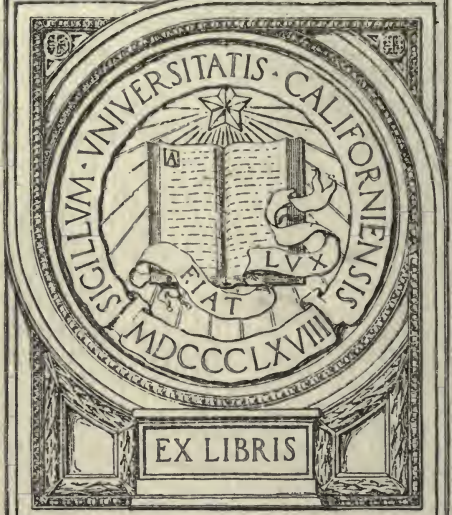
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A SCHOOL BUILDING PROGRAM FOR THE CITY OF WINONA, MINNESOTA

BY

MERVIN G. NEALE

Professor of Educational Administration, University of Minnesota

AND

SIGURD B. SEVERSON

Assistant in Educational Administration, University of Minnesota

PRICE: 50 CENTS

MINNEAPOLIS, MINNESOTA
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CONTENTS

LIST OF TABLES

LIST OF CHARTS

LIST OF FIGURES

INTRODUCTION

The significance of Professor Neale's report on the building survey for the city of Winona, which is published herewith, inheres not merely in the fact that it lays out a statesman-like building program for that city; but it lies rather in the fact that a big educational problem is approached by scientific methods, and a thoroughgoing solution is proposed in the light of results which these methods reveal. In general, building problems in cities of every size have been approached more or less by the rule-of-thumb method, without a complete analysis of all the factors upon which a rational building program can be based. Such an analysis Professor Neale has undertaken in the case of Winona and with such success that the Board of Education has adopted a building program based on his proposed solution as given in this report.

This study is also significant because of the suggestion which it carries for the solution of other educational problems confronting communities throughout the country. An adequate school plant is but one of the problems which boards of education are required to meet. Problems of curriculum, of administration, of instruction, and of teaching personnel are in general of more educational significance than are buildings, and lend themselves quite as easily to methods of scientific analysis and study. More and more will scientific methods be used to investigate such problems; more and more will experts be enlisted for such specialized study, and in ever increasing numbers public school officials are themselves securing adequate training for such work and organizing within their school systems agencies by which these studies can be carried on.

This report is significant in another sense because it represents a coöperative endeavor between the school authorities of the city of Winona and the University of Minnesota. The request for this survey was made by the Board of Education of Winona to the College of Education of the University of Minnesota. In making the request, the Board of Education agreed to pay for the time of Professor Neale and such other persons as would be required to carry the survey through and to meet all expenses incident to the making of the survey. The Board of Regents of the

University of Minnesota agreed, upon this request, to release Professor Neale from active service for such of his time as would be required to make the survey and to carry through the project, on the conditions of reimbursement offered by the Board of Education. Upon the completion of the survey, the comptroller of the University rendered the Board of Education of Winona a complete bill covering the time of all University employees who participated in the survey and covering all incidental expenses. The University undertakes to publish this report because of its general interest to the state and to the country as a whole.

Through similar arrangements, surveys have been conducted in the past year by the College of Education, both in the city of Duluth, where a complete study of the building situation was made, and a forward-looking building program was recommended, and also in the city of Austin, where a thoroughgoing study was made covering the problems of instruction, results of instruction, courses of study, etc. The Duluth survey is being printed by the Board of Education of that city. The Austin survey is being printed through special arrangements with the University.

It is believed that this arrangement between the University and local school communities is a particularly happy one because it makes available to such local communities the most expert service which the University can provide, a service which none of these school systems could provide directly for itself. At the same time, it brings the advanced students of the University into direct study of the problems of school administration, school supervision, and all problems related thereto. Both the University and the local community thus contribute to the project and both receive a measurable return.

M. E. Haggerty,
Dean of the College of Education,
University of Minnesota.

AUTHOR'S INTRODUCTORY STATEMENT

This survey was undertaken the spring of 1922 in response to an invitation from the Board of Education of the Winona Public Schools. Its purpose is to present the facts with respect to the present school building situation in Winona and to propose a school building program which will ultimately provide a first-class school plant for the city.

In order to present the facts which the Board should consider, careful studies have been made of each of the present school buildings, of the distribution of pupils of each type in the different parts of the city, of the probable increase of population in the different school districts, and of the financial ability of Winona to support a school building program as compared with other similar cities.

The building program recommended assumes a desire on the part of the citizens of Winona to provide for the children of that city school building accommodations which will be safe and healthful and which will make possible a thoroughly modern educational program.

The program recommended is not expensive when it is considered that practically no buildings for elementary or junior high school use have been constructed in Winona during the past thirty-five years.

Acknowledgment is hereby made of the services of Mr. C. A. Ronning in the scoring of the school buildings; of those of Mr. E. F. McKee who made tests of the lighting, and of the help of Messrs. R. J. Bradley, M. L. Gundlach, and Ernest R. Hanson, senior and graduate students in the University of Minnesota, who are responsible for much of the material in Chapter IV of this report.

GENERAL SUMMARY OF RECOMMENDATIONS MADE

The building program recommended in this report is, in brief, as follows:

1. The present Junior High School should be replaced by a new building located near the present Senior High School. It is

recommended that a full block of land be purchased as a site for such a building.

2. This Junior High School should provide for all public school pupils in the city of Winona from Grades 7 to 9 inclusive.

3. An auditorium and gymnasium building with accommodations for approximately 1,500 pupils should be constructed to take care of the needs of the present Senior High School and proposed Junior High School. This building should be located between the two buildings mentioned above and should be connected with them by passageways.

4. The Madison School building should be replaced by a new elementary school building to accommodate a kindergarten and Grades 1 to 6, inclusive.

5. The Central School should be replaced by an elementary school building to house pupils from the kindergarten to the sixth grade, inclusive.

6. The Jefferson and Lincoln school buildings should be repaired so as to make them conform, in so far as may be possible, to modern school building standards. Ground should be purchased at each of these buildings so that a full block of playground space may be available.

7. The Sugar Loaf School should be abandoned and the pupils in that school transported to one of the other elementary schools in the city.

8. The Jackson School should be abandoned and the pupils in that school district sent to either the new Central School or the Kosciusko.

9. The Washington and Kosciusko school buildings should be replaced by a single building, located somewhere between the sites of the above named two school buildings. At least a full block of land, preferably two, should be purchased as a playground for this proposed building.

10. It is recommended that the services of a competent school architect be secured to estimate as closely as possible the exact cost of this building program.

11. The Survey Committee estimates that the complete cost of the buildings, equipment, and land recommended will be in the neighborhood of $1,150,000.

12. If it is not desirable to undertake this entire program at once, it is recommended that it be undertaken in the following order:

1. Construction of a junior high school building
2. Construction of an auditorium and gymnasium building for junior and senior high school pupils
3. Construction of buildings to replace the Central and Madison
4. Purchase of additional playground space and repair of the Jefferson and Lincoln school buildings
5. The replacement of the Washington and Kosciusko buildings

CHAPTER I

THE SCHOOL BUILDING SITUATION IN WINONA

The city of Winona houses her school children in eleven school buildings. Ten of these buildings were constructed before the beginning of the present century. One of the elementary school buildings now in use was constructed just at the close of the Civil War; two were constructed during the seventies; two, during the eighties; and four, between 1890 and 1895. The building in which the Junior High School is now housed was constructed in 1887. The Senior High School was built between 1915 and 1917. Seven hundred eighty-seven school children are housed in buildings constructed before 1880, and eight hundred ten in buildings constructed between 1880 and 1890. Nearly two thirds of the school children enrolled in Winona are housed in school buildings built thirty-five years or more ago. These facts, which are shown in summary form in Table I, in themselves indicate with practical certainty the fact that Winona is faced with the necessity of a school building program of rather large proportions.

TABLE I

DATE OF ERECTION, TYPE OF CONSTRUCTION, NUMBER OF CLASSROOMS IN USE, PUPIL ENROLLMENT, AND GRADES ACCOMMODATED IN THE SCHOOL BUILDINGS OF WINONA

School	Year of Erection	Type of Construction	No. of Classrooms in Use	Enrollment	Grades
Central	1866	D	10	288	Kg–7
Madison	1874	D	11	379	Kg–7
Washington ...	1877	D	7	225	Kg–7
Jackson	1885	D	4	102	Kg–3
Jefferson	1886–98	D	13	352	Kg–7
Junior High....	1887	D	10	356	8–9
Madison Annex	1891	D	4	105*	Kg–4
Sugar Loaf....	1892	D	2	42	1–6
Kosciusko	1893	D	10	189	Kg–7
Lincoln	1895	D	10	224	Kg–7
Senior High....	1915–17	B	36	489	10–12†

* Included in Madison total.

† Certain classes from the Junior High School are now accommodated in the Senior High School building.

The development of modern school-housing standards has come about in a very large measure during the past twenty years and many of the cities of the United States have adopted the general policy of entirely remodeling and modernizing all school buildings that were built before the beginning of the present century. The development of modern standards of lighting, ventilation, and fire protection have rendered practically obsolete the provisions made in school buildings, thirty-five or forty years ago.

SCORING THE SCHOOL BUILDINGS

In order to get a more accurate measure of the efficiency of each of the school buildings in Winona, they were scored by three men who visited each building and made a careful study of each of the different parts. The scoring was done by means of the Strayer-Engelhardt Score Card for City School Buildings. This score card consists of 114 different points on which a school building may be analyzed and rated. A standard valuation has been given to each of these 114 different points so that, after a scorer has rated each of them numerically, the total score would indicate the rating of the building. The final score of each building was taken as the sum of the median scores of the three judges on each of the major items of the score card. It was considered advisable to have three judges score each building because in this way it is possible to eliminate any erratic scores which might come from the judgment of a single individual.

Table II shows the method of getting the final score for each building from the judgments of the three scorers. This table shows the scores given by each of the three judges and the final score of the Junior High School building. It is believed that these ratings of the buildings in Winona constitute a reliable measure of the educational efficiency of the buildings.

The Strayer-Engelhardt Score Card has been used in scoring hundreds of school buildings so that it is possible to make comparisons with other cities, on the basis of scores allotted. The points on which the buildings were scored and the maximum possible rating on each point of the score card are shown in Appendix "A" of this report.

TABLE II

SCORES ALLOTTED TO THE JUNIOR HIGH SCHOOL BUILDING BY THREE JUDGES

Scorer	1	2	3	Median	Median Total
Item I	80	67	76	..	75
A	48	45	45	45	..
B	28	20	26	26	..
C	4	2	5	4	..
Item II	54	63	68	..	61
A	10	10	10	10	..
B	24	29	36	29	..
C	20	24	22	22	..
Item III	119	111	94	..	105
A	41	41	32	41	..
B	16	12	15	15	..
C	10	12	10	10	..
D	6	10	7	7	..
E	7	4	5	5	..
F	16	9	7	9	..
G	13	23	18	18	..
H	10	0	0	0	..
Item IV	95	86	108	..	99
A	6	10	15	10	..
B	35	28	30	30	..
C	23	28	32	28	..
D	5	3	5	5	..
E	26	17	26	26	..
Item V	14	29	28	..	27
A	11	22	22	22	..
B	2	4	5	4	..
C	1	3	1	1	..
Total	362	356	374	..	367

Final score 367.

EXPLANATION OF THE SCORES

A building which attains a perfect score would be rated at 1,000. The meaning of scores lower than 1,000 is described by the authors of the score card in the following words:[1]

A score of 900-1,000 indicates a highly satisfactory degree of construction and equipment. In fact, in only a few minor respects does such a building deviate from acceptable standards. A rating between 700 and

[1] Strayer and Engelhardt, *The Classroom Teacher*, pp. 340-42.

900 points is fairly satisfactory. It should be studied in the light of its component parts. Slight building alterations will tend to raise considerably the score of a building of this group. A score of 600 to 700 points has meant, as experience in surveys points out, that considerable alteration was needed before buildings could be brought to a satisfactory standard of efficiency. Buildings that have scored 500 to 600 points have proven to be highly unsatisfactory and yet not so far gone but that extensive repairs and replacements could make them reasonably habitable. When the scores of buildings have fallen below 500 points, it has been the universal judgment of those who have applied the score card that speedy abandonment of the building for school purposes was the only justifiable course to be followed. In all instances where scores of 500 or less have resulted, it has seemed that expenditures for repairs would be highly excessive. It has also seemed that there was little possibility, even with the expenditure of relatively large sums of money, to secure as a result of such repairs a building which was suitable for school purposes in the modern sense.

THE BUILDING SCORES

Table III shows the total scores and the relative rankings of each of the eleven school buildings in Winona. The Senior High School building heads the list with a score of 679 out of a possible 1,000. The Junior High School is at the foot of the list

TABLE III

SCHOOL BUILDINGS OF WINONA ARRANGED IN THE ORDER OF TOTAL SCORES ALLOTTED

School Building	Rank	Total Score	Maximum Possible Score
Senior High	1	679	1,000
Jefferson	2	543	1,000
Lincoln	3	530	1,000
Jackson	4	513	1,000
Kosciusko	5	506	1,000
Washington	6	504	1,000
Madison	7	468	1,000
Central	8	455	1,000
Madison Annex	9	427	1,000
Sugar Loaf	10	420	1,000
Junior High	11	367	1,000

A school building that is rated at less than 500 points is considered unsuited for school use and should be abandoned. The Junior High, Sugar Loaf, Madison Annex, Central, and Madison buildings clearly fall in this group. The Washington and Kosciusko buildings are only slightly better.

with 367 points out of a possible maximum of 1,000. Five buildings, the Madison, Central, Madison Annex, Sugar Loaf, and Junior High School, score below 500 points and five school buildings, the Washington, Kosciusko, Jackson, Lincoln, and Jefferson score between 500 and 600 points.

Table IV gives the arrangement of the school buildings of Winona in the order of total scores allotted and shows the score on each of the sub-items that go to make up this total. By means of this table it is possible to see whether the low score, allotted to a given building, was due to defects in site, general structure of building, service systems, classrooms, or special rooms. From the information in this table, it is clear that the Senior High School, Junior High School, Lincoln, Jefferson, Kosciusko, and Sugar Loaf buildings are extremely deficient in site. This deficiency is due to the fact that no playground space has been provided in the case of each of these buildings.

