

DUPLICATE

P4375

School Survey of Type Counties

OF

West Virginia

W. VA. UNIVERSITY
LIBRARY

Report Made

by

L. V. CAVINS

Survey Made

by the

STATE DEPARTMENT OF RURAL SCHOOLS, NORMAL
SCHOOLS, COLLEGES, AND UNIVERSITY

Published by

STATE DEPARTMENT OF SCHOOLS

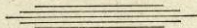
Charleston, West Virginia

School Survey of Type Counties

OF

West Virginia

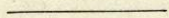
W. VA. UNIVERSITY
LIBRARY



Report Made

by

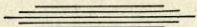
L. V. CAVINS



Survey Made

by the

STATE DEPARTMENT OF RURAL SCHOOLS, NORMAL
SCHOOLS, COLLEGES, AND UNIVERSITY



Published by

STATE DEPARTMENT OF SCHOOLS

Charleston, West Virginia

W. VA. UNIVERSITY
LIBRARY



JARRETT PRINTING COMPANY

FOREWORD

It is with pleasure that I present to the school superintendents, teachers, and others interested in education within our state, the first attempt made to discover by actual experimentation the condition of matters in the educational life of the state. This report prepared by Professor L. V. Cavins of the West Virginia University under the general direction of Mr. J. D. Muldoon, Supervisor of Rural Schools of the State Department of Education, presents some very interesting and valuable data which should become the possession of all progressive school folk.

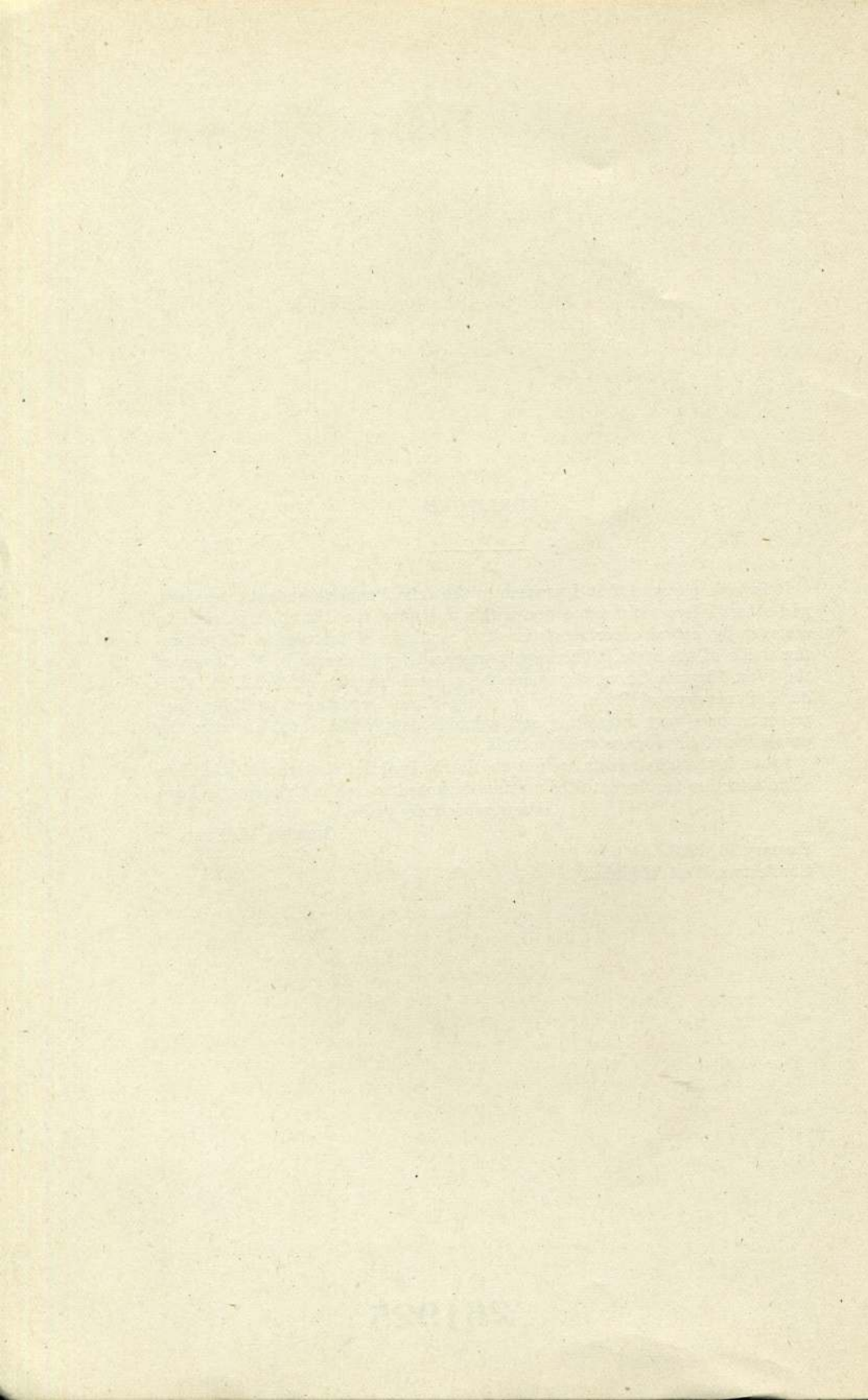
I take it that the results are not absolutely final but they should stimulate all to a further inquiry into the matters discussed so well in this report. I am

Very respectfully yours,

GEORGE M. FORD.

January 10, 1923.

Charleston, West Virginia.



INTRODUCTION

It is little more than a decade since the school survey movement began. The progress of the movement was interrupted by the War, but in spite of the three years during which very little was undertaken, there are now some thirty major surveys and a long list of minor surveys.

There are two characteristics which distinguish the earlier surveys from those which came after 1915. The earlier surveys were largely descriptive accounts of what some experienced observer had seen. To these descriptive accounts the surveyor added a few personal recommendations as a guide to improvement. The early surveys, were first, observational, and, secondly, personal.

As the survey movement went forward, test and exact records increasingly replaced mere observation. The later surveys are also the products of co-operative work rather than individual undertakings. The later surveys are, first, quantitative and exact and, secondly, objective and standardized.

If the West Virginia survey had no other virtue, it would have served a very useful purpose in training a great many people in the use of the instruments for exact evaluation of school work which have been evolved by the school survey.

There will doubtless be other benefits also from this work. The relation of achievement to intelligence, the proper grading of pupils, the treatment of individual pupils in the light of the expectations justified by comparison with others of like age, will become living issues in all the counties and the schools will profit by the careful study which will be made of these matters.

Above all, the survey will overcome in large measure that isolation which is one of the chief evils of the one-room rural school. Supervision is what the rural schools sorely need as the survey so vividly points out. If supervision is to be effective, however, it must be backed by an intelligent use of the standards which a survey like the present sets up. Teachers must learn to supervise themselves by a study of the results obtained with their pupils and through a constant comparison of these results with the standards for similar classes elsewhere.

It is to be hoped, as Professor Cavins suggests, that this work will be carried on. Surveys of school work ought to become commonplace. The County and the State ought to set up agencies which will make it possible to do every year the kind of work which is here represented. The survey movement will then have reached its natural consummation and will become a part of every educational officer's routine work rather than the purely personal observational undertaking which it was in its original stages.

CHAS. H. JUDD.

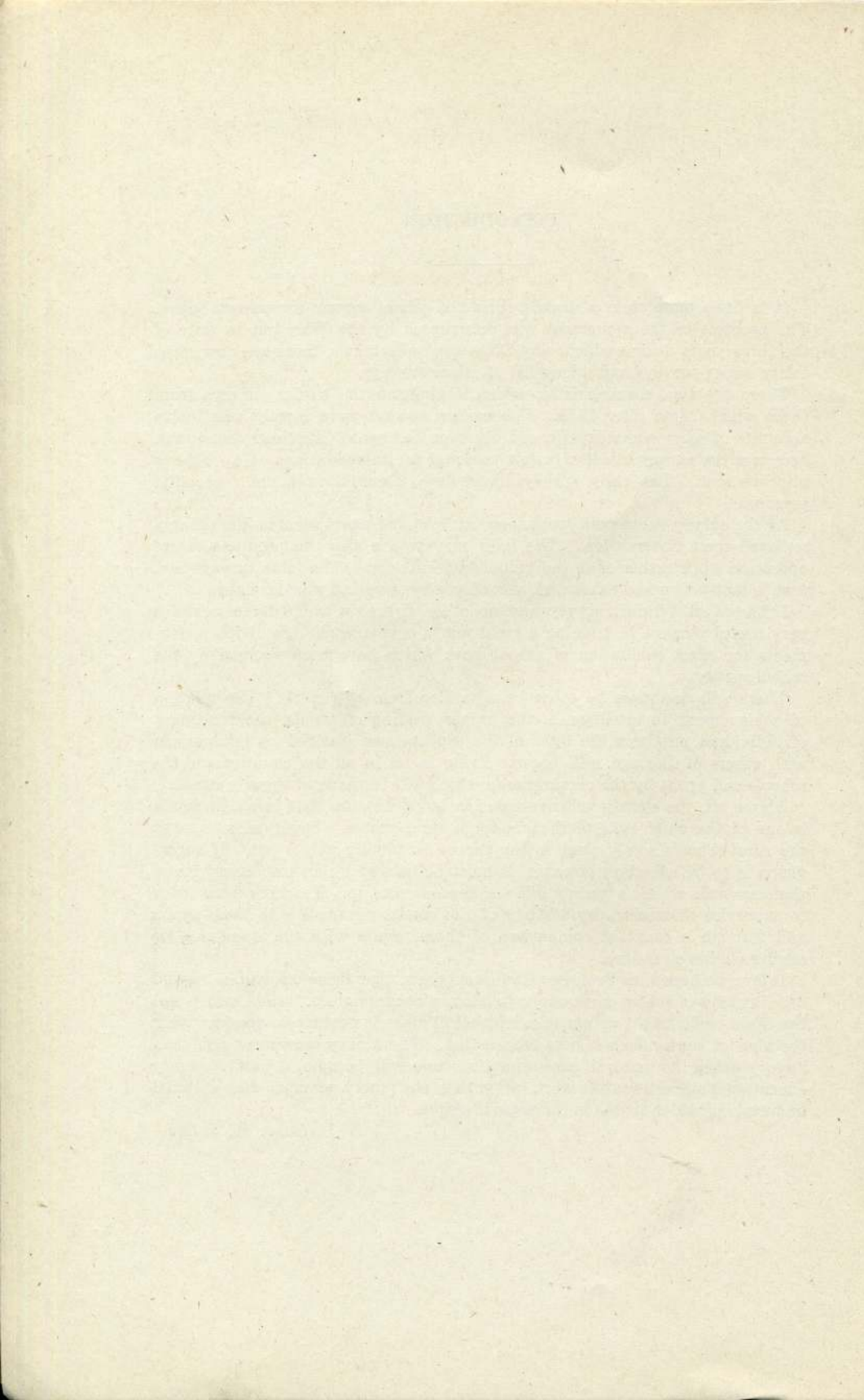


TABLE OF CONTENTS

Foreword	3
Introduction	5
List of Tables	9
List of Diagrams	10
Survey Staff	11
 Chapter	
I. PLAN OF SURVEY	13
Counties and directors	13
Training of assistants	14
Giving the tests	14
A suggestive schedule for testing a rural school.....	15
Steps in handling the test material	16
 Chapter	
II. CLASSIFICATION OF PUPILS	18
Age-Grade Table	18
Cost of teaching and reteaching	19
Progress distribution curve	21
Study of classification by means of standard deviation curve	22
Causes of retardation	23
Mental Age-Grade Table	24
Comparative age study	25
Analysis by counties	25
 Chapter	
III. A STUDY OF EDUCATIONAL ACHIEVEMENT AS INDI- CATED BY CENTRAL TENDENCIES	27
Tests and Scales Used	27
Arithmetic	27
Reading	29
Handwriting	30
Spelling	32
Summary of Educational Tests	34
State and standard medians	34
Achievement age explained	34
Comparison of county achievement	36
Comparison of achievement quotient	37
Summary of county and state medians	38

Chapter

IV. STUDY OF CLASS INSTRUCTION BY MEANS OF MEASURES OF VARIABILITY	40
The meaning of standard deviation	40
Superimposing a theoretical standard deviation curve upon an actual S. D.	40
Study of variability in ages by curves	42
Study of variability in subjects by curves	44

Chapter

V. STUDIES IN CORRELATIONS	46
Intelligence and school subjects	47
School subjects with one another	48
Tenure of teachers and achievement	48
School buildings and achievement	48

Chapter

VI. DELIVERY OF THE SURVEY	50
Methods of Delivering the Survey in Coal District.....	52
Public meeting	52
Meeting teachers and principals	52
Basis of reclassification	52
The result of the promotions	56

Chapter

VII. STUDY OF RURAL AND CITY SCHOOLS	58
Comparison of medians by subjects	59
Shouse's study of one, two, and three room schools.....	60
Comparison of variability in subjects	62

Chapter

VIII. EFFECT OF SUPERVISION	63
Achievement of supervised and non-supervised schools.....	63
Comparison of classification methods for the two groups....	65
The value of supervision	66

Appendix:

Forms used in constructiong survey.

LIST OF TABLES

Table

I.	Age-Grade Table—State Survey, 1922.....	18
II.	Cost of teaching and retaching—State Survey, 1922.....	19
III.	Mental Age-Grade Table	24
IV.	Comparative Age Study	25
V.	Comparison of Mental and Chronological Ages by Counties....	25
VI.	Arithmetic	28
VII.	Rate of Reading	29
VIII.	Comprehension of Reading	29
IX.	Speed in Handwriting (letters per minute)	31
X.	Quality of Handwriting (Ayre's Scale)	31
XI.	Spelling	33
XII.	Showing Standard and State Medians	34
XIII.	Comparison of County and State Medians	38
XIV.	Comparison of Mental and Achievement Ages by Grades....	39
XV.	Showing Correlation of Intelligence	47
XVI.	Showing the Coefficient of Correlation Between the Different School Subjects	48
XVII.	Comparison of One, Two, and Three-teacher Schools (After Shouse)	60
XVIII.	Showing a Comparison of the Average Standard Deviation of Rural and City Schools	62
XIX.	Showing the Variability of Supervised and Non-supervised Groups	66

LIST OF DIAGRAMS

Map Showing Location of Counties

Diagram

1. Showing Ideal and Actual Progress Distribution	21
2. Showing the Standard Deviation Range of Middle-two-thirds	22
3. Showing comparison of West Virginia Scores with Standards	26
4. Showing the Comparison of State and Standard Scores in Arithmetic	28
5. Showing the Comparison of State and Standard Scores in Reading	29
6. Showing the Comparison of State and Standard Scores in Speed of Handwriting	31
7. Showing the Comparison of State and Standard Scores in Quality of Handwriting	31
8. Showing the Comparison of State and Standard Scores in Spelling	33
9. Showing the Achievement Scores of Ten Counties	36
10. Achievement Quotients of Eight Counties	37
11. Showing Theoretical Variability of Chronological and Mental Ages Superimposed Upon an Actual Variability	42
12. Showing Theoretical Variability of Subjects Superimposed Upon an Actual Variability	44
13. Showing Comparison by Subjects of Rural and City Schools....	59
14. Showing the Comparison of Supervised and Non-supervised Groups	63
15. Showing Coefficient of Variability of 6th Grade	65

SURVEY STAFF

Chairman of Survey:

J. D. MULDOON, State Supervisor of Rural Education

State Director:

L. V. CAVINS, Professor of Education, West Virginia University

County Directors:

S. O. BOND, President of Salem College

C. M. KOON, Professor of Education, West Liberty Normal School

R. RAY SCOTT, Professor of Education, West Virginia Wesleyan College

J. B. SHOUSE, Professor of Education, Marshall College

MR. AND MRS. OLIVER SHURTLEFF, Sutton Public School

H. G. WHEAT, Professor of Education, Glenville Normal School

F. S. WHITE, Professor of Education, Fairmont Normal School

W. H. S. WHITE, President of Shepherdstown Normal School

L. E. VANDERZALM, Professor of Education, Concord Normal School

CHAPTER I

Plan of Survey

The survey of the type counties of West Virginia was instituted by J. D. Muldoon, State Supervisor of Rural Education. In response to an invitation by Mr. Muldoon, representatives from the various normal schools, colleges, and the University, met at Huntington, West Virginia, November 3 and 4, 1921, to discuss the matter of a school survey. At this meeting each of the various Educational institutions decided to take a county more or less conveniently located and make such a study of its educational progress as the various committees might decide was advisable. After hearing the report of these committees, the staff decided upon the following items:

1. Counties and Directors:

Harrison (Coal District).....	L. V. CAVINS
Wetzel.....	S. O. BOND
Brooke.....	C. M. KOON
Upshur.....	R. RAY SCOTT
Logan.....	J. B. SHOUSE
Braxton.....	MR. AND MRS. OLIVER SHURTLEFF
Gilmer.....	H. G. WHEAT
Marion.....	F. S. WHITE
Berkeley.....	W. H. S. WHITE
Monroe.....	L. E. VANDERZALM

The above counties were chosen chiefly because they were accessible to the various institutions charged with the work of surveying them. It may seem from the accompanying map that they are fairly well distributed and as such may be regarded as fairly typical of the entire state.

