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AN EDUCATIONAL SURVEY  
OF  
THE SCHOOL CHILDREN OF JUDITH B. IN COUNTY  
MONTANA

by

EARL F. SYMS

Presented in partial fulfillment of the  
requirement for the degree of  
Master of Arts.

State University of Montana

1931

Approved:

  
Chairman of Examining Committee

  
Chairman of Graduate Committee

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## Foreword

The writer wishes to proffer his sincere gratitude for the vital assistance and enthusiastic cooperation given him by the principals and teachers of Judith Basin County, while he was making the educational survey reported in the following pages. The teachers of the County are to be congratulated upon the keen interest which they manifested in giving the tests and upon the conscientious manner in which they carried through the testing program.

The writer is especially indebted to Dr. A. L. Ames, of the University of Montana, to Mrs. Maybird Bowman Bell, County Superintendent of Schools, and to Mrs. Bell's assistant, Miss Vernice Clauson, for their aid in planning the survey, in giving the tests, and in compiling the results.



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## Chapter I

### Introduction

The practice of making educational surveys has become increasingly important in improving the efficiency of organization, administration, and teaching technique in numerous school systems. These surveys furnish a basis for future comparisons, for planning progressive changes, and for measuring the present efficiency of the systems and units. At the present time standardized tests are possibly the most indispensable instruments used in making surveys. With such tests it is possible to measure the progress and the results secured by the particular educational system, or even to measure the results secured by using some special method of teaching or organization. They furnish a valuable means for checking the work of the various teachers and students and the methods of teaching, etc. In other words, standardized tests are the most exact means of determining a very large number of important facts. A survey such as is described in the following report furnishes an excellent means of supervision for a county superintendent or some other school administrator. Superintendent C. Gaizer of Sidney, Montana, candidate for a Master's degree at the Washington State College, wrote a thesis, "Using Stanford Achievement Tests as a Means of Supervision".

This thesis is only one of many articles pointing out the importance of standardized tests and surveys as means of measuring and improving our educational systems.

Two previous surveys, one by Miss Leora Lapner in the rural schools of Gallatin county, and another by Mr. Howard Gray in Wheatland county, comprise the only two analytical and county-wide surveys which have been previously made in Montana. Very extensive surveys of the same type have been made in many cities and counties in the other states in the United States. They are considered indispensable<sup>a</sup> to efficient schools wherever they have been used.

The purpose of the survey which was made in the Judith Basin County Schools was five fold, namely: First, to compare the general educational facilities of the county with those of the other counties in the state of Montana; second, to determine by testing with an approved intelligence test, the intelligence ratings of the children in grades four to eight inclusive, and compare the ratings with those of the children of similar grades in other counties in Montana and in other parts of the United States; third, to determine by giving a battery of educational achievement tests the achievement ratings of the same children and make similar comparisons in the following fundamental subjects: Reading, Arithmetic, Spelling, Language and Grammar, Geography, Hy-

siology and Hygiene, History, and Literature; fourth, to compare the correlation of the pupils' scores in each subject with their chronological ages, with their mental age scores, and with their subject scores in the other subjects tested; fifth, to determine the correlation of each child's accomplishment in Arithmetic as shown by the Stanford Achievement Arithmetic tests with his accomplishment as measured by the Moody McCall Fixed Fundamentals, and to compare his achievement in Reading as measured by the Stanford Achievement Reading tests with his achievement as measured by the Haggerty Reading test.

The Haggerty Intelligence Test, Delta No. 2, was selected for use in this survey for two reasons: first, it is considered one of the most reliable group intelligence tests for the grades to be surveyed; second, the County Superintendent was willing to aid in the purchase of this particular intelligence test. The Stanford Achievement Tests, Form A, consisting of a battery of nine tests was selected for the achievement testing because they met in a very satisfactory manner criteria set up by Euck in his book, "The Improvement of Written Examination". Essentially the same criteria, although differently worded, are set up by other authorities on educational measurements as the fundamental factors to be considered in selecting educational tests. The criteria as given by Euck



(Chapter II, "Improvement of the Written Examination") are:

(1) Validity, by which is meant the degree to which a test or examination measures what it purports to measure. (2) Reliability, meaning the degree to which a test or examination measures what it really does measure, not necessarily what it purports to measure. (3) Objectivity, defined as the degree to which the personal element or judgment is eliminated in the scoring of the answers. (4) Ease of Administration and Scoring. (5) Standards or Norms, by which a pupil can be said to have been measured when he has been correctly spaced along a scale of merit in such a way that his relative achievement with respect to the other members of the group has been reliably portrayed. According to the judgments of educational authorities, the Stanford Achievement Tests fulfill in a very satisfactory manner every one of the above criteria in fact, in a better manner than any other battery of achievement tests at present on the market.

The tests were given in every school in the county in which grades four to eight inclusive were taught. The testing part of the survey was limited to these grades because it is more difficult to secure reliable results in the lower grades. As a matter of fact, the County Superintendent gave the Haggerty Intelligence Test, Delta No. 1, to the second and third grades, but the results secured were so

variable that they are not included in this report. The results used cover tests given to five hundred and sixty-eight students, in the forty-eight one-teacher rural schools, in the four two-teacher rural schools, and in the five town or third-class district schools in the county.

Mrs. Roll, the County Superintendent, visited the various schools and gave the intelligence tests personally. The achievement tests were given by the individual teachers under the guidance of the writer. In order to make the achievement test results more accurate and more readily compared, a definite day, January 15th, Wednesday of the mid-week of the school year, was set as the testing day throughout the entire county. Prior to the making of this survey, very little objective testing had ever been done by the teachers or anyone else in the county; consequently, it was necessary for the writer to do a rather large amount of educative and explanatory work by means of mimeographed bulletins which were sent out at intervals for some time before the day on which the achievement tests were to be given. The teachers responded very readily and cooperated in a heartening manner.

An educational publicity program concerning the purposes and the anticipated results of the survey was carried on through the two papers in the county. It is hoped to

prepare the parents as well as the teachers for the coming survey. In the newspaper articles and in the bulletins to the teachers, the survey element was emphasized, while the individual contest element was pushed as far into the background as possible. Thus the parents looked forward to obtaining a graphic account of how their child or children compared not to their neighbors' children but to other children in their same grade all over the United States. The teachers came to the testing day looking forward to finding out how each member of the class was doing as compared to other children in the nation. They looked for the tests to reveal the individual strengths and weaknesses of their pupils, etc. It was felt that better results would be secured if the day of testing was approached in the manner outlined above rather than approached from a personal contest standpoint. This was especially true since the teachers were to give the tests themselves and inaccuracies might easily develop in case the teacher thought his class was to be compared with the other classes in the county. After the survey was made the teachers' trust was not betrayed, since no one other than the writer, the County Superintendent, and two members of the State Department ever saw the results from a comparative standpoint.

In order to give the teachers confidence in their ability to give the tests satisfactorily, the following sen-

tence, taken from the opening paragraph of the manual of general directions for the Stanford Achievement Tests, was emphasized in the bulletins: "The Stanford Achievement Tests can be given satisfactorily by any intelligent teacher who is willing to follow the directions conscientiously and who is reasonably skillful in discipline."

All of the tests were returned to the writer and personally scored by him. After the tests were scored, a record of the results was made, the pupils' subject ages for each of the nine tests were calculated, and an individual profile chart was plotted showing the child's rank in each subject. These charts showed very graphically whether the child's score in each subject was above or below the standard for his grade, and to what extent it was above or below. Chart I shown on page 8 is a sample of one of these profile charts. This particular profile chart is that of an actual child and was selected at random. The following explanation and interpretation is given in order to show the amount and type of information furnished by one of the charts. The child, who happened to be a girl, was in the seventh grade in school. The Norm or Standard for her grade at the time of year when the tests were given is shown by the heavy blue line drawn horizontally across the page. The broken red line shows the pupil's scores and

## EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION

Test 1, Parag. Mean.	Test 2, Sent. Mean.	Test 3, Word Mean.	Read. total	Test 4, Arith. Comp.	Test 5, Arith. Reas.	Arith. total	Test 6, Na. St. & Sci.	Test 7, Hist. & Lit.	Test 8, Lang. Usage	Test 9, Dicta- tion	Total Score	Educa- tional Age	Chrono- logical Age	Grade*
-102	-75	-82	-259	-179	-132	-311	-86	-84	-54	-206	-100	-18-6		
-102	-75	-81	-258	-175	-132	-307	-85	-83	-53	-204	-99	-18-4		
-101	-74	-80	-255	-171	-131	-302	-85	-83	-53	-202	-98	-18-1		
-101	-74	-79	-254	-166	-131	-297	-84	-83	-52	-200	-97	-17-11		
-101	-73	-79	-253	-161	-130	-291	-84	-83	-51	-198	-96	-17-8		
-101	-73	-78	-252	-157	-130	-287	-83	-83	-50	-195	-95	-17-6		
-100	-72	-78	-250	-152	-130	-282	-82	-82	-50	-194	-94	-17-4		
-100	-72	-77	-249	-148	-129	-277	-82	-82	-49	-191	-93	-17-2		
-99	-71	-76	-246	-147	-127	-274	-81	-81	-48	-190	-92	-17-1		
-98	-70	-75	-243	-147	-124	-271	-80	-80	-47	-189	-91	-16-11		
-96	-70	-74	-240	-146	-122	-268	-80	-78	-47	-187	-90	-16-9		
-95	-69	-73	-237	-146	-119	-265	-79	-77	-46	-186	-89	-16-8		
-94	-68	-73	-235	-145	-117	-262	-78	-75	-45	-185	-88	-16-6		
-92	-67	-72	-231	-145	-114	-259	-78	-74	-45	-183	-87	-16-5		
-90	-67	-71	-228	-145	-112	-257	-77	-72	-44	-182	-86	-16-3		
-89	-66	-70	-225	-144	-110	-254	-77	-70	-43	-181	-85	-16-2		
-88	-65	-69	-222	-144	-107	-251	-76	-69	-43	-179	-84	-16-1		
-87	-65	-68	-220	-143	-105	-248	-75	-67	-42	-178	-83	-15-11		
-86	-64	-67	-217	-142	-104	-246	-74	-66	-41	-176	-82	-15-10		
-85	-63	-66	-214	-141	-103	-244	-73	-65	-40	-174	-81	-15-9		10.0
-84	-62	-65	-211	-140	-102	-242	-72	-63	-40	-172	-80	-15-7	-Adult	9.8
-83	-61	-64	-208	-139	-101	-240	-71	-62	-39	-170	-79	-15-6	-17-9	9.7
-83	-60	-63	-206	-138	-100	-238	-69	-61	-38	-168	-78	-15-4	-16-9	9.5
-82	-59	-62	-203	-137	-99	-236	-68	-60	-38	-165	-77	-15-2	-16-2	9.3
-81	-58	-61	-200	-136	-98	-234	-67	-59	-37	-163	-76	-15-1	-15-9	9.2
-81	-57	-60	-198	-134	-97	-231	-66	-58	-36	-161	-75	-14-11	-15-4	9.0
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-74	-52	-54	-180	-124	-86	-210	-59	-46	-31	-144	-67	-13-8	-13-8	8.0
-74	-51	-54	-179	-123	-84	-207	-58	-44	-31	-141	-66	-13-6	-13-6	7.9
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-71	-49	-51	-171	-118	-78	-196	-54	-39	-28	-132	-62	-13-0	-13-0	7.4
-70	-48	-51	-169	-117	-77	-194	-52	-38	-28	-129	-61	-12-11	-12-11	7.3
-70	-47	-50	-167	-117	-75	-192	-51	-37	-27	-126	-60	-12-9	-12-9	7.2
-69	-46	-49	-164	-116	-73	-189	-50	-36	-27	-124	-59	-12-8	-12-8	7.1
-68	-45	-49	-162	-115	-72	-187	-49	-35	-26	-121	-58	-12-8	-12-8	7.0
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-58	-37	-40	-135	-96	-56	-152	-34	-22	-20	-97	-46	-11-7	-11-7	5.7
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-39	-23	-23	-85	-65	-35	-100	-15	-9	-9	-63	-28	-10-1	-10-1	4.1
-38	-22	-22	-82	-63	-34	-97	-13	-8	-8	-62	-27	-10-0	-10-0	4.0
-36	-21	-21	-78	-62	-33	-95	-12	-7	-8	-60	-26	-9-11	-9-11	4.0
-35	-20	-20	-75	-60	-32	-92	-11	-6	-7	-59	-25	-9-10	-9-10	3.9
-34	-19	-19	-72	-59	-31	-90	-9	-5	-7	-57	-24	-9-8	-9-8	3.8
-32	-18	-18	-68	-57	-30	-87	-8	-5	-6	-56	-23	-9-7	-9-7	3.7
-31	-17	-17	-65	-56	-30	-86	-6	-4	-5	-54	-22	-9-6	-9-6	3.6
-30	-16	-16	-62	-54	-29	-83	-5	-3	-4	-53	-21	-9-5	-9-5	3.5
-28	-15	-15	-58	-53	-27	-80	-4	-3	-4	-51	-20	-9-4	-9-4	3.4
-27	-14	-14	-55	-50	-26	-76	-4	-3	-3	-49	-19	-9-2	-9-2	3.4
-25	-14	-13	-52	-47	-25	-72	-3	-2	-3	-48	-18	-9-1	-9-1	3.3
-24	-13	-12	-49	-45	-23	-68	-3	-2	-2	-46	-17	-9-0	-9-0	3.2
-22	-13	-12	-47	-42	-22	-64	-2	-1	-2	-44	-16	-8-11	-8-11	3.1
-21	-12	-11	-44	-40	-20	-60	-2	-1	-1	-42	-15	-8-10	-8-10	3.1

rankings in the different tests and subjects. Reading from left to right the chart shows that the student made a score of seventy-four in the Reading test on Paragraph Meaning. This score was four-tenths of a year above the Norm. The child's score on the Reading test for Sentence Meaning was quite poor, the score being thirty-eight, which was one and six-tenths years below the Standard. This shows that this particular child apparently needed more training in comprehending the meaning of sentences. The score on the Reading test for Word Meaning was fifty-six, which was seven-tenths of a year above the Norm. The total score for all the reading tests, as shown in column four, was one hundred and sixty-nine, which was three-tenths of a year below Norm. In column five the child's score on the Arithmetic Computation test is shown to have been one hundred and forty, which was two and two-tenths years above the Standard for her class. Her score on the Arithmetic Reasoning test was ninety-two, which, although not so high as her score on the Computation test, was still nine-tenths of a year above the Norm for the seventh grade at the time of year the test was given. Column seven shows the total Arithmetic score was two hundred and thirty-one, which was one and four-tenths of a year above Norm. Her score on Nature Study and Science was shown to be sixty-two, which was nine-tenths of a grade above the Standard. The

chart shows her score on the History and Literature test to have been forty-two, which was the normal score for her grade. Her score in Language Usage and Grammar was thirty-two, which was six-tenths of a grade above the Norm. The score on the Dictation or Spelling test was one hundred and thirty-seven, which was exactly normal for her grade. The child's total score divided by ten was sixty-seven, and, as the chart shows, a child who makes a score of sixty-seven has an Educational Age of thirteen years and eight months. The next to the last column shows the child's chronological or actual age at the time the test was given to have been thirteen years and two months. In other words the child was one month younger chronologically than the normal child in her grade. The chart shows her educational age to have been six months greater than her chronological age. The last column shows that on an average in all subjects the child was doing work which is four-tenths of a year above the standard for her class.

Educational profile charts similar to the one on page eight were made out for every child in the county and were returned to the child's teacher with the suggestion that, if the teacher desired, the charts could be sent home with the report cards. The teachers were very enthusiastic over the tests and especially over the profile charts. The above fact is mentioned here merely to show that the survey had a

much more important result than the securing of data for this report. In very few other cases where similar surveys have been made, have the results of the tests been returned to the teachers and children, especially in the form of educational profile charts.

The survey was complete in the sense that it covered every school in the county, and results far more valuable than obtaining material for this report developed from the survey. Some of these results have been previously mentioned, namely, that the teachers of the county secured practical experience in giving standardized tests, and that enthusiasm for a definitely organized and continuous testing movement was created throughout the county. There was also a vast amount of very valuable data collected and filed in the County Superintendent's office, to be used as a basis for future comparisons; and a number of much needed pupil adjustments were made in the schools of the county. In pointing out the diagnostic results of the survey, it might be well to mention that the pupil making the highest total or educational score in the tests was also the one who afterwards made the highest total score in the state eighth grade examinations.



## Chapter II

### Educational Facilities of Judith Basin County

The geographical make-up of a section, the nature of its population, and of its industries often very vitally affect the nature of its educational facilities. Because of the importance of such physical characteristics, the following facts are presented: Judith Basin County lies in the very center of Montana, it includes the major part of the valley from which it derives its name, namely the Judith Basin Valley. This valley is bounded on the south by the Little Belt Mountains, on the southeast by the Big Snowy Mountains, on the northeast by the Moccasin Mountains and the Judith Mountains, and on the northwest by the Highwood Mountains; consequently, the valley faces northward toward the Missouri River. The fact that the valley faces northward greatly shortens the growing season and therefore materially affects the type of agriculture. The valley is interspersed by numerous small valleys, rolling hills, and high benchlands. The geography of the country largely determines its industries, which are cattle and sheep raising in the hills and small valleys, dry land wheat farming on the benches, and mining in the mountainous sections. The minerals obtained vary

all the way from coal, lead, iron, zinc, silver, and gold, to precious jewels such as sapphires. The largest blue-sapphire mines in the world are located in this county. The major industry and the one supporting the largest population is dry land wheat farming. The farms are usually quite large, hence the population is rather widely scattered and there is a large number of rural and consolidated schools.

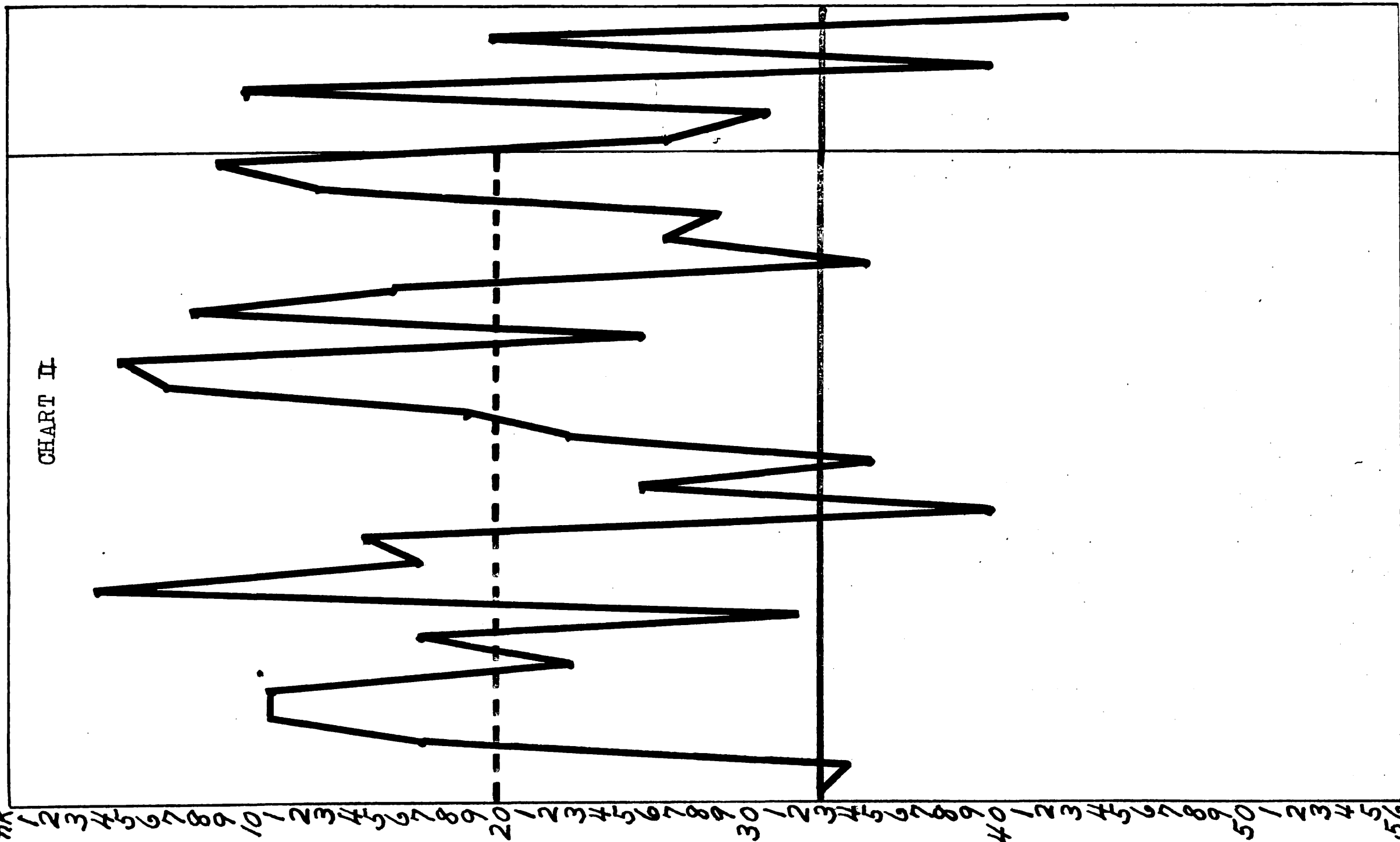
A comparison will first be made of the educational facilities of Judith Basin County as a whole with those of the other fifty-five counties in the State of Montana. Chart II, page 14, and Table I, page 15, will furnish the basis for comparison. The data for CHART II and TABLE I were secured from the Twentieth Biennial Report of the Superintendent of Public Instruction of Montana, published late in the year 1923. The data shown in Chart II and Table I is exactly the same except that in the chart it is shown in graphic form. There is a noticeable contrast in the ranking of Judith Basin County upon the various items. In some respects one cannot justly compare one county in Montana with another. Concerning this point, Rugg says:

"Cities to be used for comparative purposes could best be selected on the basis of at least four criteria: (1) They should be of roughly the same population. (2) They should have approximately the same wealth per inhabitant or school census child. (3) They should have somewhat the same geographical location in the country. (4) They should

# Judith Basin County Rankings

Rank

CHART II



- Apportionment from Equalization Fee
- Other froms of debts outstanding
- Amount of School Bonds outstanding
- No. of log School Houses
- No. of Teachers with only 1 yr. beyond H.S.
- No. of Schs. Maintained for five or less pupils
- Expenditures for Transportation of Elm. pupils
- Balance of money on hand from previous year
- Number of visits by County Superintendent
- Value of School Equipment
- Value of School Houses
- No. of Brick School Houses
- No. of High Schools
- No. of Elementary Schools
- Value of Library Books
- No. of Library books owned by Districts
- No. of Textbooks owned by Districts
- No. of College Graduate Teachers
- No. of two year Normal Graduates
- No. of Teaching Positions, Grades & H.S.
- No. of 8th grade Graduates
- Av. No. of days attendance per H.S. pupil
- Percentage H.S. Enrol. is of Grade Enrol.
- Per pupil Cost
- Length of School Term
- Valuation per teacher
- Number of Teachers
- County Apportionment per Census Child
- Taxable Valuation per Census Child
- Taxable Valuation
- School Census
- Enrollment

# JUDITH BASIN COUNTY RANKINGS

TABLE I

POINT RATED	RANK
1. Enrollment	53
2. School Census	34
3. Taxable Valuation	17
4. Taxable Valuation per Census Child	11
5. County Apportionment per Census Child	11
6. Number of Teachers	23
7. Valuation per Teacher	17
8. Length of School Term	32
9. Per pupil Cost	4
10. Percentage H. S. Enrol. is of Grade Enroll.	17
11. Average no. of days attendance per H.S. pupil	15
12. No. of Eighth Grade Graduates	40
13. No. of Teaching Positions, Grades & H.S.	26
14. No. of Two Year Normal Graduates	35
15. No. of College Graduates	24
16. No. of Textbooks owned by Districts	19
17. No. of Library Books owned by Districts	7
18. Value of Library Books	5
19. No. of Elementary Schools	26
20. No. of High Schools	8
21. No. of Brick School Houses	16
22. Value of School Houses	35
23. Value of School Equipment	27
24. Number of Visits by County Superintendent	29
25. Financial Balance on hand from previous yr.	12
26. Expenditures for transportation of pupils	9
27. No. of Schs. maintained for five or less pups.	27
28. No. of Teachers with only 1 yr. beyond H.S.	31
29. No. of Log School Houses	11
30. Amount of School Bonds outstanding	41
31. Amount of other forms of Debt outstanding	20
32. Apportionment from Equalization Fee	43

have roughly the same types of population from a racial and occupational standpoint." 1

Rugg's criteria were intended for comparisons between cities; nevertheless the same criteria should apply to comparisons between counties. But if an attempt is made to apply these criteria to inter-county comparisons in Montana, the attempt will unquestionably be a failure, because of the wide variation in the counties in the State upon the points which Rugg cites.

It is therefore necessary to select some other criteria or features upon which to base comparisons. A basic measure which is sometimes used for such purposes, is the total original enrollments of a county. For example as shown in Chart II, and Table I, Judith Basin County's ranking on the basis of total original enrollments in her public schools was thirty-third. Conceivably then, her other rankings should be somewhat the same, as for example, the number of teachers. Theoretically considered, the county ranking thirty-third in total enrollment should ordinarily rank thirty-third in the number of teachers in order to be furnishing its pupils the average educational facilities.

Using the total original enrollments as a basis for

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1. Rugg, "Public School Costs in St. Louis", p. 15.

comparison, a number of important comparisons follow: (1) In school census Judith Basin County ranked thirty-fourth. This slight variation from the ranking on the total original enrollments might be interpreted in at least three ways: (a) That the enrollment will show a decrease in a few years due to a smaller number of children entering the first grade each year. (b) That the county is drawing students from outside its borders or boundaries. (c) That the county census had not been accurately taken. The last interpretation seems to be the most feasible, because investigation showed a gradual although slow increase in the first grade enrollments each year and very few students coming into this county to go to school.

(2) In taxable valuation this county ranked seventeenth, which would go to show that it was financially able to give its children better than average educational facilities. It is possible that the assessment values were higher in this county, thus causing some difference in the taxable valuation. It is not likely, however, that the difference was great enough to have accounted for the great difference in ranking, since the assessment examiner of the State Equalization Board takes measures to prevent large differences in assessment rates.

(3) This county ranked even higher in Taxable Valuation Per Census Child than it did in taxable valuation alone. This

could have been due partly to the same chances for differences which were pointed out in the previous comparison. The rank of eleventh in taxable valuation per census child certainly shows that the county was financially able to do much more than the average county in Montana for the education of its children.

(4) It is rather a coincidence that the rank on the county apportionment per census child was the same as the rank of the taxable valuation per census child. This tends to show that the county was taxing itself up to its capacity for educational purposes, at least when compared with what the other counties in the state were doing.

(5) The fifth measure of comparison was the number of teachers employed, in this the rank was twenty-third, which was ten places higher than the rank according to enrollment. Of course this might mean more rural schools with small enrollment. But it does show an effort above the average to furnish the children with good educational facilities in the form of sufficient teachers.

(6) In taxable valuation per teacher, the rank was seventeenth or the same as the rank for taxable valuation in general. This was really a better measure of the county's ability to finance education than the valuation per census child, because the cost of keeping up a school, especially a small rural school, depends more upon the teacher's salary than upon the number of pupils.

(7) In length of school term the county's rank was thirty-second, one point higher than on enrollment. Presumably the county was not doing any more on the matter of school year than would be expected. The reason for this can be found in the fact that no school in the county held session for more than one hundred and eighty days, and that the most of the schools were rural schools and held school no longer than required by law.

(8) In per pupil cost the county's rank reached a high level, since it ranked fourth among all the counties in the state. If per pupil cost is used as one of the major criteria for determining educational facilities, as by Ayers<sup>2</sup> who some years ago compared Montana's educational ranking with that of the other states in the nation, the conclusion drawn would be that Judith Basin County had the fourth best system of schools in the state of Montana. But such a conclusion would certainly be false, since the reason for the high cost per pupil is to be found in the large number of rural schools maintained for a small number of students. High per pupil cost in such a case might be interpreted as showing a very poor educational system, a waste of school monies, and of the tax-payer's dollar. It might mean there should be more

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2. Ayers, Leonard P. -- Some Facts about the schools and their Teachers, (U. S. Bur. Edu. Bull.-1929) No. 29, pp. 13 - 18.



consolidated districts and an elimination of schools with small enrollments. This high per pupil cost, however, can be considered as showing that the county and the districts of the county were putting forth a determined effort to educate the children.

(9) The county was ranked seventeenth when one considers the percentage that the high school enrollment was of the elementary school enrollment. This meant that there was a decided tendency on the part of the pupils to remain in school longer in Judith Basin County than in the average county in Montana. It no doubt meant that high school education received more emphasis in this county than in the most of the others. It apparently means that the people of this county were financially able to keep their children in school longer than were the people in the average Montana county.

(10) The county ranked fifteenth in the average number of days attendance per high school pupil. This high rank shows that as a result of cooperation between the parents and the school officials of the county the average number of absences in the high schools was kept quite low.

(11) In number of eighth grade graduates, the ranking of the county in that it ranks fortieth, reached its lowest ebb. This was not due to actual conditions but to an error in the county superintendent's report to the state superintendent.

The writer suspected an error and by searching back through the county superintendent's reports found the error, but since only data taken from the state superintendent's biennial report is used, no correction is made in either Chart II or Table I. The county's actual rank when the error was corrected was thirty-second, or just on a par with what it would normally be expected to be.

(12) When ranked as to number of teachers in both the grades and the high school, the county stood twenty-sixth, showing that it was furnishing above the average number of teachers for the number of pupils who were enrolled.

(13) In the number of Two Year Normal Graduates employed in the elementary schools, Judith Basin County ranked thirty-fifth. A ranking of which the people of the county could not be proud.

(14) The apparently poor ranking shown under No. 12, however, can be explained somewhat by showing that the county ranked thirteenth in the number of college graduates employed. Thus, some of its elementary school teachers were college graduates, and therefore more advanced than normal graduates.

(15) Judith Basin County ranked nineteenth in number of textbooks owned by the districts. (16) The county ranked

seventh when the number of library books was considered. (17) And it ranked fifth when the value of library books was taken into consideration. These are interpreted as showing that this county furnished its pupils much more adequately with textbooks, supplementary texts, and library books, than did the average county in the state. This was a possible point for some pride on the part of Judith Basin County.

(18) In number of elementary schools maintained the county ranked twenty-sixth, again showing a determined effort to provide the children with educational facilities. Whether this was wise or not brings up the same question mentioned in #5 and #8. (19) This county's rank was still higher in the number of high schools maintained within her borders, her rank on this measure being eighth. This showed determined efforts to furnish the children with facilities for secondary education. Whether providing so many high schools was wise or unwise is a debatable question.

(20) This county ranked sixteenth in the number of brick school houses, showing that permanent structures had been built. (21) But in the value of all school houses the county's rank dropped below level, falling to thirty-fourth place. This may be accounted for by two observations: First, none of the school houses were of a superior type or very new. Second,

there were a number of very poor school houses in the out-lying districts. As a matter of fact, in a certain district one clerk estimated the value of the school house at 200, so the building certainly cannot have been a very elaborate or up-to-date structure.

(22) In value of school equipment the county's rank rose to twenty-seventh, showing that the pupils were furnished with slightly above average equipment as compared with what the other counties furnish.

(23) Judith Basin County ranks twenty-ninth, when the number of visits made by the county superintendent is considered. It is a question whether the number of visits made by the county superintendent can be considered a measure of the quality and degree of supervision which the schools of a county receive. But considering that it was a satisfactory measure of supervision this county's rank would not have been much above average. From personal observation the writer knows that the supervision in Judith Basin County had been above average when compared with other counties with which he was familiar.

(24) In the total financial balance, which the districts had on hand from the previous year, Judith Basin County ranked twelfth. This ranking showed that the financial conditions

of the districts in this county were far superior to that of the average county in Montana.

(25) The county ranked ninth in the expenditures for the transportation of elementary pupils. This shows that far more was expended than in the average county for the transportation of elementary school children at the expense of the school districts. This would seem to indicate that there were more than the average number of consolidated school districts in this county. An investigation, however, showed that there were only three consolidated districts in the county and very few large districts. The investigation did bring forth the fact that a large proportion of the money expended for transportation was used not for the transportation of elementary school pupils but for transporting high school pupils. This was, of course, illegal and an evasion of the law. :

(26) This county ranked twenty-seventh in the number of schools maintained for five or less pupils. On this point, Judith Basin County was doing about the same as most of the other counties were doing. Investigation showed that all of these schools were maintained in outlying mountainous districts which were far distant from any other schools. The ranking on this point shows a determined effort

of those districts to maintain schools for their children. From an educational standpoint, however, it is a question whether it would not have been wiser to have used the money to transport the children to a larger school rather than to maintain such small schools.

(27) Judith Basin County ranked thirty-first in the number of teachers with only one year of normal training beyond high school. On this point the ranking was about par, showing that the county was doing no more than the average county to give the children the benefit of teachers who had had superior training.

(28) In the number of log school houses, the county ranked eleventh, which was a poor ranking, because as a rule the log school house is a very poor, make-shift affair.

(29) In the amount of school bonds outstanding, Judith Basin County ranked forty-first, which was a superior ranking considering that it is an honor to rank low on this point.

(30) The rank of twentieth in the amount of other forms of debt outstanding was poor. This debt takes the form of registered warrants, outstanding bills, etc. Considering the fact shown in no. 21, that the county ranked twelfth in the financial balance of the districts on hand

from the previous year, it is certain that there was a wide variation in the financial condition of the various districts. Investigation showed that the districts which were furnishing transportation were the ones which had the greatest outstanding indebtedness.

(31) In amount of apportionments from the state equalization fee, Judith Basin County ranked forty-third. This ranking shows that there were very few districts in the county which found it necessary to levy more than twenty mills special district levy in order to support their schools. It further shows that very few of the districts were over taxing themselves to maintain their schools. Examination showed that the schools receiving apportionments from the equalization fee were those furnishing transportation for their students.

To summarize, in Chart I, the solid red line is drawn across the page from Judith Basin County's ranking (thirty-third) on original enrollments. This line furnishes a basis for comparing the other rankings. The dotted red line shows the average of the rankings on the first twenty-six points. The average rank of twentieth shows that Judith Basin County ranked very much above the average in the educational facilities which it offered its children. The average was not made

to include the last six items because in such things as bonded indebtedness, outstanding indebtedness, etc., it is an honor to rank low rather than high.

This completes the comparison of Judith Basin County with the other counties of the State; the next section of this chapter will be utilized for a comparison of the various school districts within the county. Table II, page 23, furnishes the basis for the following comparisons:

(1) The taxable valuation of the districts ranged from \$17,071. to \$1,013,396. It is safe to say that the district with the seventeen thousand taxable valuation would not be able to maintain a satisfactory school without overburdening itself, because even a fifty mill special district levy would yield only \$850. There is little doubt that the district should be consolidated with some bordering district.

(2) The total District Special Levies varied from zero mills to 24.8 mills. Examination showed that the district having the zero mills special levy was the one which did not operate or maintain a school at the present time. The 24.8 mills levy was in a small consolidated district, maintaining a high school and furnishing transportation for practically all of its students. It is interesting to note that this, the highest special district levy in Judith Basin



COMPARISON OF DISTRICTS WITHIN COUNTY

TABLE II

POINT COMPARED	RANGE
1. Taxable Valuation	\$1,013,396 to \$17,071
2. Total District Special Levy	24.3 M. to 0 M.
3. School Census	232 to 2
4. Elementary School Enrollment	152 to 0
5. High School Enrollment	85 to 23
6. Number of Days Taught	100 to 156
7. Percent of Attendance	97% to 85%
8. Number of cases of Tardiness	655 to 2
9. Number of Eight Grade Graduates	11 to 0
10. Number of Teachers	15 to 0
11. No. of Textbooks owned by Dis.	4,500 to 50
12. No. of Library Bks. owned by Dis.	2,500 to 10
13. Value of Library Books	\$3,600 to \$25
14. Number of Elementary Schools	3 to 0
15. Value of School Houses	\$73,000 to \$200
16. Value of School Equipment	\$11,500 to \$100
17. Bonds outstanding	\$27,000 to 0
18. Other forms of Debt outstanding	\$4,119 to 0
19. Number of Visits by Co. Supt.	5 to 1

County, is extremely low when compared with the levies in some of the other counties in the state. One district in a bordering county levies 58 mills in order to maintain its schools.

(3) The School census of the districts varied from two to 232. The school district with the school census of two is not maintaining a school at present.

(4) The elementary school enrollment ranged from 0 in a district not maintaining a school to 152.

(5) The high school enrollment ranged from 23 to 85. The high school having the enrollment of 23 is just across the border in Fergus county, but since the largest part of its school district is in this county, its records are handled in this county. There are five other high schools in this county.

(6) The number of days taught ranged from 156 to 180. Contrary to what one might at first think, both the highest and lowest number of days taught occurred in rural schools.

(7) The percentage of attendance ranged from 85 to 99 per cent. Even the lowest school, the one with the 85% attendance record, was not low when compared with the record of various other rural schools in the state.

(8) The number of cases of tardiness varied from two

to 655. A check showed that two schools, both in the same school district, and by coincidence, both having the same enrollment, varied greatly in the number of tardinesses: one reported only eleven tardinesses and the other 307. It is quite apparent that some radical factor must have determined the great difference. It is not likely that a difference in enforcement of punishment for tardiness by the two teachers would account for the entire difference. If strict enforcement could account for such a great difference, this incident would certainly prove the worth of strict measures to enforce the tardiness rule. It is much more likely that the difference was caused mainly by a laxity of reporting and recording tardinesses by the one teacher. It certainly offered a point which would have warranted an investigation by the County Superintendent.

(9) The number of eighth grade graduates varied from 0 to 11, showing that no school had a large class successfully completing the eighth grade and that a number of the rural schools had no one completing the work successfully.

(10) The number of teachers ranged from 0 to 15. The district employing no teacher was the one which maintained no school, while the one employing the fifteen teachers was a consolidated district.

(11) There was a range of from 50 to 4,500 in the

number of textbooks owned by the districts, and (12) the number of library books ranged from 10 to 2,500. It is a question how efficient any school would be, which owned only ten library books. (13) The value of the library books varied from \$25. to \$3,600.

(14) The number of elementary schools maintained ranged from 0 to 3, showing that districts which consolidate and yet maintain their rural elementary schools, are unpopular in this county.

(15) The value of the school houses ranged from \$200. to \$73,000. Investigation showed that the school house which was valued at only \$200. was a log one and not a fit place in which to hold any kind of school.

(16) The range in value of school equipment was from \$100 to \$11,500. The school whose equipment was valued at only \$100 was the one which had the school house valued at only \$200.

(17) The amount of bonds outstanding ranged from \$0 to \$27,000. Most of the districts were free from any bonded indebtedness. The district which had the bonded indebtedness of \$27,000 was the one which had the 24.3 Mills district special levy. This district bonded at one time for current expenses.

(18) The range in other forms of debt which was outstanding was from \$0 to \$4,119. The most of the districts had a small balance and were free from all forms of indebtedness.

The district with the outstanding indebtedness of \$4,119. was the same one which was pointed out in #2 and in #16.

(19) The number of visits by the County Superintendent varied from 1 to 5. Only two rural schools, because of special problems which arose in them, secured more than one visit. Naturally it was necessary for the County Superintendent to spend several days in each of the third class district schools.