TABLE IV

SCHOOL BUILDINGS OF WINONA ARRANGED ACCORDING TO THE TOTAL SCORE ALLOTTED TO EACH BUILDING

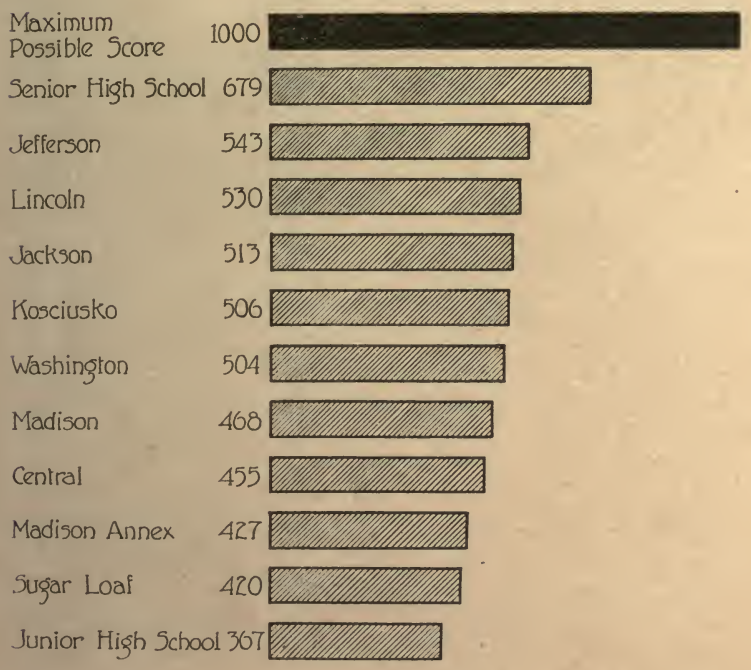
Building	Total Score of Building	Rank on Basis of Total Score	Sub-Items				
			Site	Building	Service systems	Classrooms	Special rooms
Senior High.....	679	1	80	133	192	213	61
Jefferson	543	2	69	95	146	176	57
Lincoln	530	3	74	93	138	190	35
Jackson	513	4	108	82	87	186	50
Kosciusko	506	5	67	92	125	174	48
Washington	504	6	108	86	116	159	35
Madison	468	7	98	79	103	147	41
Central	455	8	112	81	101	132	29
Madison Annex...	427	9	88	76	99	146	18
Sugar Loaf.....	420	10	57	78	63	169	53
Junior High.....	367	11	75	61	105	99	27
Maximum possible score....	1,000	..	125	165	280	290	140

This same table shows also that there is no single one of the school buildings in Winona that scores as high as 50 per cent of the total possible score, allotted for special rooms. The Senior High School which scored highest, receives only 61 out of a possible 140. Stated in plain words, it may be said that, with the exception of the Senior High School, there has been practically no provision made in the school buildings of Winona for special rooms. This is not to be wondered at because special rooms were not generally provided in school buildings erected before 1900. The low score of the Senior High School on the item of special rooms was, in large measure, due to the fact that no provision has been made in this building for a gymnasium or an auditorium. The scores allotted to the different buildings on each of the sub-items of the score card are shown graphically in Charts 1, 2, 3, and 4.

In order to get some basis for comparing the school building situation in Winona with that in other cities, Table V is inserted. It presents a comparison of the scores given to the elementary school buildings of Winona with those given to the elementary school buildings of Duluth and St. Paul. This table shows that whereas the cities of Duluth and St. Paul have 66 and 35 per cent respectively of their elementary school buildings scoring above 600 points, there is no single elementary school building in Winona which scores above 600. Winona has no single elementary school building which comes in even the "fairly satisfactory" class. In Winona, 44.4 per cent of the elementary school buildings come in the class usually recommended for abandonment and 55.6 per cent of them come in the class which is usually considered as being in need of extensive alterations, repairs, or additions. The facts of Table V are shown graphically in Chart 5.

CHART 1

SCHOOL BUILDINGS OF WINONA, ARRANGED IN ORDER OF RANK FOR TOTAL SCORES ALLOTED, AND COMPARED WITH THE MAXIMUM POSSIBLE TOTAL SCORE
(Strayer-Engelhardt Score Card)

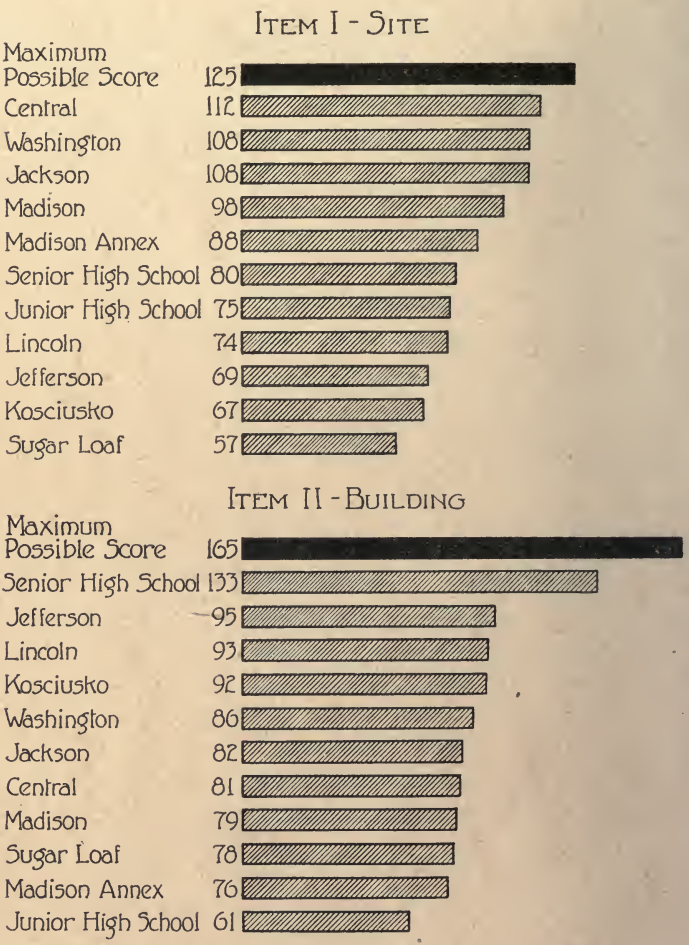


A building scoring from 900 to 1,000 is considered highly satisfactory. One scoring from 700 to 900 is fairly satisfactory. Buildings scoring from 600 to 700 commonly need alteration or additions. Those scoring between 500 and 600 are highly unsatisfactory and ordinarily can be made fit for school use only by complete overhauling and extensive additions. Buildings that score below 500 have usually been found unfit for school use and are ordinarily recommended for abandonment. Winona has no school building falling in even the fairly satisfactory class. Five out of the eleven school buildings of Winona score below 500 points and two others score only slightly above.

CHART 2

SCHOOL BUILDINGS OF WINONA, ARRANGED IN ORDER OF RANK FOR TOTAL SCORES ALLOTTED ON ITEMS I AND II, AND COMPARED WITH THE MAXIMUM POSSIBLE SCORE

(Strayer-Engelhardt Score Card)



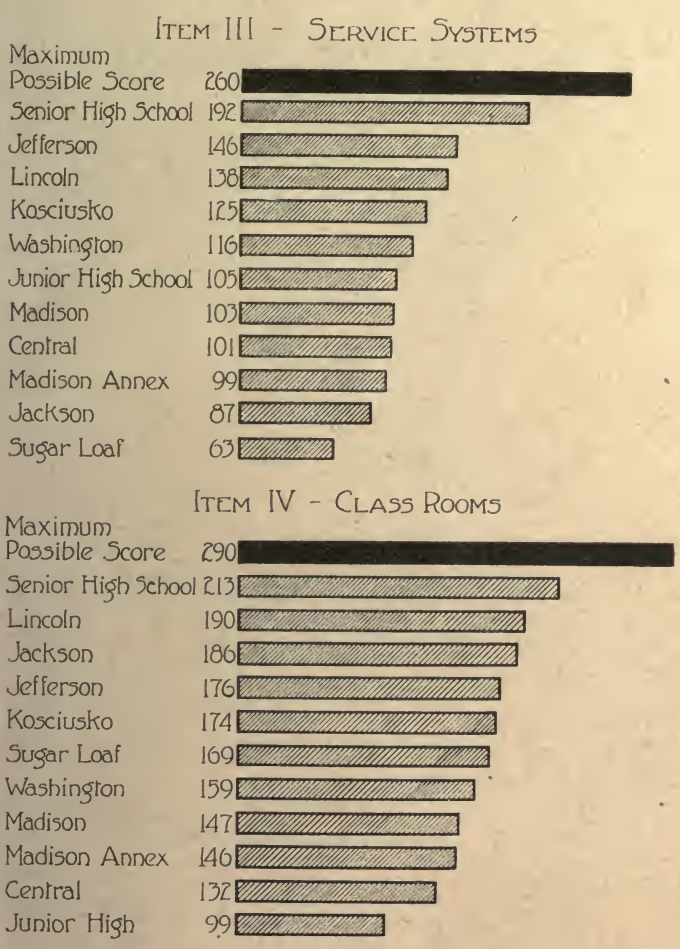
Of the eleven school buildings, six are extremely deficient in site and seven in building structure.

For sub-items making up Items I and II, see Appendix A.

CHART 3

SCHOOL BUILDINGS OF WINONA, ARRANGED IN ORDER OF RANK FOR TOTAL SCORES ALLOTTED ON ITEMS III AND IV, AND COMPARED WITH THE MAXIMUM POSSIBLE SCORE FOR THOSE ITEMS

(Strayer-Engelhardt Score Card)



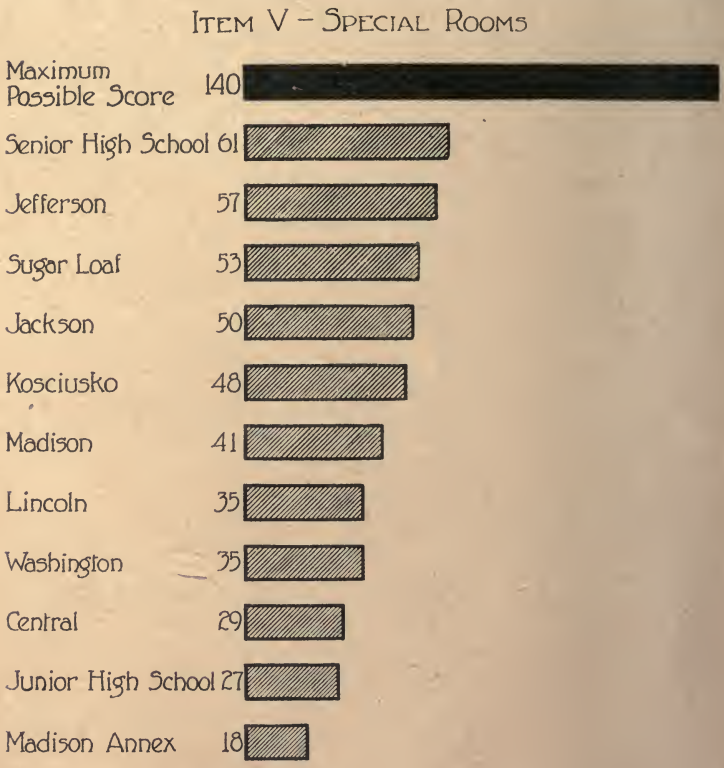
With the exception of the Senior High School building, all of Winona's buildings rank extremely low on the item of classrooms.

For sub-items making up Items III and IV, see Appendix A.

CHART 4

SCHOOL BUILDINGS OF WINONA, ARRANGED IN ORDER OF RANK FOR TOTAL SCORES ALLOTTED ON ITEM V, AND COMPARED WITH THE MAXIMUM POSSIBLE SCORE FOR THOSE ITEMS

(Strayer-Engelhardt Score Card)



All school buildings in Winona are extremely deficient in the item of special rooms.

For sub-items making up Item V, see Appendix A.

TABLE V

COMPARISON OF THE DISTRIBUTION IN PER CENTS OF ELEMENTARY SCHOOL BUILDINGS OF WINONA WITH THOSE OF DULUTH AND ST. PAUL, ON THE BASIS OF THEIR ALLOTTED SCORES ON THE STRAYER-ENGELHARDT SCORE CARD

Scores	Per Cent of Buildings Falling in Each 100-Point Group		
	Duluth	St. Paul	Winona
301- 400	9	4	0
401- 500	6	14	44.4
501- 600	19	47	55.6
601- 700	34	27	0
701- 800	16	6	0
801- 900	16	0	0
901-1,000	0	2	0
Total per cent.....	100	100	100

The majority of the elementary school buildings in Winona score lower than those in either St. Paul or Duluth.

It will be seen from the above table that 100 per cent of the Winona elementary school buildings score within the 400-600 range.

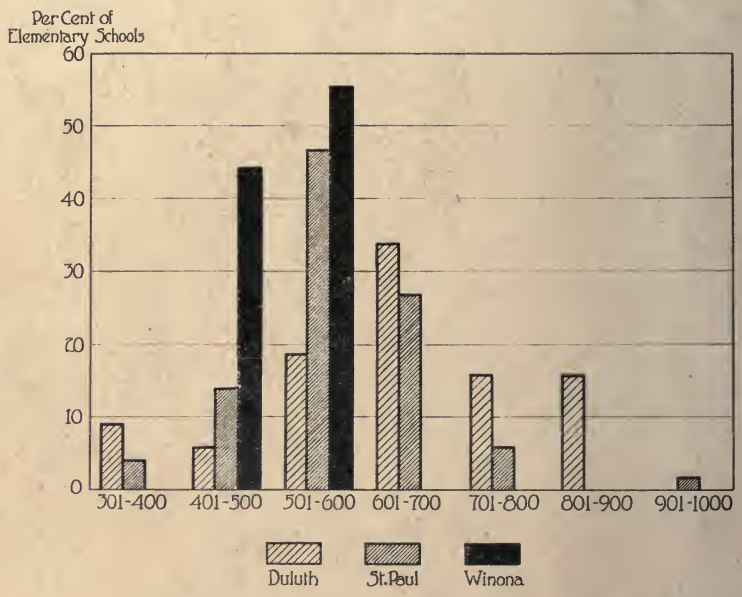
ANALYSIS OF SCHOOL BUILDING WEAKNESSES

The scoring of the school buildings by means of a standard score card indicates in a general way the condition of the school plant of Winona. The Junior High School, Sugar Loaf, Madison Annex, Central, and Madison buildings score below the point at which buildings are usually recommended for abandonment. The Washington, Kosciusko, and Jackson score only slightly above the point at which buildings are ordinarily recommended for displacement. The low scores made by these buildings together with their age, may be considered sufficient justification for the abandonment of the first five named buildings and for the abandonment of the Washington, Kosciusko, and Jackson schools as soon as the replacement of these buildings can be provided for in the building program adopted. The scores of the Lincoln and Jefferson buildings are not high and, in the opinion of the Survey Committee, mean that these buildings should not be utilized in the future without extensive additions and repairs.