2. That the survey in each county, except Coal District of Harrison County' shall include 20 per cent of all schools for white children that are under the educational supervision of the county superintendent, said schools to be selected at random (the first, sixth, and eleventh, etc., schools when grouped by sub-district, and by name, or number); that inaccessible schools, not to exceed one-fourth of the number so selected, may be dropped from the list and others substituted in their stead, or not, at the discretion of the member of the staff who conducts the survey in said county; that the efforts of each member of the staff shall be to select a representative group that shall include not fewer than 15 per cent of all of the schools nor more than 20 per cent of all of the schools for white children in the county.

3. That the survey shall include grades third, fourth, fifth, sixth, seventh and eighth.

4. That the following tests and scales shall be used in conducting the survey.

- I. Illinois Examination I and II.
 1. General Intelligence.
 2. Silent Reading.
 3. Arithmetic.
- II. Gettysburg Edition of the Ayres Handwriting Scale.
- III. Buckingham Extension of the Ayres Spelling Scale.
5. That the administration of the tests shall be subject to the discretion of the county director, after the Committee on Forms and the report of the secretary have been complied with.

Training of Assistants

Considering the number of schools to be tested in each county and the number of tests to be given, the magnitude of the work was clearly beyond the efforts of a single instructor, consequently the various directors used the members of the classes in Test and Measurement in carrying on the work. Perhaps the chief value of the survey lies in the great amount of practical training that the work afforded these students in the normal schools, colleges, and the University.

Although there was considerable variation in the methods pursued by the various county directors, the writer kept closely enough in touch with the various final county reports with sufficient pains to believe that the work was done in a very careful way. In every case the various directors spent much time in selecting the most capable students for this work, and in training them by observation and by preliminary testing to give the tests, score the papers, and make the necessary computations.

Giving the Tests

The tests were given in every case either by the county director himself or by teachers and pupils carefully trained by him to give them. In many cases these persons went in pairs and assisted one another that no errors in time or procedure might creep in.

It would be impossible to depict all of the experiences that the respective examiners have had in giving these tests. Each director had his own plan of getting around to the various schools. One familiar with the transportation facilities can easily imagine the difficulties involved in getting to the rural schools during the winter. The writer can speak only for Coal District, Harrison County, the district which the University surveyed. A detailed statement of how the tests were given in one county will serve as an illustration.

Giving the Tests in Coal District

The tests were given in Coal District during the week of December 4th and 10th. The writer was assisted by Misses Blanche Emery, Pauline Spangler, Ida Smith, and Mr. J. D. Lowry, who were advanced students of the University. Acknowledgment should be made of the fact that these persons gave up their work at the University and without other compensation than the mere expenses incident to the trip, devoted the entire week to the survey work. From frequent interviews with county directors, I dare bespeak the same interest and untiring energy for their assistants.

Upon our arrival at Clarksburg, Superintendent J. C. Timberman and four of his teachers, who had previously had work in tests and measurements, offered their assistance.

By the help of the superintendent and local teachers we were able to give the tests to all elementary schools in the district, excepting two rural schools, within one week. The various interurban car lines afforded us convenient access to most of the twenty-one school buildings. In other cases it was necessary for us to walk one or two miles from the car line to get to the rural schools. We had to rearrange our testing schedule to fit the size of the school, number of examiners, etc. The most difficulty was experienced in administering the tests to third grade pupils. The percent of foreign children was so great that we felt that the third and possibly the fourth grades hardly did themselves justice. This was especially true in administering the intelligence tests. The following order and cautions in giving the tests were observed in general.

A Suggestive Schedule for Testing a Rural School

- 9:00— 9:10. Explain the data to be filled in by the teacher.
- 9:10— 9:30. Spelling (Select 25 words from column N for grades 3, 4 and 5).
(Select 25 words from column T for grades 6, 7 and 8).
(See Word List.)
- 9:30—10:30. Exam. I. Intelligence (Grades 3, 4 and 5).
- 10:00—11:00. Exam. II. Complete (Grades 6, 7 and 8). (Recess of 20 minutes for others.)
- 11:00—11:30. Exam. I. Arithmetic and Reading (Grades 3, 4 and 5). Recess for others.)
- 11:30—11:40. Rest for pupils. (Examiner check up on data from teacher and prepare for writing test.)
- 11:40—12:00. Writing. (Following directions are taken from Monroe, DeVoss & Kelly.) Put the following stanza on the board and drill till all know it perfectly:

Mary had a little lamb
Its fleece was white as snow
And everywhere that Mary went
The lamb was sure to go.

"Write the stanza of the poem which you have learned. When you have written the stanza, write it again, and keep on writing it until I tell you to stop. Write as well as you can and as fast as you can. Write on one side of your paper. When you fill one page use another. Place your paper in position and see that your pencil or pen and ink are ready. When I say 'ready' ink your pen and place your hand in position to write, but do not begin till I say, 'Start.' When I say 'Stop' all stop at once and raise your hand so I can see that you have stopped. REMEMBER: Fast work and good work. Ready! Start! At the end of three minutes, 'Stop.' "

Cautions in Giving All Tests

1. Never lose track of time. Be absolutely exact.
2. Check and recheck all material before starting out to give tests.
3. Go over all the directions the night before several times.
4. Have a supply of pencils and extra paper always with you.
5. Label material immediately upon collecting it, and check-up before leaving the school.
6. Place all material in large envelope and fill in the blank on outside of envelope.
7. Never make a mistake in time. There's no remedy. Never do it!!!

Steps in Handling the Test Material

Before the actual work of giving the tests was begun the Committee on Forms, assisted by University students taking the courses in Measurement, had prepared a number of forms which were extremely useful in collecting, tabulating, computing and presenting the results of the tests. These forms were printed and distributed, together with the testing material, by the State Department of Education to the various county directors.

(Copies of each of the forms appear in the appendix. The reader will do well to turn to them as they are referred to.)

The steps involved in the work of handling the materials of the test are listed below:

1. As soon as the tests were given all of the papers of a single school or class room were placed in a large heavy envelope, upon which was placed the following sticker properly and completely filled out:

WEST VIRGINIA SURVEY

Teacher.....	Address.....
School.....	Grade.....
Name of District.....	County.....
Tests given by.....	Address.....
Computed by.....	Address.....
County Director.....	Address.....

2. The 75 or 80 envelopes containing this material were shipped by parcel post to the University.

3. Papers were scored according to directions accompanying the tests.

4. The individual scores in the various subjects were placed on the Summary Sheet. (Thus, each teacher had a summary record of all of her pupils.)

5. Medians for the various grades in the various subjects were computed on the form headed "Comparison of School and Standard Medians." See appendix.)

6. These medians were graphed upon the form headed "Graph by Subject."

7. By means of frequency distribution forms, such as appear in the appendix, the various items included in the survey were compiled by rooms, schools, districts, counties, and finally into a state summary.

Since it has devolved upon the University to compile the results of the ten counties included in the survey, the writer wishes to call the reader's attention to the magnitude of the undertaking. Hardly anyone who has not actually engaged in this or similar work will realize how much labor is involved. It is true that much of it might have been done by local teachers. On the other hand it would not have permitted the various directors to have checked up on the work and consequently to have secured as careful results as we believe have been secured by allowing only trained students to do the work.

It is indeed gratifying, considering the tediousness of the task, the annoying handicaps under which all have had to work, and the unquestionable magnitude of the undertaking to be able to say that the job has been completed, and completed with a marked degree of harmony. Not one of the ten county directors failed to finish his particular part of the job and to submit his report to the University before the end of the school year. Two of the reports came too late to be included in one or two of the studies which follow, but all counties are represented in the state averages and in the majority of the summaries.

The following chapters present the results of the survey in respect to the various lines of school work investigated.

CHAPTER II

Classification of Pupils

The first study that was made of results was a study of the present classification of the pupils. This was done by means of

I. AN AGE-GRADE TABLE and

II. A MENTAL-AGE GRADE TABLE

Table I. Age-Grade Table—State Survey, 1922

PUPIL AGES	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	
						Accel.	6.91%
5 yrs.- 5 yrs.-11 mo.						Normal	19.95%
6 yrs.- 6 yrs.-11 mo.	5	1				Ret'd.	73.14%
7 yrs.- 7 yrs.-11 mo.	85	11					
8 yrs.- 8 yrs.-11 mo.	359	86	9	1	1		
9 yrs.- 9 yrs.-11 mo.	409	321	83	6			
10 yrs.-10 yrs.-11 mo.	365	393	227	45	5		
11 yrs.-11 yrs.-11 mo.	181	307	323	163	69		17
12 yrs.-12 yrs.-11 mo.	88	223	283	223	161		80
13 yrs.-13 yrs.-11 mo.	62	143	215	194	219		223
14 yrs.-14 yrs.-11 mo.	27	66	129	114	206		257
15 yrs.-15 yrs.-11 mo.	9	44	70	74	143		195
16 yrs.-16 yrs.-11 mo.	4	9	24	28	86		128
17 yrs.-17 yrs.-11 mo.	1		6	2	9		37
18 yrs.-18 yrs.-11 mo.			1	1	12		15
Total	1,595	1,604	1,370	851	911		952
Accelerated	90	98	92	52	75		97
Normal	359	321	227	163	161		223
Retarded	1,146	1,185	1,051	636	675		632

The above table indicates at the top the grades in which the pupils are classified and at the left their chronological ages. We have used the Strayer-Englehardt Age-Grade Form. For purposes of comparisons with the state it is unfortunate that we did not use our own form. The heavy lines found in the representative columns include the number of pupils that are considered normal. That is, we assume that a child starts in the first grade when he is six years of age. A child between eight and nine years of age who has made his promotion should normally be placed in the third grade; and child between nine and ten years of age in the fourth grade; between ten and eleven in the fifth grade; etc. The pupils in the spaces above the heavy lines are younger than the normal children of that grade, consequently those above the heavy lines are pedagogically ahead of where we would expect to find them, or what we term accelerated.

The pupils below the heavy lines are older than the normal, consequently behind the grades in which we would expect to find them, and are what we call retarded.

A glance at the distribution of the third-grade pupils shows us that 359 are normal; 85 one year accelerated and 5 two years accelerated; 409 are retarded one year, 365 two years, 181 three years, 88 four, 62 five, 27 six, 9 seven, 4 eight, and 1 nine years retarded. The striking thing, of course, is the range in ages; 5 pupils being six years old and 1 seventeen. The range of ages in the other grades is almost as great.

Considering the entire table we have in the six grades 504 pupils accelerated from one to three years; 1454 pupils normally classified; and 5325 who are retarded from one to nine years. Reducing these numbers to percents, as the summary on the table shows us, we have 6.91% accelerated, 19.95% normal, and 73.14% retarded.

The serious consequences of such a large per cent of retardation are at once apparent to the average teacher. He at once thinks of the difficulty of instructing pupils of such variation in ages in the same class. Instruction aimed at the bright pupils is likely not to be understood by the slower ones, or if the instruction is on the plane of the backward pupils, the brighter ones are likely to work considerably under their capacity. Many other serious features will suggest themselves, but the one that impresses the average business man, is the actual cost required to give to these backward children the extra teaching. The following table makes a study of the relative costs of teaching and reteaching:

Table II. Cost of Teaching and Reteaching—State Survey, 1922

Number Pupils Retarded	Total Years of Reteaching	Number Pupils Enrolled	Number Years of Teaching
1,824 Pupils Retarded	1 year = 1,824	1,595 in third year	= 4,785
1,550 Pupils Retarded	2 years = 3,100	1,604 in fourth year	= 6,416
1,004 Pupils Retarded	3 years = 3,012	1,370 in fifth year	= 6,850
557 Pupils Retarded	4 years = 2,228	851 in sixth year	= 5,106
250 Pupils Retarded	5 years = 1,250	911 in seventh year	= 6,377
109 Pupils Retarded	6 years = 654	952 in 8th year	= 7,616
25 Pupils Retarded	7 years = 175	7,283 Pupils Enrolled for Total	= 37,150
5 Pupils Retarded	8 years = 40	Total Years of Enrollment.....	37,150
1 Pupil Retarded	9 years = 9	Years of Acceleration.....	564
3,325 Pupils Retarded for Total	= 12,292	Total Years of Teaching.....	36,586
Number Pupils Accelerated	Total Years Acceleration		
448 Pupils Accelerated	1 year = 448	36,586 Years of Teaching.....	75%
53 Pupils Accelerated	2 years = 106	12,292 Years of Reteaching.....	25%
2 Pupils Accelerated	3 years = 6	48,878 Years—Total.....	100%
1 Pupil Accelerated	4 years = 4		
504 Pupils Accelerated for Total	= 564		

Table II is computed from Table I. From it we find that 1824 pupils are retarded 1 year. This means, in case the attendance is enforced, that these 1824 will have to be retaught, requiring 1824 pupils years of extra teaching. The table shows that in the six grades there are 1550 pupils who are retarded 2 years, thereby requiring 3100 pupil years of extra teaching; 1004 pupils are three years retarded, requiring 3012 years of re-teaching, etc.

The 5325 pupils who are retarded from one to nine years have cost the state 12,292 years of reteaching in addition to the years of teaching for which they were normally entitled.

On the other hand the accelerated pupils by getting ahead of their grades have saved the state 564 years; that is, the 504 accelerated pupils have received 564 years of teaching less than their allotted portion.

In order to compute the amount of teaching during the six grades we multiply the enrollment for each grade by the number of the grade. For example, by the end of the third year each of the 1595 normal third grade pupils will have received three years of teaching, making a total of 4785 pupil-years of teaching. In all, the 7283 pupils have received 37,150 years of teaching.

Since the accelerated pupils have saved the state 564 years of teaching, the total years of actual teaching is only 36,586. In other words, the state has given to these 5283 pupils 36,586 years of teaching and 12,292 years of reteaching. Reducing these figures to percents we can say that 25% of our school money is spent on reteaching. Putting it in another way, we are getting only a 75% promotion.

The question might well be raised, should we not secure a 100% promotion? We could not, of course, expect every pupil to make his promotion each year, but should not our system of classification make it as easy to rush the bright child ahead as to hold the dull one back. Should there not be as many accelerated pupils in a school system as there are retarded? If the average pupil is to receive a year's schooling in one year it seems to the writer that we are forced to answer this question in the affirmative.

As an aid to a further study of this problem, we have made a frequency polygon of the distribution. In doing so we have placed all of the normal pupils at the zero points in the frequency, the accelerated to the right, and the retarded to the left of the zero point when plotted on the X-Axis. (See accompanying graph.)

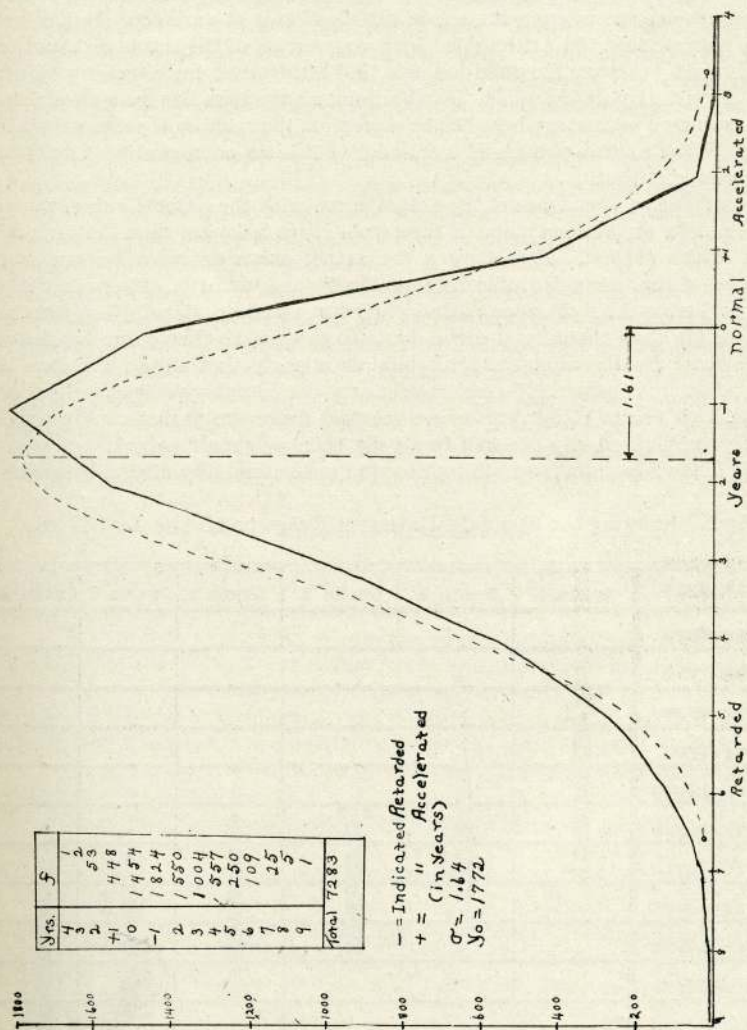


Fig. 1. Showing Ideal and Actual Progress Distribution

After plotting the actual distribution indicated by the continuous lines, we have superimposed the Normal Curve of Probability upon it as indicated by the broken lines. This enables us to detect wherein the actual curve differs from the natural or ideal curve.

If we take the broken line curve as representing the natural distribution, we can at once see wherein the actual distribution is at variance. In the first place, we note that the Arithmetic Mean, or average, of the actual distribution falls at 1.61 years on the retarded side, indicating that the average pupil in the state is 1.61 years retarded. At this point on the base line we have erected the Y sub-zero ordinate, whose height represents the number of cases we would expect to fall at this point. This number is 1772 as compared with 1824 on the actual distribution.

