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A TESTING SURVEY
IN
THIRD CLASS DISTRICTS
GALLATIN COUNTY, MONTANA

BY

LEORA M. HAPNER

PRESENTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DE-
GREE OF MASTER OF ARTS

STATE UNIVERSITY OF MONTANA

1928

SIGNED



CHAIRMAN, EXAMINATION COMMITTEE

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CHAPTER I

INTRODUCTION

During the last ten years the school survey has become not only a popular but an almost indispensable means of measuring progress and results, evaluating methods, teachers and organizations, and justifying procedures and expenditures. The rapid increase in the number and excellence of objective tests, and the spread of knowledge as to their use has made possible surveys conducted along more or less scientific lines.

The testing survey carried on in the schools of third class districts of Gallatin County, Montana during the latter half of the school year of 1927-1928 had for its immediate purpose the finding of the intelligence status and achievement status in reading and arithmetic of the pupils of the fifth, sixth, seventh and eighth grades.

Testing was done in fifty-two one-room rural schools and in five village schools of two or more rooms each. A total of five hundred thirty children were tested. The County Superintendent of Schools, Miss Mary Rosenberg, the members of the writer's class in Educational Measurements at Montana State College and the writer gave and scored the tests.

There had been very little objective testing done in the rural schools of Gallatin County, in fact, many of the teachers and most of the pupils were unacquainted with tests of the objective type. One circumstance should be mentioned at this time which has doubtless exerted an influence upon the grades made in silent reading and arithmetic. For several years the Gallatin County Rural Teachers' Association has sponsored a County Track Meet and Scholarship Contest. In the beginning spelling was the only subject in which contests were held. Later, writing, silent reading, arithmetic and other academic subjects were added. The teachers and pupils of the rural schools have taken great in-

terest in these contests which have no doubt had the effect of raising standards in the contest subjects. Objective tests were used in the contest for the first time this year.

The intelligence test used in this survey of third class districts was the Detroit Alpha Intelligence Test, Form M. devised by Harry J. Baker, Ph. D., Clinic Psychologist of Detroit Public Schools. This test was selected partly because the results of the test lend themselves exceptionally well to classification purposes, and partly because a large number of these tests were already available in the office of the County Superintendent of Schools. The reading and arithmetic tests used were Monroe's Standardized Silent Reading Test, Revised, and Monroe's Standardized General Survey Arithmetic Scales. These tests were used because they are well and favorably known, easy to give and score, and have thoroughly standardized norms.

The survey was not a complete one, in the sense that neither all the pupils nor all the schools were reached by the survey. None of those concerned in the giving and scoring of the tests had had wide experience in testing. A second test in intelligence for the purpose of verifying results of the first test was not administered. However, the following results may safely be claimed as having been achieved: the pupils and teachers have become acquainted with objective testing, data have been collected and filed in the office of the County Superintendent of Schools which will be valuable for comparative purposes, tentative standards have been established for the rural schools in the subjects in which tests were given, and a start has been made in a testing program which can be continued during the coming school year, in the form of further survey testing in other subjects, retesting in intelligence, and diagnostic testing and remedial work in reading and arithmetic.

The survey could hardly have been made without the cooperation of Miss Mary Rosenberg, County Superintendent of Schools of Gallatin County and her able assistants. For this assistance the author is greatly

indebted. The author is also greatly indebted to the members of the teaching staff of the Department of Education of the University of Montana for many helpful suggestions given before and during the preparation of this thesis, and to her students in Educational Measurements who gave valuable assistance in the giving and the scoring of tests.

Leora M. Hapner

CHAPTER II

INTELLIGENCE TESTING

The test used in the testing survey of intelligence of fifth, sixth, seventh and eighth grade pupils in schools of third class districts of Gallatin County, Montana was the Detroit Alpha Intelligence Test, Form M. devised by Dr. Harry J. Baker, Clinical Psychologist of Detroit Public Schools. These tests were especially designed to differentiate between the dull, average and bright pupils. (Baker, *Characteristic Differences in Bright and Dull Pupils*, Chapter III.) Dr. Baker provides a system of letter ratings which correspond approximately with Binet's IQ's. (Baker, Chapter XXII.) Thus a letter rating of A corresponds to an IQ of 118 to 130 or higher; B to an IQ of 111 to 117; C+, to an IQ of 105 to 110; C to an IQ of 96 to 104; C-, to an IQ of 90 to 95; D, to an IQ of 83 to 89; and E, to an IQ of 70 or lower to 82. In a large unselected group of first grade children there would be approximately 8 percent of A's and 12 percent of B's, 18 percent of C+'s, 24 percent of C's, 18 percent of C-'s, 12 percent of D's and 8 percent of E's. (Terman, *The Intelligence of School Children*, Chapter IV.)

Table II gives a summary of the letter ratings for grades 5, 6, 7, and 8, in third class districts of Gallatin County, Montana and a similar summary of findings from the Nation Wide Survey conducted by the Public School Publishing Company during the school year 1927-1928. This Table II shows that a much higher percentage of pupils of fifth, sixth, seventh and eighth grades are in the bright or A and B group than is found in an unselected group of first grade pupils. In fact, approximately one-third of all pupils of these grades are found in this group as against 20 percent of unselected first grade pupils found in this group according to Terman and Baker. Table II also shows that only 48 to 49 percent of all pupils of fifth, sixth, seventh and eighth grades fall in the average or C group, while 18 to 19 percent fall in the dull or D and E group. The Nation Wide Survey shows a gradual increase from grade to grade in the percentage of bright pupils and gradual decrease in the percentage of dull pupils which seems to

TABLE I DETROIT INTELLIGENCE TESTS NATION WIDE MEDIANS OCTOBER--NOVEMBER (1927)				
ALPHA TEST, FORM M (Based on 33593 scores)				
	GRADES			
	5	6	7	8
25 Percentile.....66	94	113	134	
MEDIAN.....88	115	133	154	
75 Percentile.....110	134	153	174	
THIRD CLASS DISTRICT MEDIANS GALLATIN COUNTY, MONTANA DECEMBER--MARCH 1927---1928				
ALPHA TEST, FORM M (Based on 530 scores)				
	GRADES			
	5	6	7	8
25 Percentile.....79	96	117	133	
MEDIAN.....99	116	136	149	
75 Percentile.....123	131	153	167	

TABLE II

**DETROIT INTELLIGENCE TESTS
ALPHA TEST FORM M**

**Summary of Letter Ratings for Grades 5,6,7,8.
Third Class Districts, Gallatin Co., Montana
December -- March 1927 - 1928**
The separate letter ratings by age groups are given in tables III to VI, for each grade.

TOTAL OF LETTER RATINGS BY GRADE GROUPS

Grade	A		B		C+		C		C-		D		E		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5	20	16	20	16	21	16	34	27	14	11	13	10	6	4	128	24
6	14	10	21	16	26	19	28	21	17	13	14	10	14	10	134	25
7	20	15	37	28	15	12	18	14	20	15	7	5	13	10	130	25
8	29	21	12	9	25	18	33	24	13	9	14	10	12	9	138	26
TOTAL	83	16	90	17	87	16	113	21	64	12	48	9	45	9	530	100

**Summary of Letter Ratings for Grades 5,6,7,8.
NATION WIDE SURVEY**

TOTAL OF LETTER RATINGS BY GRADE GROUPS

Grade	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5	1090	14	865	11	1270	16	1702	21	976	12	892	11	1139	14	7934	24
6	1375	15	1330	14	1421	15	1894	20	1160	13	911	10	1100	12	9189	27
7	1632	19	1362	16	1326	15	1678	19	1092	13	802	9	785	9	8677	26
8	1930	25	1212	16	1387	16	1468	19	918	12	612	8	366	5	7793	23
TOTAL	6025	18	4769	14	5304	16	6742	20	4146	12	3217	9	3370	10	33593	100

TABLE III
DETROIT INTELLIGENCE TESTS
LETTER RATINGS
DECEMBER-MARCH 1927-1928
GRADE 5 ALPHA TEST FORM M
THIRD CLASS DISTRICTS - GALLATIN COUNTY MONTANA

AGE	TOTAL OF LETTER RATINGS BY AGE GROUPS														TOTAL	
	A		B		C+		C		C-		D		E		No	%
	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
8																
8½																
9	2	67			1	33									3	2
9½	2	33	1	17	3	50									6	5
10	7	26	3	11	5	19	9	33	3	11					27	21
10½	8	30	6	23	2	8	7	27	2	8	1	4			26	20
11	1	4	8	30	7	27	4	15	2	8	3	12	1	4	26	20
11½			2	11	2	11	8	44	3	17	3	17			18	14
12					1	9	4	36	2	18	3	28	1	9	11	9
12½							2	33	2	33	2	33			6	5
13											1	50	1	50	2	2
13½													3	100	3	2
14																
14½																
15																
15½																
16																
16½																
17																
TOTAL	20	16	20	16	21	16	34	27	14	11	13	10	6	4	128	100

TABLE III A
DETROIT INTELLIGENCE TESTS
LETTER RATINGS BY MENTAL AGE
 December to March 1927-1928 Alpha Test Form M
 Grade 5 third class Districts Gallatin Co., Mont.
 median mental Age 11-7

Total of letter ratings by mental age groups

Mental Age	A		B		C+		C		C-		D		E		TOTAL		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
8																	
8 1/2													2		2	2	
9								1		1			2	100	4	3	
9 1/2							3		3		5		2		13	10	
10					1		8		2		4				15	12	
10 1/2					1		4		1		1		1		8	6	
11	1		1		3		7		6		1				19	15	M
11 1/2	2				6		4				1				13	10	
12			3		7		4								14	11	
12 1/2	1		6		4		2								13	10	
13	5		8												13	10	
13 1/2	5		2		1										8	6	
14	2														2	2	
14 1/2	2														2	2	
15	2														2	2	
15 1/2																	
16																	
16 1/2																	
17																	
17 1/2																	
18 and over																	
TOTAL	20	16	20	16	23	18	32	25	13	10	13	10	7	5	128	100	

indicate a gradual elimination of dull pupils in the upper elementary grades, with a corresponding retention of the bright pupils. No such change is apparent in the results of the Gallatin County Survey which actually shows a greater percentage of dull pupils in the eighth grade than in either the fifth or the seventh grades. This condition may indicate one or more of the following conditions: that Gallatin County schools being in a purely agricultural district may have a greater holding power due to the fact that the older boys and girls cannot drop out and enter industry; that the State Eighth Grade Examinations may be damming up the natural flow of pupils from the elementary schools to high schools; that the compulsory school law is operating more effectively there than in the county at large. The last column of Table II shows that 26 percent of the total enrollment of grades 5 to 8, Gallatin County are in the eighth grade, while but 23 percent of the total enrollment of grades 5 to 8, Nation Wide Survey, are in the eighth grade.

Table I shows a higher median intelligence score for Gallatin County pupils than for Nation Wide pupils in all grades except the eighth, where the median score is decidedly lower for Gallatin County. The percentile scores are also higher for Gallatin County except in the eighth grade and in the sixth grade 75 percentile where they are lower than the corresponding ones in the Nation Wide Survey.

Table III shows the chronological ages and the letter ratings of 128 fifth grade pupils in third class districts of Gallatin County, Montana. The bright group contains 32 percent, the average group contains 54 percent and the dull group contains 14 percent of the pupils in this grade. The median chronological age is 11 years with a range of 5 years and 6 months. If the ages of 10 years to 12 years are considered as normal for fifth grade, (Corning, After Testing, What? p. 37-41) 75 percent of the fifth grade pupils are "at age" for the grade, 7 percent are "below age" for the grade and 18 percent are "above age" for the grade. (Paulu, Diagnostic Testing, Ch. V)

TABLE IV
DETROIT INTELLIGENCE TESTS
LETTER RATINGS
DECEMBER - MARCH 1927 - 1928
GRADE 6 ALPHA TEST FORM M
THIRD CLASS DISTRICTS GALLATIN CO., MONTANA

TOTAL OF LETTER RATINGS BY AGE GROUPS

AGE	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8																
8 1/2																
9																
9 1/2	1	50			1	50									2	2
10	1	100													1	
10 1/2	6	46	3	23	0	0	2	15	1	8	1	8			13	10
11	4	15	6	23	14	54	2	8							26	20
11 1/2	2	8	8	33	8	33	4	17	1	4	1	4			24	18
12			2	12	1	6	7	40	4	24	3	18			17	13
12 1/2			1	6	1	6	5	29	5	29	2	12	3	18	13	13
13			1	7	1	7	7	47	2	13	3	20	1	7	15	11
13 1/2							1	12	2	25	2	25	3	38	8	5
14									1	33			2	67	3	2
14 1/2													1	100	1	
15									1	20	1	20	3	60	5	4
15 1/2											1	50	1	50	2	2
16																
16 1/2																
17																
TOTAL	14	10	21	16	26	19	28	21	17	13	14	10	14	10	134	100

TABLE IV A
DETROIT INTELLIGENCE TESTS
LETTER RATINGS BY MENTAL AGE
 December to March 1927 - 1928 Alpha rest Form M
 Third class Districts Gallatin County Montana
 Grade 6 Median mental Age 12 - 6

Total of letter ratings by mental age groups

Mental Age	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8																
8 1/2																
9																
9 1/2									1		1		3		5	4
10					1		1				2		5		9	7
10 1/2							2				3		3		8	6
11							1		5		1		3		10	8
11 1/2					1		3		4		5				13	10
12			1		8		9		3		1				22	16
12 1/2	1		1		11		7		1		1				22	16
13	1		6		7		3		2						13	10
13 1/2	1		7		2		2		1						13	10
14	5		5		1										11	8
14 1/2	2		1												3	2
15	3				1										4	3
15 1/2	1														1	0
16																
16 1/2																
17																
17 1/2																
18 and over																
TOTAL	14	10	21	16	26	19	28	21	17	13	14	10	14	10	134	100

M

TABLE V
DETROIT INTELLIGENCE TESTS
DECEMBER-MARCH 1927-1928
GRADE 7 ALPHA TEST FORM M
LETTER RATINGS
THIRD CLASS DISTRICTS GALLATIN CO. MONTANA

AGE	TOTAL OF LETTER RATINGS BY AGE GROUP														TOTAL	
	A		B		C+		C		C-		D		E			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
10																
10 1/2	1														1	
11	2	100	3												5	
11 1/2	6	35	8	60	2	12	1	6							17	
12	4	14	11	39	6	21	4	14	3	11					28	
12 1/2	7	29	11	46	2	8	3	12	1	4					24	
13			4	24	2	12	5	29	5	29	1	6			17	
13 1/2					3	25	4	33	2	17	2	17	1	8	12	9
14							1	14	5	72			1	14	7	5
14 1/2									2	40	2	40	1	20	5	4
15									2	25	1	12	5	63	8	6
15 1/2													2	100	2	2
16																
16 1/2											1	50	1	50	2	2
17													1	100	1	1
17 1/2																
18 and over													1	100	1	1
TOTAL	20	15	37	28	15	12	18	14	20	15	7	5	13	10	130	100

TABLE V A

DETROIT INTELLIGENCE TESTS
 Letter Ratings by Mental Age
 December to March 1927--1928
 Grade 7 Alpha Test Form M
 Third Class Districts, Gallatin County, Montana

Median Mental Age - 13 - 10

TOTAL OF LETTER RATINGS BY MENTAL AGE GROUPS																
MENTAL AGE	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
9													1		1	1
9½																
10													2		2	2
10½								1					2		3	2
11								1		2			4		7	5
11½							1		4	1			1		7	5
12							3		3	2			3		11	8
12½					1		5		4	1					11	8
13			1		4		2		2	1					10	8
13½			8		4		4		4						20	16
14	1		12		3		3		1						20	16
14½	4		10		3										17	13
15	5		6												11	8
15½	7														7	5
16																
16½	1														1	1
17	2														2	2
17½																
18 and over																
TOTAL	20	15	37	28	15	12	18	14	20	15	7	5	13	10	130	100

Table III^A shows a median mental age for these same pupils of approximately 11 years and 7 months, with a total range of 7 years. If the mental ages of 10 years, 6 months to 12 years, 6 months be taken as normal for fifth grade (Terman, *The Intelligence of School Children*, p. 26 and p. 93), only 42 percent of these pupils are "at age" for the grade, 27 percent are too young mentally for the grade and 32 percent are too old for the grade. In other words 32 percent of the fifth grade pupils are retarded.

Table IV shows the chronological ages and letter ratings of 134 sixth grade pupils. The median chronological age is 12 years with a total range of 6 years, 6 months. If the ages of 11 to 13 years, 6 months be taken as normal for sixth grade, 64 percent of the pupils are "at age", 12 percent are "below age" and 24 percent are "above age" for the grade.

Table IV^A shows a median mental age for these same pupils of 12 years, 6 months with a total range of 6 years, 6 months. If the mental ages of 11 years, 6 months to 13 years, 6 months be taken as normal mental age for sixth grade, 52 percent are "at age", 25 percent are "below age" and 23 percent are "above age" for the grade.

Table V shows the chronological ages and letter ratings of 130 seventh grade pupils. The median chronological age is approximately 12 years, 10 months with a total range of 8 years. If the ages of 12 to 14 years be taken as normal for seventh grade, 62 percent are "at age", 18 percent are "below age", and 20 percent are "above age" for the grade.

Table V^A shows a median mental age for the seventh grade of 12 years, 10 months with a total range of 8 years, 6 months. If the mental ages of 12 years, 6 months to 14 years, 6 months be taken as the normal mental ages for seventh grade, 48 percent are "at age", 23 percent are "below age", and 29 percent are "above age" for the grade.

Table VI shows the chronological ages and letter ratings of 136 eighth grade pupils. The median chronological age is 14 years with a total range of 6 years,

TABLE VI
DETROIT INTELLIGENCE TESTS
LETTER RATINGS
DECEMBER-MARCH 1927-1928
GRADE 8 ALPHA TEST FORM M
THIRD CLASS DISTRICTS GALLATIN CO., MONTANA

TOTAL OF LETTER RATINGS BY AGE GROUPS																
AGE	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
10																
10 1/2																
11	1	100													1	.7
11 1/2	1	50	1	50											2	1.4
12	2	67	1	33											3	2
12 1/2	5	45	1	9	2	18	3	27							11	8
13	5	23	5	23	7	32	4	18			1	4			22	16
13 1/2	11	36	2	7	6	20	7	23	3	10			1	3	30	22
14	3	13	1	4	7	30	7	30	3	13	1	4	1	4	23	16
14 1/2	1	7	0	0	1	7	6	30	3	13	2	8	1	4	14	10
15			1	8	0	0	3	23	2	15	5	39	2	15	13	9
15 1/2							2	20	2	20	3	30	3	30	10	7
16					1	25	1	25			1	25	1	25	4	3
16 1/2					1	25					1	25	2	50	4	3
17													1	100	1	.7
17 1/2																
18 and over																
TOTAL	29	12	12	9	25	18	33	24	13	9	14	10	12	9	138	100

TABLE VI A
DETROIT INTELLIGENCE TESTS
LETTER RATINGS BY MENTAL AGE
 December to March 1927-1928 Alpha Test Form M
 Grade 8 Third Class Districts Gallatin Co., Mont.
 Median Mental Age 14-6

Total of letter ratings by mental age groups

Mental Age	A		B		C+		C		C-		D		E		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
8																
8 1/2																
9																
9 1/2																
10																
10 1/2												1		1	1	1
11												6		6	4	4
11 1/2											2	3		5	4	4
12								1		6	1			8	6	6
12 1/2							1	2						3	2	2
13					1		4	2	2					9	7	7
13 1/2	1		1		1		7	6	4		1			21	15	15
14			1		5		9	2						17	12	12
14 1/2	2		1		6		6							15	11	11
15	3		5		9		5							22	16	16
15 1/2	1		3		1		1							6	4	4
16	6		1		1									8	6	6
16 1/2	9				1									10	7	7
17	3													3	2	2
17 1/2	3													3	2	2
18	1													1	1	1
Grand Total	29	21	12	9	25	18	37	24	13	9	14	10	12	9	138	100

M

TABLE VII

Letter Ratings of Eleven-year olds in Grades
5, 6, 7, 8.
Third Class Districts, Gallatin Co., Montana