The Senior High School which scores almost 150 points above any of the other school buildings in the city would be made fairly satisfactory with the addition of a gymnasium, an auditorium, and a lunch room.

CHART 5

PER CENT OF ELEMENTARY SCHOOL BUILDINGS FALLING IN EACH 100-POINT GROUP IN DULUTH, ST. PAUL, AND WINONA



This chart shows that 44.4 per cent of the elementary school buildings in Winona fall in the class usually recommended for abandonment and that the remainder of the elementary school buildings belong in the type where extensive alterations and repairs have ordinarily been found necessary.

In order to point out in a more definite and specific way some of the more striking weaknesses of the present school plant at Winona, it is believed desirable to supplement the scoring of the buildings with a discussion of the extent to which the school buildings of Winona fall short of the standards to which modern school buildings should conform.

ORIENTATION

School building authorities recommend that buildings should be so constructed that the windows will face the following directions, arranged in order of desirability: southeast, east, southwest, west, south, northeast, north, northwest. It was apparently a matter of chance in the construction of all the buildings in Winona, except the Senior High School, as to which direction the windows would face. If all the classrooms in Winona are considered, 34.7 per cent face the three most desirable directions while 36.1 per cent face the three least desirable directions.

PLAYGROUNDS

Table VI shows that adequate provisions for playground space has been made in very few of the school grounds of Winona. A very conservative standard for playground area is 100 square feet per pupil. Only the Washington, Madison, and Central schools come up to this minimum standard. The National Educational Association recommends 272 square feet per pupil as a reasonable size for school grounds. If this latter standard were adopted, there would be no single playground in Winona up to standard.

TABLE VI

TABLE SHOWING PLAYGROUND SPACE PER CHILD ENROLLED IN THE WINONA PUBLIC SCHOOLS, SUGAR LOAF SCHOOL NOT INCLUDED

Schools	Area, Square Feet of Playground Space	Enrollment 1921-22	Area, Square Feet per Child Enrolled
Washington	48,000	225	213.3
Central	48,150	288	167.2
Jackson	10,000	102	98.
Madison and Madison Annex	30,828	379	81.3
Lincoln	3,750	224	16.7
Jefferson	5,000	352	14.2
Kosciusko	0	190	0
Senior High	0	489	0
Junior High	0	356	0

BLACKBOARDS

Table VII shows the facts about the height of blackboards for classrooms in different grades in Winona. According to the very liberal standards set up in this table, it is apparent that blackboards for the lower grades have been built with practically no consideration for adapting them to the pupil groups which were to use them. The blackboards in the kindergarten and first and second grade rooms are above standard height for children in those grades in every elementary school building in the city. In Grade 3, 66.7 per cent are above the standard height, and in Grade 4, 50 per cent are above standard height.

TABLE VII

HEIGHT OF BLACKBOARDS IN THE KINDERGARTEN AND FIRST FOUR GRADES IN WINONA

	Kinder-garten	Grade 1	Grade 2	Grade 3	Grade 4
Medium height in inches..	29.8	29.5	29.8	29.8	30
Average height in inches..	30.6	29	29.6	29.6	30.2
Minimum height in inches.	28	28	28	28	28
Maximum height in inches.	36	30	32	32	36
Standard height in inches.	24–25	25–26	26–27	27–28	28–29
Per cent below standard..	...	...	...	...	...
Per cent standard.....	...	...	...	33.3	50
Per cent above standard...	100	100	100	66.7	50.

This table shows that the blackboards for the kindergarten and Grades 1 and 2 are above the standard height for children in those grades in all cases. In Grade 3, 66.7 per cent of the blackboards are above the standard height, and in Grade 4, just half are too high.

NATURAL LIGHTING

If the scores given to the natural lighting in all the classrooms in Winona are considered, they average about 60 per cent of what the scores should be if the amount of light provided in all the classrooms were up to standard.

In a standard classroom, the window space should be at least 20 per cent of the floor space. Table VIII shows that 83.5 per cent of all the classrooms in Winona are below this minimum standard. In 17.39 per cent of the classrooms the percentage is between 5 and 9, in 23.48 per cent it is between 10 and 14, and in 42.6 per cent, between 15 and 19. The relation of window area to floor area is shown graphically in Chart 6. A standard classroom should be lighted from one side, preferably the left, in order to avoid cross-lights which are a source of eye strain. Table IX shows that only 26.1 per cent of the classrooms of Winona meet this standard. In slightly over 6 per cent of the classrooms, pupils face one or more windows while they study.

TABLE VIII

PER CENT OF CLASSROOMS IN EACH OF THE SCHOOL BUILDINGS OF WINONA THAT HAVE LESS THAN THE STANDARD RATIO OF WINDOW SPACE TO FLOOR SPACE, THE PER CENT THAT HAVE STANDARD RATIO, AND THE PER CENT THAT HAVE ABOVE STANDARD RATIO

Buildings	Per Cent of Classrooms Having Less Than the Standard Ratio	Per Cent of Classrooms Having Standard Ratio	Per Cent of Classrooms Above Standard Ratio
Madison Annex	25	50	25
Jefferson	100	..	..
Junior High	70	10	20
Senior High	73.5	20.6	5.9
Sugar Loaf	100	..	..
Lincoln	100	..	..
Jackson	100	..	..
Kosciusko	70	20	10
Central	100	..	..
Madison	100	..	..
Washington	85.7	14.3	..
Total	83.5	11.3	5.2

In a standard classroom the window space should be 20 per cent of the floor space. In Winona 83.5 per cent of the classrooms are below this standard, 11.3 per cent reach the standard, and 5.2 per cent exceed it. In the Madison, Central, Jackson, Lincoln, Sugar Loaf, and Jefferson school buildings, there is no single classroom that has the standard amount of light.

For a graphical representation of these facts, see Chart 6.

TABLE IX

ORIENTATION OF ROOMS IN THE WINONA SCHOOL BUILDINGS*

Lighted From	No. of Rooms	Per Cent of Rooms
Left	30	26.1
Left and rear	56	48.7
Left, rear, and right	2	1.7
Left and right	0	0
Right	4	3.4
Right and rear	11	9.6
Front	1	.9
Front and right	3	2.6
Front and left	3	2.6
Rear	3	2.6
Rear, front, left, and right	1	.9
Front, left, and right	1	.9
Total	115	100

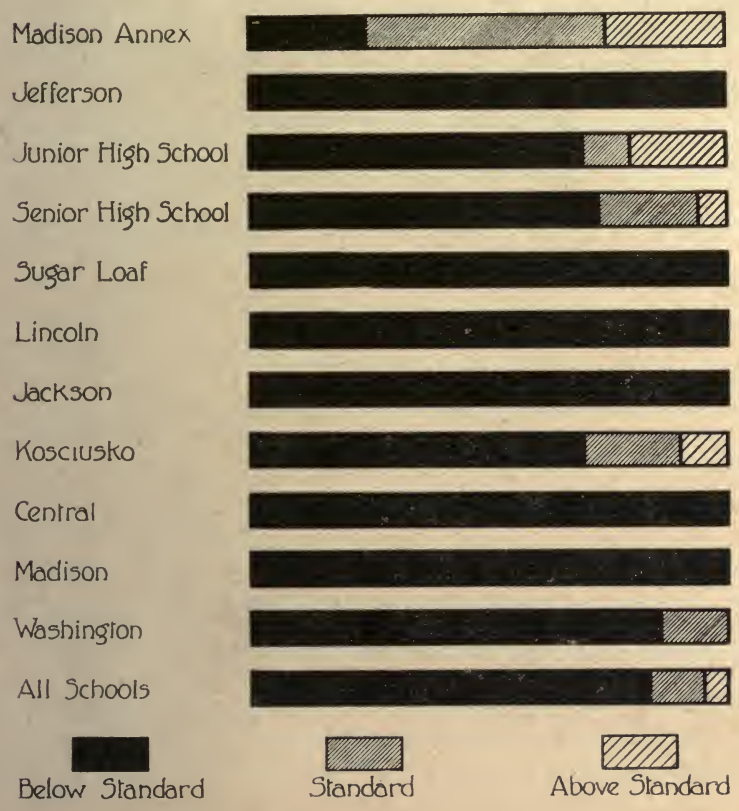
*From information furnished by the principals of the different schools in Winona, Minnesota.

Only 26.1 per cent of the classrooms in Winona are lighted from windows to the left of the pupils, which is the proper method; 3.4 per cent are lighted from the right; 2.6 per cent from the rear; 48.7 per cent from the left and rear; 9.6 per cent from the right and rear; 6.1 per cent from the front, front and right or front and left; and 3.5 per cent are lighted from three or four sides.

In order to study further the natural lighting in Winona school buildings, tests were made in five school buildings with a photometer or foot candle meter. The unit of measure for the intensity of light is the foot candle. An intensity of one foot candle would mean the intensity of one standard candle on an area of one square foot at a distance of one foot. For classrooms, study rooms, laboratories, and blackboards a standard of at least four foot candles would be an absolute minimum for natural lighting. Another standard that should be maintained is that the variation of illumination from one source should not be greater than 4 to 1. It is desirable also that the lighting should come from one side, preferably the left, in order to avoid cross-lights which are a source of eye strain.

CHART 6

THE RATIO OF WINDOW AREA TO FLOOR AREA IN THE DIFFERENT SCHOOL BUILDINGS OF WINONA



According to accepted standards, the window area in a classroom should be 20 per cent of the floor area. In the above chart the black portion to the left represents the per cent of classrooms in which the window area is less than 20 per cent of the floor area; the middle portion represents the number of rooms which are at standard; and the portion to the right, the per cent of rooms which are above the standard.

Six of the eleven school buildings in Winona have inadequate lighting in every classroom.

For the purpose of this survey a study was made of lighting in the classrooms of the Madison, Madison Annex, Jefferson, Junior High, and Senior High schools. The day was semi-cloudy with alternate clouds and sunshine. The study in the first two schools mentioned was made during midday; in the Junior High School between the hours of 9 and 11; and in the Senior High School during the last hour of the school day.

In the Madison School the light comes from two sides. The cloakrooms are practically devoid of illumination. The percentage which the glass area was of the floor area was less than half the standard required for normal lighting, running on the average a little less than 10 per cent for the entire building. On even the brightest day it would be impossible for these rooms to provide distribution that would furnish standard daylight illumination on the desks. The distribution of light in rooms of this building was about 10 to 1; that is, some parts of the room were ten times as well lighted as other parts. The most poorly lighted parts of the classrooms in the Madison building averaged about 60 per cent of the minimum standard illumination and the poorest lighting, found in any one room, was less than 40 per cent of the standard.

The natural lighting in the Jefferson elementary school and Junior High School was somewhat better but was far below the standard, the average distribution being about 8 to 1 in the Jefferson School and about 10 to 1 in the Junior High School. In neither of these buildings was the illumination up to standard, many cases being found where the illumination on desk tops was only 50 per cent of the standard.

The Madison Annex was not far below the standard in the amount of illumination but since the windows were on two sides of the rooms, there were strong cross-lights in every classroom.

Natural lighting in the Senior High School is well arranged and for the most part adequate. Excellent distribution was found in all the rooms except those facing the court. The mechanical drawing room used by Junior High School classes was deficient in lighting for those tables most distant from windows. In the emergency sewing room the natural light was only 20 per cent of the standard. In the special room, designed for that purpose, it was about 70 per cent.

The measurement of natural lighting in the Madison School building may be taken as typical of the Washington and Central buildings where the percentage which the window area is of the floor area runs about the same. In the Washington conditions are worse than in the Madison—except in the kindergarten room—and the Central is only slightly better than the Madison. The lighting in the Jefferson and the Junior High School represents about the conditions found in the Sugar Loaf, Lincoln, and Kosciusko. The lack of a sufficient amount of light and the improper orientation of the classrooms constitute a real menace to the eyesight of the school children of Winona.

ARTIFICIAL LIGHTING

The fact that the classrooms of Winona are deficient in natural lighting makes it necessary to provide artificial light in practically all the classrooms of the city. Some provision has been made in each of the buildings but, in general, it is very inadequate. On the basis of scores allotted, the artificial lighting is on the average only 35 per cent of standard efficiency. In the Madison building, no uniformity of methods is followed with respect to artificial lighting and the variation in distribution of rooms that were provided with artificial light was found to be very great. Only one room in this building had a distribution approaching the standard. This was Room 7 which was provided with two semidirect units with a total of 300 watts. The artificial lighting provided for the domestic science room was wholly inadequate. The manual training room and the toilets were without artificial lighting of any kind. In the Junior High School provision has been made for some sort of artificial illumination in all the rooms but no general policy seems to be followed as to type of units or as to method of illuminating. In no room was the lighting adequate. As long as these rooms are to be used for school purposes, an adequate system of artificial lighting is necessary. Semidirect units with a maximum of 400 watts for the smaller classrooms and 800 watts for the larger classrooms ought to be provided.

The poorest artificial lighting found in the Madison, Jefferson, and Junior High school buildings ran from 0 to 1 foot candle. The general conclusions which might be drawn from

this photometric study is that the natural lighting in the older school buildings of Winona is highly inadequate and that the system of artificial lighting provided does not adequately supplement it.

HEATING AND VENTILATION

The most commonly accepted heating and ventilating system for school buildings is the direct-mechanical, that is, direct radiators located in each room and a mechanically furnished air supply. Thermostatic control should be provided in all buildings to keep the temperature in any room at the proper degree. Each heating and ventilating system should also be equipped with efficient mechanical devices for keeping the air clean and supplied with the proper amount of moisture. The air should be taken in from above the roof or from a height of at least fifteen feet from the ground level.

As a whole, the heating systems used in the Winona school buildings are fairly satisfactory. Nine out of the eleven buildings have steam boilers, while two have hot air furnaces. Nearly all schools were reported by the principals as being satisfactorily heated, although it was noticed by the judges that the heat was not evenly distributed in all rooms, some rooms being entirely too warm as compared with standard temperature. This latter condition is due to the fact that thermostatic control is not provided in more than about half the buildings.

The ventilation in the Winona schools is less satisfactory than the heating. All except two buildings, namely, the Jackson and Sugar Loaf, are equipped with a fan for supplying the fresh air to the classrooms, but few of the buildings have a mechanical exhaust for foul air. In all except three schools, the air intake is at the ground level. In general, it may be said that the ventilating systems are below standard.

