DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION

BULLETIN, 1928, No. 15

EDUCATIONAL ACHIEVEMENTS OF ONE-TEACHER AND OF LARGER RURAL SCHOOLS

By

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UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, D. C., July 5, 1928.

SIR: The desire of rural-school patrons to provide educational opportunities for their children equal to the best has resulted in a remarkable program of rural-school consolidation throughout the United States during the past two decades. To determine whether the change from a small to a larger school organization in rural territory results in greater educational efficiency, a large number of reliable studies have been made; but no comprehensive compilation of the results is in print. I therefore asked Mr. Timon Covert, assistant specialist in rural education, to collect, summarize, and interpret these data. I recommend that the study, "Educational Achievements of One-Teacher and of Larger Rural Schools," be published as a bulletin of the Bureau of Education.

Respectfully submitted.

JNO. J. TIGERT,
Commissioner.

The SECRETARY OF THE INTERIOR.

EDUCATIONAL ACHIEVEMENTS OF ONE-TEACHER AND OF LARGER RURAL SCHOOLS

INTRODUCTION

Nearly one hundred years ago Horace Mann made his vigorous attack upon the one-room schools. Since that time educators have kept up a continual bombardment against them. It has been pointed out that one teacher working alone with all grades and with pupils of all ages can not be expected to accomplish results equal to the results made possible by the specialization of the well-graded school; that one-room schools are taught by the least-trained and youngest teachers; that the percentage of attendance in one-teacher schools is far below that of grade schools; and that the social advantages of centralized schools give them superiority in training for life that small isolated schools can not reach.

The present-day practice of attempting to evaluate scientifically the educational achievements of pupils has centered an interest in the instructional results obtained in one-teacher schools as compared with those obtained in large rural schools. This is done by carefully planned pupil-testing programs combined with certain other checks, such as teachers' marks and age-grade tables.

Before the advent of standardized tests, the task of comparing schools in educational achievement was practically impossible; with age-grade and achievement norms scientifically established, it becomes a simple matter. There are now available the results of many studies in which standardized tests have been employed to show the achievement of pupils in one-teacher and in larger rural schools. This bulletin attempts to bring together a few of the many important findings of these studies; data selected for this purpose typify the results of the respective studies from which such selections were made. Selections of scores, unless otherwise noted, have been made by taking the results reported from the largest type of rural-school organizations included in the various survey reports reviewed, to compare with the results from the one-teacher organizations included in the respective reports. Such selections were made because it is the large type of rural-school organization—i. e., sufficiently large to function economically and efficiently—rather than the two or three teacher school, which is recommended as the one to replace small rural schools where feasible.

The main purpose of this bulletin is to bring together results obtained from educational testing programs in the two types of schools.

No attempt is made here to prove the assertion that the ability of pupils in one type of school to advance is greater than that of those in the other type. In a few instances it has been impossible to present typical results without including statements relating to the advantages one or the other type of school possesses in producing those intangible results—young citizens trained to take an active part in developing the ideals of social opportunity and justice—which is generally conceded to be education's greatest task.

Growing number of large rural schools.—During the past 25 years a widespread sentiment in favor of centralized schools has been created, and these schools are increasing at the approximate rate of 1,000 a year in the United States, while the number of one-teacher schools is decreasing at five times this rate. This constant growth in numbers of large rural schools is due chiefly to the following facts: There are few thoughtful people left who fail to see the many social and administrative advantages of the larger and better equipped school; the great improvement in roads which has taken place recently; and the modern school bus, which is now equipped with comfortable seats, heater, windows, and front and rear doors.

TABLE 1.—*Growth of consolidated schools*

Year	Approximate number in the United States	
	1-teacher schools	Consolidated schools
1919–20	189,000	10,000
1921–22	175,000	13,000
1923–24	165,000	15,000
1925–26	161,000	16,000

Table 1 shows that the number of one-teacher schools has decreased from approximately 189,000 in 1920 to approximately 161,000 in 1926—an average annual decrease for the six years of approximately 4,600. The number of consolidated schools increased during the six-year period approximately 6,000, which is an average yearly increase of 1,000. The change in numbers of the two types of rural schools, a decrease on the one hand and an increase on the other, indicates that nearly 30,000 small rural schools have been closed since 1920, and that as a result 6,000 larger rural schools have been established to take their places.

Obviously large rural schools are constantly becoming more significant factors in American rural education. From reports received by the Bureau of Education from typical consolidated schools in the various States it is estimated that approximately 4,500,000 boys and girls attend these schools and 150,000 teachers are employed in them.

Studies available.—Printed reports of testing programs are usually those of the larger surveys, although a number of elaborate reports of county testing programs are available in printed form. Recently the results of educational surveys showing achievement of pupils in different types of schools have begun to make their appearance in the regular reports of State departments of education.

A study directed by a committee of the department of rural education of the National Education Association in 1921–22 to determine the comparative results of instruction in one-teacher and consolidated schools is the most extensive investigation that has been made for the purpose. The report of this study (see Table 2) shows the age-grade distribution, grade achievement, and age achievement of 10,999 pupils in 135 consolidated schools and of 4,653 in 374 one-teacher schools in 20 different States. Pupils were tested in reading, arithmetic, language, spelling, and handwriting by using the Monroe Standardized Silent Reading Tests, the Woody-McCall Mixed Fundamentals of Arithmetic, the Trabue Language Scales, the Iowa Spelling Scales, and the Ayers Handwriting Scale.

TABLE 2.—*Age-grade distribution of pupils in certain consolidated schools and in one-teacher schools*

Schools	Grades						
	III	IV	V	VI	VII	VIII	Total
Consolidated schools:							
Median age	9.59	10.61	11.68	12.69	13.60	14.54	12.07
Per cent in each grade	17.8	18.6	17.8	16.9	15.0	13.8	100.0
1-teacher schools:							
Median age	9.47	10.7	11.59	12.59	13.58	14.47	11.93
Per cent in each grade	18.7	18.6	18.6	15.9	15.5	12.7	100.0

Table 2 shows the median ages and per cent of pupils for each of the grades 3 to 8, inclusive, in the 135 consolidated and the 374 one-teacher schools included in the study mentioned. Pupils are grouped approximately the same according to their chronological age and distributed through the grades in approximately the same relative numbers in the two types of rural schools, although the holding power of the consolidated school seems to be a little greater than that of the one-teacher school in the upper grades.

READING ABILITIES OF PUPILS IN ONE-TEACHER AND IN LARGER RURAL SCHOOLS

The reading ability of a pupil is of great consequence to him throughout his school career and in adult life; much of his school progress in all subjects is limited by this ability; it is therefore regarded as one of the fundamentals. An examination of the instruc-

tional results in this subject is considered one of the best means of testing elementary school work, and reading scores of pupils have been secured in practically all educational surveys. This section sets forth typical examples of comparable results obtained from reading examinations given to pupils in small and in large rural schools.

Reading scores of pupils in rural schools of 20 States and of Logan County, Ohio.—Reading results obtained in the study directed by the committee of the department of rural education of the National Education Association show that higher median scores (see A, Table 3) in both rate and comprehension were made in each grade of the consolidated schools than in the corresponding grades of the one-teacher schools. The greatest difference in each case appears in the eighth grade. These differences are significant, since the pupils in 135 consolidated schools and in 374 one-teacher schools were tested, provided that the pupils of the two types of schools were of equal intelligence, for there was little difference in the ages of pupils in the two groups, grade for grade. (See Table 2.)