By comparing the slopes of the actual curve with the natural curve, we see that the left, or retarded slope of the actual curve is longer than the retarded slope of the normal. Especially is the actual curve drawn out more as it approaches the base line, indicating an abnormal amount of extreme retardation. Whereas the right slope of the actual curve is steep, showing less extreme acceleration than the normal curve, leads us to expect. The curve enables us to see more clearly what the table tells us, namely that we do not have as many that are considerably accelerated as are considerably retarded. Looking at the high points of our curves we see that there are perhaps more pupils slightly accelerated, say one-half to a year, than we should expect.

The following graph is an attempt to study the variability of ages by grades:

Fig 2. Showing the Standard Deviation Range or Middle Two-Thirds

Pupil Ages	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
5yrs-6yrs						
6yrs-7yrs						
7yrs-8yrs	84					
8yrs-9yrs		130				
9yrs-10yrs			215			
10yrs-11yrs				49		
11yrs-12yrs	334				74	
12yrs-13yrs		400				36
13yrs-14yrs			257			
14yrs-15yrs				194		
15yrs-16yrs					313	
16yrs-17yrs						275
17yrs-18yrs						
18yrs-19yrs						
19yrs-20yrs						

The vertical heavy lines of this graph indicate the range of the middle 68.26% in the different grades. In constructing this graph the Standard Deviation for the entire six grades was taken. It was found to be 1.64 years. The numbers above these heavy lines indicate the number of pupils who are accelerated 1.64 years or more; the number below the heavy lines indicate the number who are retarded 1.64 years or more. That is, if we should attempt to classify rigidly on the basis of chronological age (which, of course, we should not do), using standard deviation as our unit of variability we would have to promote or otherwise provide for those above the standard range and demote those below.

These and other studies of the matter of classification lead the writer to conclude that the greatest fault in our classification of pupils throughout the state is our neglect in discovering and promoting the bright pupils. Our study confirms Terman's statement that it is the bright boy or girl who is being retarded by our system of promotion.

The general recommendation that the writer would make in order to improve the classification would be to aim the instruction at the middle two-thirds of the group and provide special classes for both accelerated and retarded pupils. It is just as important to provide "furthering classes" for the bright pupils enabling them to go ahead, as to provide special classes for the slow pupils. Each group is entitled to eight years of the kind of elementary schooling it is capable of taking. To fail to provide a full program for each is poor management of the intellectual resources of our state.

Causes of Retardation

The great amount of retardation indicated in the Age-Grade Table naturally leads us to ask what are the reasons for it?

It would indeed be difficult to discuss all of the causes. It is evident for some reason that 73% of our pupils have from time to time failed to satisfy the standard which their teachers have set up for their promotion. The following are some of the outstanding questions that arise:

1. To what extent is the mentality of the pupils to blame?
2. How far are the educational advantages, including school plant, teacher, organization, etc., responsible?
3. How seriously is their progress affected by irregular attendance?

Mental Age-Grade Table

In order to study the relation that mentality bears to retardation an intelligence test was given to all pupils included in the survey. From the results of these tests the following Mental Age-Grade Table was constructed.

Table III. Mental Age-Grade Table—State Survey, 1922

Mental Ages	Point Scores	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
5 years- 6 years	0-4	94	26	2		1	1
6 years- 7 years	5-14	490	166	26	9	2	2
7 years- 8 years	15-24	512	371	136	32	9	3
8 years- 9 years	25-34	300	435	287	100	51	20
9 years-10 years	35-44	91	258	326	213	105	63
10 years-11 years	45-54	27	148	288	229	151	117
11 years-12 years	55-64	11	56	131	189	203	141
12 years-13 years	65-74	4	19	53	104	157	188
13 years-14 years	75-84	1	5	44	56	110	138
14 years-15 years	85-94		3	5	20	46	108
15 years-16 years	95-104		2	2	12	19	56
16 years-17 years	105-114			2	2	7	31
17 years-18 years	115-124					3	17
18 years-19 years	125-134			1		1	7
TOTAL		1,530	1,479	1,303	966	865	892
Accelerated		1,096	998	777	583	522	537
Normal		300	258	288	189	157	138
Retarded		134	223	238	194	186	219
Median		7-5	8-5	9-7	10-7	11-7	12-6

This table is similar to the Age-Grade Table, except that it includes the point scores corresponding to the ages. That is, mental age is determined by the point score a pupil makes on the intelligence test. If a pupil makes a score between 0 and 4 he is classified as between five and six years old; if he makes a score between 5 and 14 he is classed as between six and seven years of age, etc.

As in the Age-Grade Table the heavy lines in the respective columns indicate the pupils of normal mental age for those grades. That is, we assume that a third grade pupil is eight years old mentally. A study of the third grade distribution shows us that we have 300 pupils of normal age mentally, 1096 pupils who are from one to four years younger than the normal, and 134 who are from one to five years older than the normal. We have designated the pupils above the heavy line as accelerated, because pedagogically they are in respect to their mental ability farther along than they should be. Whereas, those below the heavy line are pedagogically retarded. A glance at the summaries reveal that there are considerably more pupils who are too young mentally than too old for the grades in which they are placed. Computing the arithmetic mean for the entire eight grades we find that the mental age of the average pupil is .91 years less than the mental age of the normal pupil. In other words, our pupils on the average are pedagogically placed .91 years farther along than their mentality would warrant. When we add to this fact, what the Age-Grade Table revealed, viz., that even placed as they are, they are still 1.61 years behind where they should be considering their chronological age, we are brought face to face with the actual retardation. In other words,

if placed according to mental age our pupils would be on the average .91 plus 1.61 years or 2.52 years retarded.

The following "Comparative Age Study" enable us to see this more clearly:

Table IV. Comparative Age Study—State Survey, 1922

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Chronological Age	9-10	10-11	12-2	12-10	13-9	14-6
Mental Age	7- 5	8- 5	9-7	10- 7	11-7	12-6
Achievement Age	7- 5	8- 4	9-6	10- 8	11-8	12-7

This table enables us to compare the chronological, mental, and achievement ages by grades. The chronological age of the median third grade pupil is 9 years and 10 months; the mental age of the median pupil of this grade is 7 years and 5 months. As stated before on an average, the median pupil of the various grades is mentally about two and one-half years behind his chronological age. It would seem that this fact alone explains in great part the retardation.

When we couple with this fact the fact that the achievement age or progress in school subjects, which will be explained later, practically agrees with the mental age, we are further confirmed in our conclusion that a very large factor in retardation is the mental capacity of the pupils.

The question naturally arises, why is the average intelligence of our pupils so far below the normal? And is it uniformly true throughout the state? A roll call of counties is in order at this point.

Table V. Comparison of Mental and Chronological Ages by Counties

	M. A.	C. A.	Per Cent of Standard
Berkeley	10	12- 3	82
Braxton	9-10	12-11	76
Brooke	11- 4	12- 3	92
Gilmer	10- 6	13-4	79
Harrison	9-10	12- 3	80
Logan	10-11	12- 9	85
Marion	9-10	12- 4	80
Monroe	9- 6	12- 4	77
Upshur	10- 2	13- 3	77
Wetzel	10- 0	12- 5	80

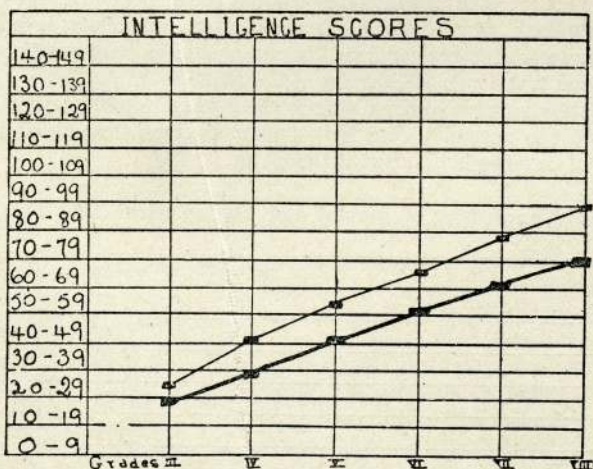
The first column of the above shows the mental age of the median pupil of each county. The second column shows the percent the mental age is of the chronological age. Since in the standards the two ages agree we may say that the third column shows the percent the mental age of the median pupil in each county is of the standard age.

Apparently the pupils of Brooke county approach more nearly the mental age of our standard than any other; those of Logan county rank second. The other counties do not vary a great deal from the medians, which is 80% of standard. This leads us to suspect that pupils tested in establishing these norms or standards were somewhat selected and of more than average intelligence.

It is without the province of the survey to answer the questions as to why West Virginia pupils are on the average below the standards in intelligence, we have no evidence bearing on the subject. It suggests an interesting line of investigation for the student of sociology. It is to be hoped that some sociologist will make a study of the matter and acquaint us with his findings. Mr. Gilbert L. Brown has an interesting article in the April number 1922 of the Journal of Educational Research on "Intelligence as Related to Nationality."

Since the standards used in arithmetic and reading are taken from the Illinois Examination battery of tests it is well to keep before us constantly a comparison of our West Virginia medians with the standard standards. The following is a graph, of intelligence:

Fig. 3. Showing Comparisons of West Virginia Scores with Standards



In the above graph the upper line is the Illinois Standard, the lower one the West Virginia median. The uniformity of the increase in the two curves is an index of the accuracy of the survey. In studying the achievement as shown in the educational subjects that follow, it is necessary to allow for the handicap in mentality. That is, we should be prepared to expect a correspondingly low achievement. For as pointed out in the "Comparative Age Study" table the achievement age and mental ages run parallel. In the following chapter we shall compare the achievement in the various school subjects with the standards.

CHAPTER III

A Study of Educational Achievement as Indicated by Central Tendencies

The present chapter proposes to study the progress of West Virginia in the Educational subjects. In order to make this study, the following tests and scales were used:

1. The Illinois Examination Test in Arithmetic.
2. The Illinois Test in Silent Reading.
3. Ayre's Writing Scale, Gettysburg Edition.
4. Buckingham's Extension of Ayre's Spelling Scale.

In order that we might get some idea of the amount of time that the elementary schools are spending on these four subjects, a careful examination of almost 100 study lists of Coal District was made, and the time devoted to these subjects actually computed. This examination revealed that practically 60% of the entire time was given to these subjects, as follows: Arithmetic 17%; Reading 27%; Writing 6%; and Spelling 8%. Had we included History and Language, we would have tested 80% or more of the work.

Arithmetic

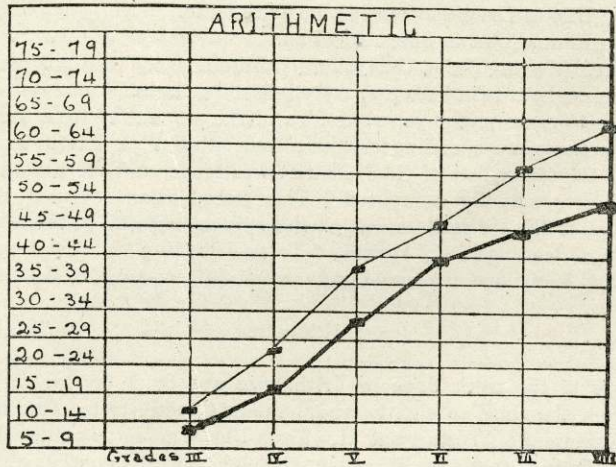
A study of the work done in Arithmetic was made by means of giving pupils from the third to eighth grades the arithmetic tests contained in the Illinois Examination Tests I and II. Tests I were given to grades three, four, and five; Tests II to grades six, seven, and eight. Test I consists of two cycles of the four fundamentals in spiral order, making eight sets of problems, containing about 50 problems in each set. Test II consists of seven sets, as follows: (1) Addition, (2) Subtraction, (3) Multiplication, (4) Division, (5) Addition and Subtraction of Fractions, (6) Division of Fractions, (7) Decimal Fractions.

The papers were scored according to directions. The total number of problems solved correctly in the given time computed, the score of each pupil. A correction of 22 was added to the score in Examination II in order to make them comparable with Examination I scores. These scores of the individual pupils were placed on the Class Summary Sheets (see appendix). From the individual scores medians were computed for the respective classes and compared to the Standards. The various county directors and their assistants likewise combined the scores of the pupils in their various school systems and provided the teachers, principals, and superintendents with the standing of their pupils. Graphs of the results in all subjects were made on a blank form, known as "Graph by Subject." This enables a superintendent to study the progress of his school grade by grade in the various subjects. At this point the reader would do well to study the State Graph in the appendix. Each of the county directors made a similar compilation for each of the districts, and also a final summary by frequencies of his entire county. From the County Summaries which were sent to the University, we have compiled the State Summary. The following table and diagram represents the medians of the ten counties of West Virginia as compared with the Illinois Standards.

Table VI. Arithmetic

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Standard	12	23	37	45	56	63
West Virginia	8	16	28	39	44	49

Fig. 4. Showing the Comparison of State and Standard Score in Arithmetic



It is obvious at a glance at the above graph that West Virginia is considerably below standard in every grade. The uniformity of the retardation in Arithmetic is rather striking. The seventh and eighth grades, are, if anything, a little farther behind than earlier grades. The various county directors have probably inquired into the causes of this condition and have perhaps discussed them in delivering the county surveys. The writer has been interested in comparing these findings with arithmetic scores in Charleston, Huntington, and other parts of the state. In general he has found that only those schools in which there has been systematic use made of practice cards, such as the Studebaker or Curtis Practice Cards, the schools fall decidedly below the standards. He found by giving the Curtis Standard Tests Series B to Charleston schools that the pupils were well up to standard. Practice cards have been in use in Charleston for years. The Curtis Medians, if anything, are higher than those for the Illinois tests. We see, then, that these standards can be achieved.

We would recommend that teachers and superintendents study the shortcomings of their respective schools in respect to arithmetic as revealed by the survey reports. If necessary diagnose the case further by the Cleveland Survey Tests. Then secure the appropriate practice cards and insist upon their rigid and intelligent use. Either set of cards can be had from the World Book Company, Yonkers-on-Hudson, New York. This procedure is urged, not for the sake of encouraging an undue emphasis upon arithmetic, but in the interests of encouraging the time spent on drill. This is not saying

we should give less time to arithmetic, but that we should achieve more in the time we now devote to it. We would not underestimate the importance of the subject. There is an appalling lack of accuracy in the fundamentals of arithmetic. A closer eye to the amount of time wasted in Algebra and Geometry in High School and higher mathematics in college due to inability to add, subtract, multiply, and divide, will incline teachers and supervisors to tighten up on requirements in arithmetic all along the line. The higher processes cannot come to them in full fruition unless the elementary processes are made automatic.

Reading

As a means of studying the efficiency of pupils in reading, the reading test included in the Illinois Examination was used. This test includes a number of short exercises to be read silently. Each exercise asks some question. The pupil reads the exercise and answers the question by underlining a word. The score value of each of these exercises has been determined and placed beside the exercise. Each paper is given two scores. One for rate and one for comprehension. A correction of 29 is added to the scores for pupils of grades six, seven, and eight in order to make them comparable to score for pupils in grades three, four, and five.

The following tables and graphs show the medians made by West Virginia pupils as compared to the standard scores.

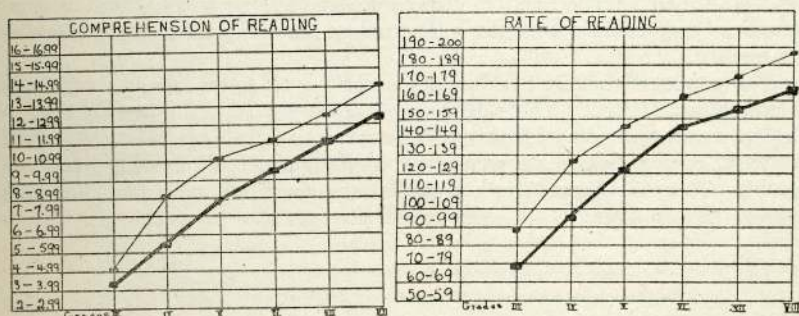
Table VII. Rate of Reading

GRADES	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Standard	88	126	145	161	173	186
West Virginia	69	95	121	147	156	167

Table VIII. Comprehension of Reading

GRADES	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Standard	4	8	10	11	12.5	14
West Virginia	3.4	5.4	7.9	9.6	11	12.6

Fig. 5. Showing the Comparison of State and Standard Scores in Reading



As in the case of arithmetic we find West Virginia uniformly behind in all grades. The retardation in rate of reading seems to be just about one year. The only grade in which it is more than a year is the sixth.

In comprehension West Virginia is likewise about one year behind. If we should compare these graphs with the graph for Intelligence, we will see that there is a worked similarity. The retardation is not any more than we should expect. In all these comparisons the reader should bear in mind that the scores are medians. There are many pupils in each grade that surpass the standards. As we shall show by a later study, the range of scores in all subjects is large.