FIRE PROTECTION

Winona buildings are very poorly protected against fire. The median score on fire protection in all schools is only 22 per cent of the standard score. The only building which may be considered fireproof is the Senior High School. All the other buildings are fire traps, with wooden floors and stairways and inadequate

facilities for fighting fire. In one building only one fire extinguisher was provided and it had never been uncrated. The tower fire escapes, consisting of metal covered wooden stairways with wooden platforms leading to them, are almost worthless and can not be relied upon in case of fire.

It is impossible to make any one of the elementary school buildings in Winona perfectly safe from fire. However, those elementary buildings which are not to be immediately abandoned should be adequately equipped with fire extinguishers, fire hose, fire alarm systems, fire doors, fire partitions, and as far as possible, fireproof stairways.

TOILETS

The toilet facilities in the Winona schools are on the whole very unsatisfactory. The toilets are poorly distributed, unsanitary, and in many instances, inadequate. Such toilets as those found in the Jackson Building—inadequate, extremely unsanitary, with wooden seats, no seclusion, and located outside the building—should not be tolerated.

CLOAKROOMS

Cloakrooms should be under teacher control, easily accessible to the children, should provide ample space for winter wraps, and be so located as to make possible ventilation away from the classroom. They should be sufficiently large and so arranged as to avoid confusion. The hangers should be so placed as to be easily within the reach of pupils accommodated, and located so as to provide for free passage of air behind the wraps.

Cloakrooms in the Winona school buildings are in general below these standards. They seem to be located wherever there is a vacant space that might be used for the purpose. Few are directly under teacher control. Many of them are located in the corridors and some are located in the basement.

Since lockers are substituted for cloakrooms in the Senior High School, the facilities for taking care of wraps are satisfactory. However, these lockers should not have been located in the corridors as they now are but in separate rooms on each floor and in close connection with the study rooms and general toilets.

SPECIAL ROOMS

It has been previously pointed out that the school plant of Winona is almost entirely lacking in special rooms. It is highly desirable that even a modern elementary school building be provided with special rooms which will make possible the type of administration, instruction, and care of health, which a school building should provide. It is recommended that each of the elementary school buildings constructed, in carrying out the building program outlined in this survey, contain as a minimum a combination auditorium and gymnasium, which will serve as a place for community gatherings; a principal's office with an adjacent book and store room; a combination teachers' rest and lunch room; a lunch room for pupils; a nurse's room; a janitor's workroom and storeroom; and a bicycle room. The Junior High School should be provided with a large number of special rooms adapted to the administration and instructional work of a modern junior high school. In the present school plant of Winona, the offices for school officials are usually small and inadequate. There are no specially designed nurse's rooms, lunch rooms, teachers' rooms, janitor's rooms, playrooms, or studios. There are no library rooms in any of the elementary school buildings. It is recommended that no rooms be provided in the proposed new elementary schools for manual training, domestic science, or industrial work. It is believed that these subjects should be offered for the first time in the seventh, eighth, and ninth grades; all pupils receiving instruction in these subjects would therefore be attending the central Junior High School. Making provision for the teaching of these subjects in a single central junior high school would be economical in that it would prevent duplication of unnecessary special rooms and special equipment. It would also make it possible to utilize the time of the manual training and domestic science teachers more fully.

DRINKING AND WASHING FACILITIES

The drinking and washing facilities in the Winona school buildings, though for the most part adequate, so far as numbers go, are in many instances unsanitary and inconvenient. In several of the schools, bubblers attached to the faucets on the washbowls serve as drinking fountains. These are undesirable both

from the standpoint of convenience and of sanitation. The drinking fountains are not of the latest type, since pupils can touch their mouths directly to the metal tops of the bubblers. The best type of fountain is one so designed that children are not able to touch with their mouths the part from which the water comes. One washbowl should be provided for every fifty children. They should be located in toilet rooms, teachers' rooms, janitors' rooms, laboratories, and bathrooms, and should be provided with both hot and cold water.

BATHING FACILITIES

There are no bathing facilities whatever in any school building in Winona. Shower baths are considered desirable in all types of school buildings. They should be provided separately for boys and girls and located so as to be easily accessible from gymnasium and playgrounds. Individual shower stalls and adjoining dressing rooms should be provided and each medical inspection room should have an adjacent tub bath.

CONCLUSIONS

1. In this chapter it has been pointed out that the city of Winona has been inactive for many years in the construction of elementary school buildings and that her school building plant is now very inadequate from the point of view of modern health standards and modern educational needs.

2. With the exception of the Madison, Washington, and Central schools, the playground space is extremely inadequate. In view of the increasing emphasis now being given to physical training and supervised play, it would be highly desirable to purchase playground space around each of the school buildings, which would provide at least 100 square feet per pupil. Two or three times that much would be better.

3. With no exceptions, the elementary school buildings of Winona have an insufficient amount of window space to provide for natural lighting. The system of artificial lighting provided is inadequate. Indeed, it would hardly be possible to install any system of artificial lighting which would remedy the defects in the natural lighting of the Winona elementary school buildings.

4. With the exception of the Senior High School, every school building in Winona is a fire risk to such an extent that the lives of pupils in these school buildings are in danger every minute they occupy the buildings. It is believed that no city should run the risk involved in housing pupils in buildings of such a dangerous type.

5. Very little provision has been made in any of the school buildings of Winona for special rooms. The buildings were constructed before the standards for special rooms in school buildings were devised.

6. It is recommended that the Madison, Central, Madison Annex, Sugar Loaf, and Junior High school buildings be abandoned, as soon as new buildings can be constructed to provide for the children which these buildings now accommodate.

7. The Washington and Kosciusko buildings score just above the point at which school buildings are recommended for abandonment. The Jackson, Lincoln, and Jefferson buildings would need thorough overhauling and modernizing in order to be adapted to modern educational uses. The Senior High School building scores low, largely because of the fact that it has neither a gymnasium nor an auditorium.

CHAPTER II

THE NUMBER OF PUPILS IN WINONA FOR WHOM SCHOOL FACILITIES SHOULD BE PROVIDED

It is the purpose of this chapter to indicate briefly the present distribution of school pupils in the different elementary schools of Winona, to estimate the probable number of pupils to be provided for in the future, and to recommend a districting of the city which would prove most economical and most desirable educationally.

Winona was a rapidly growing city from 1870 to 1890. During the period between 1880 and 1890, the population of Winona increased 78.4 per cent, an increase more than 10 per cent greater than that of the entire state. From 1890 to 1900, the population of Winona increased 8.3 per cent. During the next ten-year period there was a decrease of 5.7 per cent, but from 1910 to 1920 there was a 3 per cent increase in total population of the city. These per cents are shown in Table X.

TABLE X

COMPARISON OF TREND OF POPULATION GROWTH IN MINNESOTA AND WINONA OVER A PERIOD OF YEARS

		Population	Increase over Previous Census Number*	Per Cent
1920	Minnesota	2,387,125	311,417	15.
1920	**Winona**	19,143	560	3.
1910	Minnesota	2,075,708	324,314	18.51
1910	**Winona**	18,583	—1,131	—5.7
1900	Minnesota	1,751,394	441,111	33.7
1900	**Winona**	19,714	1,506	8.3
1890	Minnesota	1,310,283	529,510	67.8
1890	**Winona**	18,208	8,000	78.4
1880	Minnesota	780,773	341,067	77.6
1880	**Winona**	10,208	3,016	41.9

* Decrease is indicated by a minus sign.

This table shows that Winona grew rapidly from 1870 to 1890 and that after a slight decrease during the period between 1900 and 1910 the population again started to increase during the period between 1910 and 1920.

Table XI shows that the population has not increased uniformly in all parts of the city, during the ten years between 1910 and 1920. During this period, Wards I and II increased in population 9.2 and 7.9 per cent, respectively, Ward III had an increase of 2 per cent, while Ward IV showed a decline in population of 5.4 per cent.

TABLE XI

TREND OF POPULATION IN WINONA BY WARDS FROM 1910 TO 1920*

Ward	Population 1910	Population 1920	Increase† 1910–20	Per Cent Increase 1910–20
I	5,604	6,121	517	9.2
II	3,549	3,828	279	7.9
III	3,704	3,777	73	2
IV	5,726	5,417	—309	—5.4
Total	18,583	19,143	560	3

* From the United States census returns.
† Decrease indicated by minus sign.

Wards I and II have increased in population 9.2 and 7.9 per cent respectively, during the decade between 1910 and 1920. Ward III has slightly more than held its own, and Ward IV has decreased in population 5.4 per cent. The gain in population for the entire city during the period was 3 per cent.

The total column at the right of Table XII shows that there has not been any great increase in the school enrollment during the ten years from 1912-13 up to 1921-22. The minimum total enrollment for the period was 2,466 for the school year 1912-13 and the maximum was 2,621 for the school year 1919-20. The average total enrollment for the ten school years mentioned was 2,557. In general then, it might be said that Winona is a city that seems to be settling down to a slow but steady growth after a period of decrease in the population, and that the school enrollment figures for the past ten years indicate a relatively constant school population which shows only a slight tendency to increase when the total enrollment figures for each year are considered.

TABLE XII

School Enrollment in Winona by Grades from 1912-13 to 1921-22

Year	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12	Total
1912-13	189	271	254	270	241	204	192	193	179	162	106	108	97	2,466
1913-14	230	277	258	223	237	245	201	205	177	164	129	103	93	2,542
1914-15	205	284	252	235	218	198	232	193	180	169	127	88	94	2,475
1915-16	240	307	241	189	243	226	187	231	166	166	158	114	98	2,566
1916-17	206	298	248	207	170	241	231	198	198	162	142	104	108	2,513
1917-18	233	299	249	214	223	181	244	215	185	176	157	94	108	2,578
1918-19	262	320	240	250	220	187	175	206	208	159	157	100	111	2,595
1919-20	273	314	262	224	180	206	203	176	207	178	166	106	126	2,621
1920-21	258	322	244	238	194	187	203	184	175	194	172	114	129	2,614
1921-22	203	296	225	224	225	189	190	197	147	212	207	133	149	2,597
Average	230	299	247	227	215	206	206	200	182	174	152	106	111	2,557

In order to get a better basis for estimating the school population to be provided for in each of the school districts, a study was made of the distribution of students now attending school in Winona by wards and precincts as well as by school districts. In order to make this distribution fit in with the types of educational organization recommended, the pupils were arranged in three groups, the first group comprising the elementary school pupils, those from the kindergarten through Grade 6; the second group, the junior high school pupils, including those from Grades 7 to 9 inclusive; and the third group, the senior high school pupils, or Grades 10 to 12 inclusive. Table XIII is interesting in

TABLE XIII

NUMBER OF ELEMENTARY, JUNIOR HIGH SCHOOL, AND SENIOR HIGH SCHOOL PUPILS ATTENDING SCHOOL IN WINONA IN APRIL, 1922, BY WARDS AND BY PRECINCTS*

	Elementary School Enrollment	Junior High Enrollment	Senior High Enrollment	Total
Ward I.....	679	233	167	1,079
Precinct 1.....	181	76	40	297
Precinct 2.....	158	47	39	244
Precinct 3.....	152	58	42	252
Precinct 4.....	188	52	46	286
Ward II.....	218	86	131	435
Precinct 1.....	117	46	55	218
Precinct 2.....	26	18	31	75
Precinct 3.....	75	22	45	142
Ward III.....	293	105	91	489
Precinct 1.....	99	50	32	181
Precinct 2.....	106	30	36	172
Precinct 3.....	88	25	23	136
Ward IV.....	361	60	45	466
Precinct 1.....	88	20	16	124
Precinct 2.....	109	30	17	156
Precinct 3.....	59	7	5	71
Precinct 4.....	105	3	7	115
Ward totals.....	1,551	484	434	2,469

* From count of spot maps furnished by the principals of each of the schools in Winona.

that it shows that Ward I furnishes over 43 per cent of the total public school enrollment of the city. Wards II and III furnish about 38 per cent and Ward IV, about 19 per cent of the total school population.

Table XIV shows the number of pupils by school divisions in each of the elementary school districts of Winona. The total number of pupils shown in this table does not agree exactly with the totals in Table XII for the reason that it was made from spot maps furnished by the principals of the individual schools. On these maps, the principals indicated the exact location of each pupil now attending school in the city of Winona. This fact, however, does not interfere with the purpose for which Table XIV is used.

TABLE XIV

NUMBER OF ELEMENTARY, JUNIOR HIGH SCHOOL, AND SENIOR HIGH SCHOOL PUPILS ATTENDING SCHOOL IN WINONA, IN APRIL, 1922, BY PRESENT SCHOOL DISTRICTS*

Districts	Elementary School Enrollment	Junior High Enrollment	Senior High Enrollment	Total
Jefferson	279	104	49	432
Madison	322	104	118	544
Lincoln	208	57	39	304
Central	215	99	126	440
Washington	139	41	40	220
Jackson	155	52	41	248
Kosciusko	197	27	18	242
Sugar Loaf	36	..	3	39
Total	1,551	484	434	2,469

* From a spot map count of the location of pupils furnished by the school principals.

ESTIMATE OF POPULATION INCREASE

In order to estimate the probable number of pupils to be provided for in any school building program now undertaken, it was believed necessary to estimate the population up to the year 1940. This period of time is not too long because it is well within the life of any new building constructed at this time and is

within the life of permanent improvements which might be recommended for making any of the present school buildings of Winona meet, in so far as possible, modern school building standards. The estimate of the city population made for 1940 is believed to be a very conservative one. It assumes that Winona will continue to grow slowly very much as it has during the past ten years. The population figures for 1930 and 1940 were determined by continuing the general population trend in each of the wards of the city, except in Ward IV where it is not believed that there will be much further decrease in population.