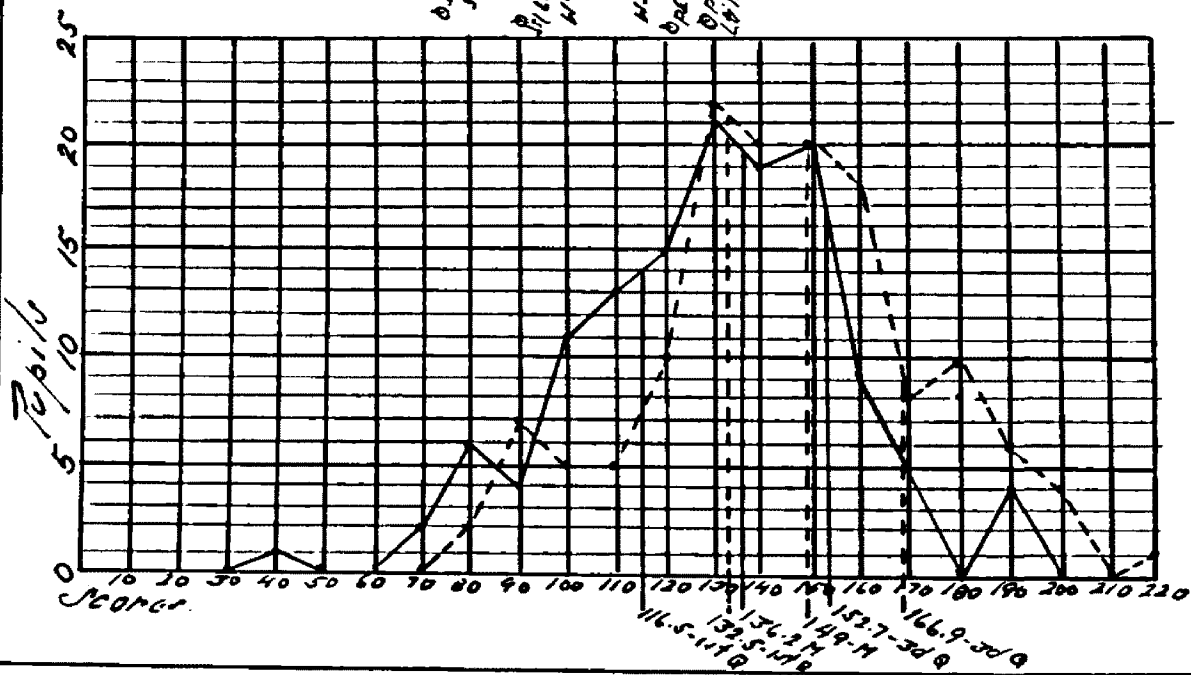
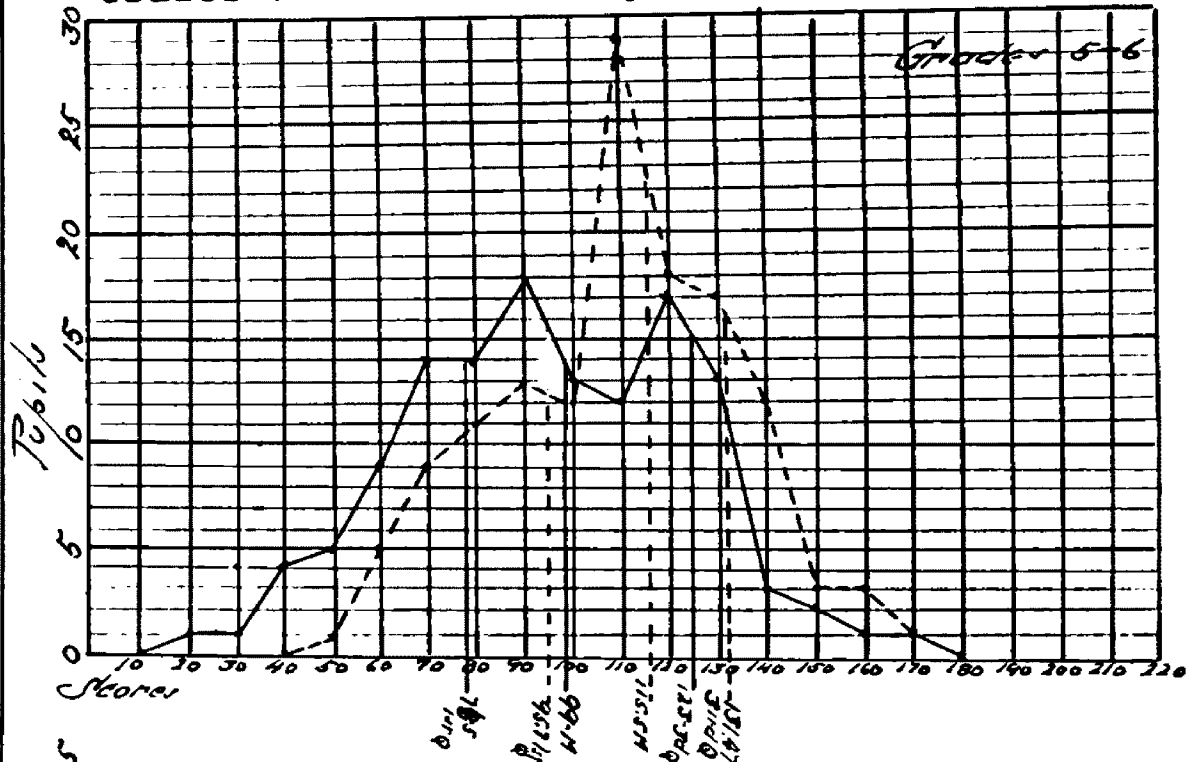
Grade	TOTAL OF LETTER RATINGS BY GRADE GROUP														Total	
	A		B		C+		C		C-		D		E		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
5	9	17	14	27	9	17	11	21	4	8	4	8	1	2	52	53
6	10	25	9	23	14	36	4	10	1	3	1	3			39	40
7	3	50	3	50											6	6
8	1	100													1	1
TOTAL	23	23	26	27	23	23	15	15	5	5	5	5	1	1	98	100

Letter Ratings of Eleven-year olds (10-6 to
11 - 6) in Grades 5, 6, 7, 8.
NATION WIDE SURVEY

Grade	TOTAL OF LETTER RATINGS BY GRADE GROUP														TOTAL	
	A		B		C+		C		C-		D		E		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
5	240	9	346	13	501	18	784	29	413	15	315	11	141	5	2740	47
6	808	29	655	24	587	21	487	18	149	5	52	2	22	1	2760	47
7	201	60	84	25	28	8	17	5	3	1	3	1			339	6
8	16	67	5	20	3	13									24	
TOTAL	1265	22	1090	19	1119	19	1288	22	565	10	370	6	164	2	5861	100

FIGURE I
INTELLIGENCE SCORES --- GRADES 5,6,7,8
LEGEND

GRADES 5 and 7 shown by the solid lines
 Grades 6 and 8 shown by the dotted lines



6 months. If the ages of 13 years to 15 years be taken as normal for the eighth grade, 65 percent are "at age", 12 percent are "below age" and 25 percent are "above age" for the grade.

Table VI^A shows a median mental age for the eighth grade pupils of 14 years, 6 months with a total range of 8 years. If the mental age of 13 years, 6 months to 15 years, 6 months be taken as normal for eighth grade, 54 percent are "at age", 24 percent are "below age", and 22 percent are "above age" for the grade.

Table VII shows the letter ratings of 11-year-olds in grades 5, 6, 7, and 8, third class districts, Gallatin County, Montana and also the letter ratings of 11-year-olds in grades 5, 6, 7, and 8 in the Nation Wide Survey. From this table it will be seen that 11-year-olds are found in all four grades, but that those in the upper grades are found in the upper end of the intelligence scale. There is a rapidly increasing percentage of pupils of high grade intelligence and a rapidly decreasing percentage of pupils of low grade intelligence from the fifth to the eighth grade. This change is more pronounced in the Gallatin County schools than in the schools included in the Nation Wide Survey. In other words, 11-year-olds included in the Nation Wide Survey seem to be accelerated more than 11-year-olds in Gallatin County.

Figure I gives a graphic representation of the Intelligence scores made by the pupils of the fifth, sixth, seventh, and eighth grades, respectively. It can be seen that the median increases from grade to grade at the rate of from 16.5 points to 17 points per grade. It can be seen also that the semi-interquartile range is greatest in the fifth grade, being 22.2 points. In the sixth, seventh, and eighth grades the semi-interquartile ranges are 17.9, 18.1 and 17.2 points, respectively. It will be seen that they vary less than 1 point in these three grades. From the above facts the following tentative conclusion might be drawn: that the process of selective elimination on the basis of intelligence is inactive or nearly so in the last three elementary grades of the schools surveyed.

SUMMARY

1. Gallatin County pupils in fifth, sixth and seventh grades of third class districts have a higher median intelligence score than pupils in corresponding grades included in the Nation Wide Survey.

2. Gallatin County eighth grade pupils have a lower median intelligence score than eighth grade pupils included in the Nation Wide Survey.

3. There is an average range in chronological age per grade of 6 years, 6 months.

4. There is an average range in mental age per grade of 7 years, 6 months.

5. Twenty-six percent of all pupils tested were ^{mentally} over-age for their grade.

6. Twenty-four percent of all pupils tested were ^{mentally} under-age for their grades.

7. Chronological 11-year-olds, 12-year-olds and 13-year-olds are found in each of the four grades tested.

8. Mental 10-year-olds, 11-year-olds, 12-year-olds, 13-year-olds, 14-year-olds, and 15-year-olds are found in each of the grades tested.

9. There is a total of 33 percent of all pupils in the bright or A and B groups, 49 percent of all pupils in the average or C group, and 18 percent of all pupils in the dull or D and E groups.

10. The grade median intelligence score increases by approximately 17 points from fifth to sixth, 20 points from sixth to seventh, and 13 points from seven to eighth grade.

11. The semi-interquartile range of intelligence scores is approximately the same in grades six, seven and eight.

12. There is a constantly decreasing percentage of dull pupils and a constantly increasing percentage of bright pupils from grade to grade in schools included in the Nation Wide Survey.

13. There is a lower percentage of dull pupils and a higher percentage of bright pupils in fifth and seventh grades than in the sixth and eighth grades of Gallatin County rural schools.

14. The highest percentage of bright pupils is in the seventh grade.

15. The highest percentage of dull pupils is in the sixth grade.

CONCLUSIONS AND RECOMMENDATIONS

1. There should be a careful retesting of intelligence of all pupils included in the survey (December-March, 1927-1928). "No child should be judged by one IQ." (Wentworth "Individual Differences in the Intelligence of School Children", p. 38-47.) Form R of the Detroit Alpha Intelligence Test or any of the well standardized intelligence tests now in the market could be used for retesting.

2. In most schools a thorough reclassification on the basis of mental age and letter rating will be neither expedient nor desirable. The teacher, however, in directing the learning of the pupils and in making promotions should keep in mind not only the mental age of the pupil, but the quality of his mind, that is, whether he is bright, dull or average. She should also make a careful study of the whole personality of every child. (Wentworth-Chapter IV.)

3. In general the bright student who is chronologically young for his grade should have his work enriched and should be regularly promoted. (Van Wageningen, "Educational Diagnosis, Chapter IX.)

4. In general the bright student who is "at age" for his grade should be accelerated. (Paulu, Diagnostic Testing and Remedial Teaching - Chapter IV.)

5. In general the dull pupil "at age" for his grade should be advanced slowly without repetition, but if this cannot be arranged for he might profitably repeat.

6. In general the dull "over age" pupil should be given work of such nature that he will be able to advance with his grade. (Baker.)

7. There is less elimination of pupils of low IQ's in Gallatin County rural schools than in the schools included in the Nation Wide Survey.

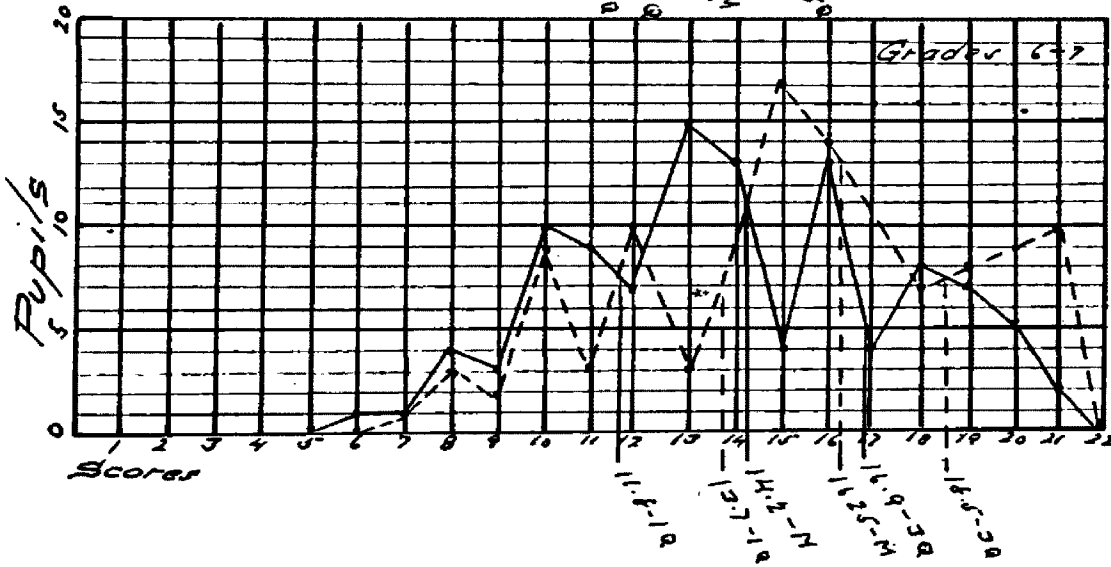
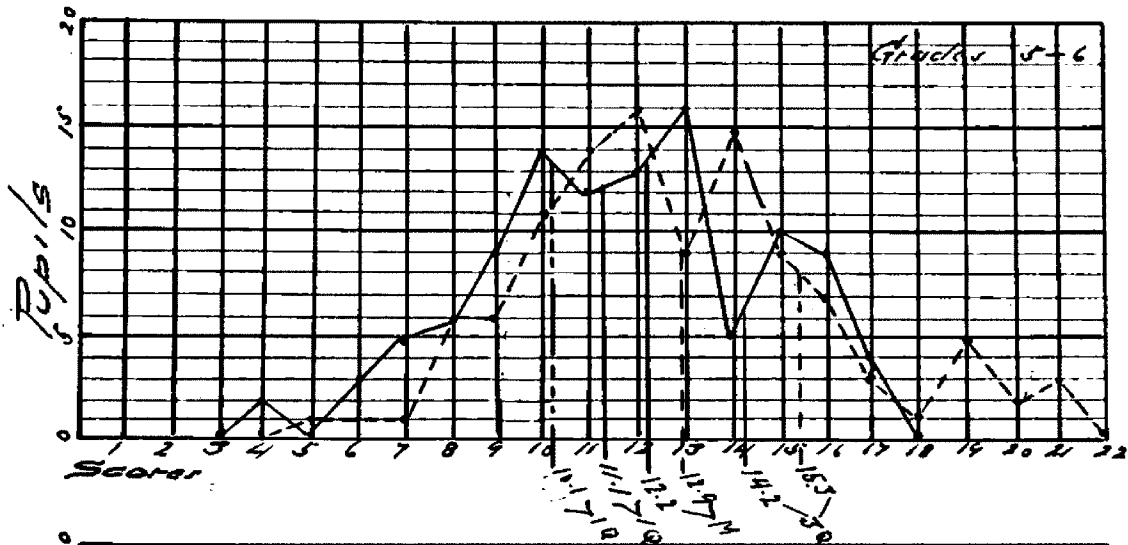
FIGURE II

READING COMPREHENSION SCORES: GRADES 5,6,7,8.

LEGEND

Grades 5 and 7 solid lines

Grades 6 and 8 dotted lines



CHAPTER III

ACHIEVEMENT IN READING

The testing survey in achievement was limited to the subjects of reading and arithmetic, because a more general survey was not considered profitable or expedient as a beginning project. Besides it was thought that achievement status in these two subjects would indicate in a general way the status of achievement in other subjects.

The Monroe's Standardized Silent Reading Test, Revised, was chosen for the testing survey in reading because, all things considered, it seemed the best for the purpose. The test has some generally recognized faults. The units of performance are not of equal difficulty, and they do not embody the same kind of material, neither do they give an accurate measure of the pupil's rate of reading, because the rate score includes the time used in indicating the correct answer. However, this test was thought to be the best available, because it measures both rate and comprehension, it is easy to give and score and has grade norms based upon many thousands of scores. It is inexpensive and is published in three forms, I, II and III. Thus, three tests a year may be given in order to measure progress.

The reading tests were given by the County Superintendent of Schools and by members of the class in Educational Measurements at Montana State College. The tests were scored and rescored by the County Superintendent's office staff, by the students in Educational Measurements and by the writer. A total of 440 pupils were tested. These were distributed by grades as follows: 108 fifth grade pupils, 110 sixth grade pupils, 106 seventh grade pupils and 121 eighth grade pupils.

Figure II is a graphic representation of the results of the Reading Comprehension test in each grade. It will be noted that the curves of distribution are much more regular for the fifth and sixth grades than for the seventh and eighth grades. The.

FIGURE III
 READING RATE SCORES

LEGEND

Grades 5 and 7 solid lines

Grades 6 and 8 dotted lines

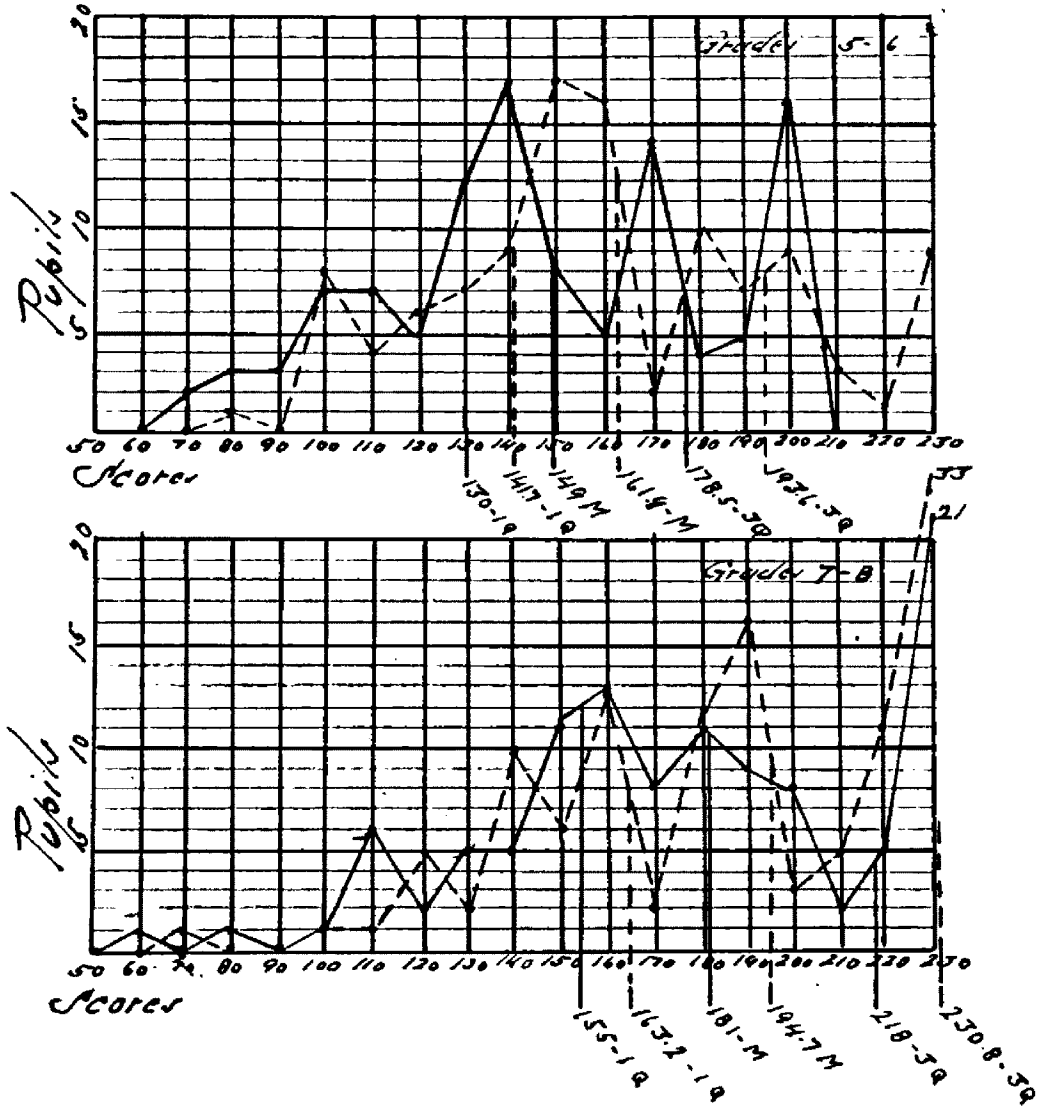
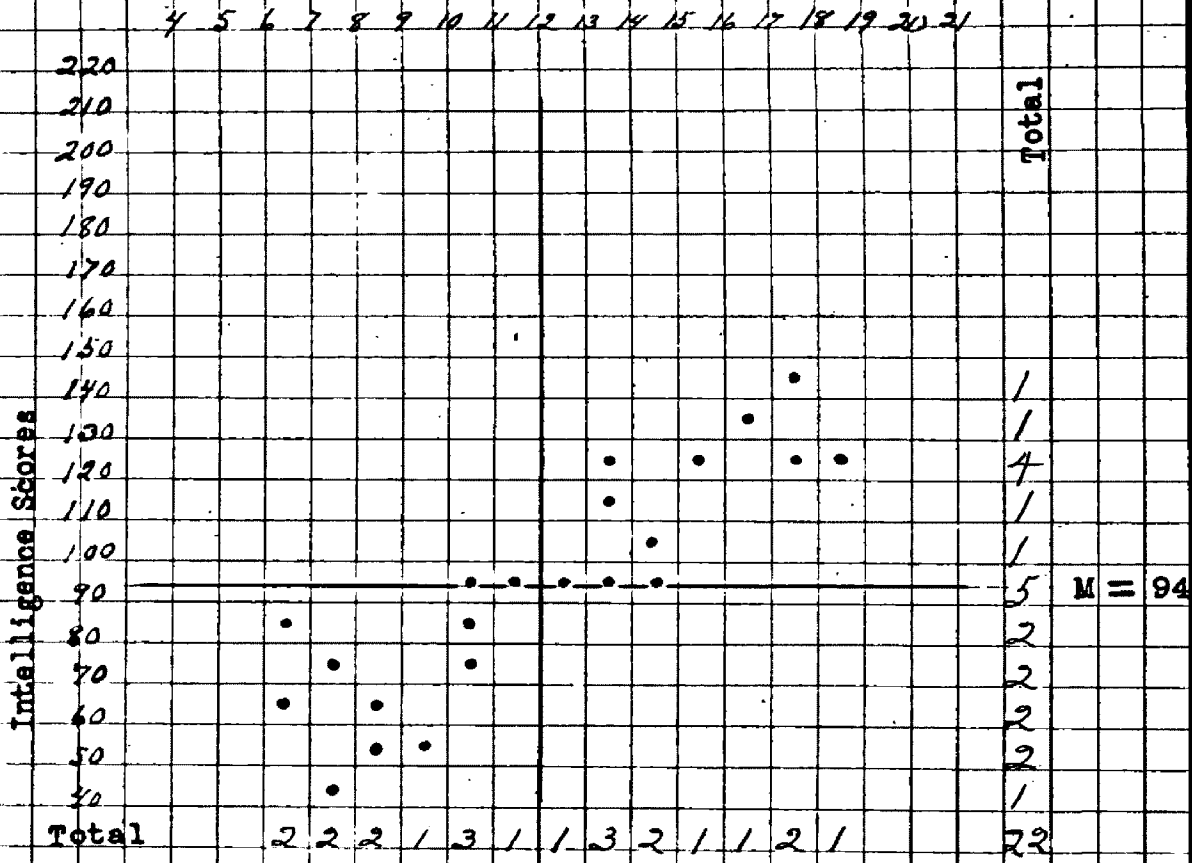


TABLE IX.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Fifth Grade Pupils of One-Room Schools.