Although the retardation is not bad, it should be overcome. The writer noted that in many of the schools which he personally surveyed considerable emphasis was laid upon oral reading. One eighth grade teacher said his remedy for the poor reading was "to make the pupils stand up and read aloud." On the contrary, we would recommend that silent reading be emphasized. Individual attention may reveal bad habits, such as lip-reading, or improper breathing habits, or regressive and slow eye movements. The teacher should make every effort to correct these faults. Each school should be well supplied with perception material in order to increase the rate. Much supplementary reading should be required. This should be a comparatively easy character that pupils may form the proper eye movements. When we consider that the reading habits formed in the early years of school life determine largely the rate at which they acquire information throughout life, we see the importance of giving silent reading the maximum of attention. Studies of time schedules reveal 27% of the time of the elementary schooling devoted to reading. If one-half of this time were spent in carefully training children to read at the maximum rate at which they can comprehend what they read, the writer believes that the reading efficiency would easily be doubled. The person who can read at the rate of 300 or 400 words per minute has a tremendous lead over the oral reader limited to 100 to 150 words per minute. Teachers should make it their business to know the rate at which their pupils read. Frequent tests, self devised, should be given to ascertain whether or not the proper progress was being made.

Handwriting

Samples of handwriting were taken by pupils from the third to the eighth grade. Under definite direction pupils were asked to write the first stanza of "Mary had a Little Lamb." They were asked to write the stanza as many times as they could within three minutes, at the same time giving attention to quality.

The papers were scored for quality according to Ayers Handwriting Scale, Gettysburg Edition. The rate was obtained by counting the number of letters and by dividing by three. The respective medians a-1 class, school, district, county, and state were then computed. The following tables and graphs show the West Virginia median as compared with the Standards established by Ayers:

Table IX. Speed in Handwriting—(Letters Per Minute)

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Standard	44	56	64	70	76	80
West Virginia	29	44	55	62	68	72

Fig. 6. Showing the Comparison of State and Standard Scores in Speed of Handwriting

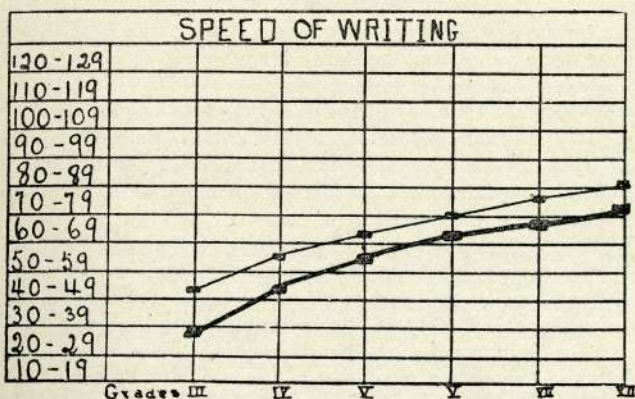
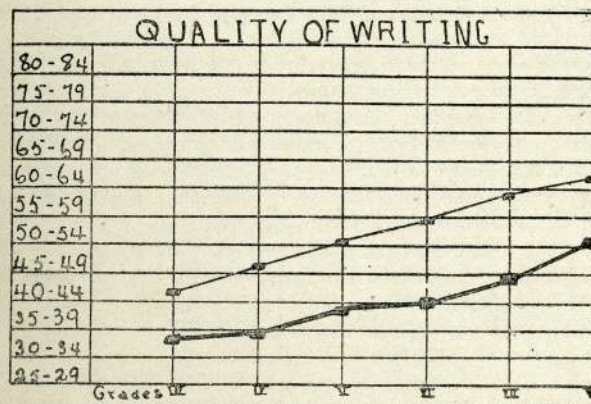


Table X. Quality of Handwriting—(Ayers Scale)

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Standard	42	46	50	54	58	62
West Virginia	33	34	38	40	44	51

Fig. 7. Showing Comparison of State and Standard Scores in Quality of Handwriting



In respect to speed the situation in handwriting is not so bad. West Virginia is on the average about one grade behind. It looks as if there was considerable effort to increase the speed of writing.

In respect to quality the situation is decidedly embarrassing. Not until the seventh grade does West Virginia surpass the third grade standard. Some consolation may be sought, perhaps, in the fact that handwriting is not as necessary as before the days of shorthand and typewriting. In fact, the standard of the Municipal Civil Service Commission of New York corresponds to 40 and 50 on the Ayres Scale; 40 for general position, and 50 for position where writing is a special requirement. There is still a demand for legible handwriting on the part of almost every one. If our pupils fall below a reasonable standard upon completing the eighth grade we can but imagine how much their writing deteriorates after leaving school.

The graph suggests that very little is being done toward securing results in quality of penmanship before the eighth grade. Before we can hope to achieve the Ayre's Standard, it is certain that special attention must be given to the subject. Attention must be focused upon individuals. Their special difficulties should be discovered and corrected by the necessary practice peculiar to their individual needs. Regardless of the system used, teachers should not rely entirely on class drills in handwriting. Not a great deal of time should be spent on the class work as a whole. Pupils who persistently fall below a reasonable quality should be required to join a writing "hospital class" and meet perhaps twice a week after school. As a means of diagnosing individual faults the writer recommends the use of "Treeman's Analytical Scale for Judging Handwriting." It is an excellent aid to pupils in discovering their individual weaknesses. Houghton Mifflin & Company publish this scale. Gray's Score Card suggests a convenient form for recording progress along specified lines. All such aids should be supplemented, however, by much individually dissected practice.

Spelling

The spelling ability of the pupils was studied by means of the Buckingham's Extension of Ayers Spelling Scale. Twenty-five words from Column N were given to pupils in grades three, four, and five; twenty-five words from Column T were given to grades six, seven, and eight. The words were chosen from the Buckingham Extension. The two lists are given below:

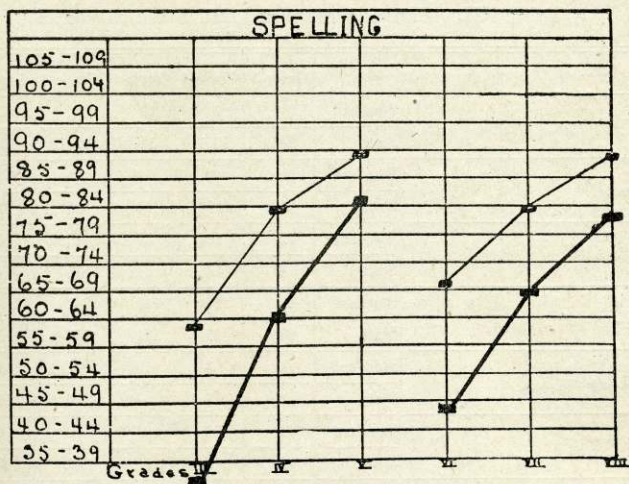
For Grades 3, 4, and 5		For Grades 6, 7 and 8	
1. arithmetic	14. fasten	1. ache	14. deceive
2. breakfast	15. flour	2. amusement	15. discoveries
3. breeze	16. forest	3. approval	16. electricity
4. broad	17. gentle	4. banana	17. error
5. chance	18. holes	5. biscuits	18. exceptions
6. climb	19. hotel	6. bruised	19. favorite
7. coffee	20. iron	7. burglar	20. genuine
8. color	21. living	8. business	21. handful
9. contains	22. monkey	9. changeable	22. hymn
10. daily	23. noise	10. chimney	23. investigation
11. eagle	24. ocean	11. choir	24. lilies
12. excuse	25. pencil	12. commence	25. liquor
13. fancy		13. compute	

A table and graph showing the position West Virginia occupies in spelling is given below.

Table XI. Spelling

	III	IV	V	VI	VII	VIII
Standard	58	79	88	66	79	88
West Virginia	24	60	81	43	64	78

Fig. 8. Showing Comparison of State and Standard Scores in Spelling



The broken line in the above graph is due to the fact that the two lists of words with varying standards were used. The writer believes that the extremely poor showing by the third grade is partly explained by the inability of pupils to write. If words have been spelled orally no doubt they would have made a better showing. Aside from this explanation he is unable to understand why our schools should do so poorly in spelling. From a study of the time devoted to this subject in Coal District, it was found that 8% of the school day was spent on Spelling, or about 30 minutes a day. This leads one to question, just how is this time used? The extreme amount of variability confirms one in the suspicion that the time is largely spent on testing their spelling. It is very common to find that some pupils in a grade miss every one of the 25 words, whereas, others spelled every word. If the thirty minutes were devoted to supervised study of the spelling lesson, in which the teacher enables the individual pupil to discover why he misspelled a given word, it is likely the class achievement would be more uniform. Surely the poor speller would learn to spell a few words during the thirty minutes. It is a pretty strong indictment against the lack of personal interest in the progress of her pupils for a teacher to permit them to spend thirty minutes a day spelling and then be unable to spell less than a fourth of their words. A

spelling hospital such as was suggested in handwriting might be formed for the habitually poor spellers. Too much time should not be taken with the class as a whole. The futility of the spelling grind was pointed out by J. M. Rice years ago.

Summary of Educational Tests

In order that we may have a complete record of the comparative ages and educational scores in a convenient form for record, we have put together the preceding tables into the following Summary Table of Standard and State Medians:

Table XII. Showing Standard and State Medians

		Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Ages	Standard	8	9	10	11	12	13
	State	9-10	10-11	12-2	12-10	13-9	14-6
Intelligence	Standard	25	40	53	66	78	89
	State	19	29	41	51	61	70
Arithmetic	Standard	12	23	37	45	56	63
	State	8	16	28	39	44	49
Rate of Reading	Standard	88	126	145	161	173	186
	State	69	95	121	147	156	167
Comp. of Reading	Standard	4	8	10	11	12.5	14
	State	3.4	5.4	7.9	9.6	11	12.6
Speed of Writing	Standard	44	56	64	70	76	80
	State	29	44	55	62	68	72
Quality of Writing	Standard	42	46	50	54	58	62
	State	33	34	38	40	44	51
Spelling	Standard	58	79	88	66	79	88
	State	24	60	81	43	64	78

Achievement Age

From the above data a number of interesting studies may be made. In order to make a direct comparison of the combined achievement in the various school subjects we have computed a combination grade for all known as the **Achievement Age**. That we may compare the Educational progress of one grade with another, or one school with another, or county with another, it is very desirable to have a single score that will represent all the subjects. Owing to the fact that reading and arithmetic are more important than writing and spelling, obviously it would not be fair to add the scores together. In other words, the various subjects must be **weighted** in some way. Any method one might use is more or less arbitrary. The method we used is in part arbitrary and in part statistical in nature. We examined the study lists of about 80 teachers of Coal District and computed the exact amount of time given to these subjects. We found, as previously stated, that 27% of the entire

school day was devoted to reading, 16% to arithmetic, 8% to spelling, and 6% to writing. Again, members of the class taking the work in measurement in the University were asked to weight the subjects according to their idea of their importance on the basis of a total of 1000 points. A median of the estimates was found to be as follows: Reading 400, (a) rate 200, (b) comprehension 200, Arithmetic 300; Speed of Writing 100; Quality of Writing 100, and Spelling 100. These values are rather close of the values that the time devoted to the subject would assign it.

In computing the combined achievement age, we have allowed a school grade that is up to standard in arithmetic 300 points; in rate of reading 200 points; in comprehension 200 points; in speed of writing 100 points; in quality of writing 100 points; and in spelling 100 points, making a total of 1000 points.

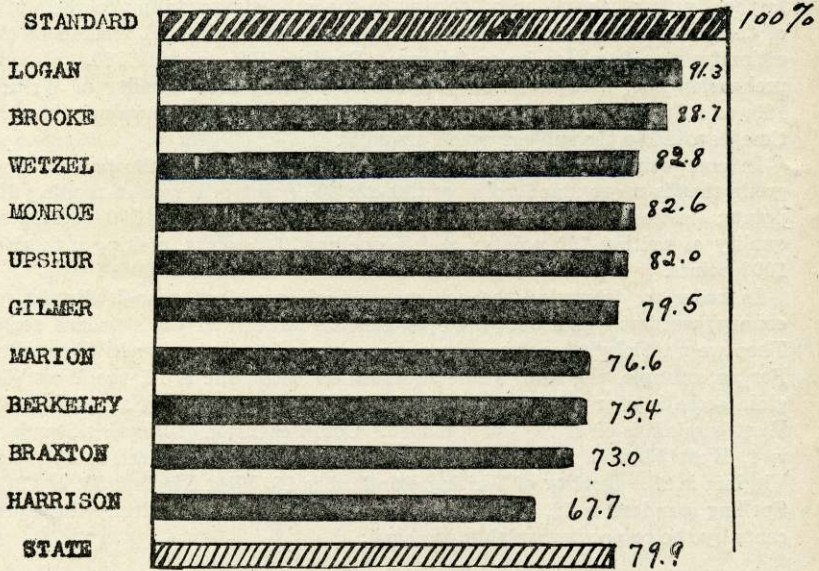
In order to determine the achievement of any class, school, district, or county, we first figure out what per cent its score is of the standard score. Then we multiply it by either three, two, or one hundred and add the results. For an example, the third grade standard in arithmetic is 12, the West Virginia score is 8 or 66 $\frac{2}{3}$ % of standard. Rate of Reading Standard is 88, West Virginia is 69 or 78% of standard. Comprehension of Reading Standard is 4, West Virginia is 3.4 or 82%. Speed of Writing standard is 44, West Virginia is 29. Quality of Writing standard is 58, West Virginia 33, or 79%. Spelling standard is 58, West Virginia 24, or 41%. If we multiply these percents by the respective **weights**, we have:

Arithmetic.....	66% x 3 = 200
Reading Rate.....	78% x 2 = 156
Comprehension.....	82% x 2 = 164
Speed of Writing.....	66% x 1 = 66
Quality Writing.....	79% x 1 = 79
Spelling.....	41% x 1 = 41

Percent of standard of combined Achievement is..... 706
or 706 out of a possible one thousand. In a similar way the percents of standards of the six grades have been combined and the arithmetic mean, or average, computed as the achievement of that county.

The following graph represents the ten counties included in the survey:

Fig. 9. Showing Achievement Scores of Ten Counties, State Summary, 1922



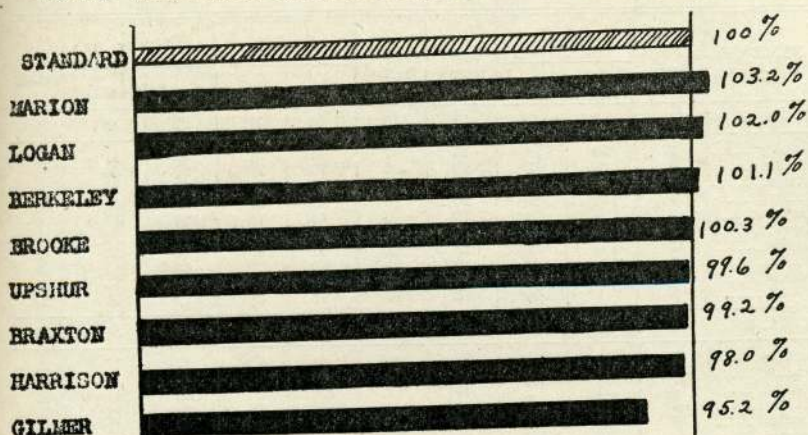
It is interesting to note that Logan county stands first, being 91% of the Standard. Brooke is a close second. Wetzel, Monroe, and Upshur relatively close together. The remaining counties vary considerably with Harrison County 68% of Standard. The average for the state is 79.94%. Hence, in so far as the tests used measure, the achievement of our pupils of West Virginia is doing about 80% of the work done in these subjects that pupils of Illinois, or the pupils upon which the standards are based.

Achievement Quotient

In order to answer our second question raised in discussing the cause of retardation, viz., How far are the educational advantages including school plant teachers, etc., responsible for the retardation previously mentioned, we must consider the above achievement in counties with the intelligence of the pupils in the various counties. Before we can evaluate the teaching and other educational factors, we must know the material with which the schools have to deal. We take this factor into account when we divide the average achievement score of a county by the average achievement percent that the county is of the standard in intelligence. In other words, the achievement age divided by the mental age gives the achievement quotient. We should expect a pupil eight years old mentally to be eight years old educationally. If he were, we would conclude that his school is up to standard.

The following graph shows the achievement quotient of eight counties. The writer is forced to explain that when the quotients were computed, Monroe and Wetzel counties had not yet sent in their reports:

Fig. 10. Achievement Quotient of Eight Counties. State Survey, 1922



The above graph is a little more encouraging to those engaged in the work of Education in West Virginia. Almost every county is working up to its capacity. That is, considering the ability of pupils with which we have to deal our schools are doing as well as the schools of Illinois, or the schools upon which the standards are based.

If we should term this ratio **school achievement**, we may say that Marion county, first in the list, has a school achievement of 103.2%. Logan a school achievement of 102. Persons more familiar with the state than the writer can perhaps find reasons why this is true. Doubtless teachers in Marion and Logan counties can explain it perfectly. The writer makes no effort to do this, but believes that there is an explanation somewhere. The evidence submitted by the survey does not permit further analysis of the situation. Anyone who has a theory is at liberty to investigate further and vindicate or refute his theory. A complete record of the medians of all the counties in all subjects, including State Medians, is found below.

