

COLORADO STATE TEACHERS COLLEGE BULLETIN

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A
Self-Survey
of
The Sterling Public Schools
District Number Twelve
Logan County, Colorado
Colorado State Teachers College
Co-operating



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Co-operative Survey
of the
Sterling Public Schools
District Number Twelve
Logan County, Colorado
1916-17

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INTRODUCTION

In the fall of 1916 the following letter from Colorado State Teachers College was sent to Superintendents of Schools in Colorado:

"President Crabbe has appointed a Survey Committee consisting of Dr. J. D. Heilman of the Department of Psychology, Dean T. C. McCracken of the Department of Education, Mr. E. D. Randolph and Dean G. R. Miller of the Department of Sociology and Mr. W. B. Mooney, Director of Extension.

"The purpose of this committee is to encourage the school survey movement on a co-operative basis. We think that there are conditions, both good and bad, in our school systems which can and should be revealed by a survey, conducted by the administrative authorities in charge of each school system, aided by expert advice from outside the system. We believe the Teachers College is under obligation to furnish this expert assistance; therefore, the committee referred to above has been appointed and is ready to render whatever service it may along the lines indicated.

"As a committee we are of the opinion that wherever such work is to be undertaken there should be a preliminary study of the underlying principles of educational and mental tests, together with a study of social problems, especially as these are related to the educational problems.

"This course may be given under the direction of the superintendent in co-operation with the college, and the result of the course should be that all those taking it will have a fair grasp of the underlying principles of the subjects treated and that some will become fairly proficient in the application of the tests to school children.

"After this course has been completed or has been pursued to a certain point, we suggest that a survey of the school system be undertaken by means of certain teachers, who are sufficiently interested to acquire the necessary skill to give the mental and educational tests and by means of a committee to consist of the superintendent of schools, a member of the board of education, and a citizen. This committee should give its attention to the survey as a whole and should be responsible for the survey of the financial, social, and educational (other than those of the school) possibilities and activities of the community. The Teachers College will undertake to give whatever advice may be necessary to insure a fair degree of accuracy and thoroughness in

the effort to survey the school system in the proposed phases.

"The findings of such a survey can be used to improve the school system. The fact that the survey is made by the authorities in charge of the school will insure that the work will be done by those, who, by reason of their acquaintance with the system, have a perspective that we think is essential to a sensible and sympathetic approach to the problem. As an institution, we want to play a minor part in the work, but we wish to make this part no less effective and contributory to the most effective and thoro-going research into the school system which time and circumstances will permit.

"If you are interested in this matter, please let us hear from you at an early date.

"Sincerely yours,

"W. B. MOONEY,

"Chairman Survey Committee."

Many superintendents responded favorably to this communication, and co-operative surveys were undertaken in as many school systems as time and available forces in the College would permit.

At Sterling, Colorado, some work had already been done, and it was, in fact, that work which suggested the possibility of such a co-operative plan of survey to the authorities of Teachers College. Work was begun in the Sterling system early in the fall of 1916.

Superintendent J. A. Sexson, his principals, teachers, and the board of education entered heartily into the work. The Committee from the College acted entirely in an advisory capacity. We believe the product is worth while, not perhaps as a contribution from the viewpoint of the expert in education, but as a means of exhibiting to the teaching force, the board of education and the citizens of Sterling some pertinent facts relative to their schools. All the work, including the publication of this bulletin, has been done for the above stated purpose.

Defects in the system have been pointed out constructively. If these defects appear in the educational work they are being remedied as far as possible by the teaching force; if in the administrative work, plans are being laid by the administrative officers to correct them.

Until this survey was made the board of education did not have a set of written by-laws by which to guide their actions. This is not an uncommon condition in cities the size of Sterling. Anyone familiar with the problems of school administration will recognize that the by-laws adopted by the Sterling board are in harmony with the best theory and practice of modern school administration.

It should be said that all who have worked on this survey do not agree with some of the ideas advanced. Suggestions and constructive criticisms will be gratefully received by the school authorities of Sterling and of Teachers College.

For the information of those outside of Sterling, into whose hands this bulletin may come, a few explanations are necessary.

Sterling is a city of about 7,000 inhabitants, located in Logan County, on the Union Pacific and Burlington Railroads, 150 miles northeast of Denver. It is supported by a very productive agricultural area some of which is under irrigation, though there are many excellent "dry" farms in this section. The town has had a very rapid growth. Its citizens have come from all parts of the United States, but most of them from the Middle West. Sugar beets are cultivated and the Great Western Sugar Company has a sugar factory here. The foreign population is quite largely German and Slav, engaged in the beet fields. These people present many knotty problems to the school authorities.

About 25 years ago a County High School was organized at Sterling. This high school was designated as the Industrial Arts High School, and is open to all the children of Logan County who have finished the eighth grade. The Superintendent of the Sterling Public Schools is also Principal of this County High School. This survey does not include a study of the high school, but is confined to a study of the grade schools of the City of Sterling, or School District No. 12, Logan County.

All who are connected in any way with the Public Schools of Sterling are entitled to credit for the earnest efforts they have made to set forth the facts as they are, and for the extra work required of them, which was by no means small, to get the material into usable condition. Special mention should be made, however, of the work of Mrs. Edith G. Painter, Special Teacher, who gave most of the mental tests and many of the educational tests and assisted in their tabulation; and Mrs. Maude Miller Jackson, President of the Board of Education, who formulated the by-laws for the government of the board of education. All the work was supervised and much of it done by Superintendent Sexson.

Doubtless those who read this report will have the impression that the findings lack conclusiveness and possibly definiteness. It must be understood that the work is not finished and perhaps never will be. All who are connected with the system are trying to keep an open-minded attitude toward all the activities of the school, neither condemning nor approving, but studying the results of these activities by the most scientific methods available.

W. B. M.

TO THE PEOPLE OF SCHOOL DISTRICT NO. 12,
STERLING, COLORADO.

GREETING:

There has never been a time when the education of our boys and girls meant more than it means today. They must be trained to take the places of the skilled men who have been called to arms in defense of Democracy.

Our schools have attempted in many different ways to place before the public evidences of the work being done in the schools; these, in some instances, have been the displaying of results which have been splendid as far as they have gone, but there still seems to be wanting a closer touch between the home and the school, coming from the lack of knowing each other intimately.

The Board of Education publish this survey in the hope that parents and others reading it will come to be more accurately informed about our schools, the work and standing, and will, for this reason, come to be more interested in them. The Board desires to show also that results obtained here in Sterling compare favorably with results obtained in other school systems.

The constant request is being made again for patrons and parents to visit the schools. This is impossible in many cases as business-hours and home duties often conflict with school-hours, but we do urge an earnest effort at all times to come in closer touch with the teachers of your children.

Every one, beyond a doubt, is striving to do the very best he or she can do; but the situation is like unto an artist who paints for six years on a canvas trying to bring out her hopes and deals, and at the end of the six years turns the canvas over to the teacher without a word of explanation, leaving her to paint for a year, only to pass it on again to another. So it is with our children; and unless we co-operate until the picture is finished, need we wonder at the result?

The schools are not ideal; no one claims that they are, but every one who is vitally interested is working toward the ideal. We all want our children to be men and women fully equipped to live this life to its fullest and best. You are cordially invited to participate to the fullest possible extent in the work of the schools with your child. Meet the teacher, principal, and the superintendent, and you will find a ready willingness to adjust everything to the best interests of your child.

Your Board of Education are giving their time freely and loyally to promote the best interests of the schools, and if you wish your children to receive the greatest good, lend the heartiest co-operation in your power.

We believe that size has nothing to do with quality; hence we have chosen the slogan, "The best schools in Colorado for

Sterling," and intend that everything possible shall be done to attain this end.

Respectfully,

MAUDE MILLER JACKSON,
President Board of Education.

BY-LAWS OF THE BOARD OF DIRECTORS, SCHOOL
DISTRICT NUMBER TWELVE, LOGAN
COUNTY, COLORADO.

ARTICLE I.

Declaration of Principles.

Section 1. The object of these by-laws is to set forth in a connected and concise way the plan of organization and administration which the Board of Education of School District No. 12, Logan County, Colorado, has found to form a successful operating basis for a school system in a district of the first class organized under the Colorado Statutes.

The idea is to make the plan strong and binding enough to prevent any retrogression, to make a firm foundation on which to build; at the same time to have the organization flexible enough to permit of all possible progress in the education of our youth.

Section 2. Every child is entitled to the best education which can be provided.

The best possible can only be obtained when the organization and management is such that the most efficient results can be obtained.

Section 3. In the first class districts citizens are elected by the people to be their representatives.

To see that the best possible results are received in return for the money expended, the Board members should keep themselves so informed that they will be able to pass intelligently on all matters delegated to them by virtue of their position and by the Colorado School Law.

Section 4. Schools exist in no sense to afford patronage for anyone. No one is entitled by right to any position in the school system except on the basis of being the best prepared of the available candidates.

ARTICLE II.

Organization of the Board of Education.

Section 1. As prescribed by Colorado School Law, the Board shall meet within twenty days after the annual school election and perfect an organization. A president, secretary and treasurer shall be chosen by the Board from their own membership to act in their respective capacities for a term of two years. A good officer is better kept, as frequent changes tend towards retrogression; however, a too lengthy continuance in any office is unadvisable.

Section 2. The Board shall transact all business possible at the regular meetings. Emergency cases shall be cared for by members of the Board who are designated chairmen of the different committees. The Board shall hold regular monthly meetings on the first Monday following the third of each calendar month. Special meetings may be called by the President.

Section 3. The Board meets distinctively as a business board and is authoritative only when in session. Its prime purpose is to serve the people and, after a conscientious selection of an expert executive, should make every effort towards centralizing in this executive complete authority and responsibility in the educational functions of the system.

Section 4. The duties of the Board are legislative, inspectorial, and executive. The executive functions are delegated to the Superintendent as the chief executive of the Board. The duties, inspectorial and advisory, shall be exercised to such an extent as to familiarize each member with the work which is being done. They shall be aided by specific reports from those in charge. Such reports shall pertain to the general organization of the school, to the achievement and rating of teachers, to the progress of pupils, to the finances of the district, to the condition of the buildings and school equipment, and to the plans of the Superintendent and his administration.

Section 5. The Board will provide for an Examining Committee who shall have the power to examine applicants for certificates and recommend persons to the Board for certification.

Section 6. The Board will retain all legislative powers delegated to it under the Colorado School Law.

Section 7. The Board is divided into the following committees: Supervision, Teachers and Text-books, Health and Sanitation, Supply and Finance, Building.

Section 8. The duties of the Supervision Committee are to keep in close touch with the administrative force in order to be thoroughly cognizant of the work being done, and to become acquainted with the future plans of the administration.

Section 9. The duties of the Teachers and Text-books Committee are to familiarize itself with the book supply, the number and condition of same; and to be thoroughly familiar with the work done by individual teachers, their relations to the community, etc.

Section 10. The Health and Sanitation Committee is to co-operate with the health supervisor, and be directly responsible for sanitary conditions, the supervision of janitors, and health certification of teachers.

Section 11. The Supply and Finance Committee is to recommend to the Board the best ways and means of purchasing supplies, to authorize incidental purchases, and to

present an annual budget showing income, and necessary expenditures to the Board.

Section 12. The Building Committee shall have charge of the buildings and grounds and make recommendations concerning these to the board.

Section 13. At the regular monthly meeting in June the Board shall approve and adopt a school calendar for the ensuing year. It should also inspect and pass upon the requisitions made for school supplies and other expenditures. All purchasing shall be under the direct approval of the Board. At the regular monthly meeting in March the Board shall employ the teachers for the ensuing year.

ARTICLE III.

Superintendent, Powers and Duties.

Section 1. The Superintendent shall be a member of the Board without a vote. He shall be the executive to carry out the legislation of the Board and shall be responsible to the Board. He shall be present at all meetings of the Board and take a free and active part in all discussion pertaining to school problems. In all educational matters he will be considered as prime advisor. He shall have the initiative in all matters relating to the appointment, assignment, transfer and promotion of the teaching corps. Teachers are directly responsible to the Superintendent. He shall have supervisory oversight of janitors. He should keep in close touch and be well informed about the financial status of the district. He should have complete charge of records, reports, etc.

Section 2. The Superintendent shall be an ex-officio member of all committees of the Board of Education.

Section 3. The teachers shall be employed only as nominated by the Superintendent.

Section 4. The Superintendent shall not present the name of anyone who has not the following qualifications:

High School graduate, two years of higher education, ten college hours of which must be in professional work or practice teaching. This practice teaching will be accepted in lieu of experience when obtained in institutions requiring bona-fide practice teaching.

Section 5. The Board still reserves the right to reject any and all candidates, without, however, making any substitution of its own.

Section 6. A list of eligible teachers bearing the endorsement of the Superintendent and approval of the Board shall be placed on file and during the year the Superintendent shall, without further action by the Board, draw upon such list to fill vacancies occurring during the school year.

Section 7. If any member of the teaching corps wishes to become a candidate for the office of County Superintendent of

Schools this Board will grant said teacher a leave of absence from September to December, inclusive.

BUILDINGS AND GROUNDS

The Survey Committee of Teachers College prepared a list of items, information upon which, it believed, would be significant to any school system that is making a study of itself. These items were sent to the Superintendents concerned and were criticised and modified by them. The result was a list of items which appear in this study in black faced type. Each building is studied separately and the facts are given as they were found by the local committee, which made the study.

COLORADO STATE TEACHERS COLLEGE

SURVEY BLANK NO. 2.

- | 1. SCHOOL DISTRICT | COUNTY | STATE |
|--|--------|----------|
| No. 12 | Logan | Colorado |
| 2. NAME OF BUILDING. | | |
| Lincoln. | | |
| 3. DATE OF CONSTRUCTION. | | |
| 4. MATERIAL USED. | | |
| Floors and staircases, wood, brick;
Basement, cement; roof, wood. | | |
| 5. NUMBER OF STORIES. | | |
| Three and basement. | | |
| 6. COST OR APPROXIMATE COST. | | |
| \$50,000. | | |
| 7. METHOD OF HEATING. | | |
| Low pressure steam. | | |
| 8. METHOD OF VENTILATING. | | |
| Few air ducts for indirect system. No fans.
Windows, doors and transoms. | | |
| 9. LOCATION OF HEATING PLANT. | | |
| In basement, directly in front of main entrance and directly under main corridor. | | |
| 10. NUMBER AND LOCATION OF FIRE ESCAPES. | | |
| None. Building has inside stairways at each end and in middle. | | |
| 11. ARE THERE ANY ROOMS NOT PROPERLY PROVIDED WITH EXITS IN CASE OF PANIC FROM FIRE OR OTHER CAUSES? | | |
| Yes. Basement room's exit would have to be made through windows too high for small children to climb out. Two rooms in new addition might be cut off by a fire at north end of building. Auditorium is fire trap of worst possible kind. It is located on third floor high above ground with empty rooms, unfinished, wood lined, and dry as tinder on either side. The one exit is a simple staircase directly over furnace room entrance and so located as to act as a direct flue for flames, should fire start. Entrance is also part of opening leading from basement to tower above building, making conditions doubly bad. Auditorium infrequently used. Third story rooms should be finished and extra exits provided. | | |
| 12. LABORATORIES, SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION. | | |
| None. | | |

13. THE GYMNASIUM, SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION.

None.

14. THE LIBRARY, SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION.

No library.

15. WHAT CLASSES IF ANY MEET IN BASEMENT ROOMS?

Three classes regularly consisting of German children who spend the entire day in these basement rooms, a special class backward children, and all manual training classes.

16. SANITARY CONDITION OF THESE ROOMS (UNDER THIS THE FACTS RELATIVE TO HEAT, LIGHT, VENTILATION, DAMPNNESS, ETC., OF THESE ROOMS SHOULD BE GIVEN).

Heating is poor, radiation overhead, ceilings low. Windows high from floor, light bad and insufficient. Ventilation bad. Air must be circulated, if at all, by using electric fans. Walls of rooms damp, muddy and unsightly. Supporting posts, steam pipes, ceiling radiators and low ceilings give depressing effect.

17. NUMBER OF CHILDREN ACCOMMODATED IN THE BUILDING:

Boys	295
Girls	303
Total	598

18. TABLE SHOWING DISTRIBUTION OF CHILDREN IN THE GRADES, NUMBER OF TEACHERS AND NUMBER OF CHILDREN PER TEACHER.

Grades.	Number of children.	Number of teachers.	Number of children per teacher.
1	148	3	49
2	116	3	49
3	110	3	36
4	94	2	47
5	65	1½	43
6	66	1½	44

The standard is one teacher for each thirty pupils.

19. HOW MANY ADJUSTABLE DESKS ARE USED IN THE BUILDING? INDICATE BY GRADES.

Grade Six	43
Grade Five	45
Grade Four	42
Grade Four	48
Grade Three	0
Grade Two	40
Grade Two	36

The standard is an adjustable desk for each child.

20. NUMBER OF SEATS IN GIRLS' TOILET.

Sixteen. Ratio of seats to girls, 1 to 14.

21. NUMBER OF SEATS IN BOYS' TOILET.

Fourteen. Ratio of seats to boys, 1 to 17.

22. FEET OF URINALS IN BOYS' TOILET.

Nineteen. Number of feet urinals to each boy, 1 to 15.

The standards are:

One seat to each 15 girls.

One seat to each 25 boys.

One foot of urinals to each 10 boys.

23. DETAILS OF CLASS ROOMS.

Grade.	(a)—Dimensions Height, Length, and Breadth.	(b) Square Feet of Floor Space Per Child.	(c)—Ratio of Glass Surface to Floor.	(d)—Distance Between Windows.	(e)—Height of Windows, Floor to Top, Floor to Bottom.
6	12x33x27 $\frac{3}{4}$	17	1 to 6	3 ft.	11-4: 3-2
5	12x28-8x27-4	16	1 to 5	3 ft.	11-4: 3-2
4	12x29x28	22	1 to 5	4 1/6 ft.	11-4: 3-2
4	12x32x27 $\frac{1}{2}$	24	1 to 5	3 ft.	11-4: 3-2
3	12x28x28 $\frac{1}{2}$	27	1 to 5	5 ft.	11-4: 3-2
3	12x28x28 $\frac{1}{2}$	28	1 to 5	5 ft.	11-4: 3-2
2	12x28 $\frac{1}{2}$ x29	30	1 to 5	3 ft.	11-4: 3-2
2	12x32 $\frac{1}{2}$ x27 $\frac{3}{4}$	39	1 to 5	3 ft.	11-4: 3-2
1	12x33x27	30	1 to 5	3 ft.	11-4: 3-2
1	12x28 $\frac{1}{2}$ x28	26	1 to 5	3 ft.	11-4: 3-2
4	12x25x12	12	1 to 15		
4 Rooms (2 toilets—1 recitation room—1 board room)					
Basement Rooms.					
4	8-4x32-8x27-8	29	1 to 14	3 2/3 ft.	8-4: 5-4
3	8-4x28x27 $\frac{1}{2}$	35	1 to 12	3 ft.	8-4: 5-4
2	8-4x29 $\frac{1}{2}$ x28	22	1 to 17	11 ft.	8-4: 5-4
1	8-4x28x29	22	1 to 17	11 ft.	8-4: 5-4
	8-4x32x37 $\frac{1}{2}$	32	1 to 12	3 ft.	8-4: 5-4

The standards are:

- (a) Class rooms should be approximately 22 x 29 x 12 $\frac{1}{2}$.
- (b) There should be at least 15 square feet of floor space for each child enrolled.
- (c) The ratio of glass surface to floor surface should be at least 1 to 6.
- (d) The distance between windows should be but a few inches.
- (e) The distance from the floor to top of window should be one-half the width of the room.
Three feet six inches is a good height for windows measured from floor to bottom of window.