TABLE XV

POPULATION OF WINONA, BY WARDS AS SHOWN BY CENSUS RETURNS IN 1910 AND 1920 WITH ESTIMATES OF POPULATION IN 1930 AND 1940

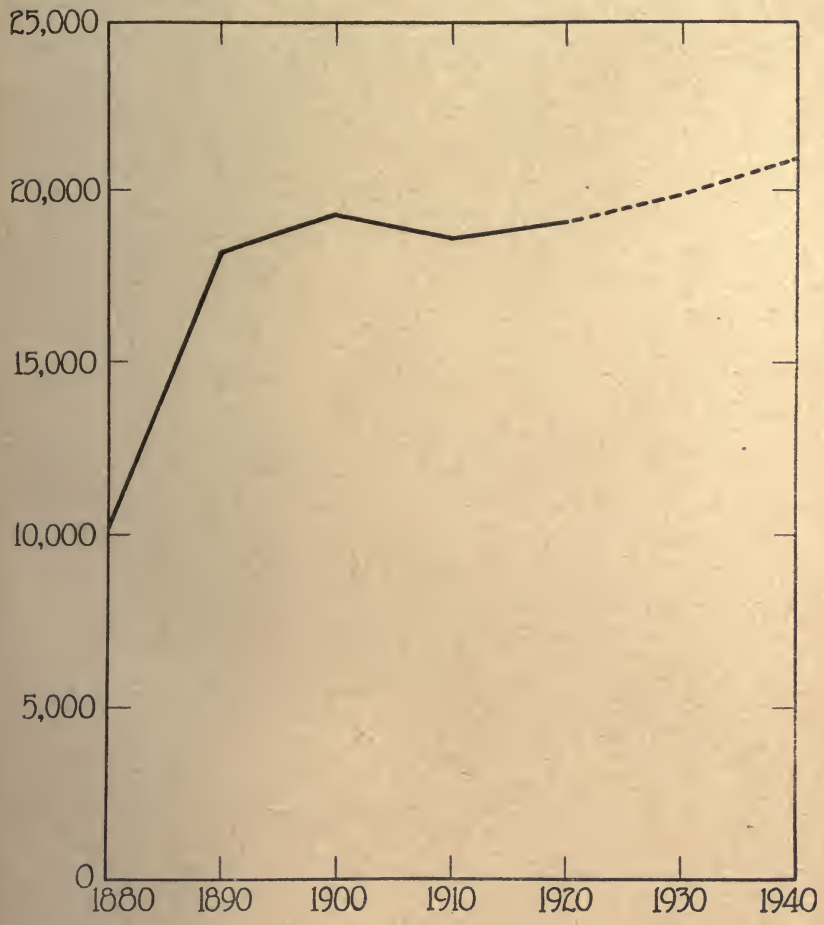
Wards	1910	1920	1930	1940
I	5,604	6,121	6,683	7,294
II	3,549	3,828	4,130	4,456
III	3,704	3,777	3,853	3,930
IV	5,726	5,417	5,200	5,200
Total	18,583	19,143	19,866	20,880

This estimate of the population trend in Winona assumes that each of the wards will continue the trend shown during the ten years between 1910 and 1920, except in Ward IV where it is estimated that there will be very little further decrease in population.

Table XV shows the United States census population figures for each of the four wards in 1910 and 1920 and the estimates of the population in these wards for 1930 and 1940. It is estimated that the total population of the city will be 20,880 by 1940. The trend of population for the entire city as shown by the United States census figures, and the estimated trend from 1920 to 1940 are represented graphically in Chart 7.

CHART 7

TREND OF POPULATION IN WINONA FROM 1880 TO 1920 AS SHOWN BY THE UNITED STATES CENSUS REPORTS, AND ESTIMATED TREND FROM 1920 TO 1940



This chart shows that, after the rapid period of growth from 1870 to 1890 and the slight decrease from 1900 to 1910, Winona has probably settled down to a slow and steady growth. It is estimated that by 1940 the population will be almost 21,000.

NUMBER OF PUPILS TO BE PROVIDED FOR BY 1940

It was next considered desirable to estimate the total number of public school pupils to be provided for out of this population of 20,880. This was done by estimating the per cent which the school population would be of the total population at that time. In 1910 the school population of Winona was 13.2 per cent of the total population. By 1920 this figure had increased to 13.7 per cent. It was estimated that by 1940 the school population would be approximately 15 per cent of the total population. On this basis, out of the total population of 20,880, there would be 3,132 public school pupils for whom building facilities should be provided. In order to tell the kind of building facilities that ought to be provided for these 3,132 pupils, it is necessary to make some estimate of the number of pupils who will attend the elementary school, the number who will have to be cared for in the Junior High School, and the number who will attend Senior High School.

As a basis for making this division, Tables XVI and XVII are inserted. The first of these tables shows the number of pupils in the kindergarten and in Grades 1 to 6, in Grades 7 to 9, and in Grades 10 to 12, by years from 1912 to 1922; and the second one shows the per cent of the total school enrollment found in each of the school divisions.

TABLE XVI

ENROLLMENT BY SCHOOL DIVISIONS IN WINONA FROM 1912 TO 1922

Year	Kindergarten	Grades 1–6	Grades 7–9	Grades 10–12	Total
1912-13	189	1,432	534	311	2,466
1913-14	230	1,441	546	325	2,542
1914-15	205	1,419	542	309	2,475
1915-16	240	1,393	563	370	2,566
1916-17	206	1,395	558	354	2,513
1917-18	233	1,410	576	359	2,578
1918-19	262	1,392	573	368	2,595
1919-20	273	1,389	561	398	2,621
1920-21	258	1,388	553	415	2,614
1921-22	203	1,349	556	489	2,597

TABLE XVII

PER CENT DISTRIBUTION OF ENROLLMENT BY SCHOOL DIVISIONS IN WINONA FROM 1912 TO 1922

Year	Kindergarten	Grades 1–6	Grades 7–9	Grades 10–12	Total
1912-13	7.7	58	21.7	12.6	100
1913-14	9	56.7	21.5	12.8	100
1914-15	8.3	57.3	21.9	12.5	100
1915-16	9.3	54.3	22	14.4	100
1916-17	8.2	55.5	22.2	14.1	100
1917-18	9	54.7	22.3	14	100
1918-19	10	53.7	22.1	14.2	100
1919-20	10.4	53	21.4	15.2	100
1920-21	9.9	53	21.1	16	100
1921-22	7.8	51.9	21.4	18.9	100

One of the most striking facts revealed in Table XVII is the large and increasing percentage of the school population which is enrolled in the senior high school grades. Ten per cent is considered a high proportion to have enrolled in Grades 10, 11, and 12. In Winona the percentage was 18.9 for the year 1921-22. Another striking fact is that there has been no increase in the percentage of pupils enrolled in the junior high school grades. This is undoubtedly due to the fact that no provision has been made in the junior high school for the seventh grade and to the further fact that the eighth and ninth grade pupils have been housed in a building which is in practically every way inadequate for the needs of a modern junior high school. There has been some decrease in the percentage of pupils enrolled in Grades 1 to 6 due largely to an increased percentage of pupils enrolling in the senior high school years.

After a careful study of Tables XVI and XVII, it is estimated that by 1940, 58 per cent of the total school enrollment will be found in the kindergarten and elementary school grades—that is, from the kindergarten through Grade 6; that 24 per cent will be enrolled in the junior high school—that is, Grades 7 to 9; and that 18 per cent of the total school enrollment will be in Grades 10, 11, and 12. On the basis of these percentages, it is estimated that the 3,132 pupils who may attend the public schools of Winona

by 1940 will be divided among the three school divisions as follows: kindergarten and elementary schools, 1,816; junior high school, 752; senior high school, 564. It is also estimated that provision will need to be made for at least 50 additional high school pupils who may attend from outside the Winona school district.

SUGGESTED REDISTRICTING

Before estimating the number of elementary school pupils to be provided for in each school district, it is desirable to make certain recommendations with respect to the rearrangement of the elementary school districts. It is recommended that the Washington and Kosciusko school districts be combined as soon as these buildings are replaced. It is recommended that the boundary line of this single district be Laird Street on the west. It is recommended further that the Central School district be enlarged by including in it the portion of the Jackson School district west of Laird Street. It is recommended also that the Sugar Loaf School building be abandoned and that the pupils from this school be transported either to the Washington or the Kosciusko School until such time as these buildings are replaced. In that event the pupils should be transported to the building which replaces the Washington and Kosciusko. It is recommended that other elementary school boundary lines be left as they are.

This recommended change in the boundary lines of these school districts will be discussed in detail in Chapter III of this report. Table XVIII shows the number of elementary school pupils, junior high school pupils, and senior high school pupils now residing within each of the proposed districts.

By 1940 it is estimated that the following school enrollment in each of these elementary school districts will need to be provided for—Washington-Kosciusko, 475; Central, 330; Madison, 400; Lincoln, 260; Jefferson, 350. Elementary school buildings should then be provided in the school building program adopted which would care for the number of pupils indicated above in each of the proposed districts. The Junior High School building should be constructed so as to provide for approximately 750 pupils.

TABLE XVIII

NUMBER OF ELEMENTARY, JUNIOR HIGH SCHOOL, AND SENIOR HIGH SCHOOL PUPILS ATTENDING SCHOOL IN WINONA IN APRIL, 1922, BY PROPOSED SCHOOL DISTRICTS*

Districts	Elementary School Enrollment	Junior High Enrollment	Senior High Enrollment	Total
Washington-Kosciusko†	456	85	69	610
Central‡	286	134	159	579
Madison	322	104	118	544
Lincoln	208	57	39	304
Jefferson	279	104	49	432
Total	1,551	484	434	2,469

* As determined from spot maps furnished by the school principals.

† Includes the elementary school pupils from the Sugar Loaf district and that portion of the Jackson bounded by Wabasha Street on the north and Laird Street on the east.

‡ Includes that portion of the Jackson School district west of Laird Street.

SUMMARY

1. It is recommended that the building program, undertaken at the present time, take into consideration the possible number of pupils to be accommodated in the different school divisions of Winona up to 1940.

2. It is estimated that by 1940 provision will need to be made for approximately 1,816 kindergarten and elementary school pupils, 752 junior high school pupils, and 564 senior high school pupils.

3. It is recommended that a rearrangement of the elementary school districts in Winona be made, so that the Sugar Loaf and Jackson school buildings will be abandoned, and so that the Washington and Kosciusko districts will be combined. This will mean that the Washington-Kosciusko district would provide for the elementary school pupils now enrolled in those schools and also for those now enrolled in the Sugar Loaf School. It is recommended that the portion of the Jackson School district east of Laird Street be annexed to the Washington-Kosciusko district and that the portion west of Laird Street be annexed to the Central School district.

4. With the district lines rearranged according to this plan, it is estimated that by 1940 the following numbers of elementary school pupils would need to be provided for in these districts: Washington-Kosciusko, 475; Central, 330; Madison, 400; Lincoln, 260; Jefferson, 350.

5. It is recommended that the capacity of the elementary school buildings planned for these districts be as above indicated.

6. It is recommended that a single junior high school building be erected with accommodations for 750 pupils. It is recommended that provision be made for approximately 600 senior high school students. With the addition of a gymnasium and an auditorium, it is believed that the present high school building will accommodate that number of students with careful planning of the daily schedule.

CHAPTER III

THE PROPOSED SCHOOL BUILDING PROGRAM FOR WINONA

In Chapter I, it was pointed out that on the basis of the scores allotted to the Junior High, Sugar Loaf, Madison Annex, and Madison school buildings, they should be recommended for replacement in the immediate future. In addition to the building scores, information was presented about each of these buildings, showing that they were unsafe, unhealthful, and not adapted to the needs of modern education. It was also shown that the Washington and the Kosciusko buildings score only slightly above the point where buildings are usually recommended for abandonment. Evidence was also presented which showed that the Lincoln and the Jefferson schools need to undergo very extensive general overhauling and repairing before they may be considered satisfactory for school use. In Chapter II, studies of the population and school enrollment were presented and suggestions relative to a rearrangement of school districts were made. It was estimated that by 1940 provision should be made for about 600 senior high school pupils (Grades 10 to 12), 752 junior high school pupils (Grades 7 to 9), 1,816 elementary school pupils (kindergarten to Grade 6). In this chapter it is desired to utilize these facts and some others in recommending a building program to the Board of Education and citizens of Winona.

THE JUNIOR HIGH SCHOOL

It is recommended that the present Junior High School building be abandoned and that a single building be constructed to take care of the total junior high school enrollment in Grades 7, 8, and 9 of the entire city. It is estimated that the enrollment in these grades will reach 752 by 1940 and it is recommended that the building be planned and built to accommodate that number. Many cities are now building junior high school buildings on sites of from seven to ten acres or more. The necessity for play space and athletic fields has been one of the chief factors in the selection of such sites. On account of the peculiar arrangement

of the city of Winona, however, it is not recommended that the building be located on a site of this size. To get such a site would necessitate locating the building far from the center of the city or paying what would be practically a prohibitive price for three or four blocks of improved property. It is therefore recommended that a single block of land be purchased, if possible, near the present Junior High School site.

It is strongly recommended that a single junior high school building be erected. The city of Winona is not so long but that the great majority of the pupils would live within a reasonable distance of a building constructed near the present Junior High School building site. School building authorities set a mile and a half as a reasonable maximum radius for a junior high school district. Figure 1 shows that a circle drawn from the corner of Winona Street and Broadway, with a radius of one and one-half miles includes all but fourteen of the junior high school students in Winona (seventh, eighth, and ninth grade pupils

FIGURE 1 Distribution of Junior High School pupils in Winona. Seventh, eighth and ninth grades included. This map shows that all but fourteen pupils are included within a one-and-one-half mile radius from the corner of Winona St and Broadway. A one-and-one-half mile radius is considered a reasonable maximum for a Junior High School District

included). The distance is not too great to have a single building. The strongest argument for a single building, however, lies in the fact that it would be financially and educationally much more economical to have a single junior high school building than to have this work divided between two buildings. It would be financially economical to have the single building because duplicate provision would not have to be made for laboratories and shops. A single junior high school principal could supervise the school. Duplication of expensive equipment would be avoided. The larger grouping of pupils in a single school would make possible a more economical grouping of pupils into class units. It would be educationally more economical because it would make it possible to have the junior high school separate from the elementary schools. This has always been found desirable educationally. In the second place, it would make possible a better classification of pupils, and thirdly, it would make possible greater specialization on the part of teachers.

Between the site of the present Senior High School and that chosen for the proposed junior high school, it is recommended that a combined gymnasium and auditorium building be constructed which will be large enough to care for the needs of both the Junior and the Senior High School pupils. An auditorium and gymnasium, thus located, could be made to serve the needs of both schools and would be a splendid community asset.

THE CENTRAL SCHOOL

It is recommended that this building be replaced by a modern elementary school building to care for the kindergarten and Grades 1 to 6, inclusive. It is recommended that the present boundary line of the Central district be changed so as to include all those pupils in the Jackson School district west of Laird Street. It is recommended that the capacity of this building be 350 pupils.

THE MADISON SCHOOL

It is recommended that the Madison Annex and the Madison elementary school buildings be replaced by a modern elementary school building erected on the same site to care for an ultimate enrollment of 400 kindergarten and elementary school pupils.