Reading Comprehension Scores



M = 12
 Norm = 11
 r = .864 ± .06

TABLE X.

Correlation Between Intelligence Scores
and Reading Comprehension Scores of Fifth
Grade Pupils of Schools of Two or More Grades.

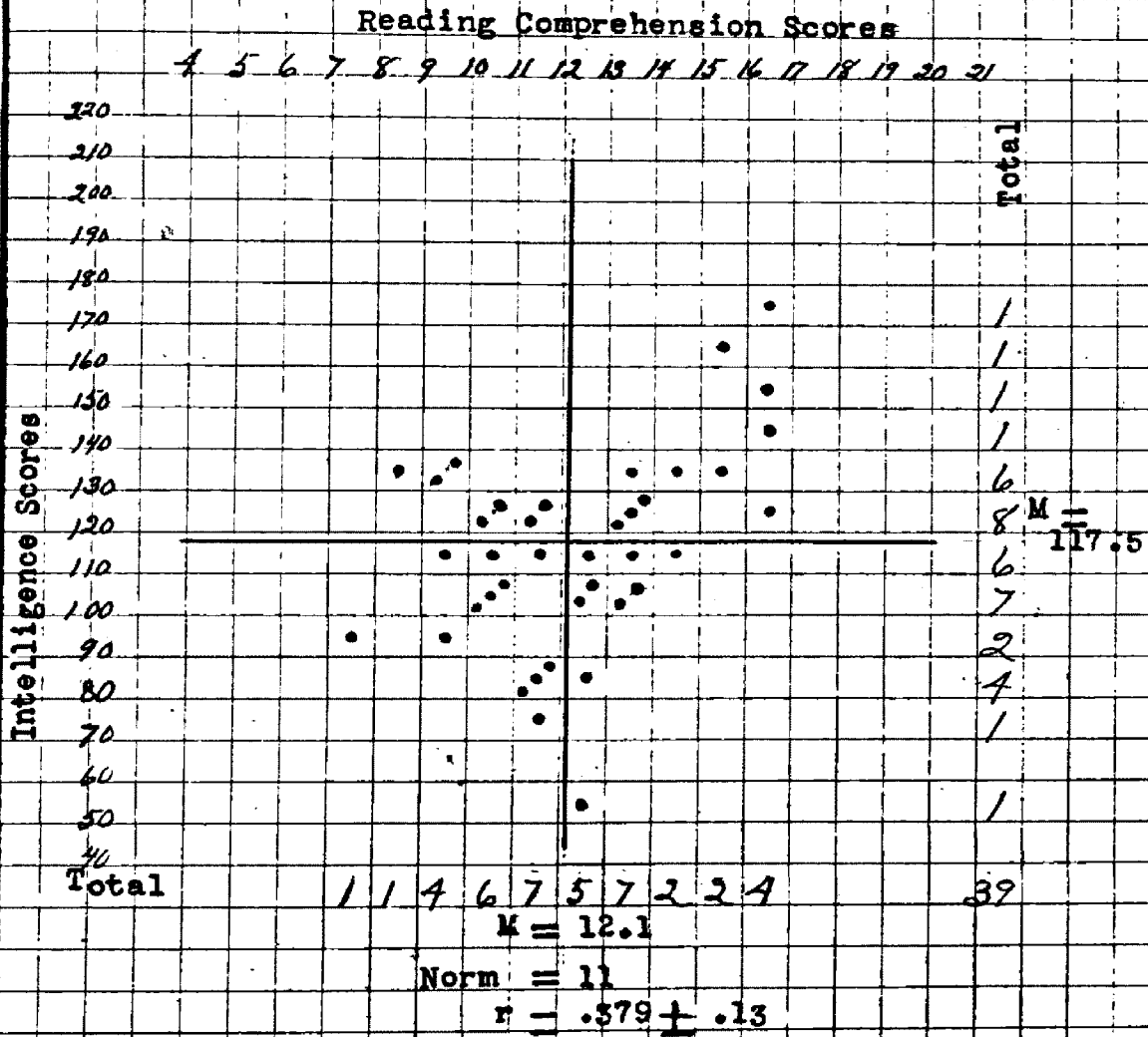


TABLE XI.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Sixth Grade Pupils of Fourteen One-Room Schools.

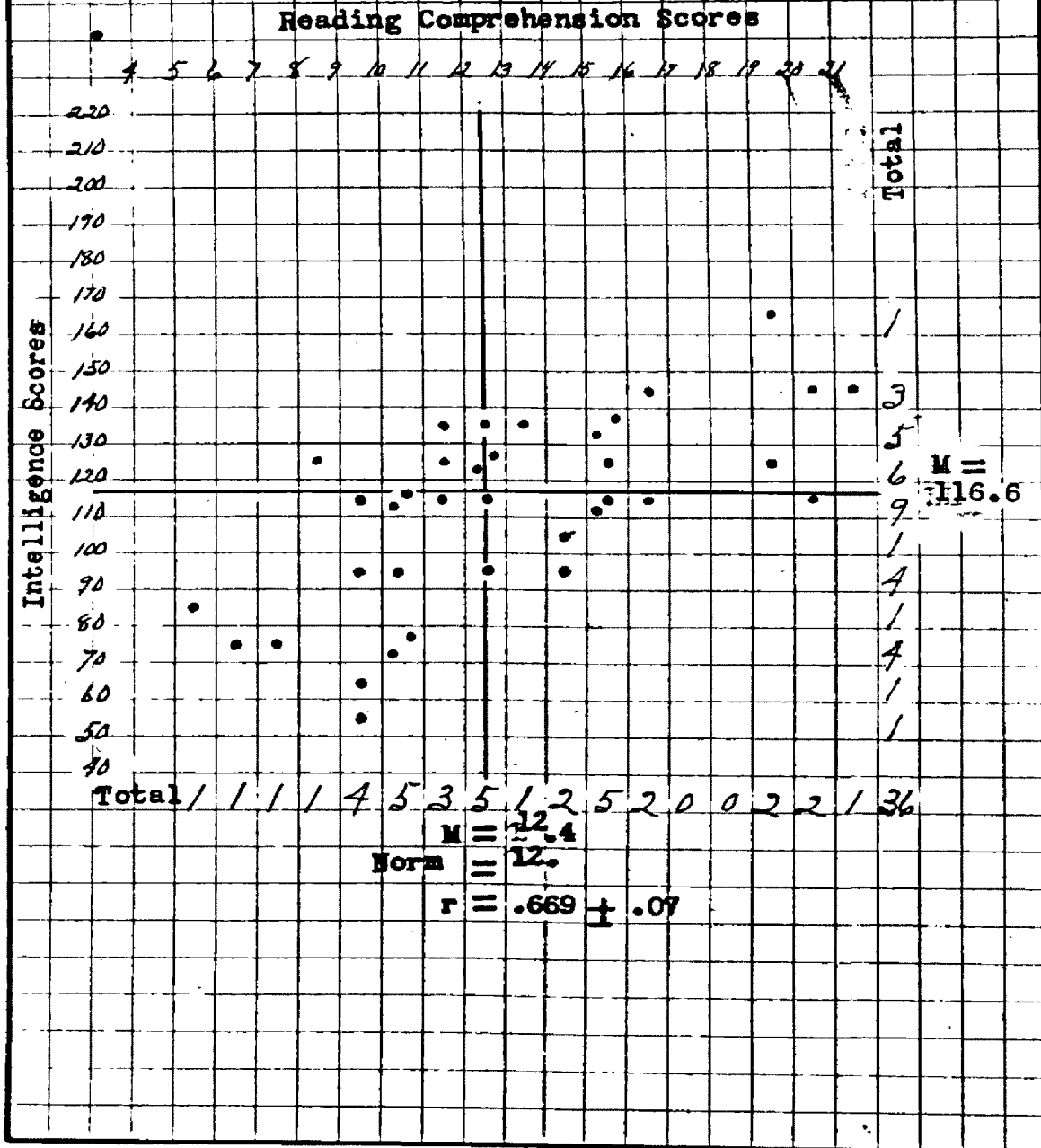
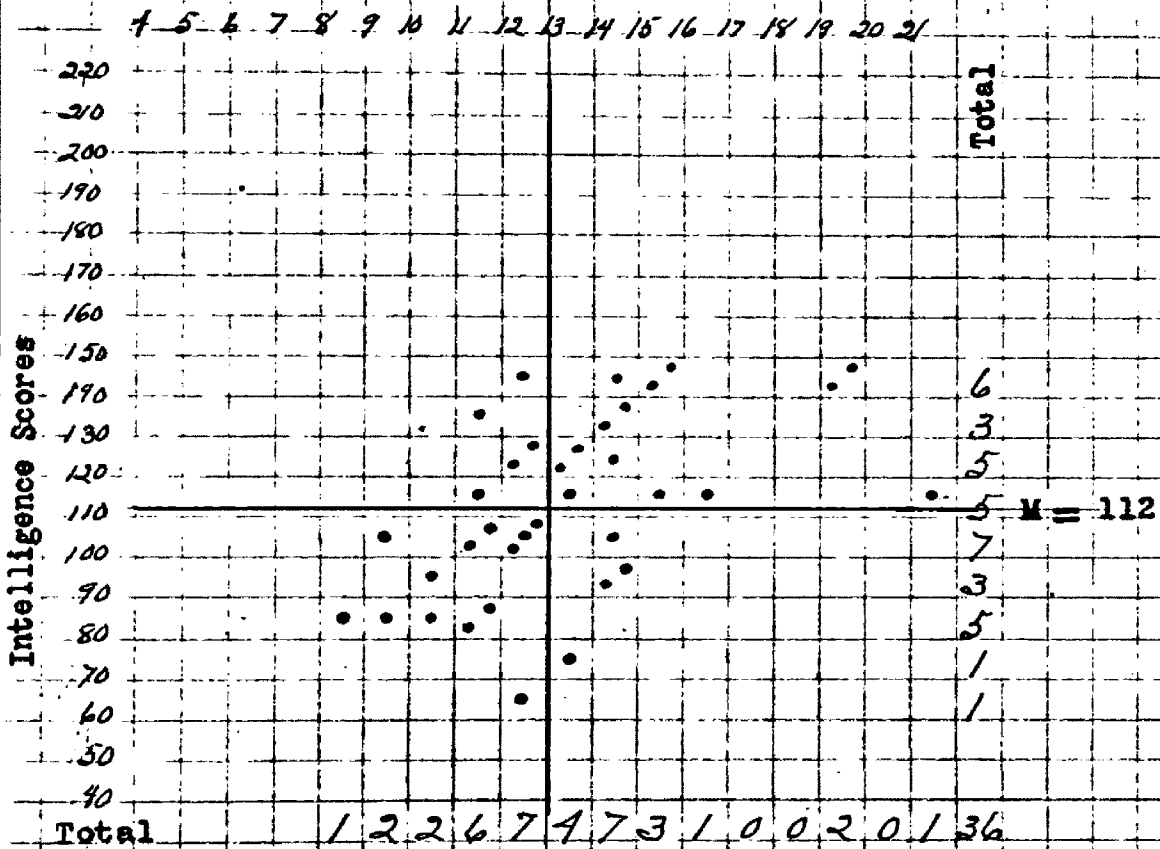


TABLE XII.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Sixth Grade Pupils of Three Schools of Two or More Rooms Each.

Reading Comprehension Scores



M = 13

Norm = 12

r = .495 ± .12

TABLE XIII.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Seventh Grade Pupils of Ten One-Room Schools.

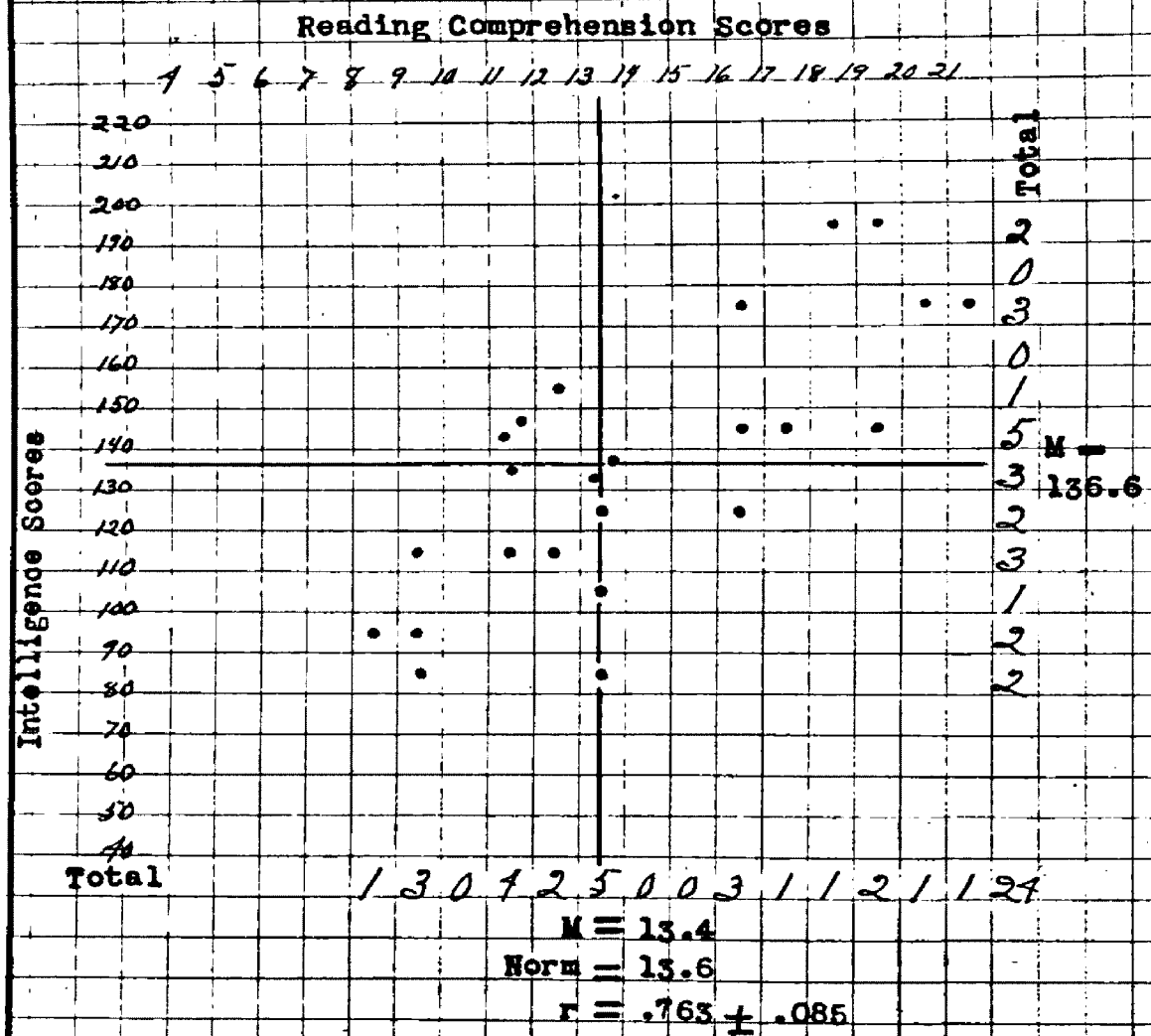


TABLE XIV.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Seventh Grade Pupils of Four Schools of Two or More Rooms Each.

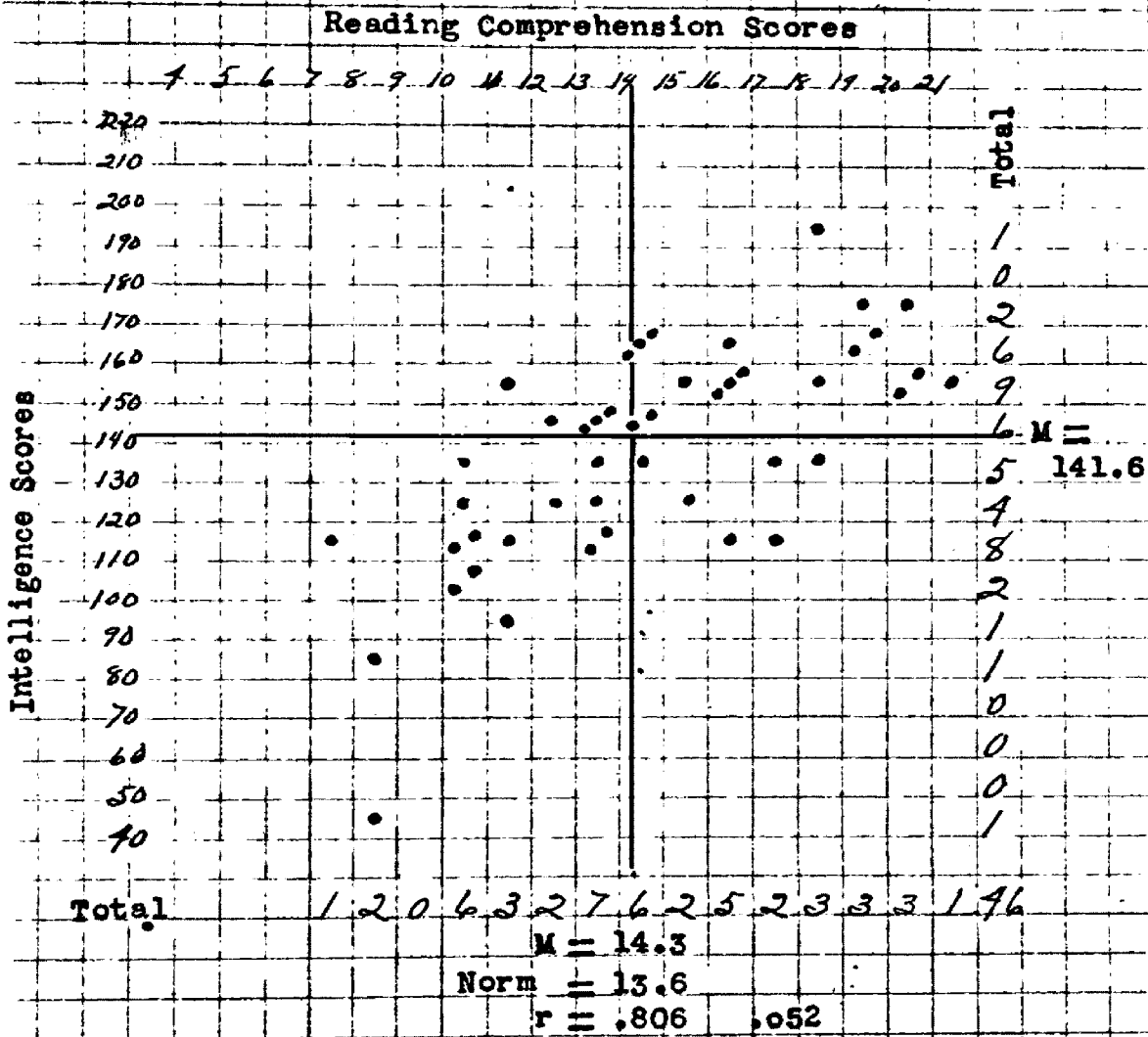


TABLE XV.

Correlation Between Intelligence Scores and Reading Comprehension Scores of Eighth Grade Pupils of Fourteen One-Room Schools.