TABLE 3.—*Median reading scores*

I. RATE SCORES BY GRADES

Schools	III	IV	V	VI	VII	VIII	Average
A. In 20 States:							
Consolidated	57.3	64.3	78.0	84.8	93.8	102.5	76.1
1-teacher	45.1	61.5	76.0	82.4	90.2	93.8	71.8
B. In Logan County, Ohio:							
Consolidated [1]		65.8	82.3	85.7	102.9	107.7	88.9
1-teacher		61.5	72.8	70.0	90.8	86.2	76.1

II. COMPREHENSION SCORES BY GRADES

A. In 20 States:							
Consolidated	5.3	10.8	14.5	17.4	21.0	23.6	14.5
1-teacher	5.2	9.6	13.9	16.4	19.8	21.7	13.4
B. In Logan County, Ohio:							
Consolidated [1]		11.3	16.9	18.8	24.0	26.0	19.8
1-teacher		9.2	12.5	14.4	17.4	18.2	14.3

[1] Of 7 large rural schools in Logan County, Ohio, included in this table, 5 were consolidated and 2 were centralized (essentially the same type).

Similar to the results mentioned in the preceding paragraph, the report of a survey of the rural schools of Logan County, Ohio, shows higher median reading scores (see B, Table 3) for each grade of the consolidated schools than for the corresponding grades of the one-teacher schools of that county. In this study 3,396 pupils in consolidated schools and 1,058 in one-teacher schools were examined.

Figure 1 shows graphically the median scores [1] in reading comprehension which were made by fourth, sixth, and eighth grade pupils in

[1] McCracken, C. C. Logan County and Bellefontaine, Ohio, school survey. Columbus, Ohio, F. J. Heer Printing Co., 1922.

the centralized, the consolidated, and the one-teacher schools in the Logan County, Ohio, survey. Scores for the centralized and consolidated schools (essentially the same type) are presented separately opposite the school names, then the scores for all one-teacher schools in the county, and the county median. The standard median for each

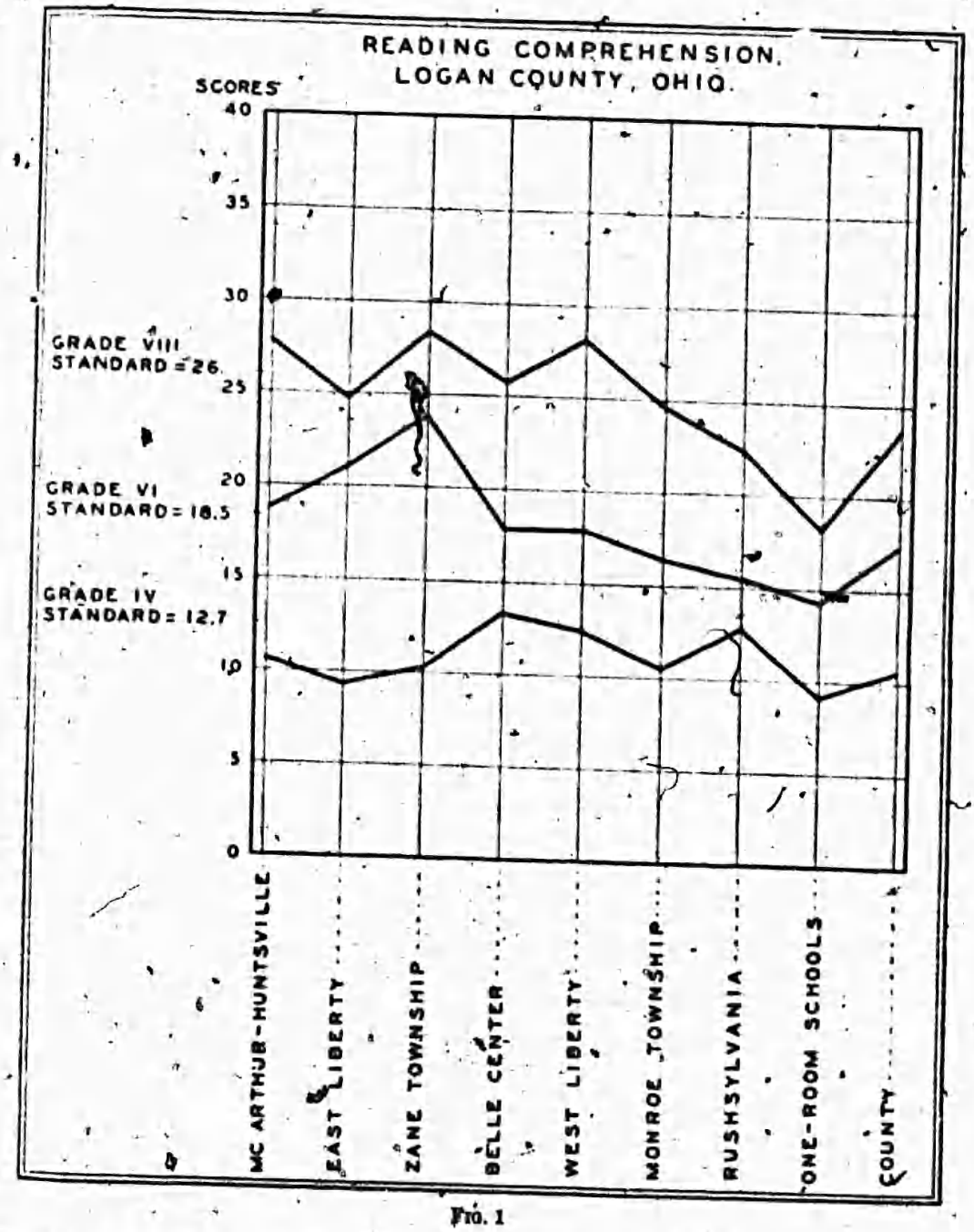

FIG. 1

grade is indicated at the left in each case. The graph shows that while there is considerable variation in reading ability among the large schools, in no instance was the median score so low in them as it was for the correspomding grade in the one-teacher schools of the county.

Reading abilities of Indiana pupils.—The results of reading tests given to rural-school pupils in a survey of Indiana schools are shown

in Table 4. Pupils in one-teacher, two-teacher, three-teacher, four-teacher, five-teacher, six-teacher, and larger rural schools, in town and in city schools, were examined. The median scores are given in the table for all of these schools for the fifth, seventh, and eighth grades. The country-wide standards for the same grades are presented for comparison. Scores in the table indicate that the poorest work was done in one-teacher schools. Higher scores were made in all types of the larger schools.[2]

TABLE 4.—*Achievements of Indiana pupils in reading, in terms of grade standards*

Kind of school	Standard reached by fifth grade [1]	Standard reached by seventh grade	Standard reached by eighth grade	Kind of school	Standard reached by fifth grade [1]	Standard reached by seventh grade	Standard reached by eighth grade
Township:				Township—Continued:			
1-teacher	4.4	5.8	6.5	6-teacher	4.9	6.3	6.9
2-teacher	4.6	6.1	6.8	Town	5.0	6.4	7.0
3-teacher	4.9	6.2	6.8	City	5.3	6.7	7.3
4-teacher	4.8	6.2	6.8	Country-wide standard	5.5	7.5	8.5
5-teacher	4.8	6.4	6.9				

[1] In this table scores are given in terms of the grade of work they represent. For example, the entry 4.4 for fifth-grade pupils in 1-teacher schools means that these pupils did work which pupils who are four-tenths of the way through the fourth grade usually do.

Median reading scores of Arizona pupils.—In a survey [3] of the Arizona public schools, fifth and eighth grade pupils in rural schools were tested in the Thorndike-McCall Reading Examination. The median scores made by pupils in the one-teacher schools were: Fifth grade, 47.7; eighth grade, 53.5. The corresponding scores made in all other rural schools in this survey were 44.8 and 58.8. In the one-teacher schools the median fifth-grade score was nearly three points higher and the eighth grade five points lower than the scores made in these grades, respectively, in the larger rural schools of the State.