Table XIII. Comparison of County and State Medians

NAME OF COUNTY	Grade	Ages		Intel- ligence	Arith- metic	Reading		Writing		Spelling
		Yrs.	Mos.			Rate	Comp.	Speed	Quality	
W. VA. S.	3	9	10	19	8	48	3.4	29	33	24
Berkeley.....	3	10	4	16	7	48	2	30	31	36
Braxton.....	3	10	3	16	6	70	2	27	30	36
Brooke.....	3	9	9	28	11	93	5	29	35	20
Gilmer.....	3	10	10	26	9	85	3	25	30	60
Harrison.....	3	9	9	18	6	45	1	28	31	9
Logan.....	3	10	2	25	14	89	4.3	39	34	40
Marion.....	3	9	8	15	8	62	3	27	32	6
Monroe.....	3	9	8	19	9	75	2.9	33	33	58
Upshur.....	3	10	4	19	8	64	2.5	30	35	42
Wetzel.....	3	9	10	13	7	72	3	29	36	29
W. VA. S.	4	10	11	29	16	95	5.4	44	34	60
Berkeley.....	4	10	8	28	16	91	4.5	47	37	64
Braxton.....	4	11	2	26	11	86	4	40	30	72
Brooke.....	4	11	1	44	18	110	6	53	41	48
Gilmer.....	4	12	2	43	14	110	6	39	34	84
Harrison.....	4	10	11	26	13	87	3.8	43	33	35
Logan.....	4	10	10	38	23	124	7	50	35	66
Marion.....	4	10	10	30	13	92	5	43	34	52
Monroe.....	4	11	2	29	19	94	5.5	41	40	81
Upshur.....	4	11	10	29	20	84	4.2	47	42	75
Wetzel.....	4	10	10	28	19	89	5	46	31	58

Table XIII—Continued

NAME OF COUNTY	Grade	Ages		Intel- ligence	Arith- metic	Reading		Writing		Spelling
		Yrs.	Mos.			Rate	Comp.	Speed	Quality	
W. VA. S.	5	12	2	41	28	121	7.9	55	38	81
Berkeley.....	5	11	3	38	28	107	6.8	56	38	83
Braxton.....	5	12	7	42	23	111	7	51	40	84
Brooke.....	5	12	7	53	27	130	9	58	51	56
Gilmer.....	5	12	9	45	24	131	7	48	46	80
Harrison.....	5	11	10	38	26	118	6.1	55	33	70
Logan.....	5	12	2	53	33	140	6.6	58	37	89
Marion.....	5	11	11	35	28	112	7	56	35	70
Monroe.....	5	10	10	37	26	119	7.7	57	41	91
Upshur.....	5	11	11	42	28	121	7.8	47	49	88
Wetzel.....	5	11	9	41	31	119	8	57	42	83
W. VA. S.	6	12	10	51	39	147	9.6	63	40	43
Berkeley.....	6	12	9	50	35	150	9.4	58	41	54
Braxton.....	6	13	1	51	35	130	9	62	40	52
Brooke.....	6	13	7	70	47	157	10	69	44	36
Gilmer.....	6	13	10	49	34	134	9	48	43	52
Harrison.....	6	12	9	47	37	132	7.5	62	33	34
Logan.....	6	12	9	56	33	168	11.1	65	41	51
Marion.....	6	12	0	53	40	143	9.8	68	35	47
Monroe.....	6	13	2	44	37	123	9.4	62	46	72
Upshur.....	6	13	11	54	40	143	8.5	58	50	74
Wetzel.....	6	13	1	53	54	148	10	59	41	33

Table XIII—Continued

NAME OF COUNTY	Grade	Ages		Intelligence	Arithmetic	Reading		Writing		Spelling
		Yrs.	Mos.			Rate	Comp.	Speed	Quality	
W. VA. S.	7	13	9	61	44	156	11	68	44	64
Berkeley.....	7	14	3	66	39	139	9.6	64	44	69
Braxton.....	7	14	10	56	40	154	10	63	40	80
Brooke.....	7	12	6	73	56	167	12.5	63	54	48
Gilmer.....	7	14	7	63	43	139	10	64	49	76
Harrison.....	7	13	7	60	44	156	8.9	74	37	48
Logan.....	7	13	9	68	47	166	12.3	78	43	74
Marion.....	7	14	0	59	42	160	10.5	68	43	52
Monroe.....	7	14	5	52	41	154	10.6	68	53	81
Upshur.....	7	14	8	61	43	150	10.3	71	54	78
Wetzel.....	7	13	6	62	55	152	11	53	56	67
W. VA. S.	8	14	6	70	49	167	12.6	72	51	78
Berkeley.....	8	14	3	69	54	160	12.2	73	50	82
Braxton.....	8	15	7	72	46	167	11.5	75	50	84
Brooke.....	8	14	1	83	49	210	14	78	59	64
Gilmer.....	8	16	1	73	49	158	12	66	54	92
Harrison.....	8	14	8	70	46	156	10.4	71	34	66
Logan.....	8	14	8	82	48	188	13.9	60	45	86
Marion.....	8	14	4	68	49	180	12.5	80	52	70
Monroe.....	8	15	7	61	50	164	11.5	73	54	90
Upshur.....	8	15	9	74	50	169	11.9	60	60	90
Wetzel.....	8	14	5	70	55	150	12	80	52	78

When we translate the median point scores of the median pupil of the state in the various school subjects and combine them into a single age, we have the average achievement age for each grade. By computing the median mental age for the various grades from the mental age grade table, we have the following comparison. Dividing the achievement age by the mental age we get the achievement quotient for each grade, also shown below.

Table XIV. Comparison of Mental and Achievement Ages by Grades

	III	IV	V	VI	VII	VIII
Achievement Age	7-5	8-4	9-6	10-8	11-8	12-7
Mental Age	7-5	8-5	9-7	10-7	11-7	12-6
Achievement Quotient.....	100	99	99.1	100.7	100.7	100.6

The above table reveals perhaps the most striking feature of the entire survey, namely, the closeness with which the achievement age agrees with the mental age. One could not hope for better evidence of the fact than actual achievement as measured by standard tests depends upon mentality. The quotients for every grade are remarkably close to 100%, indicating that the schools are realizing to a considerable degree upon the intelligence of their pupils.

CHAPTER IV

A Study of Class Instruction by Means of Measures of Variability

In the preceding chapter we had occasion to compare the scores of the average or median pupils with the standard scores in the various subjects. This comparison enables us merely to see the central tendency; it tells us nothing with respect of the range of abilities above and below this median score. It is not enough that we know the ability of the average person in our class. It is important that we know what the upper and lower fourth, or the upper and lower sixth, can do. In order words, we want to know how closely our pupils are grouped. This grouping is best studied by what is called measures of variability. The measure of variability which we have chosen to use is called standard deviation. Technically defined, Standard Deviation, is that measure of variability, which, when laid off on each side of the average, includes approximately two-thirds of the cases. Hence, by computing the standard deviation for any particular class or grade and by adding this to the average, we can see the achievement above which one-sixth of the class are found, and by subtraction it from the average we can see the achievement below which one-sixth of the class are found. In the graphs that follow we have attempted to show the range of this middle two-thirds in the various subjects.

Since there are no standards available to show us what we should expect as the average range for this portion of the class, we have undertaken to establish a theoretical standard deviation. More strictly speaking this theoretical grouping reveals uniformity of progress and classification rather than an ideal standard. By superimposing the graph of the theoretical, or uniform grouping, upon a graph showing the actual grouping, we can see how nearly uniform the classification of the various grades is. And by studying the span of the middle two-thirds when reduced to the common denominator of age, we can see at a glance which of our school subjects is best classified. Before presenting the graphs for this comparison we shall attempt to explain the method by which these graphs were made. We do this with the feeling that the school men and women of West Virginia are decidedly in earnest in their efforts to study their own conditions and are willing to spend the time and energy necessary in order to understand precisely how this sort of a study is made. The process is somewhat technical, but it is the only device known to the writer of presenting the actual classification in a subject from grade to grade, and comparing it with a classification more uniform and more nearly ideal. Acknowledgement is hereby made to the class in "Scientific Methods of Handling of Educational Data," for the hours of intense work involved in the working out of the device which makes this type of study possible.

Steps in Superimposing a Normal Standard Deviation Graph upon an Actual Deviation Graph

1. Construct an actual Standard Deviation Graph. This is done by (1) computing the means of the frequency distributions for each reads; (2) the corresponding Standard Deviations, and laying off the Standard Deviations on either side of the mean.

2. Take the difference between the mean of the third and eighth grades and divide this difference by five. This gives the average progress each year.

3. Add the quotient to the mean of the third grade in order to secure the theoretical mean for the fourth grade. Add the same quotient to the fourth grade mean in order to secure a theoretical fifth grade mean, etc. This establishes a theoretical mean for each grade indicating the uniform progress we should naturally expect.

4. From the above Standard Deviations compute the corresponding co-efficients of variabilities. This is done by the Pearson formula $V_p = \frac{100 \text{ S. D.}}{\text{Mean}}$

and gives us the relative variability.

5. Divide the sum of these co-efficients by six in order to secure an average or uniform variability for each grade.

6. Using this theoretical variability in each case and the theoretical mean for the respective grades, calculate from the above formula the theoretical Standard Deviations for the various grades.

7. Superimposing the theoretical S. D. Curve by laying off the Theoretical S. D.'s on either side of the theoretical means.

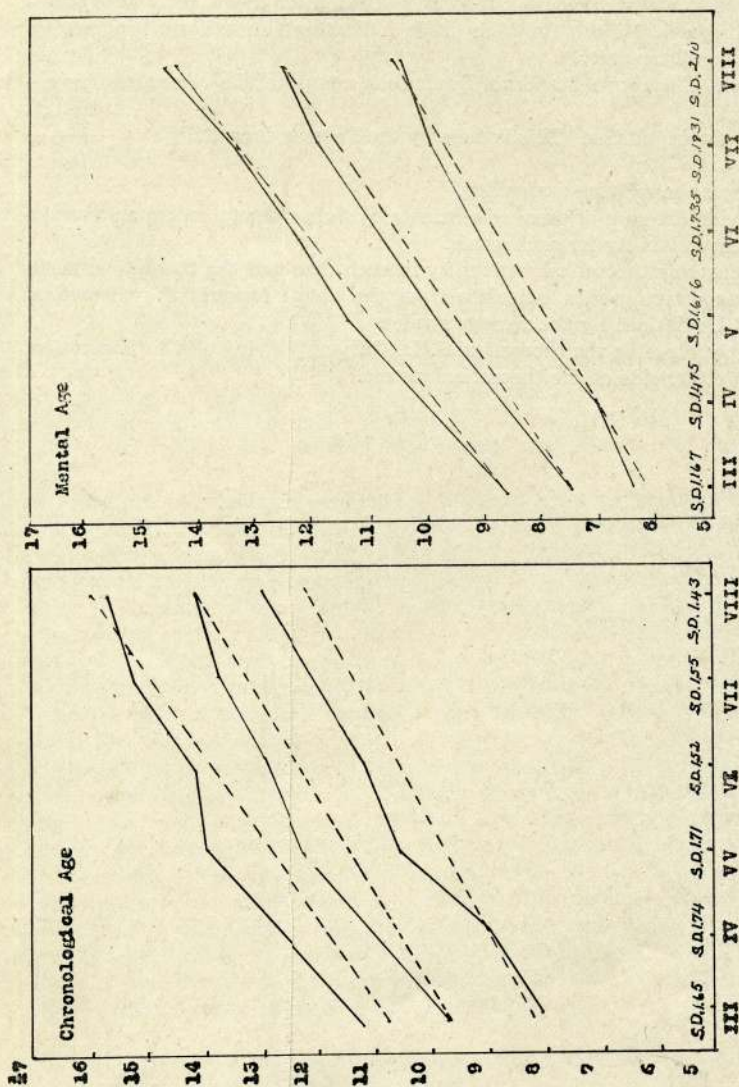


Fig. 11. Showing Theoretical Variability of Chronological and Mental Ages Superimposed upon an Actual Variability.

In the accompanying graphs the dotted lines represent theoretical or uniform classification; the continuous lines the actual classification. The variation of the curve from the theoretic curve shows how irregularly the pupils are grouped or classified.

A glance at the two Age-Graphs show again that the pupils are more uniformly classified in the mental age distribution. In fact, the theoretical mental curve fits the actual so closely that it vindicated the reliability of the intelligence tests.

Studying the grouping by the chronological age by grades, we note that the classification is poorest in the third grade, extending beyond the limits of the theoretical deviations in both directions. Classification is best in the eighth grade, falling within limits of the normal.

The graphs on the opposite page, which follows, represent a similiar study of each of the subjects tested. They are reduced to ages and drawn to scale, consequently the grouping of classifications may be directly compared.

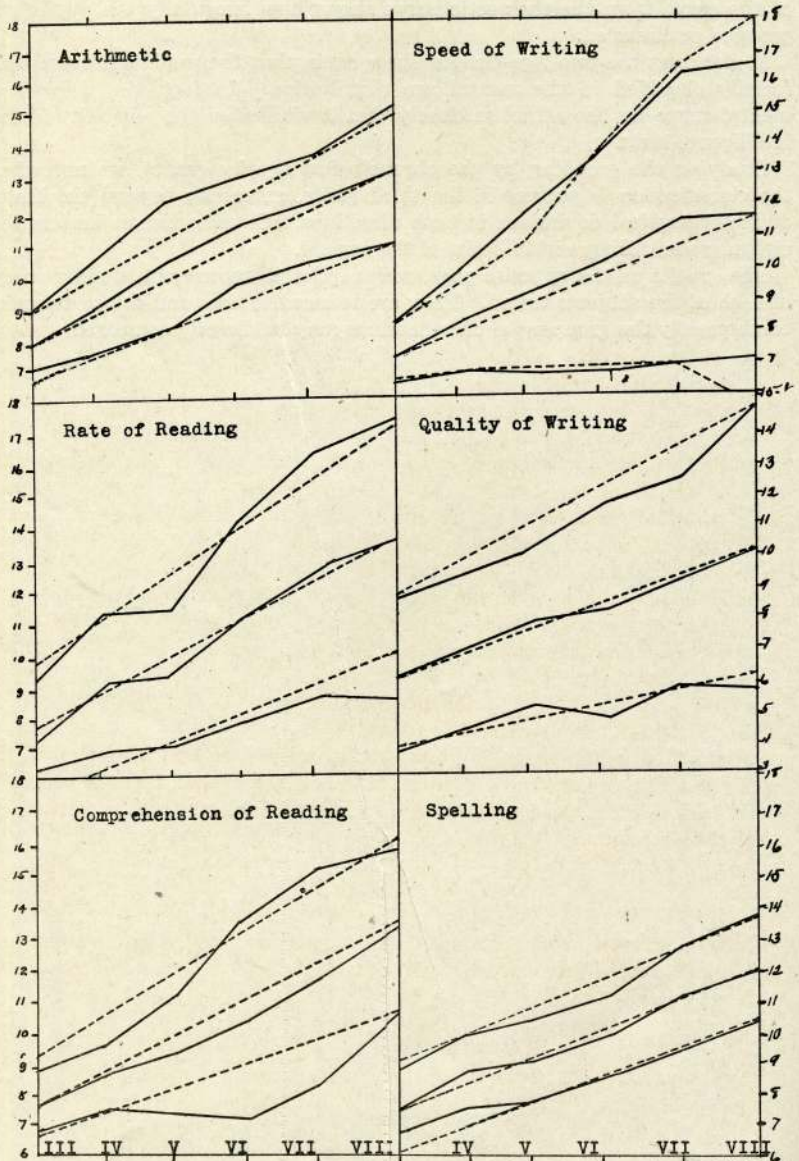


Fig. 12. Showing Theoretical Variability by Subjects Superimposed upon an Actual Variability.

Arithmetic

Studying the Arithmetic Graph we see the third grade well grouped, the fourth not so well, the fifth still less concentrated, but the sixth, seventh, and eighth are about equal to the uniform spread. Especially is the classification good in the seventh grade and the eighth grade.

Rate of Reading

The graph for the Rate of Reading reveals close grouping in the third grade and a gradually increasing range of abilities in succeeding grades until we find a very widely distributed group in the seventh and eighth grades, just opposite what we found in arithmetic.

The graph for comprehension shows a decidedly irregular classification. In the earlier grades the pupils are especially well grouped, but the sixth and seventh grade pupils vary widely in their abilities. The eighth grade shows signs of classification.

Speed of Writing

Due to insufficient standards we were unable to construct theoretical classification graph for speed of writing. We may know at once from the dotted lines that there is an error in our efforts to interpolate and extend standards. However, the actual deviations as indicated by the continuous lines reveal very poor classification in the upper grades. The upper sixth has progressed rapidly but the lower sixth has made no improvement. This probably tells the truth and a truth which is inexcusable. This illustrates the absolute necessity of individual attention in teaching hand writing.

Quality of Writing

The actual grouping as respects quality is within the theoretical limits. The spread or the amount of variation is however rather great as compared with some of the other subjects, indicating that the abilities in writing are not well classified.

Spelling

Spelling shows a more uniform classification than one might suspect from looking at the spelling frequency distribution.

CHAPTER V

Studies in Correlations

One of the most fruitful aspects of Educational Research is found in the study of correlations. The data available by means of this survey affords abundant material for this type of study. One cannot look at the individual records of pupils by the method suggested in the previous chapter without noting the agreement or lack of agreement between the scores in different subjects. For instance, as we look at a summary sheet page we note the pupils' score in intelligence. If that pupils stands high in intelligence, we naturally look to see in which of his school subjects he stands high. In other words, we are interested to know how intelligence correlates with the different school subjects. If we find by studying the scores of a number of pupils in both Intelligence and say Arithmetic, that the pupils who stand high in one stand high in another we conclude that there is a close relationship. In order that we may know mathematically just how close the relationship is, we compute what is known as the coefficient of correlation. This enables us to generalize on the entire group correlated. So long as we base our judgments on one case here and another there, interpretations are found to differ. For in any class of 30 or more pupils, exceptions are sure to occur. But by the Pearson formula we can compute a single number which represents the degree of relationship that exists in the entire comparison. A perfect relationship or correlation is indicated by a plus 1; a perfect negative correlation is indicated by a minus 1; a negligible correlation by 0. If the scores in one subject increase and decrease in another we would secure a negative correlation; if increasing scores in one subject were accompanied by permiscuous scores in another, we should find a negligible correlation.