Reading Comprehension Scores

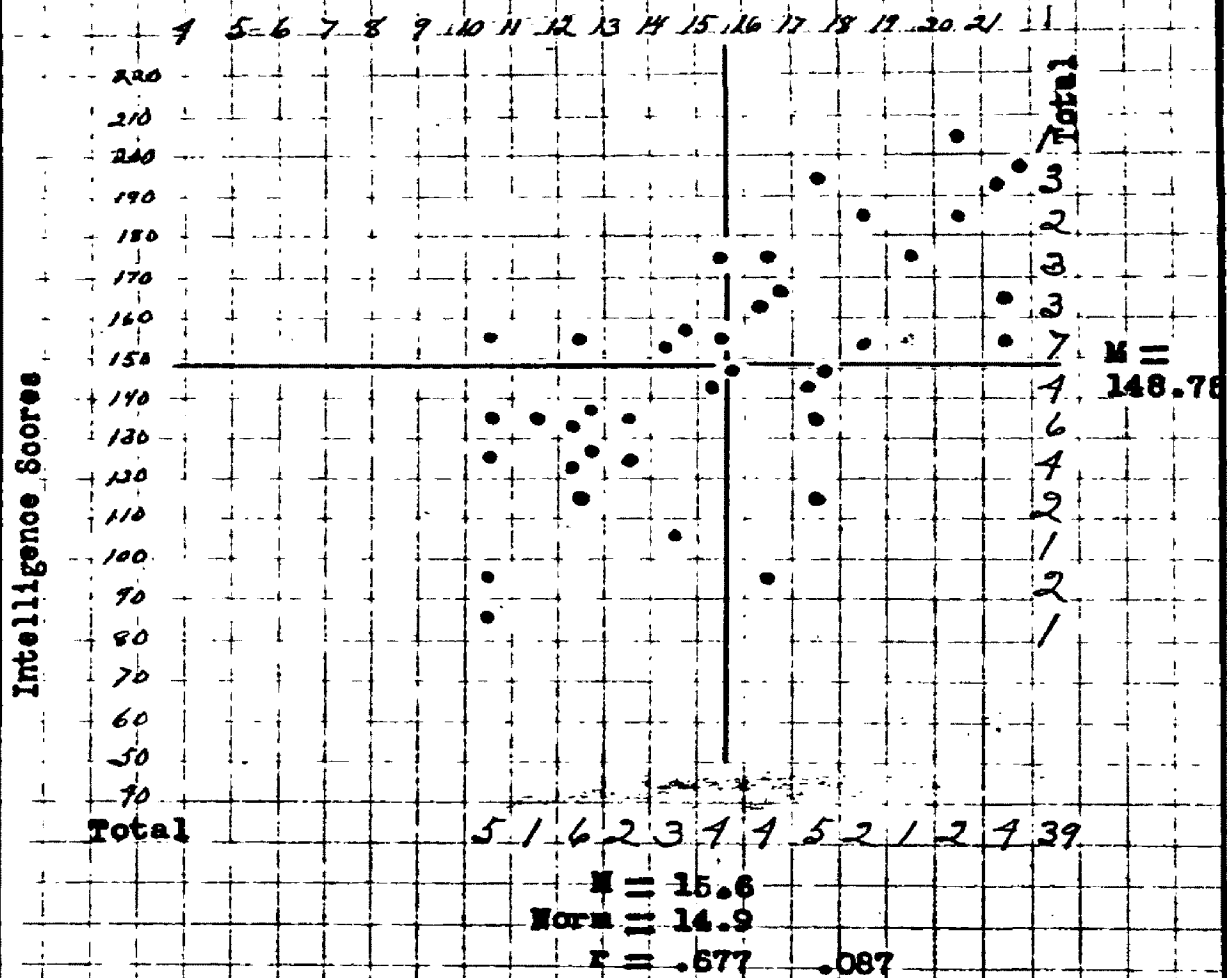
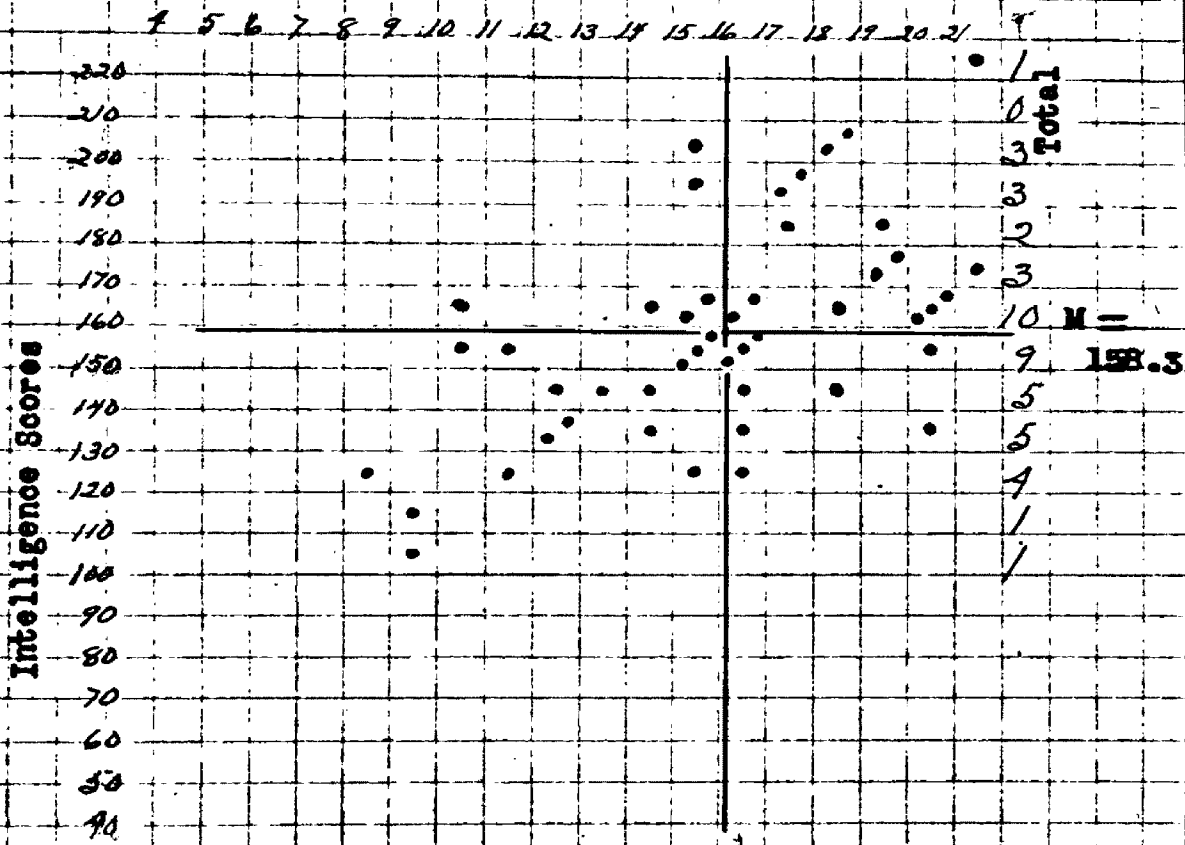


TABLE XVI.
Correlation Between Intelligence Scores and
Reading Comprehension Scores of Eighth Grade Pupils
of Four Schools of Two or More Rooms Each.

Reading Comprehension Scores



Total 1 2 2 2 3 1 3 8 8 3 9 3 5 2 7
M = 16.2
Norm = 14.9
r = .672 ± .054

median increases by .7 points from fifth to sixth grade, 1.3 points from sixth to seventh grade and 2. points from seventh to eighth grade. The fifth grade median is 12.2 while the norm for the fifth grade at the end of the year is 11. Thirty-nine pupils or 36 percent of the class failed to make this norm. In other words 64 percent of the fifth grade pupils read as well or better than the norm for beginning sixth graders. The sixth grade group has a median of 12.9 which is .4 higher than the norm for the end of the sixth grade. Approximately 56 percent of the group read as well or better than the norm. The seventh grade group has a median of 14.2 which is .5 higher than the norm for beginning eighth graders. Approximately 59 percent of the seventh grade group read as well or better than the norm for beginning eighth graders. The eighth grade group has a median of 16.25 while the norm for the end of the eighth grade is 14.9. Approximately 68 percent of the eighth grade group read as well or better than the norm for beginning ninth graders.

Figure III represents the rate scores made by each of the four grades tested. It can clearly be seen that there is no regularity of performance in the matter of rate in reading, although there is a pronounced increase in the median from grade to grade. These medians, however, are not as high as the norms in their respective grades. This is probably due to the fact that the test is not a true measure of rate for the reasons stated at the beginning of this chapter.

Tables IX, X, XI, XII, XIII, XIV, XV, and XVI show the correlation between intelligence scores and reading comprehension scores of a selected group of pupils in one-room schools and in schools of two or more rooms each. A coefficient of correlation is a measure of the degree to which high values of one variable (i.e., ratings) tend to be accompanied by high values of another variable (i.e., scores). (Otis, Statistical Method in Educational Measurement). The coefficients of correlation range from .37.9 in the fifth grade of schools of two or more rooms each to .84.6 in the fifth grades of one room schools. There

is an average correlation of .73.9 for one-room schools and .58.8 for schools of two or more rooms. In all groups except the seventh grade one-room school group, the grade median is higher than the norm for the grade.

Tables IX and X present some interesting facts. It can be seen that the median intelligence score for the one-room group is 94, while the median intelligence score for two-or-more-room group is 117.5 yet the median scores for each group are practically equal to each other. The high correlation between intelligence scores and reading scores of the one-room group shows that a high percentage of these pupils are accomplishing more in consideration of their mental capacity than are the pupils of the two-or-more-room group.

Tables XI and XII show a condition almost reversed from that shown by Tables IX and X. Here the sixth grade pupils of one-room schools have a higher median intelligence score but a lower median reading comprehension score. The pupils of the two-or-more room schools are doing better work than the pupils of one-room schools both as to actual scores made and in relation to their mental scores.

Tables XIII and XIV show a high correlation between intelligence scores and reading comprehension scores. These tables also show that while the one-room group has the lowest median score in reading, it also has the lowest median score in intelligence.

Tables XV and XVI show approximately the same correlations between intelligence scores and reading comprehension scores in the eighth grade of one-room schools and in schools of two-or-more rooms. It will be noted also that while the one-room school group has the lower median score in reading it also has the lower median score in intelligence.

Table VIII shows the correlation between intelligence scores and reading comprehension scores of 72 sixth, 70 seventh, and 86 eighth grade pupils in nine one-room schools and four schools of two-or-more rooms each. Each sixth grade pupil is represented by a dot, each seventh grade pupil is represented by a cross, and each eighth grade pupil is represented by a

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	•	X	
220																			0		
210																					
200																0	0				
190															0	0	0	0	0		
180															0	0	0	0			
170															0	0	0	0	0		
160															0	0	0	0	0		
150															0	0	0	0	0		
140															0	0	0	0	0		
130															0	0	0	0	0		
120															0	0	0	0	0		
110															0	0	0	0	0		
100															0	0	0	0	0		
90															0	0	0	0	0		
80															0	0	0	0	0		
70															0	0	0	0	0		
60															0	0	0	0	0		
50															0	0	0	0	0		
40															0	0	0	0	0		
•		1	1	1	2	6	7	9	12	5	9	8	3	0	0	4	2	2		72	
X				1	3	3	6	7	4	12	6	2	8	3	4	5	4	2			
0					1	2	7	3	9	3	6	12	12	8	6	4	7	6			
TOTAL		1	1	2	6	11	20	19	25	20	21	22	23	11	10	13	13	10			

LEGEND

Sixth grade..... •
 Seventh grade... X
 Eighth grade.... 0

MEDIANS

	Intelligence	Reading	Norm
Grade 6	115	7.75	12.5
Grade 7	142	8.5	13.7
Grade 8	154.4	9.5	14.9

TABLE XVII

The Correlation Between Intelligence Scores and Reading Comprehension Scores for the fifth Grade

Intelligence Scores	Reading Comprehension Scores																					TOTAL
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21				
220																						
210																						
200																						
190																						
180																						
170																						1
160																						1
150																						1
140																						2
130																						7
120																						12
110																						7-M=110.7
100																						8-Norm=107
90																						7
80																						6
70																						7
60																						2
50																						3
40																						1
TOTAL																						61

M=72
N=177=11

circle. The table shows the gradual increase in reading comprehension and in intelligence from grade to grade. The most significant fact shown by this table, however, is the great amount of overlapping in reading ability and intelligence. The common field of overlapping for all three grades is from 80 to 160 in intelligence and from 8 to 21 in reading comprehension. Approximately 31 percent of the seventh grade pupils and 20 percent of the eighth grade pupils do not read as well as the norm for the sixth grade. While 28 percent of the sixth grade pupils and 41 percent of the seventh grade pupils read better than the norm for eighth grade pupils.

Table XVII shows the correlation between intelligence scores and reading comprehension scores of a group of 61 fifth grade pupils from eleven one-room schools and three schools of two-or-more rooms each. Each pupil is designated by a number and may be identified by consulting Table XXIV. All of the pupils to the right of the vertical line representing the score 11 read better than the norm for the fifth grade at the end of the year. All pupils to the left of this line do not read as well as the norm for the end of the fifth grade. All pupils on or to the right of the diagonal line are working up to or above what should be expected of them considering their intellectual capacity. In other words, all of these pupils have A.Q.'s of 100 or more in reading comprehension. All pupils to the left of the diagonal line are not working up to capacity. Pupils 31, 32, 36, 37, 38, 40, 41, 42, 44, 48, 50, and 52 are pupils in a village school of two-or-more rooms. The grade contains twenty-four pupils, thus 50 percent of the class are not working up to capacity. Pupils 7, 11, 15, 21, 53, 58, and 61 are also pupils who are not working to capacity. The above findings may be verified by consulting Table XXIV.

Table XXIV is a summary sheet showing the data and interpretations of the data obtained by the survey of intelligence and achievement in reading and arithmetic of pupils of the fifth grade of third class districts. From this table it can be seen that 23 of the 61 pupils listed have accomplishment quotients below 100. That is, approximately 38 percent of these fifth grade pupils

are not achieving in reading up to their mental age level. "An Accomplishment Quotient is found by dividing the reading age by mental age. The Accomplishment Quotient is the most exact present day measure of efficiency of study, instruction, and supervision; it is the only just basis for reporting to parents and for judging pupils; and it is the best index of what pupils need special attention and spurring, of what pupils need restraining perhaps, and of what pupils need to be 'let alone'." (McCall, How to Measure In Education.) The pupils of schools A, B, C, F, and L have A.Q.'s of 100 or more respectively. The pupils of school E have A.Q.'s of 88 and 94 respectively. They both have low IQ's but E² who has the lowest intelligence score of any pupil tested has a higher A.Q. than 26 percent of the class.

Table XXV shows that 27 of the 72 pupils listed have accomplishment quotients below 100. That is, approximately 27 percent of these sixth grade pupils are not achieving in reading up to their mental level. B scores are the test scores made in the different subjects, after the scores are transformed to a common basal scale. The basal scale of B scores is the scale of median or standard achievement of pupils as they progress from month to month and from grade to grade. Thus a pupil making a rate in reading of 180 words per minute on the given reading test is found to make the median rate of pupils in the sixth month of the seventh grade. His B score is 7.6 in rate of reading. (Otis, Statistical Methods in Educational Measurements.) The B scores in reading show that the following pupils have done approximately the work of the grade in reading and should according to findings based on this single test be promoted in reading: C², D², E¹, F¹, G¹, G², G⁴, H¹, H³, M¹, M², N¹, N², P¹, P², P⁴, P⁵, P⁶, Q², Q³, Q⁴, Q⁵, Q⁶, Q⁷, Q⁸, Q⁹, Q¹¹, Q¹³, Q¹⁷, Q¹⁸, Q¹⁹, Q²², R¹, R², S¹, S², T¹, T², T³, T⁴, T⁵, U¹, W¹. While Table XXV shows the B scores and hence the location on the grade scale of every pupil as judged by his performance in the reading, arithmetic, and intelligence tests, yet it is by no means certain that promotion should ever be made on the basis of the results of one test. These B scores might be used, however, by the teacher in checking her own recommendations for promotions.

SUMMARY

1. Approximately 62 percent of all pupils tested read as well or better than the norm for the grade.

2. There is a correlation between intelligence scores and reading comprehension scores of from .37.9 to .84.6.

3. With one exception the one-room school groups show the higher correlation.

4. With one exception the one-room school groups have the lower median intelligence.

5. In all cases the one-room school groups have the lower median reading comprehension scores. The difference in median between the two groups of each grade varies from .1 in the fifth grade to .9 in the seventh grade.

6. All groups except the seventh grade one-room group have median reading comprehension scores above the norm for the grade.

CONCLUSIONS AND RECOMMENDATIONS

1. While 62 percent of all pupils read as well or better than the norms for their grades, there remain 38 percent of all pupils that do not read as well as they should in order to carry on the work of the next grade.

2. Many pupils are not working up to capacity.

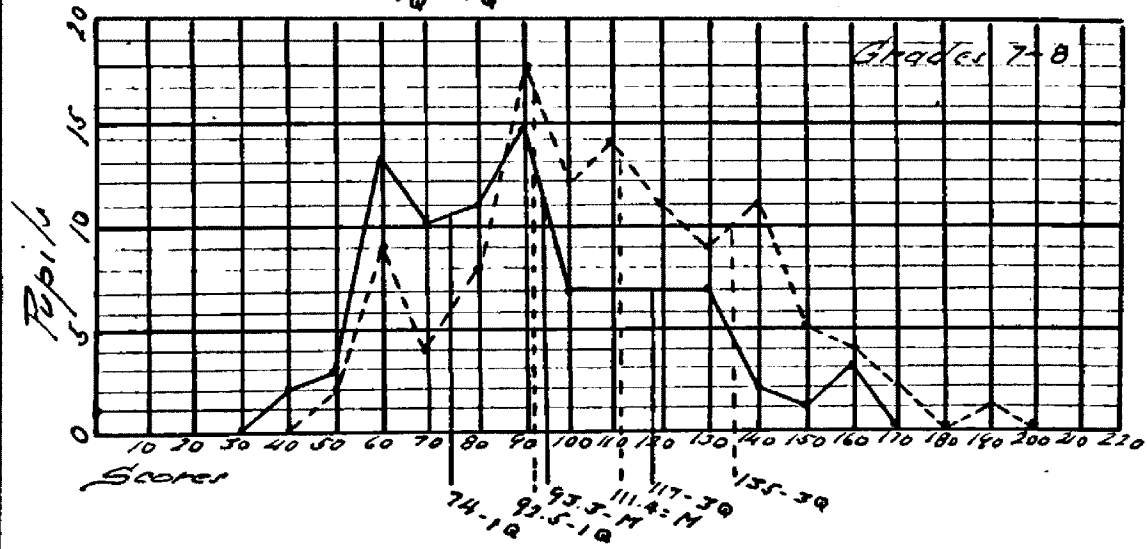
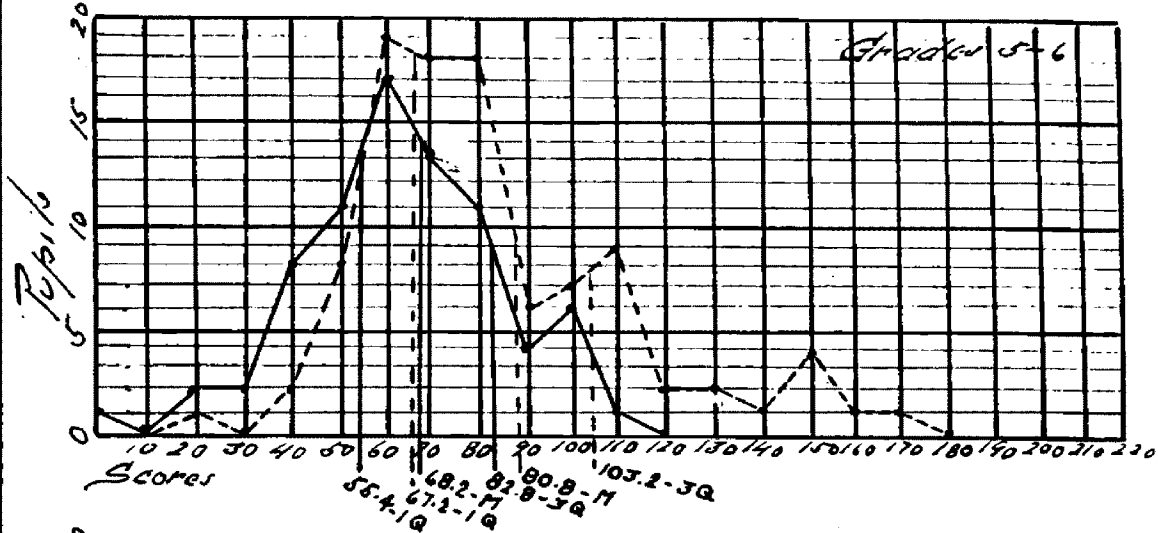
3. A program of diagnostic testing should be planned and carried out early in the school year of 1928-1929. (Van Wagenen, Educational Diagnosis), (Corning, After Testing, What?)

4. Remedial work should then be carried on for the remainder of the year. (Paulu, Diagnostic Testing and Remedial Teaching, p. 234-73.)

5. A second general survey test should be made in April, 1929 to measure the success of the program of diagnostic testing and remedial work.

FIGURE IV
ARITHMETIC SCORES GRADES 5,6,7,8.