24. TOILET ROOMS.

(a) HEATING.

Steam radiators.

(b) LIGHTING.

Upstairs toilets are naturally lighted by east windows. Glass surface ratio to floor space 1-15. Basement toilets without natural lighting of any kind. Electricity used entirely.

(c) VENTILATION.

Upstairs toilets ventilated by windows, tendency for air to circulate from window through toilet into main halls. Odors clearly discernible on days of easterly winds. Air shafts badly needed, and may be inexpensively installed.

(d) **BASEMENT TOILETS.**

Provided with small air shafts leading up three stories, but as no heat is provided these shafts do not operate at all as intended and very often act as air inlets forcing odor from toilets into main corridors.

The entrances to these toilets are directly off from main entrances to building and as they may not be closed there is a serious lack of privacy. These entrances also provide unobstructed circulation of air from these toilets into main corridors with bad effects. The use of toilets should be discontinued and the space used as corridors. The basement toilets, one for boys and one for girls were installed when the original building was built and at that time had outside ventilation and sunlight. Additions have since been built on and these toilets are now in wells in bottom of the building without natural light, ventilation, or sunlight. These toilets are a menace to health and should be closed. The only possible outlets for them are into main corridors and the odor is clearly discernible at all times, regardless of how much attention the janitor gives to cleanliness. Owing to inadequate water pressure, a condition that has developed since those toilet rooms were installed, the water available for these toilets is inadequate and conditions are becoming almost intolerable. A special installation of air pressure with tank and motor or a "step up" apparatus on the present system is now absolutely necessary to tolerable sanitary conditions.

25. PLAY GROUND.

(a) **SIZE.**

Unrestricted play area 406 ft. by 207 ft. or 104 sq. ft. per pupil. Restricted play ground, lawn 406-210 or 106 sq. ft. per pupil.

The standard is 100 sq. ft. per child, 200 sq. ft. is better.

(b) **LOCATION.**

About building, ideally located and ample.

(c) **EQUIPMENT.**

Meagre consisting of one slide donated by citizens. Beautiful lawn, trees and shrubs are attractive features. The standard is enough apparatus to keep all at play during the play period.

26. MUSEUMS (Collections made for the purpose of making instructions meaningful).

None; much needed.

**COLORADO STATE TEACHERS COLLEGE
SURVEY BLANK NO. 2.**

- | | | |
|---|---------------|--------------|
| 1. SCHOOL DISTRICT | COUNTY | STATE |
| No. 12 | Logan | Colorado |
| 2. NAME OF BUILDING. | | |
| Franklin. | | |
| 3. DATE OF CONSTRUCTION. | | |
| About 1900. | | |
| 4. MATERIAL USED. | | |
| Brick; floors and staircases wood; roof wood. | | |
| 5. NUMBER OF STORIES. | | |
| Two, and basement. | | |
| 6. COST OR APPROXIMATE COST. | | |
| \$20,000. | | |
| 7. METHOD OF HEATING. | | |
| Low pressure steam. | | |

8. **METHOD OF VENTILATING.**
Windows, doors and transoms, few air ducts but not in working order.
9. **LOCATION OF HEATING PLANT.**
In small attached building west of main building.
10. **NUMBER AND LOCATION OF FIRE ESCAPES.**
None. Building has inside stairways at each end.
11. **ARE THERE ANY ROOMS NOT PROPERLY PROVIDED WITH EXITS IN CASE OF PANIC FROM FIRE OR OTHER CAUSES?**
12. **LABORATORIES: SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION.**
None.
13. **THE GYMNASIUM SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION.**
None.
14. **THE LIBRARY, SIZE, LOCATION, EQUIPMENT, LIGHT AND VENTILATION.**
None.
15. **WHAT CLASSES IF ANY MEET IN BASEMENT ROOMS?**
16. **SANITARY CONDITION OF THESE ROOMS (UNDER THIS THE FACTS RELATIVE TO HEAT, LIGHT, VENTILATION, DAMPNES, ETC., OF THESE ROOMS SHOULD BE GIVEN).**
17. **NUMBER OF CHILDREN ACCOMMODATED IN THE BUILDING.**
- | | |
|-----------------|-----|
| (a) Boys | 151 |
| (b) Girls | 163 |
| | 314 |
| (c) Total | 314 |

18. **TABLE SHOWING DISTRIBUTION OF CHILDREN IN THE GRADES, NUMBER OF TEACHERS AND NUMBER OF CHILDREN PER TEACHER.**

Grades.	Number of children.	Number of teachers.	Number of children per teacher.
2	67	2	38
2	53	2	26
3	55	2	27
4	52	1	52
5	45	1	45
6	42	1	42
7	—	—	—
8	—	—	—

(See Lincoln Building for standards).

19. **HOW MANY ADJUSTABLE DESKS ARE IN USE IN THE BUILDING? INDICATE BY GRADES.**
- | | |
|-------------------|---|
| Grade Six | 0 |
| Grade Five | 0 |
| Grade Four | 0 |
| Grade Three | 0 |
| Grade Two | 0 |
| Grade One | 7 |
20. **NUMBER OF SEATS IN GIRLS' TOILET.**
Fourteen. Ratio of seats to number girls, 1-12.5.
21. **NUMBER OF SEATS IN BOYS' TOILET.**
Twelve. Ratio of seats to number boys, 1-13.
22. **FEET OF URINALS IN BOYS' TOILET.**
Number feet of urinals for each of 15 boys, .952 ft.
23. **DETAILS OF CLASS ROOMS.**

Grade.	(a)—Dimensions Height, Length and Breadth.	(b)—Square Feet of Floor Space Per Child.	(c)—Ratio of Glass Surface to Floor.	(d)—Distance Between Windows.	(e)—Height of Windows, Floor to Top, Floor to Bottom.
I	12-33-21	21.16	1 to 6		11-6: 3-10
I	12-34-23	23.4	1 to 4		11-6: 3-6
II	12-34-23	22.5	1 to 8		11-6: 3-6
II	12-33-23	29.8	1 to 3		11-6: 3-6
III	12-34-23	17.3	1 to 6		11-6: 3-10
IV	12-34-23	15.4	1 to 6		11-6: 3-10
V	12-34-23	17.6	1 to 6		11-6: 3-10
VI	12-34-23	18.3	1 to 6		11-6: 3-10

24.—TOILET ROOMS.

(a) HEATING.

Overhead radiation, not sufficiently supported—dangerous.

(b) LIGHTING.

Electric lights and frosted windows.

(c) VENTILATION.

Windows.

25. PLAY GROUNDS.

(a) SIZE.

Unrestricted 200x275, 143.3 sq. ft. per child.

Restricted lawn 200x275, 143 sq. ft. per child.

(b) LOCATION.

Back of building.

(c) EQUIPMENT.

None. Old equipment worn out and use discontinued.

26. MUSEUMS (Collection made for the purpose of making instructions meaningful).

Practically nothing.

COMMENTS

"The modern school," says Terman, "is in certain respects vastly different from the school of our fathers and grandfathers. When the curriculum embraced little more than the 'three R's,' the chief requirement of a school building was to furnish shelter and seats in which the children might study books. But people are demanding more and more of their schools. The curriculum has broken away from its old moorings, never to return. Shop work, domestic science and household arts, drawing, play and physical training are no longer fads, but indispensable phases of school instruction.

"These demands, coupled with the broader use of the school plant for social center activities, make necessary a new type of school building; one having in addition to classrooms at least the following appointments: A shop, one or more rooms for

domestic science and household arts, an assembly room with stage, a library, a nurse's room, a teachers' rest room, a sheltered play room or gymnasium, a store room, and a shower bath or swimming pool. In modern school planning the regular classrooms often represent considerably less than half the cost of the entire building.

"Schools to be erected in the future should in all cases include a good-sized auditorium on the first floor, a library, a rest room for children and teachers, a store room conveniently located, a nurse's room, an art room, an open-air basement play room or gymnasium with nearby showers and dressing booths. The assembly room, the library, the gymnasium, the showers, and if possible, also one club room, should be located near together and should be so arranged that they could be opened for community use while the rest of the building remained closed.

"With proper economy in the planning of buildings, it is possible to secure these advantages without greatly increasing the cost of construction."

A glance at the facts revealed in the above findings suffice to show that Sterling's grade school buildings lack many of the appointments which are now recognized as essential features of a modern school plant or building. It is hoped that when occasion comes to replace or add to the present buildings, due consideration will be given to modern needs and demands.

Sufficient comment has already been made on most of the defects this study reveals concerning Sterling's school buildings and grounds. However, there are a few items which may well receive further attention.

1. The danger to which children are exposed in case of a serious fire at the Lincoln building, especially if any considerable number were caught in the assembly room, is a matter which should be corrected at once. Either, children should not be taken up there, except in very small numbers, or safer means of exit should be furnished.

2. The basement rooms at the Lincoln building should be abandoned as classrooms. They fall too far below the standards in light and ventilation to justify their use as classrooms even for only a part of the year. It would pay the community to rent rooms or construct rooms of the portable school type rather than to use these rooms as classrooms.

3. The ratio of pupils to teachers is considerably above what it should be to produce the best results. No teacher should have more than 30 pupils enrolled in her room at any one time.

4. The Sterling grade school rooms are generally too large for economy in heating and for the best arrangement of windows for lighting. The most approved size of a school room is one that is 22 ft. by 29 ft. by 12½ ft. This size of room also

tends to prevent the giving of too many pupils to one teacher. It may appear to be economy to give teachers large classes, but there is no more wasteful practice in school administration than this. Upon this point all who have given this matter even cursory thought are agreed.

5. Outside of the bad lighting conditions in the basement rooms the school rooms of Sterling are fairly well lighted. The desks in some of the rooms at the Franklin building should be changed so that the light will strike the sides rather than the backs of pupils.

6. The defects pointed out with reference to the toilet rooms in both the Lincoln and Franklin buildings should receive early attention.

7. Approximately half the children at the Lincoln building are occupying desks that cannot be adjusted, and there are only seven adjustable desks in the Franklin building. An old fashioned city superintendent was asked once if his schools were equipped with adjustable desks. "No," he said, exhibiting some pride, "the children of this school are themselves adjustable." He spoke truer than he knew. Children are adjustable and because of this fact we have the many skeletal deformities, many of which are directly traceable to this tendency of the growing child to adjust himself to the non-adjustable school desk.

8. Sterling is to be congratulated on her ample and beautiful recreation grounds for children. The play-ground equipment, however, is entirely too meager.

MENTAL MEASUREMENTS, METHOD, RESULTS OBSERVATIONS

By Edith G. Painter, Special Teacher

In December, 1916, the Board of Education, School District No. 12, Sterling, Colorado, employed Mrs. Edith G. Painter to conduct a series of investigations to determine the status of certain problems of school administration which had from time to time been noted by teachers, principals, and superintendent. The first of these problems had been designated as the problem of determining the efficiency of the teaching in the various grades and rooms of the school system. The second problem was that connected with the accelerated pupils, the backward pupils, the retarded pupils, and those pupils who for any reason seemed not to be receiving satisfactory returns from their school experience. It was decided that the work of investigation concerning the two problems should be carried on at the same time, but that the problem of teaching efficiency should receive more attention during the first year, while the greater part of the time of the second year would be given over to the problem of the special pupil. A discussion of the results of the investigation as concerned the special child problem is shown

in the accompanying tabulation, which is self-explanatory. For the purpose of the discussion the reader will please note that the 121 selected children mentioned in the tabulation on page 27 are the children tested during the first six months or first year of the investigation and were children tested upon the suggestion of the teachers, because in their opinion these pupils were not benefiting properly by their school experience. The 258 unselected children mentioned in the tabulation represent the children of the first three grades in the Sterling Public Schools and were the children tested during the second year of the investigation, at which time all children in the grade were tested irrespective of their school progress.

During the first year the Kuhlman Revision of the Binet test was used, and the object in the minds of the investigator and the teachers during this period was to find out, if possible, what might be done to make the school experience of the child more profitable. The observations based upon this first year of work were the following:

First—The Sterling Schools as a whole were poorly graded; many bright children were retained in grades from one to two years below the grade in which the child properly belonged.

Second—There was a disposition on the part of the classroom teacher to retain backward children in a grade year after year upon the theory that all children must master the work of a particular grade equally well and that children should not be promoted irrespective of age or time spent in the grade until a preconceived degree of mastery of subject matter had been achieved.

Third—That teachers were not taking into account the mental ability and strength of pupils in the assignment of tasks and that, as a result, many backward and subnormal children were being subjected to disciplinary procedure in order to force their response to the subject matter of the course of study.

Fourth—It was found that there were in the Sterling Public Schools 13 children who had been classified and graded as normal children and who had been expected to make normal progress in the schools who were, as a matter of fact, so feeble-minded as to be classified as imbeciles, according to the Terman classification; that there were in addition to these, 13 children who were dull to such an extent as to make normal progress in the schools impossible. This group, although they would be able to complete the elementary school, would necessarily require a much longer period of time than would average children.

Fifth—It was determined that a large number of these backward and feeble-minded children had serious physical defects, some of which were in urgent need of expert medical attention.

Sixth—It was farther determined that among this group

of seriously retarded children were three who were morally defective to such an extent as to be little short of menaces to the welfare of the pupils with whom they associated.

THE TEACHERS AND THE TESTS

The teacher employed to make this investigation was a special teacher, and before the work was begun a teachers meeting was called at which time a complete detailed explanation was made to the entire group relative to the proposed investigation. The teachers were urged to familiarize themselves with the tests, with the method of administering the tests, and with the general principles underlying the interpretation of the results of the use of the tests. Their co-operation was urged by the special teacher. Every possible effort was made to keep the classroom teachers in close consultation with the special teacher in every detail and phase of the investigation.

The noticeable reaction of the teachers was about as follows: Teachers were quick to admit that children were widely variant in ability. They were, however, slow to realize that many bright children in their classes were comparatively idle, due to the fact that the work was far too simple for the stage of development in which these children were. They were also slow to recognize the fact that it was bad policy to hold back 97 per cent of the pupils in the room while the teacher devoted a disproportionate amount of her time to a backward 3 per cent. Most of the teachers were so much concerned about absolute justice for the 3 per cent that they were overlooking the rights of the 97 per cent. Teachers were, for the most part, unconscious of a distinction existing between a child of nine years in a grade beside a child of eleven years of age, both children doing, in the opinion of the teacher, about the same grade of work. The teachers were disposed to regard the eleven-year-old child the same type and kind of child as the nine-year-old, making no additional requirements of the eleven-year-old child in view of his two additional years of life and experience. In other words, they were absolutely satisfied if the child was doing the work in the grade even though it was evident upon the face of it that he should, because of his age, be at least one or two grades in advance; thus acknowledging that his additional two years of age had profited him little. Teachers were not aware that some children were idle and were forming habits of inattention because there was nothing for them to do, since they had already easily done much more than the assigned task—more of it than 90 per cent of the children in the room would ever accomplish. Beside these children was another group of children who were idle and were forming habits of inattention because there was nothing in the assigned task which they were able to do, and they were consequently idle in

the face of an assigned task far beyond their ability to perform. In the case of those teachers who vaguely realized these conditions there were few who attributed these conditions to a difference in intelligence. Most of them were disposed to explain these conditions in terms of laziness, listlessness, inattention, nervousness, mischievousness, etc.

The response of the teachers to the results as determined by application of the tests was at first very skeptical. Much time was spent in thoughtless criticism and in more or less ignorant comment upon the whole investigation. Gradually, however, as more time and attention was given to the work of the special teacher and as the teachers had time through their teachers' meetings and readings to learn of the character of the tests and their educational significance, this attitude passed over into a most sympathetic co-operation between the special teacher and the regular classroom teacher. Consultation between the special teacher and the classroom teacher became common relative to the special problems of the pupils, and there was a very far-reaching adjustment of method and grading in the case of the 121 children examined. Teachers learned quickly not to penalize and discourage these special problem children where they were backward due to low intelligence. Teachers almost immediately began to seek common ground on which to meet these individual pupils and to adapt the assigned task to the mentality and potential ability of the individual child. Many normal children had been permitted to waste their school opportunity because the teachers assumed that they were for some reason necessarily less capable than their fellows. Upon having the special teacher pronounce these children normal, the teachers immediately changed their attitude and required these children to live up to their abilities.

At the end of the year when the question of promotion was being considered, the teachers were keenly alive to the factors to be considered in determining the child's eligibility for promotion. Where the tests indicated normal intelligence teachers were slow to refuse promotion for what had heretofore been considered as sufficient reason. Parents were consulted, physical condition of the child was taken into consideration, his previous school record was consulted, and these factors, together with his school record and results of the test, made the promotions at the close of the year the most satisfactory in the history of the school. Some 60 children were permitted to advance who would otherwise have been denied promotion, and six accelerated children of superior mentality were permitted to skip a grade, thus shortening their period in the elementary school by a full year.

These general principles were quite well established in the minds of the teachers at the close of this first year of investigation:

First—That there is a wide variation in the intelligence of school children, extending all the way from imbecility up through dullness, normality, superiority, to genius, and that all these types are to be found in almost any schoolroom, and that the teacher cannot neglect these individual variations in the conduct and management of a school.

Second—They discovered that the retarded child is usually at a disadvantage as compared with a child of normal age when the two are subjected to the same educational experiences, the retarded child being dull and slow and able to master the problem only with long and more or less painstaking application; while the normal child, being keen and quick-witted, grasps the problem quickly and easily and responds at once. These children can, therefore, never be put on the same arbitrary standing.

Third—That whatever may be the defects of these tests as measurements of intelligence, they are easily superior to the unsupported judgment of the teacher, based upon casual classroom observations.

