, *Forwards* etc. for classic work.
- 2. They can not read, or understand the regular classic pieces, so I read and explain these altered stories to them.
- 3. For Oral Composition they repeat some of the stories read.
- 4. and for written composition they write these.

2. Is there an improvement (1) in quality, (2) in quantity of work done? *Improvement in quality but not quantity.*

3. Is there an increase of (1) interest and (2) effect in school work?

1. Yes. 2. Yes.

4. Remarks.

Have discovered in a 4th group students will recite who would never recite in other classes because now they do not feel themselves inferior.

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

- 1.
- 2.
- 3.
- 4.

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable?

Note - List the specific factors on which you base your judgment.

I have only had a few of the special promotion pupils so do not feel competent to judge on this last question.

Miss Van Buskirk

Lawrence, Kansas.
April 13, 1920.

To the Teachers:-

During the present year we have been trying a very important experiment. We are very anxious to secure all the evidence possible on this experiment and ask your cooperation to the extent of answering as well as you can the questions listed below. You are requested to have these answers in the hands of your Principal not later than Friday, April 16th.

Raymond Atkes

EFFECTS OF OTIS INTELLIGENCE TESTS

- I. Effects on bright children.
1. Is the quality of work done by these children (1) equal to, (2) better than, or (3) poorer than before? (Underscore for your answer)
 2. Is the quantity of work (1) equal to, (2) greater than, or (3) less than before?
 3. Is there an attitude developed to be in the first rank, section or group of the class? (Be specific in describing attitude.)
There is a desire to excel the other members of the group.
 4. Is an ideal of work developed not to fall below ones standard rank or group? *yes*
 5. Is a conscious spirit of rivalry developed among the sections or groups? *No*
 6. Remarks (Add anything not covered by the above which you think should be stated)
- II. Effect on Normal Children.
1. Are they conscious of the purpose and use of these tests in placing and promoting those of their own group? (Underscore one) Yes - No - Partly.
Remarks.
 2. What effects has the special promotions had upon (1) quality of work, (2) quantity of work, and (3) attitude toward work. Note - Put your answers to the above in the form requested under 1, 2, 3 and 4 of the questions asked concerning bright children.
1. quality of work (2) greater than before
2. quantity " " (1) Equal
3. attitude toward work. Pupils have an incentive that they did not have when in a lower group. They work very hard to stay in the higher group.
 3. Is there an ambition developed in some to secure special promotion or a transfer into the next higher group or section? *yes.*

4. Remarks.

III. Effect on Retarded Children.

1. How has the work been adopted to them? (Be very specific)

1. *Their needs have been studied and the work applied to them.*
2. *Since they are not able to grasp many things just the fundamentals have been given.*
3. *Subject matter has been given them in a much simple form than higher groups.*
- 4.

2. Is there an improvement (1) in quality, (2) in quantity of work done? *no*

3. Is there an increase of (1) interest and (2) effect in school work? *There is little interest in school shown in the retarded class, unless home surroundings are very good.*

4. Remarks. *A better quality of work is produced the work and presentation can be adapted to them.*

IV. In your judgment what have been the effects of the use of these tests upon general school spirit and interest? (Be specific)

1. *A desire to be in higher groups has been created.*
2. *Subject presentation is much simplified.*
3. *Pupils in lower groups have no chance of seeing what a bright mind can do.*
4. *Some children who are placed in a low group give up trying to do anything.*

V. As far as you have been able to judge have the results upon children of special promotion been (1) beneficial or desirable or (2) disadvantageous or undesirable?

Note - List the specific factors on which you base your judgment.

OFFICE OF
THE BOARD OF EDUCATION
LAWRENCE, KANSAS

April 12, 1920.

124.

To Parents and Patrons:-

As you already know we have been giving the children in the public schools this year certain general intelligence tests. Largely on the basis of the results of these tests we have given certain children special promotions. Your child was one who received such a promotion. We are very anxious to know what the parents of the children so promoted think the results of this action have been. I am therefore asking you to answer the questions below. Add such remarks as you care to and return your answer either to me or to the teacher having your child in charge. I assure you that we wish your frank statement in this matter and are asking it solely for the purpose of determining what the value of our procedure has been.

As far as you have been able to judge have the results of special promotions in the case of your child been (1) beneficial to the child or (2) nonbeneficial? (Underscore the word which you wish to be your answer). We should like you to be specific and state just what reasons you have in mind for making the above answer.

Thanking you for your cooperation in this and in all other matters looking to the welfare of our schools and our children, I remain

Yours very truly,

N.B.
Please use back of the sheet for your answer.

C- Correlations Between Group and Individual Test
Results.

Professors G.E.Breece and W.H.Pyle of the University of Missouri undertook a comparison of the results obtained by the use of the Yerkes-Bridges Point Scale with the results obtained by the use of standardized group tests. The subjects were 80 public school children in grades four, five, and six. The correlation by the Pearson formula between the group test rating and the Point Scale rating was .619; P.E. .046. The correlation by the Spearman foot rule formula was .84. The investigators are of the opinion that "if the raw correlation by the Pearson formula is .619 and by the /Spearman formula .84, the true correlation between the two sets of measurements is probably near unity."

A second study of the validity of group test results was made by L.W.Pressey for the Primer Scale. The coefficients of correlation for each of three groups of children, calculated by the Pearson formula, are as follows:

64 children from a feeble-minded school	+0.75
148 children in primary grades	+0.88
57 unselected children 6 years of age	+0.82

The above correlations existed between scores derived from the Primer Scale and scores obtained by using the Binet Scale. Additional correlations made for each of the four tests with

the Binet ratings are as follows: 0.53; 0.45; 0.42; 0.47.

Altho only a few studies have appeared so far concerning the reliability of group tests, yet the present indications are that a high correlation exists between the two types of mental tests. With further perfection of group tests, which is bound to result from their wide use and from careful experimenting with them, school administrators may be assured that certain group tests may be safely used for general problems of a supervisory nature.

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