Experts are not always agreed upon the interpretation of these coefficients. Dr. Rugg regards a correlation as "negligible" when (r) the symbol for correlation is less than 15 or 20; As "present but low" when r ranges between 20 and 30; as "marked" when r ranges from 35 to 50; as "high" when above 60; and 70 is "very high." By keeping these interpretations in mind we shall better understand the results that appear later.

The first study which we attempted was to study the correlation of intelligence with each of the six aspects of our study. At random we selected five classes averaging about 35 or 40 pupils each. By means of Pearson's Product Moment Method formula we computed the correlations in each of the five classes.

Table XV. Showing Correlation of Intelligence

Intelligence						Aver.
Arithmetic	.58	.28	.68	.33	.62	.50
Rate of Reading	.21	.37	.23	.22	.06	.22
Comp. of Reading	.24	.47	.59	.11	.25	.33
Speed of Writing	.24	.24	.25	.24	.58	.31
Quality	.09	.03	.15	.41	.05	.13
Spelling	.26	.18	.49	.30	.92	.43

The table shows considerable irregularity in the different classes. This is to be expected. For that reason we computed the relationship in five classes; it would have been better to have had even more classes. But by the time one correlates the various subjects with intelligence and with one another he has 21 computations for each class. It involves almost an hour for each correlation. This in part explains why we have not extended the study.

Looking at the average of the five correlations we see that arithmetic ranks highest in its relation to intelligence. This is what Theisen (Director of References and Research, Cleveland), has found. This fact suggests that a pupil's standing in arithmetic should have, as it probably always has had, a good deal of influence upon his promotion. It hardly behooves one to boast of his inability in mathematics. When r is .50 we are justified in saying that intelligence is an important factor in acquiring arithmetic. Next to arithmetic, spelling correlates highest with intelligence; .43 reveals considerable correlation. Comprehension of reading comes next with speed of writing slightly lower; .33 and .31 suggests that there is some correlation but not very much. It is still less in rate of reading. The outstanding fact in the above table is the consistently low correlation in quality of writing. In fact we may say it is negligible. This evidence suggests the injustice of holding pupils back because they are poor in handwriting or even slow in reading.

Before concluding just how much influence a single subject should have upon a pupil's promotion we need to see how closely related it is to the other subjects. If, for instance, we should find that a subject showed no correlation with either intelligence or any other of the school subjects, it would certainly argue that that subject should not figure seriously in his promotion or demotion. With this in mind we shall proceed to see how the various subjects correlate with one another.

Table 16. Showing the Coefficient of Correlations Between the Different School Subjects

	Intelligence	Arithmetic	Rate of Reading	Comp. of Reading	Speed of Writing	Quality of Writing	Spelling
Intelligence		.50	.22	.33	.31	.13	.43
Arithmetic	.50		.10	.11	.24	.11	.30
Rate of Reading	.22	.10		.40	.27	.08	.23
Comprehension of Reading	.33	.11	.40		.23	.08	.12
Speed of Writing	.31	.24	.27	.23		.14	.34
Quality of Writing	.13	.11	.08	.08	.14		.23
Spelling	.43	.30	.23	.12	.34	.23	

This table contains merely the average of the correlations for five classes in the subjects represented. The object of this arrangement is to enable one to see how intelligence or any one school subject correlates with each of the others. From the first vertical column we see how intelligence correlates with the different subjects. We have just discussed this correlation.

The second vertical column shows how arithmetic correlates with intelligence and with other subjects. The striking fact revealed here is the extremely low correlation that exists between arithmetic and all other subjects. Speed of writing and spelling are apparently slightly related to arithmetic. This is by no means disconcerting. It only emphasizes the statement above that a pupil should not be held back by any one subject, even though it be arithmetic, because of any great value that arithmetic may be to the other subjects.

Looking at the next column we find that the rate of reading does not correlate hardly at all with any except comprehension of reading, and slightly with speed of writing. That rate of reading and comprehension are related was found by Gray, Courtis, and other investigators. That our rapid readers also comprehend most is quite significant. The next column reveals that comprehension bears practically no relation to any other subject than rate. Speed of writing shows some correlation with spelling and a little with rate of reading. As mentioned before Quality of Writing seems to bear no marked relation to any of the other subjects. Spelling shows some correlation with speed of writing and arithmetic.

In general we do not find the different subjects as definitely related as we might have supposed. In one way this is encouraging. It suggests that it is possible to achieve along one particular line irrespective of thorough preparation in other subjects. In a sense it increases the responsibility of a teacher to see to it that each subject is taught for its own sake and unless it is, there is likely to be little advance in it. We cannot expect instruction in one subject to make up for lack of instruction in another.

The correlation between school subjects is only one of the possibilities of studies in correlations. In our study of other aspects of schools in Coal District, we compared the tenure of teachers with the achievement. We found a coefficient of correlation of .43 showing that tenure of teachers makes for higher achievement. We correlated the school buildings with the achievement in education subjects. The buildings were scored by Strayer-Englehardt score

card. The achievement of a building was computed as shown in Chapter III. When these two scores were correlated we found a correlation of .56. This shows rather forcibly that the building has considerable influence upon the character of the work done, in it.

By means of studies of correlation it is hoped that superintendents, principals, and teachers will discover not only what subjects are related and are helps to one another, but also just how great a factor, health conditions, training of teachers, nationality of pupils, etc., are to school progress. By such studies we may hope to analyze further the causes for retardation.

CHAPTER VI

Delivery of the Survey

One of the most important phases of the work of a survey is its delivery. It is unfortunate that this aspect of measurement is so frequently neglected. Many times conscientious and scientific investigators spend a great amount of time on their problems, and as soon as they have satisfied their own curiosity in the matter, drop the work, seemingly to forget the chief purpose for which the investigation was begun.

Although a school survey may reveal many facts valuable to the expert in scientific education and although it may provide training for students of educational measurements, we should never lose sight of the fact that the chief value of a school survey is to improve the condition of the particular pupils who are included in the investigation.

If this is true, any survey that fails to reflect itself in the reorganization and work of the school surveyed, is itself a failure. This means that the results must be so handled and presented to the local authorities as to make it possible for them to carry out the suggestions which grow out of the investigation.

In this respect, we have reason to believe that the survey of Type Counties of West Virginia is unusually successful. In the first place, the county directors, for the most part, were students of the local conditions from the standpoint of personal interest. Their special knowledge of local situations enabled them to present their findings in a way that would produce the greatest effect upon the educational future of that county. There is little question in the mind of the writer but that practically every school in the various counties has been apprized of its standing in respect to the other schools in the county. In fact, we may further say that practically every pupil in every school has been apprized of his standing in respect to other pupils of his class and school. This survey has reversed the practice of most Educational Surveys, which is suggested in the lines from Tennyson,

"So careful of the type she seems,
So careless of the single life."

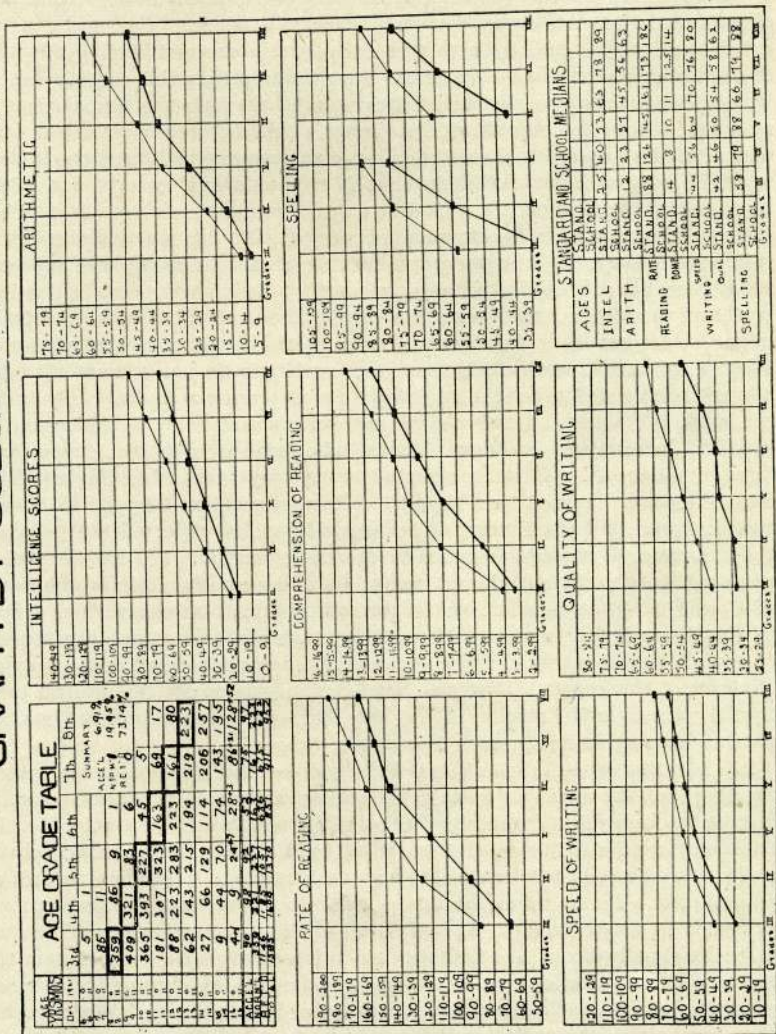
The method of reporting this survey, I dare say, is its chief virtue. Concern for the individual pupils has characterized the study. It was planned from the outset to keep a record and in duplicate, of the rating of every pupil tested in every school subject. In fact, the writer can on a minutes notice turn to the individual record of any pupil in any of the ten counties and ascertain how he stands with respect to other members of his class, his district, his county, his state, or the standards in any subject tested.

There is no attempt to disguise the fact that this form of report has taken considerable time in organization, and in recording results. But only by means of such a record is it possible to follow up the survey from time to time and see its ultimate effect. The reader will now see the importance of two of the forms devised by the committee on forms which have made individual comparisons possible. One of these is the "Summary Sheet" containing the name, grade, age, and scores on each subject of each pupil in the class tested; the second is the form entitled "Graph by Subject" containing an age-grade

table and a graph of each subject with the standards printed in, making it possible for a principal to see at a glance how his school stands with respect to the standards in each grade and in each subject. A copy of this form is seen on the opposite page. It illustrates the standing of the entire state with respect to the standards. These forms make it possible to present the results of the survey to pupils and even patron of the school in a form that they can clearly see just what the situation is.

SCHOOL
COUNTY
DATE

GRAPH BY SUBJECTS



Here again the writer is not familiar with the details of the methods used by each county director in delivering the county survey, but the same general plan was used by most of the directors that was used in Coal District, which is described below.

Method of Delivering the Survey in Coal District

1. **Public Meeting**—Before going to Coal District we prepared copies of all summary sheets, graphs by subjects of nineteen of the twenty-one schools, and the same record for the district as a whole. We know that the curiosity of pupils and patrons was considerably aroused during the week in December when we gave the tests. In order to satisfy this curiosity on the part of the public, we announced before hand through the schools and by newspapers that the results of the survey would be presented at the auditorium of the Adamston school building in the evening of March the 9th and urged all persons interested in the schools of the district to come out. Some three or four hundred people, including pupils, teachers, members of the school Board of Education, and patrons were present. At this meeting the various members of the staff who surveyed Coal District told briefly the aspect of school conditions they had studied, what they had found, and, in the light of this investigation, made concrete suggestions as to how these conditions might be improved. Miss Breck, of the Home Economics Department of West Virginia University, discussed the conditions in home economics, and offered definite and practical suggestions for improvement. Professor Anderson gave the results of the agricultural survey which Dr. Winkler and he made in December. Professor Maclin reported the industrial survey, and Superintendent R. C. Smith reported the survey of the building made by Superintendent Jackson and himself. The writer assisted by H. D. Lowry, Ida B. Smith, Blanch Emery, and Pauline Spangler, reported the results of the Educational subjects included in the State Survey. We had previously prepared lantern slides of the various tables and graphs containing the results of Coal District as a whole and some comparisons between various schools in the district. By means of the lantern slides it was comparatively easy to explain to the entire audience such details as are contained in the previous chapters of this report. It was especially gratifying to see the interest taken by the patrons in the results. Many questions were asked, and teachers, and patrons engaged in frank, open discussions.

2. **Meeting with Teachers and Principals**—Valuable though the general meetings are, the direct influence of the survey depends largely upon acquainting the teachers with the real significance of the results and the precise methods to be employed in bettering the prevailing conditions. Too frequently survey staffs presume that teachers know how to alter condition when defects are pointed out. Many times the teachers fail to understand the proper interpretation to put on results. It is the part of the investigator to explain quite fully the significance of the findings and to have a constructive program that can be definitely carried out. It is the business of an expert to work out these programs and to indicate to superintendents, principals, and teachers, how they can be put into operation.

At any rate it was a problem involving several weeks of intense study on the part of the members of the staff to determine upon just what basis it was

best to attempt to reclassify the pupils and to standardize the work. It was easy to see from the wide range of abilities shown in every grade by the frequency distributions that there was need for reclassification, but not so easy to decide upon the basis for promotion and demotion assigned to special classes. Theoretically we concluded that we should ascertain the achievement of the middle two-thirds of the class and promote the upper one-sixth and mark for special treatment the lower one-sixth. Our real problem was to find some standard of achievement which would be more or less uniform and yet one that would fit the attainment in Coal District. Three possibilities presented themselves.

1. We might promote all pupils into the next higher grade who were uniformly above the median of that grade indicated by the Illinois Standard.

2. We might promote all who were above the median for the next higher grade according to the standard of the particular school.

3. Or, finally we might promote on that basis of the median of the district as a whole.

By actually trying out the above methods we learned that the Illinois standards were too rigid and too high for our attainments. Applying them we had very few promotions. By applying the standards for the immediate school we found the medians fluctuated too much, that is, in many cases the numbers were small that the standard were not uniform enough and yielded many promotions in some grades and few in others. But by applying the district standards, we found the medians of the next higher grades cut off just about the upper sixth, or the portion we had decided should be promoted. Consequently, we decided that the basis of reclassification should be the District Medians of the next higher grades for promotions and the median of the next lower grade for demotion or for assignment to special classes.

In presenting this matter to the teachers in Coal District the members of the county staff met with all the teachers of the elementary schools of the district, called together by the superintendent. We first distributed to each teacher a Summary Sheet of her own pupils with their scores in Intelligence, Arithmetic, Reading, Writing and Spelling. The following copy is a facsimile copy:

Computed by H. C. Darlington
County, Harrison

SUMMARY SHEET

Name of District, Coal

Test given by L. V. Cavins
School, North View

Teacher, Earl McCarty

NOTE: (1) Make three copies, blue for teacher; yellow for county director; white for the University.
(2) Grade, Ages, Days Attendance for Last Year are to be filled out by teacher

No.	NAME OF PUPILS (Begin with the third grade)	Grade	Ages		Days Att'd Last Year	Int. Score	Arith- metic	Reading		Writing		Spell.	COMMENT
			Yrs.	Mos.				Rate	Comp.	Speed	Qual.		
1	Thelma Hurtsman	6	11	8	157	78	49	168	12	78	45	72	
2	Mary Granato		13	0	154	72	33	168	10	98	30	48	
3	Nellie Enochis		14	0	154	55	26	196	15	105	30	68	
4	Virginia Glenn		13	4	147	61	44	117	9	78	40	48	
5	Ruth Edwards		14	0	142	83	49	154	12	112	35	88	
6	Lillian Kennedy		14	6	157	46	45	168	9	77	40	60	
7	Lillian Pauch		14	2	135	33	37	154	9	66	30	52	
8	Tony Bellot		14	10	158	34	31	142	6	62	40	28	
9	Lanca Gillespie		14	2	158	79	47	104	9	59	25	52	
10	Joe Alkenso		14	0	144	58	44	144	11	71	30	36	
11	Carmen Stumpo		15	0	155½	40	37	181	7	65	35	16	
12	Hurley Richards		13	1	158	53	27	209	13	70	30	32	
13	Raymond Quinnt		13	2	158	42	45	130	7	66	35	20	
14	Earnest Dussaro		12	2	158	164	42	181	8	72	25	32	
15	Mike Russono		14	7	131	41	29	196	10	82	35	24	
16	Harold D. Boyce		11	9	154	96	99	168	12	81	40	80	
17	Reon Davis		11	9	146	55	43	196	7	93	35	32	

18	Smith Cox		12	2	146	54	44	104	7	75	30	44
19	John Tiame		15	0	141	29	30	181	9	63	25	12
20	John Brunette		15	11	146	34	32	130	6	56	30	4
21	William Fleming		14	4	148	77	41	154	10	91	45	86
22	Kensley Hafer		13	10	158	83	41	168	9	71	35	84
23	Donovan McKeen		11	8		108	53	236	8	82	25	84
24	Gertrude Fox		12	0	156	71	39	104	8	68	30	72
26	Fonda Gill		15	5		73	48	104	6	77	30	36
27	Leetta Catrill		13	9	142	66	47	117	10	93	35	84
28	Phay Casto		12	0	156	56	38	154	11	70	40	56
29	Viola Kopp		16	0	134	92	82	236	10	91	30	84
30	Francis Kopp		13	1	153	50	33	142	8	62	40	32
31	Marshal Martin		15	7	150	70	35	154	11	84	25	36

We next distributed blank cards and directed teachers to place in the middle of the card the number of the grade which she taught, and at one end of the card put the standards of the District Median for the next higher grade, at the other end of the card the medians for the grade below. Thus:

70	46	156	10.4	71	34	67
Intl. Arith.	Rate Comp.	Speed	Qal.	Spell.		
District Medians for Grade 8, For Promotion.						
FOR USE IN GRADE 7						
District Medians for Grade 6, For Demotion.						
47	37	132	7.5	62	33	34
Intl. Arith.	Rate Comp.	Speed	Qal.	Spell.		