Apparently there was little measurable difference between the attainment of the two groups of pupils in this State in the subject of reading. Comparisons between other grades might have shown greater discrepancies, but a comment in the survey report concerning the results ascribes the good showing made in the one-teacher schools to the fact that exceptionally high standards are maintained in the rural schools throughout the State.

Reading abilities of pupils in six different States.—Table 5 shows median reading scores made by pupils of one-teacher and of large rural schools in tests given in six different surveys in as many States. In the first column the six States are listed alphabetically. Opposite the name of each State is the name of the examination used and the

[2] Indiana Education Survey Commission. Public education in Indiana. New York City, General Education Board, 61 Broadway, 1923, p. 7.

[3] Tupper, C. Ralph. A survey of the Arizona public-school system (Phoenix, Ariz.), 1925, p. 25.

median scores made in each type of school by pupils in grades 3, 4, 5, 6, 7, and 8, with the exceptions of eighth-grade scores for Texas, seventh and eighth grade scores for Virginia, and of third, fourth, and sixth grade scores for Kentucky.

Higher median reading scores were made by pupils in each grade tested in the large rural schools of Kansas, Kentucky, New York, Texas, and Virginia than by those of the corresponding grades of the one-teacher schools of the respective States. In Oklahoma median scores were higher for pupils in grades 3 and 4 but lower in grades 5, 6, 7, and 8 in large rural schools than in the one-teacher schools.

TABLE 5.—*Median reading scores in six States*

State	Examination	Scores in one-teacher and larger rural schools by grades											
		III		IV		V		VI		VII		VIII	
		1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural
Kansas	Burgess Scale	1.9	2.9	3.7	5.3	5.2	6.7	6.4	7.3	7.4	8.8	8.7	8.9
Kentucky	Thorndike-McCall					37.0	41.4			44.5	48.4	47.5	52.9
New York	New York Sigma, III	23.0	26.0	29.2	34.0	31.5	41.6	41.7	55.0	55.3	70.5	65.8	80.7
Oklahoma	Thorndike-McCall	30.9	34.5	38.2	39.1	43.8	43.7	47.6	47.9	51.3	50.8	53.5	52.3
Texas	do	30.0	33.2	36.7	37.8	40.5	45.3	44.1	48.3	49.5	52.2		
Virginia	Thorndike	3.9	4.4	4.3	4.9	5.4	5.6	6.3	8.4				

The Kansas survey report states:[1]

> Not only did the pupils of the ungraded schools have lower median scores in every grade, based on the number of paragraphs read correctly, but they also read incorrectly a larger percentage of paragraphs in proportion to their own total of paragraphs attempted than did the pupils in the graded schools. This difference ran above 10 per cent in some grades. The meaning of these facts is that in addition to reading more slowly the pupils in one-teacher schools generally read more inaccurately.

Median scores made in the large rural schools of Kentucky on the Thorndike-McCall Reading Scale and in those of New York on the New York Reading Examination Sigma III, Form B, indicate that these pupils, grade for grade, were approximately one year in advance of pupils in the one-teacher schools of the respective States.

Median reading scores, New York State.—Figure 2, based on data for New York State in Table 5, shows graphically median scores obtained in reading tests for grades 5, 6, 7, and 8 in the two types of schools included in the rural school survey of New York State.

The diagram shows that the pupils in the large rural schools of New York State read approximately as well as those of the next higher grade in the one-teacher schools.

[1] The results of instruction in different types of elementary schools in Kansas. Pittsburg, Kans., K. S. T. C., Press, 1921-22, p. 10.

There is little apparent difference between comparable reading scores of pupils in the two types of rural schools in Oklahoma, in Texas, or in Virginia. Pupils in the small-type schools of Texas [5]

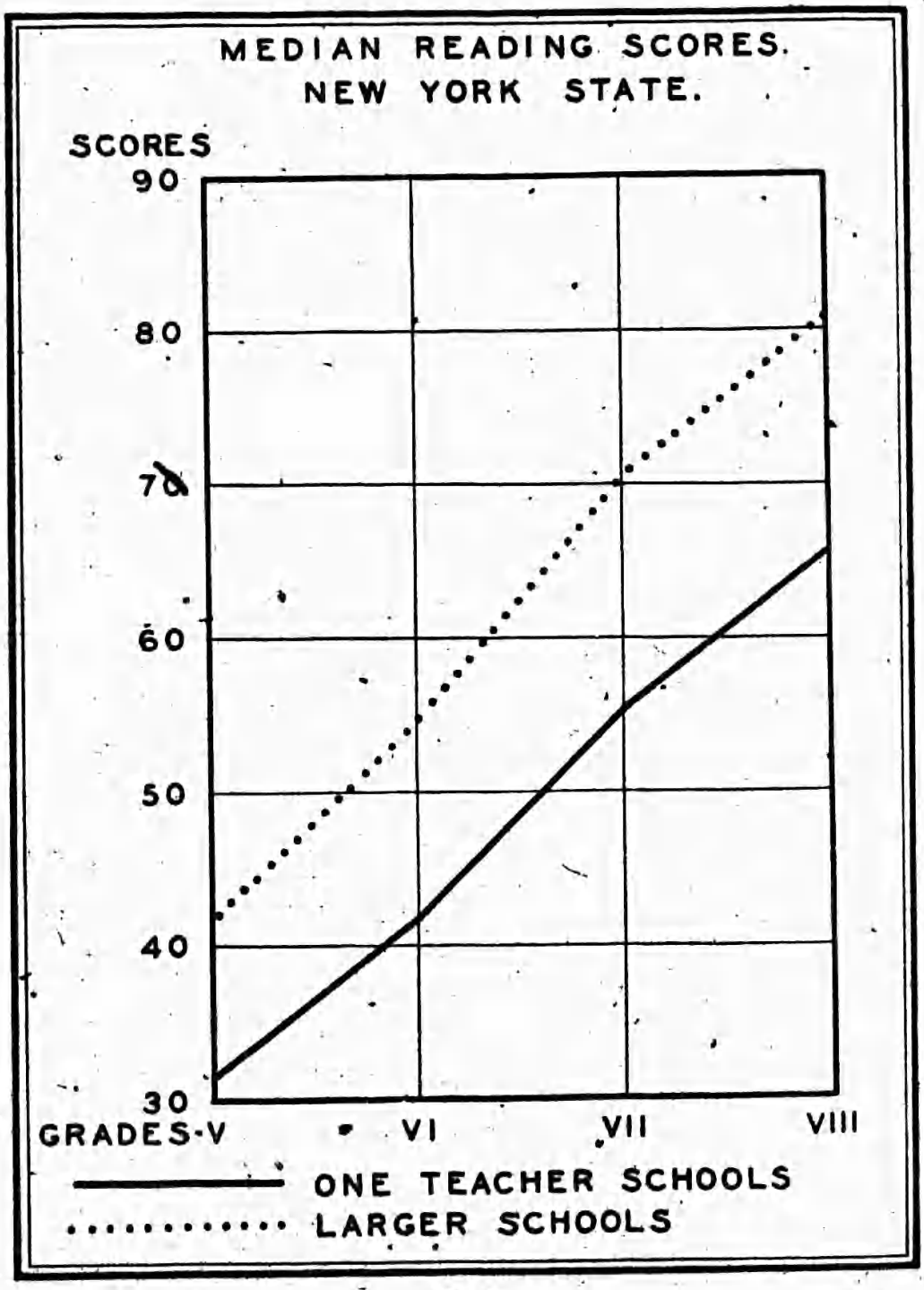

FIG. 2

were about two-thirds of a year older chronologically, grade for grade, however, and those in Virginia [6] about one year older than pupils in the large rural schools of the respective States. Considering this age

[5] Texas educational survey report, vol. 4. Texas Educational Survey Commission, Austin, Tex., p. 53.
[6] Virginia Educational Commission. Virginia public schools. Yonkers, N. Y., World Book Co., 1921.

difference, the pupils in the large rural schools of these States were approximately one year in advance of those of the corresponding grades in the one-teacher schools. In four of the six grades tested in the Oklahoma schools slightly higher comparable scores were made by pupils in the one-teacher schools than by those of the large rural schools.