LEGEND
Grades 5 and 7 solid lines
Grades 6 and 8 dotted lines



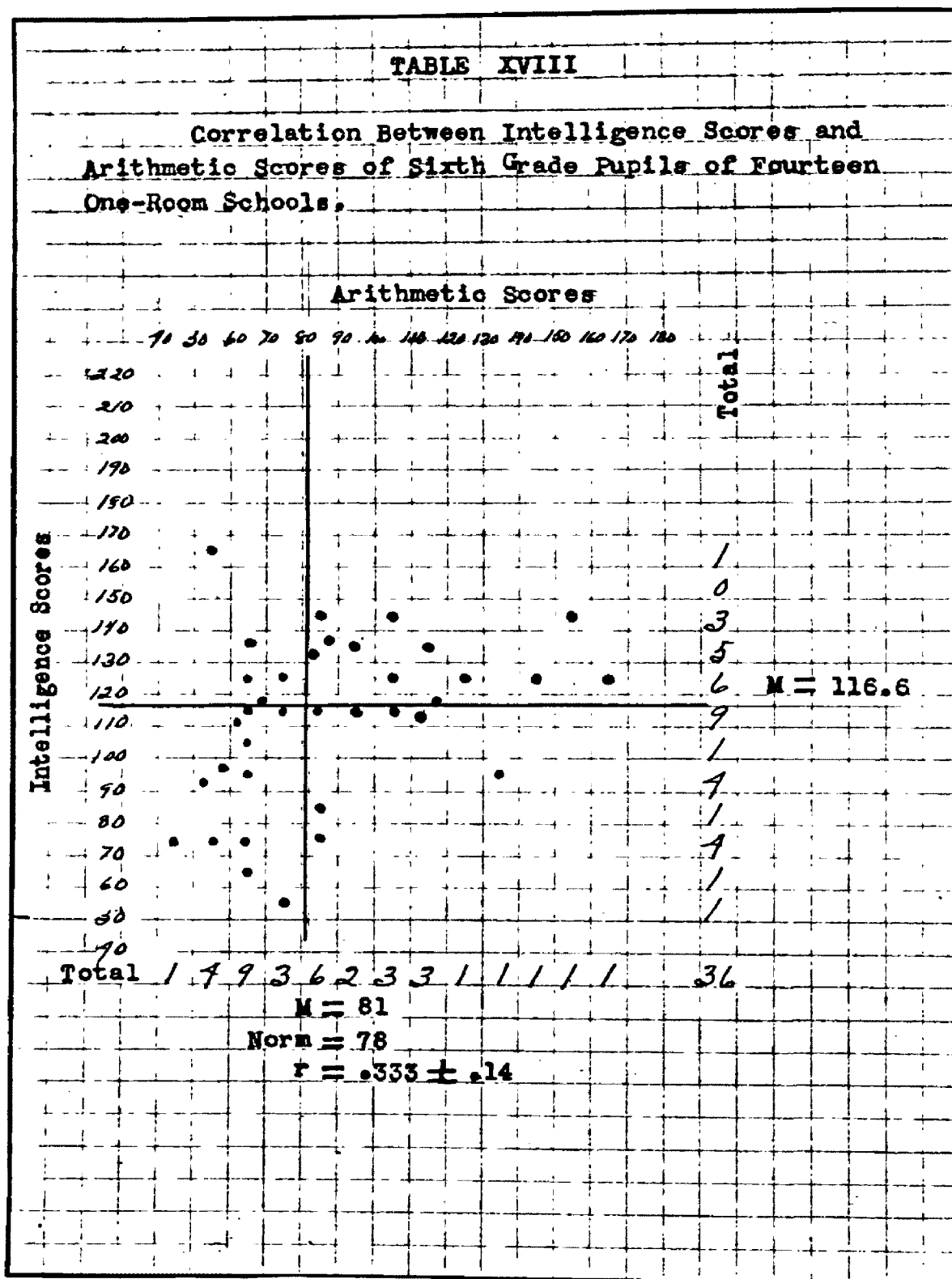


TABLE XIX.

Correlation Between Intelligence Scores and Arithmetic Scores of Sixth Grade Pupils of Three Schools of Two or More Rooms Each.

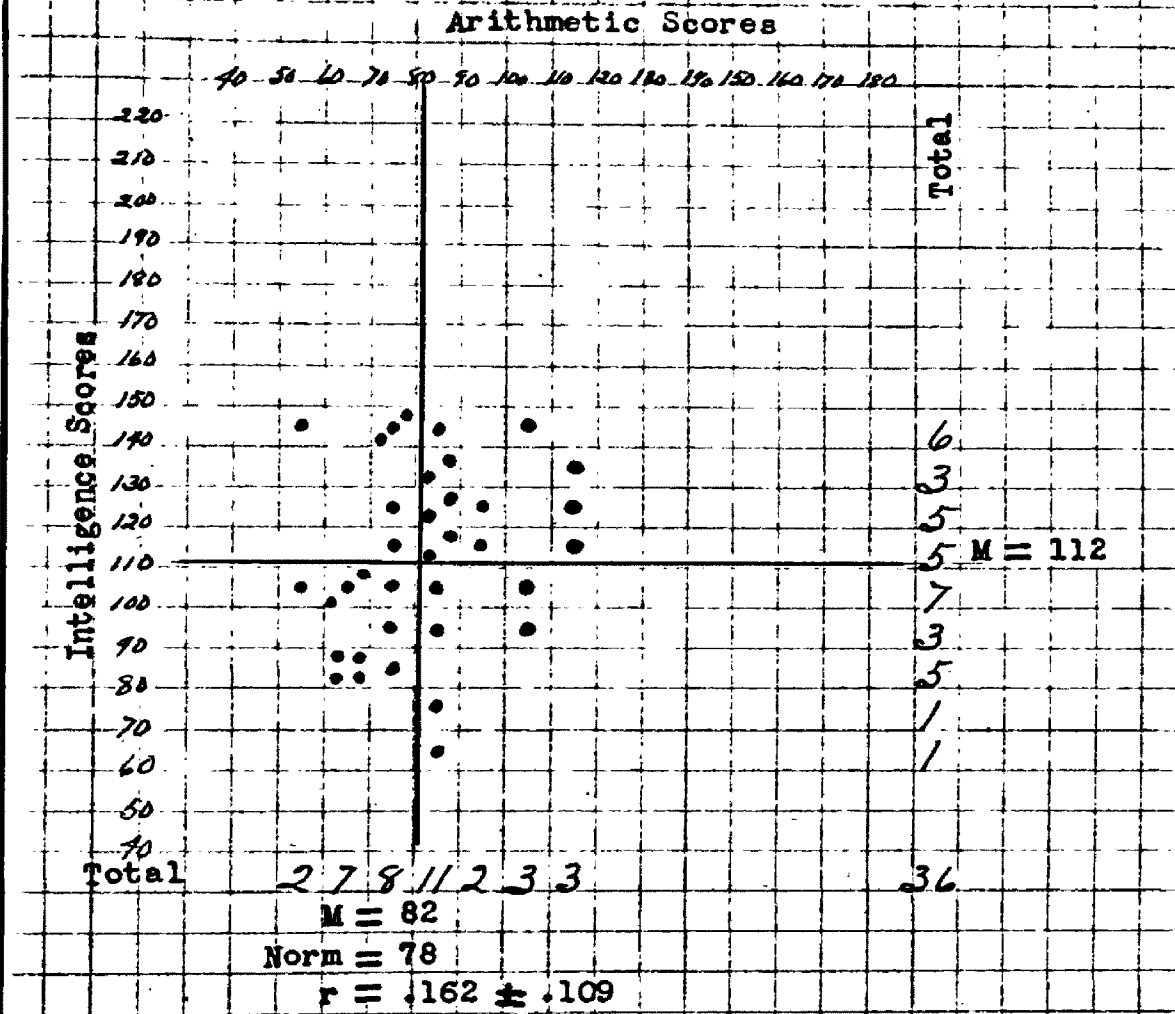


TABLE XX.
Correlation Between Intelligence Scores and
Arithmetic Scores of Seventh Grade Pupils of Ten
One-Room Schools.

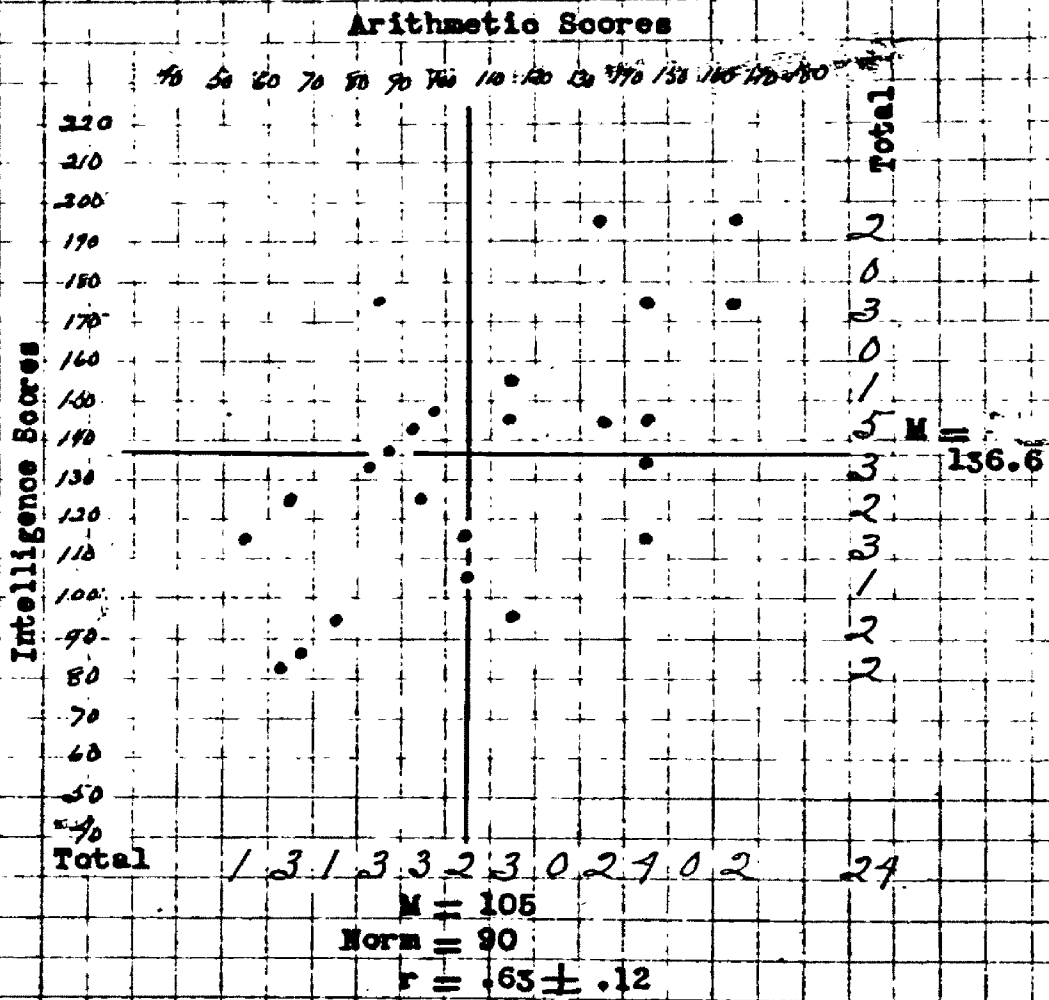


TABLE XXI.

Correlation Between Intelligence Scores and Arithmetic Scores of Seventh Grade Pupils of Four Schools of Two or More Rooms Each.

Arithmetic Scores.

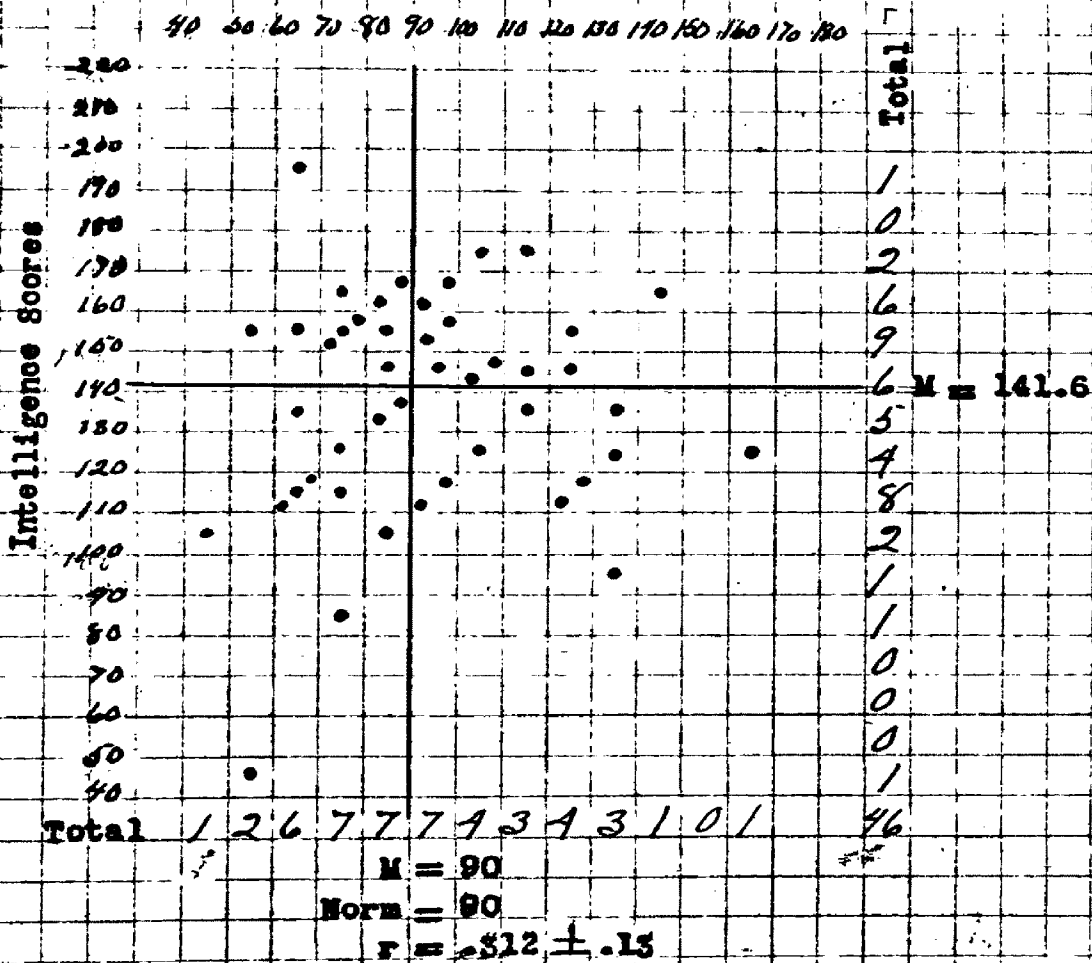


TABLE XXII.

Correlation Between Intelligence Scores and Arithmetic Scores of Eighth Grade Pupils of Fourteen One-Room Schools.

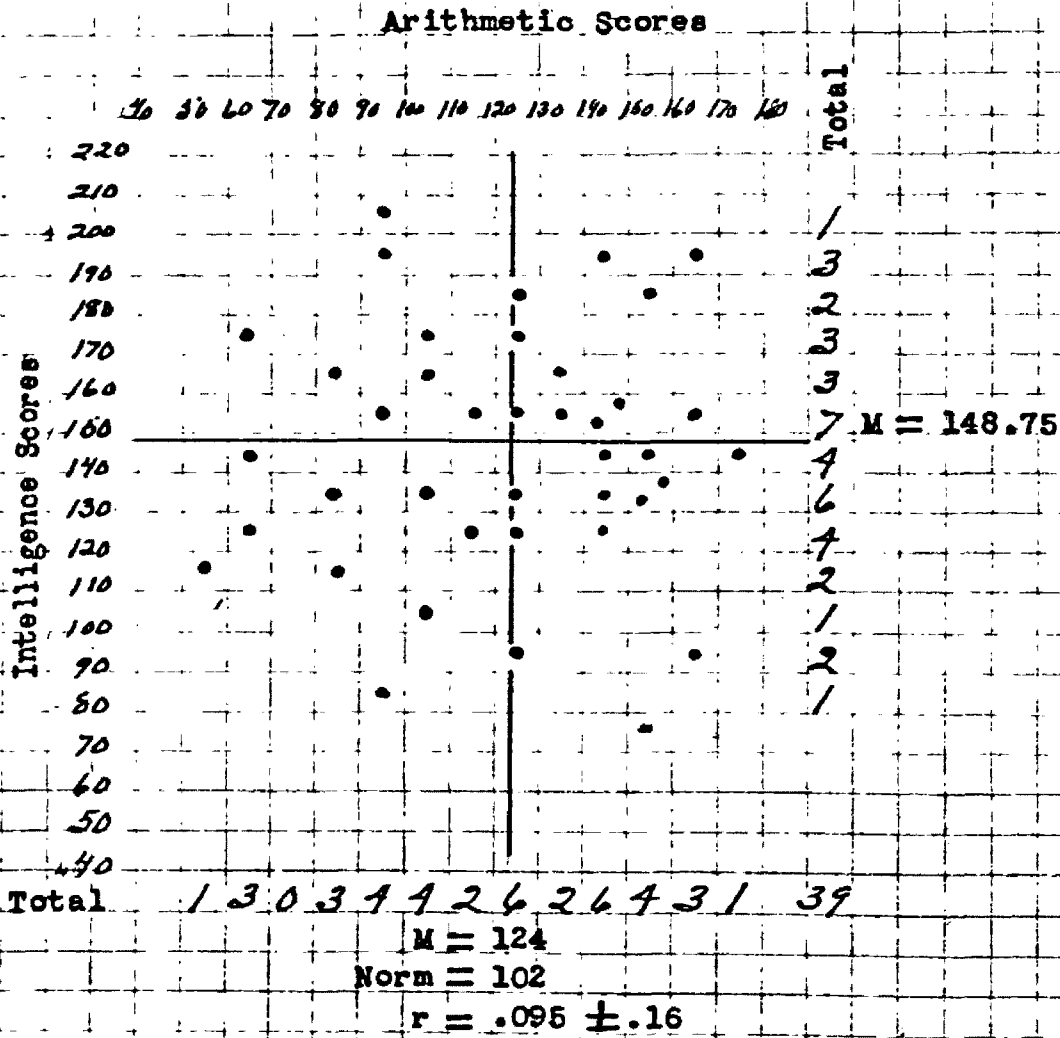


TABLE XXIII.

Correlation Between Intelligence Scores and Arithmetic Scores of Eighth Grade Pupils of Four Schools of Two or More Rooms Each.