The teachers were then asked to place these cards upon the Summary Sheets and classify her pupils into the three groups. If a pupil were equal to or above the median of the next higher grade in intelligence and in a majority of the other educational subjects, he was marked for promotion unless the teacher or principal had some good reason for not promoting him. If the pupil's score was less than the median of the grade below, he was not demoted, but marked for special attention. All others were left as they were.

Up until this time many of the teachers and principals were skeptical concerning the value of the tests, especially the intelligence tests, but after studying the results in this way one after another confessed that his faith in tests was decidedly strengthened. They were not obliged to take the opinion of the investigator, the evidence was before them. In the words of a bystander, "The survey put itself over."

On the basis of the results of the standard tests the teachers selected from the 1675 pupils tested 276 pupils or 16.5%, which is approximately the one-sixth originally aimed at, and promoted them the following Monday and Tuesday into the next higher grades, giving them a chance to show the remaining two months of school, whether they could do the work or not. At the end of the year the writer received a computed report from the various principals through the superintendent, indicating how these 276 pupils had fared. The report revealed that 269 of the number or approximately 95% had made

good, and had been promoted again at the end of the year. The following letter from one of the principals is typical of the reports that came directly to the writer:

"The school survey given by the West Virginia University, Department of Education, in Coal District, Harrison County, under your personal direction, was very much a success in many ways, especially in finding pupils that were able to do advanced work.

"In the beginning I was somewhat opposed to the test but when the results were received and upon finding that in most cases the pupils who were promoted were leading their classes, I became convinced that the test was just what we were needing for the bright pupils and pupils who were able to do advanced work.

"When our annual promotions were made in all cases but two, pupils who were promoted from the results of the test, were also promoted again with their new class, showing that their capabilities were above the pupils of the other grade."

It is probably true, as this letter suggests, that these pupils are more happily classified. Each has been saved one year of time. The district has been saved \$8,508.00, or the cost of 269 pupil-years of teaching. But the greatest gain has been the conservation of the abilities of these superior pupils in giving them an opportunity to indicate the leadership of which they are capable.

A third aspect of the delivery of the survey was to meet with the Board of Education and present the various recommendations of the Committee, such as Home Economics, Agriculture, Industrial Education, Building, and other aspects of school conditions.

CHAPTER VII

A Study of Rural and City Schools

One of the studies which the State Department asked us to make was that of a comparison of the Rural and City Schools. In our efforts to classify schools on the basis of rural and city, we encountered a great many perplexities. At the outset we are frank to admit that the comparison is more strictly speaking a comparison of schools working under graded and ungraded conditions. In general we have included one and two-room schools in the list for rural schools and other schools as city. This, of course, is an arbitrary division and should be construed to show merely what it does show, namely, the school achievement of one and two-room schools as compared with larger schools.

In making such comparison, it was necessary to re-combine all rural pupils into one frequency and all city pupils into another frequency. This was done by means of the frequency forms entitled "Summary of Ages and Point Scores by Frequencies." Then the various measures of central tendency and variability were computed. The various point scores have been translated into percents of the standard. These percents for the six grades were averaged.

The following table shows what percent of standard the rural and city schools are in the various aspects of our study:

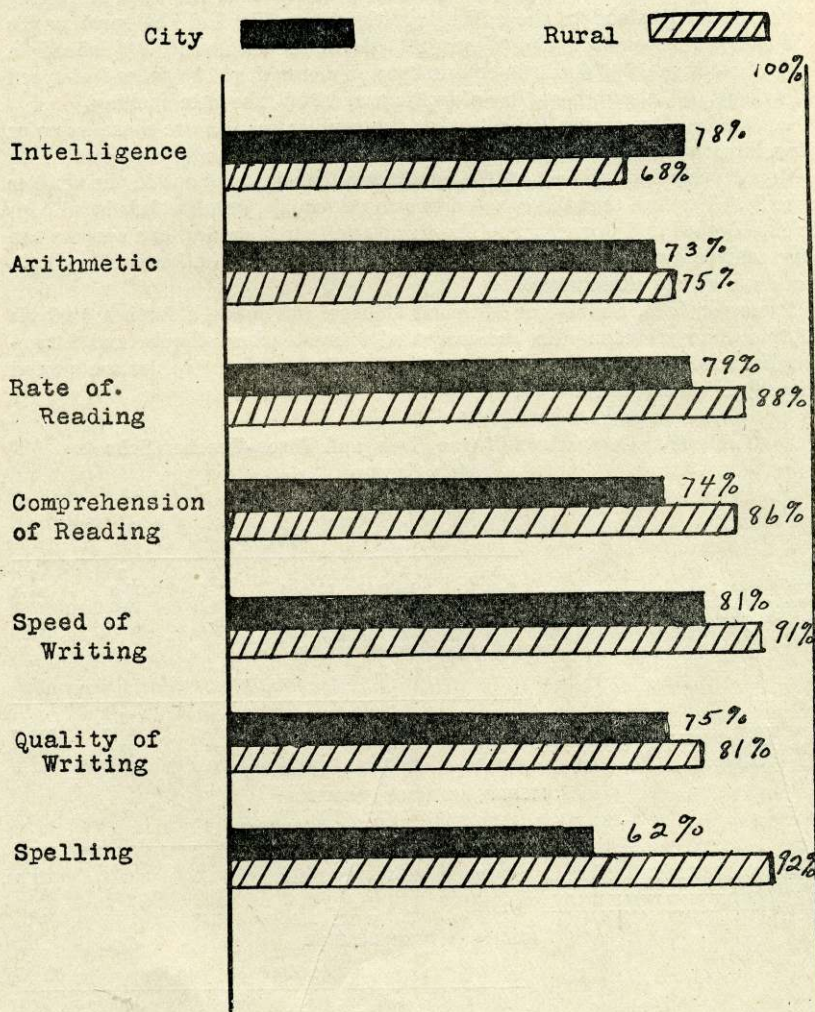


Fig. 13. Showing Comparison by subjects of Rural and City Schools.

In respect to intelligence, the rural pupils are only 68% of the standard, whereas, the city pupils are 78%. This would lead us to expect the city pupils to make a higher percent of achievement in the various school subjects. On the contrary, we find the opposite is true. This is one of the most surprising revelations contained in the entire investigation. We find the rural pupils are ahead in every single subject; 2% ahead in arithmetic, 9% ahead in rate of reading, 12% ahead in comprehension of reading, 10% ahead of speed of writing, 6% ahead in quality of writing, and 30% ahead in spelling.

An analysis by grades indicate that the smaller schools are more superior than larger schools in the upper grades than in the intermediate grades. This adds a further indorsement of the conditions for advancement in the smaller schools. The fact that the one and two-room schools, despite their handicaps in intelligence and poor start in the third and fourth grades, can surpass the city achievement in upper grades at least suggests that the larger schools do not have all the advantages.

Professor J. B. Shouse, of Marshall College, has made a further analysis of this same problem. He has compared 9 one-teacher schools, and 9 two-teacher schools, and 6 three-teacher schools. The following tables are quoted directly from his study:

Table 17. Comparison of One, Two, and Three-Teacher Schools (After Shouse)

	MEDIAN AGES					
	GRADES					
	3	4	5	6	7	8
One-Teacher.....	9-10	10-8	11-10-5	13-3	13-8	15-3
Two-Teacher.....	10-8-5	11-6	14-0	12-10	13-6	13-8
Three-Teacher.....	10-5	11-2	11-1	12-9	13-11	15-0

	MEDIAN INTELLIGENCE SCORES					
	GRADES					
	3	4	5	6	7	8
One-Teacher.....	24.5	35.6	56.7	62.5	86.7	113.3
Two-Teacher.....	29.0	36.3	45.7	48.4	78.3	85.0
Three-Teacher.....	21.1	36.0	48.3	50.0	66.8	81.7

	MEDIAN ARITHMETIC SCORES					
	GRADES					
	3	4	5	6	7	8
One-Teacher.....	10.0	19.1	40.0	45.0	42.5	57.5
Two-Teacher.....	9.1	20.5	34.5	30.6	38.1	40.0
Three-Teacher.....	16.5	21.9	28.3	37.2	41.2	55.0

	MEDIAN RATE OF READING					
	GRADES					
	3	4	5	6	7	8
One-Teacher.....	80.0	115.0	145.0	205.0	175.0	230.0
Two-Teacher.....	78.8	122.5	140.7	168.3	195.0	233.3
Three-Teacher.....	115.0	120.0	135.0	165.0	169.0	207.5

	MEDIAN COMPREHENSION OF READING					
	GRADES					
	3	4	5	6	7	8
One-Teacher.....	4.2	5.7	8.0	12.5	14.3	17.0
Two-Teacher.....	3.6	6.3	8.9	10.2	12.8	13.5
Three-Teacher.....	3.6	7.7	10.0	9.7	12.1	13.9

MEDIAN SPEED OF WRITING

	GRADES					
	3	4	5	6	7	8
One-Teacher.....	34.7	43.1	64.3	82.5	88.3	82.5
Two-Teacher.....	41.3	51.3	75.5	81.3	75.8	97.5
Three-Teacher.....	46.3	58.9	64.6	80.7	80.6	95.0

MEDIAN QUALITY OF WRITING

	GRADES					
	3	4	5	6	7	8
Two-Teacher.....	25.0	33.1	33.6	43.3	40.0	49.2
Two-Teacher.....	30.0	31.4	36.4	36.3	41.9	37.5
Three-Teacher.....	30.4	31.6	38.6	36.9	38.4	42.5

MEDIAN SPELLING SCORES

	GRADES					
	3	4	5	6	7	8
One-Teacher.....	36.8	63.3	93.5	70.0	72.0	94.0
Two-Teacher.....	39.0	75.3	91.3	39.3	81.3	80.0
Three-Teacher.....	48.3	72.0	88.0	58.0	67.3	82.0

There will be as many explanations for the above results as there are readers of this report. The writer hesitates to accept any of the various explanations yet offered, because of the lack of evidence that is presented with the inference. (1) Some have said that this is due to the fact that rural schools spend more time proportionately upon these subjects, but they fail to present the evidence proving that the rural schools do spend more time. It is possible to make such a study, but our survey did not include it. It would be interesting to know the truth in this matter. (2) Others have said the one-room schools have better teachers. The general opinion is that the cities have better teachers. Again, this matter could be studied with a score card for teachers. It would be especially interesting for a few supervisors by concerted effort to make a study of this matter. The writer suggests that they use as a means of estimating the teachers the score card devised by Dr. L. B. Hill, of West Virginia University. (3) The writer thinks that the most likely reason for the superior achievement in the rural schools is due to the number of pupils per teacher, and the correspondingly smaller number of pupils in each class in the rural schools. Proceeding upon this inference he attempted to study the ratio existing between teacher and pupils in rural and city schools. Due to the fact that the enrollment of the first and second grades were not reported by various county directors, he was compelled to abridge facts with estimates. To this extent the results are not reliable and consequently unsatisfactory. As nearly as we can get at this enrollment, using the enrollments as reported and abridging them by Ayers ratio of enrollment by grades taken from 386 cities, we find that rural teacher has an average enrollment of 15.8 pupils, and the city teacher an enrollment of 25.6 pupils.

While the number of pupils is not so very much smaller per teacher in rural schools, the difference is such as to give the rural teacher a chance to become more intimately acquainted with her pupils and enables her to hold them to a more strict account.

Mr. Hastings, County Superintendent of Monongalia County, finds that by actual count the one-room schools of his county have an average enrollment of 28 pupils, his grade schools have an average of 37 pupils. The actual attendance average is 20.8 in the rural as compared to 29.6 in the graded schools. Mr. Hastings finds that the graded schools graduate from their

eight grades a large percent of their enrollment. He finds, too, that the attendance in graded schools is better. Attendance in one-room rural schools averages 75% of enrollment; the graded schools average 80% of enrollment. The surprising thing is that these indexes of better schools do not reflect themselves in the achievement. In a sense the fact that more pupils drop out of the rural schools in the upper grades explains the higher scores in these grades. Those that remain are generally the better students and consequently the median scores would be higher than they would have been had they all remained. Until the facts are further analyzed it does not seem to the writer that the superior attainment of the rural pupils as shown in the survey can be interpreted as evidence for or against consolidation. County superintendents and district supervisors should assist the University and State Department in a further study of this situation and find the exact cause of the rural superior achievement.

The city schools are hereby challenged to show that their attainments in other lines are sufficient to offset the lead of the rural school in the subjects tested by this survey.

Studies of Variability

It is not until we come to study the progress of the group as a whole and note the classification as revealed by measures of variability that we can make a final statement regarding the achievement of rural and city schools. In order to study the grouping or classification we computed the standard deviation of each subject in each grade of both Rural and City schools. We then took an average of the six variabilities of the six different grades as an index of the variability in the different items of the survey. The following table shows this comparison:

Table 18. Showing a Comparison of the Average Standard Deviation of Rural and City Schools

	Age	Ment. Age	Arithmetic	Rate of Reading	Comp. Reading	Speed of Writing	Quality of Writing	Spelling
Rural	1.75	1.77	15.1	46.6	3.15	20.4	11.9	22.9
City	1.5	1.5	11.6	46.6	3.15	15.8	9.8	24.7

The above table clearly reveals that the city schools are better classified. The standard deviations are not so large. They are as good or better in everything except spelling. The rural schools are apparently giving more attention to this subject than the city. It is striking that the two groups are the same in rate and comprehension of reading. In arithmetic and in writing there is evidence of considerable effort toward classification in the city schools though the range is still wide enough, it is considerably better in the rural school.

On the whole we may conclude then that the rural schools are ahead in practically all school subjects if judged by the achievement of the average pupil, but the classification of the pupils of the city schools is considerably better.

CHAPTER VIII

Effect of Supervision

Another question which the State Department desired us to study was the effect of district supervision. This study was attempted in much the same way as the comparison of City and Rural schools. All of the results of the districts having supervision were thrown together into one frequency distribution, the results of the districts not having a district supervisor were placed in another frequency distribution. The various computations incident to the previous study were made and reduced to percentages of the standard. The graph on the opposite page shows the relative standing of the two groups as compared with the standards.

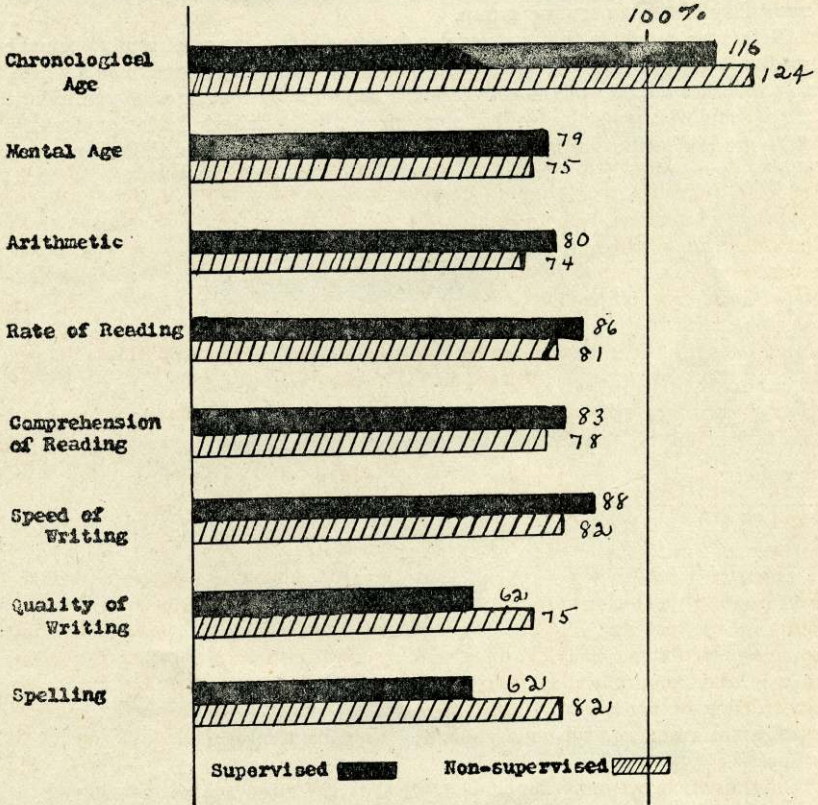
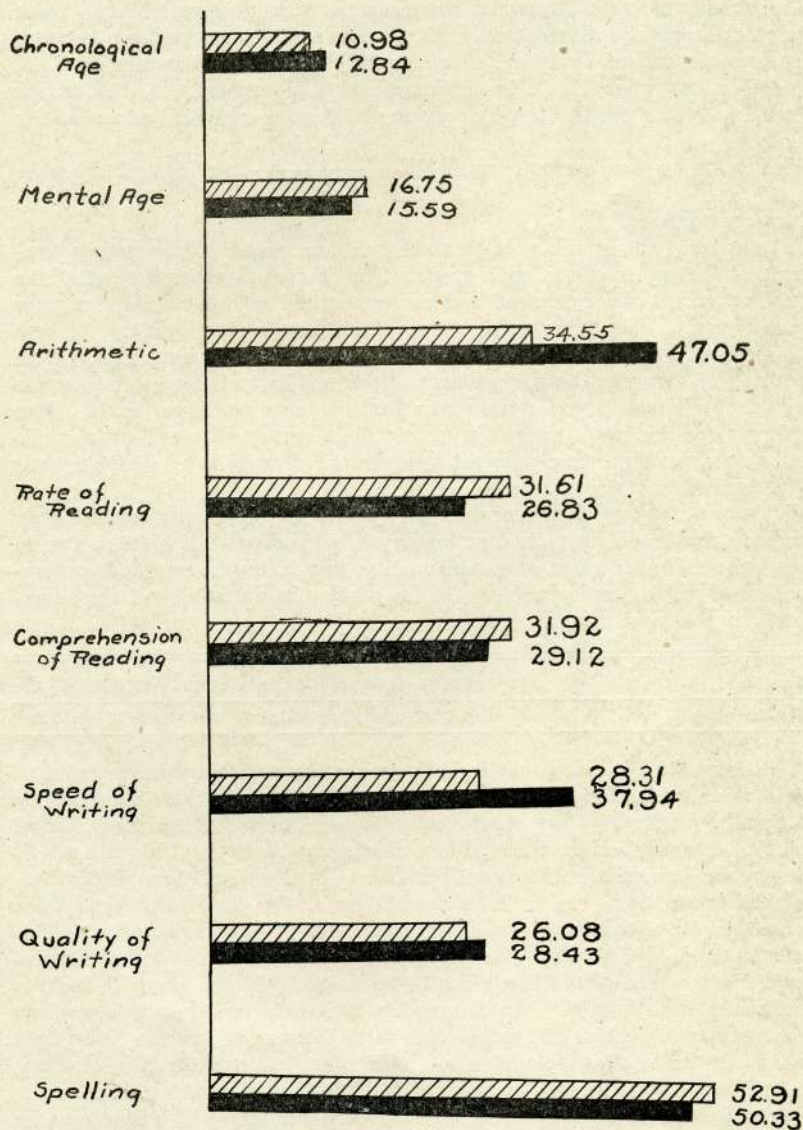




Fig. 14. Showing the Comparison of Supervised and Non-supervised Groups.