THE SECOND YEAR'S USE OF THE TEST

At the beginning of the second year it was determined to test out all the children of the first three grades by the use of the Terman Revision of the Binet tests. The substitution of the Terman test for the Kuhlman test was made because of a feeling that the suggestions contained in the blanks provided for the administration of the Terman tests were helpful to the examiner and that a more intelligent diagnosis of the individual child would result, and more detailed information would be collected. Some claims were made for the Terman Revision to the effect that the Kuhlman tests had been too easy in the lower years and too difficult in the upper years; while it was felt that there was some basis for this criticism, it was not regarded as of so much importance for our purposes as the more elaborate blank above mentioned. In addition to this proposed testing of all the children of the first three grades, it was further proposed to establish a special room for backward children, to place this room in charge of the special teacher, to carry on some experiments, and to determine whether or not it would be good policy to attempt to segregate the more backward of our children and teach them in a special room. It was decided to select twelve children from the lower grades and to make these twelve children a nucleus about which to form the proposed special room. The special teacher held a consultation with the teachers of the lower grades and secured from these teachers a list of pupils who, in the opinion of the teachers, were securing no benefits from their school experience. These children were re-examined by the use of the tests and all the available information relative to the pupils and their previous school experience was collected. While there

was no definite basis for making the selection of twelve children, it was generally understood that the children selected would be those found by the report of the teacher and by the investigation of the special teacher to be the most serious class-room problems. After twelve children meeting these requirements had been found, the parents were consulted as to whether or not they would be willing to permit these children to enter this room in charge of the special teacher. The investigation of home conditions resulting from these consultations revealed many interesting details with considerable significance which it is not possible to record in a report of this kind. It was found, however, that the parents were for the most part entirely willing that whatever action would be for the best interests of the child should be taken by the school and only in one instance were the parents unwilling that the children should be placed in charge of a special teacher. The interest of the Board of Education by this time prompted them to fit out a room very attractively for the use of the special teacher for the instruction of these children. Special equipment for hand-work and for special types of instruction was purchased by the Board, and in all several hundred dollars were expended to insure satisfactory working conditions for the experiment. The children varied in age from six to fourteen years. Variation in mental ability, however, was from imbecility to dull or Moron types. While these types had attracted very little attention in their respective grades, as soon as they were segregated in one room, one only had to step into that room for a few moments to realize the enormity of the problem which confronted the teacher. When one considered the absolute helplessness of these children, when together, it was difficult to realize that they had spent many years in the classroom with normal children and had during that time attracted very little attention. They were entirely unable to help each other. No two could be found in the group who would work together. Five of them had little or no control of their bodies and little or no muscular co-ordination, nor could they satisfactorily care for their physical wants. Some fell down when attempting to cross the room, fell out of their chairs, stumbled over the furniture, were unable to follow or carry out the most simple directions. They could not read; and it was evident that they could not be taught to read however careful and painstaking the teacher might be. Some of them were even unable to make use of the Montessori material which had been purchased with the idea that it was especially adapted for the use of backward children. It was determined to teach some of the twelve children to read just to illustrate what could be done. By constant drill in phonics, by never ending labor and patience, and by all manner of devices the teacher secured some progress in reading; but at the end of four months the progress was so little that it was hardly

discernible to any except those who had watched the children very carefully day by day. The outsider would have maintained that there had been no tangible progress. Boys who excelled in numbers and who showed much interest in this work were permitted by the teacher to devote considerable of their time to this line of work. They required, however, so much attention from the teacher to keep them employed at the task about which they were concerned, that we were not able to determine just what might have been accomplished with the boys, although we did satisfy ourselves that some considerable progress would have been possible in their cases, although it would not in any sense of the word have amounted to what could have been considered as valuable arithmetical information. Some were vicious and were a constant menace to the other children in the room. One evinced disposition to do his fellow classmates bodily injury. The teacher had to be constantly on the alert to see that he did not make use of a knife, club, or some other instrument with which he might inflict bodily injury upon his associates. Another member of the group was so much disposed to appropriate property belonging to the room and to his associates that it was necessary for the teacher to search his clothing before he was allowed to leave the room at any intermission or at the close of school, in order to prevent his carrying away equipment and whatever of personal belongings he might be able to secure from his classmates. Some of the group were so addicted to the use of profanity and obscene language as to make it necessary to keep them under constant observation if they were permitted to go upon the play-grounds at all. Others, if excused from the room on any pretext, would stray aimlessly away from the room or the building and might go home, or down town, or to any other place their fancy might direct them—they were entirely irresponsible. Some little girls, although capable of very little progress, were perfect models as to behavior and disposition and constantly manifested a love for housework and domestic tasks. They were efficient assistants to the teacher in the care of the room, the apparatus, and as far as they were able, were solicitous about the welfare of their associates.

At the end of the four months' experiment it was determined, unfortunately, to permit these pupils to return to their respective rooms.

As a result of the experiment the following generalizations were made:

First—That it was greatly to the advantage of the normal child in the various rooms to relieve the teacher from the care of these backward children. It permitted more time and attention to the normal and accelerate children and greatly benefited the working conditions in the various rooms. Discipline was

less difficult and the teachers expressed a feeling of genuine relief.

Second—It was found that with these children in the care of a special teacher they became much happier than when subjected to the competition of their more fortunate associates; and those who had heretofore been negligent and careless about their school attendance immediately became enthusiastic about school and were regular in attendance as far as their health permitted. In passing it might be said that the health of these twelve children was not good and there were many absences due to illness.

Third—It was determined that although progress was possible for most of these children, that this progress was not in such subjects as Reading, Writing, Arithmetic, and Language, but was rather in more or less mechanical tasks—tasks involving the use of the hands and tasks which were rapidly reduced to routine. It was very noticeable that whenever these children learned to do anything, to perform any task, or make any fixed response, they immediately became enthusiastic about their ability in this line and insisted that they be given an opportunity to repeat this response at every possible opportunity. They even insisted that the same story be repeated over and over, time after time, and were usually disappointed when the teacher suggested any change from the familiar material.

Fourth—It was also evident that if the teacher was to make any progress with these special types of children it would have to be done in very small groups and under almost ideal conditions; that it was consequently a very expensive form of education.

While the teaching corps, superintendent, principals and special teacher, would have been glad to maintain the special room and felt that it was well worth all it cost, the Board of Education thought that, under the existing financial conditions in this community, they could not afford to continue the special work. Consequently, they made no provision for the continuation of the work the coming school year. It is quite evident, however, that everyone concerned has a much deeper appreciation now of the problems involved in the handling of these children than at any previous time. It is also evident that in the future the general attitude of the school toward these children will be much more intelligent and friendly than it has heretofore been, and that many of the crimes unthinkingly committed against these children will not be repeated in future relations between the school and these individuals.

After the special room was discontinued, a few weeks were spent in going over the material which had been collected during the year's investigation and in making certain deductions as to the general results growing out of the whole investigation. No effort had been made to use the tests among the older

children and no effort had been made to make any vocational inferences as the results of the characteristics revealed by the tests. It was expected that if the work should be continued, these problems of the more adult children would be considered at a later time. It was felt by those who were familiar with the work here that the tests had demonstrated their adaptability for use in any school system where any teacher of usual skill and ability may be made sufficiently interested in the tests to master the details incidental to their administration. It was quite evident that the tests reveal the general ability of a child, his skill in making adjustments to new situations, certain elementary characteristics with reference to his judgment, reason, memory, association of ideas, his past and present experiences, his keenness of perception, and all of those many elements which enter into a popular conception of intelligence. One is able to judge a child's ability to do what other children of his age can do and whether or not he can meet the ordinary everyday requirements which we may expect of children of his age. In other words, the tests furnished sort of a foundation or starting place from which the teacher may go on in her study of the child and his reactions to his environment. As a result of the records collected in connection with these tests teachers became interested in collecting all the possible available data relative to the children in their charge, and in the files of the school today one will find the usual marks of A, B, C, D, representing as they do the teacher's opinion of the child's ability, but it is noted that these are not the records which the teachers usually seek. To the contrary, they search with avidity for those test sheets revealing the results of the Binet tests, the social status, the economic status, and all of those other more human indices of a child's general life and experience. One does not hear much debate among the teachers as to whether or not the child who has received a grade of 70 should be promoted, while a child who has received a grade of 69.9 shall not. The whole school seems to be permeated with a more rational and more intelligent attitude toward educational method and procedure. The popular conception of what education is has been changed and many of the weaknesses of the present-day school have been brought out in sharp contrast. It is not evident that any contribution has been made from the scientific standpoint, nor is it felt that conditions as found here have been radically different from what any experienced investigator might easily have prophesied. The difference lies only in the fact that as a result of this self-survey, those results which have always been matters of common knowledge to educational investigators in college laboratories have been made the common knowledge of the teachers who were doing the teaching in the classroom, and as a result the pupils who yearly pass from grade to grade in the Sterling Public Schools are made to

benefit in their life experiences by that information which would otherwise have been forever dead statistical information in the notebooks of those in charge of our educational laboratories.

The question often arises regarding the accuracy of mental tests made by persons who have not had long years of training in the giving of these tests. The following comparative table was made in order to discover how closely the work done with unselected children at Sterling compared with similar work done with unselected children by Dr. L. M. Herman, who revised the Binet tests. The distributions, it will be noticed, are reasonably similar. The variations can be readily accounted for in the difference in number of children tested by Terman, which was 905, and by Painter, which was 258.

It should be noted that the 121 children were selected for the most part on the basis of having done poor school work and the distributions indicated are such as might have been predicted.

Table comparing results of tests given by Terman to 905 unselected children, with results of tests given by Painter to 258 unselected children, and 121 selected * children in the schools of Sterling, Colorado. The first two groups were tested by the Stanford Revision and the last group by the Kuhlman Revision of the Binet-Simon test.

	I. Q.	I. Q.	I. Q.	I. Q.	I. Q.	I. Q.	I. Q.	I. Q.	
	of	of	of	of	of	of	of	of	
	56	76	86	96	106	116	126	136	
	to	to	to	to	to	to	to	to	
	75	85	95	105	115	125	135	145	Totals.
(905 group) No. children having I. Q. of quality indicated	22	78	182	306	210	81	21	5	905
Percentages	2.36	8.6	20.1	33.9	23.1	9	2.3	.55	100%
(258 group) No. children having I. Q. of quality indicated	9	37	55	70	64	16	4	3	258
Percentages	3.5	14.3	21.3	27.1	24.8	6.2	1.5	1.1	100%
(121 group) No. children having I. Q. of quality indicated	13	31	37	20	14	3	3	0	121
Percentages	10.7	25.6	30.6	16.5	11.6	2.4	2.4	0.	100%

* These children were selected on the basis of their school work. Most of them were making poor progress in school.

HEALTH AND ATTENDANCE

By Dr. N. Eugenia Barney.

The first definite attempt at regular and systematic health supervision in the Sterling Public Schools was instituted in

the fall of 1916, when the Board of Education employed the writer as Health and Attendance Officer. During the current school year an attempt has been made to get into close touch with the schools and to familiarize the health officer with the health problems confronting the Board of Education in the conduct of the schools. It is hardly an opportune time to evaluate the results of the work accomplished or to make prophecies for the future. The encouraging feature of the work so far is the cordial co-operation of the superintendent, principals, teachers, and the Board in any and all matters pertaining to the work of this department.

As the health officer is not employed for full time and as the compensation available for the work is small, only a limited number of problems have been considered and only initial progress has thus far been made. The following lines of work have necessarily demanded attention and such work as has been done has been confined to the following problems:

- I. Control of Contagious Diseases.
- II. Physical Examination of School Children.
- III. Advisory Supervision of Sanitation, Ventilation, and General Housing Conditions.
- IV. Advisory Supervision of Physical Education for the Correction of Pronounced Physical Defects and such obvious Health Conditions as are easily remedied by Exercise, Diet, or Correct Habits of Living.
- V. Advisory Supervision of the Health and Physical Condition of Teachers.
- VI. Attendance Officer for the Board of Education.

Some discussion of these topics will give a more definite idea of the work that has been done and of the possibilities for health service in this connection.

CONTROL OF CONTAGIOUS DISEASES

When the Health Officer began work Sterling was entering upon an extensive epidemic of measles and chicken pox. The City Health Department was doing what it could to maintain a quarantine and to examine such children as were sent to the Department by the teachers for certificates of health. It became evident that these precautions were not adequate owing to the following local conditions:

1. There was an attitude of indifference to these diseases on the part of the community. Many parents were saying that these diseases were harmless and that children might as well have them sooner as later. Physicians even, were not much disposed to regard them seriously and many were careless about their reports to the health authorities and all were lax in quarantine enforcement. Dozens of cases of these diseases were discovered by accident while the officer was investigating cases of absence from school. These cases had probably not called

a physician at all and no report of the cases had been made to health authorities. As a result children from these homes were in school and in many cases where the disease was light, the infected child was back in school before the disease was well on its course.

2. Teachers in the classroom were careless about the health of their pupils and were apparently ignorant of the characteristic signs of these diseases. As a result, children were permitted to remain in school until these diseases were well under way and until the affected child had opportunity to expose an entire room.

As a result of these conditions, the diseases mentioned got such a start that a most rigorous defensive policy was maintained throughout the year in order that the schools might be kept open at all. As it was, the amount of time lost through absence was serious.

A rigorous, systematic plan was at once put in effect to assist the city health authorities in both the quarantine and in the effort to exclude the infected children. Children who were absent from school from any cause for one day were required to have health certificates from a physician before returning. If the child desired, he might appear before the Health Officer and secure this certificate free of charge, or if he preferred, a health certificate from the family or city physician was accepted, but careful attention was given to see that no child who might be a carrier of these diseases was permitted to enter or to remain in school. This task alone involved the examination and usually an investigation at the home of from one to twenty children per day throughout the prevalence of the epidemic. But headway was made from the first and very few rooms were so seriously affected by absences as to make the work unprofitable.

These facts stand out as a result of this experience:

1. The public must understand that these are serious diseases, the results of which cannot be predicted. The death rate is highest for measles of any of the so-called children's diseases.

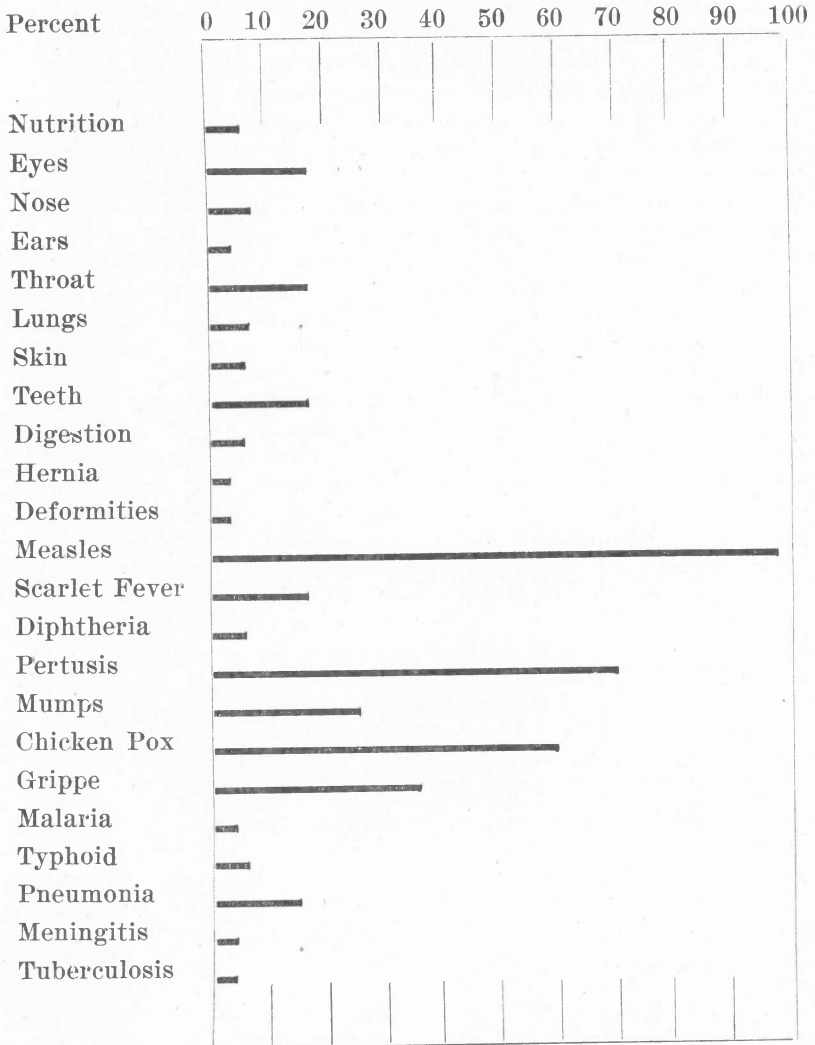
2. That these are preventable diseases and that children do not necessarily need to have them.

3. The effectiveness of any health service established will have to depend largely upon intelligent co-operation of the teachers in the school. While they are ignorant of the easily discernible symptoms of the common diseases, there is no reason for this ignorance; and they may easily acquire the necessary skill in recognizing suspicious cases of contagion if proper attention is given to this problem.

The accompanying chart represents the investigation made by the Health Officer relative to the percent of children who had defects, and relative to the number of children who had had the contagious diseases listed in the table.

It will be noted that the principal physical defects are those of the eyes, throat and teeth, while a very appreciable number of children have defects in reference to nutrition, nose, lungs, and the digestive disorders. Among the contagious diseases measles, pertusis, chicken pox and grippe are the most common, while scarlet fever, mumps and pneumonia are prevalent to a degree which makes them very serious menaces to school health.

TABLE NO. 1



This represents the investigation made by Dr. Barney, the Regular Practicing Physician in the employment of School Dis-

trict No. 12, Sterling, Colorado. Six hundred twenty-eight children were included in this investigation.

PHYSICAL EXAMINATION OF SCHOOL CHILDREN

The School Laws of the State of Colorado provide that all children in the public schools of the State shall be examined by their teachers before the end of the first school month, this examination to cover the more obvious physical and health defects.

These examinations have been given yearly in the Sterling Public Schools, as provided by law, but it is very evident that the teachers have performed these examinations in a very perfunctory manner, and that little or no attention has been given to the signs and symptoms of physical defects whereby teachers might recognize at least the major part of the ills common to school children. Notwithstanding this fact, much good has come from the physical examinations, as provided for under the law. No one would suggest, however, that this is sufficient or adequate, and all would agree that wherever possible, the work begun by the teachers in this department should be continued under the direction of a competent physician. During the past year the Health Officer began this physical examination and succeeded in making a careful examination of 628 children. This examination took account, first, of the height and weight of the boys and girls examined, the results of this examination being tabulated in table No. 2, which appears at this point.