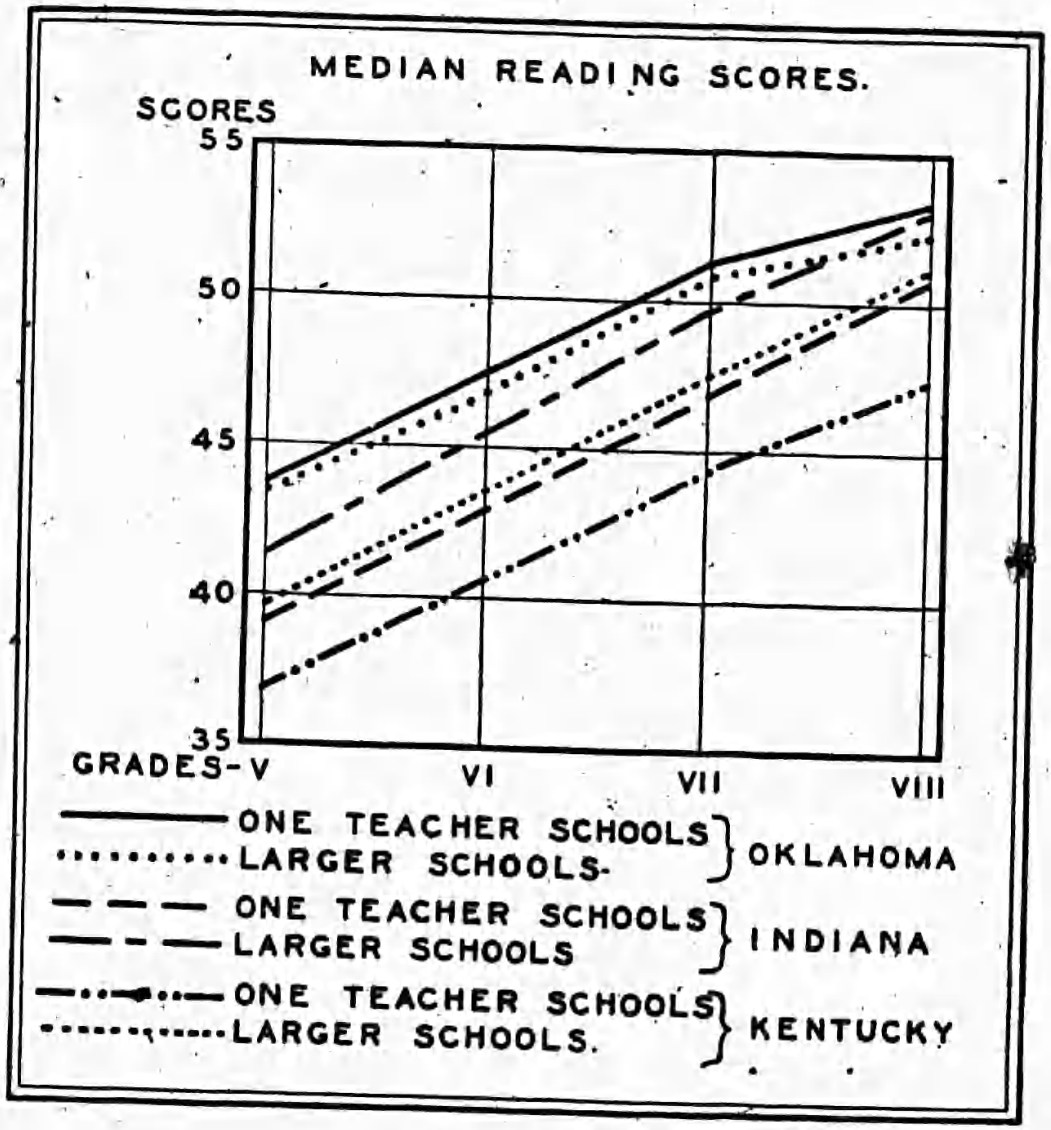

FIG. 3

The median reading scores made in grades 5, 6, 7, and 8 in the two types of schools in the Oklahoma, the Indiana, and the Kentucky surveys are shown in graphic form in Figure 3.

The graph shows that the median score for each grade represented is higher in the one-teacher schools of Oklahoma than for the corresponding grade in the large rural schools of the State, whereas the opposite is shown to be true concerning the comparable reading scores in the two types of schools in both Indiana and Kentucky.

The foregoing results of tests in reading ability of pupils in the two types of rural schools are typical of results obtained in other surveys on this subject. The comparisons show in most cases that in the subject of reading pupils in large rural schools make higher scores than those in one-teacher schools. The differences in some States or groups represent a full year's work.

ARITHMETIC ABILITIES OF PUPILS.

A number of educational survey reports are available showing the ability of pupils in small and in large rural schools on the fundamental operations and reasoning problems in arithmetic. In general, the results show a disparity similar to that noted in achievement in reading ability between pupils in the two types of schools. The selections of comparisons presented here are typical of others which might be shown.

Arithmetic scores of pupils in six different States.—Comparable arithmetic scores have been selected from each of the six State survey reports from which selections were made to compare median reading scores. These comparisons are set forth in Table 6 and are representative of data of this type available in the large survey reports.

TABLE 6.—*Median arithmetic scores in six States*

State	Examination	Scores in one-teacher and larger rural schools by grades											
		III		IV		V		VI		VII		VIII	
		1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural	1-room	Large rural
Kansas	Courtis Addition Tests	0.7	0.8	1.1	1.5	1.6	2.4	2.4	2.8	3.0	4.0	3.7	4.7
Kentucky	Woody Addition, Series B					9.4	12.8			12.1	14.9		
New York	Reasoning, Delta 2	3.9	4.9	5.5	5.6	6.6	7.7	9.0	9.8	10.4	12.1	11.3	12.3
Oklahoma	Courtis Addition Tests [1]	28.0	30.0	36.1	34.3	37.4	38.9	51.1	48.1	47.7	56.1	58.3	51.0
Texas	Woody Addition, Series B					11.2	13.0			13.5	14.9		
Virginia	Woody Arithmetic Scales	6.8	8.7	8.4	12.1	11.2	13.8	11.3	14.0	13.5	16.1		

[1] Numbers represent per cent of problems solved correctly.

Higher median arithmetic scores were made by pupils in the large rural schools than by those in the one-teacher schools on the tests named in Table 6 in every comparison shown, with the following exceptions: Scores of pupils in grades 4, 6, and 8 in the one-teacher schools of Oklahoma are higher than those of the corresponding grades of the large rural schools.

The variation in arithmetic ability, judged by the measures of central tendencies in the table, between comparable groups of pupils in the two types of schools amounts to a year or more of progress in several instances. The median fifth-grade arithmetic score for the large rural schools of Kansas is equal to that of the next higher grade

in the one-teacher schools of that State; median seventh-grade scores for pupils in the large rural schools of Kansas and New York, and third, fourth, fifth, and sixth grade scores for pupils of Virginia are higher than the corresponding scores in the next higher grades in the one-teacher schools of the respective States; and the median fifth-grade score in the large rural schools of Kentucky is higher than that of the seventh grade in the one-teacher schools.