Table III, page 33, shows the Enrollment by Schools. One school was maintained for but two students. There was very little excuse for the maintaining of this school as it meant a per pupil cost of over \$500. Two schools were operated, which had only four pupils enrolled, and one where only five were enrolled. Fifteen schools were maintained for from six to ten pupils, and fourteen schools for from eleven to twenty pupils. Three one-teacher rural schools, five two-teacher rural schools, one third class elementary school, and three 3rd Class District high schools were maintained for from 21 to 40 pupils. No one-teacher rural school had an enrollment of over forty. One two-teacher rural school, five 3rd Class elementary schools, and three district high schools had enrollments of over forty.

Table IV, page 33, shows that all the high school

## DEPARTMENT BY SCHOOLS

TABLE III

Number Enrolled	Rural One-Teacher	Rural Two-Teacher	3rd. Class Elem.	H. S.
1 pupil				
2 pupils	1			
3 "				
4 "	2			
5 "	1			
6 to 10	13			
11 to 20	14			
21 to 40	3	5	1	3
Over Forty		1	3	3

## SALARIES OF HIGH SCHOOL TEACHERS

TABLE IV

TRAINING	No.	Salary	No.	Salary
College Grads.	7	\$1,530	9	\$1,430

## SALARIES OF ELEMENTARY TEACHERS

TABLE V

TRAINING	No.	Salary	No.	Salary
College Graduates			1	\$1,215
3 yrs. of College	1	\$1,400	2	1,300
Normal Col. Grad.	3	1,200	23	1,123
1 yr. beyond H.S.	3	1,370	10	1,123
24 Ct. Credits beyond H.S.			11	1,010
12 Ct. Credits beyond H.S.			6	1,000
4 yrs. of H.S. only			2	1,000
4 yr. H. S. with Norm. Tr.			3	895
Total and Average	7	1,333	65	1,103

teachers were college graduates. It shows that there were seven men (exclusive of the principals) teaching in the high schools and that their average salary was \$1,530. There were nine women teachers in the high schools of the county and their average salary was \$1,420. Thus the men secured a salary nine percent (9%) greater than the women in similar positions.

Table V, page 33, shows the average salaries for the elementary school teachers. It shows the number of men and of women with given amounts of training and the average salary for the group with that amount of training. The men teaching in the elementary schools had a much narrower range of training than did the women. The average salary for the seven men teaching in the elementary schools was \$1,333, while the average salary for the sixty-five women was \$1,069. This shows that the average man teaching in the elementary schools of Judith Basin County secured a salary nineteen percent (19%) more than the average woman in the same positions.

Table VI, page 35, shows that the salary ranges with the average salary for each type of position. It also shows

SALARY RANGES  
TABLE VI

POSITION	No.	SALARY RANGE	AV. RATE
Principals 3rd Class Dis.	5	\$2100 to \$2700	\$2500
Smith Hughes Instructors	1	2100	2100
High School Teachers	20	1100 to 1600	1425
Elementary Teachers 3rd.	22	1100 to 1550	1250
Elem. Two-teacher Rural	12	900 to 1400	1150
Elem. One-teacher Rural	36	800 to 1300	1050

SALARY SCHEDULE  
TABLE VII

NUMBER OF TEACHERS RECEIVING			RURAL ONE TEACHER	RURAL TWO TEACHER	3rd. CLASS	
FROM	TO				Elem.	H.S.
\$ 801	to \$ 900		12			
901	1000		4	1		
1001	1100		10	1		
1101	1200		9	4	6	2
1201	1300		1	5	9	
1301	1400			1	5	10
1401	1500				1	2
1501	1600				1	4
1601	1700					
Over	\$1700					2
TOTALS			36	12	22	20

NUMBER OF YEARS WITHOUT PROFESSIONAL TRAINING  
TABLE VIII

WITHOUT PROFESSIONAL TRAINING WITHIN	RURAL ONE TEACHER	RURAL TWO TEACHER	3rd. CLASS Elem.
6 years	3	2	1
11 "	1		
15 "	2		
26 "	1		



the number employed in each type of position. This table shows a gradual decline in salary corresponding to the decline in position. The average salary for the high school teachers in the county was \$175.00 greater than that of the elementary teachers in the 3rd Class Districts. The average salary of the teacher in the two-teacher rural school was \$100.00 less than that of the average elementary school teacher in the 3rd Class districts, and the teacher in the one-teacher rural school received on an average one-hundred dollars less than the teacher in the two-teacher rural school.

Table VII, page 35, shows a salary schedule with the distribution of salaries (not including Principals) in the various types of schools. It is interesting to note that one teacher in a 3rd Class Elementary school secured a salary of over \$1500, while two high school teachers received salaries of \$1200 or less.

Table VIII, page 35, shows the number of years which teachers in the various types of schools, had gone without professional training. There were three teachers of one-teacher rural schools, two teachers of two-teacher rural

schools, and one teacher of a 3rd Class elementary school who had not had any professional training in six years.

There was one teacher of a one-teacher rural school who had not had any professional training in eleven years; also there were two in the same type of school who had had none for fifteen years, and one who had had none for twenty-six years.

### Summary And Conclusions

In the first section of this chapter, facts were offered showing that while on original enrollments in its schools Judith Basin County ranked 33rd among the fifty-six counties in the state, it ranked seventeenth on total taxable valuation, eleventh on taxable valuation per census child, eleventh on county apportionment per census child, seventeenth on taxable valuation per teacher, and fourth on per pupil cost. These points all show that this county was financially able to do more than the average county to provide satisfactory educational facilities for its children. The high county apportionment per census child and the very high per pupil cost show that the county was not only able to spend more per child for its schools, than was the average county, but that the county was actually spending it.

The rank of 23rd in number of teachers again shows that Judith Basin County is doing more than the average county to provide educational facilities for its children.

The rank of 17th in percentage that the high school enrollment is of the elementary school enrollment shows the strong determination of the parents that their children shall have not only a grade school education but a high school educa-

tion as well.

The high rank of 15th in the average number of days attendance per high school pupil again shows that the people of the county are doing much better than the average group to give the pupils a chance to do their best educationally.

The rankings of 26th in number of elementary schools and eighth in number of high schools point out still further the determination of the people of the county to give their children a good education, especially a secondary education.

The ranks of 19th in number of textbooks owned by the districts, seventh in the number of library books, and fifth in the value of library books show that the county is furnishing far more educational materials than the average county of this type.

The rank of 16th in number of brick school houses shows the tendency of the people of Judith Basin County to provide permanent structures as a part of their educational facilities.

The rank of 12th in financial balance shows that on an average the districts of the county are keeping within their income to a far greater extent than do the districts of the average county of the state.

The rank of ninth in expenditures for transportation shows a determined effort to eliminate the small rural schools and thus give the children the advantages of the larger consolidated school.

The rank of 41st in amount of bonds outstanding, speaks well for the financial condition of the districts in the county.

The rank of 43rd in amount of apportionments from the state equalization fee shows that, in spite of the large expenditures in the county for education, the districts are having, nevertheless, to draw upon the state fund for very little aid.

To conclude, the average rank of 20th on all of the twenty-six important points enumerated, shows that Judith Basin County ranks very much above the average in the educational facilities which it offers its children.

The next division of the chapter or section brought out a number of important comparisons concerning the various districts within the county. One of the points brought out was that several of the districts have such low taxable valuations that they should not be allowed to maintain a school, but should be encouraged to consolidate with some adjoining district.

The highest district special levy of 24.3 mills was not high when the high levies in some of the other counties in the state are considered.

The very wide variation in the number of tardinesses demanded an investigation and regulation by the County Superintendent.

The very wide variation in number of textbooks owned, in number of library books, in value of school equipment, and in value of school buildings further helped to prove that a number of the smaller districts should be entirely dispensed with.

The fact that four schools were maintained for from two to five students shows again the need of closing the very small schools and transporting the pupils.

A comparison of the salaries paid the teachers shows that the average man teaching in the elementary schools secured a salary 19% higher than the average woman in the same position. It also shows that the average salary of a teacher in a two-teacher rural school was \$100 less than that of the average elementary school teacher in a 3rd class district, and that the teacher in the one-teacher rural school received on an average \$100 less per year than the teacher in the two-teacher rural school.

A comparison of the high school and grade school salaries

shows that one lady elementary school teacher was getting \$300 a year more than two high school teachers.

An inspection of the professional training of the teachers of the county shows that one teacher had not had any professional training in twenty-six years, and that a number of other teachers were most certainly in need of some such training.

### Chapter III

#### Intelligence Testing

The test used in the intelligence survey of the pupils in grades four, five, six, seven, and eight was the Haggerty Intelligence Test, Delta #2. In Judith Basin County, Montana, this test was given to every child who was enrolled in the grades listed above. The actual giving of the tests was handled personally by Mrs. Maybird Beaman Roll, the County Superintendent, during visits which she made to each school in the county. It was felt that more reliable results could be secured by having the County Superintendent give the tests, rather than have the teachers do that part of the work.

Hines says of CHRONOLOGICAL AGES, in his chapter on "Measurements of Intelligence", "Before the testing of a group of school pupils is undertaken, it will in most cases be best to make an age-grade-distribution table of the children."<sup>3</sup> With the above statement in mind, an age-grade-distribution table similar to the one on page 45 was compiled. Table IX, page 45, shows the distribution of the

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3. Hines, "A Guide to Educational Measurements", p. 51.



chronological ages by grades, by sexes, and by ages, of all of the students enrolled in grades one to twelve inclusive of the Judith Basin County schools. According to the Montana State Superintendent of Public Instruction,<sup>4</sup> Corning,<sup>5</sup> and others, ages six and seven are considered normal for grade one, and ages seven and eight for grade two, and so on up through the twelve grades. The red lines in Table IX inclose those who fell in the normal group for each grade. Those above the red lines were in every case chronologically underage for their grade, and those below the lower red line were chronologically over-age for their grade. For example, in grade four there were four boys and five girls who were one year younger than the normal group for their grade. There was one girl in the same grade who was two years younger than normal. There were five boys and five girls who were one year over-age in the same grade. There were also two boys and one girl who were two years over-age. And there was one boy in the fourth grade, also, who was three years over-age for his grade. The greatest variation from normal occurred in the seventh grade, where there were two boys who were four years over-age.

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4. Twentieth Biennial Report of Supt. of Pub. Inst., p. 42.  
5. Corning, "After Testing, what?", p. 37.

CHRONOLOGICAL AGES  
DISTRIBUTION BY GRADES & AGES

TABLE 9

GRADE	I		II		III		IV		V		VI		VII		VIII		IX		X		XI		XII	
AGE	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
5	5	3																						
6	56	63	2	12																				
7	14	10	16	31	13	16		1																
8	1	1	13	12	19	25	4	5																
9			3		20	17	36	37	14	14														
10					9	3	23	15	50	25	14	22	1	3										
11					1		5	5	22	22	27	29	9	5	3	3								
12							2	1	3	6	14	10	21	22	12	19		2						
13							1		2	6	2	2	12	11	30	21	3	7		1				
14									1		5	2	11	9	13	14	19	21	6	9		2		
15												2	2	4	7	5	9	13	13	19	2	4	1	
16													1		4		8	5	7	9	15	13	4	6
17													2				2	3	6	3	4	10	9	13
18																	1	3			4	4	4	7
19																					3	1	4	1
20																							2	
TOTALS	76	77	64	53	32	61	72	64	77	73	62	67	53	64	63	62	41	52	35	41	22	24	24	27

CHRONOLOGICAL OVERAGE TABLE  
TABLE X

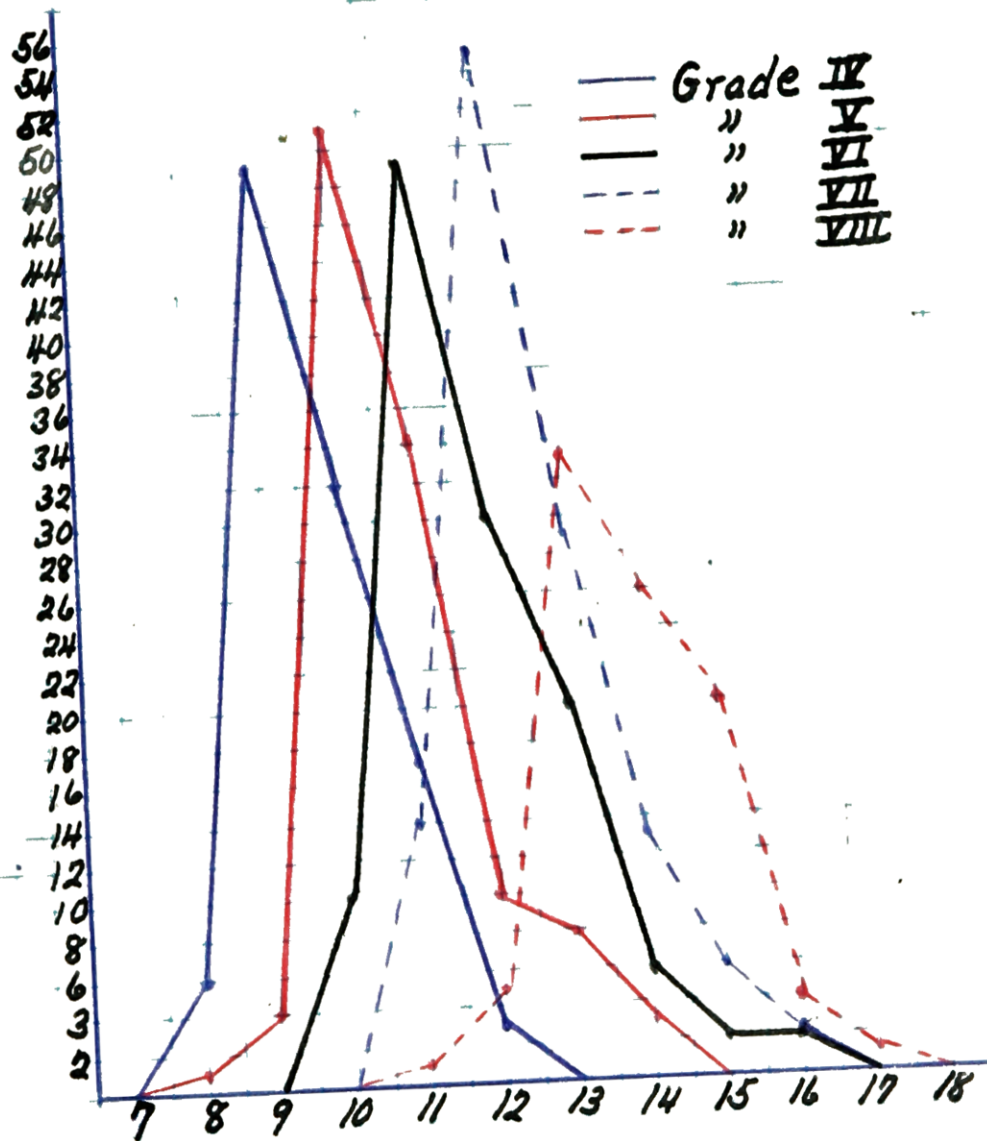
GRADE	BOYS				GIRLS				TOTAL	
	JUD. BAS. CO. No.	Percent	STATE YEL. CO. Perc.	Percent	J.B.CO. No.	State Y. CO. %	Per.	Percent	No.	%
1	1	1%	8.1%		1	1%	5.6%		2	1%
2	3	5	12.7		0	0	8.4		3	2
3	10	12	18.7		3	5	12.1		13	9
4	8	11	20.7	34%	6	10	13.3	20%	14	10
5	11	14	23.8	42	12	17	16.1	31	23	15
6	7	11	24.5	26	6	9	19.2	46	13	10
7	16	27	27.3	54	13	20	20.0	40	29	24
8	11	16	26.3	59	5	8	20.3	50	16	12
9	10	24	23.1	25	9	17	20.0	53	19	20
10	9	26	22.1	52	3	7	13.3	29	12	17
11	7	25	24.9	48	5	15	16.2	33	12	20
12	6	25	23.5	33	1	4	14.6	23	7	14
TOTAL	99	14.3%	20.2%		64	9.4	14.7		163	11.9

CHRONOLOGICAL UNDERAGE TABLE  
TABLE XI

GRADE	BOYS				GIRLS				TOTAL	
	JUD. B. CO. No.	%	ST. YEL. C. Percent	%	J. B. Co. No.	%	St. Y. Co. Per.	%	No.	Percent
1	5	7%	7%		3	4%	7%		8	6%
2	2	3	11		12	21	13		14	11
3	13	11	12		16	26	17		29	21
4	4	6	12	7%	6	9	18	6%	10	7
5	14	20	15	12	14	20	18	29	28	20
6	14	23	15	10	22	32	20	26	36	23
7	10	17	14	18	8	13	19	27	13	15
8	15	22	15	18	22	36	20	32	37	30
9	3	7	15	25	9	18	18	15	12	13
10	6	17	16	17	10	24	19	32	16	21
11	2	7	16	23	6	13	21	23	8	13
12	5	21	16	23	6	16	21	16	11	18
TOTAL	93	12.9%	12.8%		134	19.9%	15.8%		227	16.6%

# OVERLAPPING OF CHRONOLOGICAL AGES

CHART 111



The greatest range in ages occurred in the seventh grade, where there was a range of from 10 years six months to seventeen years four months, a total range of six years and ten months. This range, however bad it may have been, was not more than half as great as the ranges reported in some of the grades by the State Superintendent.<sup>6</sup> She points out that in a number of grades there was a range of over thirteen years in the chronological ages of the pupils enrolled in those grades.

Table X, page 46, is a Chronological Over-age Table, which shows the number and percentage of Judith Basin County boys who were overage in each grade, as compared to the percentage who were overage in the State and in Yellowstone County. The same comparisons are made for the girls and for the total of both boys and girls. The data for the State was secured from table #19, page 44, of the State Superintendent's Twentieth Biennial Report, and the data for Yellowstone County (which county borders Judith Basin County on the south) was secured from a Thesis prepared by Mr. Howard Gray entitled, "An Educational Survey of Yellowstone County."

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6. Twentieth Biennial Report of State Supt. of Pub. Inst.,  
p. 43.

Table X shows the percentage of overage boys to have been smaller in every grade from grade one to eight, inclusive, in Judith Basin County than it was in the State of Montana as a whole. The difference in percentage was greatest in the eighth grades where only sixteen percent of the Judith Basin County boys were overage as contrasted to twenty-six percent in the state at large. It is worthy of notice that the largest percent of overage boys, twenty-seven percent, occurred in the seventh grade. This was eleven percent higher than in any of the other first eight grades. This was due to the fact that students who were not able to keep up with their grade were retained in the seventh grade rather than allowed to accumulate in the eighth grade as is usually the case. There was a very wide difference in the percentage of over-age boys in Judith Basin County as compared to percentage in Yellowstone County. This was especially true in the eighth grade where there were forty-three percent more overage boys in Yellowstone County. In every grade in the high schools, Judith Basin County had a slightly larger percentage of overage boys than the State in general. This was probably due to a rather large number of farm boys who had to be absent frequently to do farm work and consequently required more than four years

to complete their high school course.

The comparison between the overage girls in Judith Basin County and those in the State as a whole was about the same as for the boys. The highest percent of overage girls in Judith Basin County occurred as with the boys in the seventh grade. There was a difference of twelve percent between the overage girls in the County and those in the State. As with the boys, Yellowstone County reached in the eighth grade its highest percentage of overage girls in the grades in which grade it was forty-two percent higher than in Judith Basin County. The percentage of overage high school girls in the County differed from the percentage of overage boys in that, in the high school grades, it was much lower than average for the state.

Considering the totals, it is apparent that the greatest percentage of over-ageness in the Judith Basin County schools occurred in the seventh grade. The average for all grades of the schools in the County was eleven and nine-tenths percent while for the state it was seventeen and five-tenths percent. The average total for the boys of all grades in the County was fourteen and three-tenths percent while that for the State was five and nine-tenths percent higher. The average total for all of the girls

in Judith Basin County was nine and four-tenths over-age as compared to fourteen and seven-tenths for the girls in the State, thus showing a difference of five and six-tenths percent in favor of the Judith Basin County girls.

Table XI, page 46, is a Chronological Under-age Table. The sources for the data shown in this table are the same as for Table X. The percentages of boys in Judith Basin who were chronologically under-age for their grade varied considerably from grade to grade. The smallest percentage of boys in the County who were under-age chronologically for their grade occurred in the second grade where three percent were under-age. The highest percentage of boys who were under the normal chronological age for their grade is shown to be in the sixth grade, in which grade it reached the high mark of twenty-three percent, almost one-fourth of those enrolled in that grade.

The average percentage for all the boys in the state shows a gradual rise in under-ageness from the first to the twelfth grade. The only reversal in the progressive series occurred in the seventh grade where it dropped fifteen percent to fourteen percent, which was not a very great drop and is not of much importance. The percentages of under-age boys in Yellowstone County shows quite a few variations



as would be expected of a small group, but they were slightly higher in most grades than those for Judith Basin County. Thus the Yellowstone County boys lead in percentages of under-age pupils as well as in the percentages of over-age boys. This is a rather singular coincidence and cannot be readily explained. It is worthy of note that in the eleventh grade where the Judith Basin County boys were at one of their lowest percentage marks, seven percent, the Yellowstone County boys were at their highest percentage, namely twenty-eight percent. The average percentage of under-ageness of all boys in Judith Basin County was twelve and nine-tenths percent while the average for all of the boys in the State was twelve and eight-tenths percent. Thus the two were what one might call practically equal. With the percentage of over-ageness among the Judith Basin County boys shown to have been six percent less than the average for the State it would seem natural to expect the percentage of under-ageness among the boys in the County to have been larger than the average for the State. The most plausible interpretation of this would be that the educational authorities of the County did not favor advancing every child just because he showed ability to do the work of a higher grade than the one in which he was located.

The percentages of under-ageness among the girls in the

County varied a great deal in the different grades but they were uniformly higher than those for the boys. The percentage of under-ageness for the girls reached its highest level in the eighth grade, where thirty-six percent, over one-third, were younger than the norm for their grade. The greatest variation in the percentages for the various grades occurred in the drop from twenty-six percent for the third grade to nine percent for the fourth grade girls.

The rise in the percentages of under-ageness for the girls throughout the state as a whole was by no means as uniform as it was among the boys. In the most cases, however, the percentages for the girls of the County were higher than those for the State. The total percentage of under-ageness for the girls of the County was two and nine-tenths percent greater than the average for the State. The girls of Yellowstone County showed a slightly higher percentage of under-ageness in most grades than was shown by the Judith Basin County girls.

The percentages of under-ageness for the totals of both boys and girls in Judith Basin County ranged all the way from six percent in the first grade to thirty percent in the eighth grade. The trend represents a more or less gradual increase from the first grade to the eighth, with the exception of the

fourth grade which dropped from the twenty-one percent for the third grade to seven percent. Investigation failed to show any satisfactory reason for this sudden and extensive drop. The average percentage of under-ageness of the high school students in the county was four percent lower than that for the state as a whole. This low percentage of under-ageness was not caused by the boys alone, since both the girls and the boys had a percentage which was lower than the state average for their group. Taking all grades, one to twelve inclusive, and both sexes, the county's average was sixteen and six-tenths percent while the average for the state was only fourteen and eight-tenths percent.

Grouped with the histograms in Chapter III, showing the results of the achievement tests in graphic form, are chronological age charts for each grade. Those chronological age histograms are given there in order to form a basis for comparison for the achievement test results. They are mentioned at this point because they show in graphic form the rather wide range of chronological ages found in each grade in the county.

Chart III, page 47, shows the overlapping of chronological ages which occurred from grade to grade. Such charts or

graphs are used a great deal in this report because they display a large number of important comparisons in a very effective manner. It is interesting to note that there were some students in the fourth grade in the Judith Basin County schools, who were older than some students in the eighth grade. It is also worthy of note that the range of chronological ages grew larger as the observer advanced from the fourth grade to the eighth. By comparing this chart with Chart IV, page 57, which shows the overlapping of mental ages, it becomes very apparent that although the overlapping of chronological ages was great, it was not nearly as great as the overlapping of mental ages.

#### MENTAL AGES

Table XII, page 56, is a Mental Age-Grade Table and shows the distribution of the mental ages of the pupils in Judith Basin County who were enrolled in grades four to eight inclusive. The distribution is shown by grades and by sexes. The groups enclosed between the red lines were the so-called normal groups. Thus the normal group for grade four were those enrolled in that grade who had mental ages of nine or ten. The ages given for the normal groups in this table are the same as those which authorities agree upon for chronological ages. The limits for the normal groups as used in this table are the same as those which were used in the Chronological Age-Grade Distribution Table on page 45.

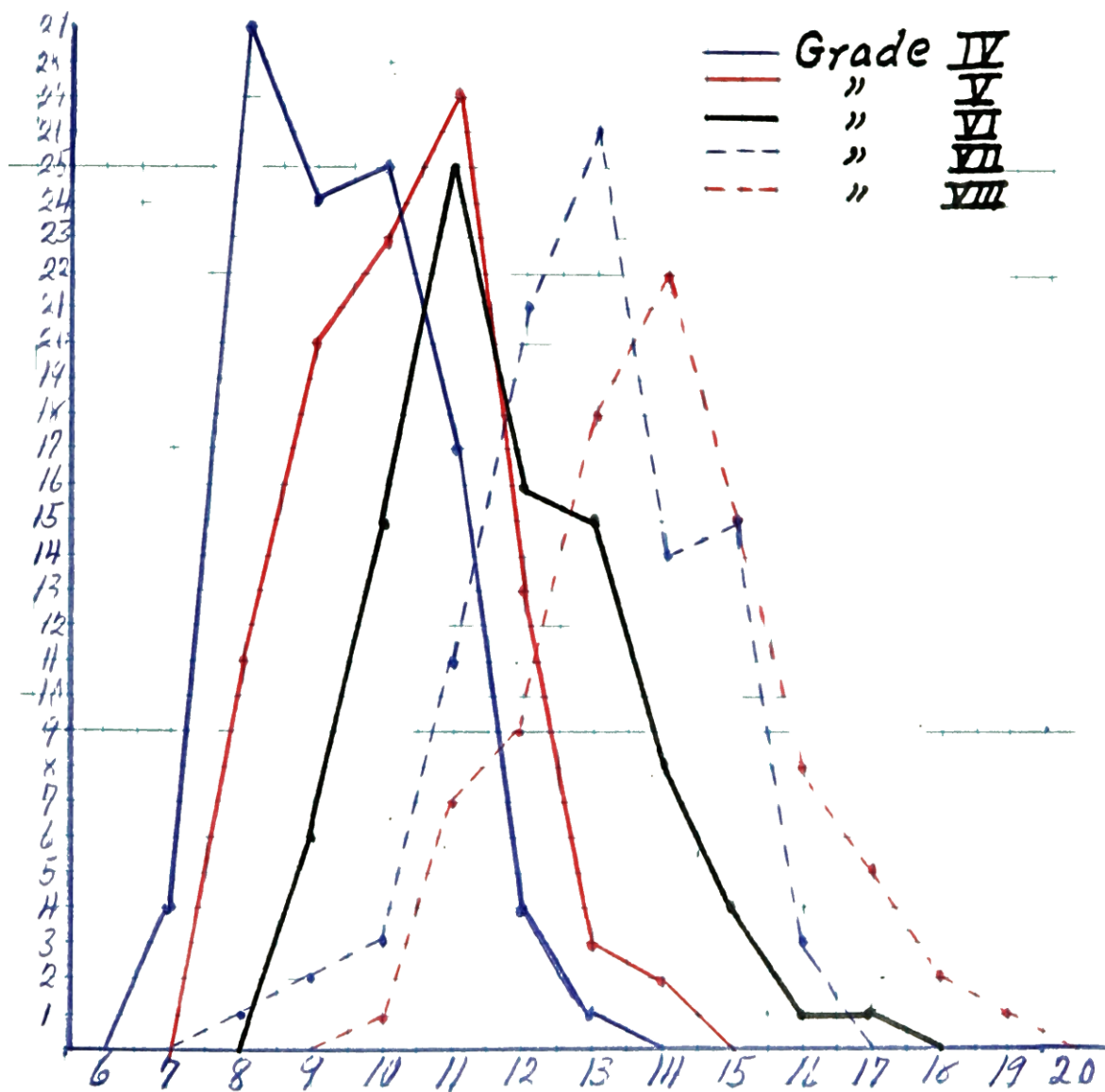
# MENTAL AGE-GRADE TABLE

TABLE 12

GRADE	IV		V		VI		VII		VIII	
AGE	B	G	B	G	B	G	B	G	B	G
7	2	2								
8	19	10	4	7			1			
9	10	14	9	10	3	3	2	1		
10	12	12	13	10	8	7	1	3	1	
11	8	10	19	10	10	12	5	5	5	1
12	5	1	8	5	6	8	12	7	3	4
13	1		2	3	3	12	13	12	8	11
14			2	1	3	3	4	10	11	11
15					2	2	4	8	5	8
16							1	2	4	4
17					1				2	2
18										2
19									1	
TOTALS										
	55	49	57	46	36	47	43	48	40	43

# OVERLAPPING OF MENTAL AGES

CHART IV



MENTAL UNDERAGE TABLE  
TABLE 13

GRADE	BOYS		GIRLS		TOTAL	
	No.	Percent	No.	Percent	No.	Percent
IV	21	39%	12	24%	33	32%
V	13	23%	17	37%	30	30%
VI	11	31%	10	21%	21	25%
VII	9	21%	9	18%	18	20%
VIII	9	23%	5	12%	14	17%
TOTAL	63	27.7%	53	22.8%	116	25.4%

MENTAL OVERAGE TABLE  
TABLE 14

GRADE	BOYS		GIRLS		TOTAL	
	No.	Percent	No.	Percent	No.	Percent
IV	12	22%	11	22%	23	22%
V	10	17%	9	19%	19	18%
VI	9	25%	17	36%	26	31%
VII	9	21%	20	42%	29	32%
VIII	12	30%	16	37%	28	34%
TOTAL	52	22.7%	73	31.3%	125	27.7%

This mental age-grade table makes it very apparent that there was a much wider distribution or scattering of mental ages than there was of chronological ages. The widest range occurred in the eighth grade among the boys where there was a variation of nine years in mental age. Such a wide range within one grade was certainly enough to warrant investigation and adjustment. In two other cases, first among the boys of grade six, and second among the boys of grade seven, there was a range of eight years or over. In all groups, excepting the fourth grade girls, there was a range of six years or more. All of the extreme cases causing these wide variations should have been examined and adjustments made wherever possible. An individual intelligence test should have been given to every one of the extreme cases. The Terman Revision of the Binet-Simon tests would have been excellent for this purpose, but such tests should only be given by an experienced examiner. Such an individual test would have served as a check on the group test and at the same time would probably have thrown more light upon the individual case. All of the cases shown in the table which were above the top red line were mentally under-age for their grade, and were a retarding factor upon the accomplishments of the classes in which they were enrolled. In other words, these



students were beyond their depth, and could hardly be expected to understand, let alone, to accomplish, the work for their grade. All of the children represented by the numbers shown below the lower red line were over-age mentally for their grade. Mentally these students represented the cream of their classes and in most cases they should have been given a quantity and a quality of work which would have caused them to work at their maximum of efficiency.

Chart IV, page 57, shows the overlapping of mental ages for the grades four to eight inclusive. It is rather appalling that there was one student in the eight grade who was over three years younger mentally than one student who was only in the fourth grade. In all there were seventeen pupils in the eighth grade who were younger mentally than one student in the fourth grade. Such situations certainly suggest the need of investigation and adjustments of some kind. The higher the grade the wider became the range of mental ages until in the eighth grade there was a range or variation of over nine years.

Table 13, page 58, is a Mental Under-Age Table and shows the percent of boys, and of girls, and both boys and girls who

were mentally under-age in each grade. These were the students who were mentioned before as being beyond their depth mentally. The table displays a fact which is scarcely conceivable, namely, that thirty-nine percent, almost one-half of all of the boys enrolled in the fourth grades in the Judith Basin County schools, were under-age mentally. And what was virtually as bad, was that thirty-seven percent of the girls in the fifth grades of the county were under-age mentally. About five percent more of the boys were under-age than of the girls, since twenty-seven and seven-tenths percent of the boys fell below the normal mental age for their grade, while only twenty-two and eight-tenths percent of the girls fell below the normal group.

In the total of both boys and girls, there was a gradual decrease in the percentage of under-ageness. The percentage having fallen from thirty-two percent in the fourth grade to only seventeen percent in the eighth grade. The above fact would tend to show that the students secured better adjustments to the work of their grade as they passed to the higher grades. The total for both the boys and girls in all five grades was twenty-five and four-tenths percent under-age. This means that one-fourth of all the pupils in grades four to eight inclusive of the Judith Basin County schools were mental-

ly under-age--certainly a bad situation.

Table 14, page 58, is a Mental Over-age Table, and it shows the percentages of boys and girls who were above the normal mental age for their grade. The greatest percentage of boys who were mentally over-age occurs in the eighth grade, and was thirty percent or almost one-third of the number of boys enrolled in the eighth grades of the county. The girls reached a much higher percentage of mental over-ageness than the boys in grades six, seven, and eight. The percentage of over-ageness for the girls reached its highest point in the seventh grade where forty-two percent of the girls are shown to have had a mental age which was higher than the normal for their grade. Only twenty-one percent of the boys in the seventh grade were over-age mentally. Thus, there were twice as many girls as boys in the seventh grade who were over-age mentally.

The total percentage of over-ageness for all the boys in the county in the five grades tested was twenty-two and seven-tenths percent as compared to thirty-one and three-tenths percent for the girls. Thus, there were eight and six-tenths percent more of the girls in Judith Basin County who were mentally over-age than there were of the boys. The totals for both the boys and girls show a rather gradual

rise in percentages from the fourth grade to the eighth grade in which grade thirty-four percent of all the boys and girls enrolled were over-age mentally. The total percentage of mentally over-age boys and girls in grades four to eight inclusive in Judith Basin County was twenty-seven and seven-tenths percent. In other words, a little over one-fourth of the pupils enrolled in grades four to eight, inclusive, of the schools in the county were over-age mentally. This large percentage of mentally over-age as well as the very large percentage of mentally under-age pupils suggests the urgent need of adjustments.

#### INTELLIGENCE QUOTIENTS

Chart V, page 65, shows the distribution of Intelligence Quotients for all the boys and girls enrolled in grades four to eight inclusive of the Judith Basin County schools. The classifications given are the same as those given by Terman.<sup>7</sup> The following is Terman's table of classification according to Intelligence Quotients:

I.Q.	Classification
Above 140	Near genius or genius.
120 - 140	Very superior intelligence.

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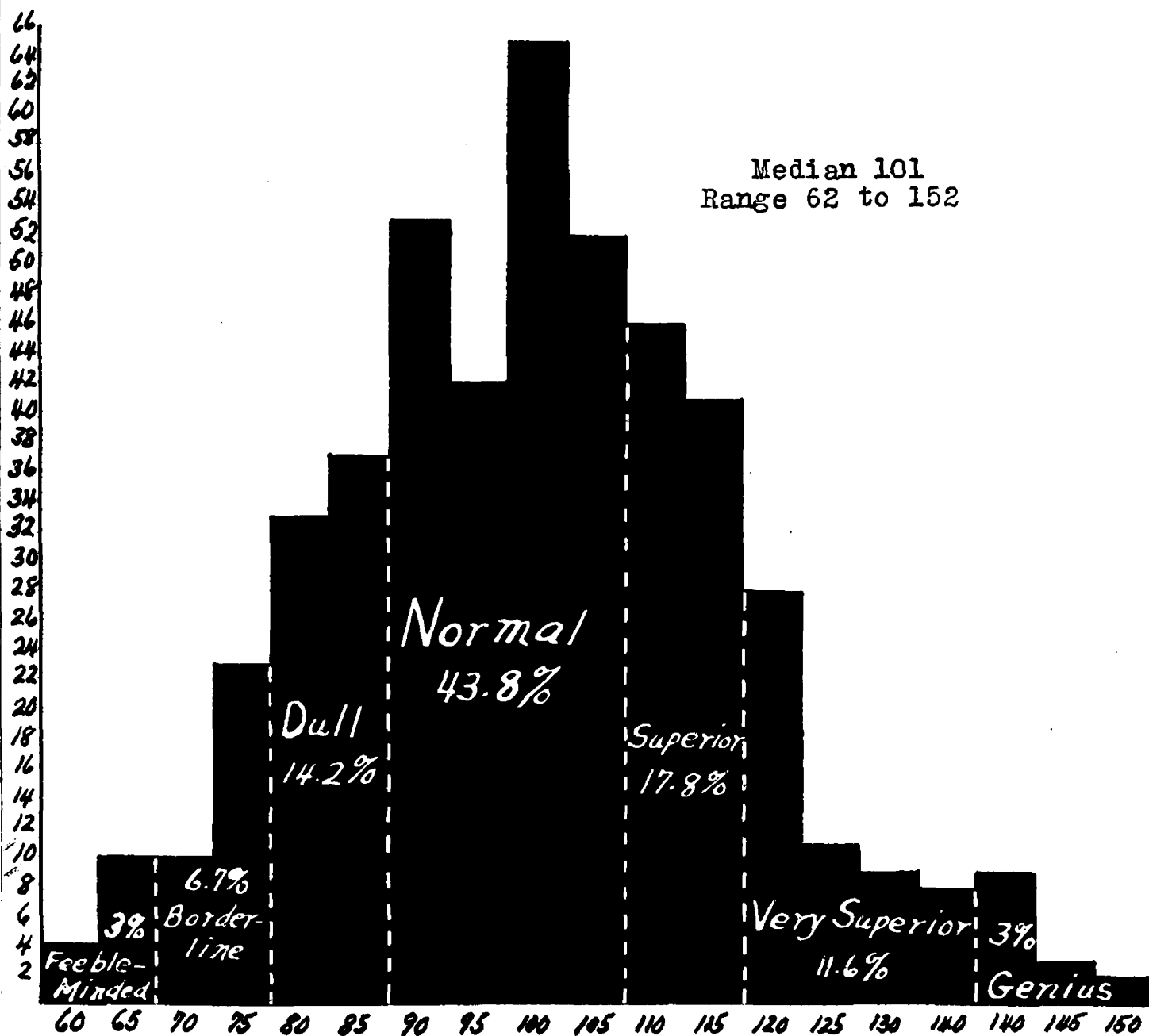
7. Terman, "Measurement of Intelligence", p. 62.

I.Q.	Classification (continued)
110 - 120	Superior Intelligence.
90 - 110	NORMAL, or average, intelligence.
80 - 90	Dullness, rarely classifiable as feeble-mindedness.
70 - 80	Border-line deficiency, sometimes classifiable as dullness, often as feeble-mindedness.
Below 70	Definite feeble-mindedness.