THE SUGAR LOAF BUILDING

It is recommended that this building be abandoned and that the pupils now attending this school be transported to the other elementary schools. This change may be justified on the ground that the school building is very inadequate, scoring only 420 out of a possible 1,000 points. This score is below the point at which schools are usually recommended for abandonment. In the second place, the pupils attending this school could be much more efficiently cared for if they were transported to one of the elementary schools in the city proper. The expense of the transportation would certainly be no greater than the expense of maintaining the present school building and paying salaries of teachers whose time might be saved if these forty-two pupils might be distributed among grades of one or more of the present elementary schools. A study of the enrollment by classes indicates that there is now room in the classes of several buildings for the few pupils who attend the Sugar Loaf School.

THE JEFFERSON SCHOOL BUILDING

The following recommendations are made with respect to the Jefferson building:

1. A competent architect should be employed to make plans and estimates for thoroughly overhauling and modernizing this building.

2. The remainder of the block on which this building stands should be purchased for playground purposes.

3. A combination gymnasium and auditorium should be added to this building so that it may be used for community purposes.

4. As a part of the overhauling of this building, the natural lighting should be improved; an adequate system of artificial lighting should be installed; the basement and stairways should be rearranged and made fireproof; the arrangement of the toilets should be made modern; and the heating plant should, if possible, be moved from under the present building.

5. Toilets and washing facilities should be provided in the kindergarten room.

THE LINCOLN SCHOOL BUILDING

Practically the same recommendations are made with respect to the Lincoln building as were made with respect to the Jefferson. An architect should make estimates and draw plans for modernizing this building. Since there is practically no playground space, it is recommended that the rest of the block be bought for that purpose. In modernizing the building, the following points should be considered:

1. The classroom windows are four feet from the floor on one side of the rooms and about eight feet from the floor in the rear. This gives a sort of prison-like appearance to the rooms in which the elementary grades are located since the bottoms of the windows are in some cases nearly two feet above the tops of the desks.

2. The fresh air for this building should be taken in from at least fifteen feet above the ground level and preferably from the top of the building.

3. The basement and the storerooms in the basement should be made fireproof, and the heating plant should be moved from under the building, if possible.

4. The stairways and corridors should be rearranged and the stairways should be made fireproof.

5. An adequate system of artificial lighting should be installed.

6. The toilet system should be thoroughly modernized. Washbowl and toilets should be provided in the kindergarten room.

THE JACKSON SCHOOL

It is recommended that the Jackson building be abandoned and the pupils west of Laird Street be sent to the proposed new Central School. Those to the east of Laird Street might be cared for in either the Central or the Kosciusko until such time as a single elementary school building is constructed to take the place of the Washington and Kosciusko buildings. After the construction of this building, the pupils east of Laird Street should be accommodated in it. If a location for this proposed building could be secured about halfway between the Washington and Kosciusko buildings, no child in the Jackson district, as it is now constituted, would be outside of a circle drawn with a one-half mile radius from one or the other of these elementary schools.

THE WASHINGTON AND KOSCIUSKO SCHOOLS

It is recommended that as the last step in this building program a single elementary school building be constructed approximately midway between the Washington and Kosciusko buildings to take care of all the kindergarten and elementary school enrollment (Grades 1 to 6) in both districts, and that additional provision be made for caring for the children who would be transported from the Sugar Loaf district as well as those east of Laird Street in the Jackson district. The estimated number of pupils to be cared for in this building is 475. A site could be chosen for such a building so that practically every pupil in the district would live within a half-mile radius of the school.

WOULD SUCH A CONSOLIDATION PLAN BE REASONABLE?

Figure 2 is an outline map of the city of Winona with the present school districts sketched in, in heavy black ink lines. Circles were drawn on the map with a radius of one-half mile, using the present school buildings as centers. This map is interesting because it shows the enormous amount of overlapping of elementary school districts when a very reasonable standard of one-half mile radius for each is taken.

The overlapping is greatest in the case of the Central. Washington, Kosciusko, and Jackson school districts. There are certain blocks where pupils are within one-half mile of either of these four school buildings. The circle with the cross lines drawn on the map has a one-half mile radius and its center is located at about the point where the building recommended to replace the Washington and Kosciusko school buildings should be built. If this proposed building were located as shown on this map, there would be only seven elementary pupils from the Washington and Kosciusko districts left outside of the one-half mile radius. In no case would any one of these seven pupils be more than one block outside of the radius named. Figure 3 shows the redistricting plan recommended. The dots on this map indicate the pupils who would be outside the circles with one-half mile radii under the proposed plan of districting. The largest number of pupils who would live more than one-half mile from

the elementary school would be found in the western part of town. In the vicinity of the point where the boundary line between the Madison and Central school districts meets the Mississippi River, there are about seven pupils who are without a one-half mile radius. In the Jefferson School district, there are twenty-nine elementary school pupils in the extreme western part who are outside of a one-half mile radius from that school.

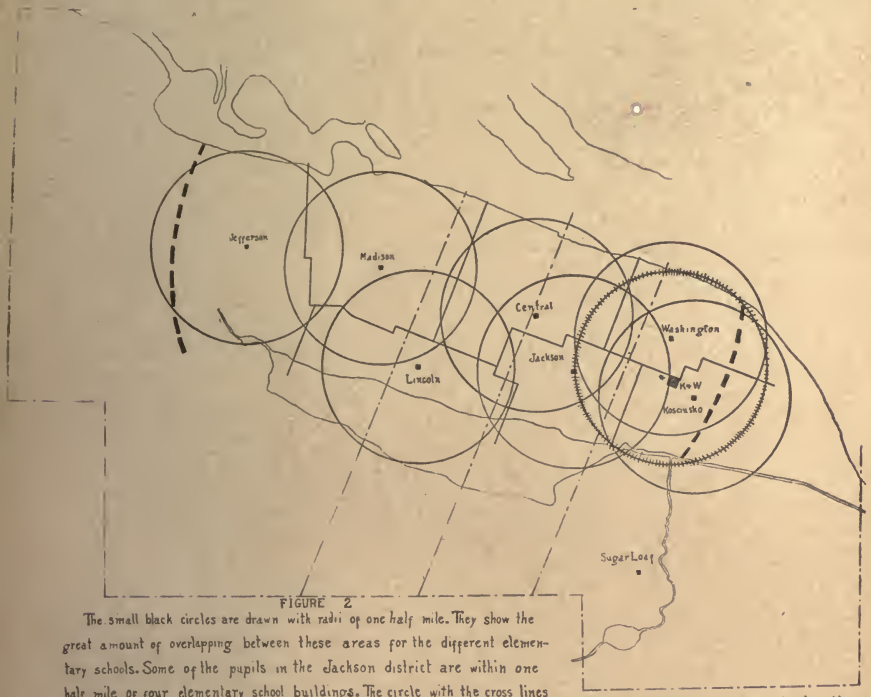


FIGURE 2

The small black circles are drawn with radii of one half mile. They show the great amount of overlapping between these areas for the different elementary schools. Some of the pupils in the Jackson district are within one half mile of four elementary school buildings. The circle with the cross lines is drawn to show that all the elementary pupils in the Washington and Kosciusko buildings, except seven, would be included in a circle of half mile radius drawn from a point between those two buildings.

* The cross hatched square indicates the approximate location recommended for the building to replace the Washington and Kosciusko buildings.

ADVANTAGES OF CONSOLIDATION

The inclusion of such a consolidation in the Winona building program would be a long step in the direction of economy for the following reasons:

1. The small building makes it impossible to secure the highest type of supervisory service from the principals because the cost of employing a high type of principal for a six- or an eight-room building is prohibitive.

2. It is impossible to make provision for the right sort of instructional and recreational facilities where the small building idea is prevalent. Gymnasiums, playrooms, lunch rooms, lunch service, playground equipment, shower baths, bicycle rooms, auditorium, motion picture equipment, teachers' rest rooms, etc., would be too expensive in small school buildings. In large school buildings, they may be provided without greatly increasing the per capita cost.

3. With a number of small school buildings, it is impossible to utilize the services of special teachers of art, music, physical training, manual training, home economics, etc., without a great waste of time in having teachers walk or ride from one building to another. Moreover, special teachers who come into a building for a brief period do not have the influence of teachers who remain for a longer period of time and who are available for consultations with students and teachers.

4. In small school buildings, it is impossible to put into practice a sound policy of grouping pupils according to their special abilities.

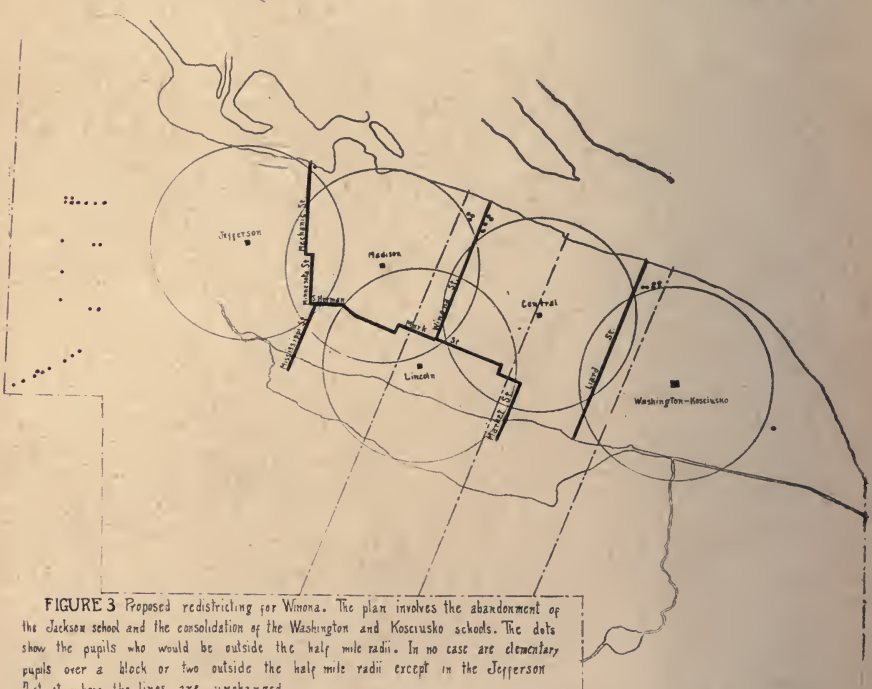


FIGURE 3 Proposed redistricting for Winona. The plan involves the abandonment of the Jackson school and the consolidation of the Washington and Kosciusko schools. The dots show the pupils who would be outside the half mile radii. In no case are elementary pupils over a block or two outside the half mile radii except in the Jefferson District where the lines are unchanged.

THE COST OF THE PROGRAM

No attempt is made in this survey to estimate the exact cost of such a building program. The services of a competent school architect should be secured to make an estimate on the building program which the board adopts. A rough estimate of the probable cost of the entire program recommended indicates that it will be about $1,150,000.* This estimate includes the cost of the additional playgrounds recommended and the cost of equipping the buildings. In case only a part of this program is undertaken, it is recommended that this order be followed:

1. Erection of a Junior High School building and a gymnasium and auditorium for the Junior and the Senior High schools.

2. The erection of modern elementary schools to replace the Madison and the Central. Thorough modernization of the Lincoln and the Jefferson.

3. The erection of a single building to replace the Washington and the Kosciusko.

* Since this estimate was made, the cost of building materials has materially increased. The amount set is therefore too low at present prices.

CHAPTER IV

THE ABILITY OF WINONA TO FINANCE THE PROPOSED PROGRAM

The foregoing portions of this report have shown that the physical condition of the school plant in Winona is far short of what modern education demands. Several of her buildings are so old and worn as to need immediate replacement. They are entirely unsuited to meet the needs of up-to-date American school activities. Winona has a building program to face. She can not escape it if she intends to make adequate provision for the health and safety of her school children.

How is she fixed financially? Can Winona construct the buildings needed without placing heavier tax burdens on her people than other cities are carrying? In this chapter, facts bearing on these questions will be presented. The method of this section of the report will be to compare Winona with other cities in order to show how she ranks in the important items which should be considered.

The task of selecting a list of cities to serve as a basis of comparison is not a simple one. First, to be fair, the cities compared must be of about the same size. Second, they must be cities of the same type. Winona is a trading center and small manufacturing city. Third, the cities must be located in about the same environment as regards climate, type of population, and wealth of surrounding territory. Fourth, the rate of increase in population must be approximately the same, for a rapidly growing city faces educational needs which an older, more slowly growing city does not experience. Cities have been selected for comparison which have either stood still or grown slowly for the last twenty years. Two sets of cities have been used, not that two lists are necessarily better than one, but because similar data could be found for the cities in each list which could not be secured for all. Also, the wider the basis of comparison, the fairer the study will be and the safer the conclusions drawn. One list is made up of the cities shown in Table XIX. All these cities are of about the same size as Winona; they are all located in the Mississippi Valley; and have all grown rather slowly for the past twenty years.

TABLE XIX

POPULATION BY DECADES OF FOURTEEN CITIES USED IN MAKING FINANCIAL COMPARISONS*

City	1920	1910	1900
Alton, Illinois	24,682	17,528	14,210
Appleton, Wisconsin	19,561	16,773	15,085
Cairo, Illinois	15,203	14,548	12,566
Clinton, Iowa	24,151	25,577	22,698
Eau Claire, Wisconsin	20,906	18,310	17,517
Freeport, Illinois	19,669	17,567	13,258
Galesburg, Illinois	23,834	22,089	18,607
Kankakee, Illinois	16,753	13,986	13,595
Keokuk, Iowa	14,423	14,008	14,641
Logansport, Indiana	21,626	19,050	16,204
Richmond, Indiana	26,765	22,324	18,226
Streator, Illinois	14,779	14,253	14,079
Ottumwa, Iowa	23,003	22,012	18,197
Winona, Minnesota	19,143	18,583	19,714

* The United States census returns.

The second list, shown in Table XX, is made up of the largest Minnesota cities whose population has grown slowly and with which it would be fair to compare Winona. On account

TABLE XX

POPULATION BY DECADES OF TEN MINNESOTA CITIES USED IN MAKING FINANCIAL COMPARISONS*

City	1920	1910	1900
Brainerd	9,591	8,526	7,524
Crookston	6,825	7,559	5,359
Faribault	11,089	9,001	7,868
Fergus Falls	7,581	6,887	6,072
Mankato,	12,469	10,365	10,599
Moorhead	5,720	4,840	....
Owatonna	7,252	5,658	5,561
Red Wing	8,637	9,048	7,525
Willmar	5,892	4,135	....
Winona	19,143	18,583	19,714

* The United States census returns, 1920.

of the care used in the selection of cities, it is believed that all comparisons made are entirely fair to Winona and show the situation in its true setting.

WINONA'S FINANCIAL CONDITION

What is Winona's present financial condition? How heavily in debt is she? How much taxable wealth has she to draw upon for financing the proposed school building program?