Arithmetic scores made by rural pupils of Licking County, Ohio.—Thirty-four eighth-grade pupils, 12 in the three 1-teacher schools and 22 in the one consolidated school, of St. Albans Township, Licking County, Ohio, were tested in the Courtis and Illinois arithmetic examinations to compare their achievement and ability in this subject.[7] The results given in Table 7 show the median intelligence quotient, the median accomplishment quotient in arithmetic, and the median scores on the four fundamentals of arithmetic for pupils in each of the two types of schools. The name of the examination used in each case is given in the column headings.

TABLE 7.—*Test results, St. Albans Township, Licking County, Ohio*

School	Illinois intelligence examination (I-Q)	Illinois examination, arithmetic (A-Q)	Courtis Series B, Arithmetic fundamentals			
			Addition	Subtraction	Multiplication	Division
Consolidated	101	107	8	9	7	7
1-teacher	100	82	2	6	4	3

Pupils in the consolidated school were from 50 to 400 per cent more proficient in the fundamentals of arithmetic than those of the one-teacher schools. The fact that the intelligence ratings of these pupils had been determined made it possible to establish their accomplishment quotients. In doing this a second arithmetic examination was used, and it was found, as the table shows, that the pupils of the large school did much better work according to their capacity than those of the one-teacher schools.

Results of arithmetic tests in the small study mentioned and in most cases in the larger surveys indicate that pupils in large rural schools master the fundamentals of arithmetic and can solve reasoning problems in this subject, grade for grade, decidedly better than those in one-teacher schools.

The following statements concerning test results on arithmetic are quoted from two survey studies:

As measured by the Monroe Reasoning Tests it is plainly evident that the results in the graded schools show what appears to be the influence of the more

[7] Black, Lester. The value of consolidated schools as determined by a mental and educational survey of one-room and consolidated schools. Educational Research Bulletin, Columbus, Ohio, 2: 3-5, January, 1923.

effective teaching in those schools with reference to pupils' ability to reason on problems in arithmetic.[8]

The smaller schools are uniformly lower (in addition) than the large schools, although the difference in grade 5 is slight. * * * There is not a single age group represented on reasoning problems where there is less than a year's difference in favor of the larger schools.[9]

SPELLING ABILITIES OF PUPILS

Table 8 presents the median spelling scores of pupils in large and in small rural schools in grades 5, 7, and 8 in Indiana, Kentucky, Oklahoma, and West Virginia, and for grades 5 and 7 in North Carolina.

TABLE 8.—*Median spelling scores in five States*

State	Examination	Scores in 1-teacher and in larger rural schools by grades					
		V		VII		VIII	
		1-teacher	Larger	1-teacher	Larger	1-teacher	Larger
Indiana	Ashbaugh Scale	47.7	55.9	26.5	29.3	41.3	43.2
Kentucky	Ashbaugh Iowa Scale	48.2	71.1	32.7	41.1	44.6	51.7
North Carolina	Buckingham's extension of Ayers Scale	40.0	50.5	29.0	25.0	.....	.....
Oklahoma	Ashbaugh Scale	63.8	62.3	55.0	51.1	55.1	57.8
West Virginia	Buckingham's Extension of Ayers Scale.	93.5	88.0	72.0	67.3	94.0	82.0

Table 8 shows that higher median scores were made by fifth-grade pupils in the large-type schools than in the one-teacher schools in Indiana, Kentucky, and North Carolina; lower ones in Oklahoma and West Virginia. Higher comparable scores were made by seventh-grade pupils in the large rural schools than in the one-teacher schools in Indiana and Kentucky; lower ones in North Carolina, Oklahoma, and West Virginia. Higher scores were made in large than in one-teacher schools in the eighth grade in Indiana, Kentucky, and Oklahoma; lower scores in West Virginia.

Spelling scores in rural schools in three States.—Figure 4 shows graphically the results of spelling tests in one-teacher and large rural schools in Indiana, Kentucky, and Oklahoma. Median scores are represented for grades 5, 7, and 8 of Indiana and Kentucky schools, and for grades 5, 6, 7, and 8 of Oklahoma schools. In 8 of the 10 comparisons, higher median scores, and in 2, lower ones were made by pupils in the large rural schools than by those of the one-teacher schools. Pupils in the fifth and the seventh grades of the one-teacher schools in Oklahoma made higher median scores than those of the corresponding grades in the large rural schools.

Comparable spelling scores in Wisconsin rural schools.—Median scores in standardized spelling tests in one-teacher and larger rural

[8] The results of instruction in different types of elementary schools in Kansas. Pittsburg, Kans., K. S. T. C. Press, 1921-22, p. 14.

[9] Haggerty, M. E. Rural-school survey of New York State. Educational Achievement. Ithaca, N. Y., 1923, p. 10.

schools in Wisconsin, as given in the biennial report of the State superintendent of public schools, for 1924–1926, are given in comparative form in Table 9.