The percentages in the different classifications or groups run very near to normal for an unselected group. The group which gave the curve shown here was a selected group in that all of the pupils had got through the first three grades of school, and some of them had reached the eighth grade. The histogram or curve is skewed slightly on the upper part since there were almost eighteen percent in the superior group as compared to fourteen percent in the dull group. There were also eleven and six-tenths percent in the very superior class as compared to only six and seven-tenths percent in the borderline class. The percentages of geniuses and feeble-minded balanced with the normal three percent. The Median for the five hundred and sixty-eight children tested was one hundred and one, just one point above a perfectly normal I.Q. score. Taken as a whole, these pupils would be said to form a very normal group, as far as intelligence quotients were concerned. The range in I.Q.'s for the whole group was from sixty-

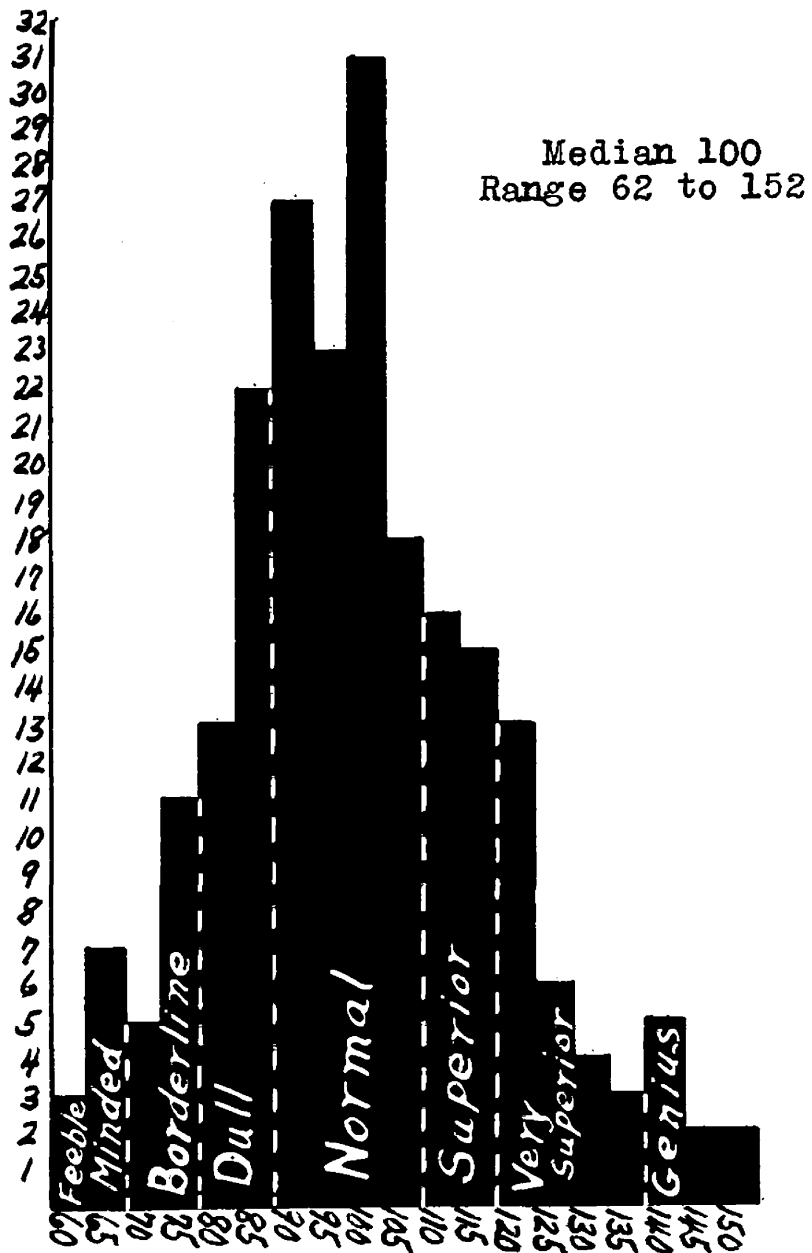
# DISTRIBUTION OF I.Q.'s BOYS & GIRLS

CHART V



# DISTRIBUTION OF I.Q.'s BY SEXES

## BOYS



## GIRLS

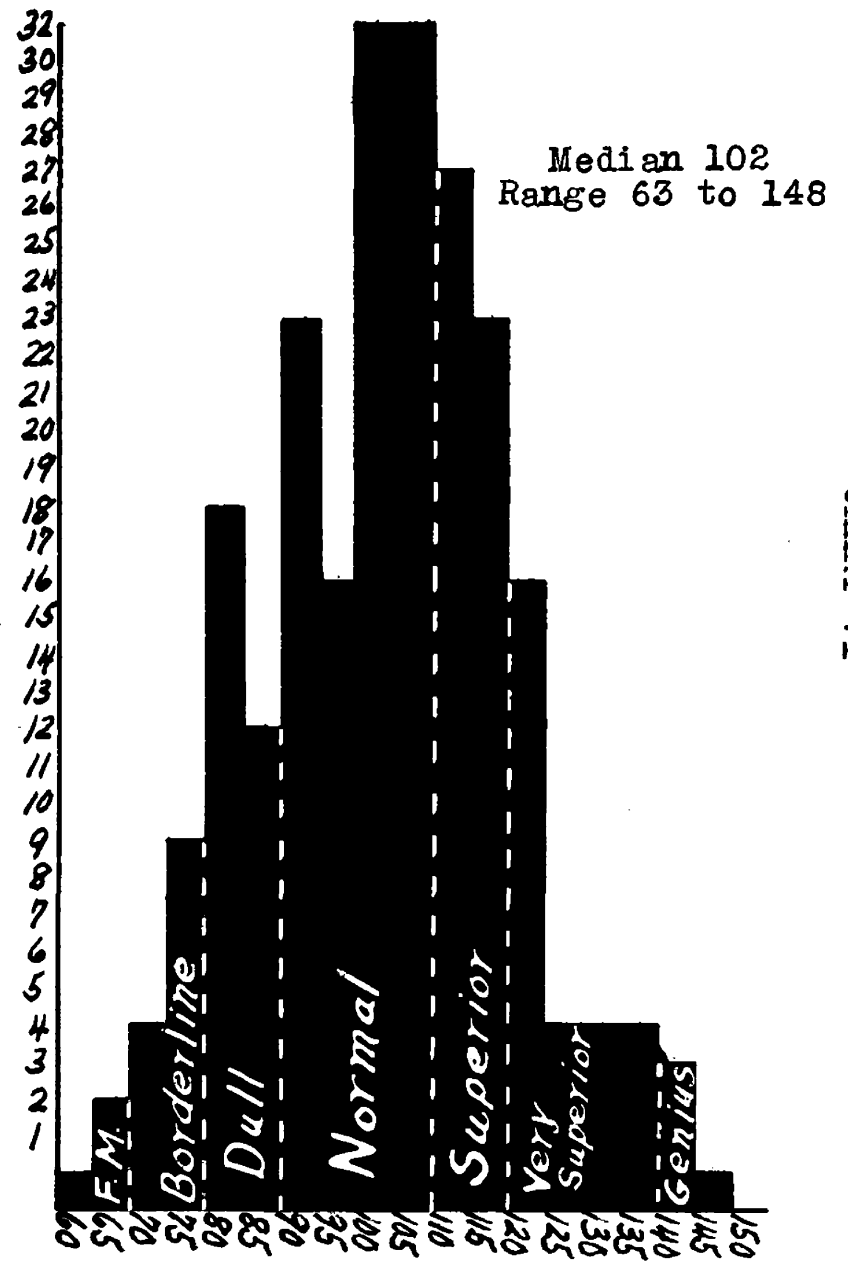


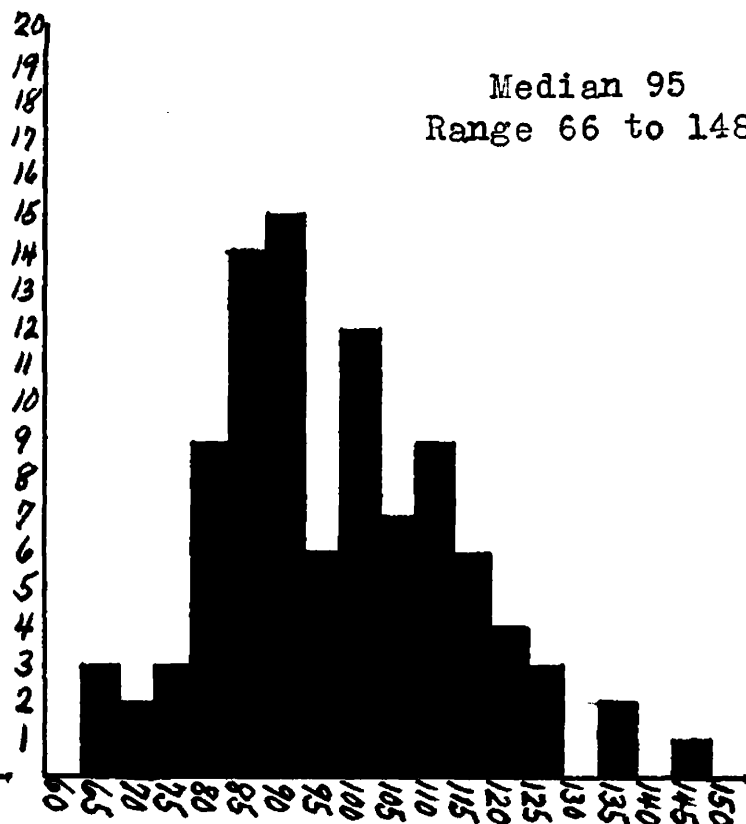
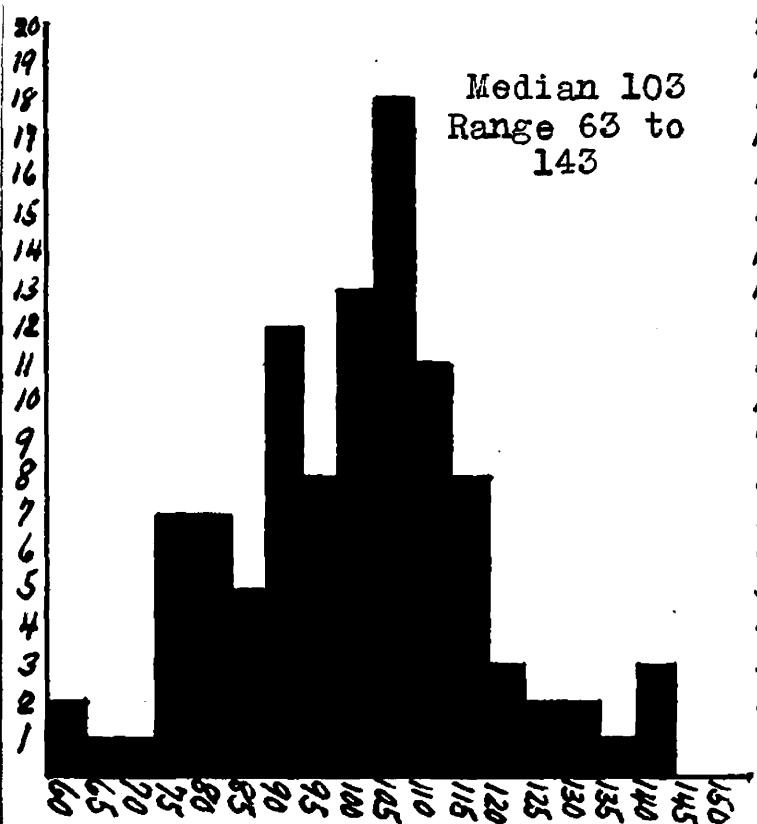
CHART VI

# DISTRIBUTION OF I.Q.'s BY GRADES

GRADE IV

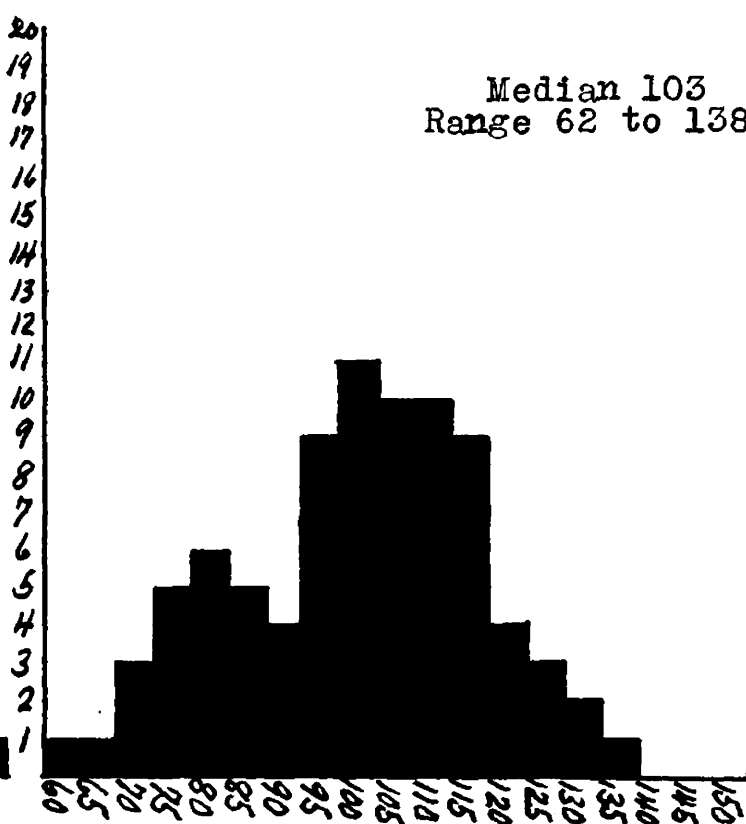
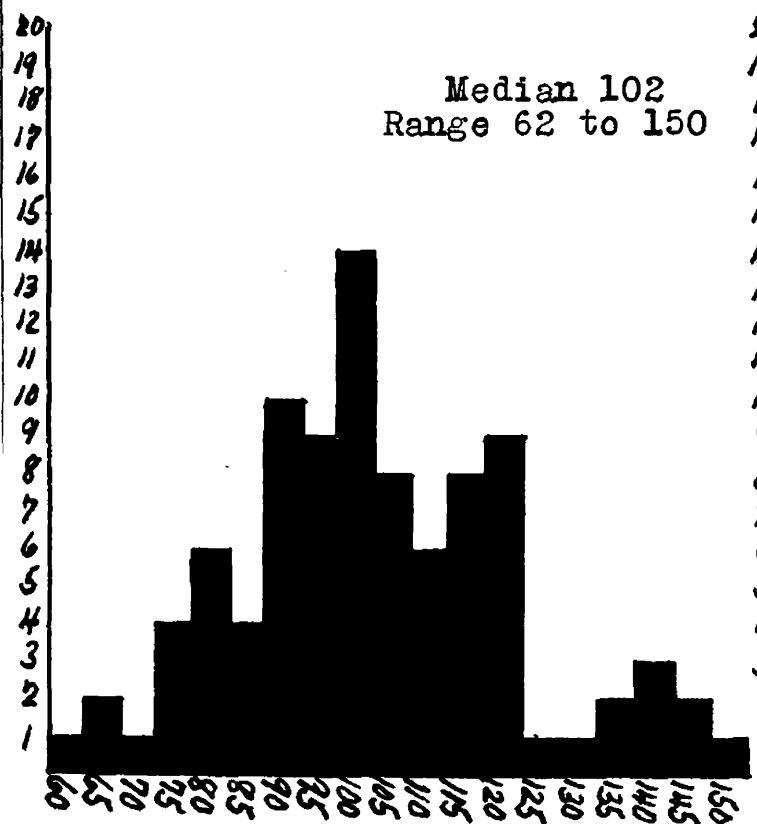
CHART VII

GRADE V



GRADE VI

GRADE VII

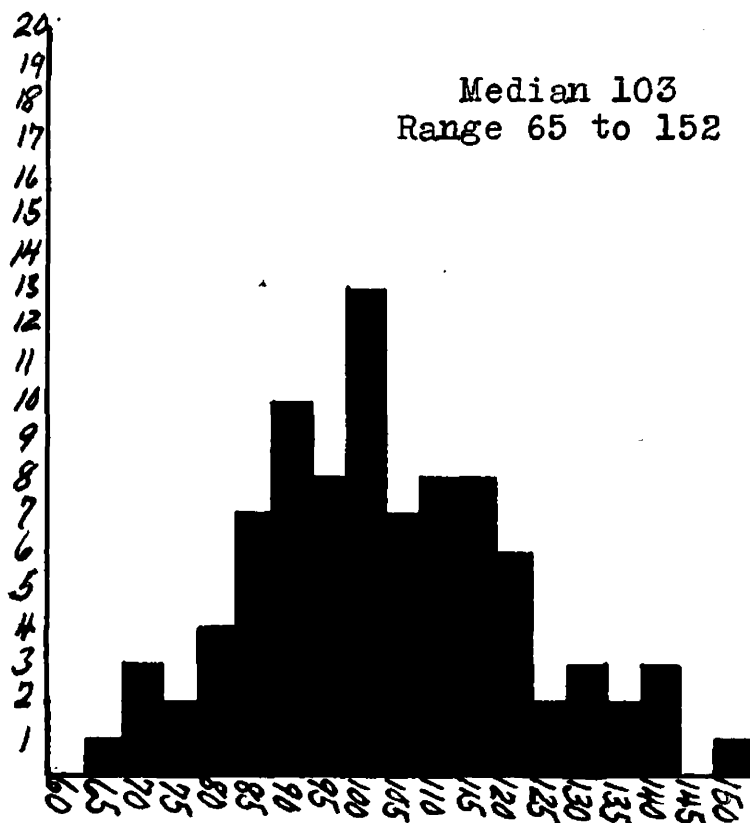




# DISTRIBUTION OF I.Q.'s BY GRADES (Cont.)

CHART VIII

## GRADE VIII



# Distribution of I. Q.'s by Grade & Sex

## Grade IV

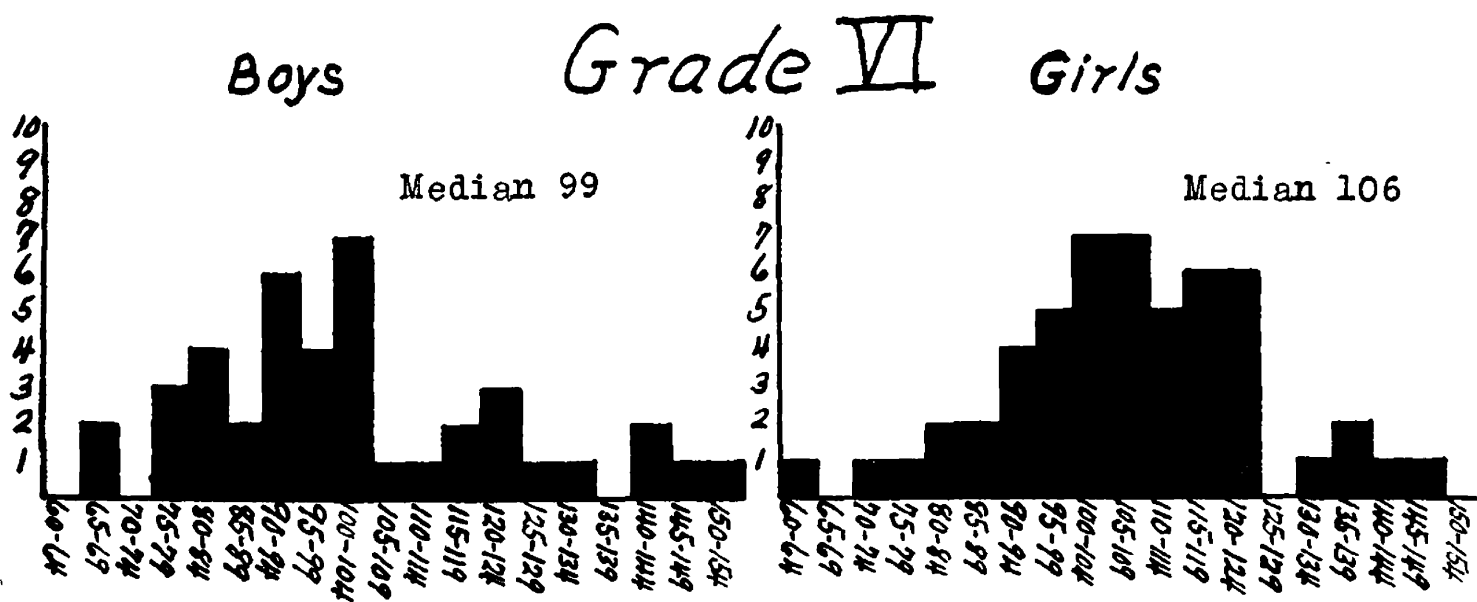
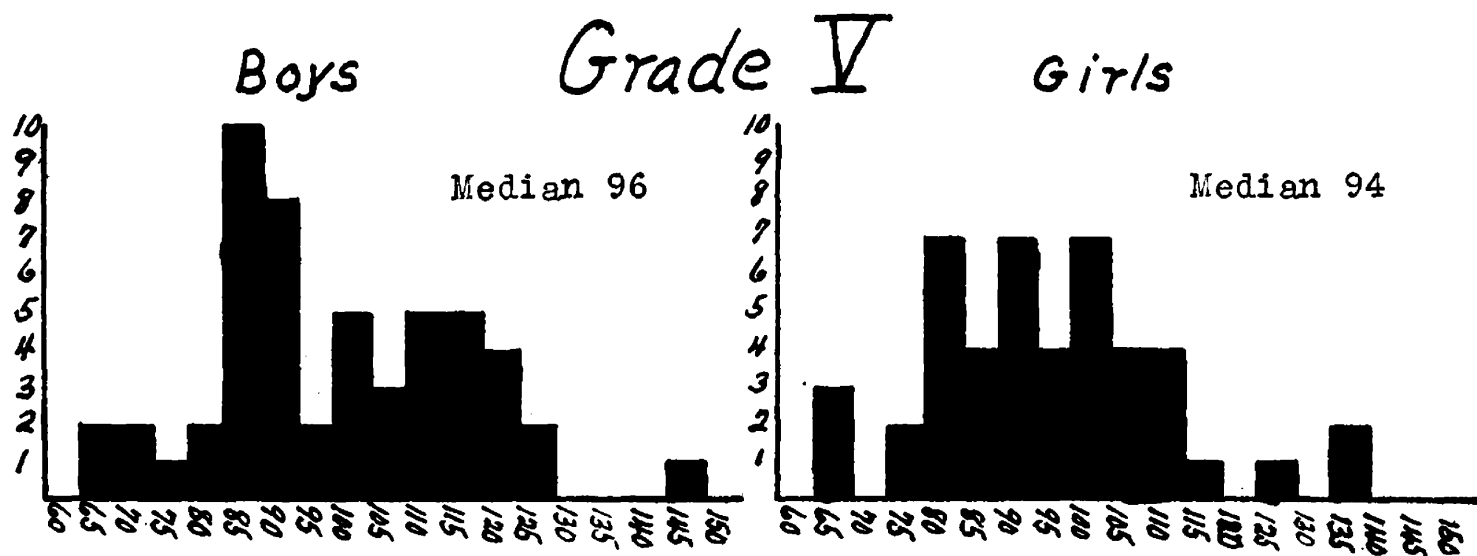
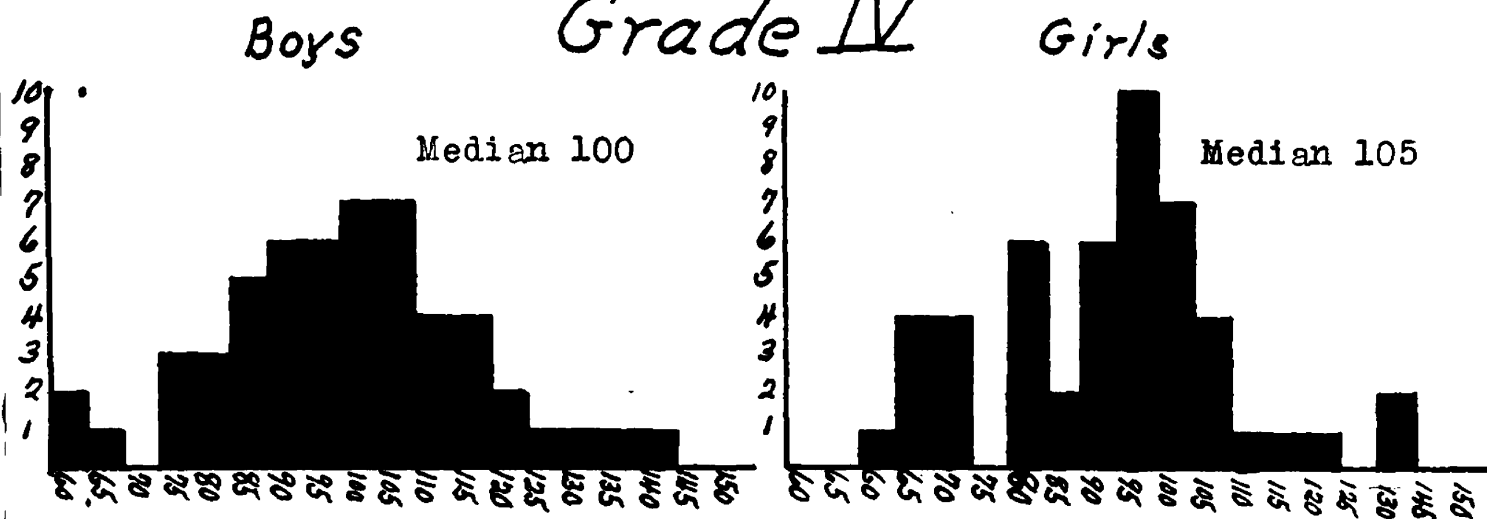


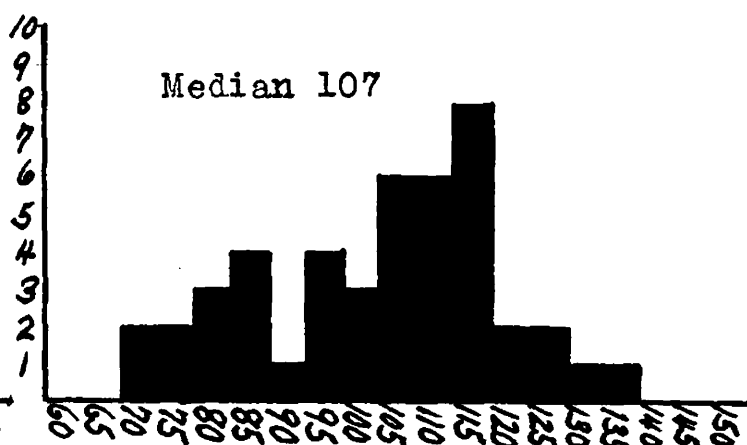
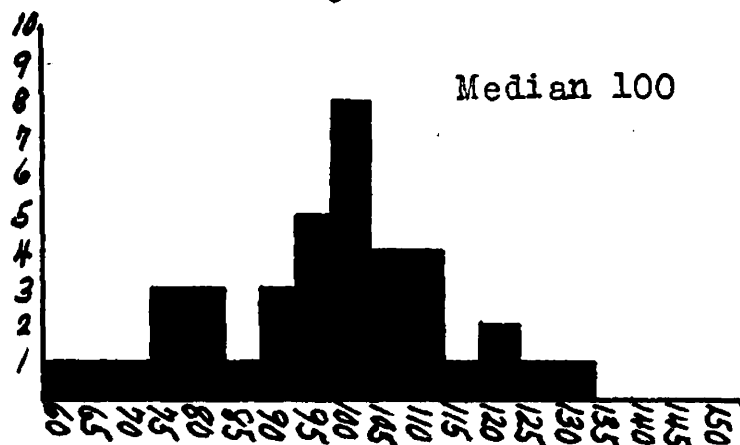
CHART X

# Distribution of I.Q.'s by Grade & Sex

## Grade VII

Boys

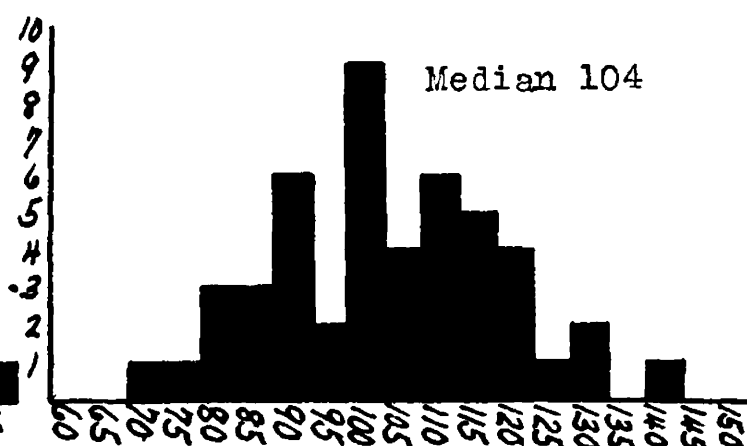
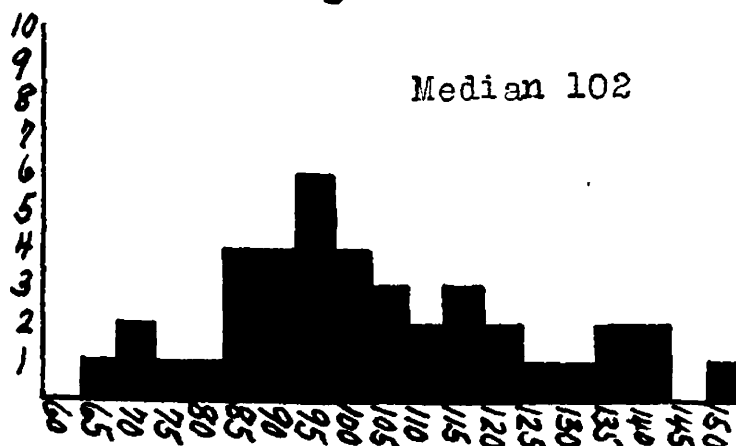
Girls



## Grade VIII

Boys

Girls



two to one hundred and fifty-two. This was a very wide range, and the extreme cases both high and low should have been re-examined with an individual test such as the Terman Revision of the Binet-Simon Intelligence test. Those with the very high I.Q.'s should have received special attention and if possible should have been placed in special classes or schools where they would have had an opportunity to develop their talents.

This very high group represented the topmost or the cream of the students and society owes it to itself to provide the means for them to reach their maximum development. On the other hand the very low group also needed special treatment. The ordinary school curriculum is practically worthless to such pupils. Society needs to protect itself by giving this very low group the type of training which will prevent them from becoming a burden and a dangerous element in their later lives.

Chart VI, page 66, shows the distribution of I.Q.'s by sexes. These curves, excepting in a few cases, are very much alike. For example, there was a much larger percentage of girls in the superior group than there was of the boys; also there were more feeble minded boys than there were girls. At the same time there was a larger percentage of boys in the

genius group. The range of I.Q.'s was five points greater for the boys than it was for the girls. The range for the boys was sixty-two to one hundred and fifty-two, while that for the girls was sixty-three to one hundred and forty-eight. The group was large enough to justify some significant conclusions; for example, there were more extremes among the boys than there were among the girls. In this group, the girls showed, on the average, ability superior to that of the boys, in that their Median was one hundred and two, while that for the boys was one hundred. Thus the girls in grades four to eight inclusive of the Judith Basin County schools would be said to have been slightly above normal in intelligence.

Chart VII, page 67, and VIII, page 68, show the distribution of I.Q.'s by grades. It is worthy of note that in general the distribution curves were much alike for all five of the grades. The range of Intelligence Quotients was very much the same for all of the classes. The widest range, sixty-two to one hundred and fifty, was found in the sixth grade, although there was a range of one point less in the eighth grade. The lowest I.Q.'s, both sixty-two, were found in the sixth and seventh grades. The highest I. Q. was one hundred and fifty-two and was found in the

eighth grade.

The Median I.Q.'s were exactly the same in grades four, seven, and eight, in which grades it was one hundred and three. The Median for grade six was one hundred and two, virtually the same as for the other three grades. The big difference occurred in the fifth grade where the median I.Q. dropped to ninety-five. Corning states, "The I.Q. which results from a comparison of the mental age with the chronological age is an index of ability; from it we know whether the child had inferior, average, or superior capacity to learn."<sup>8</sup> With Corning's statement in mind, the conclusion which would be drawn from Charts VII and VIII is that the pupils in grades four, six, seven, and eight of the Judith Basin County schools were slightly above average in ability, while the pupils in grade five were a little below average in ability.

Chart IX, page 69, and Chart X, page 70, show the distribution of the I.Q.'s by grade and by sex. The groups used here are not large enough to give well rounded and even curves of distribution, for example, in the group of fourth grade girls there is a gap with no girls having an I.Q. of seventy-

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8. Corning, "After Testing, What?", page 138.

five to eighty. Taken as a whole, however, the histograms are quite normal. A comparison of the Medians for various grades and sexes shows that the girls were well in advance of the boys in every case except in the fifth grade, in which case the average I.Q. for the girls was ninety-four as compared to ninety-six for the boys. In both the sixth and seventh grades the girls had an average I.Q. seven points higher than the boys. In the sixth grade the average I.Q. for the boys was ninety-nine, while that for the girls was one hundred and six; and in the seventh grade the average for the boys was one hundred as compared to one hundred and seven for the girls of the same grade. The conclusion drawn from the above charts would be the same as that stated at the bottom of page 71, namely, that the girls of Judith Basin County in grades four to eight inclusive had mental ability slightly above average. Their ability or average I.Q. was also slightly above that of the boys in the same grades, the total average for the boys being exactly normal.

A comparison of the average I.Q.'s for the various grades in Judith Basin County with those of the same grades in Yellowstone County shows those in Judith Basin County to have been higher than those in Yellowstone county in every

grade except the fifth.<sup>9</sup> In the fifth grade the average for Judith Basin was only ninety-five while for Yellowstone it was ninety-seven. The greatest difference occurred in the sixth grade where the average I.Q. in Judith Basin was one hundred and two as compared to eighty-six for Yellowstone, a difference of sixteen points. In the other grades there was only a small difference in favor of Judith Basin county the average I.Q. for the other grades in Yellowstone county being: fourth grade, ninety-eight; seventh grade, one hundred two and seven-tenths; and eight grade, one hundred and one. The comparisons cited in the above paragraph may not be especially significant in that a different intelligence test was used as the measuring instrument in each case. Such tests, however, are presumably quite well standardized.

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9. Gray, "An Education Survey of Yellowstone County", p. 56.



### Conclusions

The following conclusions are drawn from the material presented in the foregoing chapter:

(1) There was a wide difference in mental capacity among the school children in Judith Basin County. This was shown by wide ranges in Intelligence Quotients as shown in all grades. For example, in the eighth grades the range was from sixty-three to one hundred and fifty-two, or from feeble-minded to genius.

(2) On the basis of chronological ages, the children of Judith Basin County were much better adjusted to their grades than in most other places where surveys have been made. This county showed an average through all twelve grades of seventy-one percent at age for their grade as compared to fifty-two percent reported by Corning<sup>10</sup> and sixty-two percent reported by Madsen.<sup>11</sup> There was a much smaller percentage of the pupils in Judith Basin who were retarded than in other systems. The county showed only twelve percent retarded, while Madsen reported thirty-five percent and Corning forty percent. However, this

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10. Corning, "After Testing, What?", p. 175.

11. Madsen, in Hines, "A Guide to Educational Measurements", p. 53.

county showed a much larger percentage of under-aged or advanced pupils than was reported by Madsen or Corning. The county showed seventeen percent under-age as compared to Madsen's three percent and Corning's eight percent. See page 43, for comparisons of Judith Basin County with the average for the whole State of Montana and for Yellowstone County.

(3) The children in the same grade were widely separated in mental age; only forty-seven percent of all the children tested were doing work consistent with their mental age, while a little over half of the rest were doing work too easy for them, and the remaining group were attempting to do work entirely too difficult for them. The percentage of children who were mentally at age for their grade in Judith Basin was slightly greater than that found by Corning. He reported forty-three percent at age.

(4) There was a greater range of mental ages in every grade than there was in even the chronological ages. The greatest range in mental ages came in the seventh grade among the boys, and it showed a variation of eight years and two months.

(5) The ranges of mental ages found in each grade were entirely too great to even expect satisfactory results. For

example in grade seven of the Judith Basin County schools, students of only third grade ability were grouped together with tenth grade ability, and all of these students were given the same course of study and expected to accomplish the same results. In other words those of third and fourth grade intelligence were expected to compete with those who were mentally capable of doing ninth and tenth grade work. The teachers of such groups were expected to present the same subject-matter, in the same amount of time, and by the same methods and devices, to children of third-grade ability and ninth grade ability. While the teacher was striving to get nine-year old children to grasp subject-matter which was designed for eleven year old children, she had to keep fifteen or sixteen year old children busy and stimulated with material which they could easily have grasped when they were four or five years younger.

Teachers and some so-called educational philosophers have been happy in the thought that such procedure is correct and fair because all children are treated alike. But such great individual differences can only result in dissatisfaction, discouragement, loss of ambition and decreased efficiency on the part of both the pupil and the teacher.

(6) The girls of Judith Basin County were slightly

superior to boys and to the norm in intellectual ability, as shown by the average I.Q. scores. This difference agrees with findings made by Commins, and by Lincoln. Lincoln suggests that girls are brighter than boys of the same age, at least up to fourteen or fifteen years, because of the advanced maturity of the girls, as indicated by anatomical and physiological tests as well as mental tests. Not all intelligence tests show this difference, however, and Lincoln asserts that they are weighted in favor of the boys, and hence do not show a difference where they should.

## Chapter IV

### Achievement Testing

"Standardized achievement tests accomplish three things: They check, first of all, with deadly accuracy, the exact progress of the student made in the subject on which he is being examined. The element of chance is practically eliminated. Memory, per se, will not do. He must understand the subject and the meaning of the answers he gives. Second, they record the progress of the student by comparison with an average student in the same grade, based on the average performance of tens of thousands of students in the same grade all over the United States. Third, they check the teacher and turn a ghastly spotlight on his or her teaching ability. Gone are the days when the student can say: 'I like Miss A.; her examinations are a cinch and anyone can pass them.' Gone also are the days when a teacher must suffer the opprobrium of pupil judgment crying out that she deliberately makes her examinations so hard and confusing that no one could pass them. If the whole class does badly, the reason is immediately sought. If the pupil material is good or better than average, the teacher is completely sunk; her own promotion or even her retention in the service is in jeopardy and rightly so. In the same way, individual extremes in a class are investigated."<sup>12</sup>

Along the same line are the following statements from

Corning:

"The success of the teaching process should be judged by results. First, school marks are inaccurate and inconsistent. A grade of 75 with one teacher indicates a different degree of accomp-

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12. Ernest Greenwood, (Inp. Vol. 115, Nov. 14, 1925) pp. 557-8.

lishment from that indicated by the same grade given by another teacher. Second, if a single examination paper in any subject or an English theme is examined by a group of teachers, there is no agreement as to the value of the paper. Third, if one teacher grades a set of papers twice, there will be sufficient variation to establish the fact that the teacher is not even consistent in her own grading. Fourth, teachers are unable to judge the relative difficulty of different problems, etc. Fifth, Examination and term grades are meaningless when we consider that they bear no reference to standards. The use of Standardized Achievement Tests in many school districts has done much to bring order out of chaos, to furnish a reasonably accurate measure of the teaching process and to awaken in the minds of administrators and teachers a more scientific attitude toward the work being done in the classrooms. No single agency has done more than Standardized Tests to determine definite objectives for the teaching process."<sup>13</sup>

The above statements are quoted merely to emphasize the great importance of standardized tests. The achievement tests selected for this survey consisted of a battery of nine tests called the Stanford Achievement Tests, by Kelley, Ruch, and Terman. These tests were selected because they met, in a superior manner, the criteria listed on page three of the Introduction. As mentioned in the Introduction, these tests were given on the same day (which was the exact middle of the school year) in every school

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13. Corning, "After Testing, What?", p. 33-37.

in Judith Basin County. By giving the tests in this manner it was possible to make more accurate comparisons.

The previous chapter on Intelligence Testing was opened with a Chronological Age-Grade Table, showing the distribution of the chronological ages by grade and by sex of all the students enrolled in the Judith Basin County schools. In the same chapter a Mental Age-Grade Table which showed the distribution of the mental ages of the students was given. The first group of data to be reviewed in this chapter will be that which is included in the Educational Age-Grade Table shown on page 83. The educational ages shown in this table were taken from the total scores made on all nine of the achievement tests. The Educational Age shows the actual degree of educational progress made by the child, as measured by the entire battery of tests.