TABLE NO. 2

Age	Boys		Girls	
	Height	Weight	Height	Weight
6	3- 9.8	47	3- 7.8	47.1
7	4	52.3	3-11	45.5
8	4- 2.6	58	4- 1.5	54.3
9	4- 4.66	63.3	4- 3.25	59
10	4- 6.33	71.57	4- 5.8	66.5
11	4- 8	75.75	4- 9	80.2
12	4- 9	80.33	4-11.25	86
13	5	96	5	90.8

In addition to these points, the examination extended to all of the ordinary defects, and a health record chart, copy of which is printed herewith, is made out in full for each child examined. It will be seen that this health chart is a complete record of each child during his history in school, and should, as the record accumulates, become of great value to officers and teachers in the control of contagious diseases, and in the direction of physical education for the relief of such physical defects as are to be remedied by physical education, diet, correct sleeping habits and other easily administered hygienic regulations.

In this connection it is intended to conduct a course in hygiene for the instruction of the teachers in the public schools,

and during the course of this instruction to acquaint the teachers more definitely with those phases of public health immediately applicable to the problem of the public schools.

III. ADVISORY SUPERVISION OF SANITATION, VENTILATION AND GENERAL HOUSING CONDITIONS

1. Sanitation. Sanitation in the Sterling Public Schools is probably about average, when the better school systems of the country are considered. The floors in all the buildings are treated with dressings calculated to keep down the dust; and the janitors in sweeping make use of a good grade of sweeping compound so that from this standpoint there is nothing to be offered in the way of criticism. It is quite evident, however, from even a casual examination of the buildings, that the dusting with an oiled cloth is not done as thoroughly as it should be done. For instance, the fact of the dust over the window tops, on top of the furniture, on picture moldings and elsewhere, indicates that more efficient janitor service would do much to make the sanitary condition of the buildings better.

Throughout the buildings paper towels, liquid soap and other adequate facilities for cleanliness are provided. In the toilet rooms of the various buildings, trade disinfectants and deodorizers are used in these rooms and they are kept in as sanitary condition as one finds in the average school system. There is, however, a great deal of room for improvement. It might be noted that the buildings vary greatly in their equipment. This has been enlarged upon in the survey, so it need be only mentioned at this time. The toilet facilities at the Lincoln building, particularly, are in need of repair and additional equipment is needed to make them satisfactory.

The school buildings are scrubbed twice during the year and thoroughly disinfected once during the year and after any outbreak of contagious diseases. In scrubbing a very efficient disinfectant is used, and as all woodwork, floors and equipment are thoroughly washed, there can be no doubt that the buildings are in satisfactory condition immediately following these cleanings. The fumigators used are the Dupree, Standard Formaldehyde Fumigating Candles, and as these have been approved by numerous boards of health, it seems that no improvement can be made upon the method of fumigation.

2. Ventilation. In both the Franklin and Lincoln buildings the ventilation is practically that offered by open windows, transoms and doors. While there are some few air passages leading in and out of the rooms, the amount of air handled through these passages is insignificant. The impression gained by visiting the schoolrooms in all the buildings is to the effect that the teachers are grossly negligent in the matter of ventilation. The rooms are allowed to become over-heated, the air to become foul and oppressive and many other serious condi-

tions are permitted to develop which might be easily remedied by careful attention on the part of the teachers.

3. General Housing Conditions. General housing conditions are discussed fully under the building survey in another part of this report. It is, therefore, unnecessary to make any comment at this time other than to call the attention of the taxpayers to the general crowded condition of the schools, and the suggestion that there should be erected upon the present site of the Franklin school building, a modern school building, thoroughly equipped for modern school work, large enough to take care of the probable increase of the school population in this section of the city. Under present conditions, pupils are being sent to the Lincoln school from points as far south as Lincoln street, and this necessitates not only a long walk for the little children, it also necessitates crossing of the B. & M. tracks, which are now being used much more extensively for switching purposes. It is becoming more and more necessary that the Franklin school be enlarged to where it will at least take care of children in the lower grades.

**ADVISORY SUPERVISION OF PHYSICAL EDUCATION
FOR THE CORRECTION OF PRONOUNCED PHYSICAL
DEFECTS AND SUCH OBVIOUS HEALTH CONDI-
TIONS AS ARE EASILY REMEDIED BY EXERCISE,
DIET, OR CORRECT HABITS OF LIVING.**

1. The one pronounced impression left after the examination of the school children was the noticeable bad posture of many of the boys and girls in many of the lower grades. Stoop shoulders, round shoulders, sloppy and careless habits of standing and moving were so noticeable as to indicate a pressing necessity for physical education. It is certainly high time that boards of education throughout the country come to take a more constructive attitude toward physical education. The training of the mind was long a dominant aim in education. To this has recently been added manual training or the training of the hands, and to these two must be added, and quickly, a systematic physical education which is fundamental in both the other types of education. Many of the defects of such serious nature as to make the school of little or no value to the child, might be easily remedied by ordinary attention to such simple matters as exercise, diet and correct habits of living. It is certainly desirable that some teacher be appointed to take special charge of this particular department; but until this is possible, all teachers throughout the system should be required to give up at least a part of their school program to such physical education as may be carried on under the direction of the supervisory corps and the health officer. There is assuredly no excuse for the present neglect of these matters by the regular teachers, and no excuse for their apparent indifference or

ignorance of the simple exercises calculated to remedy some of the more obvious faults of carriage and posture.

ADVISORY SUPERVISION OF THE HEALTH AND PHYSICAL CONDITION OF TEACHERS

The health of the school children is internally bound up with that of the teacher. The prevalence of ill health among teachers is usually traced in part to the absence of any serious physical examination of candidates for educational service, and in part to the teacher's strenuous work, indoor life, and neglect of personal hygiene. Considerations of economy, as well as justice to both children and teacher, demand that all these matters be given attention.

HEALTH CERTIFICATES FOR TEACHERS

Candidates for teaching positions should be required to pass a thorough medical examination given by the school physician. This should include examination for defects of lungs, heart, vision, hearing, nervous system, nutrition, etc. Experience shows that the more formal requirements of a certificate of good health, signed by a reputable physician is absolutely worthless. (Any one who has not already been turned over to the undertaker can secure such a statement.)

Suitable blanks should be provided for these examinations.

ATTENDANCE OFFICER, BOARD OF EDUCATION

The attendance officer has been employed by the Board of Education for a number of years. It has been the custom for the teachers to report to the principals, the names of pupils who may be absent from school, the principals to report these names to the truant officer, who is permitted by those employing him to make an investigation of the cause of absence and to return the child to school if, in his opinion, the absence is not excusable. The results from this method have been unsatisfactory and the actual school attendance has been notably low, particularly in reference to certain classes of children. During the year past the work has been conducted upon this basis, but the results have been poor. The work has been difficult because the attendance officer did not have any accurate data as to age, number, or location of the children. Neither the attendance officer nor the principal can know, with any degree of accuracy, what children should report for school at the beginning of any school year. They do not know what children are attending private or parochial schools instead of the public schools. What is needed to secure any adequate enforcement of compulsory attendance laws, is an accurate school census, a copy of this to be supplied to the principal and attendance officer. This data will assist the attendance officer in the investigation of those cases which are reported to the truant officer as being habitually truant.

This, however, will not solve the problem in reference to the attendance of the children commonly referred to as Russian children, coming from those homes supported by the labor of the parents and their children in the beet fields of the community. The attendance of these children in the public schools is so very unsatisfactory as to call the attention of the entire state to the problem and to have been the cause of a spirited fight in the last Legislature to secure the passage of a law which will make it illegal to permit them to be employed in any agricultural labor. There can be no doubt that a serious crime is being committed against the children of these people by permitting them to be out of school anywhere from 50 to 70 per cent of the school year. The attendance records show an average of 40 to 50 days per school year, is rather the exception than the rule for many of these children, and there are many instances in which these children are not in school to exceed 20 or 30 days out of a total of 190 days while school is in session.

The parents of these children maintain that their labor is necessary for their support, and finally maintain that it is beneficial to these children to be employed in agricultural labor. A very careful investigation of the facts goes to show that the labor of these children is not necessary either for their own, or for their parents' support. In the first place, the laws of the State of Colorado provide for the care of children where inability of the parents to properly support them and keep them in school has been proven. And in the second place, it is evident to any one who comes in contact with these people, and comes to know their business affairs, that they are for the most part well-to-do people, and are much further removed from danger of poverty than are the parents of many children who would not, under any circumstances, sacrifice a day of their school life for economic gain. There are records to substantiate the case of one parent who took oath that the child's labor was necessary for his support, and who had in the bank at the time he took his oath, in the neighborhood of \$40,000.

Not only is the attitude of these people one of indifference to school attendance, but the attitude of the officers of the law, and the community in general is against a rigorous enforcement of the public education laws for these children. Just why this community should care to profit at the expense of these child laborers and to bring up a group of people in our midst, for the most part unhealthy and uneducated Americans, is not quite clear. But that this is the condition in this community cannot for a moment be doubted. It is certainly high time that those responsible for the conduct of affairs in this community should take it upon themselves to insist that the law be enforced to a point where these children are in school

the required amount of time. A campaign to this effect will be carried on until these results have been accomplished.

In conclusion it is well to say that the work of this department is new and that only a beginning has been made. There is no pretense that this report is in any sense of the word adequate, nor is it claimed that statistical information has been collected at this time to completely verify all the statements made in this report. It should be said, however, that the investigation has been carried on far enough to indicate that these facts are true and that there is no reason for the continued negligence of them on the basis that the need for the service has not been clearly demonstrated. By the end of another year it is hoped that the department will be upon its feet and that a fund of statistical information will have been collected, and that a number of projects will have been conducted to a point where results will be noticeable and that a more satisfactory report, covering all activities of the department will be made. In the meantime it is hoped that the Board of Education, Superintendent, Principals and Teachers, and the people of the community will co-operate in every possible way in the interests of public health.

THE STANDARDIZED TEST

Its Use in the School System

All are familiar with the system of marking or grading in vogue in the school systems of the country for many years past. This system of marking was simple, and although the parents, teachers and pupils found certain phases of it more or less unsatisfactory, it was generally accepted without much protest and the results indicated upon the report card were seldom questioned by any one immediately concerned. This system of marking had two phases. One of these phases was the opinion which the teacher expressed of the child's ability and achievement based upon the child's classroom reaction to such questions as the teacher might ask and such tasks as might from time to time be imposed. It is easily to be seen that a child's grade based upon his classroom response was very likely to be influenced by such factors as the child's bashfulness, timidity or self-assertiveness, or upon whether the child was a member of a large class or a small one, or whether by chance he was called upon many times during the month or only a few times, and whether or not, when called upon, he made all possible use of his opportunity to show his knowledge or whether he was inclined to pass by the opportunity to recite with little or no effort.

The other phase of the older system of marking is the so-called examination in which the teacher or some other person made out a set of questions presumed to test the ability of the child on certain subject-matter which he was assumed to

have mastered and after he had responded to the examination the teacher passed an opinion expressed in percents or letters as to how much or little of the subject-matter called for the child had been able to give. It will be seen at once that this test was influenced by the temperament of the person making out the questions. One teacher would make a set of examination questions very technical and difficult, calling for exact and precise information; another would make a set of examination questions easy, general and vague, so that any child with the most general knowledge of the subject-matter might succeed fairly well.

The most superficial observer of the examination-class-average system, which is the report card system, in common use, will discover that the marking is largely governed by a standard that is founded upon the individual and evanescent ideals of different teachers. There is no uniformity, the standard is multiple, and each teacher is a law unto herself in the administration of the marking. Under such a system it is not possible for two teachers marking the same work independently to agree even approximately in their marks. An experiment in Sterling, under the most favorable conditions, showed a variation of over twenty points in the marking of identical work by different teachers equally competent to judge. Not only is it impossible for teachers to agree with each other, but the individual teacher cannot even agree with herself, for her standard is elusive and variable, changing from month to month and from day to day, even from hour to hour. She cannot fix the same value upon work in the afternoon that was placed upon it in the morning, and the estimates clearly are modified by the existing physical condition and the passing state of mind. Whether the teacher has a headache while marking the examination papers or the recitation, whether she has a cold, has failed to receive a looked-for letter, or is distressed by what she ate late in the evening before—these things, under the usual system of monthly standings, all become material factors in the measurement of the ability and achievement of the children; and it is highly probable that not infrequently such extraneous circumstances have been determining influences in deciding the momentous questions of promotion or retention.

For many years attempts have been made to collect the results of these haphazard methods and to obtain a system of procedure that would insure a degree of scientific accuracy in the measurement of certain phases of school achievement. The fundamental essential back of the standardized test is that there are certain fundamental facts to be taught in connection with each of the common branches, and that all children, in whatever school system they may be, should become familiar with these facts to a certain standardized degree. Examinations calling for a knowledge of these facts have been devised

by experts in education and have been given to thousands of school children throughout the country, and the results obtained by these children have been collected and carefully scrutinized to determine whether or not the tests as devised actually measure the attainable result to be expected of the children in any certain grade. After many years of experience and after a most thorough investigation, standardized examinations have been devised for a number of the common branches. These examinations are uniform for all school systems throughout the country. They are always given, as nearly as possible, under the same conditions; they call for the same knowledge; the answers to all the questions are standardized so that one teacher can grade papers as well as another and so that two teachers grading the same set of papers would necessarily give a child the same grade, thus eliminating most of the objectionable features characteristic of the older systems of marking. It will be seen from the above that the standardized test is not radically different in principle from the tests which have been employed in the public schools from time immemorial; they are simply a refinement of the older methods in that they have reduced to greater accuracy those elements of the test which were haphazard and inaccurate.

By the foregoing it may be seen that it would be possible to compare one school system with another, since all take the same examinations and all must be necessarily graded by the same standards. This is exactly what the survey is calculated to do. In the results tabulated in the survey which follows, the reader will note that Sterling is constantly compared to other school systems in the results which she is able to achieve in the teaching of the common branches. It is not claimed, of course, that a higher or lower score than other school systems absolutely proves or disproves that Sterling schools are superior or inferior to school systems to which they are compared. The assumption is that, when Sterling schools are able to do as well in the teaching of the common branches as other school systems that the methods in Sterling are equally good, and that when our results are notably inferior to those achieved by other school systems that there is serious question whether or not our methods may be regarded as satisfactory.

The most valuable feature of such tests lies, however, not in comparing Sterling's schools to other schools, but in revealing to the teacher and the supervising officials the special defects of each boy and girl in the system. This makes it possible to center effort on the correction of the defect. We have learned that children are not poor in arithmetic but are poor in certain phases of the subject, while they are good in other phases of it. A child may be good in addition and poor in division, good in subtraction and poor in multiplication or the reverse. The same principle applies in other subjects.

ARITHMETIC

Arithmetic has held a relatively important place in the minds of Sterling teachers. In a small system, located in an agricultural community there has been a firm insistence on the part of patrons that the schools secure practical results in arithmetic always with the implication that this subject is the one really practical, worth while subject in the modern school curriculum.

TABLE 1

Amount and distribution of time in arithmetic, standard based on report of W. A. Jessup, the Fourteenth Year Book of the National Society for the Study of Education, 1915.

Grades	1	2	3	4	5	6	7	8	% of All
Proposed Standard of time allotment	75	100	125	150	150	150	150	170	10.7
Time allotted in Sterling schools	110	130	105	160	175	185	200	200	11.8

Table No. 1 shows that Sterling does not devote an excessive amount of time to arithmetic. While the amount in each grade, except the third, is above the maximum recommended in the report of the National Society, the excess is not a large amount and when taken for the system as a whole only amounts to slightly over one per cent.

The table, however, shows only the class recitation time and does not take account of the supervised study periods. This is the element of most significance so far as this system is concerned. Many of the teachers use every available bit of excess time for drill work in arithmetic, none of which time is computed in this table.

The tendency to departmentalize the teaching above the fifth grade has afforded the strong special teacher opportunity to seize a lion's share of the child's study time. Observation confirms this condition in the arithmetic work. There can be no doubt that this subject receives an undue amount of attention, and that there is need for a redistribution of time.

COURSE OF STUDY AND TEXT-BOOKS

The course of study prescribed is the typical formalized prescription common to state and city courses of study. Care has been taken to include minimum essentials after the recommendations of the Fourteenth Year Book of the National Society for the Study of Education, and adjustments have also been made to conform to requirements of the State Course of Study for Colorado.

Suggestions and devices have also been incorporated in the course so that the course may be of great value to the teacher

in the conduct of her class. At the same time there is no attempt to enumerate minute details or to hamper individual initiative.

The course may be criticized for its lack of evident definite aim. Improvement would result if some clear thinking were done on the planes of achievement to be reached by each grade, and if a careful analysis were made of the processes and procedures by which these planes are to be achieved by the pupils in each grade.

Where supervision is necessarily limited it is more important that specific instructions supplant generalities and formalistic suggestions.

The text-books used for a period of years have been the following in the order named:

White's First Book, and Complete, from date of early publication to 1910.

The Smith Arithmetics, from 1910 to 1915.

Wentworth-Smith's, Three Book Series, from 1915 ———.

That the text-book practically determines the course of study despite any and all suggestions is generally well known, and an intimate acquaintance with Sterling schools shows no exception. The text-book becomes more an end to be attained than an aid to the teaching of the subject.

THE TESTS

The work was tested by the Courtis Tests, Series B, and by the Starch Arithmetic, Scale A, for testing reasoning.

These tests were given by a special teach and the results were scored in the Superintendent's office. It was found that the scoring of papers by the pupils, as suggested by Mr. Courtis, resulted in an appreciable amount of error, enough in many cases to make the results of the tests misleading, as far as certain rooms were concerned. Our experience with these tests in this, a small system where attention should be given to minute detail, has lead us to doubt the authenticity of many survey reports where the task has been so extensive as to necessitate partial investigations, selection of certain rooms or pupils presumed to be "typical," and the scoring of papers by methods that permit of error. These tests are not safe guides except where all the evidence is in, and is in under conditions guaranteeing accuracy.

WHAT ARE THE TESTS?

The following illustrations will give an idea of the tests:

ARITHMETIC. TEST NO. 1. ADDITION

Series B. Form 2

You will be given eight minutes to find the answers to as many of these addition examples as possible. Write the

answers on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

127	996	237	386	186	474	877	537
375	320	949	463	775	787	845	635
953	778	486	827	684	591	981	452
333	886	987	240	260	106	693	904
325	913	354	616	372	869	184	511
911	164	600	261	846	451	772	988
554	897	744	755	595	336	749	559
167	972	195	833	254	820	256	127
554	119	234	959	137	533	258	323

Twenty-four problems of the above character made up the test in addition.