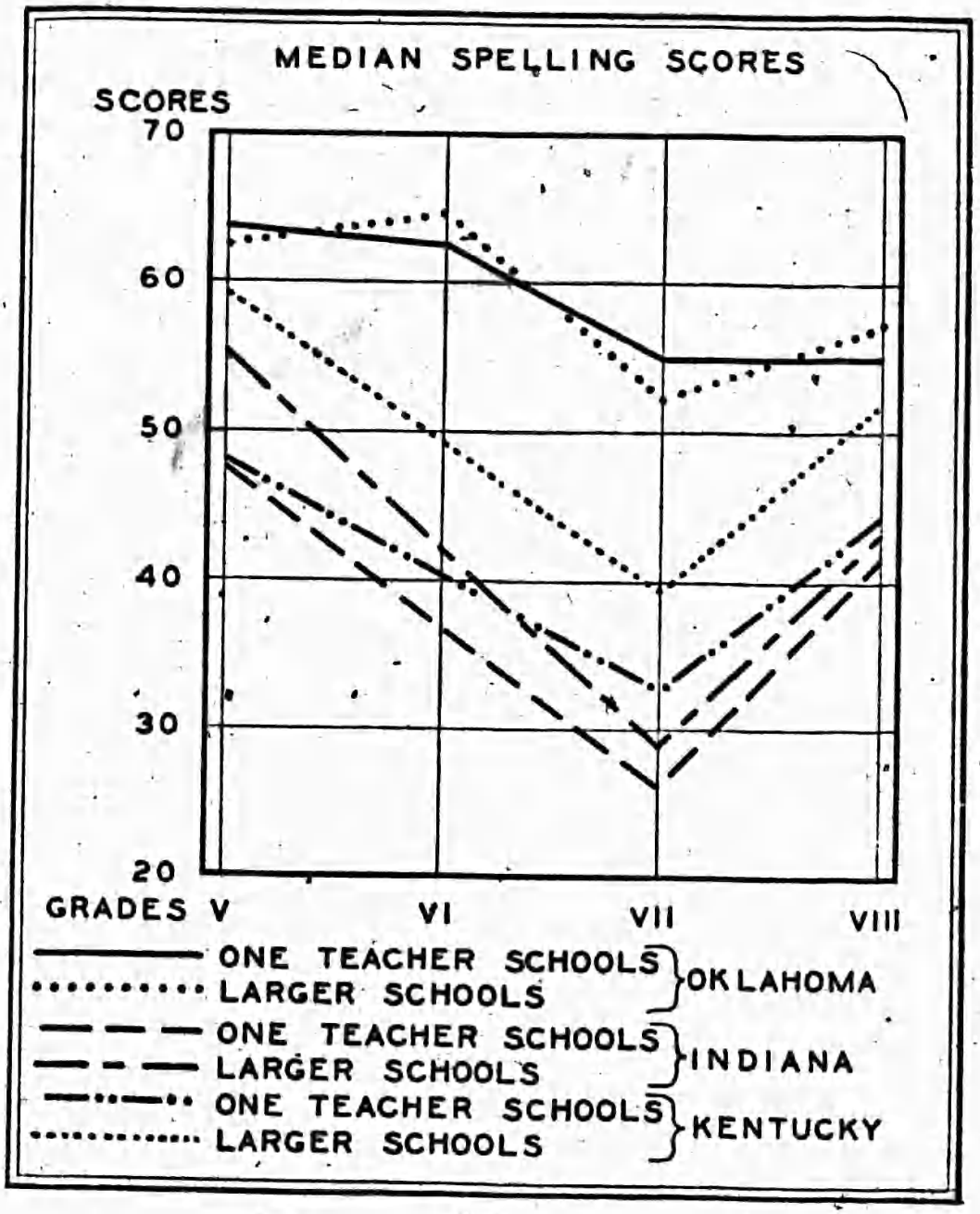

FIG. 4

TABLE 9.—*Median spelling scores in Wisconsin*

Tests used	Type of school	Scores by grades						Number of pupils tested
		III	IV	V	VI	VII	VIII	
Iowa Word List	1-teacher	40.7	38.9	32.6	32.6	33.4	33.5	1,384
	Larger	44.1	43.6	34.0	37.8	32.9	34.9	1,338
Ayers Spelling Scale	1-teacher	64.0	79.0	60.0	71.0	63.0	73.0	15,825
	Larger	64.0	80.0	59.0	74.0	67.0	78.0	6,838
Morrison-McCall Spelling Scale	1-teacher	11.0	16.9	24.0	30.5	24.9	40.7	441
	Larger	17.5	22.2	30.2	33.7	32.56	46.1	347

The scores included are those of pupils in one-teacher and larger schools in grades 3 to 8, inclusive, in each of three different tests arranged by grades and schools for the purpose of comparison. The number of pupils examined on each test in each type of school is also shown.

In 15 of the 18 comparisons shown in Table 9 higher median scores were made by pupils in the large-type schools than by those in the small schools; in 2 comparisons, the seventh grade on the Iowa Word List and the fifth grade on the Ayers Spelling Scale, the opposite is true. In one case, the third grade on the Ayers Spelling Scale, the scores are equal. The results of the first two tests are probably of more significance than those of the last one, due to the fact that greater numbers of pupils were examined in the first two tests. While the differences shown in the comparisons are not striking, the consistency with which the higher scores appear for pupils in the large type schools of Wisconsin indicates that pupils learn to spell better in them, grade for grade, than they do in the one-teacher schools of the State.

Spelling scores of pupils in Spokane County, Wash.—A comparison of the spelling scores made by pupils in a survey of the one-room and the village graded schools of Spokane County, Wash., shows that the pupils in the large-type school were 2.7 per cent more efficient in spelling than those in the surrounding one-room schools. The greatest difference appeared between scores of pupils in the seventh grade. Although this difference between the two groups of pupils is not great, it is significant, since the pupils were paired on the basis of intelligence-test scores and chronological ages. The comment is made in the report of the survey that the graded-school pupils were approximately one-half school year in advance of pupils in the surrounding one-room schools with whom they were paired.

WRITING ABILITIES OF PUPILS

A number of typical comparisons of median scores on handwriting in the two types of rural schools under discussion are presented here. They show the relative achievement of pupils in various elementary grades of rural schools in different sections of the country.

TABLE 10.—*Median handwriting scores in four States*

State	Examination	School	Scores by grades					
			III	IV	V	VI	VII	VIII
Kansas	Ayers Scale	1 room	23.5	26.4	29.2	31.6	36.1	39.8
		Large	28.1	31.6	33.1	36.5	41.8	39.7
Oklahoma	do	1-room	26.8	33.9	39.3	33.4	43.0	47.0
		Large	31.1	34.4	22.1	39.5	42.6	45.4
West Virginia	do	1-room	25.0	33.1	33.6	43.3	40.0	49.2
		Large	30.4	31.6	38.6	36.9	38.4	42.3
Wisconsin	Thorndike Scale	1-room	8.5	8.6	9.1	9.5	10.8	10.7
		Large	7.6	8.2	9.0	9.8	9.3	10.6

Table 10 gives the median handwriting scores of pupils in grades 3 to 8, inclusive, of one-teacher and of large rural schools in the States named. The scores indicate the quality of writing and are arranged to compare this ability of pupils, grade for grade, in the two types of schools in the respective States.

Higher scores were made by third, fourth, fifth, sixth, and seventh grade pupils in the large rural schools in Kansas, by third, fourth, and sixth grade pupils in Oklahoma, and by third and fifth grade pupils in West Virginia than by those of the corresponding grades in the one-teacher schools of the respective States. The median sixth-grade score was the same for pupils in the large and in the one-teacher schools of Wisconsin, while in all other comparisons higher median scores were made by pupils in the one-teacher schools than by those of the corresponding grades of the large rural schools.

Pupils of the one-teacher schools scored higher in 13 of the 24 comparisons shown and lower in 10 than those of the large rural schools. In one comparison the scores were equal. In some instances the differences are significant, while in others there is little apparent difference between the quality of handwriting of the comparable groups of pupils. Of most significance are the median scores made in the large rural schools of Kansas, which indicate that the pupils in these schools were more than a school grade ahead of those in the one-teacher schools of that State. In Wisconsin higher scores appear regularly for pupils of the various grades of the one-teacher schools than for those of the large-type school, but the difference in no case is great

COMPARISONS OF TEACHING RESULTS IN CERTAIN CONTENT AND OTHER SUBJECTS

In discussing the educational output of the schools, survey reports attach much importance to the results of tests which measure pupils' ability to read understandingly about problems of effective citizenship. A number of the reports contain results of tests that indicate the extent of attainment of pupils in the social sciences and other content subjects, some of which permit comparison between the attainment of pupils in these subjects in the two types of rural schools under discussion. Some typical results are presented here.

TABLE 11.—*Median history scores in three States*

State	Type of school	Scores by grades on—			
		Information questions		Thought questions	
		Seventh	Eighth	Seventh	Eighth
Indiana	1-teacher	9.1	10.4	9.7	14.6
	Large	9.8	11.4	11.4	15.8
Kentucky	1-teacher	7.0	9.7	3.8	6.8
	Large	10.1	15.5	7.9	14.5
New York	1-teacher		31.0		33.6
	Large		39.0		37.6

Table 11 shows the median history scores made in one-teacher and in large rural schools by seventh and eighth grade pupils in Indiana and Kentucky and in the eighth grade in New York State. The questions were selected from the Van Wagenen History Scales to test pupils on information and thought. Pupils in Indiana were tested during the second half of the year; those in Kentucky during the first half. Schools designated as "large" in Indiana and Kentucky employed six or more teachers each; those in New York employed four teachers each.

In every comparison it is seen that pupils of large rural schools scored higher on history questions, both informational and thought, than those of the corresponding grades of the one-teacher schools. The greatest difference occurs between the scores of pupils in the two types of schools in Kentucky. The comparisons indicate more than a year's difference between the two groups of pupils, grade for grade, in history ability. Of the results made in New York the report states:[10]

> The foundation of a genuine Americanization is a knowledge of American history, and the basis for acquiring this knowledge is an adequate mastery of the language in which that history is recorded. Judged by the degree to which their pupils have this knowledge and mastery, the rural schools of New York are distinctly and sadly deficient and the smaller schools most deficient of all.

A comparison of geography scores of rural pupils.—Geography scores [11] of 2,311 pupils in consolidated schools and of 1,135 pupils in one and two teacher schools of Ohio are shown in the report of a state-wide testing program in that State, in which the Buckingham-Stevenson Place Geography Tests were used.