A review of Table 15, page 83, plainly shows that a far greater number of the children in the Judith Basin County schools were above their grade educationally than were below their grade. In fact in the Fourth grades throughout the entire county there was not one child who was educationally below grade. This was indeed a remarkable record. It means that although some of the children were below grade in some one of two subjects; nevertheless, when

# EDUCATIONAL AG-ORDS TABLE

**24 FEB 15**

GRADE IV V VI VII VIII  
AGT B G B G D G D G D G

[illegible]

13

53 47 53 54 54 53 54 61 46 44



the average score in all the subjects was taken into consideration, there was not a child in any fourth grade in the county who was below grade educationally. By educationally, is meant educational standing as shown by actual accomplishment in the school subjects tested. The fifth grade had a record almost as good as the fourth since only one pupil, a boy, had an educational age which was below grade. From the lower to the higher grades there was a gradual increase in the number of educationally under-age children. It is worthy of mention that in the lower grades there was a greater number of boys who were over-age educationally than there were girls, while in the upper grades the opposite was true.

Table 16, page 85, shows the actual number and percentage of educationally under-age boys and girls in each grade. This table shows the gradual increase in percentage of under-age boys and girls, from grade to grade. There was an unusually large percentage of both under-age boys and under-age girls in the sixth grade. This no doubt partially accounts for the low median scores shown for this grade on Chart XI, page 87. It is startling to note that thirty percent or almost one-third of the boys in the eight grades of this county were below age educationally, some of them as much as two years, as shown on the previous Educational

**EDUCATIONAL UNDERAGE TABLE**  
**TABLE 16**

GRADE	BOYS		GIRLS		TOTAL	
	No.	Percent	No.	Percent	No.	Percent
IV	0	0%	0	0%	0	0%
V	1	2%	0	0%	1	1%
VI	9	17%	5	9%	14	13%
VII	5	9%	5	8%	10	9%
VIII	14	30%	7	10%	21	23%
TOTAL	29	11%	17	6%	46	9%

**EDUCATIONAL OVERAGE TABLE**  
**TABLE 17**

GRADE	BOYS		GIRLS		TOTAL	
	No.	Percent	No.	Percent	No.	Percent
IV	14	25%	10	21%	24	23%
V	10	31%	15	27%	33	29%
VI	14	26%	12	23%	26	24%
VII	14	26%	29	49%	43	37%
VIII	12	26%	22	50%	34	37%
TOTAL	72	27%	88	34%	160	30%

Age-Grade Table. At the same time some of the eighth grade girls were advanced educationally as much as three years.

Table 17, page 85, shows the number and percentage of educationally over-age boys and girls. The percentages here were in every case higher, with the single exception of the eighth grade boys. The lowest percentage of over-ageness either boys or girls was twenty-one percent. The highest percentage of over-ageness occurs among the eighth grade girls where fifty percent or one-half of the girls are shown to have been over-age educationally. This was certainly a high percentage. Taking all the eighth grade girls as a whole, only thirty-four percent or one-third of them were found at age educationally for their grade. The situation was almost as bad in the case of the seventh grade girls and the eighth grade boys, where only forty-four percent or less than half of the pupils were at age educationally for their grade. Such situations certainly suggest the need for investigation and adjustment. Taken as a whole, thirty percent or almost one-third of the students tested were over-age educationally for the grade in which they were enrolled.

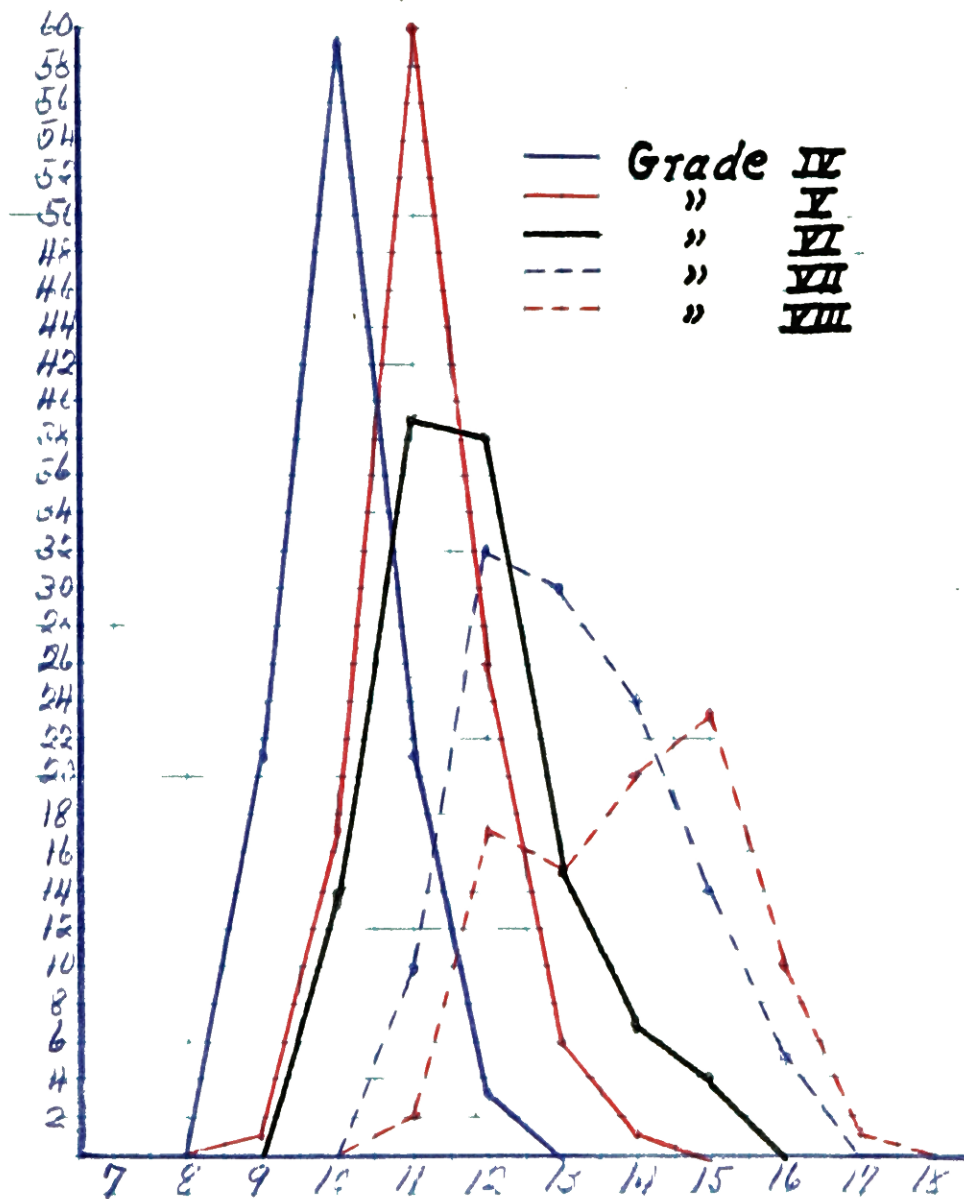
Chart XI, page 83, shows the great Overlapping of Educational Ages occurring in the various grades. When it is

realized that this overlapping was of a composite score for all nine of the achievement tests, the seriousness of the situation becomes more apparent. This chart shows that at least fifty percent of the students in the fifth grade were older educationally than at least two of the students in the eighth grade. Of course, there was a far greater overlapping, if the scores in the individual subjects are considered. This fact is shown by Tables 18-31, on pages 114 and 121. Another noteworthy fact, shown in the chart referred to above, is that the spread of educational ages became greater and greater from grade to grade. The very pointed curves of grades four and five furnish a great deal of contrast to the flattened curve of grade eight.

The Educational Profile Chart XII, page 89, shows in a very graphic manner the relative standings of the Median Scores in the various subjects for the different grades. The straight horizontal lines show the norm or standard for each grade at the particular time of year when the tests were given. When a broken line is above a horizontal line, it means that the median for that particular grade in that particular subject was above the norm or standard, and vice versa if the broken line

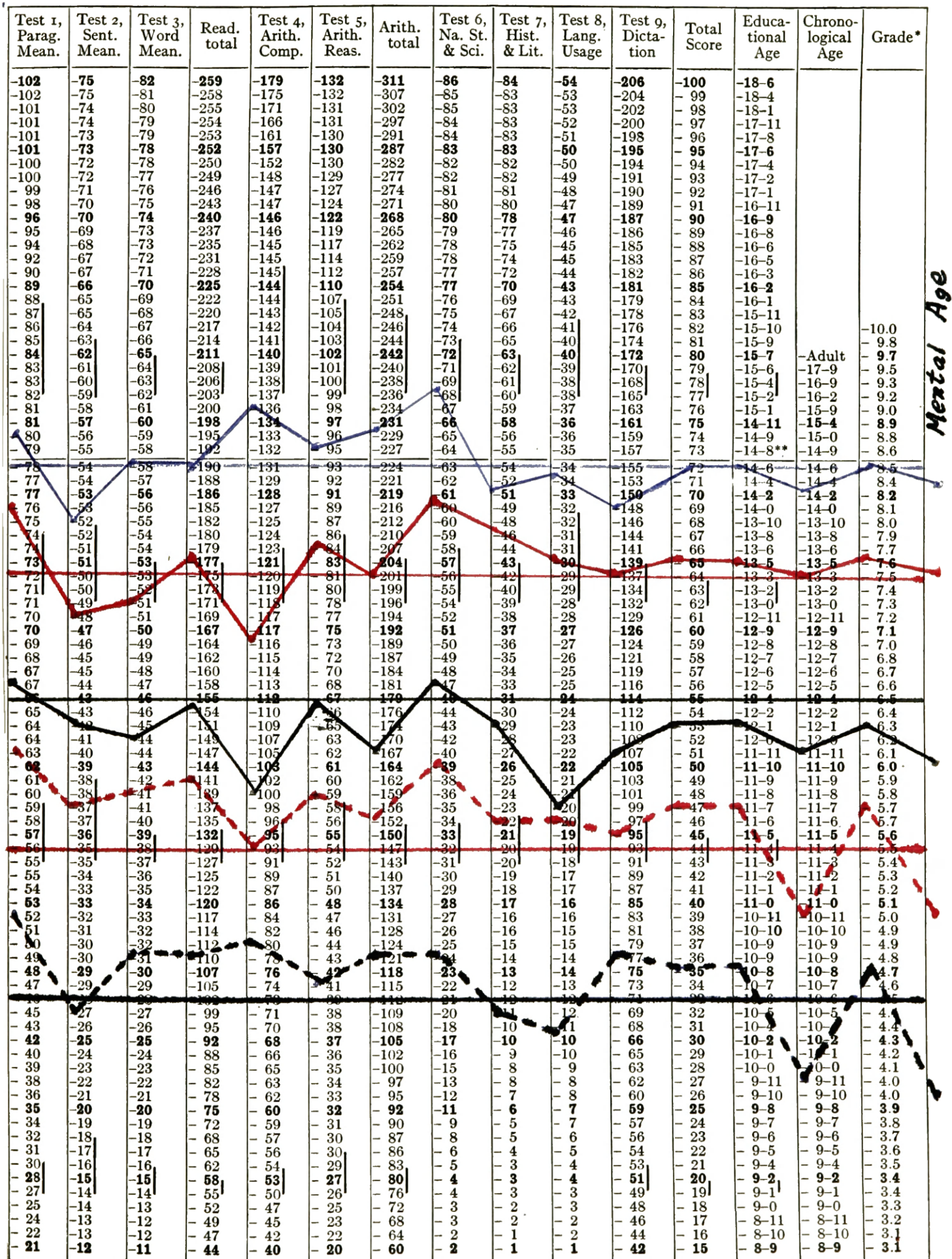
# OVERLAPPING OF EDUCATIONAL AGES

CHART XI





## EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION



is below the horizontal it means that the median for the class is below the norm or standard in that subject.

It is especially noteworthy that, although the medians in the Reading Paragraph Meaning Tests were in every case above the norm, the medians in the Reading Sentence Meaning Test were in every case below norm. There are only two possible explanations for the situation: either the norms were improperly standardized or set, or paragraph meaning was over-emphasized and sentence meaning under-emphasized in the Judith Basin County schools. The latter was probably more likely the case. In either case, however, steps should be taken to modify or correct the situation. There are numerous fluctuations in the various grades and various subjects, two points of common agreement being previously mentioned. Another subject in which all the grades showed a common agreement or trend was in Nature Study & Science. In this subject all the Medians are notably above the norm. The reason for this is found, no doubt, in the fact that this county is composed of rural and agricultural communities where the children are more apt to come in contact with the facts of nature study and elementary science.

Another very important fact shown by this chart is

that the median educational ages were in every grade above either the median chronological ages or the median mental ages. This would show that either the students in the Judith Basin County schools had abnormally high I.Q.'s or that the teachers of the county were working at a very high degree of efficiency. The first situation could not have been true, because it was shown in the previous chapter that the median I.Q.'s for the different grades were just normal. It remains then that the second situation must be true, namely, that the teachers of this county were working at a much higher degree of efficiency than the teachers in the average school system. This was probably the result of well trained and well paid teachers who were well supervised and were given good equipment to work with.

The fact that there was a much greater difference between the median educational ages and the median chronological and mental ages in the lower grades seems to indicate that the best grade of teaching was being done in those grades. It is possible that the advance normal training methods were put into greater practice in the lower grades than in the upper grades.

The reader's attention is called to the fact that the median total scores or educational ages were above the norm



or standard in every grade except the sixth. Judging from the median mental age for this grade as shown in the special column inserted on the graph for this purpose, the cause for the poor showing made by the sixth grade lies in the lack of mental capacity on the part of the students in this grade. The same deficiency of mental capacity was shown in grades four and five, but in these grades the difference was apparently made up through superior teaching methods and more conscientious efforts.

To judge from the median chronological ages, the children in the lower grades in this county were advanced beyond what their chronological ages would normally call for. As long as they were able to carry the work in the splendid manner in which they were and still keep up their health, there could be little cause for criticism.

In only one case did the median subject scores for two grades coincide, and that was in the fifth and sixth grades in Language. The exact cause for this is hard to determine. Apparently the sixth graders had not advanced a great deal in Language during their year of schooling. The fault for this might be found in the course of study and the Language work it emphasizes for the fifth grade.

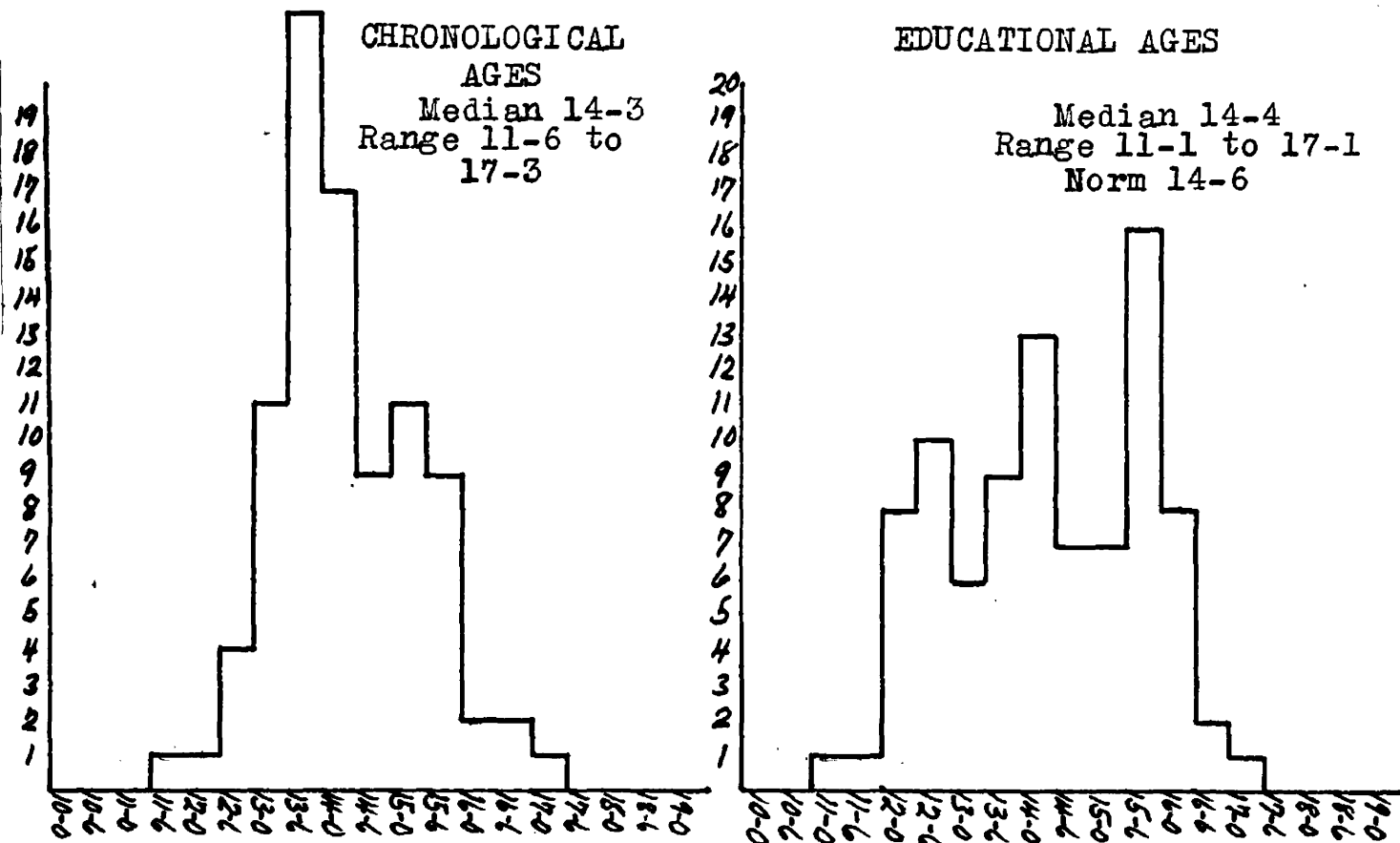
Achievement Test Results By Grades & By Subjects

In the first part of this section the results of the achievement tests by grades will be analyzed. The results to be considered are presented in the form of histograms for each subject and each grade. The histograms on pages 94 and 95 present the results of the achievement tests given the eighth grades in the form of graphs.

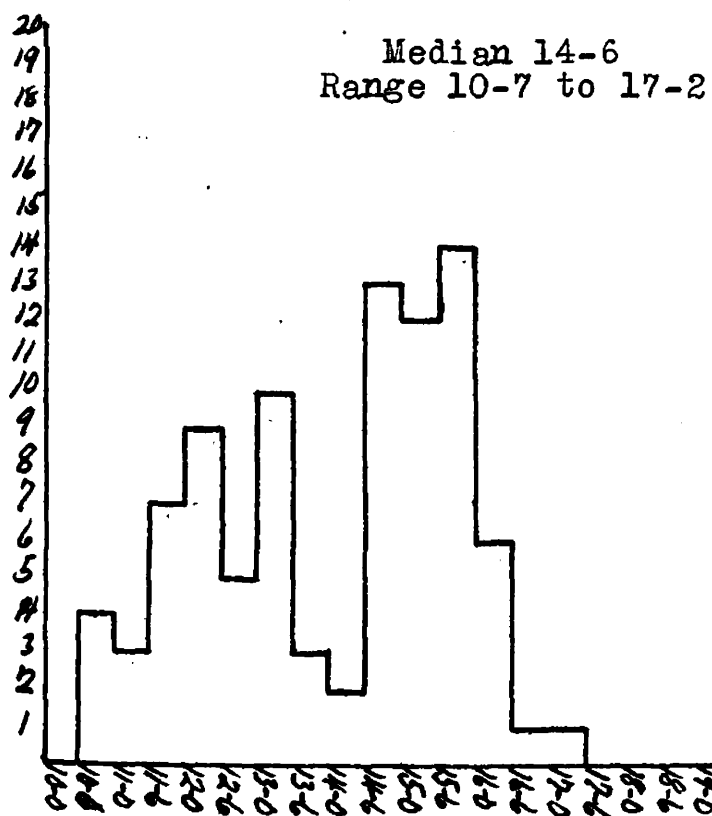
A histogram showing the distribution of the chronological ages of those enrolled in the eighth grade is given first, so as to serve somewhat as a basis of comparison for the histograms of the subjects themselves. The median chronological age for the eighth grade was fourteen years and three months, or three months lower than the norm of fourteen years and six months. The average child in the eight grades in Judith Basin County was advanced three months chronologically. This first histogram also shows that there was a range in the chronological ages of those enrolled in the eighth grades of five years and nine months, the youngest child enrolled being eleven years and six months old, while the oldest was seventeen years and three months. The State Superintendent's Report shows a range of chronological ages in the state of ten years, from ten

# CHART 13

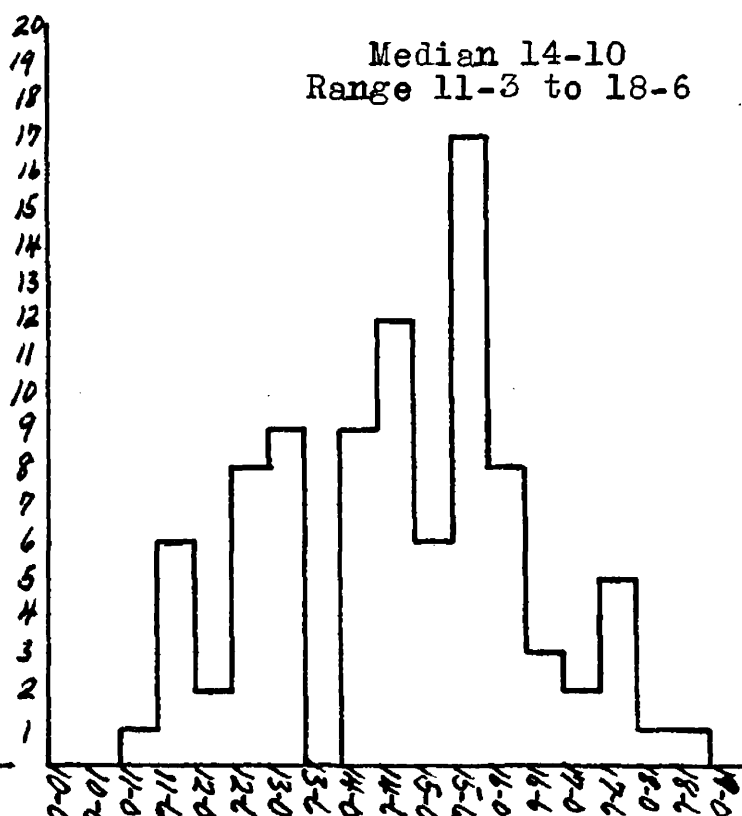
## DISTRIBUTION BY SUBJECT AGES GRADE VIII



### READING AGES

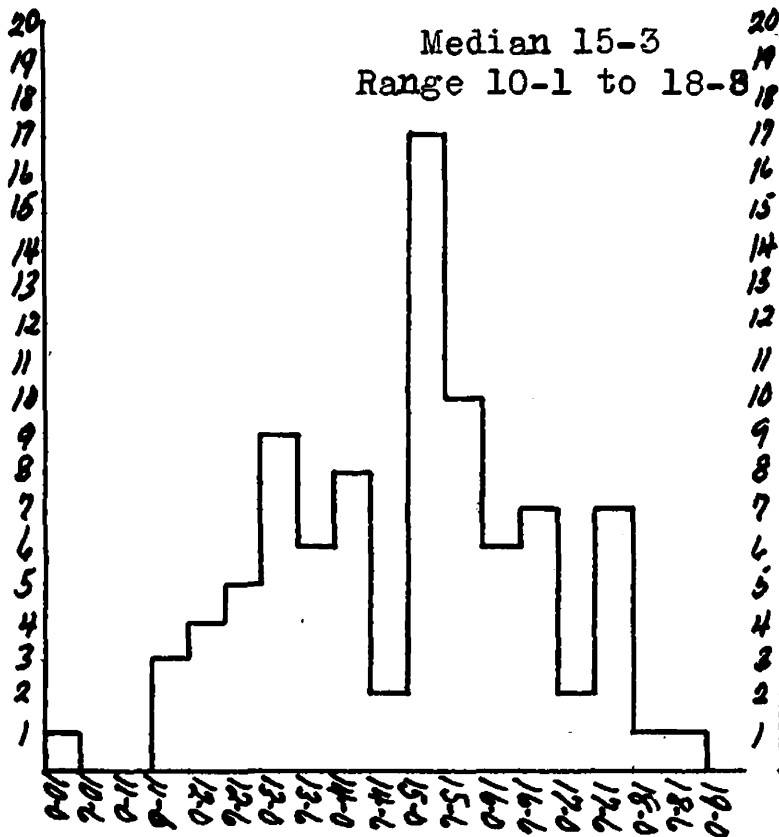


### ARITHMETIC AGES

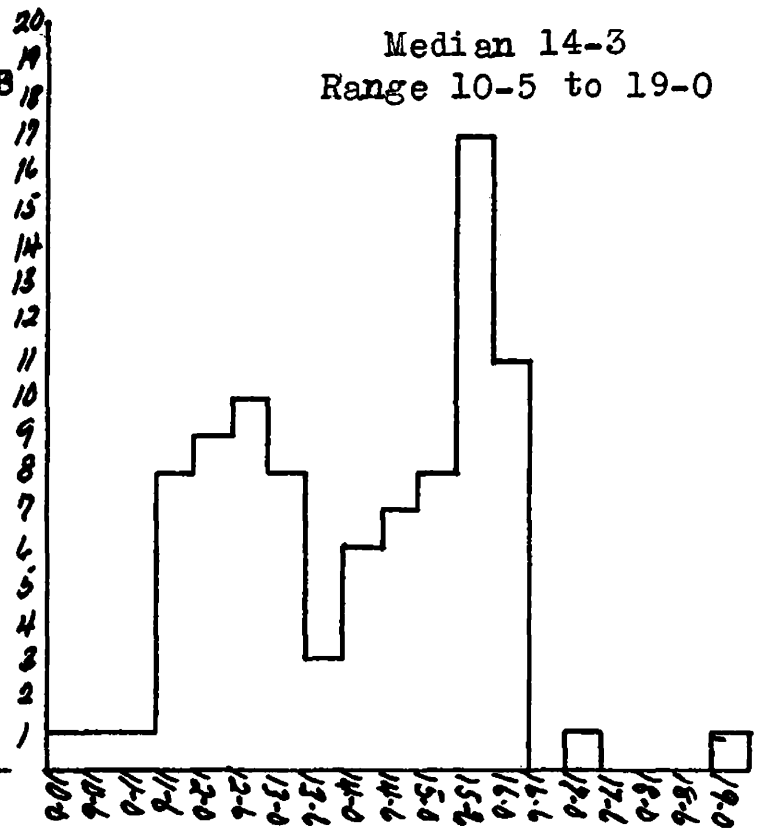


DISTRIBUTION BY SUBJECT AGES GRADE VIII  
(Cont.)

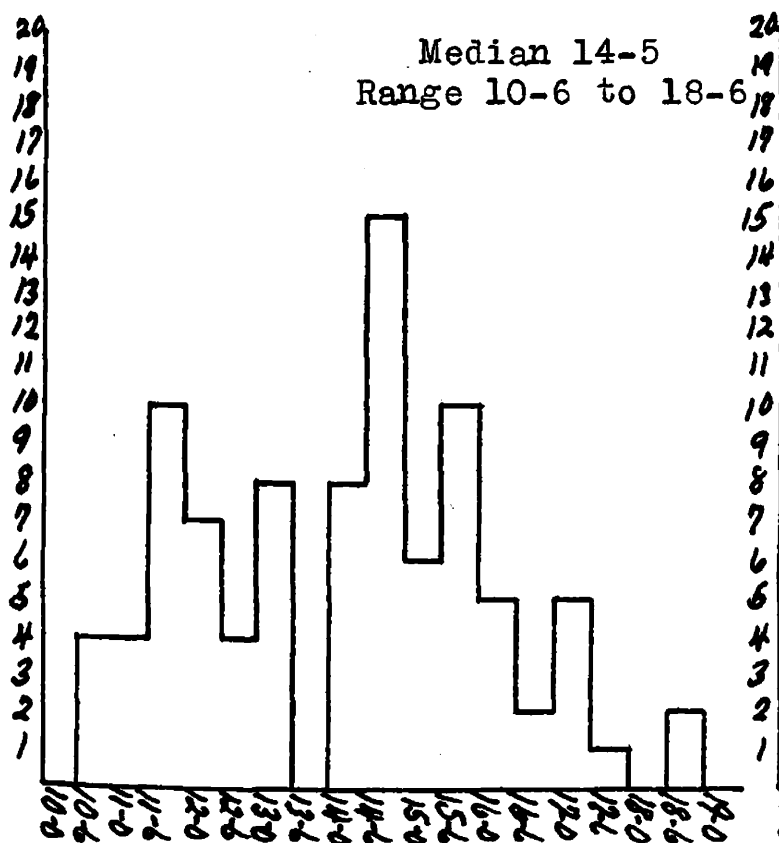
## NATURE STUDY AGES



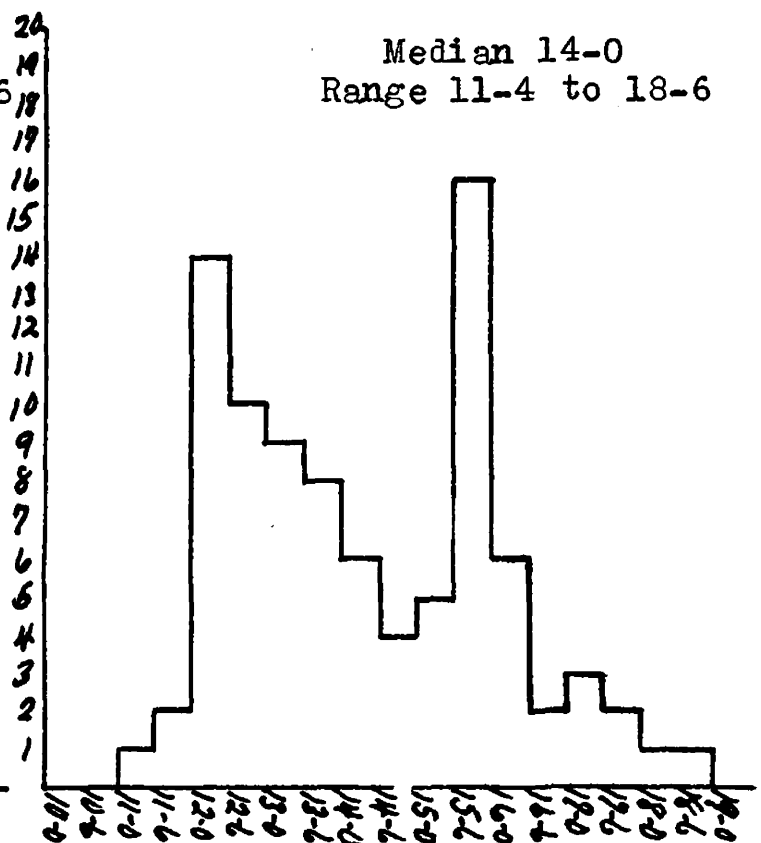
## HISTORY &amp; LITERATURE AGES



## LANGUAGE AGES



## SPELLING AGES



years of age to twenty years of age.<sup>14</sup> The state range is, therefore, four years and three months greater than the range for Judith Basin County. A greater range is to be expected, due to the large group represented by the state as a whole.

The next histogram shows the distribution of the Educational Ages in the eighth grades of the county. The Median educational age was fourteen years and six months or exactly the same as the norm. The range of educational ages was exactly six years or three months greater than range of chronological ages.

The histograms showing the Reading Ages shows a still wider range, from ten years and seven months to seventeen years and two months, or a total range of six years and seven months. Special attention is called to the scatter of reading ages and of the other subject ages which follow. It is especially noteworthy that there was a sharp division line between a poor group and a good group in every subject in the eighth grade. Such a break occurred in no other grade and is very seldom found in any distribution curve covering as many cases as this one covers. It is especially peculiar that the break splits the entire grade into two groups of

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14. Twentieth Biennial Report, pp. 42-43.

almost equal size in every subject. The only plausible cause for this rather singular break seems to be that the eighth grades of the county were composed of two rather distinct groups of students with a distinctly different degree of achievement for each. A close examination of the intelligence test results fails to show any such break in mental capacity, so that the difference was very apparently one of achievement only. Examination showed that approximately seventy percent of the lower group in each subject was composed of pupils from the one-teacher and two-teacher rural schools, and that only about thirty percent of the upper group came from such schools. In the low group, composed of rural children, the percentages varied from fifty-six percent to seventy-seven percent in the case of language usage.

The histogram showing the spread of arithmetic ages, shows a range of seven years and three months, a still wider range than in the reading ages. The median in arithmetic was four months above the norm, showing that arithmetic was taught in a manner that secured results. One reason for this is that arithmetic is a concrete subject, and it is much easier for a teacher to tell when she is getting results from such a subject.

The first histogram on page ninety-five shows a still wider range in the case of the nature study ages. The range in this case was eight years and two months. The median age was fifteen years and three months, or nine months above norm. This was the highest median for the eighth grade and was no doubt due to the fact that this is a rural county under which circumstances the children have a greater opportunity to come in contact with nature.

The history and literature ages show the widest range of all, namely, eight years and seven months. The range was from ten years and five months to nineteen years. The seriousness of such a situation is realized when it is interpreted as showing that one student in the eighth grade had an ability in such a basic subject as reading of almost nine years less than the best member in the same grade. It is also worthy of notice that the median for all of the eighth grade students was three months below norm in reading.

The language ages show a total range of exactly eight years, with a median language age of one month below norm. The median for the spelling ages was the lowest of the entire group, the median in the latter case being only fourteen years or six months below norm. This would hardly be

expected, since spelling like arithmetic is quite concrete and should suffer less neglect than some of the other subjects.

The histograms on pages 100 and 101 show the results of the achievement testing in the seventh grade. The median chronological age here was six months below norm, and was three months farther below norm than in the case of the median chronological age for the eighth grade. The range of chronological ages was smaller in the seventh grade, being only five years and two months.

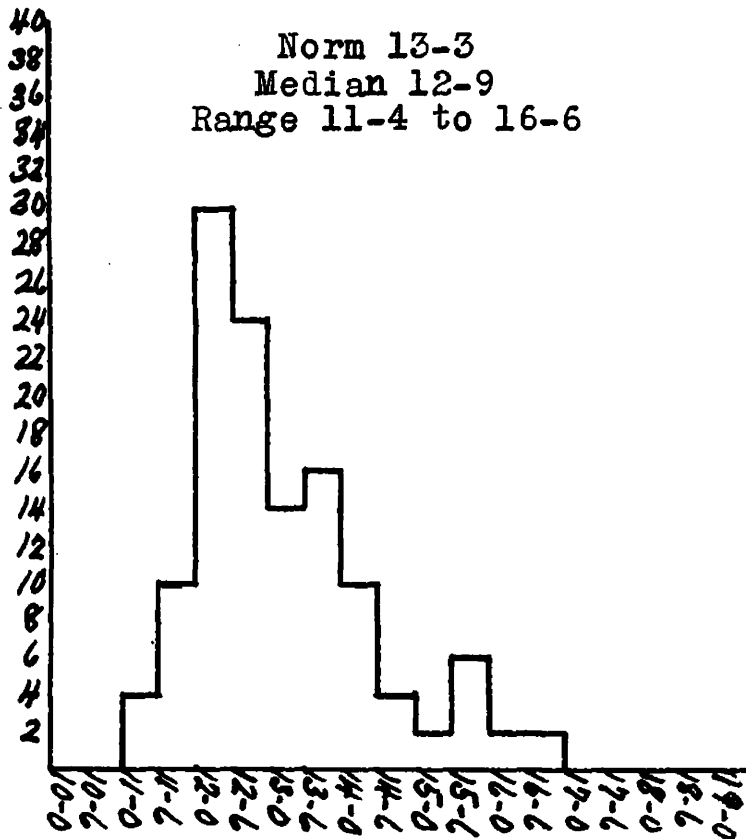
The median educational age for the seventh grade was thirteen years and five months or two months above the norm. The total range of educational ages for this grade was five years and ten months. It is worthy of note that the lowest educational age in the seventh grade was eleven years and one month or the same as the lowest educational age in the eighth grade. There was only two months' difference between the highest educational age in the eighth grade and the highest one in the seventh grade.