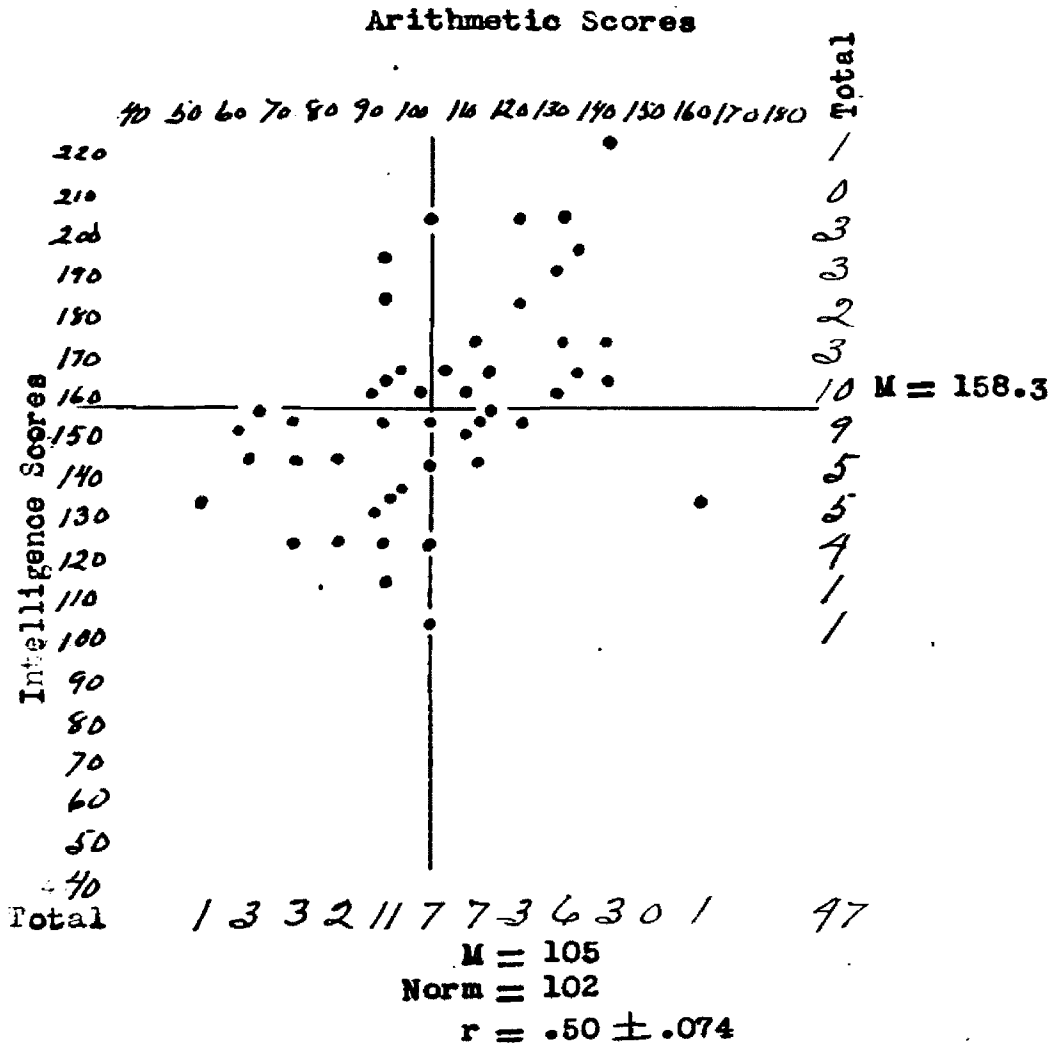


Table XXIV

FIFTH GRADE		Detroit Alpha Intelligence Test Form M					Monroe's Standardized Silent Reading Tests (Revised)					Monroe's Standardized General Survey										
No.	School	Pupil	Ages		M.A.	I.Q.	Letter Rating	Comprehension			Rate			Average		Arithmetic			Intel Reading			Arith
			Yr.	Mo.				Score	A.A.	A.Q.	Score	A. A.	A. Q.	A. A.	A. Q.	Score	A. A.	A. Q.	Score	A. A.	A. Q.	
1	A	A 1	9-1	123	12-11	141	A	17	17-6	134	206	17-6	134	17-6	134	104	15-	115	6.7	9.1+	9. +	9.
2	A	A 2	10-8	88	11-	103	C	10	11-	100	184	14-9	134	12-11	117	68	12-	109	5.3	5.2	8.	6.2
3	B	B 1	9-1	99	11-6	127	A	13	13-6	117	171	13-	113	13-3	115	90	14-	121	5.7	7.4	6.9	7.9
4	B	B 3	10-7	132	13-6	127	A	16	16-6	122	206	17-6	129	17-	126	102	15-	111	7.3	9.1+	9. +	8.9
5	B	B 4	11-4	93	11-3	99	C	12	13-0	115	146	11-	100	12-	108	74	12-6	109	5.5	6.7	5.2	6.7
6	C	C 1	9-7	127	13-2	137	A	18	18-6	140	173	13-6	103	16-	121	116	16-	118	7.	9.1+	7.1	9. +
7	E	E 1	13-	98	11-6	88	D	10	11-	96	109	9-	79	10-	88	84	13-6	117	5.7	5.2	3.7	7.4
8	E	E 2	13-5	40	9-1	67	E	7	9-	100	89	8-	89	8-6	94	78	13-	136	3.6	3.8	3.2	6.9
9	F	F 1	11-5	112	12-3	107	C +	13	13-6	110	158	12-	98	12-9	104	62	11-6	92	6.2	7.4	5.9	5.8
10	F	F 3	13-11	58	9 -6	68	E	8	9-6	100	158	12-	126	10-9	113	44	10-	106	4.	4.1	5.9	4.6
11	I	I 1	9-8	105	11-10	122	A	14	14-6	120	171	13-	108	13-9	114	66	12-	100	5.9	8.3	6.9	6.
12	I	I 2	9-8	97	11-5	118	B	11	12-	104	146	11-	96	11-6	100	72	12-6	109	5.6	6.	5.2	6.4
13	I	I 3	11-	68	9-11	92	C -	6	8-6	85	99	8-6	85	8-6	85	78	13-	129	4.5	3.6	3.4	6.9
14	I	I 5	11-9	91	11-2	95	C -	14	14-6	131	193	16-	144	15-3	137	82	13-	113	5.4	8.3	8.7	7.1
15	I	I 6	13-6	80	10-6	78	E +	6	8-6	81	74	7-9	74	8-1	74	51	10-6	100	5.	3.6	3. -	4.9
16	L	L 1	11-2	120	12-9	114	C +	15	15-6	124	154	11-6	90	13-6	107	59	11-6	89	6.5	9.1	5.8	5.5
17	M	M 2	10-4	143	14-1	136	A	17	17-6	125	173	13-6	96	15-6	110	60	11-6	100	7.8	9.1+	7.3	5.5
18	M	M 3	11-11	75	10-3	86	D	10	11-	110	106	8-6	85	9-9	97	27	9-0	86	4.9	5.2	3.6	3.7
19	M	M 4	12-1	57	9-6	78	E	9	10-	105	109	9-1	95	9-6	100	54	11-	112	4.	4.6	3.7	5.1
20	N	N 1	10-11	122	12-10	118	B	13	13-6	104	206	17-6	134	15-6	119	97	14-6	111	6.7	7.4	9. +	8.4
21	P	P 1	10-5	100	11-7	111	C +	10	11-	96	146	11-	96	11-	96	58	11-6	100	5.7	5.2	5.2	5.3
22	P	P 2	10-9	126	13-1	122	B	13	13-6	104	206	17-6	134	15-6	119	86	15-6	100	6.9	7.4	9. +	7.6
23	P	P 3	10-10	154	14-8	135	A	16	16-6	114	206	17-6	120	17-	117	71	12-6	86	8.3	9.1+	9. +	6.4
24	P	P 4	11-	109	12-1	109	C +	13	13-6	112	206	17-6	145	15-6	128	68	12-	98	6.	7.4	9. +	6.2
25	P	P 6	11-	129	13-3	120	B	16	16-6	124	206	17-6	132	17-	128	77	15-	96	7.	9.1+	9. +	6.9
26	P	P 10	12-2	109	12-1	99	C	12	13-	108	158	12-	100	12-6	104	45	10-6	88	6.	6.7	6.	4.6
27	P	P 12	12-9	117	12-7	99	C	13	13-6	108	206	17-6	139	15-6	124	103	15-	115	6.4	7.4	9. +	8.9
28	P	P 13	12-10	120	12-9	99	C	13	13-6	104	206	17-6	139	15-6	121	57	11-6	89	6.5	7.4	9. +	5.3
29	Q	Q 1	10-	164	15-3	152	A	15	15-6	100	203	17-	113	16-3	106	66	12-	78	9.	9.1	9. +	6.
30	Q	Q 2	10-1	134	13-8	135	A	13	13-6	100	171	13-	96	13-3	98	95	14-6	104	7.3	7.4	6.9	8.2
31	Q	Q 3	10-5	125	13-	125	A	10	11-0	85	133	10-	77	10-6	81	56	11-	85	6.8	5.2	4.5	5.3
32	Q	Q 4	10-5	103	11-9	113	C +	10	11-1	94	125	9-6	81	10-3	88	49	10-6	88	5.8	5.2	4.1	4.8
33	Q	Q 5	10-7	109	12-1	114	C +	12	13-	108	163	12-6	104	12-9	106	61	11-6	94	6.2	6.7	6.4	5.5
34	Q	Q 6	10-8	130	13-4	125	A	15	15-6	115	193	16-	116	15-9	117	38	9-6	71	7.1	9.1	8.6	4.4
35	Q	Q 7	10-9	142	14-	130	A	16	16-6	118	206	17-6	125	17-	121	60	11-6	82	7.7	9.1+	9.	5.5
36	Q	Q 8	10-9	115	12-5	115	B	10	11-	88	137	10-3	82	10-6	85	44	10-0	88	6.3	5.2	4.7	4.6
37	Q	Q 9	10-10	131	13-5	124	A	9	10-	75	126	9-6	71	9-9	73	62	11-6	85	7.1	4.6	4.2	5.8

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Summary Sheet: Survey of Intelligence, and Achievement in Reading and Arithmetic of Pupils of Sixth Grade of Third Class Districts of Gallatin County, Montana, December - May, 1927-1928

Table XXX

SIXTH GRADE				Detroit Alpha Intelligence Test Form M				Monroe's Standardized Silent Reading Tests (Revised)							Monroe's Standardized General Survey			B. Scores				
No.	School	Pupil	AGES Yr. Mo.	Score	M.A. Yr. Mo.	I.Q.	Letter Rating	Comprehension			Rate		Average		Arithmetic			Intel	Reading	Arith.		
								Score	A.A.	A.Q.	Score	A.A.	A.Q.	A.A.	A.Q.	Score	A.A.	A.Q.	Score	Comp.	Rate	Arith.
1	C	C 1	11-6	56	9-6	83	D	9	10-	105	85	8:00	85	9-	95	74	12-6	131	4.	4.6	3.1	6.6
2	C	C 2	13-4	129	13-3	99	C	12	13-	100	206	17-6	129	15-3	115	147	18-6	136	7.	6.7	9. +	9.
3	D	D 1	10-9	76	10-3	95	C	10	11-	105	209	18-	170	14-6	138	46	10-6	100	4.9	5.2	9. +	9. +
4	D	D 2	11-5	120	12-9	112	C +	12	13-	100	181	14-6	111	13-9	105	71	12-6	96	6.6	6.7	7.7	9. +
5	D	D 3	12-3	95	11-4	93	C -	10	11-	96	152	11-6	100	11-3	98	63	11-6	100	5.6	5.2	5.6	8.7
6	D	D 4	13-6	77	10-4	77	E	7	9-	86	130	10-	95	9-5	90.5	63	11-6	109	4.9	3.8	4.4	8.3
7	E	E 1	15-8	122	12-10	82	D	19	19-6	149	173	13-6	104	16-6	126.5	163	20-	153	6.7	9. +	7.1	9.
8	F	F 1	11-8	99	11-6	101	C	12	13-	113	168	13-	113	13-	113	59	11-6	100	5.7	6.7	6.6	9.
9.	F	F 2	11-8	129	13-3	113	B	11	12-	89	154	11-6	85	11-8	87	69	12-	89	7.1	6.	5.8	7.5
10	G	G 1	11-5	119	12-8	111	C +	15	15-6	119	181	14-6	111	15-2	115	60	11-6	89	6.5	9. +	7.7	9. +
11	G	G 2	12-4	117	12-7	102	C	12	13-	104	196	16-	127	14-5	115.5	68	12-	96	6.4	6.7	8.8	9. +
12	G	G 3	13-2	93	11-3	85	D	9	10-	87	137	10-6	91	10-3	89	54	11-	96	5.5	4.6	4.7	8.
13	G	G 4	13-11	104	11-10	85	D	14	14-6	120	153	11-6	96	13-1	108	64	12-	100	5.9	8.3	5.7	8. +
14	G	G 5	15-5	62	9-8	63	E	9	10-	100	151	11-6	115	10-8	107.5	65	12-	120	4.5	4.6	5.5	9. +
15	H	H 1	10-11	142	14-2	130	A	16	16-6	118	204	17-	121	16-8	119.5	151	19-	130	7.7	9. +	9. +	9. +
16	H	H 2	11-5	114	12-5	109	C +	10	11-	88	104	8-6	69	9-8	78.5	104	15-	120	6.5	5.2	3.6	6.2
17	H	H 3	12-6	95	11-4	91	C -	14	14-6	126	168	13-	113	13-8	119.5	130	17-	147	5.6	8.3	6.7	9.
18	J	J 1	11-2	131	13-	116	B	11	12-	92	141	10-6	81	11-3	86.5	88	14-	108	7.2	6.	5.	7.1
19	J	J 2	11-8	111	12-3	105	C	9	10-	80	141	10-6	84	10-3	82	80	13-	104	6.2	4.6	5.	7.4
20	J	J 3	12-4	113	12-4	100	C	10	11-	88	143	10-6	84	10-8	86	65	12-	96	6.2	5.2	5.1	7.4
21	K	K 2	9-11	78	10-5	105	C +	10	11-	105	223	19-6	184	15-3	144.5	53	11-	105	5.	5.2	9.	9.
22	K	K 3	12-7	82	10-8	91	D	5	8-6	81	103	8-6	81	8-6	81	82	13-6	122	5.1	3.3	3.5	7.1
23	M	M 1	10-10	164	15-3	141	A	19	19-6	125	235	21-6	138	20-6	131.5	54	11-	71	9.	9. +	9.	9.
24	M	M 2	11-11	136	13-9	115	B	15	15-6	111	154	11-6	82	13-6	96.5	64	12-	86	7.5	9. +	5.7	7.2
25	N	N 1	10-11	140	13-11	129	A	20	21-	149	204	17-6	125	19-3	137	80	13-	93	7.6	9.	9.	7.
	N	N 2	11-9	137	13-9	116	B	13	13-6	96	168	13-	93	13-3	94.5	96	14-6	104	7.5	7.4	6.7	8.4
	N	N 3	11-10	119	12-8	107	C +	11	12-	92	168	13-	100	12-5	96	99	14-6	111	6.5	6.	6.7	8.6
	P	P 1	11-10	149	14-5	122	A	14	14-6	100	206	17-6	120	16-1	110	59	11-6	80	8.1	8.3	9.	5.4
	P	P 2	12-	104	11-10	99	C	14	14-6	120	167	12-6	104	13-6	112	100	15-	124	5.9	8.3	6.7	8.7
	P	P 3	13-1	108	12-1	92	C -	12	13-	108	130	10-	84	11-5	96	59	11-6	96	6.	6.7	4.4	5.4
	P	P 4	13-4	123	12-11	97	C	13	13-6	104	206	17-6	134	15-6	119	89	14-	108	6.8	7.4	9.	7.7
	P	P 5	13-5	144	14-1	105	C +	12	13-	93	236	21-6	153	17-3	123	72	12-6	89	7.8	6.7	9.	6.4
	P	P 6	14-5	128	13-2	91	C -	12	13-	100	154	11-6	89	12-3	94.5	81	13-	96	7.	6.7	5.7	7.1
	Q	Q 1	10-11	82	10-8	98	C	11	12-	114	154	11-6	109	11-8	111.5	69	12-	109	5.	6.	5.7	6.2
	Q	Q 2	11-1	108	12-1	109	C +	12	13-	108	164	12-6	104	12-8	106	68	12-	100	6.	6.7	8.4	6.1
	Q	Q 3	11-1	105	11-10	107	C +	12	13-	108	155	11-6	96	12-3	102	85	13-6	112	5.9	6.7	5.8	7.5

Table 221V

No.	School	Grade	AGES		Detroit Alpha Intelligence Test Form 34		Monroe's Standardized Silent Reading Tests (Revised)		Monroe's Standardized General Survey		Monroe's Standardized General Survey											
			Yr.	Mo.	Score	Yr.	Mo.	Score	Rate	A. A.	A. Q.	Score	Rate	Comp.	Reading	Arith.						
38	Q	Q	10	11	98	105	C +	9	10-6	87	171	13-	113	11-6	100	52	11-	96	5.7	4.6	6.9	4.9
39	Q	Q	11	11	170	143	A	16	16-6	106	206	17-6	113	17-	109	59	11-6	75	9.5	9.1+	9.+	5.4
40	Q	Q	12	11-	129	120	B	11	12-	92	159	12-	92	12-	92	49	10-6	78	7.	6.	6.	4.8
41	Q	Q	13	11-2	130	119	B	8	9-6	71	103	8-6	64	9-	68	88	14-0	104	7.1	4.1	3.6	7.6
42	Q	Q	14	11-2	122	115	B	10	11-	85	144	10-6	81	10-9	83	60	11-6	100	6.8	5.2	5.2	5.3
43	Q	Q	15	11-5	118	111	C +	12	13-	104	146	11-	88	12-	94	66	12-	104	6.5	6.7	5.3	6.
44	Q	Q	16	11-5	121	112	B	11	12-	92	136	10-	77	11-	84	80	13-	113	6.7	6.	4.7	7.
45	Q	Q	17	11-6	110	106	C	11	12-	100	134	10-	84	11-	92	73	12-6	109	6.2	6.	4.5	6.4
46	Q	Q	18	11-6	125	112	C +	13	13-6	104	171	13-	100	13-3	102	77	13-	113	6.8	7.4	6.9	6.9
47	Q	Q	19	11-9	135	117	B	14	14-6	105	174	13-6	98	14-	102	86	13-6	112	7.4	6.0	7.3	7.5
48	Q	Q	20	12-1	136	114	C +	9	10-	74	112	9-	66	9-6	70	66	12-0	100	7.5	4.6	5.7	6.
49	Q	Q	21	12-1	69	91	C -	12	13-	118	146	11-	100	12-	109	85	13-6	122	6.3	6.7	5.2	7.4
50	Q	Q	22	12-2	1.3	101	C	9	10-	80	116	9-	73	9-6	77	63	12-0	96	6.3	4.6	3.5	5.8
51	Q	Q	23	12-9	83	83	C	11	12-	112	137	10-	94	11-	103	9	7-6	69	6.1	6.	4.7	5.9
52	Q	Q	24	12-10	96	88	C -	7	9-	79	110	9-	79	9-	79	65	12-	104	6.6	3.8	5.7	4.8
53	R	T	1	10-4	67	96	C	8	9-6	95	125	9-6	95	9-6	95	48	10-6	105	4.4	4.1	4.1	7.4
54	T	T	1	10-4	83	104	C	11	12-	109	147	11-	100	11-6	104	84	13-6	122	5.1	6.	5.5	8.1
55	T	T	2	10-9	75	95	C	11	12-	144	133	10-	95	11-	105	96	14-6	137	4.8	6.	4.5	7.2
56	T	T	3	11-1	105	108	C +	13	13-6	112	171	13-	108	13-3	110	82	13-6	112	5.9	7.4	6.9	7.7
57	T	T	4	11-1	115	111	C +	14	14-6	116	183	14-6	116	14-6	116	88	14-	112	6.2	8.3	7.8	7.7
58	T	T	5	11-5	108	106	C +	10	11-0	92	135	10-	84	10-6	88	108	15-6	124	6.	5.2	4.6	9.4
59	T	T	6	11-7	86	96	C -	11	12-	109	147	11-	100	11-6	104	72	12-6	113	5.3	6.	5.3	6.4
60	T	T	7	11-9	58	82	C -	12	13-0	136	147	11-	115	12-	125	72	12-6	131	4.1	6.7	5.3	6.4
61	U	U	2	10-8	70	95	C -	7	9-	90	100	8-6	85	8-9	87	99	15-	142	4.6	3.8	3.5	8.6

SIXTH GRADE Detroit Alpha Intelligence Test Form M

Monroe's Standardized Silent Reading Tests (Revised)

Monroe's Standardized General Survey

No.	School	Pupil	Ages			I.Q.			Comprehension				Rate				Average				Arithmetic			Intel			Reading			arith.		
			Yr.	Mo.	Score	Yr.	Mo.	I.Q.	Rating	Score	A. A.	A. C.	Score	A. A.	A. C.	Score	A. A.	A. C.	Score	A. A.	A. C.	Score	A. A.	A. C.	Score	Comp.	Rate	arith.				
37		Q 4	11-4	116	12-6	109	C +	15	15-6	124	235	21-6	171	17-6	147.5	82	13-6	108	6.3	9.	9.	7.1										
38		Q 5	11-6	148	14-4	125	A	19	19-6	134	235	21-6	147	20-6	140.5	73	12-6	86	8.	9.	9.	6.5										
39		Q 6	11-7	118	12-8	109	C +	16	16-6	131	235	21-6	171	19-1	151.	86	13-6	104	6.5	9.	9.	7.5										
40		Q 7	11-7	139	13-11	120	B	14	14-6	104	153	11-6	82	13-1	93.	84	13-6	96	7.5	8.3	5.7	7.4										
41		Q 8	11-9	145	14-2	121	B	15	15-6	111	181	14-6	104	15-1	107.5	108	15-6	107	7.8	9.	7.6	9.										
42		Q 9	11-9	116	12-6	106	C +	21	22-	175	235	21-6	171	21-8	173.	78	13-	104	6.3	9.	9.	6.9										
43		Q 10	11-10	89	11-2	94	C -	11	12-	109	130	10-	91	11-	100.	79	13-	113	5.3	6.	4.4	7.										
44		Q 11	12-1	94	11-3	94	C -	14	14-6	126	154	11-6	104	13-1	115.	80	13-	113	5.5	8.3	5.7	7.										
45		Q 12	12-2	81	10-7	87	D	10	11-	105	140	10-6	100	10-8	102.5	64	12-	114	5.	5.2	4.9	5.9										
46		Q 13	12-3	136	13-9	112	C +	14	14-6	104	165	12-6	89	13-6	96.5	85	13-6	96	7.5	8.3	6.5	7.5										
47		Q 15	12-3	112	12-3	100	C	11	12-	96	142	10-6	84	11-3	90.	95	14-6	116	6.2	5.	5.	8.3										
48		Q 16	12-5	108	12-1	97	C	9	10-	84	117	9-	76	9-5	80.	66	12-	100	6.	4.6	3.8	6.										
49		Q 17	12-6	124	13-	104	C	12	13-	100	154	11-6	89	12-3	94.5	77	13-	100	6.8	6.7	5.7	6.8										
50		Q 18	12-10	149	14-5	112	B	14	14-6	100	197	16-6	114	15-6	107.	74	12-6	86	8	8.3	8.8	6.6										
51		Q 19	12-10	74	10-2	79	E	13	13-6	134	168	13-	129	13-3	131.5	83	13-6	128	4.9	7.4	6.8	7.3										
52		Q 21	13-7	102	11-8	86	D	11	12-	104	150	11-	96	11-5	100.	71	12-6	104	5.8	6.	5.5	6.3										
53		Q 22	13-9	62	9-8	70	E	12	13-	129	222	19-6	193	16-3	161.	82	13-6	134	4.5	6.7	9.	7.3										
54		Q 23	15-1	108	12-1	80	D	11	12-	100	167	12-6	104	12-3	102.	68	12-	100	6.	6.	6.7	6.1										
55		Q 24	15-1	86	10-10	72	E	8	9-6	87	154	11-6	104	10-6	95.5	72	12-6	113	5.2	4.1	5.7	6.4										
56		Q 25	15-1	83	10-8	71	E	9	10-	91	104	8-6	78	9-3	84.5	68	12-	109	5.2	4.6	3.6	6.1										
57		Q 26	15-10	90	11-1	70	E	10	11-	100	143	10-6	96	10-6	98.	74	12-6	109	5.4	5.2	5.	6.3										
58	RR	R 1	11-4	129	13-3	117	B	15	15-6	115	167	12-6	93	14-1	104.	104	15-	111	7.	9.	6.7	9.										
59	RR	R 2	11-5	119	12-8	112	C +	20	21-	160	215	18-6	142	19-8	151.	117	16-	123	6.5	9.	9.	9.										
60	SS	S 1	10-9	114	12-5	115	B	15	15-6	124	196	16-	127	15-8	125.5	79	13-	104	6.3	9.	8.8	7.										
61	SS	S 2	11-1	147	14-4	129	A	21	22-	151	235	21-6	147	21-8	149.	104	15-	103	7.9	9.	9.	9.										
62	FT	F 1	9-11	117	12-7	127	A	13	13-6	108	167	12-6	100	13-1	104.	112	16-	123	6.4	7.4	6.7	9.										
63	FT	F 2	10-9	123	12-11	119	B	14	14-6	111	181	14-6	111	14-6	111.	90	14-	108	6.8	8.3	7.7	7.9										
64	FT	F 3	11-	120	12-	116	C +	13	13-6	112	154	11-6	96	12-8	104.	119	16-6	137	6.6	7.4	4.7	9.										
65	FT	F 4	11-3	94	11-4	100	C	14	14-6	126	181	14-6	126	14-6	126.	104	15-	130	5.6	8.3	7.7	9.										
	FT	F 5	12-2	140	14-	115	B	19	19-6	139	235	12-6	153	20-8	146.	83	13-6	96	7.6	9.	9.	7.3										
	FT	F 6	13-5	137	13-10	103	C	11	12-	86	141	10-6	75	11-3	80.5	118	16-6	118	7.5	6.	5.	9.										
	UU	U 1	11-3	110	12-2	108	C +	16	16-6	137	163	12-6	104	14-8	120.5	113	16-	127	6.1	9.	6.5	9.										
	UU	U 2	11-8	132	13-6	116	B	12	13-	96	129	10-	75	11-5	85.5	83	13-6	100	7.3	6.7	4.3	7.3										
	WW	W 1	11-2	135	13-9	123	B	15	15-6	111	181	14-6	104	15-1	107.5	111	15-6	111	7.4	9.	7.7	9.										
	WW	W 2	12-6	71	10-1	81	E	6	8-6	85	117	9-	90	8-8	87.5	89	14-	133	4.9	3.6	3.8	7.8										
	WW	W 3	13-6	125	13-	96	C -	8	9-6	74	103	8-6	66	9-1	70.	125	17-	130	6.8	4.1	3.5	9.										