Median scores of pupils in the consolidated schools on world geography questions were: Fifth grade 12.3, sixth grade 23.7, seventh grade 37.6, and eighth grade 40; corresponding scores in one and two teacher schools were 4.1, 11.2, 26.8, and 35.3. The differences in favor of the consolidated schools were 8.2, 12.5, 10.8, and 4.7 points for the respective grades. Median scores of pupils in the consolidated schools on United States geography questions were: Fifth grade 9.9, sixth grade 16.6, seventh grade 23.3, and eighth grade 28.3; corresponding scores in one and two teacher schools were 6.7, 11.2, 20.8, and 30.2. The differences in favor of the consolidated schools were 3.2 points for the fifth grade, 5.4 for the sixth grade, and 2.5 for the seventh grade, while the difference was 1.9 points in favor of the small-type schools in the eighth grade.

Composition scores of pupils in rural schools.—In the state-wide survey of instruction in elementary schools of Kansas, 1,232 pupils

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[10] Rural school survey of New York State. Educational achievement, p. 180.

[11] Whitmer, J. W. A comparison of consolidated and one-teacher schools, based upon results obtained on the Buckingham-Stevenson Place Geography Tests. State University, Columbus, Ohio. Educational Research Bulletin, vol. 2, pp. 9-10, January, 1923.

were tested on the Willing Language Scale in one-teacher schools and 932 in rural village schools. Higher median scores were made by pupils in each of six grades, 3 to 8, inclusive, in the large-type schools than by those of the corresponding grades in the one-teacher schools of the State. The difference in favor of the larger schools varied from 5 per cent in the third grade to 12 per cent in the sixth grade. The seventh grade pupils in the large-type school averaged as high as eighth-grade pupils in the one-teacher schools.

Ability in English of pupils entering high schools from large and small rural schools.—A number of studies have been made to determine whether pupils entering the ninth grade from one-teacher schools were as well prepared for high-school work as those from rural village schools. Results of standardized tests given pupils in each of the two groups soon after entering high school, or class records in first or second year high-school courses, have been compared. Results reported on English tests and class records of pupils in small high schools in Illinois, Iowa, and the State of Washington are typical of those available.

A recent investigation [12] of high-school records of pupils in Illinois shows that pupils trained in town schools averaged 1.34 per cent higher in all high-school subjects and 1.74 per cent higher in English than pupils from the one-teacher schools. Results of a study [13] made in Iowa, using the Briggs English Form Test, the Kirby Grammar Test, and the Willing Composition Scale, given the first month in eight high schools, show that fewer errors were made by pupils from village elementary schools in the use of capitals, question marks, completion sentences, commas before "but," correct English in sentences, correctly spelled words, and application of the rules of grammar in sentences, but more errors in the use of terminal periods and the apostrophe of possession than by those from the surrounding one-teacher schools. Scores [14] on Briggs English Form Test, given to ninth-grade pupils from one-teacher schools and to an equal number from graded village schools in Spokane County, Wash., indicate an average difference in ability between the two groups of pupils equal to 4.9 months of school work in favor of those from the graded schools.

Typical statements.—The following statements concerning the teaching of appreciation, content, and other subjects in rural schools are contained in various survey reports:

> If a child is obliged to attend a one-teacher school, he is for the most part denied opportunity for work in music and other fine arts and in the household and industrial arts. His elementary school life is limited almost entirely to the

[12] Illinois State Teachers' Association. High-school records of rural-trained and of city-trained children. Illinois State Teachers' Association, Springfield, Ill. Research Department, 1926. (Mimeographed.)

[13] McFarland, W. H. English ability of town and rural pupils. University of Iowa, Iowa City, Iowa, 1926. (Master's thesis.)

[14] Stone, C. W., *and* Curtis, J. W. Progress of equivalent one-room and graded-school pupils. Journal of Educational Research, 16: 200-204.

drudgery of learning the simple fundamentals; but in these subjects, in which he may be expected to make his best showing, inasmuch as his work is practically limited to them, he falls far behind the average city child, being nearly two years behind at the end of his elementary course.—*Indiana Education Survey Commission. Public education in Indiana. New York General Education Board, page 19.*

These results (higher median arithmetic and reading scores for every grade of the consolidated school than for the corresponding grades of the five adjacent one-room schools of the township) are not necessarily indicative of lack of teaching ability in the one-room rural schools, but rather show the inadequacy of the present system, for it is handicapped by the lack of time and the inadequacy of equipment.—*Results of a testing survey of the Strasburg consolidated and adjacent one-room schools. State University, Columbus, Ohio. Educational Research Bulletin, volume 6, February, 1927.*

Pupils of the Colo Consolidated School averaged from 11 per cent more efficient in the eighth grade to 29 per cent more in the sixth grade than those of the corresponding grades of the 12 surrounding one-teacher schools. In rate of reading, scores varying from 10 to 60 per cent higher were made in the different grades of the consolidated school than in those of the one-teacher schools. As in reading comprehension, the smallest difference was in the upper grades * * *. Pupils of these two (upper) grades possibly may have received much the same type of training in their earlier school life, or many of the less efficient pupils in the rural schools drop out of school before these grades are reached.—*Iowa State Teachers College. Results of teaching in one-room rural schools compared with results in consolidated schools. Cedar Falls, Iowa. (Mimeographed.)*

In April, 1927, the Woody-McCall Mixed Fundamentals, Form III, was given to all eighth-grade pupils—514 city (village) 615 rural (one-teacher and larger rural schools)—in Tulare County, Calif. The city median was 30.39, and the rural median 31.18.

At the same time the Woody-McCall, Form III, was given we also gave standard tests in language, geography, United States history, and literature. The possible score in those tests was 65. The city median was 40.19 and the rural median 43.03.

You will note the surprising fact that the rural median was several points above the city median. This we attribute to the system of rural supervision that has been practiced in this county for the past three or four years. It shows conclusively that the county school properly supervised is a mighty fine institution.—*Buckman, J. E. (county superintendent). Results of a county-wide testing program. Visalia, Calif., 1927. (Unpublished report.)*

Even in a very few cases, where the use of the technique of individual instruction seems to have solved the problem so far as a mastery of the subject matter is concerned in the small isolated school, there is always lacking the other and more important phase of secondary education, namely, training in the theory and practice of the social sciences. Actual large group contacts in classroom and extra-curricular activities are necessary for the adequate preparation of young citizens for the larger group life of adulthood.—*Whitney, F. L. High-school opportunities in Colorado, State Teachers College, Greeley, Colo. Research Bulletin No. 18, August, 1927.*

The general low standing of the one-teacher schools is not confined to the subjects tested. We must not forget that the one-teacher schools are also at a disadvantage in facilities to attain some of the other important outcomes which we have not tested. Among these may be listed breadth of reading; skill in the use of reference books; ability in, and enjoyment of, music and art; and learning

of cooperation and good will by mingling with others. Poorer showing was made on the tests in history and literature and in language usage than in the fundamentals.—*Surface Creek Survey Commission. An educational survey of school districts 6, 9, 18, 22, 23, and 24, of Delta County, Colo., Delta, Colo. County superintendent, 1924.*

SUMMARIES AND CONCLUSIONS

In the preceding pages typical comparisons have been shown between the achievement of pupils trained in one-teacher schools and those trained in large rural schools, covering a number of elementary school subjects. The tabulation of data has been arranged mainly by subjects. In Table 12 and the following pages a summarization is given of the results of testing programs appearing in eight State survey reports showing the comparative ability of pupils in the two types of rural schools by States, and for the group of States, in reading, arithmetic, and spelling.