Winona has a total bonded indebtedness of $606,000. Of this amount, $205,000 is for schools. Thus, approximately one third of her debt has been contracted for education. It is generally found that fully one half of the total debt of a city is for schools, and frequently this proportion runs considerably higher. The bonded debt for schools in Winona is the lowest of any of the Minnesota cities in Table XXI. She has but $10.50 school debt per capita of population while Moorhead has $87.40, and Owatonna, $78.30. These two cities with much less than half the population of Winona have recently invested a half million dollars in school buildings.

TABLE XXI

PER CAPITA DEBT OF MINNESOTA CITIES FOR SCHOOLS

City	Per Capita School Debt, 1921	
Moorhead	$87.40	
Owatonna	78.30	
Willmar	35.30	The median point of the debt of these cities is $27.65 per capita of population.
Mankato	32.80	
Crookston	31.50	
Red Wing	23.80	
Fergus Falls	21.80	
Faribault	18.60	
Brainerd	10.90	
Winona	10.50	

The above data were taken from the 1921 report of the Minnesota State High School Inspector. Winona's figure includes all bonds sold up to April 1, 1922, in addition to those given in the above report. Winona has little bonded debt for school purposes.

TABLE XXII

TOTAL AMOUNTS SPENT EACH YEAR FOR LAND, NEW BUILDINGS, AND EQUIPMENT IN MINNESOTA CITIES. DATA FROM STATE HIGH SCHOOL INSPECTOR'S REPORTS

Cities	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904
Brainerd ..	1,819	6,398	683	2,228	6,538	775	6,021	6,128	4,100	2,700	2,800	9,287	No report	2,152	2,596	2,128	3,091	48,958
Crookston .	2,602	7,397	558	433	1,369	1,819	40,258	106,777	15,142	6,436	10,097	12,050	44,263	16,113	3,310	4,830	6,397	480
Faribault ..	....	....	....	1,201	6,302	47,225	144,697	26,500	24,052	961	1,615	518	881	957	24,893	3,403	1,358	1,290
Fergus Falls	1,236	725	1,208	1,637	1,631	1,597	44,906	22,397	556	2,700	No report	1,548	3,853	770	628	34,564	59,649	1,091
Mankato ..	73,381	111,316	76,270	9,455	7,600	1,700	1,859	2,300	3,700	16,098	85,820	7,284	278	188	51	5,290	....	40
Owatonna .	49,077	2,225	1,315	5,324	6,231	1,656	2,254	16,776	2,200	681	4,600	1,886	326	483	1,922	9,289	....	399
Red Wing..	486	1,534	1,834	62,814	124,026	16,791	1,121	237	3,500	330	12,566	52,448	No report	700	654	662	490	216
Winona ...	138	....	....	16,509	119,557	47,804	446	1,541	379	3,976	800	794	98	137	104	168	250	249

Except for the years 1916, 1917, 1918, when the new high school was being built, Winona has spent very little for the above items and practically nothing for the items, land and new buildings.

Why is it that Winona has little school debt? Has she spent money but paid off her debts, or has she simply gone along, year after year, spending little or nothing? Table XXII shows the latter to have been the practice. This table shows the expenditures for land, new buildings, and equipment in eight Minnesota cities year by year from 1904 to the present time. A glance at the table shows at once that, except for the erection of the Senior High School in 1916 and 1917, Winona has spent practically nothing on school buildings or land in eighteen years. Table XXIII, which summarizes the figures given in Table XXII, brings out the fact that Winona has spent but fifty-six cents per capita of population per year for the purposes mentioned. Every one of the other seven cities has spent more. Crookston and Mankato have each spent over two dollars per capita per year, or about four times as much as Winona. Compared with other cities, Winona has a small amount of debt and has spent little money for buildings for a long time.

TABLE XXIII

EXPENDITURES FOR CAPITAL OUTLAY OF WINONA AND SEVEN OTHER COMPARABLE MINNESOTA CITIES, 1904-21

City	Total Expenditures for Land, New Buildings, and Equipment, 1904-21	Average per Capita Expenditures per Annum
Crookston	$280,331	$2.33
Mankato	402,639	2 01
Red Wing	280,409	1.96
Faribault	285,853	1.70
Fergus Falls	180,696	1.60
Owatonna	106,644	.95
Brainerd	108,402	.75
Winona	192,950	.56

This table shows that Winona has spent very little for land, new buildings and equipment when compared with other Minnesota cities.

Why has Winona not spent money for schools at somewhere near the rate of other Minnesota cities? Is it because she is poor and does not have it to spend? Tables XXIV, XXV, XXVI, XXVII, and XXVIII throw light on these questions. Table

XXIV, showing the assessed values of real estate and personal property in 14 Mississippi Valley cities and the ratio between this valuation and the true valuation makes it possible to tabulate in the fourth column the real wealth of the various cities. Table XXV gives the ranking of these cities on the basis of real wealth per capita while Table XXVI ranks them on the basis of the amount of wealth behind each child in average daily attendance in school. Winona, with $962 per capita of population, ranks sixth of the fourteen cities. Winona is above the average middle western city in wealth per capita. The amount of money behind each child in school is also high. Winona has $8,423 for each child in average daily attendance which is $1,634 or 24 per cent more than the median or middle city possesses.

TABLE XXIV

ASSESSED VALUATION, THE RATIO OF ASSESSED TO REAL OR TRUE VALUATION, AND THE REAL VALUATION OF FOURTEEN MISSISSIPPI VALLEY CITIES OF ABOUT WINONA'S POPULATION IN 1917-18

City	Assessed Value in Thousands of Dollars	Ratio of Assessed to Real Value	True Valuation of Real and Personal Property
Alton, Illinois	$ 4,752	14	$33,942,000
Appleton, Wisconsin ..	20,000	90	22,222,000
Cairo, Illinois	4,203	60	7,005,000
Clinton, Iowa	3,120	25	12,480,000
Eau Claire, Wisconsin.	13,811	67	20,613,000
Freeport, Illinois.....	5,547	33	16,641,000
Galesburg, Illinois	7,535	33	22,605,000
Kankakee, Illinois.....	4,533	33	13,599,000
Keokuk, Iowa.....	3,145	23	13,672,000
Logansport, Indiana...	10,247	50	20,494,000
Ottumwa, Iowa	5,265	25	21,060,000
Richmond, Indiana....	17,809	59	35,618,000
Streator, Illinois	3,100	20	15,500,000
Winona, Minnesota...	7,499	40	18,624,000

Basic data, with the exception of those for Winona, from Bonner, H. R., *Statistics of City School System, 1917-18,* pp. 468-77. Figures for Winona are from *Minnesota State High School Inspector's Report*, 1917-18.

TABLE XXV

REAL WEALTH PER CAPITA OF FOURTEEN MISSISSIPPI VALLEY CITIES OF ABOUT THE SAME POPULATION AS WINONA. DATA FOR 1917-18

City	Real Wealth per Capita
1. Alton, Illinois	$1,374
2. Richmond, Indiana	1,331
3. Appleton, Wisconsin	1,136
4. Streator, Illinois	1,048
5. Eau Claire, Wisconsin	986
6. **Winona, Minnesota**	962
7. Galesburg, Illinois	948
8. Keokuk, Iowa	948
9. Logansport, Indiana	947
10. Ottumwa, Iowa	911
11. Freeport, Illinois	846
12. Kankakee, Illinois	811
13. Clinton, Iowa	516
14. Cairo, Illinois	461

Winona stands above the middle city in amount of wealth per capita.

TABLE XXVI

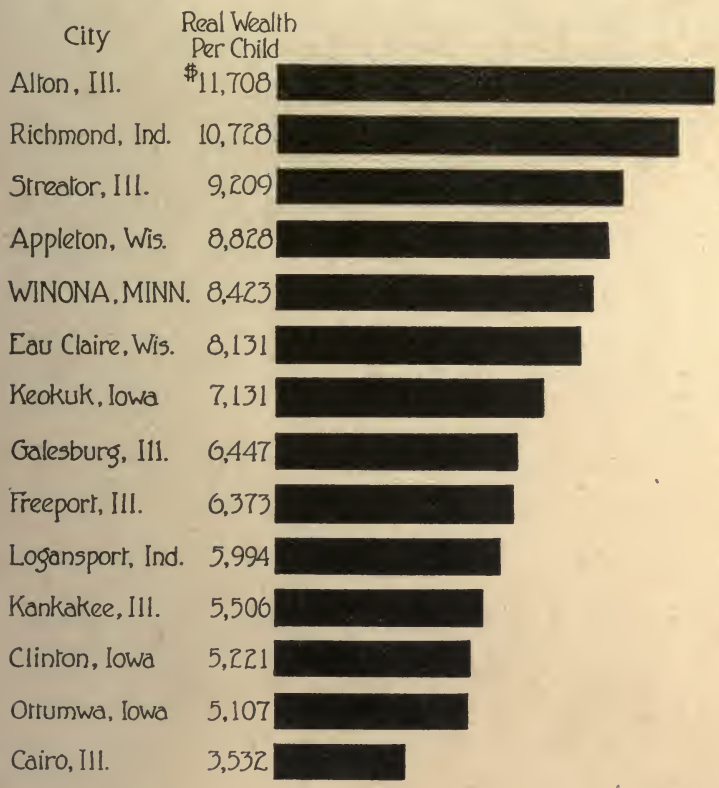
REAL WEALTH PER CHILD IN AVERAGE DAILY ATTENDANCE IN FOURTEEN MISSISSIPPI VALLEY CITIES OF ABOUT THE SAME POPULATION AS WINONA. DATA FOR 1917-18

City	Real Wealth per Child in Average Daily Attendance at School
1. Alton, Illinois	$11,708
2. Richmond, Indiana	10,728
3. Streator, Illinois	9,209
4. Appleton, Wisconsin	8,828
5. **Winona, Minnesota**	8,423
6. Eau Claire, Wisconsin	8,131
7. Keokuk, Iowa	7,131
8. Galesburg, Illinois	6,447
9. Freeport, Illinois	6,373
10. Logansport, Indiana	5,994
11. Kankakee, Illinois	5,506
12. Clinton, Iowa	5,221
13. Ottumwa, Iowa	5,107
14. Cairo, Illinois	3,532

Winona stands high in wealth behind each child in attendance at school.

CHART 8

REAL WEALTH PER CHILD IN AVERAGE DAILY ATTENDANCE IN WINONA AND THIRTEEN COMPARABLE CITIES



The cities compared in this figure are all in the middle west and have had approximately the same rate of growth as Winona. Compared with these cities, Winona ranks high in wealth per child to be educated.

Table XXVII compares Winona with other Minnesota cities. Winona ranks fourth in per capita assessed valuation of real estate and personal property. Since the ratio of assessed valuation to true valuation is the same throughout the state, it is possible to compare the wealth of these cities by studying the assessed valuations. The per capita assessed valuation in Winona is $461. The middle Minnesota city has $435.50. It is evident that Winona has more wealth than the average Minnesota city.

In addition to the above showing of wealth, Winona has about nine million dollars in moneys and credits which is taxed at $3 a thousand all over the state. One third of the money raised by this tax goes to the school district. During the fiscal year, ending March 31, 1922, the Winona school district received $9,954.61 from this source. Table XXVIII shows that Winona has a decidedly higher per capita valuation of moneys and credits than any of the Minnesota cities with which it seems fair to make comparisons. She has nearly six times the per capita valuation in moneys and credits of the lowest city in this group and more than three times the per capita valuation of the middle city. Bond dealers and others, who ought to know, state it as their opinion that Winona has proportionally more wealth in moneys and credits than other cities of the state, with the possible exception of Duluth. We must conclude, then, that Winona has even more wealth than her neighbors. She has not failed to build schools because she is poor. Due to her large wealth and lack of a building program in past years, her tax rate has consistently been last

TABLE XXVII

ASSESSED VALUATION OF REAL ESTATE AND PERSONAL PROPERTY AND THE ASSESSED VALUATION PER CAPITA IN TEN MINNESOTA CITIES WHICH HAVE GROWN IN POPULATION AT ABOUT THE SAME RATE AS WINONA AND ARE OF ABOUT THE SAME TYPE*

City	Assessed Valuation Real and Personal Property	Assessed Valuation Real and Personal Property per Capita
Mankato	$7,256 229	$582
Red Wing	4,721,852	546
Owatonna	3,551,104	489
Winona	9,012,716	461
Moorhead	2,513,070	439
Willmar	2,548,691	432
Fergus Falls	2,893,042	381
Faribault	4,116,420	371
Crookston	2,507,907	367
Brainerd	3,024,354	315

* *Minnesota State High School Inspector's Report*, 1921.

Compared with Minnesota cities, Winona is above the average in wealth per capita.

or next to last in the group of cities studied. For a long time her people have had a very light tax load on account of their schools. They should not complain of heavy taxes if the rate is considerably increased in the next few years. Table XXIX presents the facts upon which the above assertion is based.

TABLE XXVIII

TOTAL AND PER CAPITA WEALTH IN MONEYS AND CREDITS OF WINONA AND EIGHT OTHER COMPARABLE MINNESOTA CITIES*

City	Total Wealth in Moneys and Credits	Per Capita Wealth in Moneys and Credits
Winona	$8,991,321	$469 69
Red Wing	3,436,870	397.92
Mankato	1,742,468	139 74
Fergus Falls	1,608,956	212 23
Faribault	1,580,210	142 50
Owatonna	995,633	137.29
Crookston	948,154	138.92
Willmar	934.617	158.62
Brainerd	748,207	78.01

* Figures from State Tax Commission.

Winona is far in the lead of other Minnesota cities in both total and per capita amount of moneys and credits. She has over three times as much per capita in moneys and credits as the median of the Minnesota cities listed in this table.

TABLE XXIX

THE TAX LEVY IN MILLS FOR SCHOOL PURPOSES BY YEARS*

City	1920	1919	1917	1916	1914	1913	1909
Brainerd	31.4	27.9	19.35	16.73	19.75	17.71	18.29
Crookston	36.1	32.3	27.5	25.6	26.80	30.10	23.0
Faribault	38 4	33.1	23.0	19.2	12.1	12.2	12.4
Fergus Falls	31.6	30.8	25.0	22.3	14.3	17 8	21.8
Mankato	23.0	23.0	14.0	13.7	11.0	10.0	10.5
Owatonna	51.0	30.45	21.8	18 2	16.5	15.0	12.0
Red Wing	26 75	19.2	17.0	12.8	10.0	11.7	8.3
Winona	18.71	18.07	13.0	15.93	11.0	11 0	9.0
Median	31.5	29 2	20.1	17.5	13.2	13.6	12.2

* *Minnesota State High School Inspector's Reports.* 1909-20.