The median reading age for this grade was also two months above norm. The reading ages show a range of six years and eleven months. One important point about all of the distribution curves for the seventh grade is that although

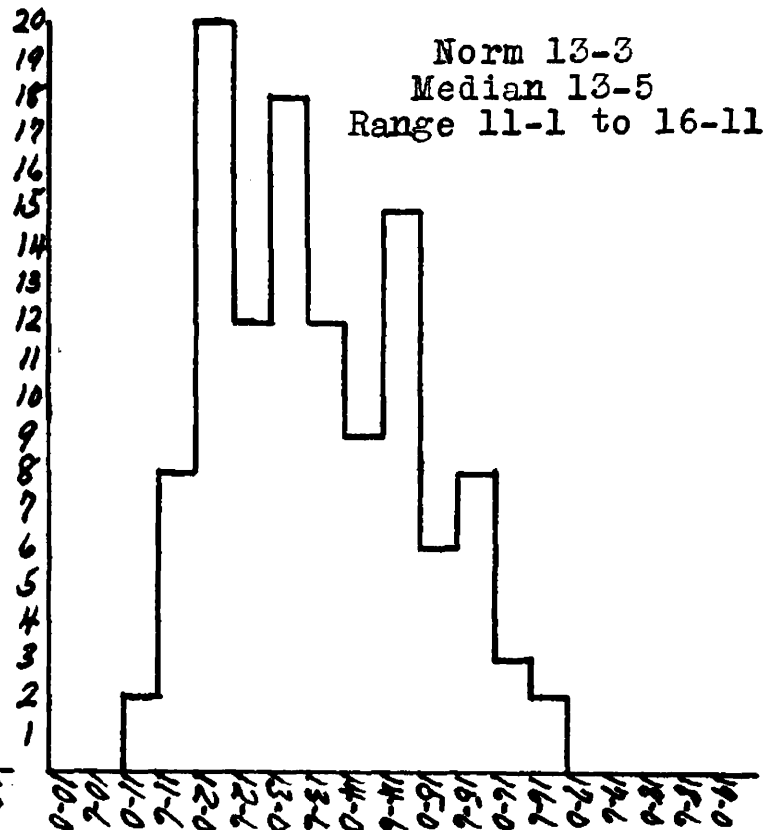


## DISTRIBUTION BY SUBJECT AGES GRADE VII

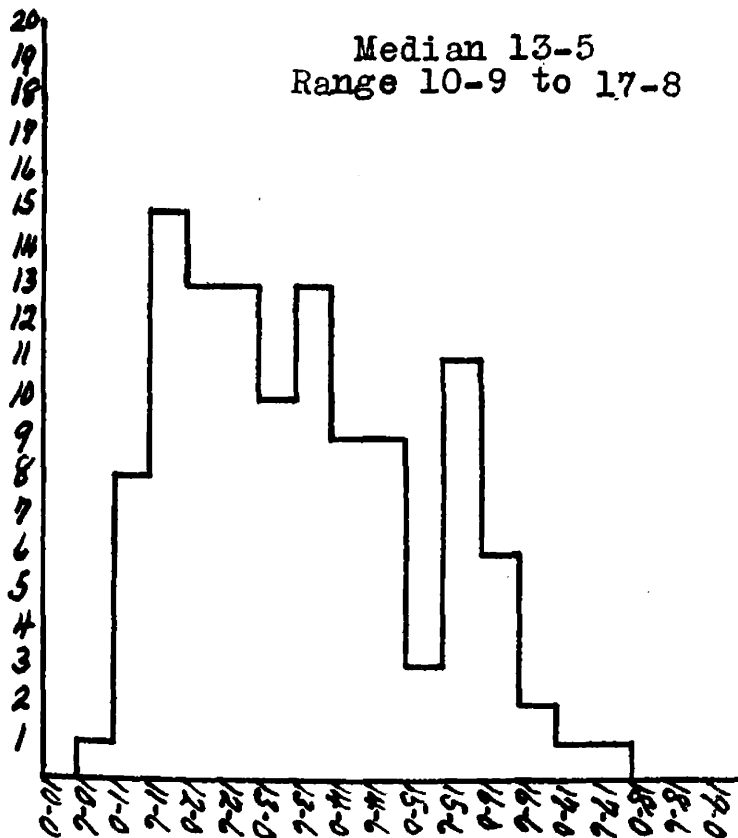
## CHRONOLOGICAL AGES



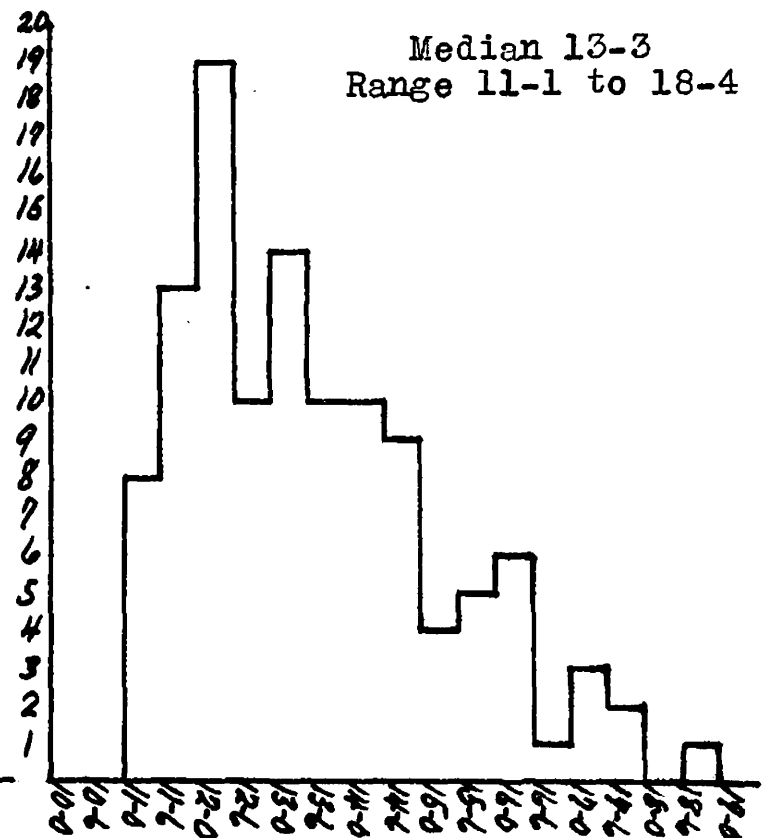
## EDUCATIONAL AGES



## READING AGES



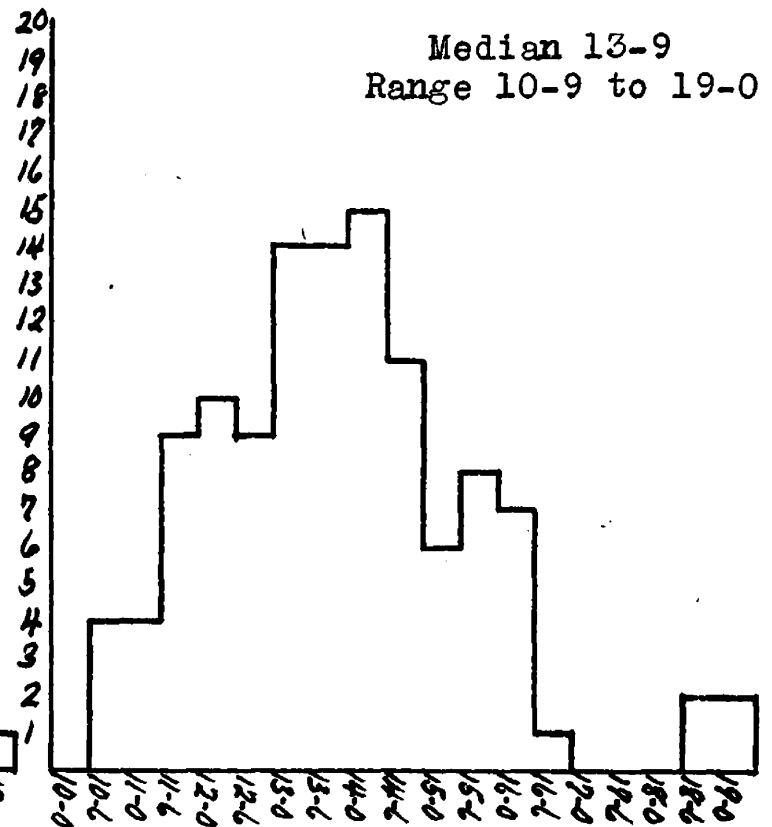
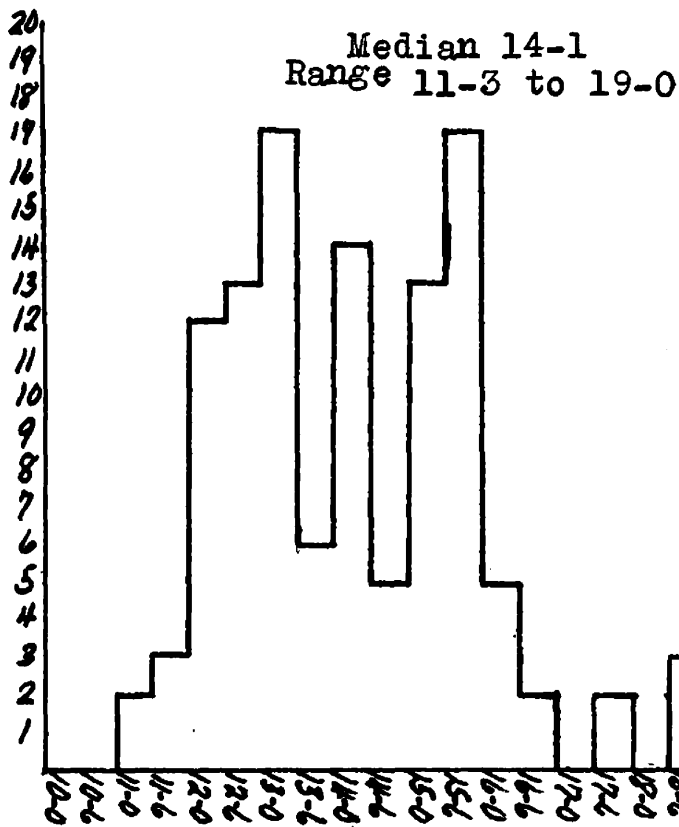
## ARITHMETIC AGES



DISTRIBUTION BY SUBJECT AGES GRADE VII  
(Cont.)

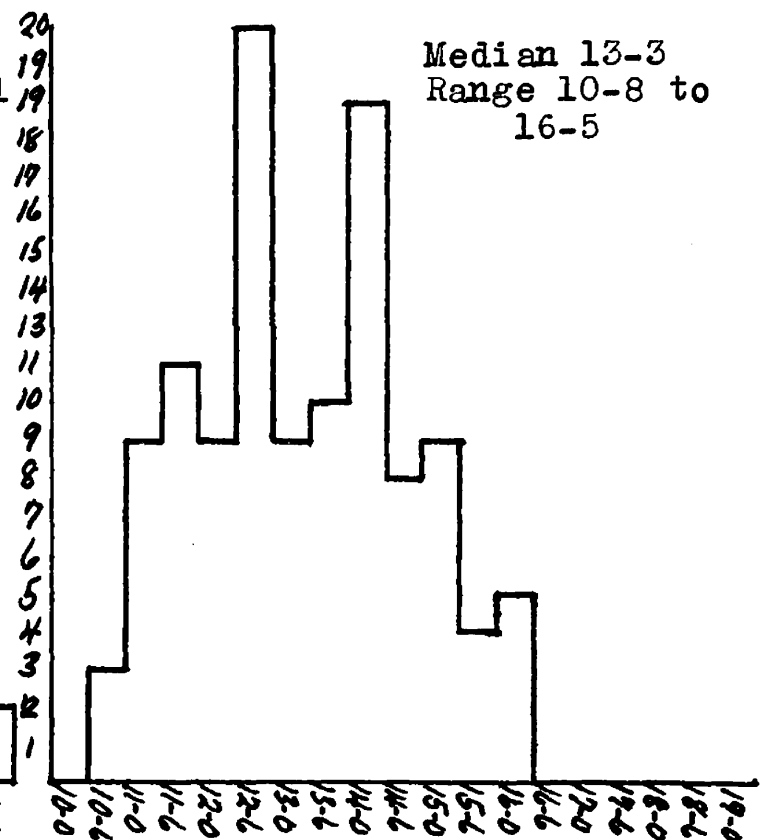
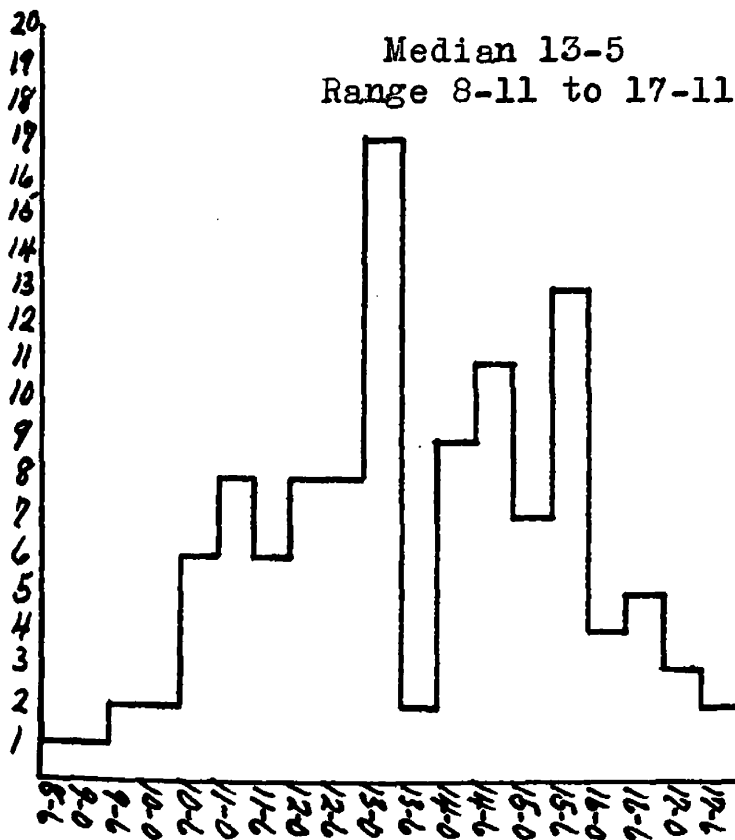
NATURE STUDY AGES

HISTORY & LITERATURE AGES



LANGUAGE AGES

SPELLING AGES



none of them show great extremes of ranges, nevertheless none of them show any general central tendency. Instead they show wide and rather flattened curves.

The arithmetic ages show a median arithmetic age of exactly the norm. The range in this subject was wide amounting in all to seven years and three months. The nature study ages show a median of fourteen years and one month, which was ten months above norm. The range in this subject was also quite large, since it amounted to seven years and nine months.

The median for the history and literature ages was six months above norm. In the eighth grade, a wide range occurred in these subjects, the seventh grade range being eight years and three months. The widest range in the seventh grade, however, occurred in the case of language usage ages. The range in this case was exactly nine years, from eight years and eleven months to seventeen years and eleven months. The median for the spelling ages was the same as the norm. The range was five years and nine months. Such wide ranges as that shown under language usage certainly require adjustment.

The histograms for the sixth grade are given on pages 104 and 105. The median chronological age for this grade was five months below norm. That was without a doubt one

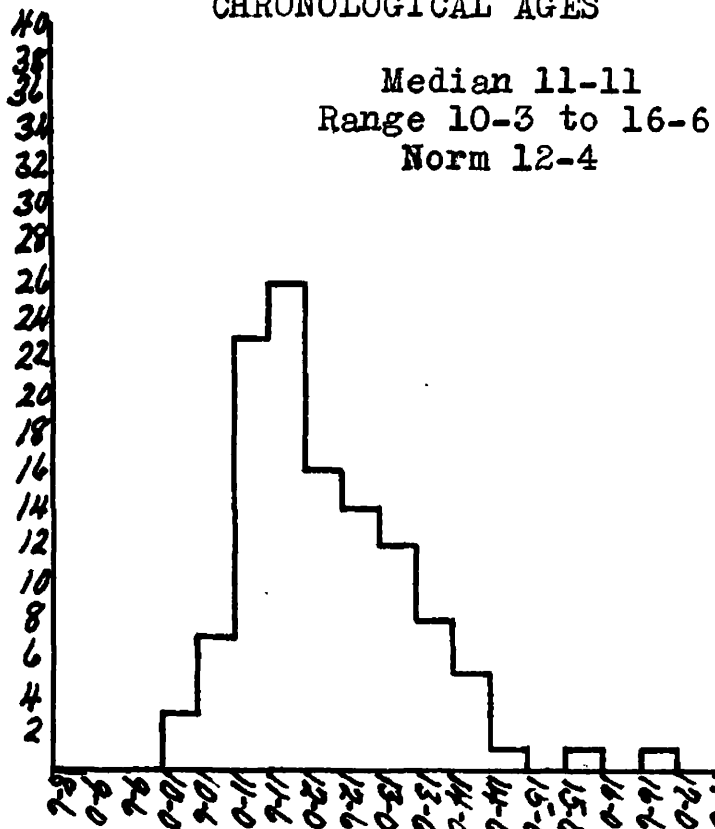
of the reasons for this grade making such a poor showing. In this grade there was but one median age in any subject which either equalled or exceeded the norm for the grade and subject. The one exception was in the case of nature study where the median age exceeded the norm by one month.

The median educational age was three months below norm. The range of the educational ages was exactly five years. The median for the reading ages was one month below norm, and the range was six years and nine months. The median arithmetic age was five months below norm and was equal to the median chronological age and median spelling age. The range in the arithmetic ages was exactly seven years. As mentioned in the paragraph above, the nature study age median exceeded the norm one month, while the range of nature study ages was six years and five months.

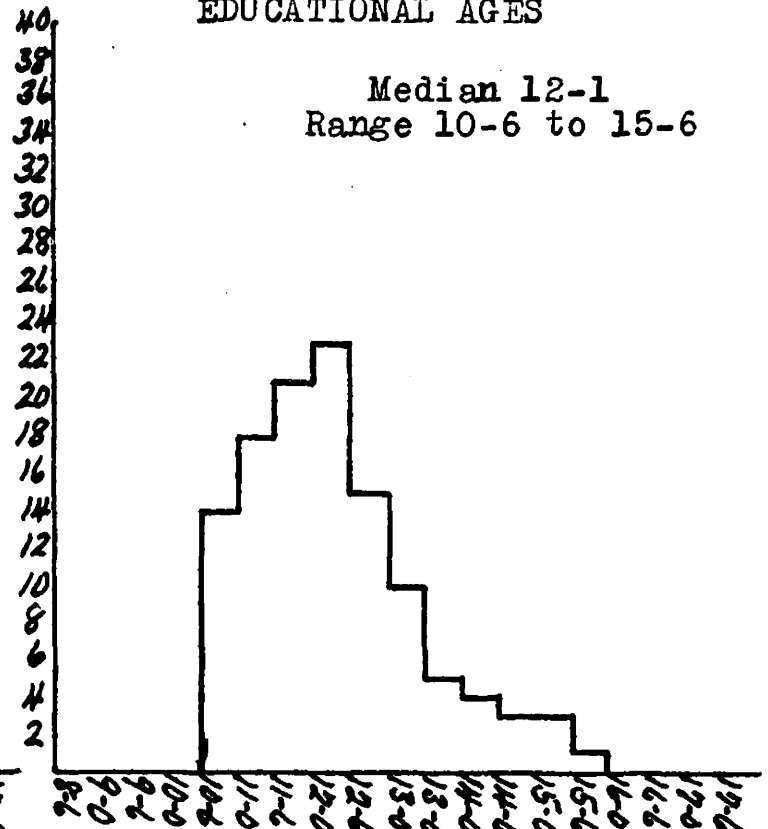
The median history and literature age was three months below the norm, and the range amounted to seven years. The median language age was the lowest of all the subject ages for the sixth grade, being nine months below the norm. As referred to in the previous section, this median coincided with the median for the fifth grade. The sixth grade median might have been even lower had the test measured lower rankings, because ten sixth grade students made the lowest possible score on the language test. The total range for this

DISTRIBUTION BY SUBJECT AGES GRADE VI

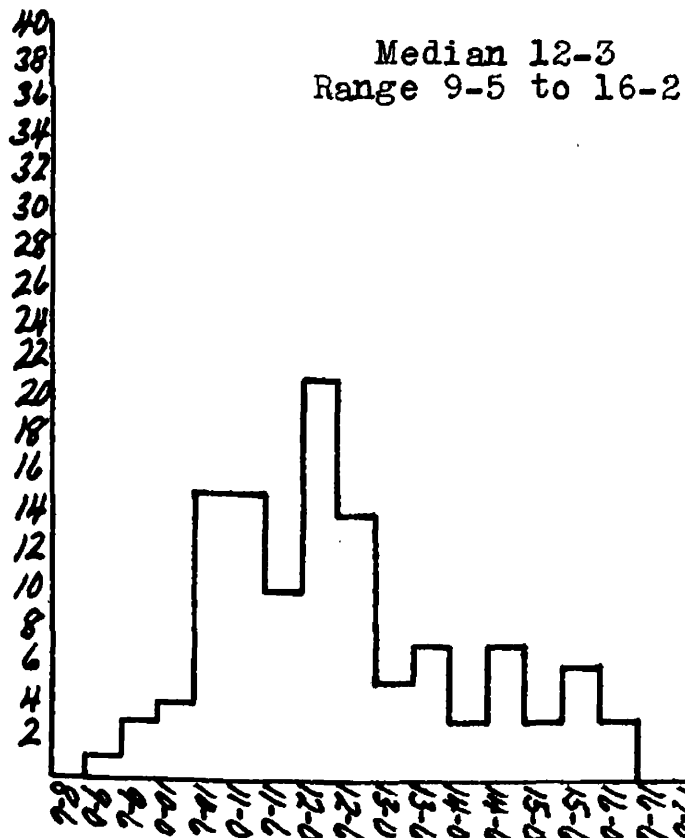
CHRONOLOGICAL AGES



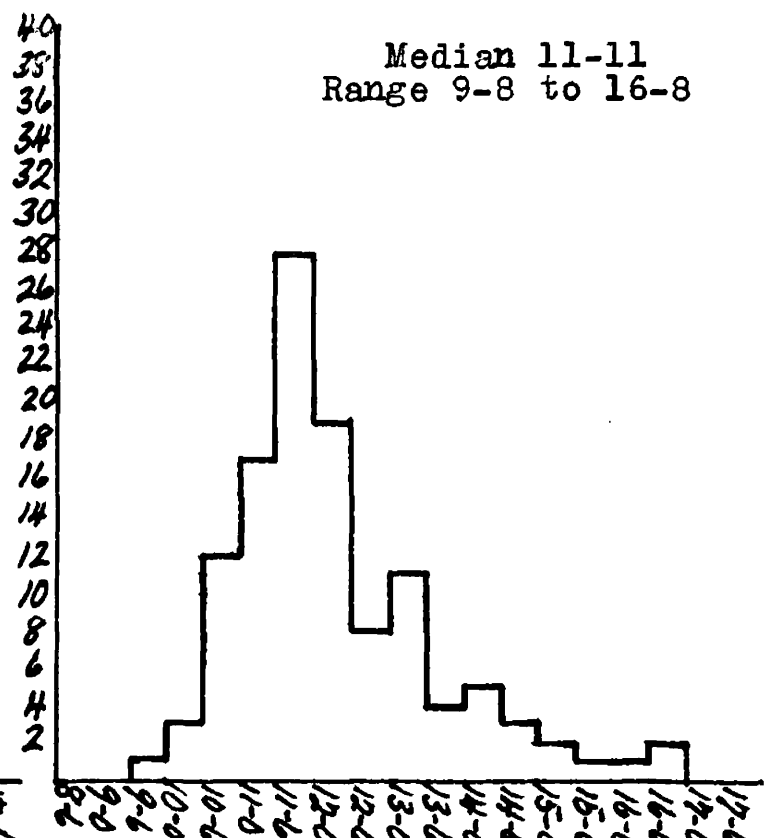
EDUCATIONAL AGES



READING AGES



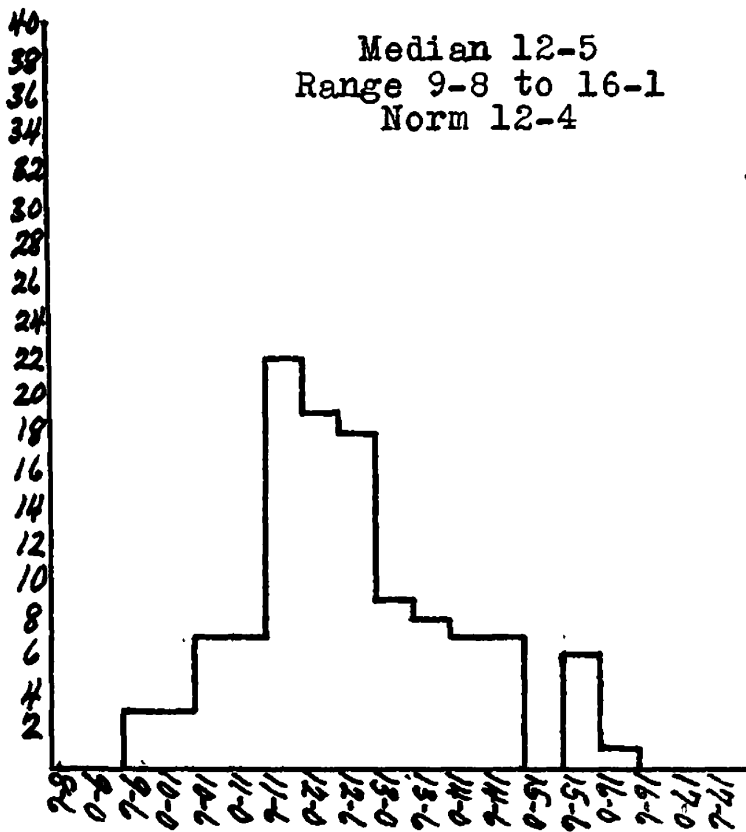
ARITHMETIC AGES



DISTRIBUTION BY SUBJECT AGES GRADE VI  
(Cont.)

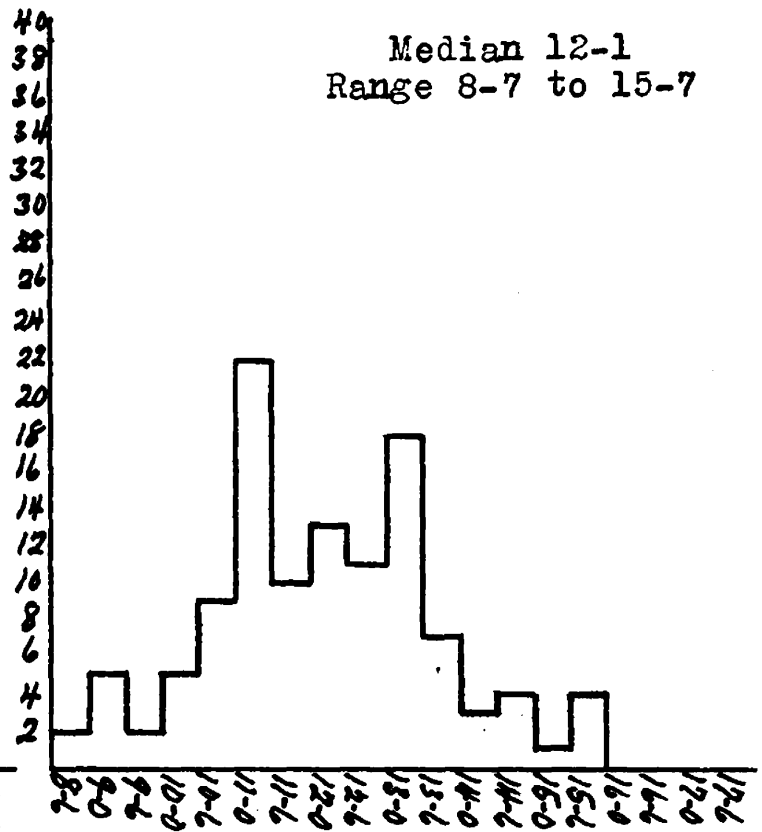
## NATURE STUDY AGES

Median 12-5  
Range 9-8 to 16-1  
Norm 12-4



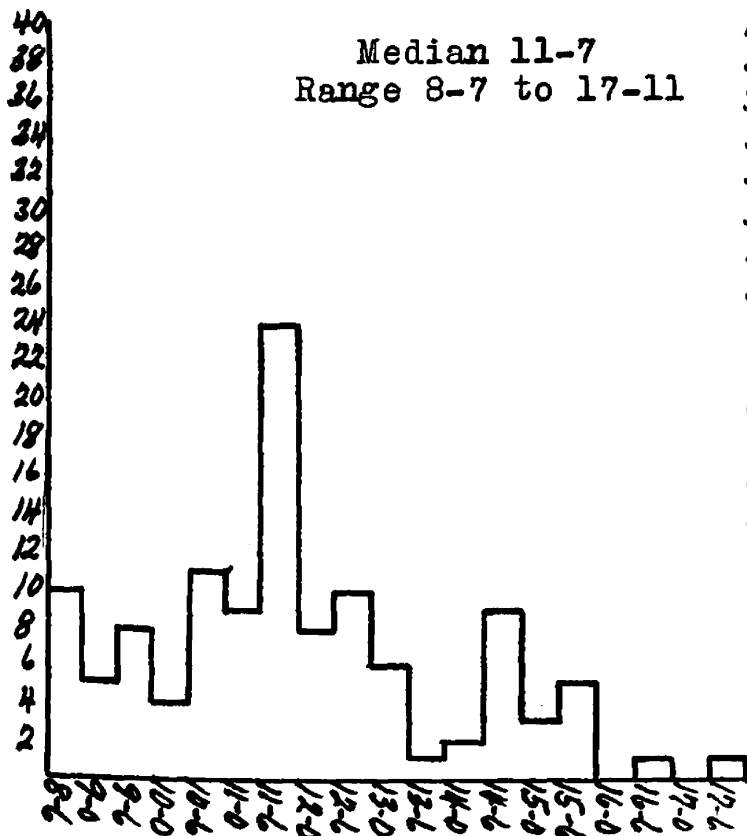
## HISTORY &amp; LITERATURE AGES

Median 12-1  
Range 8-7 to 15-7



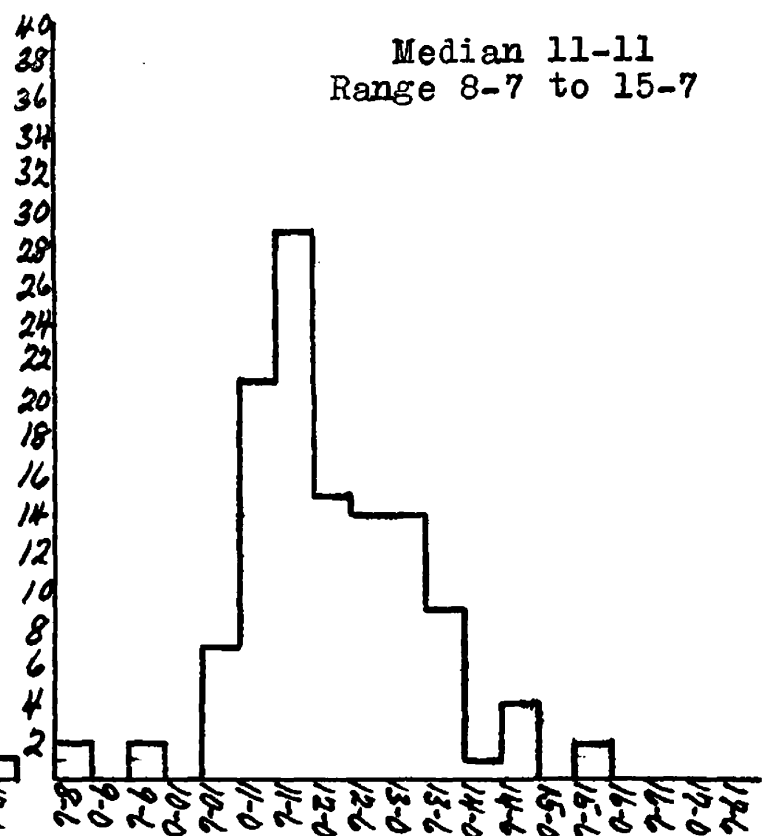
## LANGUAGE AGES

Median 11-7  
Range 8-7 to 17-11



## SPELLING AGES

Median 11-11  
Range 8-7 to 15-7



subject and this grade was the lowest encountered in carrying out this survey. The total range was nine years and four months but could easily have been greater if this particular language test had measured for lower scores. Such a range means that the total range was almost twice as great in years as the number of years this group of students has been in school.

The median spelling age was five months below norm, and the range in spelling ages amounted to exactly seven years. The normal expectation is to find the ranges decreasing from the higher grades down, but in this case there was very little change in the total ranges until the fourth grade was reached.

The histograms for the fifth grade are shown on pages 108 and 109. The median chronological age was five months below norm, while the total range of chronological ages amounted to five years and ten months. The median educational age was three months greater than the norm. The educational ages showed a range of four years and six months. The median for the reading ages was also three months above norm, while the total range of educational ages was six years and three months. The median arithmetic age was two months above norm, with a range of six years and four months.

The median nature study age was six months above norm, and the total range of nature study ages was six years and

two months. The median history and literature age was two months above norm, while the total range amounted to seven years and five months. The median language age was the same as the median history and literature ages, but the range was greater since it amounted to seven years and eight months. The median spelling age for the fifth grade was one month greater than the norm. The range in this case amounted to five years and three months.

Pages 111 and 112 contain the histograms for grade four. The median chronological age for this grade was seven months below norm, and the range amounted to three years and ten months. The median educational age exceeded the norm by two months and it exceeded the median chronological age by nine months or almost a year. The median reading age was ten years and nine months or three months above norm. The range for the reading ages was six years and eight months. The median arithmetic age was the same as the median reading age, the total range of arithmetic ages was only three years. This was the smallest range of subject ages encountered in making this survey.

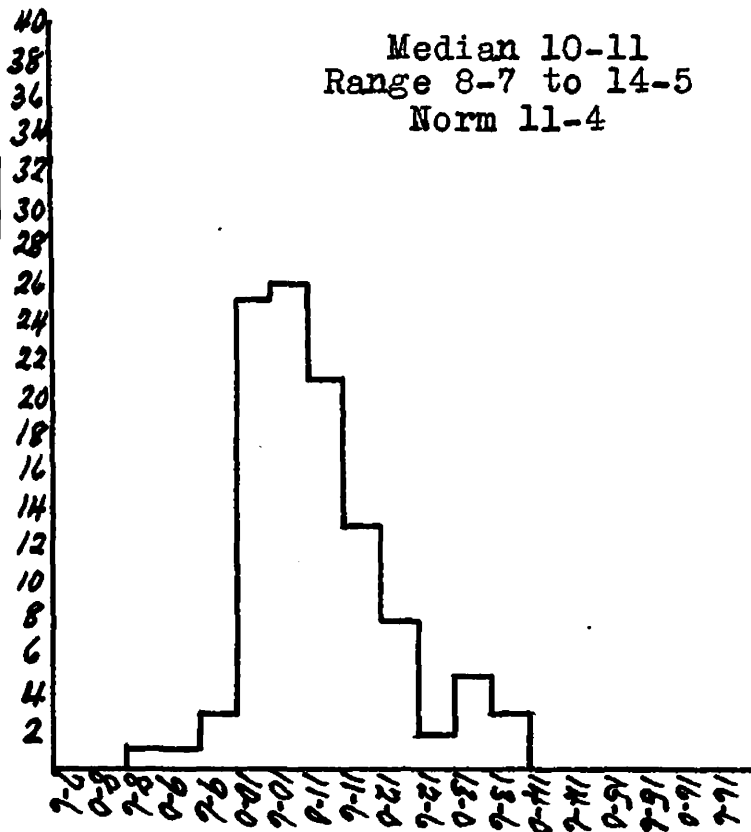
The median nature study age was also the same as the median reading age. The range in this case was six years and six months. The median history and literature age was one month below norm, while the total range was three years



DISTRIBUTION BY SUBJECT AGES GRADE V

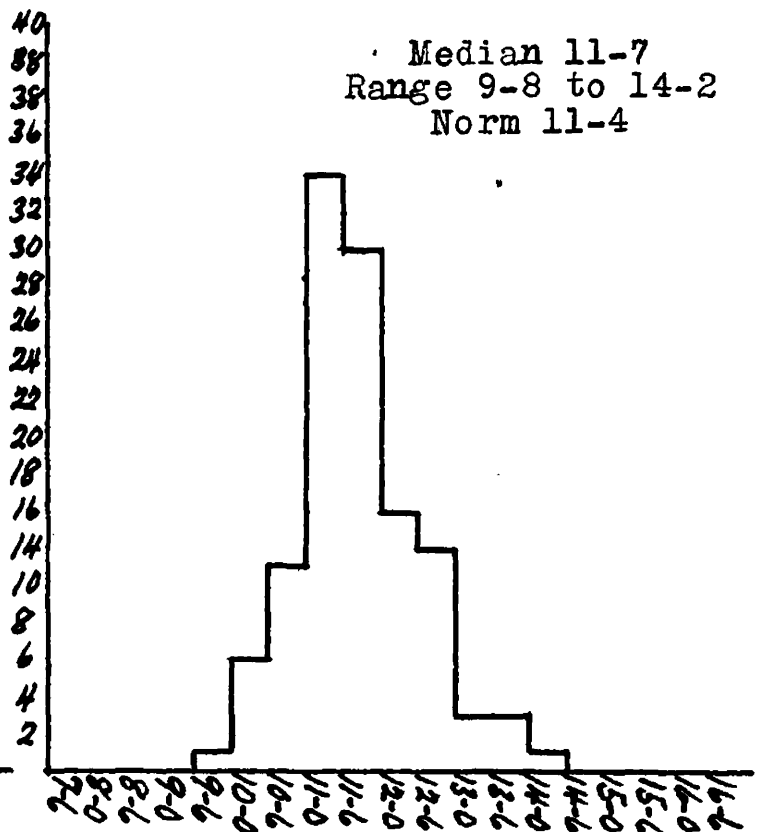
CHRONOLOGICAL AGES

Median 10-11  
Range 8-7 to 14-5  
Norm 11-4



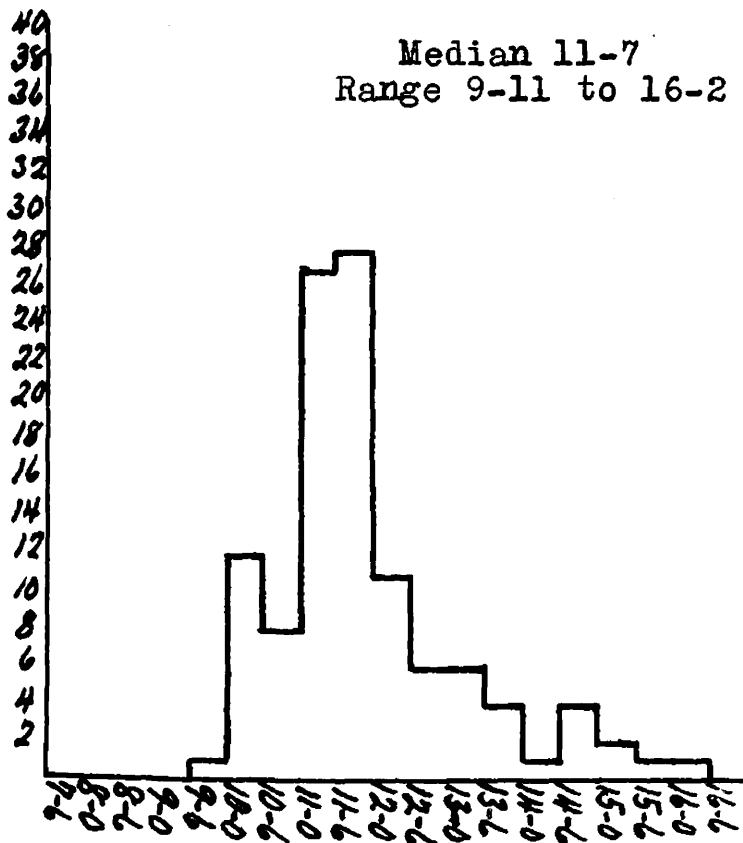
EDUCATIONAL AGES

Median 11-7  
Range 9-8 to 14-2  
Norm 11-4



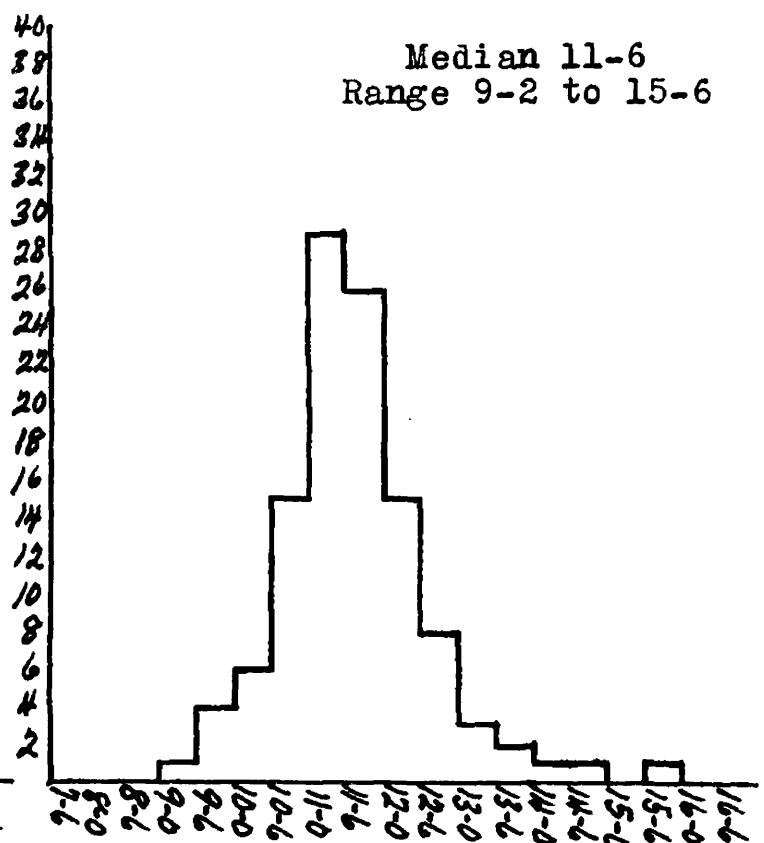
READING AGES

Median 11-7  
Range 9-11 to 16-2



ARITHMETIC AGES

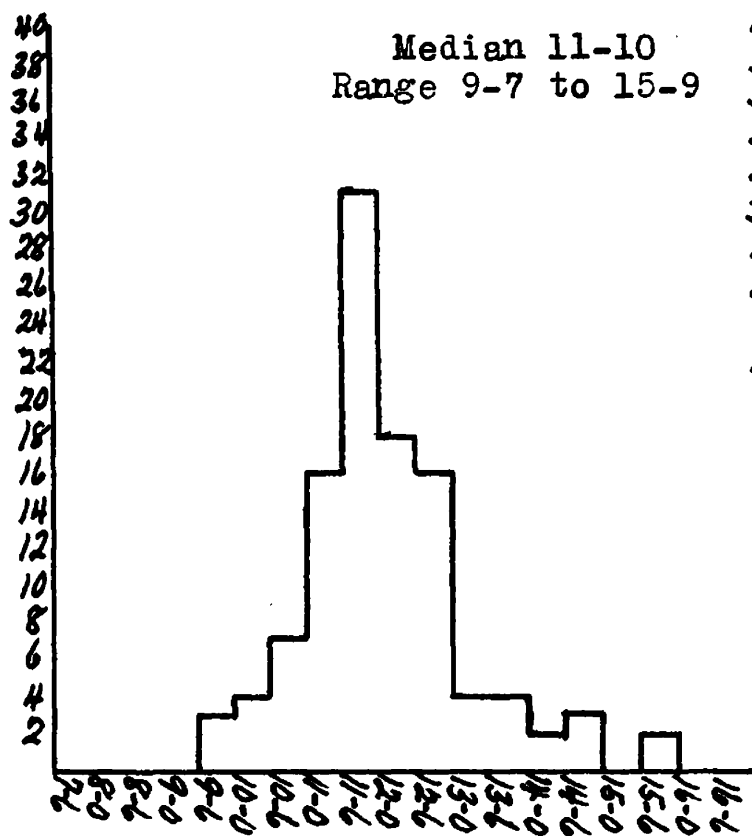
Median 11-6  
Range 9-2 to 15-6



DISTRIBUTION BY SUBJECT AGES GRADE V  
(Cont.)