ARITHMETIC. TEST NO. 2. SUBTRACTION

Series B. Form 2

You will be given four minutes to find the answers to as many of these subtraction examples as possible. Write the answers on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

114957187	94752808	106089449	99833978
90271797	67349640	16915390	73160227

Twenty-four problems similar to the above constitute the test in subtraction.

ARITHMETIC. TEST NO. 3. MULTIPLICATION.

Series B. Form 2

You will be given six minutes to work as many of these multiplication examples as possible. You are not expected to be able to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

8259	3467	4637	2859	7436
28	93	82	47	65

Twenty-four similar problems constitute the test in multiplication.

ARITHMETIC. TEST NO. 4. DIVISION

Series B. Form 2

You will be given eight minutes to work as many of these division examples as possible. You are not expected to be able

to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

24)6984 95)85880 36)10440 87)81867

Twenty-four similar problems constitute the test in division.

TABLE 2

The following tabulation deals with the problems attempted within a given time, and is, therefore, a measurement of speed only, and does not deal at all with how dependable the figuring of the children really is.

Grades	Addition					
	3	4	5	6	7	8
June standard for speed.....	4	6	7.5	9.0	10.5	12.0
Sterling April Record	5.6	6	7.5	9.4	7.9	8.7
Deviation from standard	1.6	0	0	.4	-2.6	-3.3
Sterling April Record	5.6	6	7.5	9.4	7.9	8.7
Sterling October Record			5.3	6.7	6.8	7.6
Growth October to April			2.2	2.7	1.1	1.1
	Subtraction					
June standard for speed	4	6	8	10	11.5	12.5
Sterling April Record	5.2	6.4	8.3	10.1	9.9	10.8
Deviation from standard	1.2	.4	.3	.1	-1.6	-1.7
Sterling April Record	5.2	6.4	8.3	10.1	9.9	10.8
Sterling October Record			7.3	8.2	8.4	9.7
Growth October to April			1.0	1.9	1.5	1.1
	Multiplication					
June standard for speed		4.5	7	8.5	10	11.5
Sterling April Record		5.8	8.2	11.1	9.1	10.7
Deviation from standard		1.3	1.2	2.6	-9	-8
Sterling April Record		5.8	8.2	11.1	9.1	10.7
Sterling October Record			5.1	6.7	7.6	8.6
Growth October to April			3.1	4.4	1.5	2.1
	Division					
June standard for speed		3.5	5	6.5	8.5	10.5
Sterling April Record		3.9	6.3	9.1	6.8	9.6
Deviation from standard .....		.4	1.3	2.6	-1.7	-9
Sterling April Record		3.9	6.3	9.1	6.8	9.6
Sterling October Record			3.5	5.6	6.5	8.2
Growth October to April			2.8	3.5	.3	1.4

TABLE 3

The following tabulation deals only with problems correctly worked, and does not show how many were attempted or for which incorrect answers were given. This is a comparison based upon the dependable figuring of the children in the Sterling public schools.

Grades	Addition					
	3	4	5	6	7	8
June Standard	2	3	4	5	6.5	8
Sterling April Record	1.7	2.6	4.5	6.2	4.2	5
Deviation from standard .....	.3	.4	.5	1.2	-2.3	-3
Sterling April Record	1.7	2.6	4.5	6.2	4.2	5
Sterling October Record			2	3.5	3.7	3.6
Growth October to April			2.5	2.7	.5	1.4
	Subtraction					
June Standard	1	3	5.5	7	8.5	10
Sterling April Record	2.2	3.5	6.5	6.7	7.2	9
Deviation from Standard	1.2	.5	1	-3	-1.3	-1
Sterling April Record	2.2	3.5	6.5	6.7	7.2	9
Sterling October Record			4.4	4.6	6	6.8
Growth October to April			2.1	2.1	1.2	2.2
	Multiplication					
June Standard		1.5	4	5.5	6.5	8
Sterling April Record		2.8	3.9	8.3	7	8
Deviation from standard		1.3	-1	2.8	.5	0
Sterling April Record		2.8	3.9	8.3	7	8
Sterling October Record			2.9	3.5	4.6	4.5
Growth October to April			1.0	4.8	2.4	3.5
	Division					
June Standard		1	3	5	7	9
Sterling April Record		1.4	4.5	7.2	5.2	7.7
Deviation from Standard .....		.4	1.5	2.2	-1.8	-1.3
Sterling April Record		1.4	4.5	7.2	5.2	7.7
Sterling October Record			1.6	2.4	4.6	5.3
Growth October to April			2.9	4.8	.6	2.4

A close study of tables 1 and 2 with reference to standards reveals a satisfactory condition in grades three, four, five and six. While there are variations, sometimes below, usually above the standards, these variations are not large nor do they indicate that there is any serious cause for criticism of the results we are now securing in these grades.

In the seventh and eighth grades there is a serious deficiency. These grades are far below standard both in speed and accuracy. When the fall standards are considered it is evident that this deficiency is of long standing and that, while the fault cannot be charged entirely to this year's teaching in these grades, there is serious fault to be found with the conditions existing there. There has been a most decided stiffening up of the arithmetic teaching since the fall tests were given in grades five and six, but the growth for the seventh and eighth grades is negligible and the returns from the effort in the eighth grade is particularly unsatisfactory.

The following table shows that the growth in the fundamentals in these grades has not been comparable to the growth in the fifth and sixth grades.

TABLE 4

This table shows total gains in speed and accuracy in all the fundamental operations between time of fall and time of spring tests in grades from five to eight.

Grade	5	6	7	8
Accuracy	8.5	14.4	4.7	9.5
Speed	9.1	12.5	4.4	.57

It is evident that the seventh and eighth grade pupils' plane of achievement in the fundamentals is much too low. This is true in the seventh grade at both fall and spring tests, and the eighth grade results do not indicate that two years of teaching produce any satisfactory changes.

TABLE 5

(Cubbery)

Table showing standing of Sterling in the fundamentals of arithmetic, compared with other cities.

Addition					Multiplication			
5	6	7	8		5	6	7	8
5.7	7.0	7.5	9.4	Detroit	5.8	7.2	7.8	9.8
6.6	8.3	9.0	10.4	Boston	5.6	7.2	8.2	9.3
3.6	5.4	6.3	7.1	Others	4.0	5.8	8.6	8.5
4.1	6.4	6.9	8.5	Salt Lake	4.3	5.3	7.1	8.3
5.2	5.7	5.6	7.5	Iowa	5.6	6.7	8.2	9.5
3.6	4.4	4.9	5.8	Indiana	3.9	5.1	5.9	7.3
3.0	3.9	4.8	5.4	Kansas	3.1	4.7	5.9	8.3
4.5	6.2	4.2	5	Sterling	3.9	8.3	7	8
Subtraction					Division			
7.9	8.6	9.9	12.5	Detroit	4.6	7.3	9.7	11.7
7.7	9.5	10.3	11.8	Boston	4.9	7.4	8.8	11.0
5.6	7.3	9.9	10.3	Others	3.7	5.7	6.7	9.3
5.2	7.8	8.8	9.8	Salt Lake	3.0	5.5	7.7	9.5
7.0	8.0	9.2	11.1	Iowa	5.0	6.3	8.0	10.9
5.0	6.5	7.9	8.9	Indiana	2.6	4.8	6.7	9.1
4.0	5.9	7.2	7.7	Kansas	2.0	3.5	5.3	7.2
6.5	6.7	6.5	9	Sterling	4.5	7.2	5.2	7.7

The above table shows the results in Sterling as compared to other cities. It will be seen that our results compare very favorably with those obtained elsewhere, except in our seventh and eighth grades. In some grades the Sterling achievement is well up with that of other cities. In some grades it is higher, and in others lower. Taken as a whole the comparison is creditable, but not to the point where the condition may be regarded with complacency.

REASONING.

The reasoning ability in the schools was tested by Starch's Arithmetical Scale A. This test was given in the spring and

shows how Sterling compares with the standards so far determined for this test.

TABLE 6

Grade	4	5	6	7	8
Standard	6.2	7.8	9.4	11	12.6
Sterling	5.8	7.9	10.2	12	12.7

It will be noticed that the Sterling schools are almost entirely above the standard, the fourth grade being slightly below. It is also noticeable that in the seventh grade where the showing was unsatisfactory in the fundamental operations, it is well above the standard in reasoning ability. It is also true that both the seventh and eighth grades have made a most excellent showing in this reasoning test. The teachers are of the opinion that this proves that they have secured satisfactory results in the things they have emphasized. They urge that they have yielded to the demand for practical problems and meaningful arithmetic as opposed to mere formal drill and that the tests have revealed a wrong emphasis but not poor results. This comment is offered for what it is worth. It represents the reaction of the teachers and they have much detailed information worthy of careful consideration when discussing a point of this kind.

CONCLUSION

I. The tests have clarified the ideas of our teachers with regard to the teaching of arithmetic. They know what should be expected of children in the various grades. They know how to determine when they have attained the desired skill, and they are beginning to see the necessity for method in arithmetic teaching.

II. Teachers know now that drill on the fundamentals is of little or no value until definite aims are set. To secure speed a teacher must set certain standards and devise methods of attaining those standards. The same is true of accuracy. If a child uses wrong addition habits, a continued drill tending to fix those habits does not improve his achievement. These habits must be remedied, new ones formed, and skill acquired.

III. Mere emphasis is not a guarantee of results. A proper amount of time well spent is more meaningful than an endless amount of time spent aimlessly.

IV. The returns of the arithmetic teaching in grades seven and eight are not satisfactory. The reasoning ability of pupils must be developed about as it is, but ability in the fundamentals must not be neglected. The business man who has maintained that our eighth grade people cannot add, subtract, multiply and divide has been right.

V. There is a wide variation in the results secured by different teachers in the same grade. Some grades in one building did twice as well as corresponding grades in other buildings.

From Grade VI: "We have tried to avoid the old idea of parrot-like reading—the lesson read aloud by different pupils again and again. Naturally a child's interest wanes when he hears the same thing read over and over, which he himself has studied."

"Most readers, like good-natured cows,
Keep browsing, and forever browse;
If a fair flower comes in their way,
They take it, too, nor ask 'What, pray?'
Like other fodder it is food,
And for the stomach just as good."

One child in the third grade made the following interesting and illuminating impromptu comment—a comment suggesting that our pupils have a good deal of the spirit of all our school work.

"I like best the 'Land of Lake and Mountain,' because it tells of the great high mountains and the big snow-fields of ice and snow, and the glaciers and avalanches and crevasses, and how the Swiss guides have spikes on the soles of their shoes, and of the mountain tunnels, and the swift little chamois, and of the Swiss people, and the queer cottages, and how the herds-men take the herds up the mountain side, and how a guide can walk on ground where there is hardly room enough to place your feet."—Kenneth Curlee.

TEACHER'S PREPARATION OF LESSONS

Supervisors have insisted on lesson preparation by teachers. Coming to class and trusting that sudden inspiration will solve the problems that arise has been frowned upon and specific requirements for lesson preparation have been repeatedly emphasized. The following facts bearing out the point are noted during the progress of the survey:

1. The results as shown by the standardized reading tests are decidedly superior in those rooms where the following points of lesson preparation were observed:

1. The teacher shall familiarize herself with the subject matter to be presented and shall anticipate as many as possible of the difficulties likely to arise in the presentation.

2. The teacher shall employ every available means and device for bringing the children into experiential contact with the reading vocabulary.

3. The teacher shall keep in mind the past and present experience of the children and focus this experience upon the reading lesson.

It is evident to those who have had supervisory experience that teachers will vary greatly in their willingness and ability to make effective principles like the above. Sterling's Corps was no exception. Most of them complied with principle I;

Principle 2 was seized upon by the more resourceful, and the results in these rooms would lead one to infer that this principle is fundamentally significant. All the results as determined by the standardized tests show a close relation between this principle and satisfactory achievement. Uniformly those teachers excelling in their comprehension of this point excelled in achievement.

Principle 3 was applied effectively by many of the corps, and ludicrously by others. A casual observer must have been impressed by the glaring ignorance many teachers have of child life and experience. Where "vast" is defined to children of the plains as "wide like the ocean"—"the sea is vast" or "gloomy shade" is illustrated by "dark and deep and gloomy like a dense forest" when no one of the class ever saw a score of trees together, one feels a sense of baffled despair. So long as teachers manifest this unthinking, unimaginative attitude toward their task, children under their instruction are more or less to be pitied. Sterling has her share of teachers who teach one or more subjects with this flagrant disregard for the children. Fortunately many of the corps see the children first and the subject matter in perspective.

CLASS ROOM PROCEDURE

Time Allotment

TABLE I

Grade	3	4	5	6	7	8
Class Variation	170	175	150	150	120	120
in	to	to	to	to		
Allotted Time	338	192	175	160		
Class Variation	11	10.5	9	9	7	7
in per cent of	to		to	to		
Alloted Time	20	11.5	10.5	9.5		
Average Allotted Time.....	245	185	165	165	120	120
Average in per cent of						
Alloted Time	15	11	10	10	7	7
Per cent Allotted to Supervised						
Silent Reading	3	2.2	4	6	*	*
Per cent Alloted to Oral Reading	12	8.8	6	4	7	7
Ratio of Allotments Silent						
Reading to Oral Reading.....	¼	¼	2/3	3/2		

All allotments are expressed in minutes per week.

Only time specifically allotted is accounted for.

*Time not specifically allotted.

By the foregoing table (I) it will be seen that the time regularly allotted to reading in Sterling shows considerable uniformity of practice in the upper and the lower grades, but in the different classes of the intermediate grades there is a wide variation, particularly so in Grade III where the variation is a hundred per cent, ranging from 170 minutes a week to twice

that amount, or 338 minutes a week. There were special conditions, however, that caused the allotment of one class to be lowered to 170 minutes, but as the next higher allotment in the same grade was only 225 minutes, it still gives a wide variation.

This is a problem to which the supervisory department should give its attention. On the face of the showing, it would seem that that department should have required here a greater degree of uniformity in practice, for if 300 minutes is necessary to secure competent results, then 200 minutes must be wholly inadequate and will tend to destroy all efficiency in the work; while, on the other hand, if 200 minutes may be made productive of satisfactory results, then 300 minutes is a material waste of time. As a matter of fact, the supervisory department found the allotment of 170 minutes to be unsatisfactory, and the children who were allotted 338 minutes tested out somewhat below those who were allotted only 225 minutes. In general, however, the lack of uniformity is upheld by that department on two counts: first, that conditions vary in different classes and different conditions require different time allotments; second, that the body of knowledge on the subject of time allotments is neither sufficiently definite nor sufficiently tested to warrant an assumption in favor of any one particular allotment, but that there is necessary a more intimate and exact knowledge of the subject in its various relations before it will be possible with any degree of certainty to say just what allotment is the proper one. Such knowledge can be derived only through repeated experiments. The variations in allotment, therefore, become important conditions contributing to progress.

In the routine of class room practice uniformity is apparent throughout the grades. Some slight variations in the allotted time ratio between silent reading and oral reading is noted as one ascends through the grades. Oral reading is predominant in the classes of grade four and silent reading in those of grade six.

The teachers seem convinced that reading is a matter of practice and the pupils read a great deal. Little extraneous matter is injected into the reading lesson. Phonics, word drills, and vocabulary lessons are regularly given at a separate time. Dissected and analyzed reading are at a minimum. As one teacher puts it, "Difficult words, allusions, contractions, and so on have no literary quality which would make them belong to reading." Most of the teachers are willing to concede that the dictionary is not a reading book. The thought of the above teacher should become a leading influence in the development of the reading course when she continues and quotes approvingly. "Beware the dictionary in reading; let it be a last resort. Encourage the habit of getting at the meaning of a word

through the context, which is far more important than dictionary hunting. Few words have fixed values; they take their complexions from the company they are in."

EQUIPMENT

All text books for the use of pupils in the Sterling Public Schools are furnished by the Board of Education. Text book bills are ordinarily a shock to committees and Boards of Education. While the free text book policy is first received with loud acclaim by parents and children, as the bills come in for the texts necessary, this enthusiasm wanes and inquiries are made as to possible curtailment of expenses.

The success of any method of reading instruction is conditional upon an adequate amount of suitable reading matter. The educational maxim that children learn to do by doing is no less true in reading than in other fields; and here, as elsewhere, practice makes the master. To a generation trained in the use of one reading book a year, in other words, to the great majority of the general public as now constituted, an adequate supply of reading material will doubtless seem prodigality, if not waste. Unless school boards take this feeling somewhat into account, they are likely to fall under the displeasure of the public, particularly so if there is a rise in the tax-rate. Accordingly, it is well nigh universal for the requisitions to exceed the funds, and a just balance is attempted through an apportionment of the moneys to the various items in the budget. Naturally the reading texts are about the first thing to receive curtailment. These books really are expensive and considerations of economy require that their number be limited to the minimum compatible with reasonably efficient work. The problem, then, becomes how to get the most reading out of a given number of books. This is an especially acute problem in Sterling where the district furnishes all books and supplies to the children free of cost, so that the annual outlay of the Board on this account is a matter of considerable consequence. The problem can be solved only by keeping each book a long time in use, that is, by having each book serve more than one child.

With this end in view the Superintendent at the beginning of the current school year worked out and inaugurated a system whereby texts are collected in a Central Store Room and put in charge of a librarian whose duty it is to check them out to, and call them in from, the several teachers. The books are allotted by the Supervisor of Methods to the various classes and divisions for a specified time, during which time classes are expected to cover approximately a certain designated amount of work. At the expiration of the period the books are recalled and a new allotment is made.

The Central Store Room plan has reacted chiefly in four ways. (1) In Grades I to VI, each book has served from three to sixteen pupils, depending on the grade, the smallest number

being served in the highest grade. (2) Dead stock has been eliminated and idle stock reduced to a minimum. (3) Each class has been provided a larger amount of reading-book material than could have been otherwise furnished because of the prohibitive cost. (4) The exchange of books at fixed intervals, requiring, as it did, a certain degree of standardization in the amount of time consumed to cover a given quantity of reading matter, necessitated among the several teachers of the same grade a conferring upon and a comparison of their work which resulted not only in an enlarged understanding of the subject but also induced an element of emulation in the teaching that made distinctly for progress.

MATERIALS CLASSIFIED

Under the Central Store Room plan the following titles with the number of copies of each were available for a reasonable period of time to each of the several classes of the elementary grades.