Summary Sheet: Survey of Intelligence, and Achievement in Reading and Arithmetic of Pupils of Seventh Grade of Third Class Districts of Gallatin County, Montana, December - May, 1927-1928

Table XXVI

SEVENTH GRADE		Detroit Alpha Intelligence Test Form M					Monroe's Standardized Silent Reading Tests (Revised)						Monroe's Standardized General Survey					
School	Pupil	Ages		Score	M.A. Yr. Mo.	I.Q.	Letter Rating	Comprehension			Rate			Average		Arithmetic		
		Yr. Mo.	Yr. Mo.					Score	A. A.	A. Q.	Score	A. A.	A. Q.	A. A.	A. Q.	Score	A. A.	A. Q.
1	A	A 1	11-6	142	14-	122	B	16	16-6	118	215	18-6	132	17-6	125	91	14	100
2	A	A 2	12-5	146	14-3	113	B	17	17-6	120	235	21-6	147	19-6	133.5	112	15-6	107
3	A	A 3	12-8	173	15-9	124	A	16	16-6	103	235	21-6	134	19-1	118.5	164	20	125
4	B	B 1	11-7	173	15-9	136	A	20	21	131	235	21-6	134	21-3	132.5	141	18	112
5	B	B 2	11-11	135	13-9	115	B	13	13-6	96	181	14-6	104	14-1	100	148	19	135
6	B	B 3	12-2	142	14	115	B	19	19-6	139	204	17-3	123	18-4	131	95	14-6	104
7	D	D 1	13-10	95	11-4	82	D	9	10	87	130	10	87	10	87	73	12-6	109
8	D	D 2	13-11	134	13-8	98	C	13	13-6	100	154	11-6	85	12-6	92.5	86	13-6	96
9	F	F 1	11-7	141	14	122	D	11	12	86	206	17-6	125	14-8	105.5	94	14-6	104
10	F	F 3	14	122	12-10	90	C-	16	16-6	126	206	17-6	134	17-1	130	69	12	92
11	K	K 1	10-9	174	15-10	148	A	21	22	137	235	21-6	134	21-8	135.5	87	15-6	85
12	K	K 2	11-7	194	16-11	146	A	19	19-6	114	222	19-6	114	19-6	114	132	17-6	103
13	K	K 3	12	89	11	92	C-	13	13-6	122	167	12-6	113	13-1	117.5	69	12	109
14	K	K 4	12	86	10-10	90	C-	9	10	91	117	9	82	9-5	86.5	61	11-6	104
15	L	L 1	11-4	198	17-1	150	A	18	18-6	109	194	16	94	17-3	101.5	167	26	117
16	L	L 2	11-11	152	14-7	122	A	12	13	90	110	9	63	11	76.5	115	16	107
17	L	L 3	13-3	143	14-1	106	C+	11	12	86	173	13-6	96	12-8	91	131	17-6	120
18	M	M 1	15-5	110	12-2	79	D	9	10	84	173	13-6	112	11-8	98	50	10-6	84
19	N	N 1	13-1	133	13-7	104	C	11	12	89	117	9	67	20-5	78	83	13-6	100
20	N	N 2	14-4	124	13	91	C-	13	13-6	104	142	10-6	81	12-1	92.5	96	14-6	111
21	P	P 2	12-9	173	15-9	124	A	19	19-6	122	235	21-6	134	20-6	127	105	15	94
22	P	P 3	14	136	13-9	98	C	18	18-6	132	235	21-6	153	20-1	142.5	135	17-6	125
23	P	P 4	14-6	139	13-11	96	C-	10	11	79	181	14-6	104	12-8	91.5	117	16	114
24	P	P 6	15	41	9-1	61	E	8	9-6	105	130	10	111	9-8	108	58	11-6	121
25	P	P 7	15-1	86	10-10	72	E	8	9-6	87	107	9	82	9-3	84.5	72	12-6	113
26	P	P 8	15-4	96	11-5	75	E	11	12	104	181	14-6	126	13-3	115	139	18	155
27	Q	Q 1	11-6	133	13-7	118	B	14	14-6	107	178	14	104	14-3	105.5	52	11-6	82
28	Q	Q 2	12	195	17-	141	A	18	18-6	109	221	19-6	114	19-1	111.5	68	12	71
29	Q	Q 3	12-1	112	12-3	101	C	10	11	88	143	10-6	84	10-8	86	72	12-6	100
30	Q	Q 4	12-1	156	14-10	121	A	11	12	80	134	10	67	11	73.5	79	13	87
31	Q	Q 5	12-2	145	14-2	116	B	13	13-6	96	181	14-6	104	14-1	100	104	15	103
32	Q	Q 7	12-9	158	14-11	116	B	16	16-6	110	196	16-6	110	16-6	110	54	11	74
33	Q	Q 9	12-9	165	15-4	120	A	14	14-6	94	235	21-6	138	18-1	116	85	13-6	87
34	Q	Q 10	12-9	161	15-1	118	B	19	19-6	130	210	18	120	18-8	125	148	18-6	119
35	Q	Q 11	12-10	154	14-9	115	B	15	15-6	103	169	13	87	14-3	95	69	12	80
36	Q	Q 12	12-11	154	14-9	114	B	20	21	139	235	21-6	143	21-3	141	72	12-6	84

Table XXVI

SEVENTH GRADE

Detroit Alpha Intelligence
Test Form MMonroe's Standardized Silent
Reading Tests (Revised)Monroe's
Standardized
General Survey

No.	School	Pupil	Ages		Score	M.A. Yr.No.	I.Q.	Letter Rating	Comprehension			Rate			Average		Arithmetic		
			Yr.	Mo.					Score	A. A.	A. Q.	Score	A. A.	A. Q.	A. A.	A. Q.	Score	A. A.	A. Q.
37	Q	Q 18	12	11	159	15	116	B	16	16-6	110	196	16-6	110	16-6	110	96	14-6	97
38	Q	Q 14	12	11	140	14	108	C +	14	14-6	104	167	12-6	89	13-6	96.5	104	15	107
39	Q	Q 16	13		164	15-3	117	B	14	14-6	94	163	12-6	81	13-6	87.5	87	13-6	87
40	Q	Q 17	13	1	165	15-4	117	B	14	14-6	94	221	19-6	125	17-1	109.5	96	14-6	94
41	Q	Q 18	13	1	110	12-2	93	C -	11	12	100	130	10	84	11	92	62	11-6	92
42	Q	Q 19	13	2	111	12-3	93	C -	7	9	73	69	7-6	61	8-3	67	68	12	96
43	Q	Q 20	13	6	143	14-1	104	C	13	13-6	96	154	11-6	82	12-6	88	126	17	117
44	Q	Q 21	13	7	157	14-10	109	C +	16	16-6	110	209	18	120	17-3	115	121	16-6	110
45	Q	Q 22	13	7	122	12-10	88	C -	15	15-6	119	181	14-6	111	15-1	115	101	15	115
46	Q	Q 23	13	10	119	12-8	92	C -	10	11	88	121	9-6	76	10-3	82	64	12	94
47	Q	Q 24	15	2	137	13-10	91	C -	17	17-6	125	197	15-6	118	17-1	121.5	83	13-6	96
48	Q	Q 25	15	10	104	11-10	61	E	10	11	92	154	11-6	96	11-3	94	48	10-6	88
49	R	R 1	13	1	102	11-8	89	C -	13	13-6	117	181	14-6	126	14-1	121.5	103	15	124
50	T	T 1	11	9	149	14-5	123	A	12	13	90	181	14-6	100	13-8	95	137	18	124
51	T	T 2	12	7	169	15-7	124	A	13	13-6	87	167	12-6	81	13-1	84	161	20	125
52	T	T 3	12	9	150	14-6	110	B	17	17-6	120	205	17-6	120	17-6	120	120	16-6	114
53	T	T 4	13	4	159	15	116	B	13	13-6	90	196	15-6	110	15-1	100	128	17	113
54	U	U 1	12	2	119	12-8	104	C	11	12	96	130	10	80	11	88	147	18-6	142
55	U	U 3	13	1	91	11-2	85	D	8	9-6	87	119	9-6	87	9-6	87	111	15-6	134
56	U	U 4	14	1	116	12-6	89	C -	12	13	104	151	11-6	92	12-3	98	101	15	120
57	V	V 1	11	3	153	14-8	130	A	20	21	144	235	21-6	147	21-3	145.5	94	14-6	97
58	V	V 2	11	8	134	13-8	117	B	13	13-6	100	154	11-6	85	12-6	92.5	89	14	100
59	V	V 3	11	8	141	14	120	B	13	13-6	96	169	13	93	13-3	94.5	113	16	114
60	V	V 4	11	9	176	15-11	135	A	20	21	131	235	21-6	134	21-3	132.5	112	16	100
61	V	V 5	12	4	116	12-6	101	C	13	13-6	108	155	11-6	92	12-6	100	98	14-6	116
62	V	V 6	12	7	130	13-4	106	C	21	22	162	235	21-6	158	21-8	160	75	12-6	93
63	V	V 7	12	9	163	15-2	119	A	19	19-6	130	235	21-6	143	20-6	136.5	79	13	84
64	V	V 8	12	11	155	14-9	114	B	18	18-6	123	210	18	120	18-3	121.5	80	13	87
65	V	V 9	13	6	140	14	104	C	14	14-6	104	169	13	93	13-8	98.5	95	14-6	104
66	V	V 10	14		127	13-7	94	C -	10	11	82	169	13	96	12	89	79	13	96
67	V	V 11	14	1	128	13-2	94	C -	16	16-6	126	205	17-6	134	17-1	130	96	14-6	107
68	V	V 12	14	9	112	12-3	83	D	16	16-6	131	191	15-8	124	16-1	127.5	91	14	112
69	V	V 13	15	7	109	12-2	77	E	10	11	92	209	18	149	14-5	120.5	82	13-6	108
70	V	V 15	12		140	14	117	B	12	13	93	182	14-6	104	13-8	98.5	83	13-6	96

Summary Sheet: Survey of Intelligence and Achievement in Reading and Arithmetic of Pupils of Eighth Grade of Third Class Districts of Gallatin County, Montana, December - May 1927-1928

Table XXVII

No.	School	Pupil	EIGHTH GRADE Detroit Alpha Intelligence Test Form H				Monroe's Standardized Silent Reading Tests (Revised)						Monroe's Standardized General Survey						
			AGES		M. A. Score	Yr. Mo.	I. C.	Letter Rating	Comprehension			Rate			Average		Arithmetic		
			Yr.	Mo.					Score	A. A.	A. C.	Score	A. A.	A. C.	A. A.	A. C.	Score	A. A.	A. C.
1	A	A 1	14		187	16-6	118	A	18	18-6	112	235	21-6	130	20-1	121	120	16-6	100
2	A	A 2	14-5		193	16-10	117	A	21	22	129	235	21-6	126	21-8	127.5	168	20-6	120
3	C	C 1	13-5		99	11-7	86	D	10	11	96	129	10	87	10-5	91.5	161	20	165
4	C	C 2	14-5		135	13-9	95	C	10	11	79	184	15	107	13	93	144	18-6	132
5	D	D 1	11-10		136	13-9	116	B	11	12	86	167	12-6	89	12-3	87.5	152	19	135
6	D	D 2	12-16		129	13-3	106	C	13	13 -6	100	141	10-6	78	12-1	89	142	18-6	136
7	D	D 3	12-7		129	13-3	105	C	12	13	96	167	12-6	93	12-8	94.5	110	15-6	115
8	D	D 4	14-2		93	11-3	80	E	16	16-6	143	208	18	155	17-3	149	124	17	125
9	E	E 1	12		149	14-5	120	B	17	17-6	120	194	16	110	16-8	115	150	19	130
10	E	E 2	12-9		123	12-11	101	C	12	13	100	194	16	123	14-5	111.5	125	17	130
11	F	F 1	13		158	14-11	115	B	12	13	87	196	16-6	110	14-8	98.5	98	14	97
12	F	F 2	13-3		167	15-5	117	B	16	16-6	106	167	12-6	81	14-6	93.5	85	13-6	87
13	F	F 3	14-1		131	13-5	95	C -	12	13	96	141	10-6	78	11-8	87	81	13	96
14	F	F 4	14-5		163	15-2	105	C +	16	16-6	110	206	17-6	116	17-1	113	101	15	97
15	F	F 5	15-3		130	13-4	86	C -	17	17-6	129	196	16-6	122	17-1	125.5	101	15	111
16	G	G 1	13-6		209	17-9	133	A	20	21	116	235	21-6	119	21-3	117.5	91	14	78
17	G	G 2	14-6		195	17	117	A	21	22	129	235	21-6	126	21-8	127.5	94	14-6	86
18	G	G 3	14-9		114	12-5	84	D	12	13	104	126	9-6	76	11-3	90	84	13-6	108
19	G	G 4	15-2		114	12-5	82	D	17	17-6	139	188	15-6	124	16-6	131.5	56	11	88
20	H	H 1	13-2		159	15	114	B	14	14-6	97	168	13	87	13-8	92	122	16-6	110
21	H	H 2	13-11		159	15	108	C +	15	15-6	103	168	13	87	14-3	95	165	20	133
22	H	H 3	14-8		171	15-8	107	C +	15	15-6	100	154	11-6	75	13-6	87.5	126	17	106
23	L	I 1	13-8		151	14-6	106	C +	10	11	76	117	9	63	10	69.5	112	16	107
24	I	I 2	14-1		174	15-10	112	B	16	16-6	103	181	14-6	91	15-6	97	100	15	107
25	J	J 1	14-2		108	12-1	88	D	14	14-6	120	134	10	84	12-3	102	108	15-6	124
26	J	J 2	16-8		192	16-10	101	C +	17	17-6	103	165	12-6	74	15-1	88.5	140	18	106
27	L	L 1	14-3		159	15	105	C +	14	14-6	97	129	10	67	12-3	82	137	18	120
28	L	L 2	14-10		88	11	74	D	10	11	100	173	13-6	122	12-3	111	95	14-6	131
29	M	M 1	12-8		173	15-9	124	A	19	19-6	122	212	18-6	115	19-1	113.5	62	11-6	72
30	M	M 2	13-1		146	14-3	109	C +	15	15-6	107	148	11	76	13-3	91.5	65	12	83
31	M	M 3	13-7		121	12-10	94	C -	10	11	85	145	11	85	11	85	69	12	92
32	O	O 1	12-10		165	15-4	119	A	21	22	141	194	16	103	19	122	137	18	116
33	O	O 2	14-7		156	14-10	102	C	18	18-6	123	194	16	107	17-3	115	144	18-6	123
34	P	P 1	12-11		160	15-1	117	E	15	15-6	103	181	14-6	97	15-1	100	103	15	100
35	P	P 2	13		168	15-6	119	B	16	16-6	106	235	21-6	138	19-1	122	110	15-6	100

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Table XXVII

EIGHTH GRADE			Detroit Alpha Intelligence Test Form II				Monroe's Standardized Silent Reading Tests (Revised)						Monroe's Standardized General Survey					
No.	School	Pupil	Res		I. Q.	Letter Rating	Comprehension			Rate			Average		Arithmetic			
			Yr.	Mo.			Score	A.	A.	Per. C.	Score	A.	A.	Per. C.	Score	A.	A.	Per. C.
36	P	P 3	13-2	159	15	114	B	15	15-6	103	181	14-6	97	15-1	100	93	14	93
37	P	P 4	14-7	151	14-6	99	C	16	16-6	114	235	21-6	147	19-1	130.5	114	16	107
38	P	P 5	15	127	13-2	88	D	8	9-6	74	208	18	138	13-8	106	97	14-6	107
39	P	P 6	15-4	163	15-2	99	C	20	21	139	235	21-6	143	21-3	141	106	15-6	100
40	P	P 1	12-2	161	15-1	124	A	14	14-6	97	181	14-6	97	14-6	97	98	14-6	97
41	P	P 2	12-6	184	16-4	131	A	17	17-6	106	206	17-6	106	17-6	106	97	14-6	88
42	P	P 3	12-8	135	13-9	108	C +	20	21	149	229	20-6	146	20-8	147.5	93	14	100
43	P	P 4	13-1	186	16-6	126	A	19	19-6	118	209	18	109	18-8	113.5	123	16-6	100
44	P	P 5	13-2	138	13-10	105	C	12	13	82	181	14-6	91	13-8	86.5	161	20	125
45	P	P 6	13-3	132	13-6	102	C	12	13	96	155	11-6	85	12-3	90.5	99	14-6	107
46	P	P 7	13-3	146	14-2	108	C +	13	13-6	96	161	12	86	12-8	91	66	12	83
47	P	P 8	13-4	126	13-1	98	C	11	12	92	142	10-6	81	11-3	86.5	73	12-6	93
48	P	P 9	13-5	150	14-6	108	C +	15	15-6	107	221	19-6	134	17-6	120.5	69	12	83
49	P	P 10	13-7	154	14-8	108	C +	16	16-6	114	194	16	110	16-3	112	106	15-6	103
50	P	P 11	13-8	143	14-1	103	C	18	18-6	132	235	21-6	153	20-1	142.5	108	15-6	107
51	P	P 12	13-11	172	15-8	112	B	19	19-6	125	221	19-6	125	19-6	125	110	15-6	97
52	P	P 13	13-11	128	13-3	95	C	15	15-6	103	153	11-6	77	13-6	90	80	13	84
53	P	P 14	13-11	179	16-1	115	A	19	19-6	122	221	19-6	122	19-6	122	147	18-6	112
54	P	P 15	14-1	143	14-1	100	C	12	13	93	167	12-6	89	12-8	91	79	13	93
55	P	P 16	14-4	159	15	104	C +	10	11	74	129	10	67	10-5	70.5	110	15-6	100
56	P	P 18	14-5	158	14-11	104	C +	15	15-6	103	174	13-6	90	14-6	96.5	66	12	80
57	P	P 19	14-5	166	15-4	106	C +	20	21	135	235	21-6	138	21-3	136.5	98	14-6	94
58	P	P 20	14-7	142	14	96	C	16	16-6	118	196	16-6	118	16-6	118	112	16	110
59	P	P 23	14-11	150	14-6	97	C	16	16-6	114	196	16-6	114	16-6	114	76	13	90
60	P	P 29	16	109	12-1	75	E	9	10	84	129	10	84	10	84	100	15	120
61	P	P 30	16-2	139	13-11	86	D	14	14-6	104	143	10-6	75	12-5	89.5	57	11	92
62	R	R 1	13-6	136	13-9	101	C	13	13-6	96	208	18	128	15-8	112	152	19	135
63	R	R 2	13-7	148	14-4	102	C	17	17-6	120	235	21-6	147	19-6	133.5	177	21	144
64	R	R 3	13-10	141	14	101	C	15	15-6	111	181	14-6	104	15-1	107.5	141	18	128
65	R	R 4	13-11	189	16-8	126	A	20	21	127	235	21-6	130	21-3	128.5	152	19	112
66	S	S 1	11-11	153	14-8	132	A	21	22	151	235	21-6	147	21-8	149	142	13-6	103
67	S	S 2	14-8	133	13-7	92	C -	12	13	96	142	10-6	78	11-8	87	120	16-6	118
68	T	T 1	13-9	162	15-2	110	C +	20	21	139	235	21-6	143	21-3	141	143	18-6	119
69	T	T 2	13-11	162	15-2	110	C +	18	18-6	123	222	19-6	130	19-1	126.5	138	18	116
70	T	T 3	14	118	12-8	91	C -	9	10	80	74	7-6	61	8-8	70.5	93	14	108
71	T	T 4	16-7	128	13-3	80	D	16	16-6	126	222	19-6	149	18-1	137.5	100	15	111
72	V	V 1	12-7	202	17-4	138	A	18	18-6	106	235	21-6	123	20-1	114.5	105	15	86
73	V	V 2	13-1	153	14-8	112	C +	20	21	144	235	21-6	147	21-3	145.5	117	16	107
74	V	V 3	13-2	179	16-1	121	A	21	22	137	235	21-6	134	21-8	135.5	132	17-6	106
75	V	V 4	13-3	191	16-9	127	A	17	17-6	103	235	21-6	126	19-6	114.5	93	14	83
76	V	V 5	13-6	220	18-3	135	A	21	22	119	235	21-6	116	21-8	117.5	142	18-6	100