SCHOOL AND CITY TAX RATES

It has been pointed out in this chapter that Winona ranks high in wealth per inhabitant and in wealth per child enrolled in school. It has also been shown that Winona has the smallest per capita debt of a group of comparable Minnesota cities. It was further shown that during the past eighteen years Winona has made a decidedly smaller expenditure per inhabitant for school purposes and improvements than any other of this group of Minnesota cities. It would be interesting to know whether or not Winona is displaying the same extremely conservative attitude in taxation for municipal purposes which she displays in taxation for school support. Do the schools get their fair share of the money raised by taxation? The answer to this question is found in Table XXX and Chart 9. In Winona the major portion of the money raised by local taxation has been devoted to municipal purposes. Of all the Minnesota cities listed in Table XXX, Winona has the highest tax rate for city purposes. In tax rate for school purposes,

TABLE XXX

RELATIVE MUNICIPAL AND EDUCATIONAL EFFORT AS EXPRESSED IN TAX RATE IN MILLS OF WINONA AND EIGHT OTHER COMPARABLE MINNESOTA CITIES, 1921-22

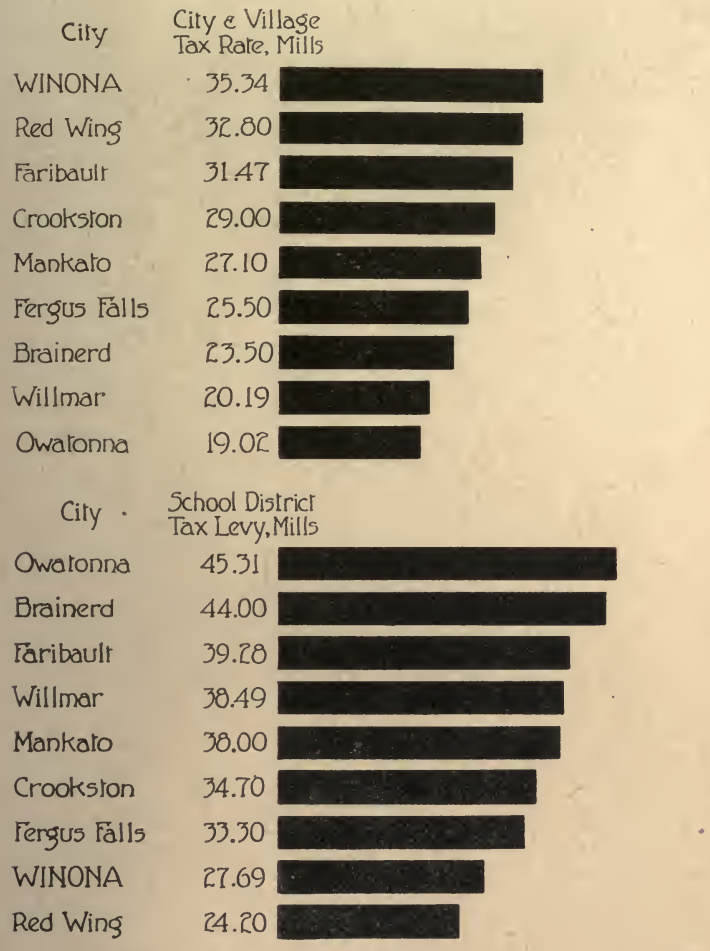
City	City and Village Tax Rate in Mills*	City	School District Tax Rate in Mills
Winona	35.34	Owatonna	45.33
Red Wing	32.80	Brainerd	44.00
Faribault	31.47	Faribault	39.28
Crookston	29.00	Willmar	38.49
Mankato	27.10	Mankato	38.00
Fergus Falls	25.50	Crookston	34.70
Brainerd	23.50	Fergus Falls	33.30
Willmar	20.19	**Winona**	27.69
Owatonna	19.02	Red Wing	24.20

* From figures compiled by State Tax Commission.

Of the cities shown, Winona has the largest tax rate for municipal purposes and next to the smallest tax rate for education. Winona and Red Wing are the only cities with a school tax smaller than the municipal tax.

CHART 9

RELATIVE MUNICIPAL AND EDUCATIONAL EFFORT AS EXPRESSED IN TAX RATE IN MILLS, OF WINONA AND EIGHT OTHER COMPARABLE MINNESOTA CITIES, 1921-22



In comparison with other cities, Winona underemphasizes taxation for school purposes. Winona ranks highest in tax rate for municipal functions and next to the lowest in tax rate for school purposes. Although all other cities, except one, had a school tax rate from 5.7 to 26.3 mills greater than the municipal tax rate, Winona's school rate was 7.6 mills lower.

Winona ranks next to the last. With two exceptions, all cities listed in this table have a much higher tax rate for education than for municipal purposes. Winona's tax rate for schools is almost 8 mills lower than her tax rate for city purposes.

CAN WINONA FINANCE A $1,150,000 BUILDING PROGRAM?

In Chapter III, it was estimated that the approximate cost of the building program recommended for Winona, including the purchase of the necessary land and expenditures for equipping the buildings, would be about $1,150,000. How will the bonding of the city for this amount affect the tax rate? Can Winona carry this debt without placing an unduly heavy burden on the taxpayers of the city? Allowing for a reasonable increase in the valuation of taxable property, calculations show that Winona could retire a bond issue of $1,150,000 in thirty years with an average yearly increase of 8 mills over her present school levy.

The total tax levy for school purposes in Winona was 28.69 mills for the school year 1921-22.[1] A levy of 8 mills added to this would make a total of 36.69 mills. Would this be an unreasonable tax levy as compared with other Minnesota towns and cities? Reports on file in the office of the state superintendent of public instruction show that it would not. In Table XXXI, the total school levies of twenty-eight Minnesota towns and cities are given. If Winona should add to her present total school levy the additional 8 mills required to retire a bond issue of $1,150,000 in thirty years, she would still have a lower levy than any of these twenty-eight cities had during the school year 1921-22.

SUMMARY

1. Compared with nine other comparable Minnesota cities, Winona ranks last in per capita bonded indebtedness for schools. Winona has a per capita debt of only $10.50 whereas the median per capita indebtedness for these cities is $27.65.

2. Compared with seven other Minnesota cities as to per capita yearly expenditures for land, new buildings, and school

[1] From report on file in the office of the state superintendent of public instruction. This figure is one mill greater than the levy, quoted above, from the State Tax Commission. This difference is doubtless due to the inclusion of the state one-mill levy in the report to the state superintendent.

equipment for a period of years, ranging from 1904 to 1921, Winona stands at the foot of the list with only $0.56 per inhabitant per year, whereas the median for these cities is $1.65.

3. In a list of fourteen Mississippi Valley cities of approximately Winona's population and general characteristics, Winona ranks sixth in per capita wealth. In a list of ten Minnesota cities

TABLE XXXI

TOTAL SCHOOL TAX LEVIES IN CERTAIN MINNESOTA TOWNS AND CITIES FOR THE SCHOOL YEAR, 1921-22*

City	Total School Levy in Mills
Grand Forks	94
Montevideo	75
Bemidji	64.9
Moorhead	57.5
Little Falls	56.6
Lanesboro	55
Mantorville	49 8
Park Rapids	48.3
Wabasha	47 7
Two Harbors	46.28
Owatonna	45.33
Alexandria	44.92
Brainerd	44
Breckenridge	42.45
Albert Lea	42 1
Austin	41.93
St. James	41 9
Lake City	41 87
Olivia	39.9
Faribault	39.3
Morris	39
Willmar	38.5
Northfield	38.4
Pipestone	38.3
Mankato	38
St. Cloud	37.1
Stillwater	36.8
Winona (Present levy and proposed additional 8-mill levy for bonds)	36.69

* From reports on file in the office of the state superintendent of public instruction.

which have grown in population at almost the same rate as Winona, she ranks fourth in per capita wealth.

4. In the list of fourteen Mississippi Valley cities, referred to above, Winona ranks fifth in wealth per pupil in average daily attendance. Winona, therefore, ranks high as to the amount of wealth behind each child attending school.

5. Winona could retire a bond issue for school buildings, amounting to $1,150,000 in thirty years with an addition of 8 mills to her present school levy.

APPENDIX A

SCORE CARD FOR CITY SCHOOL BUILDINGS[1]

SCORE OF BUILDING

	1	2	3
I. SITE	..	..	125
A. Location	..	55	..
1. Accessibility	25	..	..
2. Environment	30	..	..
B. Drainage	..	30	..
1. Elevation	20	..	..
2. Nature of soil	10	..	..
C. Size and Form	40	40	..
II. BUILDING	..	..	165
A. Placement	..	25	..
1. Orientation	15	..	..
2. Position on site	10	..	..
B. Gross Structure	..	60	..
1. Type	5	..	..
2. Material	10	..	..
3. Height	5	..	..
4. Roof	5	..	..
5. Foundations	5	..	..
6. Walls	5	..	..
7. Entrances	10	..	..
8. Aesthetic balance	5	..	..
9. Condition	10	..	..
C. Internal Structure	..	80	..
1. Stairways	35	..	..
2. Corridors	20	..	..
3. Basement	15	..	..
4. Color scheme	5	..	..
5. Attic	5	..	..

[1] By Strayer and Engelhardt. Published by the Bureau of Publication, Teachers College, Columbia University.

SCORE CARD FOR CITY SCHOOL BUILDINGS—*Continued*

	1	2	3
III. Service System	..	..	280
A. Heating and Ventilation	..	70	..
1. Kind	10	..	..
2. Installation	10	..	..
3. Air supply	15	..	..
4. Fans and motors	10	..	..
5. Distribution	10	..	..
6. Temperature control	10	..	..
7. Special provisions	5	..	..
B. Fire Protection System	..	65	..
1. Apparatus	10	..	..
2. Fireproofness	15	..	..
3. Escapes	20	..	..
4. Electric wiring	5	..	..
5. Fire doors and partitions	10	..	..
6. Exit lights and signs	5	..	..
C. Cleaning Systems	..	20	..
1. Kind	5	..	..
2. Installation	5	..	..
3. Efficiency	10	..	..
D. Artificial Lighting System	..	20	..
1. Gas and electricity	5	..	..
2. Outlets and adjustment	5	..	..
3. Illumination	5	..	..
4. Method and fixtures	5	..	..
E. Electric Service System	..	15	..
1. Clock	5	..	..
2. Bell	5	..	..
3. Telephone	5	..	..
F. Water Supply System	..	30	..
1. Drinking	10	..	..
2. Washing	10	..	..
3. Bathing	5	..	..
4. Hot and cold	5	..	..

SCORE CARD FOR CITY SCHOOL BUILDINGS—*Continued*

	1	2	3
G. Toilet System	..	50	..
1. Distribution	10	..	..
2. Fixtures	10	..	..
3. Adequacy and arrangement	10	..	..
4. Seclusion	5	..	..
5. Sanitation	15	..	..
H. Mechanical Service System	..	10	..
1. Elevator	5	..	..
2. Book-lifts	2	..	..
3. Waste-chutes	3	..	..
IV. Classrooms	..	..	290
A. Location and Connection	35	35	..
B. Construction and Finish	..	95	..
1. Size	25	..	..
2. Shape	15	..	..
3. Floors	10	..	..
4. Walls	10	..	..
5. Doors	5	..	..
6. Closets	5	..	..
7. Blackboards	10	..	..
8. Bulletin board	5	..	..
9. Color scheme	10	..	..
C. Illumination	..	85	..
1. Glass area	45	..	..
2. Windows	30	..	..
3. Shades	10	..	..
D. Cloakrooms and Wardrobes	25	25	..
E. Equipment	..	50	..
1. Seats and desks	35	..	..
2. Teacher's desk	10	..	..
3. Other equipment	5	..	..

SCORE CARD FOR CITY SCHOOL BUILDINGS—*Continued*

	1	2	3
V. Special Rooms	..	..	140
A. Large Rooms for General Use	..	65	..
1. Playroom	10	..	..
2. Auditorium	15	..	..
3. Study hall	5	..	..
4. Library	10	..	..
5. Gymnasium	10	..	..
6. Swimming pool	5	..	..
7. Lunch room	10	..	..
B. Rooms for School Officials	..	35	..
1. Officers	10	..	..
2. Teachers' room	10	..	..
3. Nurse's room	10	..	..
4. Janitor's room	5	..	..
C. Other Special Service Rooms	..	40	..
1. Laboratories	20	..	..
2. Lecture rooms	10	..	..
3. Storerooms	5	..	..
4. Studios	5	..	..
Totals	1,000	1,000	1,000

APPENDIX B

ADVANTAGES OF A CENTRAL JUNIOR HIGH SCHOOL

It has been recommended in the body of the survey that all seventh grade pupils of Winona be accommodated in the proposed new junior high school building. Whenever pupils from individual elementary schools are transferred to a central building, there is always complaint on the part of some of the patrons because of the fact that the pupils are taken away from the community school building and are forced to walk greater distances. The elementary school principals also frequently complain because their more advanced pupils are taken away. Since these criticisms are likely to arise in case all the seventh grade pupils in Winona are accommodated in a single junior high school building, it is desired to set forth in this appendix some of the chief reasons why such a procedure would be desirable educationally.

In the first place, the seventh grade pupils would receive much better educational advantages if they went to a single central junior high school than they would in individual elementary school buildings. This is true because of the fact that it would be possible to have, in a large junior high school, departmental teachers, each teaching one or at most not more than two special subjects. Such teachers, who would be specialists, could do much better teaching than the general grade teacher who would have to teach these pupils in the individual elementary school buildings. The instruction which the seventh grade pupils would receive at the single central junior high school would also be better because better equipment could be provided; more kinds of laboratory room would be available, and a larger library could be provided for their use.

In the second place, it would be very much less expensive for the district to place all the seventh grade pupils in a single junior high school building because the elementary schools could then be built without manual training rooms, domestic science rooms, and the other special rooms which would be needed for seventh grade instructional purposes. It would be less expensive because the seventh grade pupils could be more economically classified

if they were grouped in one building. For example, suppose there were four seventh grade classes in as many elementary school buildings. Suppose these classes had enrollments of 18, 26, 19, and 25, respectively. During each recitation period, it would take the time of four teachers to instruct these pupils in the four elementary schools. If they were attending a single central junior high school, they could be instructed in three classes, which would be a saving in the time of one teacher.

In the third place, the central junior high school would be advantageous for the seventh grade pupils because it has been found that the seventh grade marks the beginning of the adolescent period for a very large number of boys and girls. Consequently, this is the grade with which junior high school instruction should begin. It is therefore very strongly recommended that the seventh grade pupils be sent to the central junior high school.