GRADE I

Primers		First Readers	
Aldine	165	Aldine	83
Beacon	35	Beacon	30
Blodgett	29	Blodgett	30
Brownie	44	Brooks	30
Easy Road	24	Circus	15
Heath	48	Cyr	26
Hiawatha	59	Graded Literature	30
Merrill	35	Heath	60
Rational	20	Language	23
Silver-Burdett	16	Merrill	64
Story	68	New Education	38
Story Hour	6	Rational	11
		Silver-Burdett	83
		Story Hour	67
		Thought	48

GRADE II

Second Readers		Other Titles	
Baker & Carpenter.....	15	Alan's Jungle Story.....	40
Baldwin	20	Bunny Boy	93
Baldwin & Bender.....	42	Grizzly Bear Stories.....	6
Brooks	56	Jack and the Beanstalk.....	63
Circus	22	Story of Joseph.....	47
Graded Literature	31	Story of Two Little Rabbits....	46
Haliburton	39	Tale of Bunny Cotton Tail....	55
Heath	74		
Language	16		
Merrill	47		
Rational	11		
Silver-Burdett	67		
Story Hour	69		

GRADE III

Third Readers	Other Grades		
Baldwin & Bender.....	69	AEsop's Fables	45
Brooks	15	Child's Garden of Verse.....	46
Davis-Julien I	24	Indian Children's Tales.....	43
Davis-Julian II	24	Robinson Crusoe	22
Graded Literature	50	Stories from Anderson.....	23
Haliburton	40		
Heath	38		
Jones by Grades.....	601		
Merrill			
Silver-Burdett	96		
Story Hour	40		

GRADE IV

Fourth Readers	Other Titles		
Brooks	89	Aladdin	46
Davis-Julien I	24	Farmer and His Friends.....	18
Davis-Julien II	24	Fifty Famous Stories.....	47
Graded Literature	21	Our Pilgrim Forefathers.....	43
Jones by Grades.....	43	Stories of Great Americans....	80
Merrill	60		
Searson & Martin.....	86		
Silver-Burdett	81		

GRADE V

Fifth Readers	Other Titles		
Brooks	44	Children's Hour	21
Cyr	21	Diggers in the Earth.....	17
Davis-Julien I	25	King of the Golden River.....	45
Davis-Julien II	25	Little Lame Prince.....	52
Merrill	60	Makers of Many Things.....	17
Searson & Martin.....	40	Miraculous Pitcher	58
		Nurnberg Stove	47
		Old Stories of the East.....	56
		Pied Piper	36
		Robin Hood	49
		Selections from Hiawatha.....	49
		Stories of Our Country.....	48
		Travelers and Traveling.....	17
		Young American	34

GRADE VI

Sixth Readers	Other Titles		
Jones by Grades.....	47	A Dog of Flanders.....	48
Merill	48	Krag and Johnny Bear.....	48
Searson & Martin.....	110	Lobo, Rag and Vixen.....	46
		Robinson Crusoe	15
		Story of the Greek People....	81
		Story of the Roman People....	91
		Tappan's England	39

GRADES VII and VIII

Enoch Arden	36	Shakespeare's Julius Caesar....	40
Goldsmith's Deserted Village...	33	Shakespeare's Merchant of Ven-	
Jones' Fifth Reader.....	46	ice	34
Kingsley's Heroes	17	Silas Marner	146
Lamb's Tales from Shakespeare	32	Snow Bound	20
Literary Studies	57	Snow Image	46
Legend of Sleepy Hollow.....	54	Stories from Dickens.....	34
Longfellow's Evangeline	26	Studies in Reading VII.....	107
Longfellow's Miles Standish...	38	Studies in Reading VIII.....	72
Longfellow's Poems—Selected..	33	Tom Brown's School Days....	57
Quentin Durward	47	Vision if Sir Launfal.....	39
Schiller's William Tell.....	50		

BASIS OF CLASSIFICATION OF MATERIALS

In the arranging of the reading texts by grades as here shown, the grouping of titles was not claimed to be an ideal one, nor even the best one that could be made under the circumstances. It was designed merely to be a reasonable grouping made for the purpose of practical administration.

We gravely question the suitability of some of this material, particularly in the upper grades. Titles such as Enoch Arden, William Tell, and Silas Marner, for example, have little place in the elementary schools.

The accompanying Table II shows the maximum and minimum number of pages read in the several classes of the first six grades during the year ending June 1, 1917. It includes the prepared reading, the sight reading, and the supervised or tested silent reading, but takes no account of library books, untested reading, or reading done in the preparation of other subjects. As far as our investigations go the amount of material read in Sterling is much greater than that of the average school system. The following table shows the amount read by grades:

TABLE II

Class of Grade	I	II	III	IV	V	VI
Total pages read.....	1750	1450	1500	1550	1200	1600
	to	to	to	to	to	to
	2600	3000	3900	2850	1300	1700

It will be observed from Table II that different classes of the same grade show quite generally a material variation in the amount of subject matter covered. This was naturally to be expected for a number of reasons, the more notable among which are variations in class ability, in class attendance, in teaching ability, and in the individual interpretation of aims and the divergent ideals and methods of the various teachers. Of these several reasons, the last mentioned is probably the chief contributing cause of the variations observed. An examination of Table V shows a similar variation in the achievement

and in the growth of different classes of the same grade. The same thing is observed in the silent reading. (See Tables IX and X.) If these variations all be chiefly due to the same cause, the matter of divergent practice is plainly a problem to which the supervisory department should direct its attention.

It has been the rule for the supervisory department to allow the utmost freedom in method and procedure, and there is no doubt a high degree of wisdom in the policy of permitting to each teacher a wide latitude for the working out of her own individuality. But all practice is not equally good, and it is the office of the supervisory department to ascertain which is most efficacious and to institute that which is found to be productive of the best results.

The survey of achievement in the various grades indicates, in general, that efficiency in reading is closely correlated with the amount of practice given on material easily within the comprehension of the child, in view of which finding the supervisory department should exercise a more detailed control over the subject matter of instruction by prescribing within much narrower limits the kind of matter to be read and the amount of material to be covered in each grade.

Efficiency in reading is a difficult thing to measure since no sure way has yet been found of determining absolutely the quality of comprehension. But no sure way has yet been found of determining absolutely the pressure of a sunbeam, or the distance to one of the stars, yet these things are measured, and calculations based upon the results confidently in so far as the results are obtained through what appear to be rational methods of estimation in which the element of guessing is confined to reasonably narrow limits. That measurements of reading ability and achievement are not absolute does not invalidate them as data out of which to frame a working hypothesis; it only calls attention to the desirability of correcting and refining them so that the margin of error may be thereby reduced. Up to the present time the most serious attempt at refining these measurements by eliminating obvious sources of error is the standardized test.

The three thousand test sheets are standardized reading sheets, and the test results mentioned throughout the course of this study and tabulated in its various tables are data derived from using the following standardized sheets in an attempt to measure the efficiency of the children in reading, and, by implication, the efficiency of the teaching process.

STANDARDIZED READING PARAGRAPHS

William S. Gray

School..... Teacher..... Grade.....
Pupil..... Nationality..... Grade.....

1

A boy had a dog.
The dog ran into the woods.
The boy ran after the dog.
He wanted the dog to go home.
But the dog would not go home.
The little boy said,
"I cannot go home without my dog."
Then the boy began to cry.

2

Once there was a little pig,
He lived with his mother in a pen.
One day he saw his four feet.
"Mother," he said, "what can I do with my feet?"
His mother said, "You can run with them."
So the little pig ran round and round the pen.

3

Once there were a cat and a mouse. They lived in the same house. The cat bit off the mouse's tail. "Pray, puss," said the mouse, "give me my long tail again."
"No," said the cat, "I will not give you your tail till you bring me some milk."

4

Once there lived a king and queen in a large palace. But the king and queen were not happy. There were no little children in the house or garden. One day they found a poor little boy and girl at their door. They took them into the beautiful palace and made them their own. The king and queen were then happy.

5

One of the most interesting birds which ever lived in my bird-room was a blue-jay named Jackie. He was full of business from morning till night, scarcely ever still. He had been stolen from a nest long before he could fly, and he had been reared in a house long before he had been given to me as a pet.

6

The part of farming enjoyed most by a boy is the making of maple sugar. It is better than blackberrying and almost as good as fishing. One reason why a boy likes this work is that someone else does most of it. It is a sort of work in which he can appear to be very industrious and yet do but little.

7

It was one of those wonderful evenings such as are found only in this magnificent region. The sun had sunk behind the mountains, but it was still light. The pretty, twilight glow embraced a third of the sky, and against its brilliancy stood the dull white masses of the mountains in evident contrast.

8

The crown and glory of a useful life is character. It is the noblest possession of man. It forms a rank in itself, an estate in the general good will, dignifying every station and exalting every position in society. It exercises a greater power than wealth, and is a valuable means of securing honor.

9

He was approximately six feet tall and his body was well proportioned. His complexion inclined to the florid; his eyes were blue and remarkably far apart. A profusion of hair covered the forehead. He was scrupulously neat in his appearance; and, although he habitually left his tent early, he was well dressed.

10

Responding to the impulse of habit Josephus spoke as of old. The others listened attentively but in grim and contemptuous silence. He spoke at length, continuously, persistently, and ingratiatingly. Finally exhausted through loss of strength he hesitated. As always happens in such exigencies he was lost.

11

The attractions of the American prairies as well as of the alluvial deposits of Egypt have been overcome by the azure skies of Italy and the antiquities of Roman architecture. My delight in the antique and my fondness for architectural and archaeological studies verges onto a fanaticism.

12

The hypotheses concerning physical phenomena formulated by the early philosophers proved to be inconsistent and in general not universally applicable. Before relatively accurate principles could be established, physicists, mathematicians, and statisticians had to combine forces and work arduously.

A copy of the test is printed that patrons may understand the character of the material and the essential features of the test. Each child comes before the examiner and as soon as the nervousness is over and the child feels ready to work a copy of this test is given to the child and he is asked to read the paragraphs one after another. The examiner marks all mistakes and with a stop watch notes the time for each paragraph. The

score is based on the two results. To score perfectly a child must read the paragraph within a given time and without more than a specified number of errors. The requirements are more exacting for each succeeding grade.

HOW TESTS WERE GIVEN

In Sterling, the tests in oral reading were given by a special examiner who had taken her Master's degree at Denver University, an experienced teacher especially trained along the line of educational measurements and eminently qualified in all respects for the work which she performed. The children under test were not permitted to glance ahead in their reading, but the successive paragraphs were kept covered until it was time for them to be read. Stop-watches were used to do the timing. Every child in school was tested, and all scores were included in making the computations. For instance, the spring report of one class in Grade I include fifteen children who scored zero. In justice it should be noted that this class, as well as others, suffered severely from an epidemic of children's diseases that raged through the city for a considerable portion of the year.

On the W. S. Gray Standardized Reading Paragraphs the Sterling scores compared with the Standard are given in Table IV. The Class Variation through the first six grades is shown in Table V, and the Individual Variation through the same grade in Table VI.

TABLE IV
Gray Oral Reading Test Sterling and Standard.

	I	II	III	IV	V	VI	VII	VIII
Standard Score—Oct.....	3.4	22.5	38.9	41.7	42.7	43.7	44.3	42.7
Sterling Score—Oct.....	...	21.1	35.5	38.6	25.3	29.3	...	...
Standard Score—April.....	26	39	44.7	46	47	48	46.5	47
Sterling Score—April.....	28.5	42.3	46	45	32.8	37.7	32.7	30
Standard Growth	22.6	16.5	5.8	4.3	4.3	4.3	2.2	4.3
Sterling Growth	21.2	10.5	6.2	7.5	8.4	...	...	...
Sterling—April 10, 1917.....	x	x	x	x	x	x	x	x
Score above Standard.....	2.5	3.3	1.3	...	...	...	...	...
Score below Standard.....	...	...	...	1.0	14.2	10.3	13.8	17.0
Growth above Standard.....	2.5	4.7	4.7	1.9	3.2	4.2	...	...
Growth below Standard.....	...	...	...	...	...	...	...	...

TABLE V
Gray Oral Reading: Class Variation.

Grade	I		II		III	
	Scor	Grow	Scor	Grow	Scor	Grow
April 10						
Standard	26	26	39	16.5	44.7	5.8
Class Z	17.1	17.1	39.9	22.5	40.4	4.4
Class Y	25	25	40.1	21.1	46.3	12.9
Class X	34	34	41	17	47.6	11.8
Class W	37.8	37.8	48	26	50.1	13.1

TABLE V—Continued.
Gray Oral Reading: Class Variation.

Grade	IV		V		VI	
	Scor	Grow	Scor	Grow	Scor	Grow
April 10						
Standard	46	4.3	47	4.3	48	4.3
Class Z	42	4	32.4	4.4	36	4.1
Class Y	45.3	6.6	33.2	10.5	39.4	12.7
Class X	47.3	8.1	...	...	...	...
Class W	...	...	...	...	...	...

*Growths are from October to April, except Grade I, which is from September to April.

TABLE VI

Gray Oral Reading Tests show individual variation in various grades. Below are tabulated scores (April, 1917, Tests) of five pupils testing highest and five pupils testing lowest in each of the first six grades.

	I		II		III		IV		V		VI	
	5 High Pupils	5 Low Pupils	5 High Pupils	5 Low Pupils	5 High Pupils	5 Low Pupils	5 High Pupils	5 Low Pupils	5 High Pupils	5 Low Pupils	5 High Pupils	5 Low Pupils
Five pupils designated A	68.7	0	58.7	0	70	21.2	67.5	18.7	58.7	5	58.7	11.2
B	68.7	0	56.2	0	65	23.7	67.5	20	52.5	6.2	57.5	16.2
C	68.7	0	56.2	0	62.5	23.7	66.2	21.2	51.2	7.5	56.2	17.5
D	67.5	0	55	0	58.7	30	66.2	22.5	50	10	55	17.5
E	66.2	0	55	0	58.7	31.2	65	27.5	48.7	11.2	55	18.7
Av. score...	68	0	56.2	0	63	26	66.5	22	52.2	8	56.5	16.2
Class score	28.5	28.5	42.3	42.3	46	46	45	45	32.8	32.8	37.7	37.7
Standard score	26	26	39	39	44.7	44.7	46	46	47	47	48	48

For example, in Grade I the five pupils testing highest in this grade averaged 68. The class averaged 28.5. The standard score for this grade, 26. In the same grade the five pupils testing lowest in this grade averaged 0. That is five of them couldn't read at all after a year of effort. Note the class score was 28.5, and the standard score 26. The comparison suggested above is significant, especially in the Third Grade. It is also significant that the gain in reading ability is greatest in the Third Grade while the variation between highest and lowest individuals, while it is wide at all grades, is least at this point.

CONCLUSIONS BASED ON TESTS

The foregoing Table VI is a tabular epitome of the salient facts of this study. Its material more than any other has commanded the attention of teachers throughout the system and has become subject of their most serious thought. A number of interpretations and analyses of the facts of this table have been submitted to the supervisory department, from which

the following is selected as meriting careful consideration, and, further, because the supervisory department is not in accord with certain conclusions implied therein.

This teacher says, "I was particularly interested in knowing whether a year's work in reading would give practically uniform growth to the three classes of readers—poor, average, and superior—as graded by the fall test—or show with which class the greatest growth was made during the year. **THE RESULTS OF THE ORAL TESTS REVEAL IT TO BE GREATLY IN FAVOR OF THOSE INDIVIDUALS GRADING LOW IN THE FALL READING.**"

The results of the silent tests show a trifle more uniform growth than do the oral. The ten individuals making the greatest gain are pupils who scored five above and five below standard at the fall reading; and the five who scored above standard make an aggregate gain of 38.7 points, against an aggregate of 38.2 points for the five who scored below. But the five making the least gain in the room are ones who graded above standard to begin with. The medium gains are two whose scores in the fall were above standard and four whose scores were below."

"Of the ten greatest gains in the oral test, five (and the five highest), were made by individuals who graded below standard—from one to twenty points—in the fall reading; while the other five graded from one to ten points above standard, but with an aggregate gain of only 57 points for the latter, as against 106 points for the first five. The two individuals making the least gain are pupils who made the two highest scores in the fall test. The medium gains are two whose scores in the fall reading were above standard and four whose scores were below."

"This proof of the decidedly greater advancement on the part of the poor reader brings one to serious consideration as to the cause. Is the poor class receiving undue attention? Is my room just the thing that I seriously object to its being—a leveling ground? **IS THE BRIGHT PUPIL—THE SUPERIOR READER IN THIS CASE—PRACTICALLY AT A STANDSTILL IN THE THIRD GRADE, WHILE HE WAITS FOR OTHERS TO CLIMB SLOWLY UP TOWARD THE HEIGHTS HE HAS ALREADY ATTAINED**—it matters not how, whether by toilsome struggle or a natural gift? Can't I do something for the more advanced reader, as well as for the inferior one? Can't my methods, my material, or something, be such that these superior pupils can have as profitable a year's work in reading as do the others?"

The opinion, that the whole Elementary School system as commonly organized is a crime against the superior pupil, seems warranted; but in this particular instance it is possible that the "leveling ground" feature complained of develops logi-

cally and inevitably from the nature of the subject. It is evident that there is need for a bit of constructive school management to remedy the conditions complained of by this teacher. The following conclusions may help with this task. They are set forth with little defense of argument other than that apparent upon the face of our returns:

1. That numerous children completely master the formal subject of reading in Grade I.
2. That the majority of children master it in Grade II.
3. That there are children slow in development but probably normal otherwise, in number sufficient to warrant consideration, who do not acquire a mastery of the subject until the completion of Grade III. (Incidentally, it may be seen in Table VI that the Standard Score for Grade I and the average of the five low scores of Grade III are identical.)
4. That after Grade III is past, reading, in the commonly accepted interpretation of the subject, is not worth its cost in Sterling, or in any other place.
5. That when Grade IV is past, reading is dead. Not only that, but decay has already begun to set in as may be seen from the numerous children who here start to retrogress. From this point on it will be noted that the superior reader not only ceases to make a superior advance, but his advance is even below the mediocre advance of his classmates when averaged together as a whole.
6. That reading in its commonly accepted interpretation has little place in Grades IV and V.
7. That the stirrings of a new life in the child, accompanying the stage of early adolescence, may so react as to bring about a temporary resurrection of the subject in Grade VI, especially in the case of those children who have up to this time failed in its mastery. (Note also Tables XI and XII.)

We believe on the face of the tabulations of the materials covered, and, likewise, of the test results, reading—both oral and silent—reaches its culmination in Grade III. This is probably in accord with the facts of mastery. As a formal study it has evidently been mastered by the great majority of children when they reach the fourth year of school. Commonly, the mastery is achieved during the second year, so that we find second graders reading whatever material is within their comprehension with as much facility as eighth graders or adults. Ordinarily, however, it does not seem to attract much attention either from parents or from teachers, when children thus acquire facility in reading at an early age. Very few of those who are most interested grasp the significance of it, and it is the rule for facility in silent reading to be positively deprecated. The belief is almost universally accepted that the rapid silent readers do not get what they read, and the accomplishment is therefore an undesirable one. The typical attitude

is that which was indicated by the feeling of a first grade teacher who was much distressed one morning when a little fellow told her that he had read through the book which she had given him to take home the evening before. She was not only skeptical of his report but seemed eager to cherish a hope that it was untrue.