Table XXVII

Monroe's
Standardized
General Survey

Monroe's Standardized Silent
Reading Tests (Revised)

No.	School	Pupil	AGES		DETROIT ALPHA INTELLIGENCE TEST FORM B		I. Q.	Letter Rating	COMPREHENSION		DATE		VERSE		ARITHMETIC		
			Yr.	Mo.	Score	M. A.			Yr.	Mo.	Score	A. S.	Yr.	Mo.	Score	A. S.	Yr.
77	V	V 6	13-7	206	17-6	129	A	18-6	106	235	21-6	123	20-1	114.5	130	17-6	100
78	V	V 7	13-9	164	15-5	111	B	15-6	100	185	15	97	15-3	98.5	93	14	90
79	V	V 8	13-10	208	17-8	128	A	15-6	89	224	20	114	17-8	101.5	121	15-6	92
80	V	V 9	13-11	198	17-1	123	A	15-6	91	169	13	77	14-3	84	130	17-6	100
81	V	V 10	14-1	193	16-10	119	A	17-6	103	235	21-6	126	19-6	114.5	133	17-6	103
82	V	V 11	14-4	160	15	105	C +	16-6	110	197	16-6	110	16-6	110	136	18	120
82	V	V 12	14-4	144	14-1	98	C	14-6	104	182	14-6	104	14-6	104	80	13-	90
83	V	V 13	14-6	139	13-11	95	C -	16-6	118	196	16-6	118	16-6	118	92	14	100
84	V	V 14	14-11	151	14-6	97	C	12	83	185	15	103	13-5	93	126	17	117
85	V	V 15	15-7	167	15-5	99	C	11	71	108	9	59	10	66	115	16	103

CHAPTER IV

ACHIEVEMENT IN ARITHMETIC

The tests chosen for the survey of achievement in arithmetic were Monroe's Standardized General Survey Arithmetic Scales, I and II, Form I. These tests were chosen because they have been widely used and have well established grade norms. They are easy to give and score and are inexpensive. The three forms of the tests make possible a testing survey three times a year for the purpose of measuring progress in arithmetic achievement. The tests are not diagnostic.

The tests were given by the County Superintendent of Schools of Gallatin County and members of the class in Educational Measurements, at Montana State College. They were scored by the office staff of the County Superintendent, members of the class in Educational Measurements and the writer. A total of 363 pupils were tested.

Figure IV shows the curve of distribution of scores of 76 fifth grade pupils, 99 sixth grade pupils, 78 seventh grade pupils, and 110 eighth grade pupils. These graphs show that the median increases from fifth to sixth grade by 12.6 points, from sixth to seventh grade by 12.5 points, and from seventh to eighth grade by 18.1 points. The semi-interquartile range is 13.7 in the fifth grade, 18 in the sixth grade, 21.5 in the seventh grade and 21.2 in the eighth grade. The above facts show that there is much greater uniformity of accomplishment in the fifth grade than in any of the other grades. The norms for end-of-the-year accomplishment are 66, 78, 90, and 102 respectively. A glance at the figure will show that the median in each grade is higher than the norm for that grade. The figure also shows that there is a great deal of overlapping in achievement in arithmetic from grade to grade. Scores from 50 to 110 are found in each of the four grades.

Tables XVIII, XIX, XX, XXI, XXII, and XXIII show the correlation between intelligence scores and arithmetic scores of 72 sixth grade pupils, 70 seventh grade

pupils, and 86 eighth grade pupils, representing 19 one-room schools and 4 schools of two-or-more rooms each. These pupils were selected from the larger group because each pupil had been tested in intelligence, reading and arithmetic. It can be seen that the correlation in grades six and seven is higher in one-room schools than in schools of two-or-more rooms each. The correlation for sixth grades in one-room schools is .33, while in schools of two or more rooms, the correlation is .16. The correlation for the seventh grades in one-room schools is .63, while that of schools of two-or-more rooms is .31. In the eighth grades of one-room schools there is a correlation of .09 while in schools of two-or-more rooms, the correlation is .50. There is no significant correlation between intelligence scores and arithmetic scores except in seventh grades of one-room schools and eighth grades of schools of two-or-more rooms. The P. E. or probable error is the median deviation of a given coefficient of correlation from the true coefficient of correlation due to sampling. (Otis, Statistical Method in Educational Measurements.) The coefficient of correlation must be at least four times as great as the P. E. in order to be significant.

Tables XVIII and XIX show that 16 pupils or 44 percent of the sixth grade pupils in one-room schools and 15 pupils or 41 percent of the sixth grade pupils in three schools of two-or-more rooms each are below the norm for the grade in arithmetic achievement.

Tables XX and XXI show that 8 pupils or 33 percent of the seventh grade pupils in ten one-room schools and 23 pupils or 50 percent of the seventh grade pupils in four schools of two-or-more rooms each are below the norm for the grade in arithmetic achievement.

Tables XXII and XXIII show that 12 pupils or 31 percent of the eighth grade pupils of fourteen one-room schools and 21 pupils or 45 percent of the eighth grade pupils of four schools of two-or-more rooms each are below the norm for the grade in arithmetic achievement.

Table XXIV shows that according to B scores in arithmetic, 45 of the 61 fifth grade pupils listed made B scores of 5.5 or better and probably should be promoted to the sixth grade in arithmetic in September.

Those making B scores of less than 6 and more than 5.4 will not have the opportunity to be promoted in January for there are no half year promotions in the schools tested.

Table XXV shows that 59 of the 72 sixth grade pupils listed made B scores of 6.5 or better and probably should be promoted to the seventh grade in arithmetic for the reason stated above provided that these B scores are corroborated by other data in possession of the teacher.

A study of tables XXIV, XXV, XXVI, and XXVII reveals the fact that a total of ninety-three pupils have A.Q.'s of less than 100. Of the bright (A, B) group, 44 percent have A.Q.'s of less than 100, 35 percent of the average (C+, C, C-) group have A.Q.'s below 100, and only 14 percent of the dull (D, E) group have A.Q.'s below 100. This condition seems to indicate that there is not sufficient challenge in the work being offered to bright pupils to engage their best efforts. It would also seem to indicate that the group receiving the best program in arithmetic is the dull group, because it keeps them working up to capacity.

SUMMARY

1. The median of arithmetic achievement in each grade is higher than the norm for that grade.
2. There is much overlapping in arithmetic achievement from grade to grade, scores of from 50 to 110 being found in each grade.
3. In most groups there is not a significant correlation between intelligence scores and arithmetic scores.
4. Forty-two percent of the pupils made scores below the norm for the grade.
5. Approximately 32 percent of the pupils in fifth, sixth, seventh, and eighth grades are not working up to capacity, that is, their A.Q.'s are below 100.

CONCLUSIONS AND RECOMMENDATIONS

1. The first three weeks of the school year (1928-1929) should be devoted to an intensive review of the work of the previous year. A diagnostic test in arithmetic should then be given for the purpose of locating each pupil's individual difficulties. (Judd, C. E., Measuring the Work of the Schools.)

2. Remedial drill work should be planned to solve these individual difficulties.

3. Pupils who are mentally over-ge for their grades and who are able to do more difficult work should be encouraged to do the work of the next higher grade. This procedure will help reduce overlapping and will reduce retardation.

4. Every pupil should be given work of that degree of difficulty which will enable him to attain to his full capacity for achievement. (Van Wagonen, Educational Diagnosis.)

5. Tests that may be used for diagnostic purposes:

Cleveland Survey Arithmetic Tests, Public School Publishing Co.

Compass Diagnostic Tests, Scott Foresman.

Monroe's Diagnostic Arithmetic Tests, Public School Publishing Co.

Spencer Diagnostic Arithmetic Tests, Bureau of Administrative Research, University of Cincinnati

Wisconsin Inventory Tests, Public School Publishing Company.

Wood; Arithmetic Scales, Bureau of Publications, Columbia University

CHAPTER V

GENERAL SUMMARY AND CONCLUSIONS

In the following pages a summary will be made of the important facts brought out in the testing survey of 530 pupils in intelligence, of 445 pupils in reading, and of 363 pupils in arithmetic. Two hundred and eighty-nine of these pupils were tested in intelligence, reading, and arithmetic.

1. The pupils in fifth, sixth and seventh grades had a higher median intelligence score than pupils in corresponding grades included in the Nation Wide Survey.

2. The pupils of eighth grade had a lower median intelligence score than the eighth grade pupils included in the Nation Wide Survey.

3. In the fifth grade 32 percent of the pupils were in the bright group, 54 percent were in the average group, and 14 percent were in the dull group.

4. In the sixth grade 26 percent of the pupils were in the bright group, 53 percent were in the average group, and 20 percent were in the dull group.

5. In the seventh grade 43 percent of the pupils were in the bright group, 41 percent were in the average group, and 15 percent were in the dull group.

6. In the eighth grade 30 percent of the pupils were in the bright group, 51 percent were in the average group, and 19 percent were in the dull group.

7. In the Nation Wide Survey of 33,593 pupils in fifth, sixth, seventh, and eighth grades, 25 percent, 29 percent, 35 percent and 41 percent respectively were in the bright group, and 25 percent, 22 percent, 18 percent and 13 percent respectively were in the dull group.

8. As will be seen there was a constantly increasing percentage of bright pupils and a constantly decreasing percentage of dull pupils from grade to grade

in the schools included in the Nation Wide Survey. No such condition was found in Gallatin County. On the contrary, the highest percentage of dull pupils and the lowest percentage of bright pupils was found in the sixth and eighth grades.

9. In the Gallatin Survey 33 percent of all pupils tested were in the bright (A, B) group, 48 percent were in the average (C) group, and 18 percent were in the dull group. The results shown in the Nation Wide Survey almost exactly agree with the above percentages.

10. There was an average range in chronological age per grade of 6 years, 6 months.

11. There was an average range in mental age per grade of 7 years, 6 months.

12. Approximately 12 percent of all pupils were chronologically under-age for their grade. Under-ageness is probably due to mental age above normal. (McCall, How to Measure in Education.)

13. Approximately 22 percent of all pupils were chronologically over-age for their grades. Under-ageness was least in the fifth grade and greatest in the seventh grade. Over-ageness was least in the fifth grade and greatest in the sixth grade.

14. Twenty-six percent of all pupils were mentally over-age for their grade. The percentage of mental over-ageness is greatest in the fifth and seventh grades.

15. Twenty-four percent of all pupils were under-age for their grade.

16. Chronological 11-year-olds, 12-year-olds, and 13-year-olds were found in each of the four grades tested.

17. Mental 10-year-olds, 11-year-olds, 12-year-olds, 13-year-olds, 14-year-olds and 15-year-olds were found in each of the four grades tested.

18. The median I.Q.'s for fifth, sixth, seventh, and eighth grade were 107, 102, 108, and 103, respectively. The dull pupils seem to collect in grades six and eight.

19. The median intelligence scores for the fifth, sixth, seventh, and eighth grades were 99, 116, 136, and 149, respectively.

20. The grade median intelligence score increased from fifth to sixth grades by 17 points, from sixth to seventh grades by 20 points, and from seventh to eighth by 13 points.

21. The semi-interquartile ranges in intelligence scores for grades five, six, seven, and eight were 22, 17.5, 18, and 17 respectively.

22. In reading comprehension approximately 62 percent of all pupils tested read as well or better than the norm for their respective grades.

23. In general, the pupils of schools of two or more rooms read better than pupils of one-room schools. That is, there was a higher median score per grade.

24. But it was also true that in every grade except the sixth the median intelligence score was higher for the pupils of village schools than for pupils of one-room schools.

25. There was a correlation between intelligence scores and reading comprehension scores of from .37.9 to .84.6.

26. With one exception (the seventh grade) the one-room school groups showed the higher correlation between intelligence scores and reading comprehension.

27. All groups except the seventh grade one-room school group had median reading comprehension scores above the norm for the grade.

28. There was much overlapping in reading ability. Scores from 8 to 21 were common to grades six, seven and eight. Scores from 8 to 18 were found in all four grades tested.

29. In arithmetic each grade had a higher median score than the norm for the grade.

30. Approximately 58 percent of the pupils made scores above the norm for their respective grades.

31. Approximately 32 percent of the pupils in all grades were not working up to capacity. That is, their A.Q.'s were below 100.

32. There was no significant correlation between intelligence scores and arithmetic scores except in the seventh grade group in one-room schools and the eighth grade group in schools of two-or-more rooms. In order to be significant a coefficient of correlation must be at least four times as great as the probable error.

33. There was much overlapping in arithmetic achievement from grade to grade. Scores from 50 to 110 were found in each of the four grades.

34. The one-room schools had a higher median score in arithmetic than the schools of two-or-more rooms. This was true in spite of the fact that in all grades except the sixth the median intelligence score was higher for the village school groups than for the one-room school groups.

35. The highest percentage (44) of pupils not working up to capacity was found in the bright group and the lowest percentage of pupils not working up to capacity was found in the dull group.

CONCLUSIONS AND RECOMMENDATIONS

A testing program should be begun early in the school year of 1928-1929 which should include a re-testing in intelligence in order to check the results already obtained. In case of great discrepancies between the results of the first and second test, a third test might be given to those pupils whose scores in the two tests showed the greatest discrepancies.

Diagnostic tests should be given in the subjects of reading and arithmetic in order to discover each pupil's difficulties. Remedial work should then be planned and carried on for at least a semester, when a second survey test might be given in order to measure the progress of the pupils and incidentally the success of the diagnostic and remedial programs.

Survey tests in other subjects might also be given early in the year to determine the status of the pupils in these subjects.

Pupils who are mentally over-age for their grades should be allowed and encouraged to advance as rapidly as possible from grade to grade until they reach a grade of work better suited to their mental ages. This applies particularly to those pupils who are chronologically "at age" for their present grade. Pupils who are mentally over-age for their grades and chronologically much under-age should be given an enriched program. An enriched program does not mean a program of merely more work of the same type, but work that will require powers of association rather than rote memory. Work that will require larger and better vocabularies, and instructional units that will be longer and present long-time projects. (Van Wagenen, Educational Diagnosis, Chapter IX) also (Wilson & Hoke, How to Measure, Chapter XVII)

Pupils who are chronologically much over-age for their grades should be given such help as will enable them to advance. The elementary grades have little to offer that will stimulate the boy or girl of sixteen, seventeen or eighteen years of age. If they have good

working habits and the persistence to keep on trying to do the work, provision should be made for their entry into and progress in high school. This should be done especially in case the high school can offer courses other than the usual classical and scientific courses.

The problem of chronological over-ageness is not as great in the rural schools of Gallatin County as was found by Strayer, Morton, and others in various surveys of city school systems. (Strayer, George D., Age and Grade Census of Schools and Colleges), (Morton, W. H. S., Retardation in Nebraska) and (McCall, How to Measure in Education.)

An attempt should be made to regrade on the basis of mental age and degree of brightness. But regardless of any grading system used, the needs of individual children should always be kept in mind by the teacher. (Baker, Characteristic Differences in Bright and Dull Pupils.)

From facts 1, 2, 3, 4, 5, 6, 7, 8, and 9 the conclusion might safely be drawn that dull pupils are not eliminated as rapidly from the schools of Gallatin County as from schools in general. This retention of the dull pupils may be more apparent than real due to the fact that only a comparatively small number of pupils were tested in Gallatin County, but all facts obtained certainly indicate that dull pupils are retained.

This retention of dull over-age pupils may be due to any one of the following causes or to all of them combined: the compulsory school law may be operating more effectively in Gallatin County than in general elsewhere; the over-age boys and girls of rural communities unlike the over-age boys and girls of industrial centers cannot obtain remunerative employment during the school year; the eighth grade examination requirement for entry into high school may be offering a more effectual check to progress of the dull pupils in Gallatin County than is offered by the ordinary test given to eighth grade pupils in closely articulated city school systems.

The facts brought out by the survey would also seem to indicate that the pupils of the rural schools of Gallatin County were, on the whole, well equipped mentally to do the work of the elementary school.

In general, reading seems to be better taught in the village schools and arithmetic seems to be better taught in the one-room schools, if norms of achievement may be considered indices of good teaching. If, however, correlation between intelligence and achievement be used as an index of good teaching, reading is being better taught in the one-room schools, and arithmetic is being poorly taught in both types of schools.

The facts brought out by the survey seem to warrant the following and final conclusion: that the retardation of bright pupils is the most serious problem confronting the teachers and school administrators of the schools of third class districts of Gallatin County. (McCall, How to Measure in Education.)

The above conclusion is based upon the following facts brought out in the testing survey: that 26 percent of all pupils were mentally over-age for their grades; that practically all mentally over-age pupils were in the bright groups; and that 44 percent of the bright group were not working up to capacity. These facts seem to indicate that the mentally over-age pupils are wasting their time by not working up to their capacity. Therefore, the prevention of this waste in time of the bright student presents itself as a most important problem of the school.

The first solution might be to give the bright pupil more work of the same type. This, however, would merely keep him busy. It would not challenge his best efforts and it would not reduce the amount of mental over-ageness in the grades. The second solution might be that of enrichment of his course. By enrichment is meant the addition of such curricular material as will challenge his superior powers of association, call for a richer vocabulary, demand greater skill, better form, and suggest higher use-values. This method of solution might keep him working to capacity but would not reduce mental over-ageness.

A third solution and one better suited to the case of the mentally over-age pupil physically well developed and "at age" for his grade is a combination of the second solution stated above and acceleration without skipping. This method of solution would keep the pupil working to capacity while it would reduce the amount of mental over-ageness by advancing him from grade to grade more rapidly.

The following brief statement of the important ways in which the pupils of the dull group differ from those of the bright group will suggest different teaching procedures: (Baker, Characteristic Difference in Bright and Dull Pupils.

1. They have not the same mastery of previous learning; therefore, they are apt to require more review work.

2. Their interest span is shorter; they need shorter units of work.

3. They cannot carry many things in mind at one time; learning situations must not contain too many elements in number or kind.

4. They do not comprehend or see well the significance of things; facts and questions must be direct and specific.

5. They cannot make the same mental associations or analogies; very few facts or conditions can be omitted in the statements of a unit of work.

6. They cannot organize ideas and facts as well; situations must be organized for them or must require little organization.

7. They take shorter steps in their thinking; therefore explanations must be more explicit.

8. They do not transfer ability from one situation to another as well; consequently more type situations must be met.

On the other hand, for bright pupils:

1. They learn by association rather than by rote

and their learning, consequently, takes on a somewhat different aspect.

2. Vocabulary difficulties are less for bright pupils because of their natural linguistic interests and wider range of association from the content.

3. Instructional units can be longer and long-time projects with additional references and personal goals can be carried out.

4. Motives for skill, good form, and use-values are the best incentives to good work in the physical activities of manual-training, gymnasium, and art or skill training.

5. They have a more spontaneous interest in intellectual matters.

They keep their instincts and emotions under better control and resent being forced into emotional choices against their better intellectual judgments.

7. To quote - "The teacher of bright pupils must be a general manager who directs the general policies of the organization, in contrast to a gang foreman who supervises the details." (Baker, Characteristic Differences in Bright and Dull Pupils").

Another method of solving the problem of mental over-ageness in the rural school is suggested by Van Wagenen in his chapter on Classifying the Pupils in the Small City Grade School. He suggests that the pupils with the higher mental ages, higher intelligence quotients and higher achievement records would be placed in the eighth grade while those with the lower mental ages, lower intelligence quotients and lower achievement records would be placed in the seventh grade. Thus a more homogeneous grouping for instructional purposes would at once be accomplished. The present method, used in the rural schools of Montana, of grouping the third and fourth grade pupils, the fifth and sixth grade pupils and the seventh and eighth grade pupils into three groups for purposes of instruction lends itself readily to Van Wagenen's plan. For example the seventh-eighth grade group may be scheduled to do the

work of the eighth grade. Those of the seventh grade who have higher mental ages, higher intelligence quotients and higher achievement records should be allowed and encouraged to complete the work of the two grades in one year and finish the eighth grade with the eighth grade group instead of going back to finish the seventh grade the following year. It can readily be seen that this plan could be used to accelerate the mentally superior pupils in any of the grade combinations. (Van Wageningen, Educational Diagnosis, Chapter X), (Sears, The Boise Survey, Chapter VI).

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