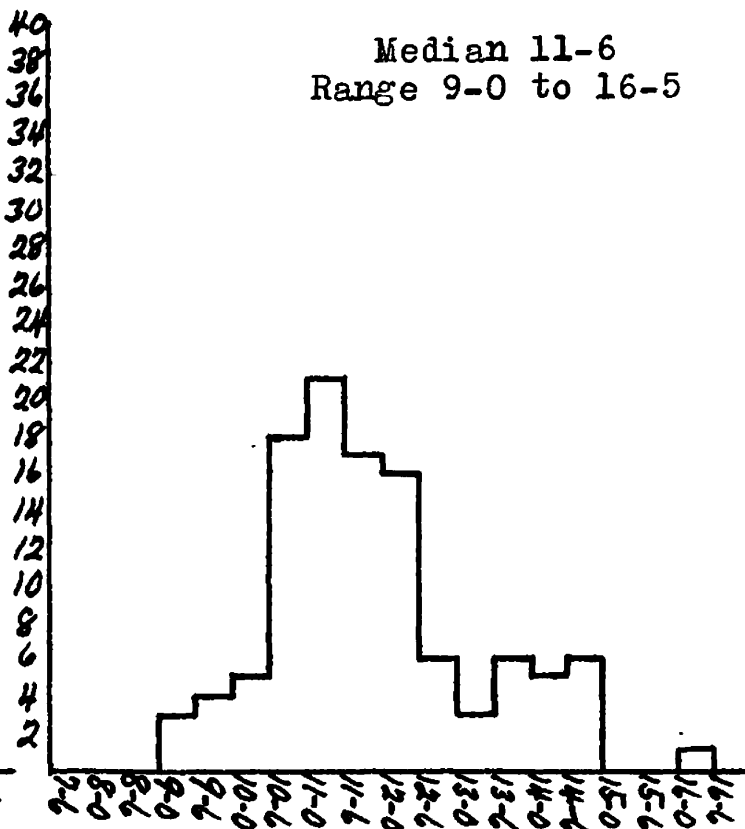
NATURE STUDY AGES

Median 11-10  
Range 9-7 to 15-9



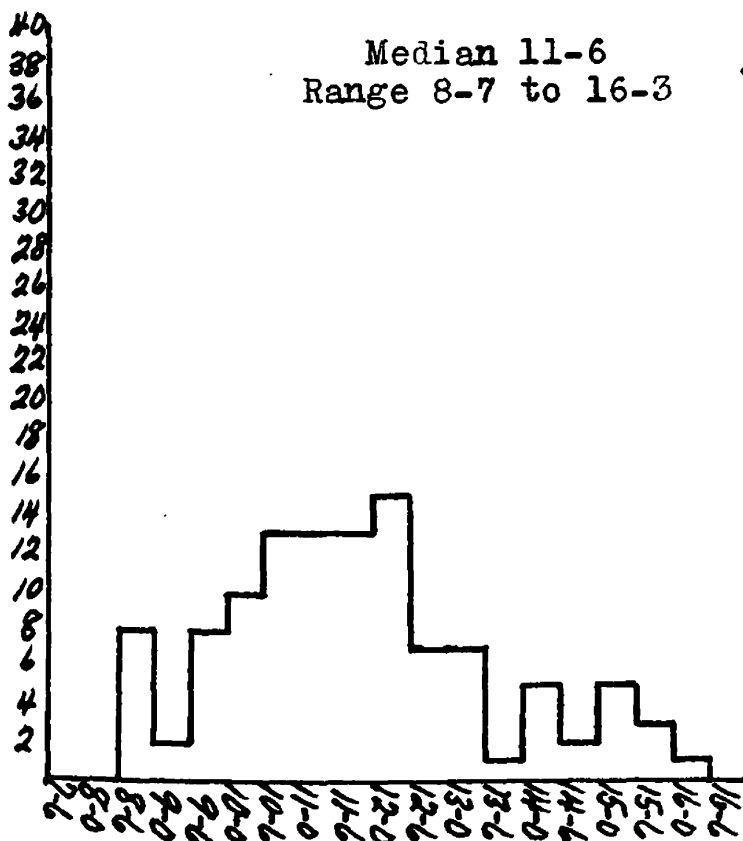
HISTORY &amp; LITERATURE AGES

Median 11-6  
Range 9-0 to 16-5



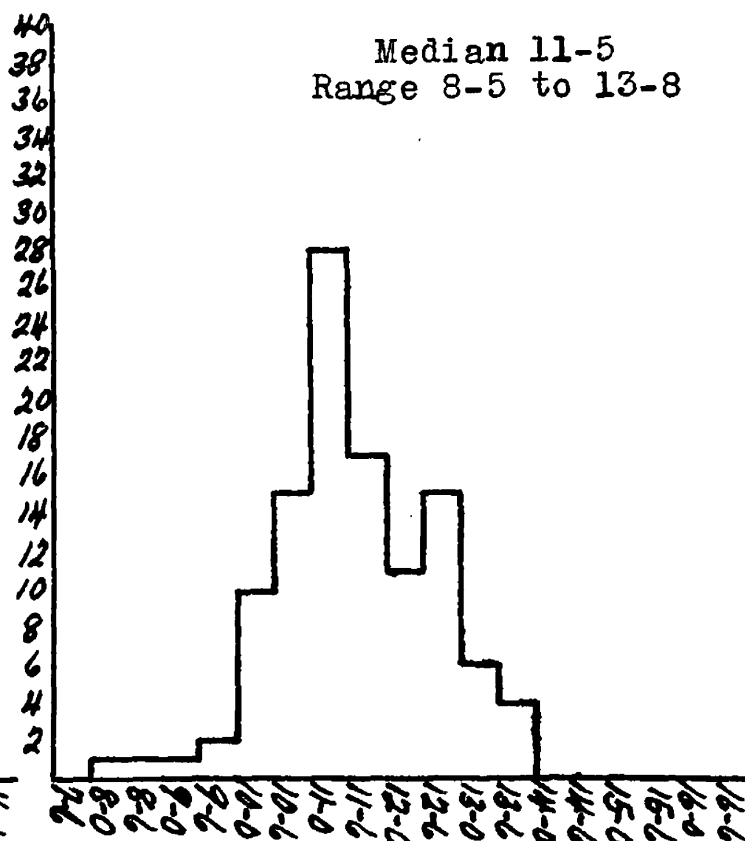
LANGUAGE AGES

Median 11-6  
Range 8-7 to 16-3



SPELLING AGES

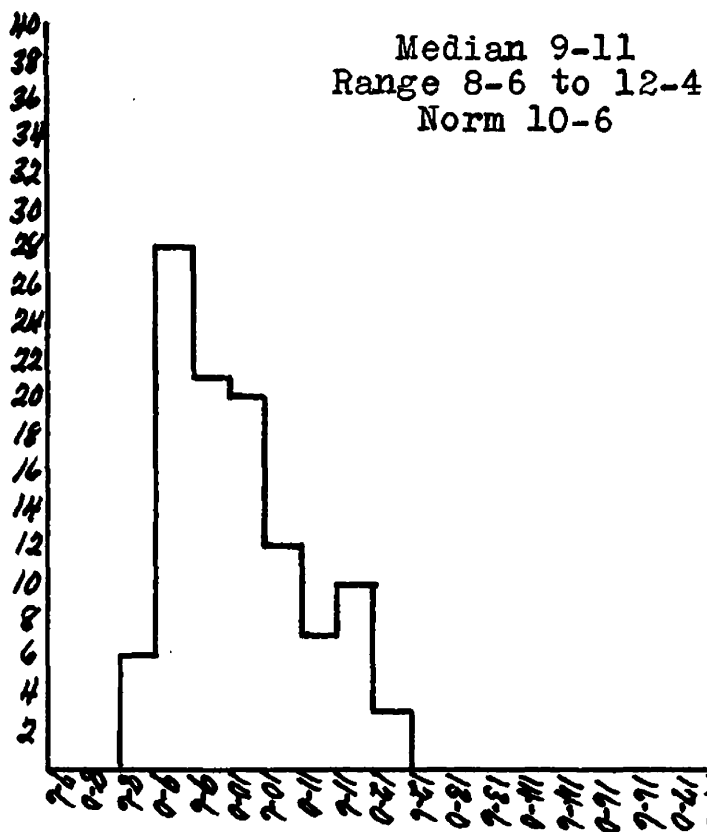
Median 11-5  
Range 8-5 to 13-8



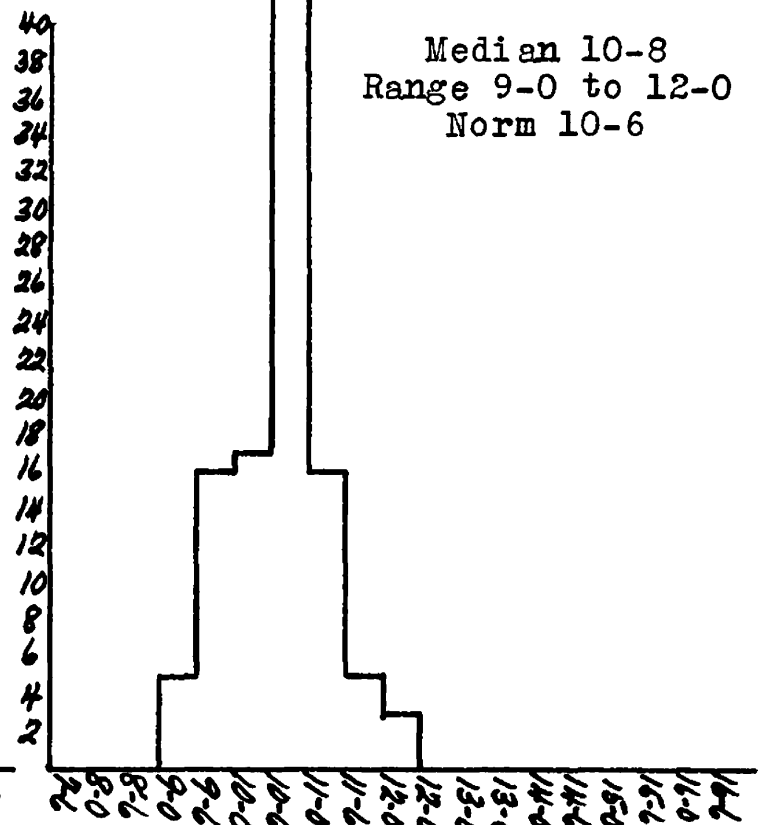
and eleven months. The median language age was the lowest median subject age for the fourth grade. It was three months below norm. Apparently sufficient emphasis was not being placed upon this subject in the fourth grade. The median spelling age for the grade was three months above norm, while the range amounted to four years and seven months.

DISTRIBUTION BY SUBJECT AGES GRADE IV

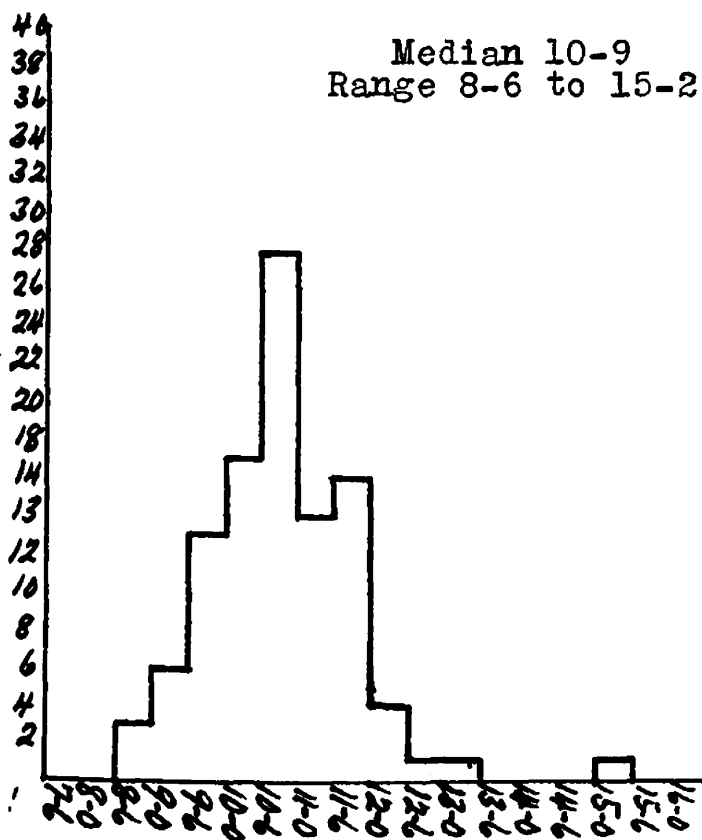
CHRONOLOGICAL AGES



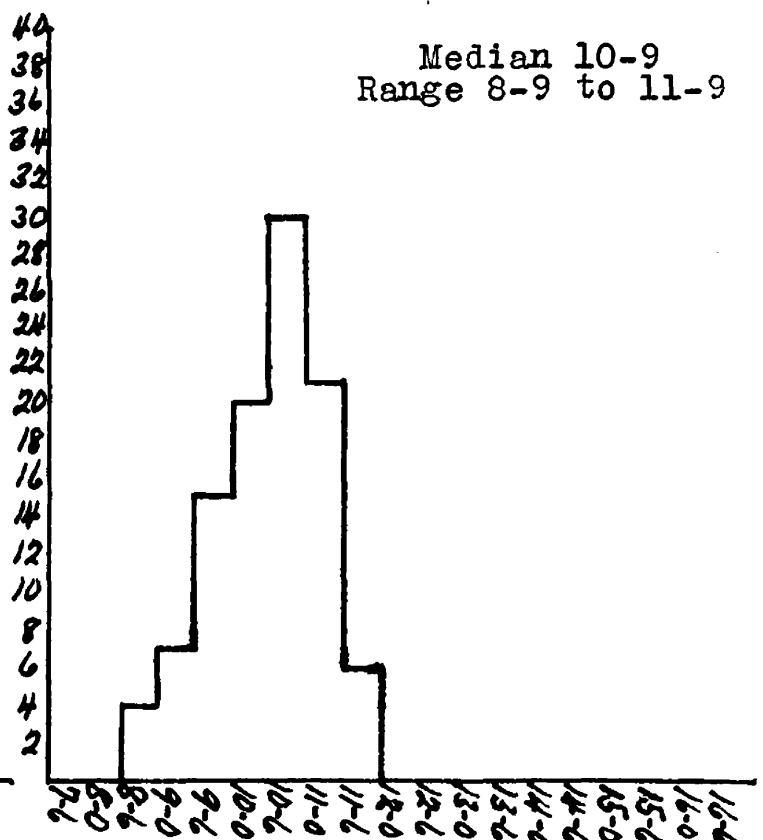
EDUCATIONAL AGES



READING AGES



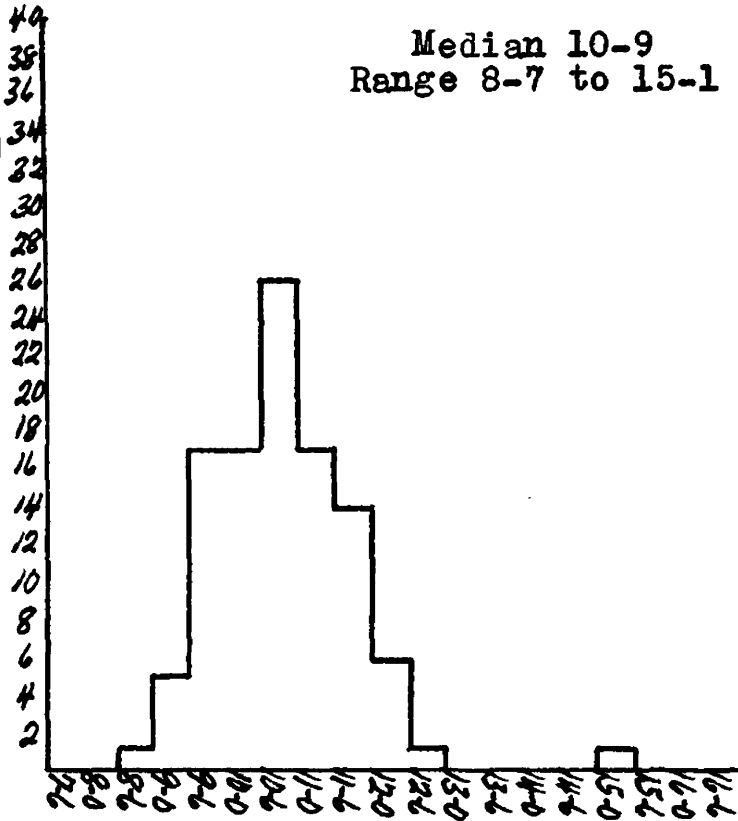
ARITHMETIC AGES



DISTRIBUTION BY SUBJECT AGES GRADE IV  
(Cont.)

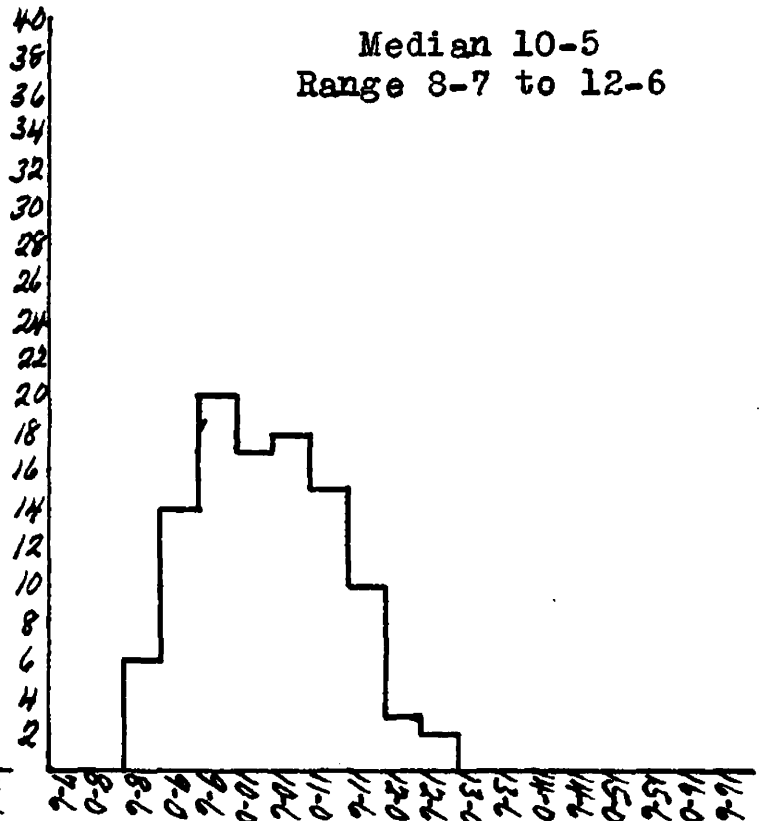
NATURE STUDY AGES

Median 10-9  
Range 8-7 to 15-1



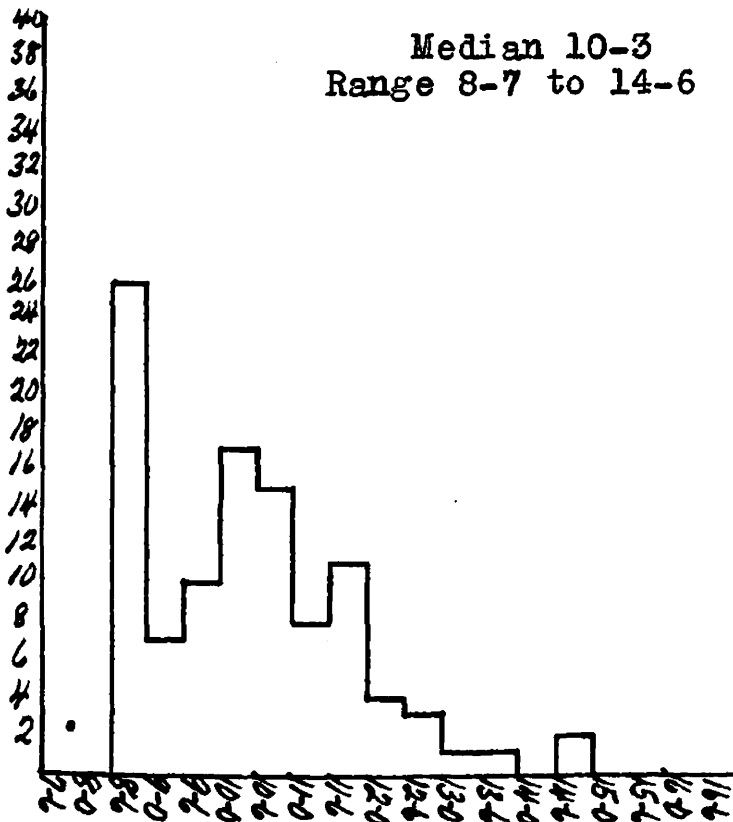
HISTORY & LITERATURE AGES

Median 10-5  
Range 8-7 to 12-6



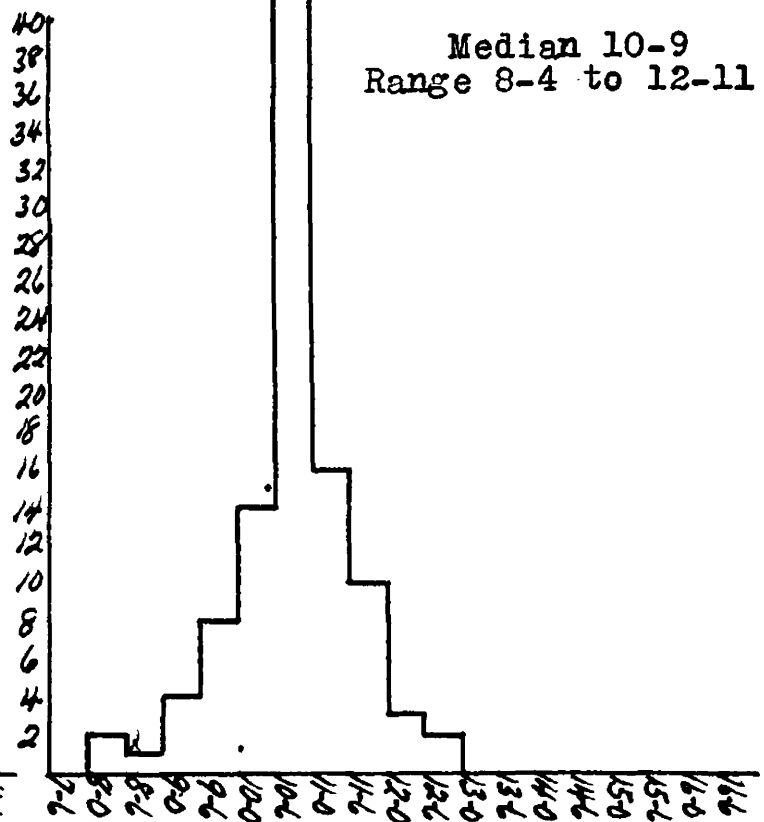
LANGUAGE AGES

Median 10-3  
Range 8-7 to 14-6



SPELLING AGES

Median 10-9  
Range 8-4 to 12-11



### Distribution of Scores By Subjects

Tables 13, 19, 20, 21, 22, 23, and 24, on pages 114 to 117 show the distribution of the actual scores by subjects and by grades. Very little comment concerning these tables is necessary because of discussions which have gone before. It is well to call attention to the very great over-lapping which occurred in all of the subjects. Such extensive over-lapping serves only to emphasize the need of adjustment as shown by the intelligence test results.

Another point which demands attention is the great number of zero scores which occurred in history and literature tests and in the language test. This is a condition which the constructors of the Stanford Achievement Test alone can remedy. But until these defects are corrected these particular tests cannot be counted as being very accurate tests for the measurement of achievement.

Tables 25, 26, 27, 28, 29, 30, and 31 on pages 118 to 121 show by subjects and by grades the scores for quartile I ( $Q_1$ ), Quartile III ( $Q_3$ ), Quartile Deviation (I.Q.), Median (Med.), Mean, Lowest Score, Highest Score, and Total Range. In four of the tables the greatest total range occurs in the sixth grade. In the case of reading, the greatest range occurs in the fourth grade, which shows a

DISTRIBUTION OF READING SCORES  
TABLE XVIII

SCORES GRADE	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260
IV	3	6	13	7	10	13	15	8	10	12	4	1		1		1							
V			1	5	7	3	5	15	13	22	11	5	3	5	4	6	1		1				
VI		1	2	2	3	6	8	8	9	8	17	12	6	8	5	7	6	4	2				
VII							1	3	5	15	13	9	9	16	11	11	8	4	6	2	1	1	
VIII							2	2	3	7	5	4	5	10	5	13	13	6	4	1	1		

DISTRIBUTION OF ARITHMETIC SCORES  
TABLE XIX

SCORES GRADE	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
IV	4	2	5	7	8	20	22	15	14	4	2															
V			1	2	3	5	11	13	20	14	12	10	5	8	3	2	1	1		1						
VI				1	2	5	8	8	9	10	13	10	9	8	11	4	5	3	2	1	1	2				
VII									4	5	9	10	15	10	14	10	10	9	4	5	6	1	3	2		1
VIII									1		6		2	8	9		9	12	6	17	8	3	2	5	1	1

DISTRIBUTION OF NATURE STUDY & SCIENCE SCORES  
TABLE XX

SCORES GRADE	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92
IV	5	13	12	12	19	9	8	10	4	2		1				1							
V		3	4	2	5	6	10	21	18	10	9	6	4	4	5		1						
VI		3	2	3	5	4	7	13	10	9	8	10	9	8	10	4	6		1				
VII							2	3	4	8	6	7	17	6	16	16	10	7	5	2	3	1	
VIII			1					3	2	2	3	2	9	6	10	17	7	3	6	9	8	1	

DISTRIBUTION OF HISTORY & LITERATURE SCORES  
TABLE XXI

SCORES GRADE	0	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88
IV	6	20	17	13	15	6	4	3	2														
V	3	4	5	13	21	14	9	10	6	3	4	2	5	6				1					
VI	7	2	5	9	22	10	7	6	11	14	6	5	3	4	1	4							
VII				4	4	6	7	7	9	10	7	11	15	11	6	8	3	4	1			2	2
VIII			1	1	1	5	5	7	10	5	4	2	6	7	8	15	7	5	1		1		1



DISTRIBUTION OF LANGUAGE USAGE SCORES  
TABLE XXII

SCORES GRADE	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
IV	26	7	10	17	15	8	11	4	3	1	1	1									
V	8	2	8	10	13	13	13	15	7	7	6	2	5	3	1						
VI	10	5	8	4	11	9	24	8	10	6	3	9	3	5		1	1				
VII	1	1	2	2	6	8	6	8	8	17	11	11	7	13	4	5	5				
VIII					4	4	10	7	4	8	8	13	6	10	5	2	5		2		

DISTRIBUTION OF SPELLING SCORES  
TABLE XXIII

SCORES GRADE	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200
IV	2	1	4	8	14	44	14	6	6	3	2											
V	1	1	1	2	10	15	24	11	10	11	12	5	4	4								
VI		1		1		7	15	11	24	15	11	7	10	9	1	4		1				
VII						3	4	6	10	9	13	4	7	10	19	8	9	4	5			
VIII							1		2	14	8	4	7	8	6	4	5	16	6	5	2	2

DISTRIBUTION OF TOTAL ACHIEVEMENT TEST SCORES  
TABLE XXIV

SCORES GRADE	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92
IV			5	10	9	14	33	12	12	5	1	2										
V				1	2	4	7	8	23	20	11	11	12	3	3	2						
VI							8	10	16	14	9	20	15	10	5	4	3	3	1			
VII									2	4	5	19	12	13	12	9	15	6	6	3	2	
VIII									1	1	2	6	10	6	9	13	7	7	16	8	2	1

READING SCORES  
TABLE 25

GRADE	$Q_1$	$Q_3$	Q.D.	Med.	Norm	Low	High	Range
VIII	158	210	26	190	190	105 -	249	144
VII	154	195	20	177	175	110 -	253	143
VI	125	182	23	154	155	63 -	225	157
V	125	155	15	137	129	82 -	225	143
IV	88	135	23	110	102	40 -	203	163

ARITHMETIC SCORES  
TABLE 26

GRADE	$Q_1$	$Q_3$	Q.D.	Med.	Norm	Low	High	Range
VIII	204	249	22	230	224	143 -	311	168
VII	184	227	21	201	201	137 -	307	170
VI	150	196	23	167	179	92 -	265	173
V	137	176	19	152	147	80 -	232	152
IV	100	131	15	121	112	60 -	162	102

NATURE STUDY & SCIENCE SCORES  
TABLE 27

GRADE	Q <sub>1</sub>	Q <sub>3</sub>	Q.D.	Med.	Norm	Low	High	Range
VIII	59	76	8	69	63	16	85	69
VII	52	71	9	60	56	31	90	59
VI	33	59	10	47	46	11	76	65
V	33	50	8	39	32	9	73	64
IV	17	32	7	24	21	1	67	66

HISTORY & LITERATURE SCORES  
TABLE 28

GRADE	Q <sub>1</sub>	Q <sub>3</sub>	Q.D.	Med.	Norm	Low	High	Range
VIII	38	65	14	51	54	11	85	74
VII	35	57	11	46	42	15	85	70
VI	19	40	10	29	31	0	63	63
V	16	35	9	22	20	2	74	72
IV	6	19	6	11	12	0	28	28

LANGUAGE USAGE SCORES  
TABLE 29

GRADE	Q <sub>1</sub>	Q <sub>3</sub>	Q.D.	Med.	Norm	Low	High	Range
VIII	24	40	8	34	34	12 - 56		44
VII	24	39	7	30	29	2 - 52		50
VI	13	28	7	20	24	0 - 52		52
V	12	27	7	20	19	0 - 44		44
IV	3	18	7	11	12	0 - 34		34

SPELLING SCORES  
TABLE 30

GRADE	Q <sub>1</sub>	Q <sub>3</sub>	Q.D.	Med.	Norm	Low	High	Range
VIII	133	174	18	148	155	93 - 206		113
VII	114	154	20	137	137	75 - 183		103
VI	95	132	18	107	114	40 - 172		132
V	83	114	10	95	93	35 - 144		109
IV	69	89	10	77	71	30 - 120		99

TOTAL SCORES  
TABLE 31

GRADE	Q <sub>1</sub>	Q <sub>3</sub>	Q.D.	Med.	Norm	Low	High	Range
VIII	64	80	8	72	72	41 - 92		51
VII	56	73	8	65	64	41 - 91		50
VI	45	61	8	53	55	33 - 79		46
V	42	54	6	47	44	25 - 70		45
IV	30	40	5	35	33	18 - 52		34

total range of one hundred and sixty-three points. Since these tables are largely self-explanatory and since most of the important points shown have been covered by previous discussion, no further comments will be made upon them.

### Summary And Conclusions

Educationally (rank according to achievement as measured by the battery of achievement tests) the children of Judith Basin County showed a much higher percentage of children who were over-age educationally than of children who are under-age. As a matter of fact there was not a child below grade (educationally) in any fourth grade in the county.

It is startling that only 34% or one-third of the eighth grade girls of the county were educationally at age for their grade, 50% of them being over-age educationally and the remaining 16% under-age. These situations only serve to emphasize the drastic need of adjustments as shown in Chapter III.

Taken as a whole, 30% of the children were educationally over-age for their grade and 9% were under-age. The percentage of under-ageness was in general not only undesirable but was critically bad in special cases, as for example, among the eighth grade boys, 30% or almost one-third of whom were educationally under-age for their grade.

The vast amount of overlapping of educational ages in the various grades becomes very apparent when it is shown that at least fifty percent of the students in the fifth grade was



older educationally than at least two of the students in the eighth grade.

The fact that all of the medians in the Reading Paragraph Meaning Tests were above norm and the medians in the Reading Sentence Meaning Tests were in every case below norm seems to show that paragraph meaning in reading was over-emphasized and sentence meaning under-emphasized in Judith Basin County. But when the same variation is emphasized and in the same manner, in the case of the Missoula and Stevensville schools (Chart 26, page 143 in the chapter on Comparisons), then the situation seems to show that the tests have been improperly standardized, or else that there were a number of schools in this state which were over-emphasizing paragraph meaning in reading and under-emphasizing sentence meaning. If the latter case was true, it was probably due to our state course of study in reading.

The median educational ages for every grade were above either the median chronological ages or the median mental ages. This would show that either the students in the Judith Basin County schools had abnormally high I.Q.'s or that the teachers of the county were working at a very high degree of efficiency. The first situation cannot very well have been true, since, as it was shown in the previous

chapter, the median I.Q.'s for the different grades were on an average just normal. It remains then that the second situation must be true, namely, that the teachers of this county were working at a much higher degree of efficiency than the teachers in the average school system.

The fact that there was a much greater difference between the median educational ages and the median chronological and mental ages in the lower grades, seems to indicate that the best grade of teaching was being done in the lower grades.

The median total scores or educational ages were above the norm or standard in every grade except the sixth. Considering the median mental ages, the cause for the poor showing made by the sixth grade lies at least partially in the lack of mental capacity on the part of the students in that grade.

The range of chronological ages for the eighth graders in Judith Basin County was five years and nine months as compared to a range of ten years for the state as a whole. The State range of chronological ages was four years and three months greater than the range in the eighth grades of Judith Basin County.

The reading ages in the eighth grades of the county

show a range of from ten years and seven months to seventeen years and two months, or a total range of reading ages in the eight grades of six years and seven months.

There is a sharp division line between a poor group and a good group in the distribution curves for every subject in the eighth grade.

The range in arithmetic ages is still greater even than that in reading, amounting to seven years and three months in the eighth grade alone.

The range in the case of nature study was wider still, totaling eight years and two months, while the range of history and literature ages was the greatest of all, amounting to eight years and seven months.

The total range in the case of the language ages was exactly eight years.

The median for the spelling ages in the eighth grade was the lowest of the entire group, the median being six months below norm.

#### Seventh Grade

The Median chronological age in the seventh grade was six months below norm.

The Median educational age was two months above norm.

The Median reading age was also two months above norm.

The median arithmetic age was exactly the norm or standard.

The median for the history and literature tests was six months above norm.

The widest range in the seventh grade occurs in the case of the language usage ages, which was exactly nine years, or one year greater than in the eighth grade.

The median for the spelling ages was the same as the norm.

#### Sixth Grade

Median chronological age for the sixth grade was five months below norm.

The median educational age or total score was three months below norm.

Median reading age was one month below norm.

Median arithmetic age was five months below norm.

Median nature study age exceeded the norm by one month.

Median history and literature age was three months below the norm.

The median language age was the lowest of all the subject ages for the sixth grade, being nine months below the norm. It is especially important that the median for the sixth grade in language coincided with the median for the

fifth grade.

The median spelling age was five months below norm, and the range in spelling ages amounted to exactly seven years.

The normal expectation is to find the ranges decreasing from the higher grades down, but in the case of this survey, there was very little change in the total ranges until the fourth grade was reached.

#### Fifth Grade

The Median chronological age for the fifth grade was five months below norm.

Median educational age was three months greater than the norm.

Median reading age was also three months above norm.

Median arithmetic age was two months above norm.

Median nature study age was six months above norm.

The median history and literature age was two months above the norm.

The median language age was also two months above norm, while the total range is the largest for this grade, amounting in all to seven years and eight months.

The median spelling age was one month greater than the norm.

Grade Four

The median chronological age for the fourth grade was seven months below norm.

The median educational age or total score exceeded the norm by two months and exceeded the median chronological age by nine months or almost a year.

The median reading age was three months above norm, while the total range in reading ages amounted to six years and eight months.

The median arithmetic age was the same as the median reading age, but the total range of arithmetic ages was only three years. This was the smallest range of subject ages encountered in making this survey.

The median nature study age was also three months above norm.

The median history and literature age was one month below norm.

The median language age was the lowest median subject age for the fourth grade. It was three months below norm.

The median spelling age for the grade was three months above norm.

The great number of zero scores in the history and literature test and in the language test demand the attention

of the test builders, because tests giving such a large number of zero scores cannot be considered accurate instruments for the measurement of achievement.