Nevertheless, a careful examination of some three thousand test sheets wherewith the reading efficiency of the Sterling children was tested brings out convincing evidence for the proposition that reading as a formal subject may be mastered very early in the grades. Moreover, these sheets also reveal that in the case of the great majority of children the facility with which they read comprehensible matter is not materially increased after they pass beyond the third or fourth year of the elementary school. And yet further, in certain cases where children have been put through the usual prolonged drill in the upper grades, there appears reason to believe that an actual retrogression has taken place. It would seem, therefore, that the necessity for continuing reading as a formal subject of study ought not to exist beyond third or fourth grade, and that when such necessity does exist beyond these grades, it is largely indicative of a procedure that has failed to realize upon its opportunities.

If there is the warrant of truth back of these seven propositions that there appears to be on the face of the showing, the subject of reading is in urgent need of a thorough reorganization not only in Sterling, but probably throughout the schools of the country.

In the little red schoolhouse of our ancestors "readin" meant oral reading. While they were dimly conscious, no doubt, that there was such a process as silent reading it was certainly given little thought in the educational scheme. Today we realize that our information is mostly gained from the printed page, from books, papers and magazines read silently. Silent reading is tremendously important. It lies at the heart of learning to study and is a prerequisite to progress in every branch of knowledge. It makes up almost exclusively the reading through life, and occupies a larger place in the life of the average individual than all the other subjects of the curriculum combined.

Silent reading is probably capable of a development far beyond anything that can be shown anywhere in any kind of school. In nearly every school there are a few individual examples of high efficiency, children who read with a high degree of rapidity and an excellent quality of comprehension. But these cases, being rare and isolated are without significance save that they indicate as entirely possible the achieving of an end greatly to be desired. They can in no wise be identi-

fied as a product of the school in which they are found, when that school does not even pretend to plan or point out the way of their attainment. How their efficiency was achieved no one knows. It was an accident, a mere chance. Few schools have in time past ever made provision in their courses of study for a systematic instruction and training in silent reading, and those children who acquire proficiency in it come upon the treasure as one, eating, might come upon a pearl in an oyster, unexpectedly, without effort, and incidental to another process—a process neither calculated nor fitted to achieve the end attained.

In the Elementary schools of Sterling the subject of silent reading has recently undergone considerable reconstruction. The emphasis upon it has been vastly increased, particularly in the upper grades, where it may be said to have achieved the dignity of a separate subject with an importance superseding that of oral reading.

In accordance with the evidence that points the advisability of beginning the study of silent reading very early in the child's school life, there was worked out and instituted in Sterling a plan whereby practice and instruction in the subject is given systematically throughout the grades, beginning with the first. In general the idea is to develop speed and comprehension through practice under supervision. Each element is constantly tested—the first by limiting the time for the reading of a specified amount, and the second by questioning the child upon the content of the pages read. The second test is not complete without some kind of positive reaction on the part of the child, for ability merely to express the substance of the thought is very inadequate.

The accompanying Table VII shows the amount of material covered under this plan by giving the maximum and minimum number of pages read silently in the several classes of the first six grades during 180 days of the current year. One portion of this material was read silently and afterward re-read orally, which practice is commonly regarded as the "preparation" for oral reading. The other portion was read silently only and the child's comprehension tested by questions upon the content, or by requiring a reproduction or summary of what was read. Neither Table VII nor Table VIII takes into account library books, untested reading, or reading done in the preparation of other subjects.

TABLE VII: MATERIAL READ

Grade	Pages read both silently and orally	Pages read only silently and orally	Total pages read silently
I	1500 to 2250	100 300	1650 to 2500
II	1200 to 2300	50 450	1300 to 2700
III	1050 to 2400	300 1250	2300 to 3550
IV	1000 to 2000	400 600	1450 to 2600
V	1000 to 2000	400 600	1450 to 2600
V	450 to 5550	500 700	1050 to 1150
VI	650 to 950	500 900	1400 to 1550

RESULTS OF TEST OF EFFICIENCY IN SILENT READING

Efficiency in silent reading may perhaps be more nearly measured than in oral, since in silent reading one of the two elements most difficult of measurement—namely, the interpretative reaction of the reader to what is read—is not only more simple, but is far less prominent, being for the most part suppressed. Still the problem presents vast difficulties, as there is no absolute measure for comprehension. It is not wise, therefore, to regard the results of these tests with any considerable degree of finality.

The particular tests selected for use in Sterling were the standardized sheets designed for the testing of silent reading by Dean Kelly of the School of Education, University of Kansas. The tests were given twice during the year, October and April, in Grades 3 to 8. The schools have derived a good deal of satisfaction from the results which are shown in Tables IX and X, compared with a standard established by the testing of from 4,000 to 6,000 other children in each of the several grades. Copies of the test for Grades 3, 4 and 5 are published to illustrate their character. The tests for Grades 6, 7 and 8 are of similar character but more difficult.

STATE NORMAL SCHOOL

EMPORIA, KANSAS

Bureau of Educational Measurements
and Standards

Put
Pupil's
Score
Here

TEST I

THE KANSAS SILENT READING TEST

Devised by F. J. Kelly,

For

Grades 3, 4 and 5

City..... State..... Date.....
Pupil's Name..... Age..... Grade.....
School..... Teacher.....

DIRECTIONS FOR GIVING THE TESTS

After telling the children not to open the papers, ask the children on the front seats to distribute the papers, placing one upon the desk of each pupil in the class. Have each child fill in the blank space at the top of this page. Then make clear the following:

INSTRUCTIONS TO BE READ BY TEACHER
AND PUPILS TOGETHER

This little five-minute test is given to see how quickly and accurately pupils can read silently. To show what sort of game it is, let us read this:

Below are given the names of four animals. Draw a line around the name of each animal that is useful on the farm:

Cow tiger rat wolf

This exercise tells us to draw a line around the word, cow. No other answer is right. Even if a line is drawn UNDER the word cow, the exercise is wrong, and counts nothing. The game consists of a lot of just such exercises, so it is wise to study each exercise carefully enough to be sure that you know exactly what you are asked to do. The number of exercises which you can finish thus in five minutes will make your score, so do them as fast as you can, being sure to do them right. Stop at once when time is called. Do not open the papers until told, so that all may begin at the same time.

The teacher should then be sure that each pupil has a good pencil or pen. Note the minute and second by the watch, and say, BEGIN.

ALLOW EXACTLY FIVE MINUTES

Answer no questions of the pupils which arise from not understanding what to do with any given exercise.

When time is up say STOP and then collect the papers at once.

Value 1.2	<p style="text-align: center;">No. 1</p> <p>I have red, green and yellow papers in my hand. If I place the red and green papers on the chair, which color do I still have in my hand? _____</p>
Value 1.2	<p style="text-align: center;">No. 2</p> <p>Think of the thickness of the peelings of apples and oranges. Put a line around the name of the fruit having the thinner peeling.</p> <p style="text-align: center;">apples oranges</p>
Value 1.4	<p style="text-align: center;">No. 3</p> <p>Three words are given below. One of them has been left out of this sentence: I cannot _____ the girl who has the flag. Draw a line around the word which is needed in the above sentence.</p> <p style="text-align: center;">red see come</p>
Value 1.4	<p style="text-align: center;">No. 4</p> <p>There are seven boys and twelve girls in a room. If there are more boys than girls, write boys on the line below. If more girls than boys, write girls on the line below.</p> <p style="text-align: right;">_____</p>
Value 1.6	<p style="text-align: center;">No. 5</p> <p>If you would rather have a dollar than a little stone, do not put a line under dollar, but if you would rather have five dollars than a pencil, put a line under stone.</p> <p style="text-align: center;">dollar stone</p>
Value 1.7	<p style="text-align: center;">No. 6</p> <p>The first letter in the alphabet is "a." Below are some words containing the letter "a." Draw a line under one in which the first letter of the alphabet is found the greatest number of times.</p> <p style="text-align: center;">hat easy baby age alas manfully</p>

<p>Value 1.8</p>	<p style="text-align: center;">No. 7</p> <p>A child wrote these letters on the blackboard, b y a k. He then rubbed out one letter and put c in its place. He then had b y c k on the blackboard. What was the letter which he erased?</p> <p style="text-align: right;">_____</p>
<p>Value 1.9</p>	<p style="text-align: center;">No. 8</p> <p>Count the letters in each of the words written below. You will find that pumpkin has seven letters, and thanks has six letters. One of the words has five letters in it. If you can find the one having five letters, draw a line around it.</p> <p style="text-align: center;">breeze thanks yours pumpkin duck</p>
<p>Value 2.0</p>	<p style="text-align: center;">No. 9</p> <p>Here are some names of things. Put a line around the name of the one which is most nearly round in every way like a ball.</p> <p style="text-align: center;">saucer teacup orange pear arm</p>
<p>Value 2.1</p>	<p style="text-align: center;">No. 10</p> <p>A recipe calls for milk, sugar, cornstarch and eggs. I have milk, sugar and eggs. What must I get before I can use the recipe?</p> <p style="text-align: right;">_____</p>
<p>Value 2.2</p>	<p style="text-align: center;">No. 11</p> <p>We planted three trees in a row. The first one was nine feet tall and the last one was three feet shorter than the first one. The middle one was two feet taller than the last one. How tall was the middle one?</p> <p style="text-align: right;">_____</p>
<p>Value 2.2</p>	<p style="text-align: center;">No. 12</p> <p>Below are three lines. If the middle line is the longest, put a cross after the last line. If the last line is the longest, put a cross after the first line. If the first line is the longest put a circle in front of the middle line.</p> <p>_____</p> <p>_____</p> <p>_____</p>

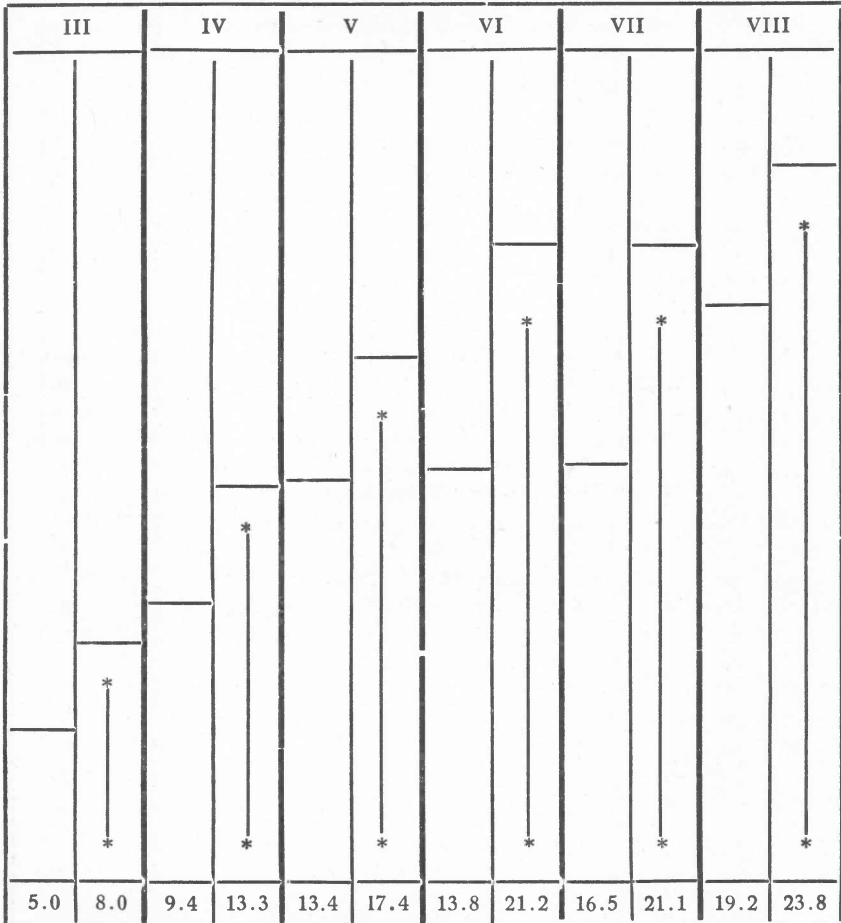
<p>Value 3.1</p>	<p style="text-align: center;">No. 13</p> <p>Three men have to walk to a town ten miles away. Each man carries a load. The first carries 25 pounds, the second 30 pounds, and the third 40 pounds. The heavier the load the slower the man travels. In order that they may arrive in town at the same time, which man must start first?</p> <hr/>
<p>Value 3.5</p>	<p style="text-align: center;">No. 14</p> <p>My house faces the street. If a boy passes my house going to school in the morning, walking toward the rising sun, with my house on his right hand, which direction does my house face?</p> <hr/>
<p>Value 4.8</p>	<p style="text-align: center;">No. 15</p> <p>Fred has eight marbles. Mary said to him: "If you will give me four of your marbles, I will have three times as many as you will then have." How many marbles do they both have together?</p> <hr/>
<p>Value 8.9</p>	<p style="text-align: center;">No. 16</p> <p>If in the following words e comes right after a more times than e comes just after i, then put a line under each word containing an e and an i, but if e comes just before a more often than right after i, then put a line under each word containing an a and an e.</p> <p style="text-align: center;">receive feather teacher believe</p> <hr/>

In Table IX which appears below it will be noted that Sterling has scored far above the expected standard. This means, that as compared to other school systems in the country Sterling has made an enviable record in silent reading.

TABLE IX
Kelly Silent Reading Tests—Sterling and Standard Scores.

Grade	III	IV	V	VI	VII	VIII
Standard—June	5.0	9.4	13.4	13.8	16.5	19.2
Sterling	x	x	x	x	x	x
April Score	8.0	13.3	17.4	21.2	21.1	23.8
Class Variation	6.8	11.3	16.3	21.0	...	...
	to	to	to	to		
	9.3	14.3	18.4	21.3	...	...
Above Standard—Years	2/3	1	2 1/3	2 3/4	1 3/4	1 1/2

GRAPHIC REPRESENTATION OF TABLE IX
Kelly Silent Reading Tests: Sterling and Standard



* This column represents Sterling.

Note in Table IX that the Standard scores are for June, the Sterling scores for April; and, in Table X, that the Standard growths are for a year, while the Sterling growths are only from October to April.

TABLE X
Kelly Silent Reading Tests—Sterling and Standard Growths.

Grade	3	4	5	6	7	8
Standard Year		4.4	4.0	0.4	2.7	2.7
Sterling Growth	x	x	x	x	x	x
October to April	4.5	6.3	4.9	7.5	7.8	5.2
Same Above Standard	?	1.9	0.9	7.1	5.1	2.5
Per cent Above Standard	?	43.0	2.0	1875.0	188.0	82.0
Class Variation	4.2	3.4	4.5	7.4		
	to	to	to	to		
	5.1	8.3	5.2	7.6		

In silent reading as in oral there is a wide range of individual variation, and the indications, likewise, are that the subject may be mastered very early in the grades. More than that—the great majority who fail to master it before reaching Grade VII do not master it at all. The higher scores after passing Grade III are probably due to a higher quality of comprehension rather than to an increase in ability to read. In Grade VIII, reading instruction, as such, is a one hundred per cent failure for the superior reader, and nearly a fifty per cent failure for the inferior one, as indicated by the characteristic scores of superior and inferior readers shown in Table XI. Grade III on the other hand, shows a material progress for both classes; but, after this grade is past, the teaching of reading as a formal subject seems to be a mere leveling process which reaches its culmination in Grade VI, where only about one half the pupils show any worthy gain, and of those who do make a material advancement, something like eighty per cent come from among the tail-enders.

In Table XI are given the five highest and the five lowest individual scores made under the October tests in Grades III and VIII, and the scores of the same children again in April together with their gain or loss in the interim. In Grade III a hundred per cent of the children tabulated are making a worth-while progress as against only thirty per cent in Grade VIII—and it is our belief that this thirty per cent would have made about the same showing had they been left entirely to their own devices.

TABLE XI.

Progress of Superior and Inferior Silent Readers—Grades 3 and 8.

Grades	3			8		
	Oct.	Apr.	Gain	Oct.	Apr.	Gain
Kelly Tests	13.4	24.0	10.6	37.5	39.5	2.0
Reader A	11.6	23.8	12.2	32.2	32.3	0.1
Reader B	10.9	23.8	12.9	30.3	30.3	0.0
Reader D	9.8	14.6	4.8	29.6	32.2	2.6
Reader E	8.6	12.2	3.6	29.4	27.6	1.8
Reader A		6.5	6.5	7.9	10.5	2.6
Reader B		6.8	6.8	8.9	23.1	14.2
Reader C		9.3	9.3	11.2	26.3	15.1
Reader D		-0.5	10.5	11.6	13.0	1.4
Reader E		11.0	11.0	12.8	19.7	6.9

Some idea of the leveling tendency that reaches its culmination in Grade VI may be obtained from an examination of Table XII, in which are tabulated the ten highest and the ten lowest scores under the October tests, and the scores of the same children again in April, together with their gain or loss over the October showing and the decrease in the difference between the pairs of corresponding high and low scores, which is, in other words, the degree of "leveling" expressed in terms of the reading score.

TABLE XII.

Silent Reading: "The Leveling" Grade 6.

Oct.	Score	Apr.	Score	Gain	Loss	Level
1	2	3	4	5	6	7
High	Low	High	Low	High	Low	
25.8	3.9	24.0	8.1	1.8	4.2	6.0
25.5	4.3	27.7	22.3	3.2	18.0	14.8
24.3	4.7	23.9	13.2	0.4	8.5	8.9
23.3	4.7	36.5	23.3	13.2	18.6	5.4
24.3	5.7	26.3	13.1	2.0	7.4	5.4
22.3	6.3	39.5	26.3	17.2	20.0	2.8
22.2	6.5	19.9	15.4	2.3	8.9	11.2
21.3	6.7	17.4	14.0	3.9	7.3	11.2
20.1	7.2	26.3	15.4	6.2	8.2	2.0
20.7	7.3	13.8	8.5	6.9	1.2	8.1

To read Table XII remember that this table shows the October and April scores of twenty pupils—the ten highest and the ten lowest in the October tests. In column 1 you have the ten high scores in October. In column 3 you have the April score of these same pupils. In column 5 you will see their gain or loss. Column 7 shows how much leveling (bringing down the high and bringing up the low) was done in this grade.

Columns 2, 4, 6, and 7 show the same data for the ten children making the ten lowest scores in October.