TABLE 12.—*Comparison of median scores of pupils in large and in small rural schools in eight States*

Subjects	Number of comparisons made	Number of instances in which higher median scores were earned in—		Per cent of instances in which higher median scores were earned in—	
		Large rural schools	Small rural schools	Large rural schools	Small rural schools
1	2	3	4	5	6
Reading:					
Indiana	3	3		100	
Kansas	6	6		100	
Kentucky	3	3		100	
New York	8	8		100	
Oklahoma	8	4	4	50	50
Texas	7	7		100	
Virginia	4	4		100	
West Virginia	12	4	8	33.3	66.6
Total	51	39	12	76.5	23.5
Arithmetic:					
Indiana	6	6		100	
Kansas	22	[1] 21		95.4	
Kentucky	6	6		[1]100	
New York	8	8		100	
Oklahoma	11	6	5	54.5	45.4
Texas	4	4		100	
Virginia	20	20		100	
West Virginia	6	2	4	33.3	66.6
Total	83	73	9	87.9	10.9
Spelling:					
Indiana	3	3		100	
Kansas	3	3		100	
Kentucky	3	3		100	
New York	3	3		100	
Oklahoma	6	4	2	66.6	33.3
Texas	2	2		100	
Virginia	5	5		100	
West Virginia	6	2	4	33.3	66.6
Total	31	25	6	80.6	19.4

[1] Of 22 comparisons between pupils scores in the 2 types of schools in Kansas in arithmetic, the median scores in 1 case were equal.

Sizes of rural schools and numbers of pupils included in each of the surveys were as follows: Indiana, one-teacher 2,852, six or more teacher 714; Kansas, one-teacher 1,232, third-class city schools (villages with populations between 500 and 2,000) 1,008; Kentucky, one-teacher 2,947, six or more teacher 261; New York, one-teacher 2,050, four or more teacher 2,835; Oklahoma, one-teacher 3,169, consolidated 2,527; Texas, one-teacher 643, five or more teacher 2,430; Virginia, one-teacher 186, four or more teacher 2,259; West Virginia, pupils in 9 one-teacher schools and those in 6 three-teacher schools.

Read Table 12 as follows: In the Indiana survey report three comparisons between the median reading abilities of pupils in large rural schools and of those in the corresponding grades in one-teacher schools are shown. In each of these, higher scores were made by pupils of the large schools, which amounts to 100 per cent of the times comparisons were made between the two. In a similar manner read across the page for results in each State on each subject and for the total results on each subject.

Data presented in Table 12 show that pupils in large rural schools made higher median reading scores in 39 of the 51 comparisons and lower in 12 than those of the corresponding grades in one-teacher schools. In terms of percentage the median scores were higher in large schools in 76.5 per cent of the total number of comparisons made.

In arithmetic and in spelling, as in reading, pupils in large rural schools made a much larger per cent (see Table 12) of the higher median scores than those of corresponding grades in one-teacher schools. In a total of 83 comparisons between arithmetic ability of pupils in the two types of rural schools included in the eight surveys, 73, or 87.9 per cent, show higher, and 9, or 10.9 per cent, lower median scores (in one comparison they were equal) for pupils in large rural schools, grade for grade, than for those in the one-teacher schools. In a total of 31 comparisons of writing ability 25, or 80.6 per cent, show higher, and 6, or 19.4 per cent, lower median scores for pupils in the large schools, grade for grade, than for those in the one-teacher schools.

Of the 8 State survey reports, 6 show that all comparable median reading, arithmetic, and writing scores were uniformly higher in large than in one-teacher rural schools. In 2, the Oklahoma and the West Virginia studies, some scores were higher in one-teacher schools. In Oklahoma the median scores were higher in 4 of a total of 8 comparisons in reading, in 5 of a total of 11 comparisons in arithmetic, and in 2 of a total of 6 comparisons in writing, for pupils in one-teacher schools than for those of the corresponding grades of large rural schools. In West Virginia the median scores were higher in 8 of a

total of 12 comparisons in reading, in 4 of a total of 6 comparisons in arithmetic, and in 4 of a total of 6 comparisons in writing for pupils in one-teacher schools than for those of the corresponding grades of large rural schools.

Since the tests in each survey were given to large numbers of pupils (see page 20), they should be representative. Assuming that pupils tested in both types of rural schools were equally well classified, summaries shown in Table 12 indicate that pupils attending large rural schools in various sections of the United States learn to read, spell, and solve arithmetical problems decidedly better than those who attend one-teacher schools. Summaries of similar results on other subjects confirm the statement that pupils trained in large rural schools make higher comparable scores on educational tests than those trained in one-teacher schools.

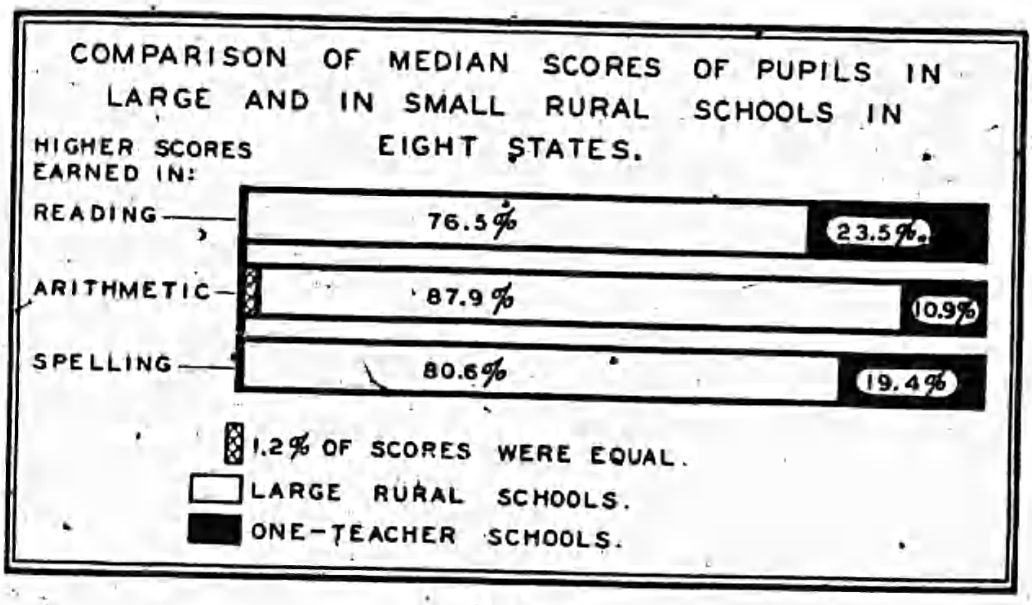

FIG. 5

To show the facts in Table 12 graphically, Figure 5 is presented. The percentage distribution of higher median reading, arithmetic, and spelling scores shown in the table are represented in the respective bars of the graph.

The upper bar of Figure 5 represents all, or 100 per cent, of the comparisons made between reading abilities of pupils in the two types of schools in the eight States; the light portion represents the per cent of higher median scores earned in the large type rural schools; the shaded portion, that earned in the small type. Similarly the middle bar represents comparisons in arithmetic abilities; the hatched portion of this bar shows the per cent of scores which were equal, grade for grade, in the two types of schools.

The results of a majority of studies, a few of which have been reviewed here, indicate that pupils trained in large rural schools

acquire a better mastery of the fundamentals of learning, grade for grade, than those trained in one-teacher schools; a few studies show the opposite; while the results of at least one extensive study, although showing higher scores for pupils of large rural schools than for those of small ones, when converted into achievement quotients, indicate greater effectiveness in the small type school.

The rural school administrator will want to know the causes of these conditions. It may be better classification and teaching, longer terms, better holding power of the larger schools than of the small ones, or it may be other factors. Results should be studied in the light of all available data. Continued study and additional information, which will permit wider comparison and more definite conclusions on the instructional results in the two types of rural schools, are needed.

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