## Chapter V

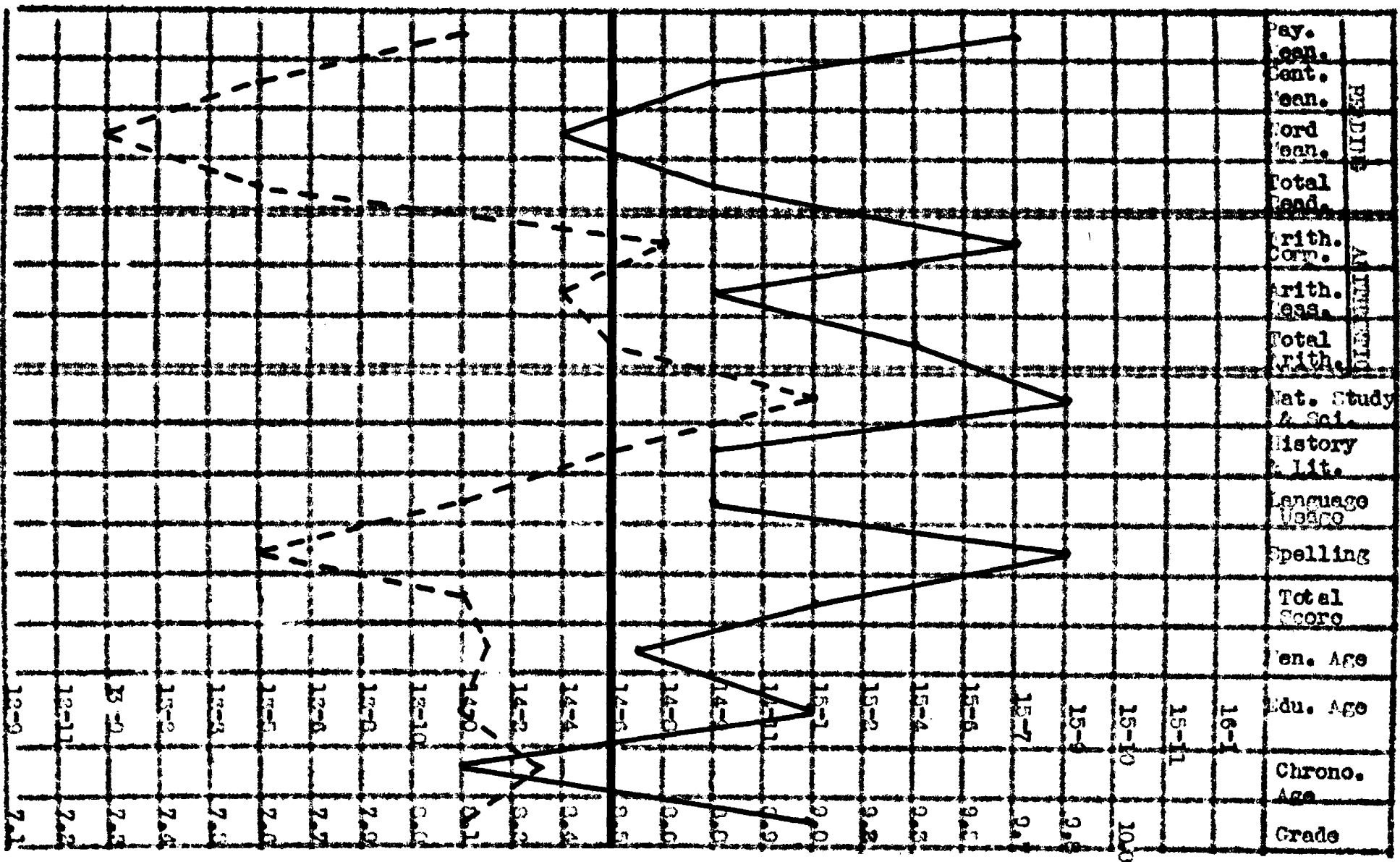
### Comparisons

#### Boys vs. Girls

Chart 23, page 132, compares the medians for all of the eighth grade boys and the medians for all of the eighth grade girls in Judith Basin County in the various subjects. An additional column has been added in order to compare the mental ages of the two groups. This column shows that the mental age of the girls in the eighth grades exceeded that of the boys by two months, and that neither were quite up to the norm. It will be recalled that in the chapter on Intelligence Testing a comparison was made between the I. Q.'s of the boys and of the girls and that the girls exceeded the boys in all but the fifth grade. But taking the median I. Q.'s for the boys of all the grades tested and comparing them with the medians for the girls showed the girls to have on the average an I. Q. two points higher than the boys.

Are girls brighter than boys of the same age? This survey seems to show but a slight difference in favor of the girls, but Lincoln, in his book, "Sex Differences in School Children", was previously quoted as suggesting that they are, at least up to the ages fourteen or fifteen, because of the





advanced maturity of the girls, -- indicated by most anatomical and physiological tests. But most intelligence tests do not show this. Lincoln says that the reason they do not show more difference is due to most intelligence tests being weighted in favor of the boys.

Commins states that the McCall multi-mental scale showed a consistent difference in favor of the girls, but that the National Intelligence Test showed no difference between boys and girls when given to the same group.<sup>15</sup> Therefore the question, "Are the ordinary Intelligence Tests weighted in favor of the boys?" Wahlquist found that the girls consistently showed higher I.Q.'s than the boys both in the rural schools and in the towns.<sup>16</sup> The differences as found by Wahlquist were much greater in the case of the rural children than in case of the urban children. The Utah Survey found the girls to have higher intelligence quotients and higher mental ages in all grades.

Chart 24, also shows the girls more advanced for their grade than the boys when chronological ages are considered, since the girls were two months younger than the boys and six months under the norm for the eighth grade. A comparison

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15. Commins, Sch. And Soc., (Vol. 23) pp. 599-600.

16. Wahlquist, Elem. Sch. Jr. (Vol. 27) 1926, p. 682-91.

of these chronological ages appeared at the beginning of the chapter on Intelligence Testing. When Educational Ages or achievement is considered, the girls showed themselves to be thirteen months more advanced than the boys. The median educational age for the girls was seven months above norm, while the median for the boys was six months below norm.

A closer study of the chart shows that the girls were superior to the boys in every subject and every test. Commins however, found the boys to be superior to the girls in arithmetic, nature study, history and literature, while the girls surpassed the boys in reading, language usage and dictation. Commins used the Stanford Achievement Tests, so that the difference is not due to the use of different tests. The Utah Survey found the girls to be superior to the boys in everything but history and literature.

In Chart 24 the curve for the boys follows quite closely the contour of the curve for the girls with the notable exception of spelling, in which subject the curves diverge radically in opposite directions. There was a difference of two years and four months between the spelling age of the girls and of the boys. The median score for the boys was nearest the median score for the girls in the history and literature test, in which case there was only a difference of three months.

Town vs. Rural

Chart 25, page 140, presents a graphic comparison of the results of the testing in Judith Basin County for the rural one-teacher and two-teacher schools as contrasted to the results from the third class district schools. The rural students were one month younger than the third class district children. At the same time the rural children were five months under-age chronologically. Mentally, the rural children were three months younger than the town children, and four months under the norm. Educationally, the rural students were one year and eight months below the urban children, and eight months below the norm.

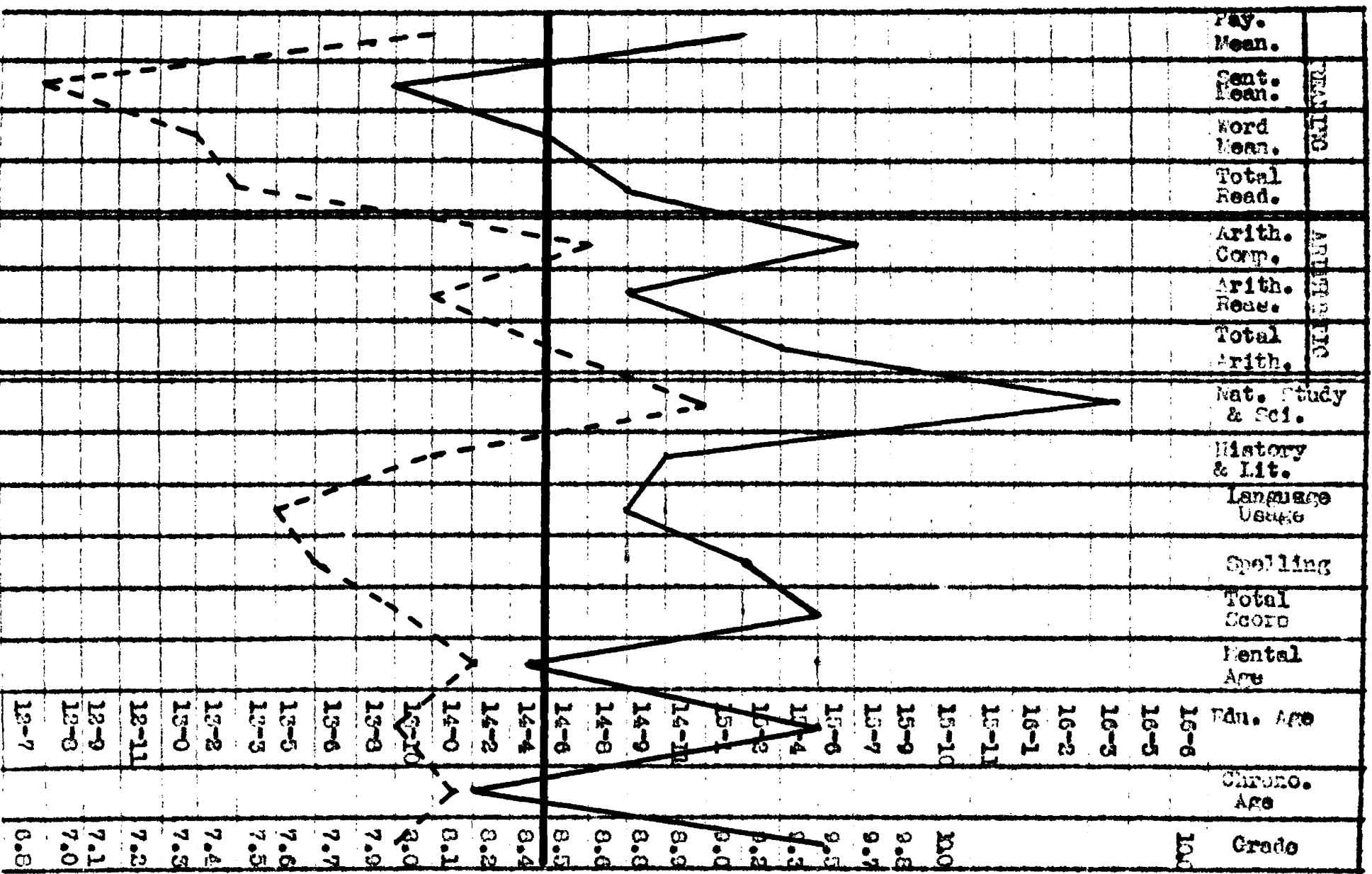
Wahlquist found in comparing the scores of the different grades in the rural schools with the scores in the same grades in the town schools that the former were four and one-third school months below the norm, whereas the latter were seven and two-thirds school months above the norm. Wahlquist found that the average difference in educational achievement between the country school districts and the city districts, as measured by the Stanford Achievement Tests, was twelve and three-tenths months. The difference in the case of the Judith Basin County students was eight months greater. This is a very important difference

especially when it is considered that Judith Basin County has no real city schools, the third class district schools being the nearest approach to be had in the county. Such wide differences as were shown in this county suggest the need of better supervision and administration. No doubt the main cause of the trouble lies in the very small rural schools with teachers who had only high school normal training courses. This lack of preparation has been dealt with by recent legislation raising the standards of requirements for teachers so that they can no longer go directly out from high school and attempt to teach.<sup>17</sup>

These three important ages considered, it is very apparent that the rural children were more advanced in school than they should be even if the chronological ages alone were considered. It is the common conception that town children are more advanced beyond what their chronological age normally calls for than are the rural children. But with Judith Basin County, just the opposite was true, because the rural children were younger chronologically for the grade in which they were enrolled than were the town children. Such advancement was certainly not justified,

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17. Wahlquist, Elen, Sch. Jr., (Vol. 27) 1926, p. 682-91.



as shown by the mental and educational ages. The above facts cause the writer to suggest that the number allowed to skip grades in the rural schools should be especially limited.

As in the case of the boys and girls the general contour of the curves for the rural and the town schools are quite similar, with the exception of language and spelling. In both subjects the gap between the two groups is greatly widened. The reason for the widening gap in these two subjects is rather hard to determine, especially in the case of spelling. Spelling is concrete enough that every teacher should be able to tell when she is accomplishing results in that subject. Of course, in the matter of language usage the urban child has some advantage, since he is more likely to come in contact with good language in his every-day contacts.

This chart tends to show the decided superiority of the town or consolidated school over the small rural school and suggests that the children would receive better training if the smaller rural schools were closed and the children provided means of attending the larger schools. This particular survey shows possibly even more than other surveys

which have been made the marked superiority of the town or large school, because in this case the students are of nearly equal chronological and mental ages; but, due apparently to a difference in educational facilities under which they receive their training, they have widely different educational ages.

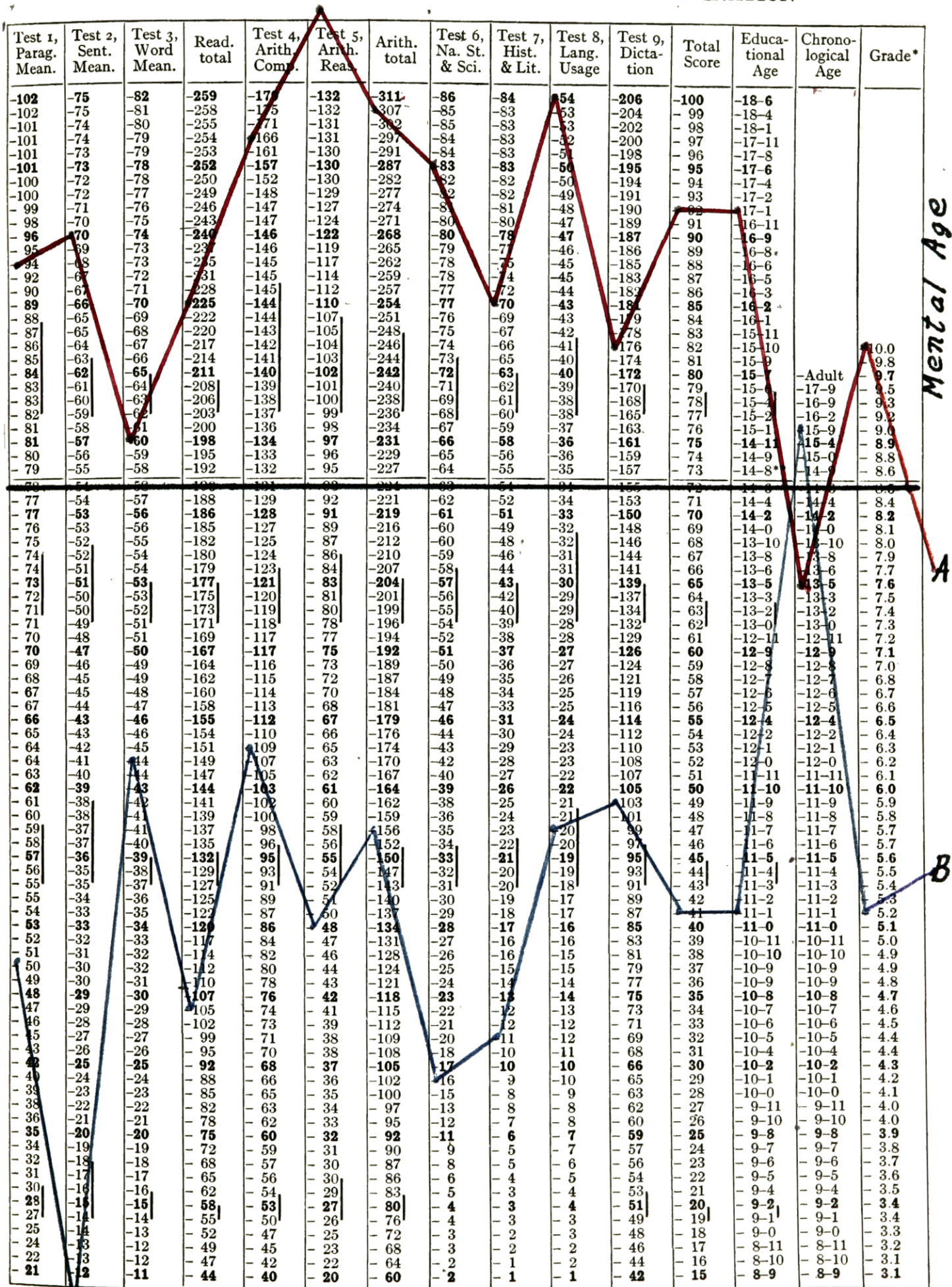
Highest Eighth-Grader vs. Lowest

Chart 25, page 140, contrasts the scores of the highest eighth grader and the lowest eighth grader in Judith Basin County. Odd as it may seem, both cases were girls. Pupil A or the highest student had a mental age of only thirteen years and six months or twelve months below the norm for the eighth grade. Her intelligence quotient was only one hundred and two, quite normal. But her educational age was seventeen years and one month or three years and eight months above her chronological age. The writer investigated the situation and found that the apparent cause of her high scholarship was her great amount of ambition and industry. The writer would suggest that pupil A be given another intelligence test to make sure that no error had been made in giving her the first intelligence test.

Pupil B or the lowest pupil had a mental age of eleven years and four months with an intelligence quotient of sixty-



## EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION



Mental Age

A

B

eight. Her chronological age was two years and four months greater than the chronological age of Pupil A. Pupil B's educational age was three months below her mental age, showing that her ratio of efficiency was very low. This may have been the result of her being completely beyond her depth. Fifth grade work would have been plenty difficult for her. It is noteworthy that her educational age was four years and eight months below her chronological age. It is also noteworthy that her score on the reading sentence meaning test was so low that it could not even be recorded on the chart.

Contrary to the popular opinion that superior students owe their superiority to extraordinary reading power, Pupil A, made a lower score in reading than in any other subject outside of spelling. The wide difference between the scores of Pupil A and those of Pupil B only add proof of the extreme differences which occur in each grade. It helps to emphasize the demand for adjustments.

Judith Basin vs. Missoula vs. Stevensville

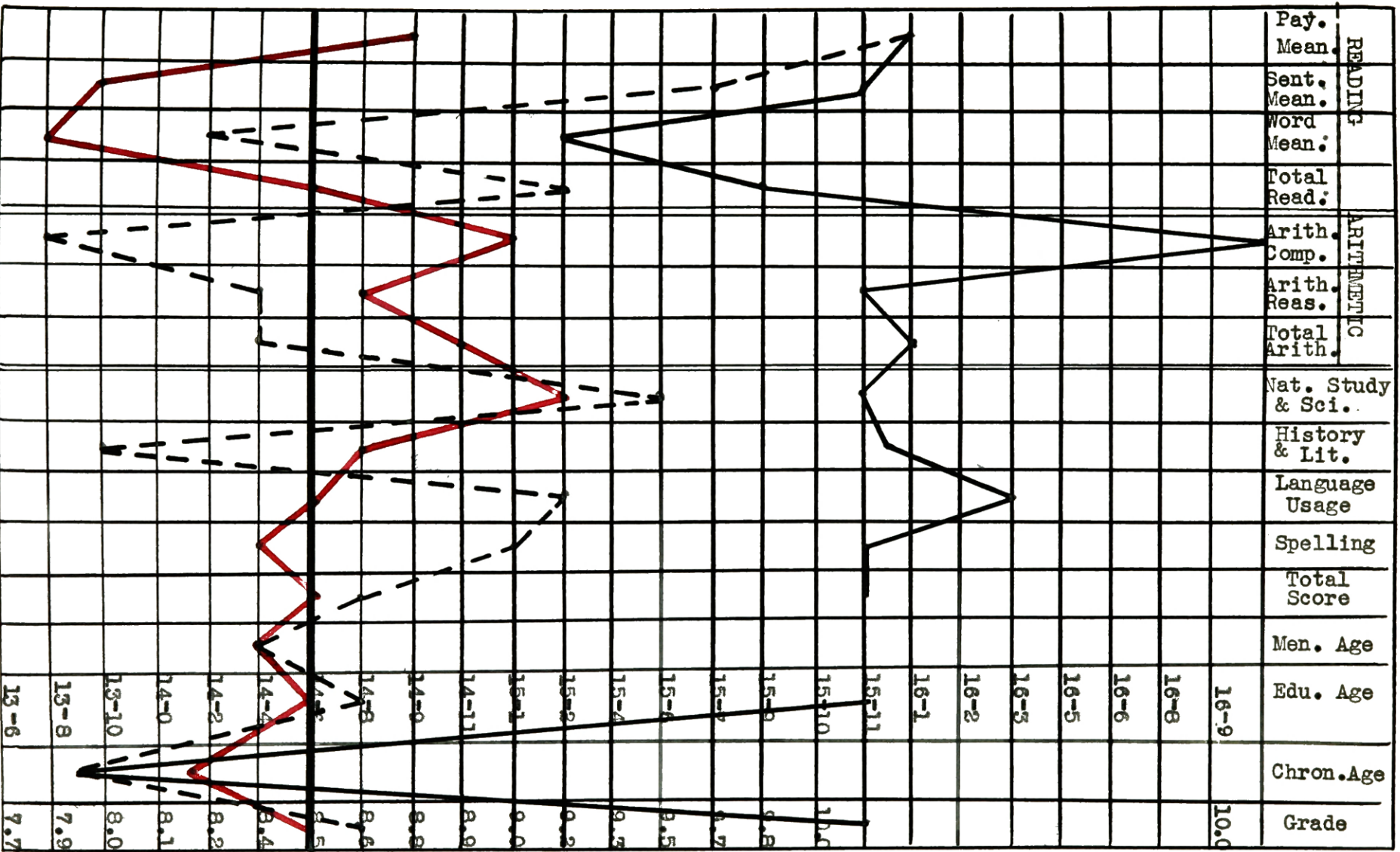
The material shown on Chart 26, page 143, contrasts the achievement of the eighth grade students in Judith Basin County with those in Missoula and in Stevensville. Since these tests were not given at exactly the same time of year in the three places the results or scores were equated so

as to give a satisfactory basis for comparison. The median chronological ages for Missoula and for Stevensville were the same, namely thirteen years and nine months. This was nine months below the norm and four months below the median for Judith Basin County. This shows that the eighth grade students in both Missoula and Stevensville were more advanced chronologically than those in this county. Since no intelligence tests had been given in Missoula it was impossible to make comparisons with Missoula in mental ages. It is a rather singular coincidence that the median mental ages for both the Judith Basin County and Stevensville group coincided. The mental age for both groups was two months below the norm.

The median scores for the Missoula group was much greater than the Judith Basin County group in all subjects. It was also greater than the Stevensville group in all but the reading paragraph meaning test on which test the two groups were tied. Great emphasis must have been placed on paragraph meaning and sentence meaning reading exercises at Stevensville because of the high marks made in those two tests, while the marks in all of the other tests were much lower. The median total reading score for Stevensville was eight months higher than that for Judith Basin County, while the median for the latter on the total arithmetic score was seven months higher



EIGHTH GRADE



Judith Basin Co. —  
 Stevensville - - -  
 Missoula —

than the Stevensville score. This difference seems to show that reading was given more emphasis in Stevensville while arithmetic received the most emphasis in Judith Basin County.

On the median nature study score Stevensville was four months higher than Judith Basin County, while on history and literature Judith Basin County was ten months ahead. In language usage the opposite was again true, namely that Stevensville was eight months ahead. Stevensville also had a lead of nine months in spelling. On total educational ages there was a difference of two months in favor of Stevensville. Attention is called to the point that the comparative ranking of these two groups would have been just the opposite if the scores of only the students in the Third-Class districts had been used instead of the scores of the students enrolled in all types of schools in Judith Basin County. The total educational age for the eighth grade students enrolled in the Third-Class schools in Judith Basin County was fifteen years and six months or ten months higher than that of the Stevensville group. This shows that the Judith Basin County schools were doing a very good grade of work when compared with other schools in the state of the same type.

Chart 27, page 146, compares the fourth grade medians of Judith Basin County with those of Missoula. The median

chronological age for Judith Basin county is two months greater than that of the Missoula fourth grade, while the educational age of the Missoula group was one month greater than that of the former group. The medians were the same on the total arithmetic scores and on the history and literature scores. The Judith Basin County median was one month higher on the spelling test, while the Missoula medians were higher in reading, nature study and language.

Chart 23, page 143, shows a comparison of the medians of the Judith Basin County fifth grades and the Missoula fifth grades. In this grade the chronological ages were exactly the same, while the educational age of the Missoula group was three months greater than that of the Judith Basin County group. On all of the subject medians, Missoula held the lead, although the lead amounted to only one month in the case of arithmetic and spelling. The greatest difference occurred in language where the Missoula group had a lead of ten months.

Chart 29, page 143, compares the medians of the Judith Basin County sixth grades with the sixth grades in Missoula. Judith Basin County surpassed Missoula only in the case of the median chronological ages, in which case the Missoula median was nine months below the norm, while the Judith Basin County group was only five months below norm. This was Ju-

# FOURTH GRADE

Missoula  
Jud. Bas. Co. ---

GRADE 27

Reading Total	Arithmetic Total	Nat. Study and Science History and Literature	Language Usage	Spelling	Total Score	Edu. Age	Chron. Age	Grade
						11-5	11-5	5.6
						11-4	11-4	5.5
						11-3	11-3	5.4
						11-2	11-2	5.3
						11-1	11-1	5.2
						11-0	11-0	5.1
						10-11	10-11	5.0
						10-10	10-10	4.9
						10-9	10-9	4.8
						10-8	10-8	4.7
						10-7	10-7	4.6
						10-6	10-6	4.5
						10-5	10-5	4.4
						10-4	10-4	4.3
						10-3	10-3	4.2
						10-2	10-2	4.1
						10-1	10-1	4.0
						10-0	10-0	3.9
						9-11	9-11	3.8
						9-10	9-10	3.7
						9-9	9-9	3.6
						9-8	9-8	3.5
						9-7	9-7	3.4
						9-6	9-6	3.3
						9-5	9-5	3.2
						9-4	9-4	3.1

dith Basin County's weakest class, and since the Judith Basin County medians only exceeded the norm in one subject (nature study), there was very little need for comparing the medians with the Missoula medians.

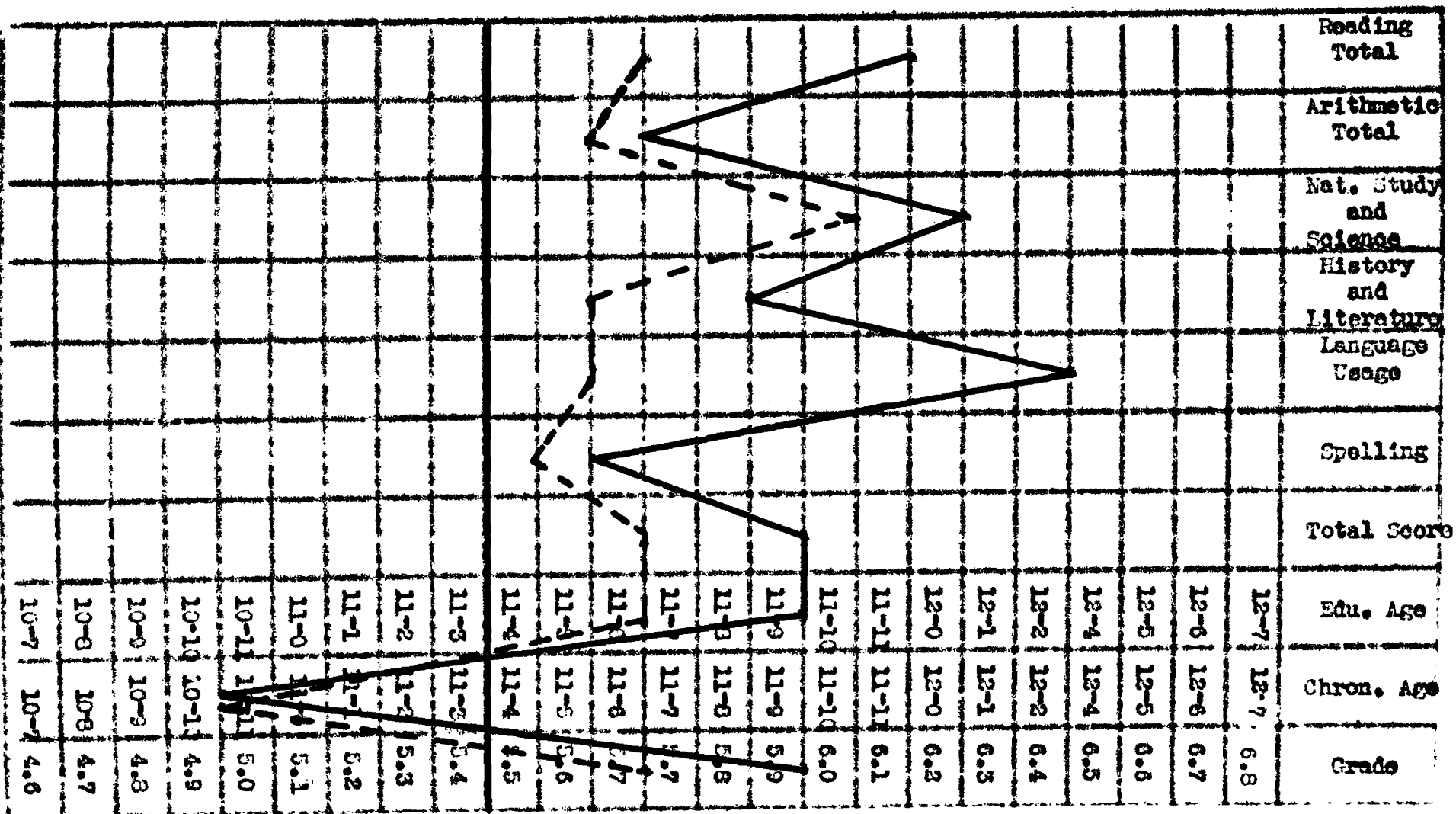
Chart 30, page 150, compares the medians for the seventh grades. In this case the chronological age medians were the same for the two groups, but there was a difference of one year and four months in favor of Missoula on the educational age medians. The Missoula medians surpassed the Judith Basin County medians by at least nine months in every subject. These charts (Charts 26, 27, 28, 29, and 30) show that the Missoula schools gradually draw away from Judith Basin County schools from the lower to the higher grades. This difference is without a doubt due to the increased advantages offered in the larger school systems. Missoula has one of the best grade-school systems in the state, which is the reason for choosing it as a basis for comparison. Attention is again called to the fact that the relative standing of the two systems would have been considerably different if the selections from Judith Basin County had have been limited to the third class schools.



# FIFTH GRADES

Missoula

Jud. Bas. Co.

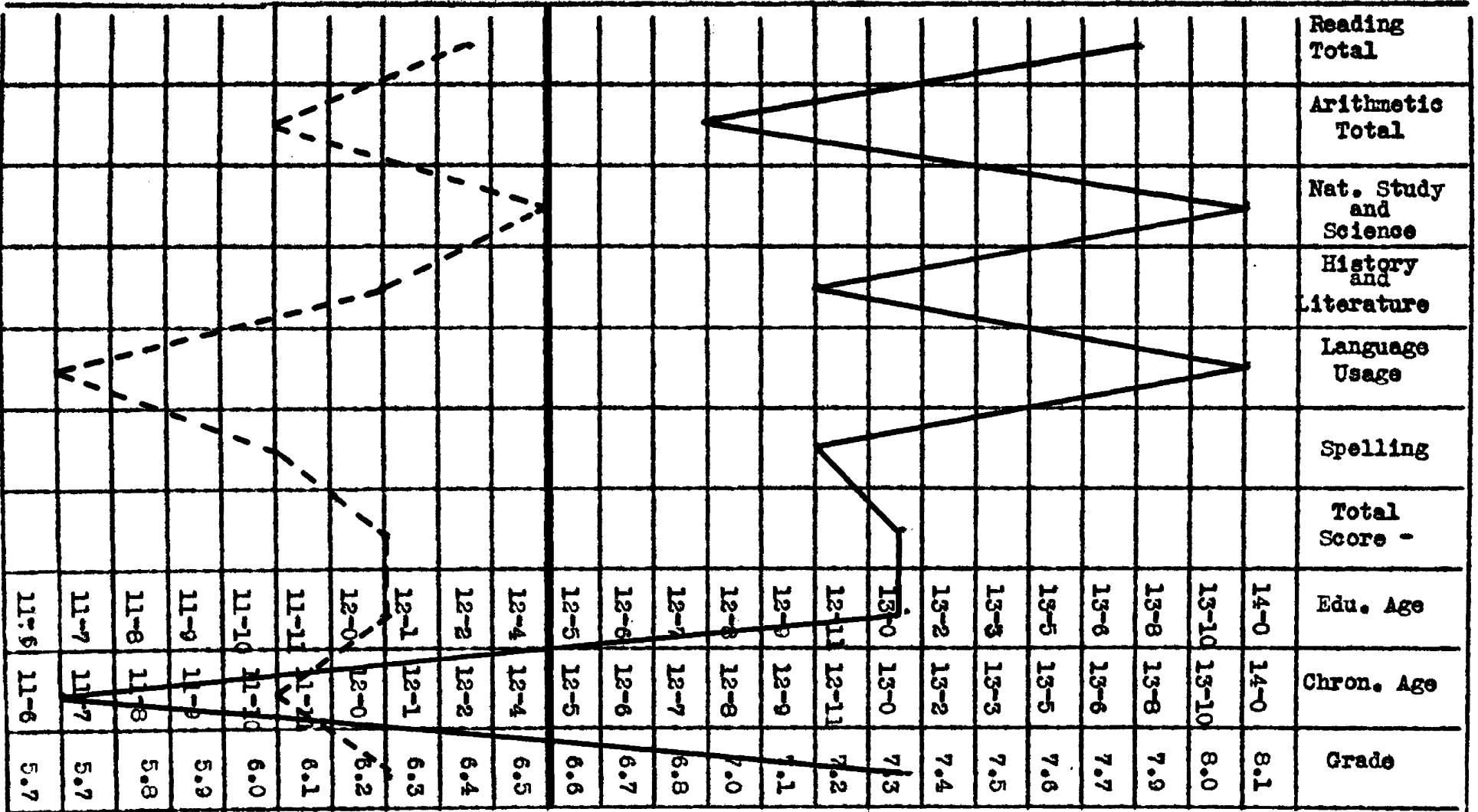


# SIXTH GRADE

Missoula

Jud. Bas. Co. ---

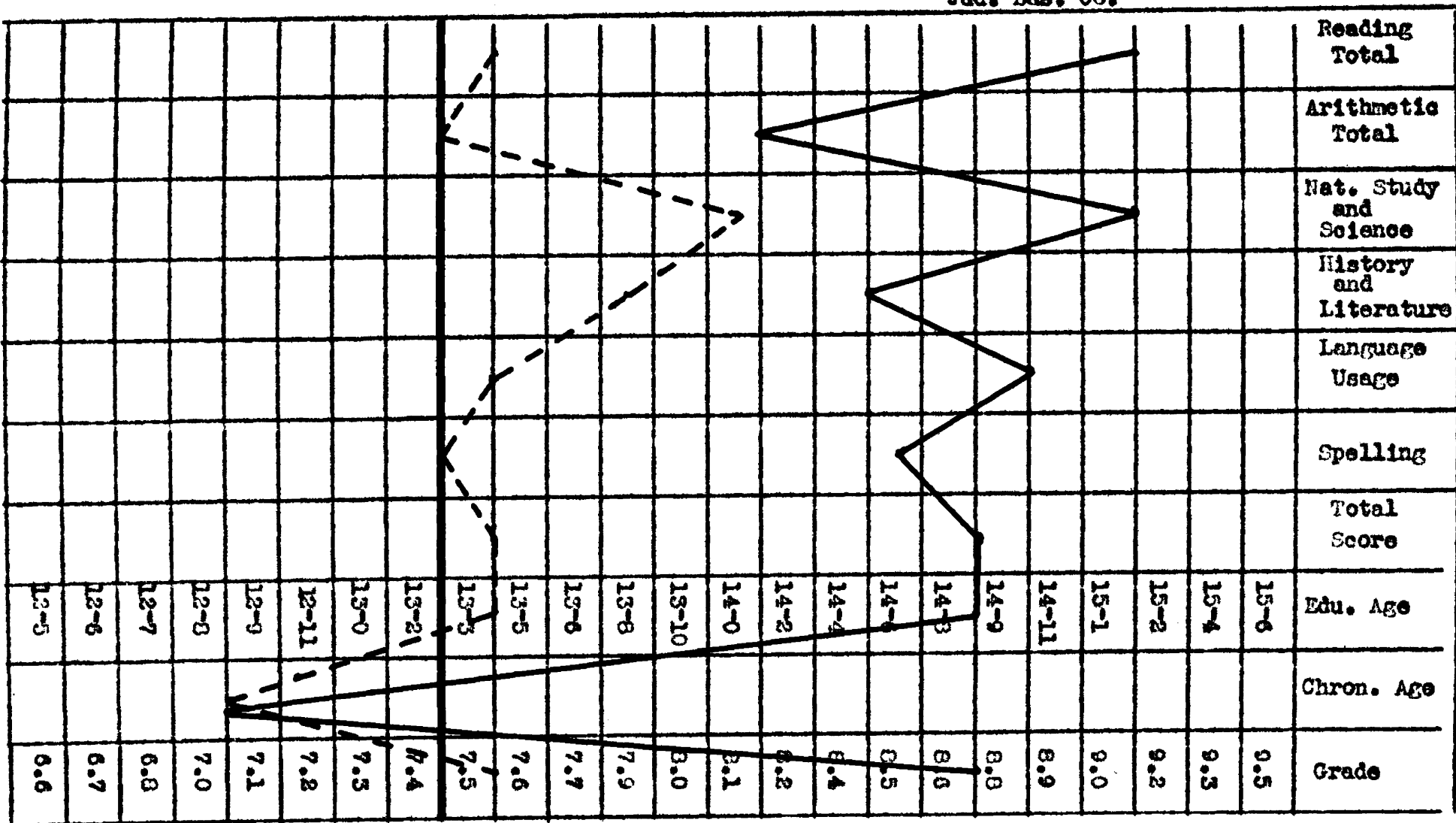
Chart 29



# SEVENTH GRADE

Missoula  
Jud. Has. Co. ---

CHART 30



Highest vs. Lowest Eighth Grade Class

Chart 31, page 152, shows the contrast between the highest eighth grade class in Judith Basin County and the lowest eighth grade class. The class making the highest mean scores was composed of fifteen members, while the poorest class was composed of nine members. Both were in Third-Class District schools. The mean or average chronological age of the poorer group was four months greater than that of the superior group, while the mean educational age of the latter was two years and three months above that of the poorer group. The greatest difference occurred in the case of the history and literature test, in which test there was a difference of two years and ten months. Such class difference certainly suggests the need of better supervision both on the part of the Principal of the Third-Class district and of the County Superintendent. The arithmetic mean or average was used on this chart in place of the median which is used on the other charts because of the small size of the two groups.

## EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION

Test 1, Parag. Mean.	Test 2, Sent. Mean.	Test 3, Word Mean.	Read. total	Test 4, Arith. Comp.	Test 5, Arith. Reas.	Arith. total	Test 6, Na. St. & Sci.	Test 7, Hist. & Lit.	Test 8, Lang. Usage	Test 9, Dicta- tion	Total Score	Educa- tional Age	Chrono- logical Age	Grade*
-102	-75	-82	-259	-179	-132	-311	-86	-84	-54	-206	-100	-18-6		
-102	-75	-81	-258	-175	-132	-307	-85	-83	-53	-204	-99	-18-4		
-101	-74	-80	-255	-171	-131	-302	-85	-83	-53	-202	-98	-18-1		
-101	-74	-79	-254	-166	-131	-297	-84	-83	-52	-200	-97	-17-11		
-101	-73	-79	-253	-161	-130	-291	-84	-83	-51	-198	-96	-17-8		
-101	-73	-78	-252	-157	-130	-287	-83	-83	-50	-195	-95	-17-6		
-100	-72	-78	-250	-152	-130	-282	-82	-82	-50	-194	-94	-17-4		
-100	-72	-77	-249	-148	-129	-277	-82	-82	-49	-191	-93	-17-2		
-99	-71	-76	-246	-147	-127	-274	-81	-81	-48	-190	-92	-17-1		
-98	-70	-75	-243	-147	-124	-271	-80	-80	-47	-189	-91	-16-11		
-96	-70	-74	-240	-146	-122	-268	-80	-78	-47	-187	-90	-16-9		
-95	-69	-73	-237	-146	-119	-265	-79	-77	-46	-186	-89	-16-8		
-94	-68	-73	-235	-145	-117	-262	-78	-75	-45	-185	-88	-16-6		
-92	-67	-72	-231	-145	-114	-259	-78	-74	-45	-183	-87	-16-5		
-90	-67	-71	-228	-145	-112	-257	-77	-72	-44	-182	-86	-16-3		
-89	-66	-70	-225	-144	-110	-254	-77	-70	-43	-181	-85	-16-2		
-88	-65	-69	-222	-144	-107	-251	-76	-69	-43	-179	-84	-16-1		
-87	-65	-68	-220	-143	-105	-248	-75	-67	-42	-178	-83	-15-11		
-86	-64	-67	-217	-142	-104	-246	-74	-66	-41	-176	-82	-15-10		
-85	-63	-66	-214	-141	-103	-244	-73	-65	-40	-174	-81	-15-9		
-84	-62	-65	-211	-140	-102	-242	-72	-63	-40	-172	-80	-15-7		
-83	-61	-64	-208	-139	-101	-240	-71	-62	-39	-170	-79	-15-6		
-83	-61	-63	-206	-138	-100	-238	-69	-61	-38	-168	-78	-15-4		
-82	-60	-62	-203	-137	-99	-236	-68	-60	-38	-165	-77	-15-2		
-81	-59	-61	-200	-136	-98	-234	-67	-59	-37	-163	-76	-15-1		
-81	-57	-60	-198	-134	-97	-231	-66	-58	-36	-161	-75	-14-11	Adult	
-80	-56	-59	-195	-133	-96	-229	-65	-56	-36	-159	-74	-14-9		
-79	-55	-58	-192	-132	-95	-227	-64	-55	-35	-157	-73	-14-8		
-78	-54	-57	-189	-131	-94	-224	-63	-54	-34	-155	-72	-14-6		
-77	-54	-57	-188	-129	-92	-221	-62	-52	-34	-153	-71	-14-4		
-77	-53	-56	-186	-128	-91	-219	-61	-51	-33	-150	-70	-14-2		
-76	-53	-56	-185	-127	-89	-216	-60	-49	-32	-148	-69	-14-0		
-75	-52	-55	-182	-125	-87	-212	-60	-48	-32	-146	-68	-13-10		
-74	-52	-54	-180	-124	-86	-210	-59	-46	-31	-144	-67	-13-8		
-74	-51	-54	-179	-123	-84	-207	-58	-44	-31	-141	-66	-13-6		
-73	-51	-53	-177	-121	-83	-204	-57	-43	-30	-139	-65	-13-5		
-72	-50	-53	-175	-120	-81	-201	-56	-42	-29	-137	-64	-13-3		
-71	-50	-53	-173	-119	-80	-199	-55	-40	-29	-134	-63	-13-2		
-71	-49	-51	-171	-118	-78	-196	-54	-39	-28	-132	-62	-13-0		
-70	-48	-51	-169	-117	-77	-194	-53	-38	-28	-129	-61	-12-11		
-70	-47	-50	-167	-117	-76	-192	-51	-37	-27	-126	-60	-12-9		
-69	-46	-49	-164	-116	-73	-189	-50	-36	-27	-124	-59	-12-8		
-68	-45	-49	-162	-115	-72	-187	-49	-35	-26	-121	-58	-12-7		
-67	-45	-48	-160	-114	-70	-184	-48	-34	-25	-119	-57	-12-6		
-67	-44	-47	-158	-113	-68	-181	-47	-33	-25	-116	-56	-12-5		
-66	-43	-46	-155	-112	-67	-179	-46	-31	-24	-114	-55	-12-4		
-65	-43	-46	-154	-110	-66	-176	-44	-30	-24	-112	-54	-12-2		
-64	-42	-45	-151	-109	-65	-174	-43	-29	-23	-110	-53	-12-1		
-64	-41	-44	-149	-107	-63	-170	-42	-28	-23	-108	-52	-12-0		
-63	-40	-44	-147	-105	-62	-167	-40	-27	-22	-107	-51	-11-11		
-62	-39	-43	-144	-103	-61	-164	-39	-26	-22	-105	-50	-11-10		
-61	-38	-42	-141	-102	-60	-162	-38	-25	-21	-103	-49	-11-9		
-60	-38	-41	-139	-100	-59	-159	-36	-24	-21	-101	-48	-11-8		
-59	-37	-41	-137	-98	-58	-156	-35	-23	-20	-99	-47	-11-7		
-58	-37	-40	-135	-96	-56	-152	-34	-22	-20	-97	-46	-11-6		
-57	-36	-39	-132	-95	-55	-150	-33	-21	-19	-95	-45	-11-5		
-56	-35	-38	-129	-93	-54	-147	-32	-20	-19	-93	-44	-11-4		
-55	-35	-37	-127	-91	-52	-143	-31	-20	-18	-91	-43	-11-3		
-55	-34	-36	-125	-89	-51	-140	-30	-19	-17	-89	-42	-11-2		
-54	-33	-35	-122	-87	-50	-137	-29	-18	-17	-87	-41	-11-1		
-53	-33	-34	-120	-86	-48	-134	-28	-17	-16	-85	-40	-11-0		
-52	-32	-33	-117	-84	-47	-131	-27	-16	-16	-83	-39	-10-11		
-51	-31	-32	-114	-82	-46	-128	-26	-15	-15	-81	-38	-10-10		
-50	-30	-32	-112	-80	-44	-124	-25	-15	-15	-79	-37	-10-9		
-49	-30	-31	-110	-78	-43	-121	-24	-14	-14	-77	-36	-10-9		
-48	-29	-30	-107	-76	-42	-118	-23	-13	-14	-75	-35	-10-8		
-47	-29	-29	-105	-74	-41	-115	-22	-12	-13	-73	-34	-10-7		
-46	-28	-28	-102	-73	-39	-112	-21	-12	-12	-71	-33	-10-6		
-45	-27	-27	-99	-71	-38	-109	-20	-11	-12	-69	-32	-10-5		
-43	-26	-26	-95	-70	-38	-108	-18	-10	-11	-68	-31	-10-4		
-42	-25	-25	-92	-68	-37	-105	-17	-10	-10	-66	-30	-10-2		
-40	-24	-24	-88	-66	-36	-102	-16	-9	-10	-65	-29	-10-1		
-39	-23	-23	-85	-65	-35	-100	-15	-8	-9	-63	-28	-10-0		
-38	-22	-22	-82	-63	-34	-97	-13	-8	-8	-62	-27	-9-11		
-36	-21	-21	-78	-62	-33	-95	-12	-7	-8	-60	-26	-9-10		
-35	-20	-20	-75	-60	-32	-92	-11	-6	-7	-59	-25	-9-8		
-34	-19	-19	-72	-59	-31	-90	-9	-5	-7	-57	-24	-9-7		
-32	-18	-18	-68	-57	-30	-87	-8	-5	-6	-56	-23	-9-6		
-31	-17	-17	-65	-56	-30	-86	-6	-4	-5	-54	-22	-9-5		
-30	-16	-16	-62	-54	-29	-83	-5	-3	-4	-53	-21	-9-4		
-28	-15	-15	-58	-53	-27	-80	-4	-3	-4	-51	-20	-9-2		
-27	-14	-14	-55	-50	-26	-76	-4	-3	-3	-49	-19	-9-1		
-25	-14	-13	-52	-47	-25	-72	-3	-2	-3	-48	-18	-9-0		
-24	-13	-12	-49	-45	-23	-68	-3	-2	-2	-46	-17	-8-11		
-22	-13	-12	-47	-42	-22	-64	-2	-1	-2	-44	-16	-8-10		
-21	-12	-11	-44	-40	-20	-60	-2	-1	-1	-42	-15	-8-9		

### Summary And Conclusions

The median mental age for the eighth grade girls was two months greater than that for the eighth grade boys.

The median chronological age for the girls was two months less than that for the boys, and six months less than the norm for the eighth grade.

Educationally, total scores considered, the girls were thirteen months more advanced than the boys and seven months above the norm or standard.

The girls were superior to the boys in every subject and every test given the eighth grade.

The curve for the boys follows quite closely the contour of the curve for the girls with the notable exception in spelling, in which subject the curves radically diverge. There was a difference of two years and four months between the median spelling age of the girls and of the boys.

The median score for the boys was nearest the median score for the girls in the history and literature test, in which case there was only a difference of three months.

The median chronological age of the eighth grade children in the rural schools was one month less than that of the children in the third class districts, showing that there had

no doubt been more extra promotions in the rural schools than in the town schools.

Mentally, the rural children were three months younger than the town children and four months under norm.

Educationally, (total scores) the rural students were one year and eight months below the urban children, and eight months below the norm.

Considering the three important ages listed above, it is very apparent that the rural children were more advanced than they should have been even if the chronological ages alone were considered.

The contours of the curves for the rural and the town schools were quite similar, with the exception of language and spelling. In both subjects the gap between the two groups was greatly widened.

In all points surveyed the town schools are shown to be superior to the rural schools.

The best and the poorest eighth grader in Judith Basin County were shown to be both girls.

The mental age of the highest pupil was only thirteen years and six months, or twelve months below the norm for the eighth grade. Her intelligence quotient was only 102, or just normal. But her educational age was seventeen years

and one month or three years and eight months above her chronological age. Investigation showed that the apparent cause of her high scholarship was her great amount of ambition and industry.

The lowest pupil had a mental age of eleven years and four months with an I.Q. of 63. Her chronological age was two years and four months greater than the chronological age of the best pupil. The low pupil's educational age was three months below her mental age, showing that her ratio of efficiency was very low.

The contrast of these two students merely re-emphasizes the vast differences of ability and accomplishment which were found in the different grades.

A comparison of the Judith Basin County eighth grades with the Missoula and Stevensville eighth grades showed the median chronological ages for the two latter school systems to be four months less than that for Judith Basin County and nine months less than the norm.

The median mental ages were the same for both the Judith Basin County and the Stevensville group.

The median subject scores for the Missoula group were much greater than those of the Judith Basin County group in all subjects. They were also greater than those of the Stevens-



ville group in all but reading paragraph meaning, in which subject the two scores were tied.

The median total reading score for Stevensville was eight months higher than that for Judith Basin County, while the median for the latter on the total arithmetic score was seven months higher than the Stevensville score.

The median nature study score for Stevensville was four months higher than Judith Basin County, while on history and literature Judith Basin County was ten months ahead.

In language usage, Stevensville was eight months ahead. Stevensville had a lead of nine months in spelling.

In total educational ages there was a difference of two months in favor of Stevensville.

If the medians for the town schools in Judith Basin County had been used instead of those for all the schools, the Judith Basin County schools would have been ten months higher in median educational ages than was the Stevensville group.

The median chronological age for the Judith Basin County fourth grades was two months greater than that of the Missoula fourth grades, while the educational age of the Missoula group was one month greater than that of the former group.

In the fifth grade the median chronological age for the Missoula and Judith Basin County groups were both the same, while the educational age of the Missoula group was three months greater than that of the Judith Basin County group.

The Missoula sixth grades passed the Judith Basin County sixth grades by a very wide margin in every case excepting chronological ages, in which the Judith Basin County group was four months older than the Missoula group.

In the seventh grade the median chronological age of the two groups was the same, but on educational age medians there was a difference of one year and four months in favor of Missoula.

The Missoula medians in the seventh grade surpassed the Judith Basin County medians by at least nine months in every subject.

These comparisons bring out the important conclusion, that although the two systems were about equal in the lower grades, there was, nevertheless, an ever widening margin in favor of the larger school system, going from the lower to the higher grades. This difference was no doubt due to the superior educational facilities of the larger school system.

The comparison of the highest eighth grade class in Judith Basin County with the lowest eighth grade class in

the county showed the mean or average chronological age of the poorer group to be four months greater than that of the superior group, while the mean educational age of the latter was two years and three months above that of the poorer group.

The greatest difference between the two groups occurred in the history and literature test, where there was a difference of two years and ten months.

## Chapter VI

### Correlations

This chapter will be devoted to a discussion of various correlations which were worked out in connection with the Judith Basin County survey. Chart 32, page 160, shows a model of the actual correlation chart for the total reading scores in the Stanford Reading Tests and the total scores in the Haggerty Reading Tests. Mrs. Maybird Beaman Roll, County Superintendent of Schools decided to give the Haggerty Reading Tests and the Burgess Arithmetic Tests to the pupils in grades four to eight. She gave all of the tests personally, and completed the giving of them shortly after the Stanford Tests were given by the writer. The writer felt that some results could be developed by correlating the scores of the tests given by the County Superintendent with the scores on the corresponding Stanford Tests. The writer used Otis Correlation Charts for computing the correlations in every case given in this report.<sup>13</sup>

As stated above, Chart 32 shows the correlation between the Haggerty Reading test and the total scores of the

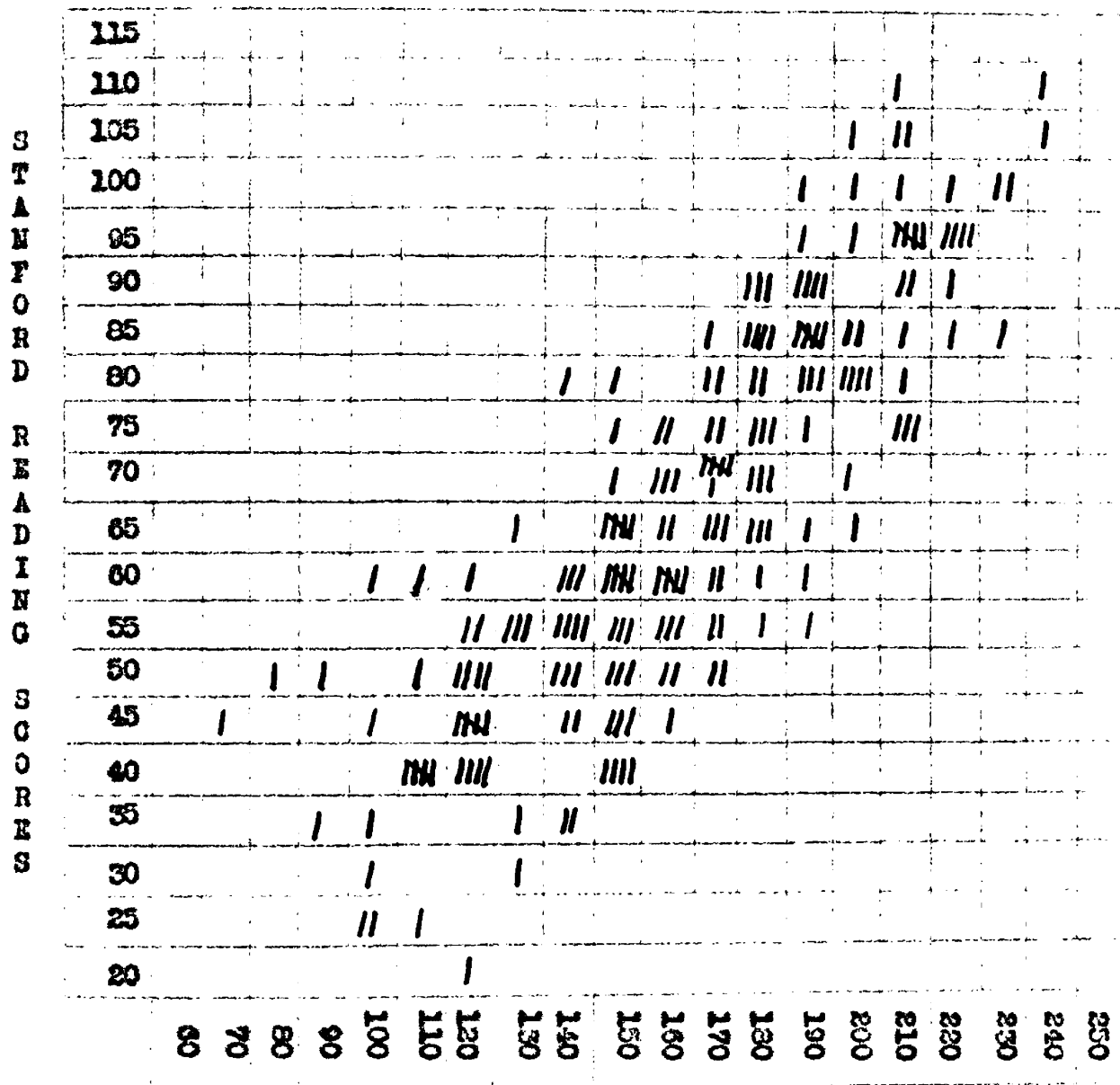
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13. Otis Correlation Charts, published by World Book Co.

## Correlation

### Stanford Reading Total Scores &

### Haggerty Reading Test Scores



### HAGGERTY READING SCORES

$$r = .862 \pm .007$$

Stanford Reading tests. This correlation as computed by the Otis method is shown to be a positive correlation of  $.862 \pm .007$ . This is considered a high correlation, and shows that both of the tests, test the same thing (presumably skill in reading) with a high degree of accuracy. The whole matter of skill in testing or surveying ability in a certain field such as arithmetic is entirely a relative matter, and in these cases we are merely checking one test by another or several others. But such checking is the most accurate test that can be used at the present time.

Chart 33, page 162, displays in graphic form the correlation between the scores on the Burgess Arithmetic test and the total scores on the Stanford Arithmetic tests. The correlation in this case is slightly lower than was the case with the reading tests, the correlation being  $.796 \pm .009$ . This is a fairly high correlation, and shows that the two tests check the arithmetic skill of the pupils with a fairly high degree of accuracy. Of course, the case could very readily be that the Stanford Tests checked the skill with a very high degree of accuracy and that the cause of the only fairly high correlation could be that the Burgess tests were not such good checks on skill in arithmetic. Or it could be vice versa.

Correlation

Stanford Arithmetic Total Scores &

Burgess Arithmetic Test Scores

STANFORD ARITHMETIC TOTAL SCORES	BURGESS ARITHMETIC TEST SCORES																			
	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80
270																				
260																				
250																				
240																				
230																				
220																				
210																				
200																				
190																				
180																				
170																				
160																				
150																				
140																				
130																				
120																				
110																				
100																				
90																				
80																				

BURGESS ARITHMETIC SCORES

$r = .796$

**Intelligence Test Scores &  
Stanford Achievement Total Scores**





Table 32, page 166, shows the coefficients of correlation between the different reading tests in the Stanford Achievement tests. This table shows the correlation to be .94 between reading test number one and reading test number two. There is a correlation of .92 between reading test one and reading test number three. A correlation of .95 is shown to exist between reading test one and the total score on all of the reading tests. The correlation of reading test two with reading test three was .93, while the correlation of test two with the total reading score was .94. And the correlation of test number three with the total reading score was .93. These correlations are all very high and tend to show that all of the reading tests check or test skill in reading with a very high degree of accuracy.

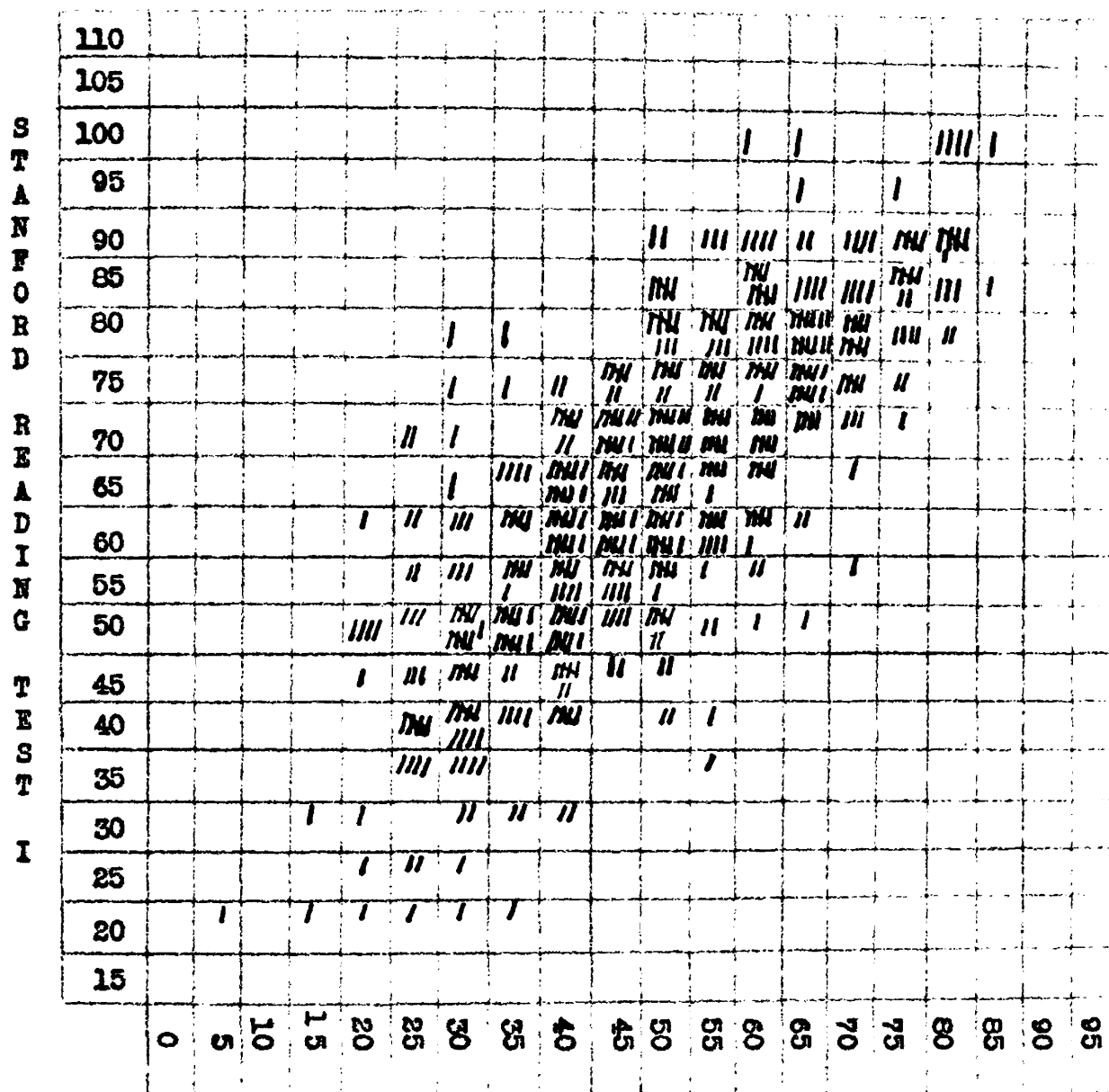
Table 33, page 166, gives the coefficients of correlation between the different arithmetic tests included in the Stanford Achievement tests. The table shows a correlation of .94 between arithmetic test number one and test number two, and a correlation of .96 between test one and the total arithmetic score. Arithmetic test number two shows a correlation of .95 between arithmetic test number two and the total arithmetic score. These very high correlations show that the Stanford Achievement Arithmetic Tests

CHART 35

Correlation

Stanford Reading Test I &

Stanford Reading Test II



$$r = .940 \pm .003$$

CORRELATIONS ON READING TESTS  
TABLE 32

	Read. I	Read. II	Read. III	Read. Total
Read. I	:	.94	.92	.95
Read. II	: .94	:	.93	.94
Read. III	: .92	: .93	:	.93
Read. Total	: .95	: .94	: .93	:

CORRELATIONS ON ARITHMETIC TESTS  
TABLE 33

	Arith. I	Arith. II	Arith. Total
Arith. I.	:	.94	.96
Arith. II	: .94	:	.95
Arith. Total:	: .96	: .95	:

test or check ability in the same subject (arithmetic) with a very high degree of accuracy.

Table 34, page 168, shows in tabular form the coefficients of correlation of the scores in each subject with the scores in each other subject and with the Total or Educational Age score, and the Mental Age or Intelligence score. Reading shows a coefficient of correlation of only .43 with Arithmetic. Reading shows a correlation of .65 with nature study and science, of .54 with history, of .60 with language, of .57 with spelling, of .83 with educational or total score, and .78 with mental or intelligence score. The last are quite high, possibly for the reason that the ability to make high scores in any other test depends a good deal upon the ability to read. At least that would be the verdict of some writers such as Lincoln. But on the other hand the coefficients of the individual subjects with reading seems to show that reading has no more to do with ability in the other subjects than any one of several other subjects.

The arithmetic score shows a correlation of .62 with Nature study and science, of .56 with history and literature, of .52 with language, of .55 with spelling, of .73 with total score, and of .72 with intelligence test score. Again the correlations are fairly high in the case of the last two, namely, total educational and intelligence, but the correla-

COEFFICIENTS OF CORRELATION  
TABLE 34

	Read.	Arith.	Nat.	His.	Lang.	Spell.	Edu.	Ment.
Read.		.43	.65	.54	.60	.57	.83	.73
Arith.	.43		.62	.56	.52	.55	.72	.72
Nat.	.65	.62		.57	.47	.54	.79	.66
His.	.54	.56	.57		.57	.54	.76	.67
Lang.	.60	.52	.47	.57		.61	.72	.65
Spell.	.57	.55	.54	.54	.61		.76	.64
Edu.	.83	.72	.79	.76	.72	.76		.73
Ment.	.73	.72	.66	.67	.65	.64	.73	

tions are low in the case of the other individual subjects. This means that students might make high marks in arithmetic and low or very low marks in some other subject such as spelling, or vice versa. Although with a correlation of .55 it would be quite unusual for a student to make a high score in arithmetic and a very low score in spelling.

Nature study and science shows a correlation of .57 with history and literature, of .47 with language, of .54 with spelling, of .79 with educational or total score, and of .66 with intelligence test score. Again the coefficients are fairly high in the case of the last two items. History and literature showed a coefficient of correlation of .57 with language, of .54 with spelling, of .76 with total score, and of .67 with intelligence test score.

Language showed correlations of .61 with spelling, .72 with total score, and of .65 with intelligence score. Spelling showed correlations of .76 with the educational or total score, and .74 with the spelling score. The educational or total score on all of the achievement tests showed a coefficient of correlation of .73. The latter is a fairly high correlation as are the correlations of a number of the subject scores with the intelligence scores and may be said to show that when we think we are testing raw native intelligence, we are really testing abilities in small sections of various

academic subjects. The reason for the relative high correlation between the total score and the scores in the various subjects lies at least partially in the fact that the scores in the individual subjects are added together to get the total or educational score.

### Summary and Conclusions

The correlation of  $.862 \pm .007$  between the total scores of the Stanford Reading Tests and the scores on the Haggerty Reading Test is a high correlation, and shows that both of the tests test the same thing (presumably skill in reading) with a high degree of accuracy.

The correlation of  $.796 \pm .009$  between the total scores of the Stanford Arithmetic Tests and the Burgess Arithmetic Test is also quite high.

The correlation between the Haggerty Intelligence Test Scores and the total Stanford Achievement Test Scores amounts to  $.718 \pm .012$ , which is fairly high correlation.

The correlations of .94, .92, .95, .93, and .94 represent very high degrees of correlation between the three Stanford Reading Tests. They show that all of the reading tests check or test skill in reading with a very high degree of accuracy.

The correlations of .94, .96, and .95 between the arithmetic tests included in the Stanford Tests are also very high.

The correlations between the various subjects vary all the way from .43 between reading and arithmetic to .65 between reading and nature study. These correlations are only fair, and fail to show any very definite relation between the various subjects.



The highest correlations were shown between the various subjects and the educational age or total score and between the various subjects and the intelligence test scores.

The fairly high correlation between the educational scores and the various subjects are no doubt due to the fact that the subject scores are added together to get the educational scores.

## Chapter VII

### Conclusions and Recommendations

Since the specific conclusions have been stated during each chapter and again at the close, the conclusions given in this particular chapter will be limited to those for which changes of administration and supervision are recommended.

The small rural schools, (those with an enrollment of under five) with low taxable valuations, consequently with poorly paid and poorly trained teachers, with poor school buildings, and with poor equipment, should be closed. The district should either be consolidated with a neighboring district or the children transported to the nearest large school. When expenses get as high as \$600.00 per child as it did one case in the county, there is certainly no excuse for maintaining a school.

There should be either a county or state equalization fund to be used solely as an aid for transporting pupils in the more sparsely settled districts. This would eliminate a great many of the very small rural schools and give the children the superior educational facilities offered in the larger schools.

The state requirements for professional training should be made retro-active to the extent of requiring even those

teachers, who have life certificates issued in the past and exempting them from requirements for further professional training, to take a certain amount of professional training within stated intervals. The need for some such requirement certainly becomes apparent when it is realized that at least one teacher in Judith Basin County has had no professional training of any kind for twenty-seven years, more than a quarter of a century. Times and methods change and we trust they improve, and teachers should be required to either keep up or quit.

The expenditure of time and money which is involved in a testing and survey program is justified only where the results attained are used in a systematic way to increase the efficiency of the schools. In the case of this survey and testing program there has been a splendid follow-up throughout the entire county. The individual educational profile charts which were sent out to the teachers and then on to the parents proved very illuminating, and many of the needed adjustments which are listed below have been carried out already. The teachers and the County Superintendent have planned a definite program of diagnostic tests and remedial instruction for the coming year.

There should be a retesting of all students in intelligence to obtain an accurate check and to be sure that the

children are accurately classified. In all extreme cases the children should be given the Terman Revision of the Binet-Simon Individual Intelligence Examination as a check.

The survey showed pupils of fifth and sixth grade intelligence grouped together in the eighth grades of the county with pupils who are mentally capable of doing ninth and tenth grade work. The teachers of such groups are expected to present the same subject-matter to the children of fifth-grade ability and tenth-grade ability in the same amount of time, and by the same methods and devices. While the teacher is striving to get children mentally eleven years old to grasp subject-matter which was designed for fourteen year old children, she has to keep sixteen year old children busy and stimulated with material which they could easily have grasped when they were several years younger.

Chronologically the children of Judith Basin County seemed to be fairly well distributed, there being only eleven and nine-tenths percent in grades one to twelve who were retarded, and sixteen and six tenths percent advanced. This means that seventy-two percent of the students are chronologically at age for their grade. Corning found only fifty-two percent at age in his Trinidad survey.

Mentally only forty-seven percent of the children in the Judith Basin County schools were at age for their grade.

twenty-five and four-tenths percent were under-age mentally, and twenty-seven and seven-tenths percent were over-age mentally. Corning found forty-three percent at age mentally. In Judith Basin County one-fourth of the children enrolled in each grade were too young mentally to grasp the work of the grade and another one-fourth and over were too old mentally to be interested in the work which they were being compelled to do.

The wide group differences listed above are insignificant when compared to the wide individual differences which were found in the various grades. In the following paragraphs are listed some of the types of solutions or corrections and adjustments used in cases similar to conditions found in Judith Basin County.

Some schools try semi-annual instead of annual promotions as a method of keeping the pupils more evenly grouped. Such a system, even though it were successful elsewhere, could not be used in this county because of the small rural schools and the small town schools.

Skipping is also used as a means of correction. Unfortunately it has been too generally accepted as a cure for all the ills of our grading system. Corning criticizes skipping with the following statement,

"By what miraculous process can even a very brilliant child absorb without instruction or contact

the subject-matter which was presented in the grades he has skipped? In skipping, the child's health must be considered, and his social development cannot be ignored. He frequently becomes a social misfit for life. He is always too young, and is even too young to secure a good position when he gets out of college. Too frequently he falls victim to the allurements and temptations of college life because he is too young to be away from home influence or to be thrown upon his own resources."<sup>19</sup>

Other educators such as Brooks feel that skipping is necessary at least in regrouping so as to get homogeneous groups. Brooks as well as others feel that the child would not be injured nearly as much by what he missed in skipping as he would to be left in a grade and group where all of his mental powers were deadened and none of them worked to their full capacity.<sup>20</sup>

The semi-annual promoting plan, the Cambridge double-track plan, the Pueblo plan, the Batavia plan, the Dalton plan, the many other flexible grouping plans, and the special promotion or skipping plan all are based upon the theory that some children work rapidly, while others proceed more slowly. But not one of the plans recognized that some pupils are of greater capacity than others. They all provide that individuals can advance at different rates of speed, but they presuppose that all individuals can ultimately learn the same things.

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19. Corning, "After Testing, What?", page 171 - 173.

20. Brooks, S. S., "Improving Schools by Standardized Tests".

Corning's Trinidad Plan reclassifies all children upon a five-track plan of organization, with a separate and distinct curriculum for each track. The mere division of children into ability groups will produce little or no advantage over the old grading plan, but the Trinidad plan goes a step farther, it adjusts the subject-matter to the capacities of the individuals. Many expensive experiments have been conducted in school systems along the line of ability grouping, which have proved a waste because after the re-grouping all of the children have been required to do the same amount and kind of work.

Corning maintains that the Trinidad plan can be adapted for use in the rural school, although he does not give any definite outline for doing so. After considerable studying and reviewing of the various plans, the writer believes that a combination of the Trinidad plan and the Minnetka work book, minimum essentials, individual study plan would be the most suitable for the rural schools and small town schools of Montana. However, it would be necessary for such a system with its definite work books, minimum essentials, etc. to be worked out by the State Department of Public Instruction. It would be necessary for the State Department to handle this work for two reasons: First, very few of the teachers

in the rural schools and small town schools would have the ability or training to work out such a system satisfactorily. Secondly, none of the teachers in such small schools would have the time or the material with which to work out the devices or materials necessary.

The mental age alone should not be used as the basis for the ability grouping, because the mental age does not signify ability or capacity to learn; it rather indicates the mental development attained at the particular time. The I. Q. or intelligence quotient must also be used. Corning has a good system under the Trinidad Plan by which he classifies vertically by mental age and then classifies horizontally by I. Q. The writer feels that still better results will be obtained if the educational age or achievement test results are also taken into consideration. Corning, however, states that classification on the basis of intelligence coincides very closely with the accomplishment of students in various subjects as tested by Stanford Achievement Tests.<sup>21</sup> The writer found a number of cases where the above statement would not hold true, for example the case of the girl making the highest total score in all

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21. Corning, "After Testing, What?", page 177.



the eighth grades of Judith Basin County. Her mental age and I.Q. would have shown her capable of doing work in an average eighth grade group, while her educational age showed that she was actually doing the work of a normal eleventh grader. The high achievement of this particular student was no doubt due to her high ambition and great amount of industry. Therefore, the writer maintains that the educational achievement of the pupils should be taken into consideration in regrouping.

Corning found that the regrouping of pupils, as outlined under the Trinidad Plan, was quite permanent. The degree of permanency depends very largely upon the constancy of the I.Q. Exceptional changes occur because of: First, an error in scoring the test or in computing the I.Q. Second, using the incorrect chronological age. Third, physical conditions of and surrounding the child. Fourth, mental attitudes of and surrounding the child. Any grouping must be sufficiently flexible to permit any necessary transfers.

At least the students who are below grade in one or two subjects should be given diagnostic tests in those subjects. Of course, it is best if the teacher or school can financially afford to give diagnostic tests to all of the pupils. However, such tests are of little or no value unless the results are used in the giving of remedial instruction

and drill. The real profit to the child comes through the remedial instruction which is given, and in turn, the remedial instruction is made possible only by discovering individual difficulties through the use of standardized tests. Such educational tests do not in any sense take the place of teaching. They do, however, make teaching more definite and concrete by disclosing weaknesses to the removal of which teaching efforts can be directed. Some diagnostic tests such as the Compass Diagnostic Tests in Arithmetic not only analyze ability in every process in arithmetic, but they have definite remedial work planned for each and every phase or type of weakness.

Other more simple solutions than those listed earlier in this chapter for the mentally over-age problem might be as follows: First, give the bright student more work of the same type. This, however, would merely keep him busy. It would neither challenge his best efforts nor reduce the amount of mental over-ageness. Second, enrich the course of the superior student by adding 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 it would not reduce mental over-ageness. Third, and best for the mentally over-

age pupil who is physically well developed and "at age" for his grade, is a combination of the second solution outlined above and acceleration without skipping. Such a method would keep the pupil working to capacity and would also reduce the amount of mental over-ageness by advancing him from grade to grade more rapidly.<sup>22</sup>

Brooks outlines the following proposed plan for grading or grouping a rural school:

"Let us suppose that we have given the intelligence tests in a rural school and the mental ages and intelligence quotients of the pupils as found are shown in a table called Table A. Now, let us select from this table all the pupils with mental ages within the first-grade range (all below eight years and zero months), and let us list them separately in another table called Table B, with their respective intelligence quotients. Suppose in our testing, it was noted that part of the children in a 7-0 to 7-11 age group would normally be in the second grade. How shall we decide which ones to place in the second grade? To begin with, no child just beginning school will belong there. Accordingly, in Table B let us mark with a star the number of each pupil who attended school the previous year. Those pupils may enter the second grade if their mentality is normal or better. Let us therefore mark with an additional star those with intelligence quotients of ninety or above. Those thus marked with a double star may be assigned to the second grade. All the others in Table B will therefore go to make up the first grade.

"Similar tables should be constructed for each age group. If in the 10-0 to 10-11 group there was a pupil with a mental age of 10-9 and an I.Q. of 132, it may be

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22. McCall, "How to Measure in Education".

possible for him to do the work of grade six providing he has good instruction and is ambitious and industrious. The remaining children may be assigned to their grades in like manner, whereupon the preliminary grading of the school is completed. Some readjusting will probably be found necessary for various reasons which the results of intelligence tests do not allow for. But when once adjusted there should be possible a uniformity of achievement within grades that is absolutely impossible in the school as ordinarily graded, where pupils differing in mental age by as much as five or six years are often found working together, or trying to work together in the same grade."<sup>23</sup>

Madsen gives the following problems which may be solved by using the data secured by giving standardized tests:

A. Problems primarily of interest to superintendents and principals.

- (a) Sectioning of classes into two or more sections according to ability. This may be done by the use of intelligence or educational tests or by a combination of both.
- (b) Selection of pupils for special classes such as classes for exceptionally bright or exceptionally dull pupils or classes for pupils with defects in certain subjects.
- (c) Determination of efficiency of the school as a whole by comparison of obtained scores and with scores made by other schools.
- (d) Determination of whether the proper emphasis is given to all subjects or whether some are stressed unduly.
- (e) Comparison of different methods of instruction or new methods with old methods.

B. Problems primarily of interest to teachers.

- (a) Determination of efficiency of a class in the different subjects. Specifically, "Is my class up to standard in arithmetic, history, geography, reading, etc.?"

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23. Brooks, S.S., "Improving Schools by Standardized Tests", pp. 119-123.

- (b) Similar determination of efficiency of pupils in a class.
- (c) Determination of whether different subjects are equally stressed. Specifically, "Am I giving too much or too little time to arithmetic, spelling, history, geography, etc. in comparison with other subjects?"
- (d) Diagnosis of defects of pupils in the various subjects. For example, "What phases of arithmetic need more attention, of history, of handwriting, etc.?"
- (e) Determination of whether a pupil is doing as well as can be expected. This requires the use of both intelligence and educational tests. A pupil who scores high in intelligence test should score equally high in an educational test. A pupil who scores low in an intelligence test cannot reasonably be expected to score high in an educational test. In other words, a pupil's achievement is satisfactory if it is up to his level of intelligence.<sup>24</sup>

As a result of the Judith Basin County Educational Survey, sufficient data <sup>were</sup> furnished the County Superintendent of Schools and each and every teacher in the county, so that he or she could work out the answers to any of the problems listed above. And the writer is pleased to say that the majority of the teachers in the county took advantage of the situation and made the maximum use of all the data furnished them by the survey.

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