The non-supervised pupils are older chronologically, leading us to expect a correspondingly higher showing in the school subjects. On the other hand, the supervised pupils are older mentally, leading us to expect a higher educational achievement of the supervised pupils. By examination the various subjects we shall expect to see in which ones supervision seems most effective. We do not see any very striking evidence of supervision in any one subject. The achievement is slightly more in arithmetic, rate of reading, comprehension of reading, and speed of writing. The unsupervised pupils seem to be slightly ahead of the others in quality of writing and considerably ahead in spelling. One might infer that because of the lack of supervision, the unsupervised were devoting an undue amount of time to these subjects. However, this is only an inference and unsupported by any statistical study of study program, such as would be necessary to establish it as a cause for the higher scores. In general we are forced to conclude that with respect to measures of central tendency the effect of supervision is not very noticeable, the superiority is scarcely more than one would expect from the superior mentality of the supervised group.

Before we conclude that supervision is not effective we must study then the median achievement. We must study the attainment of the group as a whole, this involves a study of the classification of pupils by measures of variability. This comparison was made by computing the standard deviation for the sixth grade distribution in both groups for each subject. The following graph shows our results:

- 87 -



Coefficients of Variability of 6th Grade of West Va.
 Comparison of Supervised and Non-Supervised.
 Supervised  Non-Supervised 

The accompanying graph differs from the variability graphs in Chapter IV in that standard deviations, which represent absolute variabilities, are reduced to coefficients of variability which are measures of relative variability. Since our point scores are different we cannot make a direct comparison, between measures of standard deviation. For an example, standard deviations, 2 S. D. for age is 1.43 years, S. D. for arithmetic is 14.45 problems, S. D. for rate of reading is 47.9 words. But by reducing S. D. to a coefficient of variability S. D. 100,

which we do by the Pearson formula $V_p = \frac{S. D.}{M}$ we can then make

direct comparisons.

The bars in this graph represent the relative spread of the middle two-thirds of the pupils of the sixth grade. The shorter the bars the better the classification. Both supervised and non-supervised schools reveal very poor classification. This is especially true of arithmetic and spelling. There is almost no evidence of standardization whatever in these subjects. With such a wide range in the achievement of the middle two-thirds of the grade we can but wonder how far the upper sixth is above the lower sixth. Here again we see the importance of a more mobile system of classification. To hold this upper sixth to a pace set by even the average is to dissipate their efforts and blast their ambitions.

When we compare the supervised group with the non-supervised we may conclude that supervision is functioning considerably in arithmetic, also in speed of writing, to some extent in quality, but failing in rate and comprehension of reading and spelling. On the whole the variability of the supervised group is more uniform.

Supervised	34.55	31.61	31.92	28.31	26.08	52.91
Non-supervised	47.05	26.83	29.12	37.94	28.43	50.33

It is interesting to note that in both groups the variability in mental ages is greater than in chronological ages, thereby indicating that there is a tendency to classify pupils by their chronological ages rather than by their mental ability. Our comparison with achievement ages shares that this is not correct, for we found that achievement parallels mental and not chronological age.

Whether we study the average attainment or the classification of pupils we see only a slight improvement in districts that have supervision. This leads us to inquire, to what extent may these districts be said to have supervision? Superintendent Bliss in his book entitled "Methods and Standards for Local School Surveys" cites the median ratio existing between supervisors and teachers to be 12.9 and the median ratio between supervisors and pupils as 475. If these ratios are what we should expect in order to secure adequate supervision, I think we may at once conclude that we have at least a plausible explanation for the small showing, made by supervision. The writer is under the impression that in the strict sense of the word the supervisor in this district is entirely inadequate. Take for example, Coal District. The district supervisor has twenty-one separate schools, containing over one hundred teachers, and over 3200 pupils to supervise. One can readily see how with the great amount of detail involved in attendance records, looking after text books, supplies, physical equipment, etc., that the supervisor has little time for

real supervision. Most of the supervisors that the writer has had occasion to talk to, frankly admit that their opportunity for real class room supervision is decidedly limited.

This situation should seriously challenge the thought of every educator in the State of West Virginia. Robert Clarke, of the Teacher Training Department, pointed out that during the year of 1921-22, 4800 of the 10,600 elementary school teachers of the state were less than high school freshmen in their educational preparation. This reveals the startling fact that these 4800 teachers are not only untrained, but uneducated. While this is rapidly changing, some 7000 teachers are in summer schools this summer, yet for years to come it is clear that a large percent of our children will be in the hands of these uneducated and untrained teachers. The importance of adequate supervision is hereby forced upon our attention. The only hope for even a reasonable achievement from these untrained teachers is to have close and able supervision.

By supervision we do not mean vigilant inspection. Ideals of supervision must undergo a radical change if we are to bring our schools up to standard. Our supervisors must be trained. Experience in school work is not always training in supervision. We should have a much higher standard for our supervisors than for our high school teachers. Salaries should be sufficient to attract trained men and women into the special field of supervision. Supervisor certificates should be required of all candidates and issued sparingly.

In this connection then, we wish to call attention to a small book entitled "The Value of School Supervision" by Pittman, published by Warwick and York, Baltimore. This book reports an experiment which Mr. Pittman has carried out. He calls it the Zone Plan of Supervision, which he defines as follows: "A plan of supervision in which the supervisor divides his entire supervisory district into territorial units, each of which serves as the territorial limits, for one week of supervisory effort has been designated by the writer as the Zone Plan. The purpose back of such territorial organization is to provide for systematic supervision of classroom instruction, for convenient, effective, and democratic teacher meetings, and for the development of a community consciousness on the part of rural communities with a view to inspiring and facilitating more effective social, educational and commercial action."

One of the distinct features of Professor Pittman's plan was a definite calendar, as detailed as a university calendar made out in advance for the entire year. With one exception the calendar was carried out exactly. The experiment consisted of measuring the results of two similar groups of schools, one supervised, the other not supervised. A portion of the calendar follows:

"Sept. 28th to Oct. 10th—Initial survey of the experimental and central groups of schools.

"Sept. 27th to Nov. 1st—First supervisory tour. Improvement in the speed and comprehension of reading."

Seven such supervisory tours were made, and as many teachers meeting of small groups of teachers. Demonstration lessons and reports of various methods of teaching were prominent in these meetings.

At the end of the year the unsupervised groups were tested and it was found that the supervised group showed an improvement of 194% over the unsupervised group. That is, the experimental group did 194% as much

as did the control group in the same length of time. In addition to the improvement made by pupils, the teachers of the experimental group had read an average of 8.6 books during the session, while the teachers of the control group had read an average of 2 books. Teachers of the former group had attended an average of 6.1 teacher meetings while the teachers in the latter group attended an average of two, both of which had been required by law.

From these and other results of the experiment Mr. Pittman concludes, "The foregoing data shows that supervision practically doubled the efficiency of the school for more than half of the school subjects and in doing that it did not decrease the efficiency in the other half of the school work. The obligations for the American school system, which these results imply, are clear. For supervisors not to be supplied is unfair to the taxpayers who provide the funds with which the schools are maintained. It is a waste of the time and intelligence of the teachers for them to have the inspiration to professional growth which supervision gives. The greatest of all losses accrues to the children who might be advancing twice as rapidly and possibly with much more joy if provided with the right sort of supervision."

COMPARISON OF SCHOOL AND STANDARD MEDIANS

School.....Teacher.....Name of District.....County.....
 NOTE: Make three copies, blue for teacher; yellow for county director; white for the University.

ITEMS COMPARED	Medians	GRADES					%			COMMENT
		III	IV	V	VI	VII	VIII			
Ages	Standard									
	School									
Intelligence	Standard									
	School									
Arithmetic	Standard									
	School									
Reading	Standard									
	School									
	Rate									
	Comprehension									
Writing	Standard									
	School									
	Speed									
	Quality									
Spelling	Standard									
	School									

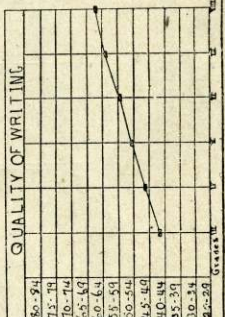
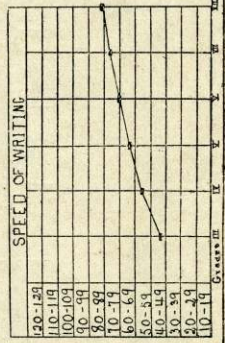
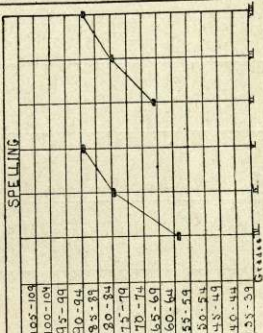
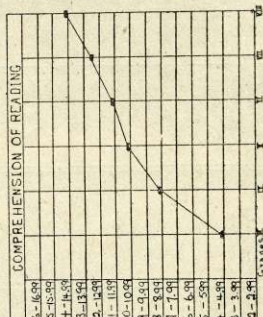
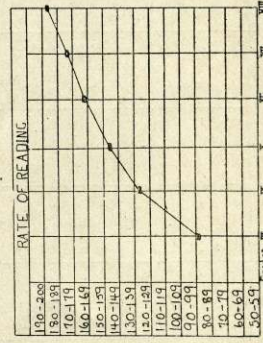
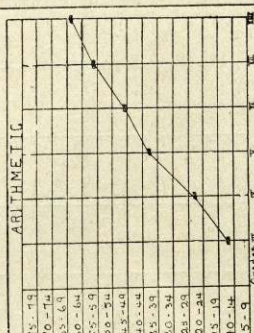
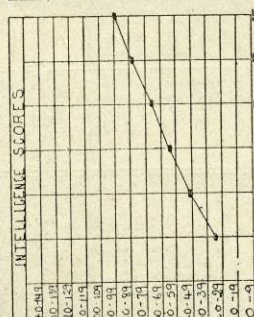
Tests given by..... Computed by.....
 Address..... Address.....

SCHOOL.....
COUNTY.....
DATE.....

GRAPH BY SUBJECTS

AGE GRADE TABLE

AGE	3rd	4th	5th	6th	7th	8th
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						
96						
97						
98						
99						
100						



STANDARD SCHOOL MEDIAN

AGE	STAND. SCHOOL	STAND. SCHOOL	STAND. SCHOOL	STAND. SCHOOL	STAND. SCHOOL
INTEL	75	78	81	84	87
ARITH	60	65	70	75	80
READING	100	120	140	160	180
WRITING	20	30	40	60	80
SPELLING	80	85	90	95	100

ARITHMETIC

INTELLIGENCE

Point Score	3rd	4th	5th	6th	7th	8th	Point Score	3rd	4th	5th	6th	7th	8th
240-249							120-124						
230-239							115-119						
220-229							110-114						
210-219							105-109						
200-209							100-104						
190-199							95-99						
180-189							90-94						
170-179							85-89						
160-169							80-84						
150-159							75-79						
140-149							70-74						
130-139							65-69						
120-129							60-64						
110-119							55-59						
100-109							50-54						
90-99							45-49						
80-89							40-44						
70-79							35-39						
60-69							30-34						
50-59							25-29						
40-49							20-24						
30-39							15-19						
20-29							10-14						
10-19							5-9						
0-9							0-4						
Total							Total						
Median							Median						

COMPREHENSION OF READING

RATE OF READING

COMPREHENSION OF READING		RATE OF READING	
Point Score	3rd	4th	5th
240-249			
230-239			
220-229			
210-219			
200-209			
190-199			
180-189			
170-179			
160-169			
150-159			
140-149			
130-139			
120-129			
110-119			
100-109			
90-99			
80-89			
70-79			
60-69			
50-59			
40-49			
30-39			
20-29			
10-19			
0-9			
Total			
Median			

Point Score	3rd	4th	5th	6th	7th	8th
25						
24						
23						
22						
21						
20						
19						
18						
17						
16						
15						
14						
13						
12						
11						
10						
9						
8						
7						
6						
5						
4						
3						
2						
1						
Total						
Median						

QUALITY OF WRITING

SPEED OF WRITING

Point Scores	3rd	4th	5th	6th	7th	8th	Point Scores	3rd	4th	5th	6th	7th	8th
120-124							120-124						
115-119							115-119						
110-114							110-114						
105-109							105-109						
100-104							100-104						
95-99							95-99						
90-94							90-94						
85-89							85-89						
80-84							80-84						
75-79							75-79						
70-74							70-74						
65-69							65-69						
60-64							60-64						
55-59							55-59]						
50-54							50-54						
45-49							45-49						
40-44							40-44						
35-39							35-39						
30-34							30-34						
25-29							25-29						
20-24							20-24						
15-19							15-19						
10-14							10-14						
5-9							5-9						
0-4							0-4						
Total							Total						
Median							Median						

REMARKS

SPELLING

Point Scores	3rd	4th	5th	6th	7th	8th
100						
96						
92						
88						
84						
80						
76						
72						
68						
64						
60						
56						
52						
48						
44						
40						
36						
32						
28						
24						
20						
16						
12						
8						
4						
0						
Total						
Median						

(Indicate below such special information as is necessary in an interpretation of the above data. Such as the following are merely suggestive add others):

Has you District District Supervision?
 Any variation in giving or scoring tests?
 Do teachers visit and study social industries?
 Do industries manifest special interest in schools?
 General character of inhabitants—% of colored/%foreign, etc.
 Financial condition:
 Are you near the tax limit?
 State local issues pending this report would be valuable.

RECOMMENDATIONS

In view of the various studies herein contained, we herewith make the following recommendations to the State Department of Schools:

1. That the "Survey of Type Counties" be extended to include all counties in the state.

2. That county superintendents, city superintendents and principals, district and city supervisors, and all other administrative agents be urged to acquaint themselves with this type of work sufficiently to make an accurate survey.

3. That the schools of the state be standardized upon the basis of reclassification used in Coal District (Page 00) namely, that pupils be promoted when they are equal to or superior to the median scores in intelligence and the principal school subjects of the next higher grade according to the local district standard.

4. That the classification be further improved by making the semester, or quarter wherever possible, instead of the year the unit of promotion.

5. That pupils three years or more retarded be assigned to special teachers.

6. That accelerated pupils be given equal opportunity by means of "furthering classes" that will abridge the essentials missed by the irregular promotions.

7. That all school buildings be rigidly scored by the state department score card and that all buildings that fall below 50% of a perfect score be replaced by new buildings or the pupils sent to a consolidated school.

8. That supervision be extended and decidedly intensified by urging supervisors to prepare supervising schedules for months in advance similar to the one proposed by Professor Pittman in his zone plan described in his book entitled, "The Value of Supervision."

9. That the reports upon the above recommended investigations be sent at stated times to the proper representatives of the state department as designated by the state superintendent of schools.

10. That teachers and supervisors be requested to secure copies of the "School Survey of Type Counties of West Virginia," and familiarize themselves sufficiently enough with its contents to make co-operation in all phases of school work possible.