The fact seems rather impressive that tests as divergent in nature as are those of Gray in oral reading and Kelly in silent should with such a unanimity of results point to identical conclusions in regard to the place of reading in the curriculum. Aside from the agreement in this matter of a common "reading period," however, there does not appear to be any very pronounced correlations between silent and oral reading. The conflict in principle and methods has already been mentioned. As to mastery, it may be noted that ability to score high in one does not by any means carry an assurance of ability to score high in the other. In fact, it is not at all unusual for the same child to rank high in one and low in the other. For example, in Grade VI twenty-five per cent of those who tested superior in oral reading, when taken together made an average score of 16.7 points in silent reading, or 4.5 points below the average score for the class; whereas, at the same time and under the same test, twenty-five per cent of those who scored poor in oral reading when taken together made an average score of 23.2 points in silent reading, or 2 points ABOVE the average for the class. Formerly, those in the second group were unjustly regarded as failures while those in the first were thought to be surpassingly efficient. A proper estimate of their work is arrived at only by taking into consideration both phases of the subject.

And, for a perfect evaluation, there may be other phases to consider. Who knows what? Or whether such an evaluation be possible? For, after all, reading is more than recognition, or pronunciation, or vocabulary, fluency, kinetic reaction, or reproduction. It has spiritual and elusive qualities that arise from the vicarious contact with worth-while experiences and the manifold emotions of life. And who can tell when these qualities have been imparted? Or how it was done? Or set up a standard for the measuring of the doing of it?

Such thoughts may well give us pause; but there is a reverse side to them. The reverse side is this—that human experience and emotion has its language, and it is a language as formal as the alphabet or the dictionary. As humans, we do not each make our own preferred noise when we see a new sight or experience a new sensation; we make a "standardized" noise. Human perceptions and emotions are standardized in their expression, signifying that they have been gauged and measured many, many times. Thus, the things that we are pleased to term spiritual and elusive have, at least, periods of incarnation in a body that may be very definitely dealt with and appraised. This does not deny the spiritual and the elusive. It does not deprecate them. Let teachers strive after them with zeal and aspiration, for there is a value in the mere striving. But the fundamental values lie with other things that must be achieved, not merely striven after. It has been said that we cannot

measure appreciation; but when we measure comprehension, however, have we not measured the foundation of appreciation, for who can appreciate unless he comprehends?

SPELLING

Spelling in the Sterling Public Schools has passed through at least three periods during each of which a totally different policy has been maintained. The first period was one in which the child had a text book from which he studied his daily lessons with little or no supervision from his teacher. The function of the teacher was to assign lessons and pronounce words.

This period passed over into one where the teacher selected the words, taught them to the pupils, and assumed entire responsibility for the lesson. This period faded ingloriously away when teachers weary with well doing had gradually permitted spelling to sink to a relatively insignificant place in the curriculum.

The third period is upon us and we are today using the text book as in the early period, but we are teaching the words with the care characteristic of the second period, and spelling is holding a place of first importance in our schools as is shown by the following facts:

The course of study states, "The pupil should be taught to spell the words of his own vocabulary—the words actually used. To these words add those used in ordinary life." In the actual teaching practice, however, word lists are made up by the teachers in Grades I and II, while Grades III to VIII use a spelling book.

In Grades III, IV, V and VI the work has been completely routinized since September 20, 1916, when a bulletin was issued by the supervisory department in which teachers were given detailed instructions as to time allotment, and the manner and order of presentation. This bulletin, with but one modification of any consequence, was followed closely throughout the remainder of the year. The time allotments and material covered are shown in Table I.

The common practice in the matter of time allotted on the school program to spelling is about seventy-five minutes per week; but the total amount of time actually spent upon the subject cannot be definitely stated because of a considerable portion of unallotted study time that is commonly devoted to it.

The allotment of fifteen to twenty minutes a day in Sterling, as shown in Table I, includes the total time expended upon the subject in both recitation and study. Children were not permitted to study their words at any other time than dur-

ing the study-recitation period. The lesson was always written during the last five minutes of this period, and, usually corrected by the children in class, to be rechecked afterward by the teacher.

TABLE I.
Sterling Time Allotments and Words Studied.

Time Allotted				
Grades	3	4	5	6
Per lesson	15 to 20	15 to 20	20	20
Per week	75 to 100	75 to 100	100	100
New Words				
Per lesson	6	6	7	7
Per Week	24	24	28	28
Per year	850	850	1000	1000
*Review Words				
Per lesson	0 to 6	0 to 6	0 to 7	7
Per week	24	24	28	28
Per month	96	96	112	112
Per term	288	288	336	336

*It will be observed that every fifth lesson is a review lesson, and that daily, weekly, monthly, and term reviews are all independent of each other.

It will be seen by the foregoing table that Sterling requires that one lesson out of each week shall be a review lesson. This review lesson has been found to be well worth the time it takes; and the showing of teachers who make use of the review as compared to the results where the review is omitted justifies fully this review lesson, although it seems to cost a large proportion of the available time.

We have not found it profitable to emphasize spelling until the latter half of the second school year. Indeed our experience seems to indicate that "spelling ability" (if there is such a thing) does not develop before Grade VI. So far as we can determine up to this time children learn to spell special words largely by rote and no amount of phonics training or rules for spelling exercises any particular influence over the results. In fact it seems almost as if in Grades IV to V there is more difficulty with the words that are spelled by rule.

METHODS CAUSE VARIATION IN SPELLING RESULTS

The same words given in column spelling and then repeated in sentences showed great discrepancies in the results. Classes that averaged over 95 per cent on words spelled in column, have made an average of less than 50 per cent on the same words the same day, when these words were repeated in sentences. Under one efficiency test where the words were given in dictated sentences, a surprising fact developed in regard to a Grade IV class that had stood head and shoulders above the others in its daily work of column spelling. This class not only failed to excel the others on the test, but its growth was only about half the normal growth of the grade. The matter is significant, and its application should not be lost to the situation.

It should be clearly borne in mind that the FINAL END OF SPELLING IS WORDS WRITTEN IN SENTENCES OR PARAGRAPHS.

ROUTINIZED METHODS SECURE THE BEST SPELLING RESULTS

The individual variation shown by children under the routinized methods was decidedly less than it had been before the methods were routinized. In general, outside the differences in mental capacity, the variations were not marked. There was a decided advantage in favor of the all-round bright children; but aside from this, neither previous training in phonics, nor extensive reading, nor home culture appeared materially to affect the results. On the other hand, the routinized Grades V and VI vastly discounted the non-routinized Grades VII and VIII, as may be seen in Table II. Spelling received much less time and attention in the latter grades, however, which must be taken into account when considering the differences.

The routinized presentation as prescribed in the bulletin before mentioned, and afterward slightly modified is as follows:

1. The teacher writes on the board in the presence of the class the first word, indicating syllables by breaks, not by dashes.
2. The teacher pronounces the word distinctly as a whole, drills individuals and then the class.
3. The teacher pronounces the word by syllables, making a distinct pause between syllables, drills, and then takes up the special features of the word.
4. The teacher again pronounces the word distinctly as a whole, and the class repeats.
5. Children close eyes and recall the image of the word.
6. Children motorize with a pen or pencil, and then write the word, sometimes with eyes open, sometimes with eyes closed.
7. Children compare what they have written with the text, and then write again.
8. Each successive word is taken up in the same way, and at the end, the children review the visualization and motorization in silence.
9. Children write the lesson as the teacher pronounces the words or dictates them in sentences.

TABLE II.

About six months after this routinized treatment went into effect in Grades III to VI, as before mentioned—that is in March, 1917—the Courtis Standard Tests in Spelling were given through Grades II to VIII. These tests consist of dic-

tated sentences, timed. The results compared with the Curtis Standards are given in Table II. No Curtis score for March has yet been determined. The one used in our comparisons is found by taking a median between the January and the June score for each grade. For example Grade III scores 67 in January and 74 in June, so we have assumed that it will score half way between these points in March—and so on with the other grades. In Table II the non-routinized Grades II, VII and VIII are placed adjoining each other.

TABLE II.
Spelling—Sterling and Standard—Also Class Variation.

Grades	3	4	5	6	2	7	8
*Curtis Standard	70.5	83.0	71.0	81.0	61.0	73.0	86.0
Sterling—Class Z	88.5	87.9	81.9	83.3	55.0	59.0	68.1
Sterling—Class Y	82.6	86.7	81.9	82.1	51.3		
Sterling—Class X	81.4	83.3	65.8		51.1		
Sterling—Class W	63.2				39.6		

*Curtis Standards estimated for March, except that of Grade 2 which is the High Second standard.

WRITING

The course of study in writing for the elementary schools of Sterling is not of the conventional type in that the major portion of it is given over to the applied psychology of the subject, while a very minor part is devoted to the aims, requirements, prescribed methods, and standards of achievement.

The course is divided into three parts—namely, Primary Writing, including Grades I and II; Transitional Writing, Grade III; and Upper Grade Writing, Grades IV to VIII. The Upper and Lower Grades have each a distinct kind of movement and separate ideals and standards of achievement.

Writing receives a very moderate amount of supervision. No special teacher is employed, though a little departmental work is done. As a rule, each teacher teaches her own writing and administers the course as she understands it. In the main, the course is adhered to as closely as could reasonably be expected under these conditons.

In a pure habit study such as writing, where precise form is a governing factor, and where the measure of efficiency is the degree of facility with which precise form are reproduced, it is not to be expected, with all the individualities of writing which exist among teachers, that a perfect unity will be found throughout the classes of the several grades; but a certain part of the effort will in the nature of things go to nullify what was acquired at a previous time, and, in turn, will be nullified by the effort of the succeeding year. Sterling may be criticised for permitting an unnecessary amount of this wasteful practice.

Because of this fact—and a corollary to it, that most teachers have not acquired command of the technical and highly specialized forms and movements necessary to a mastery of the subject—better results would undoubtedly be obtained if the work were in charge of a special teacher. On the other hand, the daily influence of the regular teacher is far greater than that of a special teacher can hope to be, and if there is any marked divergence in the examples set by the two, even though in principle the practice of each may be equally good, it must necessarily constitute more or less of an impediment to progress. At any rate, results in Sterling show that some unified policy properly supervised and insistently followed would greatly improve the writing.

The Sterling course of study in writing is in reality merely the statement of a unified policy. Success in the subject under such a plan depends upon the capability of the several teachers, guided by a moderate supervision, the chief function of which shall be to unify the practice of the different teachers.

Every teacher through the first six grades appeared to possess a working knowledge of the essential elements of this policy, and nearly every teacher appeared to be earnestly and intelligently striving to carry out its principles in the course of her work. Those who failed did so chiefly because they were slow to apprehend the overshadowing influence of habit upon the process.

The high points of the writing policy as stated in the course of study are briefly these:

1. That good writing is entirely a matter of habit and must be judged exclusively from the habitual practice of the child as shown in the regular work.
2. That the teacher must have clearly in mind the KIND of character the child is to produce.
3. That Grades I and II are not concerned with the formation of perfect letters.
4. That writing does not lend itself to busy-work and must not be so used.
5. That Grades I and II are to use no other than the full arm movement, and write large, chiefly upon the blackboard or upon rough paper with a large pencil held after the fashion of a blackboard crayon.
6. That copies are of small use in themselves, the sight of the teacher writing presents to the child the clearest form of the process of writing.
7. That the writing periods should be short, occupying from ten to twenty minutes.
8. That movement drills should be neither prominent nor preliminary to writing.
9. That in Grade III a transition be made from the free-arm to the muscular movement.

10. That the exact position of the pen or of the wrist is of little moment, but rhythm is a factor of prime importance.

11. That certain prescribed forms be used to the exclusion of all others.

12. That marked improvement should begin in Grade IV, and a complete mastery of the writing process be reached in Grade VI.

In accordance with point I, the transcribing of work is strictly forbidden in the first six grades—that is, children are not permitted to copy work over for the sake of securing a neater appearance or better arrangement. A “finished product” is demanded on the first attempt. Further, all writing is required to be done at a reasonable rate of speed. The effect of these regulations is beneficent in working an economy of time for the more careful and over-scrupulous children, and in a general developing of judgment and foresight in the arrangement of the work. The Note Books of Grades IV, V and VI are particularly well kept.

In the enforcement of point II, referring to uniformity of characters, carelessness was noticed on the part of a few teachers. It was further noted that these teachers were those whose classes made the poorest scores under the efficiency tests.

Unusual skill in writing is not profitable. Training should continue as long as the average results recompense for the effort expended, and no longer. Sterling has ruled that Thorndike Quality 13, written at a speed of seventy letters a minute, is an acceptable standard for the completion of the course. In accordance with this ruling, during the latter part of the year those children who have attained the standard set are excused from further work in the penmanship class, while those who write below the median of the grade next beneath them are relegated to a lower grade for their penmanship instruction. Incidentally this plan exerts a decidedly stimulating influence upon the children. Under it, for example, one boy noted made more improvement in his writing during the first three weeks than he had made before in the preceding three years—from which it may justly be inferred that all slow progress is not due to poor teaching. It is clear, however, that a good deal depends upon the way in which the subject is presented, for the results obtained from the same expenditure of time showed considerable variation in the different classes. Results and time together are the measure of economy. The time allotted to writing in Sterling seems somewhat excessive, and could probably be reduced without detrimentally affecting the results.

Table I shows the number of recitations per week and the time in minutes per week allotted to writing throughout Grades

I to VIII of the Sterling Elementary Schools. Table II shows the same grades scored on Form, Thorndike Scale, under a timed efficiency test, and compares Sterling with the average scores of 56 *LARGE* cities, beside other places well known in this locality. Table III shows the same grades again scored on speed in letters per minute, and makes comparison with the same places as Table II. The comparison between Sterling and 56 large cities is also, in a measure, a comparison between the regular-teacher plan, before mentioned, and the special-writing-teacher plan, since the large cities employ special teachers of writing while Sterling does not.

TABLE I.
Writing: Sterling Time Allotment.

Grade	Av.								
	All	I	II	III	IV	V	VI	VII	VIII
Periods per week		*	10	8	8	5	5	*2	*2
Total minutes per week....	77	75	90	105	105	100	100	40	40
†Same—Denver	100								
†Common Practice	75								

* Periods not regular. Time approximate.
† Prof. Frank N. Freeman in Denver Survey 1916.

To read this table note that the various grades from I to VIII are indicated by the Roman numerals at the top of the columns. The first column gives the average number of minutes per week devoted to penmanship in Sterling, Denver and other cities investigated. The figures under the respective grades give first the number of recitations per week and below that the number of minutes devoted to the subject.

TABLE II.
Writing Form—Sterling and Other Cities—June Score.

Grade	III	IV	V	VI	VII	VIII
56 Large Cities	8.9	9.6	10.1	10.8	11.5	11.9
Denver	7.4	8.0	8.8	9.3	10.2	10.8
Grand Junction	7.8	8.4	9.3	10.8	10.7	11.1
Sterling	9.3	10.0	10.0	11.6	10.7	10.3
Sterling Variation	8—11	8—11	8—11	8—12	8—12	7—10
Per cent Inside Limits	75	84	80	82	82	68

To read this table remember that a standardized test provides for scoring all the children in different school systems by the same scale, all having taken the same test under practically the same conditions. This table shows that in the VII grade for instance, 56 cities score an average of 11.5; Denver scored 10.2; Grand Junction 10.7; Sterling 10.7. That pupils in the

seventh grade vary in score from score 8 to score 12 and that 82 per cent of the pupils in the grade write within the standard scores determined for this grade.

TABLE III.
Writing Speed—Sterling and Other Cities—June Score.

Grade	III	IV	V	VI	VII	VIII
56 Large Cities	43.8	51.2	59.1	62.8	67.9	73.0
Denver	36.0	50.0	54.0	63.0	66.0	69.0
Sterling	41.0	51.7	61.6	70.7	80.4	88.8

In reading this table please note that in the Fourth Grade, for instance, the average speed for writing in 56 cities is 51.2; Denver Fourth Grades write at a speed of 50; Sterling at a speed of 51.7. Other grades may be read in the same way.

In the matter of Form, Sterling makes a very favorable showing through the first six grades, and the same may be said in regard to Speed through all the grades, as will be seen by consulting Tables II and III.

In Table II it will be noted that Grade V shows no improvement over Grade IV when both are judged solely by the quality of the product; but, when speed is taken into consideration, Grade V shows a distinct advance, producing 20 per cent more writing of just as good a quality in an equal period of time. Compare Tables II and III.

This feature is still further developed in Grades VII and VIII, where a distinct retrogression from Grade VI is shown in Form while Speed continues to increase. The retrogression in itself indicates the sacrifice of Form to Speed. It is doubtful if writing lessons in Grades VII and VIII are worth while, provided the work of the first six grades has been efficiently done, for "we can count on some progress even when no drill is given"—probably as much as is here shown by the tests.

The range of individual variation as shown in Table II is rather narrow—about eighty per cent of the children being grouped under four degrees of quality in the lower grades, and under five degrees in the upper grades. A noteworthy fact to be observed in this connection is that the quality limits are practically the same for eighty per cent of the children who constitute Grades III to VII, while the majority in Grade VIII write within a range lower than that within which is to be found the majority of the children of Grade III. Now, this is not equivalent to saying that Grade VIII does not write so well as Grade III, for form is not the only element by which writing should be judged. Speed, also, must be taken into consideration, and, in the matter of speed, Grade VIII more than doubles Grade III, which gives the former a much higher efficiency score when the two factors are combined.

As children ascend through the grades, the emphasis on Form gradually diminishes while that upon speed is correspond-

ingly increased; but, in the course of experimentation, Sterling found it unsatisfactory *CONSCIOUSLY* emphasize Speed before reaching Grade VI. It made too acute the problem of exchanging excess Speed for deficiencies in Form.

Illegible writing, however rapidly it may be done, is valueless; and so, too, commercially, is perfect writing if done slowly and laboriously. But efficiency in writing is compounded of speed and form taken together, as excess of either one may within certain limits compensate for deficiencies in the other. The truest index to the writing achievement is a product of which the score of each element is a factor. Scores thus compounded for the several grades are given in Table IV where Sterling and 56 large cities are compared.

TABLE IV.
Efficiency in Writing: Sterling and 56 Large Cities.

Grade	3	4	5	6	7	8
56 Large Cities	39.0	49.2	59.7	67.8	78.1	86.9
Sterling	38.1	51.7	61.6	82.0	86.0	81.5

THE WRITING INSTRUCTION IN STERLING IS EFFICIENT AND THE RESULTS CREDITABLE

No school can tell where it stands until it measures its work in some sort of survey. When it measures its work, it should judge methods of instruction by the results they produce. Under the efficiency tests of this Writing Survey, the showing made by the first six grades of the Sterling elementary schools is entirely creditable. The work of the two upper grades needs some readjustment.

Writing: Combination or efficiency score.

Graphic representation of Table IV.

*Sterling.

III etc., 56 large cities.

Writing: Combination or Efficiency Score. Graphic Representation of Table IV. III Etc. 56 Large Cities.

